

**Adolphe Sax's Brasswind Production**  
**with a Focus on Saxhorns and Related Instruments**

*Evgenia Mitroulia*



Doctor of Philosophy  
School of Arts, Culture and Environment  
College of Humanities and Social Science  
University of Edinburgh  
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*For my niece Dimitra who was born on 29 November 2010  
when this thesis was submitted for examination*



## **DECLARATION**

I declare that this dissertation has been composed by me and that the work reported in it is my own. I further declare that the work has not been submitted for any other degree or professional qualification.

Evgenia Mitroulia



## **Abstract**

Adolphe Sax developed in Paris in the early 1840s a family of brass instruments, the saxhorns, which gained an immediate popularity in France, Britain and other parts of the world. The originality of saxhorns was challenged at the time through long-lasting litigations, and is still questioned by many researchers. This thesis investigates the development of the saxhorn from an organological standpoint. Saxhorns are examined in comparison to instruments predating them by other makers, along with relevant archival material (patents, lawsuit minutes, daily press, publicity material etc.) so as to reveal whether the allegations against their originality were sound. It is noticed that idiosyncrasies of intellectual property law of the time facilitated a strong interaction between musical instrument makers particularly of France and Britain. Instruments examined are Adolphe Sax saxhorns, saxhorns by other contemporary makers, mainly French and British, but not exclusively, as well as a number of related instruments, made before and after the development of Sax's saxhorns. The assertions of Sax's rivals are not fully confirmed based on the analysis of instrument measurements. It is also argued that the saxotromba family, so far considered extinct, is in fact represented by two members in the saxhorn family, the alto and the baritone.

A number of related instruments emerged around the middle of the nineteenth century in various wraps and with different names. These are compared to saxhorns and classified according to bore-profile properties. Only certain groups were distinct, whereas most were essentially saxhorns in different forms. Sax's brasswind production as a whole is reviewed not only as an enumeration of his developments, but also to provide an assessment of the genuine innovation in his work.



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# Chapter One

## Introduction

The brasswind patents of Adolphe Sax were the cause of a long series of litigations, which involved most of the well-known brass instrument makers of the time within the French borders and some other European makers. Sax's opponents alleged that Sax had copied their instruments when he introduced his saxhorns and saxotrombas and that there was nothing new about them but their name. They managed to annul his 1845 patent for some time. Sax denied their accusations and managed to make his patent valid again after a few years. Then in his turn he took some of his adversaries to court with the accusation of having copied his instruments during the period of his patent's nullification.

Adolphe Sax has often been a research topic for organologists and musicologists. His life and instruments have been the subject of books, conference presentations and journal articles. However, the saxophone has received the greatest attention of all his instruments, whereas saxhorns and saxotrombas have not been the subject of a thorough and systematic study. Correcting this imbalance was the author's objective in her research.

The scope of this thesis is the examination of the brasswind production of Adolphe Sax, with the focal point being instruments of the saxhorn/saxotromba family, as well as related instruments made not only in the Sax workshop, but also by other makers. Relevant surviving instruments have been examined along with primary nineteenth-century sources, such as patents and court case minutes, so as to present the development of saxhorns in the Sax workshop and elsewhere. The saxotrombas, a group of instruments also introduced by Sax, are examined. It is argued that instruments which became known as the alto and baritone saxhorn are in fact the alto and baritone saxotrombas. The alto saxhorn, as Sax envisaged it (as an instrument of wider dimensions than the saxotromba), must have never been realized commercially, at least in his workshop. Instrument models which pre-existed Sax's saxhorns and saxotrombas have also been examined here, so as to investigate any correlations. Relevant instruments of similar bore profile characteristics, which

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emerged after Sax's patents of the mid-1840s, have also been examined and compared with saxhorns, so as to determine which of the novelties of the second half of the nineteenth century had any distinctive features. Relevant instruments from parallel traditions, such as brass instruments used in the British brass band movement have also been studied, so as to show any developmental characteristics. France and Britain have been the main focus since they were part of the same marketplace. It is maintained that patent legislation of nineteenth century allowed the importation of inventions or products from the French musical instrument making scene into Britain, resulting in a strong interaction between France and Britain in the making of brass musical instruments. Instruments from traditions other than Britain or France, such as the United States of America and Germany, have also been considered but to a more limited degree.

Saxhorns are valved brass instruments of intermediate bore profile (as discussed later in this chapter) made by Adolphe Sax in Paris from 1843 onwards. (Typical values of various parameters for all the differently pitched members of the saxhorn group can be found in Chapter Eight.) Similar instruments made by other makers in France throughout the nineteenth century are also called "saxhorns" here. Although Sax's saxhorns for a long time were characterized by the use of Berlin valves (usually three or four, rarely more, depending on instrument size), saxhorns made during the second half of the nineteenth century by Sax and other makers were also made with Périnet, and later other (for example independent), valves. For similar instruments from other countries, such as Britain or the United States of America, even when they share similar bore profile characteristics with saxhorns, there has been an effort to maintain the terminology used in the instrument's original playing environment. The terminology choice is made, thus, according to geographical criteria.

### **1.1 Adolphe Sax: a brief outline**

Antoine-Joseph Sax (known as Adolphe Sax) was born in the Belgian town Dinant in 1814. His father, Charles-Joseph Sax, was a musical instrument maker in Brussels. Adolphe had the first encounter with instrument making in his father's workshop. As a clarinet player, Adolphe was concerned with the instrument's

imperfections, so his first patent issued in 1838, dealt with the development of the bass clarinet. Eventually Sax moved to Paris in 1842, and in 1843 opened his instrument making workshop in rue Neuve Saint-Georges. Sax acquired the support of prominent figures of the time, such as Berlioz, Kastner, Meyerbeer and others. Berlioz often wrote about Sax's new instruments in his column in the *Journal des Débats*. In 1845 Sax competed against Michelle Carafa, director of the Gymnase Musicale Militaire, during an open-air contest in Le Champ de Mars in Paris. Two bands organized by Carafa and Sax played at the presence of a big crowd. Sax's band consisting mainly of saxhorns and other instruments improved by him was nominated the winner. The composition of his band was chosen as an advantageous one and became the guide for the re-organization of French military bands. An official military decree was issued in August 1845 including saxhorns and other brass instruments *système Sax* in the official composition of French infantry and cavalry bands.<sup>1</sup> Sax's saxhorns and saxotrombas were under patent protection at the time and as a consequence in this way Sax acquired a monopoly for providing the French army with instruments. This was not well-received by the majority of Parisian makers. A long series of litigations against the originality of Sax's instruments started; in 1848 part of the 1843 patent (specifically the part which regarded the addition of tuning slides to the valves), and the 1845 patent (which regarded the invention of the saxotromba as an instrument and as a form) were annulled. A military decree of the same year removed the "sax" prefix from instruments used in the military bands causing, thus, Sax great financial loses. A series of appeals both by Sax and his rivals concerning the court decision of 1848 followed, resulting in 1854 Sax's rivals demands for the nullity of his patents being dismissed. Sax's opponents were also condemned to pay Sax damages. The 1843 patent had only been issued for five years, so by that time it had already expired. The 1845 saxotromba patent continued being valid until 1860 when Sax managed to acquire an extra five-year period protection. Sax in his turn prosecuted his opponents for having manufactured copies of his instruments. He managed between 1855 and 1859 to have many French makers signing license agreements, for manufacturing his brass instruments which lasted until the expiry of his 1845 patent in October 1865. The

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<sup>1</sup> For more information on military decrees regarding the composition of Army bands from 1845 and throughout the nineteenth century see Appendix E.

ministerial decree of 1854 had brought Sax's instruments into French army bands again; saxophones which had been patented in 1846 were also included in the composition of military bands in 1854.

Although having acquired the monopoly for providing the army with instruments, Sax's business was declared bankrupt three times; the first was in 1852. The second and third bankruptcies were in 1873 and 1877, respectively. The long-lasting lawsuits had damaged the maker financially. After the last bankruptcy Sax's private collection of musical instruments was also sold during an auction.

Between 1847 and 1892 Sax held the post of the music director of the Paris Opéra stage band, known as *banda*. There he had the chance to use many of his instruments. In 1892 the post was taken over by his son Adolphe-Edouard (1859-1945) and the band was called *fanfare* thereafter. Adolphe-Edouard also took over his father's workshop after Adolphe's death. Eventually, in 1928 the business was sold to Selmer.

## 1.2 Previous work on Sax and his brasswind production

Sax's first biography was written during his lifetime by his close friend, Oscar Comettant. Comettant's work *Histoire d'un inventeur au dix-neuvième siècle* published in Paris in 1860 is the earliest biographical tribute to Sax.<sup>2</sup> Most of the later works draw from Comettant, although as he was one of Sax's friends his writings should be used with caution.

Jean-Georges Kastner was another close friend of Sax who also devoted a considerable amount of his writings to Sax. His *Supplément*<sup>4</sup> to the *Traité d'instrumentation*<sup>5</sup> published in 1844 promoted Sax's instruments. Kastner over his lifetime also published nine *livre-partitions*, works which combine an extensive text on a specific subject with musical composition related to the previous discussed topic. In most of them the usage of Sax's instruments woodwinds and brasswinds is obvious. The best-known work by Kastner is his *Manuel général de musique*

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<sup>2</sup> Oscar Comettant, *Histoire d'un inventeur au dix-neuvième siècle: Adolphe Sax, ses ouvrages et ses luttes* (Paris: Pagnerre, 1860).

<sup>4</sup> Kastner, *Supplément au Traité général d'instrumentation* (Paris: [n.p.], 1844).

<sup>5</sup> Jean-Georges Kastner, *Traité général d'instrumentation, comprenant les propriétés et l'usage de chaque instrument, précédé d'un résumé sur les voix, à l'usage des jeunes compositeurs* (Paris: [n.p.], 1837).

*militaire* published in Paris in 1848.<sup>6</sup> There Kastner discussed extensively the usage of the Sax instruments in the French military band, discussed Sax's instruments and their characteristics, and presented illustrations depicting the saxhorn and saxotromba families among other instruments. The iconographical evidence included in this work is invaluable since few other iconographical sources from this early period survive. However, in this case also the information provided should be used with caution. Inarguably Kastner seems to have had a broad spectrum of knowledge regarding musical instruments in his time but in many cases inaccuracies have been found.

Adolphe le Doulcet marquis de Pontécoulant and François-Joseph Fétis have also discussed Sax in their works. Pontécoulant in the second tome of his *Organographie* published in 1861<sup>7</sup>, particularly in the chapter regarding military music, deals extensively with the story with the competition between Sax and Carafa for the composition of the military bands and presents a short history of the various litigations involving Sax and his rival makers.

Fétis included biographies of the various members of the Sax family including brief descriptions of most of their inventions in his *Biographie universelle des musiciens et bibliographie générale de la musique*.<sup>8</sup> Two editions were completed, the first in 1860 and the second in 1883. The latter thus covers the years after Comettant's publication.

The first relatively extensive twentieth-century work covering to some extent Sax's inventions was Rebekah Crouch's doctoral thesis titled *The Contributions of Adolphe Sax to the Wind Band* submitted to Florida State University in 1968. Crouch's information on Sax's developments for brass instruments derives mainly from Kastner's *Manuel General de Musique Militaire* and does not draw on other significant primary sources such as patents, or the instruments themselves.

Malou Haine's thesis on Sax submitted to the Université de Bruxelles and later published as a book with the title *Adolphe Sax: sa vie, son oeuvre, et ses*

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<sup>6</sup> Kastner, *Manuel général de musique militaire à l'usage des armées françaises* (Paris: E. Didot frères, 1848).

<sup>7</sup> Adolphe Le Doulcet marquis de Pontécoulant, *Organographie: Essai sur la facture instrumentale. Art, industrie, et commerce*, vol. 2 (Paris: Castet, 1861).

<sup>8</sup> François-Joseph Fétis, *Biographie universelle des musiciens et bibliographie générale de la musique*, eight volumes (Paris: Firmin-Didot et Cie, 1883-84).

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*instruments de musique*<sup>9</sup> is a monumental work. Haine managed to locate a great number of primary sources thus presenting a detailed biography of Sax. She discussed Sax's life and gave an objective overview of his activities as a maker. Without focusing on any specific aspect of his instrument production, this book is an excellent objective source of information and a good basis for further work on Sax as an instrument maker.

In 1980 the first extensive work on Sax was published in English by Wally Horwood entitled *Adolphe Sax 1814-1894: His Life and Legacy*. The first edition was followed by a revised, longer edition in 1983.<sup>10</sup> Although Horwood's book was published in the same year as Haine's book he seems not to have been aware of Haine's parallel work and either the existence of her thesis or the publication of her book. The importance of his book is that it constitutes the first extensive source regarding Sax in English, and is thus accessible to a wider readership. However, some information provided is not accurate. Horwood did not locate or study many primary sources. In many cases he fails to differentiate between reliable information and his own views. Although the book received good reviews at the time of its publication, it is inadequate for the musical instrument scholar.

In 2004 Jean-Pierre Rorive published a new biography of Sax titled *Adolphe Sax 1814-1894. Inventeur de génie*.<sup>11</sup> Rorive treated Sax's life from the point of view of a saxophonist. He does not always refer to the original documents, such as those regarding the lawsuits, and only refers to parts of them cited in other sources such as Comettant. A few primary sources regarding French military bands not mentioned by Haine have been located and studied, but as a whole his book provided little new material regarding Sax's brasswind production.

In 1980 Malou Haine and Ignace de Keyser published a catalogue of all Sax instruments in the collection of the Musée des Instruments de Musique in Brussels. This *Catalogue des instruments Sax au Musée Instrumental de Bruxelles*<sup>12</sup> is the first publication giving detailed attention specifically to Sax instruments. Brass and woodwind instruments made by Adolphe Sax, his father Charles Sax and his brother

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<sup>9</sup> Brussels: Editions de l'Université de Bruxelles, 1980.

<sup>10</sup> First edition published by Bramley, 1980; second edition by Egon Publishers Ltd.

<sup>11</sup> Brussels: Editions Racine, 2003.

<sup>12</sup> Brussels: Musée Instrumental, 1980.

Alphonse in the Brussels museum are catalogued in detail. Also, an appendix with all known musical instruments up to that point made by the Sax family and two brass instruments licensed by Adolphe Sax is included. This list was the basis upon which the present author and Arnold Myers worked to create an updated online listing of all known Adolphe Sax instruments (brass and woodwinds) titled *List of Adolphe Sax Instruments*. This is supplemented regularly with new information, and is available to the general public through the World Wide Web, in <http://www.galpinsociety.org/gdsl.html>. This catalogue has been an invaluable tool in the detailed study of Sax's brasswinds.

## 1.3 Sources

### 1.3.1 Patents and registered designs

Some of the most important primary sources have been the brasswind patents of Adolphe Sax and other makers, available at the Institut Nationale Propriété Industrielle (INPI) in Paris. Information on patents of makers coming from countries other than France was drawn mainly from *The New Langwill Index*.<sup>13</sup> Copies of British registered designs were acquired through the National Archives of the United Kingdom. Some Austrian patents were acquired through the Austrian Intellectual Patent Office. Although being an irreplaceable source of information, patents have proved to be a difficult tool to use. One reason for this is that nineteenth-century French patents are handwritten and not always legible. This problem is usually aggravated by the fact that the Institut Nationale Propriété Industrielle in Paris provides black-and-white photocopies of French patents, and usually not of a good quality. The originals which contain colours in their drawing sections are not accessible to the general public. Moreover, in some cases the original scale for the patent drawing section, although it must have been accompanying the original, is missing from the copies available to the public.

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<sup>13</sup> William Waterhouse, *The New Langwill Index of Wind Instrument Makers and Inventors* (London: Tony Bingham, 1993).

### **1.3.2 Surviving instruments**

The most valuable source is the body of surviving instruments in public and private collections worldwide. Locating instruments in private collections is challenging since it requires networking: in most cases private collectors do not issue catalogues. A great number of surviving brass instruments coming from the Sax workshop is in the Musée de la musique in Paris. Some of these were originally part of the Sax's private collection, auctioned in 1877. An equally significant collection of Sax instruments is at the Musée des Instruments de Musique in Brussels. Gathering measurements and other information regarding historic instruments was a painstaking procedure that lasted over five years and involved much travel. The difficulty in acquiring financial support for research trips in some cases resulted in instruments in remote collections not being studied. Eight research visits to Paris, two visits to Brussels, one visit to Dinant (Sax's birth place), two visits to the United States, one visit to Germany, and several trips within Britain were undertaken to examine primary sources, including the measurement of instruments. In other cases, measurements made by Arnold Myers in his research were used.

Numerous problems occur in the study of instruments in public and private collections. Often, both private and public collections offer inadequate documentation of their instruments. The study of mouthpieces is a very problematic aspect of any research regarding historic brasswinds. There is insufficient information on the exact mouthpiece types preferred for historic instruments and in the literature the descriptions are too vague. A large number of surviving mouthpieces are unsigned, unlike most brass instruments. In most cases catalogues do not record the usage of specific mouthpieces for certain instruments or instrument types and do not record any information on the association of certain instruments with particular mouthpieces, although such information might have been available when the instrument and/or mouthpiece initially became part of a collection. Often a random choice is made for museum display purposes without the storage of sufficient information even for the identification of the mouthpiece makers. This can be misleading for the researcher since the random choice of mouthpieces is not usually indicated by any museum label. (The Edinburgh University Collection of Historic Musical Instruments is an exception since there the association of individual



mouthpieces with instruments is documented in detail.) Thus, in this study mouthpiece dimensions are not taken into consideration when instruments are measured.

### 1.3.3 Court-case minutes

An invaluable primary source of information is the minutes of the various lawsuits in which Sax was involved over many years. These are stored in the library of the Musée des Instruments de Musique in Brussels and the Bibliothèque Nationale de France, in Paris. As many relevant documents as possible were consulted. Some minutes published in legal newspapers of the time were also found in the Bibliothèque de l'Opéra in Paris in the *Dossier d'Artiste Adolphe Sax*, a short archive with press clippings and other documents relevant to Sax's life and his activities in the Paris Opéra. The minutes are considered important since they are, most of the time, the objective expression of both Sax's views and those of his rival instrument makers, recorded so that readers can develop their own unbiased opinion on the issues discussed. The only document related to the lawsuits which had been widely known to the scholarly community was an extract of the case *Rivet contre Sax*<sup>14</sup> which was reproduced by M.A. Soyer in Lavignac's *Encyclopédie de la musique*.<sup>15</sup>

### 1.3.4 Handbills and instrument makers' catalogues

A few handbills from the Sax workshop have survived.<sup>16</sup> Copies of the early ones can be found in the *Dossier d'artiste Adolphe Sax* in the library of the Paris Opéra and the last one in the Département de Musique of the Bibliothèque Nationale de France in Paris. The latter is reproduced here for the first time, whereas earlier handbills had been included in various publications, the best-known being the one dating from c. 1850. The later handbill of 1867 is cited in most sources as such, although this was originally part of the *Catalogue Officiel* regarding the French entries in the 1862 London International Exhibition.<sup>17</sup> This catalogue included a

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<sup>14</sup> *Nullité de brevet. Instruments et brevets Sax. Tribunal Correctionnel de la Seine, 6<sup>me</sup> Chambre. Affaire Rivet contre Sax. Documents* (Paris: Dondey-Dupré, 1855).

<sup>15</sup> Paris: Librairie Delagrave, 1925.

<sup>16</sup> See Appendix I for surviving handbills from the Sax workshop.

<sup>17</sup> *Exposition Universelle de 1862 à Londres. Section Française. Catalogue officiel publié par ordre de la commission impériale* (Paris: impr. Impériale, 1862).

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second page with illustrations that was not republished with the first page (today known as the 1867 handbill); both pages are reproduced.

A number of early catalogues and handbills from other makers' workshops have also been studied. Some of these have been studied through reproductions in *Larigot: Bulletin de l'Association des Collectionneurs d'Instruments à Vent*, and others have been located in various libraries. A good collection of nineteenth-century French makers' catalogues is located in the *Bibliothèque Historique de la Ville de Paris*. These catalogues provide significant iconographical and literary information.

### 1.3.5 Music for brass and instrumental tutors

A large number of nineteenth-century compositions for brass ensembles, especially those written by French composers, were studied. The main purpose here was to explore the instruments used by composers, determine the periods of usage of specific instruments and the nomenclature preferred by composers; the information derived was compared with the prevalent instrument models throughout the nineteenth century. Most of these works were located in the Département de Musique of the Bibliothèque Nationale de France in Paris. Instrumental tutors are a great source of information. These present a dual role: as sources of iconographical and literary evidence. A large number of these are in the Bibliothèque Nationale. Information coming from the tutors needs to be studied with caution and often with a critical eye taking into consideration the background and degree of specialisation of the tutor's author.

## 1.4 Taxonomic tools

Classification of musical instruments is a tool used by a large number of professionals dealing with musical instrument collections. Museum curators, organologists, makers of musical instruments and others classify instruments both for cataloguing and display purposes. Additionally, classification has proven an effective research tool since in some cases it reveals associations between previously unrelated instruments.<sup>18</sup>

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<sup>18</sup> Margaret Kartomi, *On Concepts and Classifications of Musical Instruments* (Chicago: University of Chicago Press, 1990), 3-15.

Most classification systems are usually based on the description of the instrument's morphology. The scheme followed for the taxonomy of brass instruments in this thesis is based on the instruments' dimensional characteristics. Instruments with similar bore profiles will have similar acoustical properties, and vice versa. This scheme is considered ideal for intermediate bore-profile instruments whose perplexing diversity and complex history would not allow the use of merely general criteria for classification. Morphological, cultural, historical characteristics of intermediate bore-profile instruments are not always sufficient as classification criteria since different instruments of this kind often present similar morphology, performance characteristics and historic background.

The most common classification scheme used for many musical instrument collections worldwide is that of Hornbostel and Sachs (1914). This system is more complex than other similar systems, such as that of Mahillon where instruments are only divided in four classes according to the mode of sound production: self-sounders (idiophones), membrane instruments, string instruments, and wind instruments. The Hornbostel-Sachs system takes into consideration the mode of sound production, the instrument's morphology and playing methods.

As far as brass instruments are concerned and intermediate brasswinds in particular, numerous generalizations result from the use of existing classification schemes. For instance, according the Hornbostel-Sachs classification scheme, brass instruments are divided in three categories regarding their bore profile; valve bugles include instruments with conical bore throughout, valve horns including instruments with predominantly conical bore and valve trumpets incorporating instruments with cylindrical bore throughout. Saxhorns and other instruments of intermediate bore profile should, thus, be classified as valve horns. The same can be said about cornets. However, are saxhorns and cornets instruments of the same family? Additionally, if saxhorns are valve horns why do most scholars describe them as valve bugles?

In 1998 Arnold Myers through his doctoral dissertation submitted to the University of Edinburgh and titled *Characterization and Taxonomy of Historic Brass Musical Instruments from an Acoustical Standpoint* introduced various parameters exclusive to brass instruments for their taxonomy. Some of these were also followed by the author during the first stages of her research. Three parameters were used: the

diameter at mid-point length, parameter  $K$  regarding the proximal half of the instrument's tubing and parameter  $C$  regarding the distal half of the instrument's tubing.<sup>19</sup> Although these proved satisfactory new methods were introduced recently<sup>20</sup> and for taxonomic purposes of this thesis the new potential brassiness parameter (subsequently also called  $B$ ) is used together with the instruments' minimum diameter and diameter at mid-point length. Brassiness was first introduced by Pyle and Myers<sup>21</sup> and after further research and experiments were carried out it was presented in 2007.  $B$  or the "brassiness parameter" reflects the instrument's ability to produce brassy sounds, especially when playing during a *crescendo*.<sup>22</sup> If the bore of an instrument is divided into  $n$  elements then  $B$  is defined as:<sup>23</sup>

$$B \approx \sum_1^n \frac{\ln}{L(ecl)} \left( \frac{D_0}{D_n + D_{n-1}} \right)$$

where  $\ln$  is the tube length of each  $n$  element.  $D_n$  is the diameter at the end of each  $n$  element.  $D_0$  is the minimum bore which is usually located a few millimetres in the mouthpiece receiver.<sup>24</sup>  $L(ecl)$  is the equivalent cone length, which varies depending on pitch standards. For historic instruments, where playing tests are not an option, we can infer the playing pitch of an instrument when we know the time period and place where it was intended to be used, or from similar playable instruments, or even just by adding to the instrument's actual tube length the percentage of the mouthpiece length. The mouthpiece length, and additional lengths introduced by valves is not taken into consideration when measuring instruments for taxonomic purposes. The actual measured length of a brass instrument appears about ten percent shorter than its equivalent cone length, due to the missing mouthpiece length and end-corrections. Depending on the instrument size, the contribution of the mouthpiece can vary a little. Error in the estimation of the equivalent cone length is unlikely to contribute to

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<sup>19</sup> See Arnold Myers, *Characterization and Taxonomy of Historic Brass Musical Instruments from an Acoustical Standpoint*, PhD diss., University of Edinburgh 1998.

<sup>20</sup> See Arnold Myers, Gilbert, J., Pyle, R. W., Murray D. Campbell, "Non-linear Propagation Characteristics in the Evolution of Brass Instrument Design", paper read at the 19<sup>th</sup> International Congress on Acoustics, Madrid 2-7 September 2007. Published at [http://www.sea-acustica.es/WEB\\_ICA\\_07/fchrs/papers/mus-02-002.pdf](http://www.sea-acustica.es/WEB_ICA_07/fchrs/papers/mus-02-002.pdf) (Accessed 19/06/08).

<sup>21</sup> Robert W. Pyle Jr., and Arnold Myers, "Scaling of brasswind instruments" *Journal of the Acoustical Society of America* 119, no. 5 Pt.2 (May 2006): 3259.

<sup>22</sup> See Myers et al. "Non-linear Propagation Characteristics".

<sup>23</sup> The equation is taken from Myers et al. "Non-linear Propagation".

<sup>24</sup> See Conventions section (1.5) for a discussion on the minimum bore.

a more than three percent error in the total value of brassiness potential parameter  $B$ , so does not undermine the usefulness of parameter  $B$  as a taxonomic tool.

The measured length of an instrument can be measured with an accuracy of three percent. Minimum bore diameter can be measured with the same level of accuracy (three percent). Bore diameters along the length of an instrument can be measured with one percent accuracy, when it is possible to be measured directly internally (for example at the tuning slides) and with three percent accuracy when measured externally.<sup>25</sup> Again, errors in measurements at this level do not detract from the effectiveness of  $B$ , which can range between 0.3 and 0.9.<sup>26</sup>

Some members of the organological community have objected to any measurements taken from instruments when the performers are not involved and have argued that this way of examining a musical instrument cannot be of value. However, here it is argued that measurement data communicate information regarding instruments which otherwise would not be attainable. Measurements, when not performed *per se* can prove to be an invaluable source of information. For example, baritones and euphoniums are both made in 8-ft C or 9-ft B-flat. Their fundamental difference is their difference in bore-profile: baritones are narrower than euphoniums. Often, observation alone can be misleading as far as the distinction between the two is concerned. Such an example is an instrument in the Edinburgh University Collection of Historic Musical Instrument (inventory no. 1800), which had been previously and for a long time been catalogued as a baritone. When it was measured it was revealed that it was in fact a euphonium. Another case of a miscataloged instrument is a vocal horn in the Kneller Hall instrument collection. Its external appearance is that of a tenor cor, and it was catalogued as a tenor cor in the collection's archive. The present author's measurements showed that it is in reality a vocal horn in tenor cor wrap.

When data from measurements is studied in combination with documentary sources, the intentions of the makers can sometimes be unraveled, something that otherwise would not be feasible. Associations between instruments can be discovered. Evolutionary or developmental changes can be shown. Had not it been for our measurements the saxotromba would be still considered an extinct family of

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<sup>25</sup> For more on the accuracy of measuring data see Myers, *Characterization and Taxonomy*, 182-83.

<sup>26</sup> Myers et al. "Non-linear Propagation Characteristics".

brass instruments. Thanks to the way we measure it was possible to establish that Sax's plan for creating two distinct complete families of brasses, the saxhorns and the saxotrombas, never came into realization. Sax's commercial trick regarding the existence of a saxotromba family has now been exposed.

### 1.4.1 The measuring procedure

Myers and Parks introduced a method of measuring brass instruments.<sup>27</sup> The same measuring principles have been followed here. A regular tape measure is used for calculating the instrument's total length. The process followed is that described by Myers and Parks as the "mid-line approach"; the instrument's length is measured by following the centre of the bore, and not the outer or inner side of the tubing.<sup>28</sup> As discussed by Myers and Parks this has proved the most satisfactory approach for measuring a brass instrument so as to calculate parameters for taxonomic purposes. It should be noted that the techniques involved in measuring an instrument for making a replica would be more extensive.

The last part of the instrument's length, the bell length, is measured with the help of a steel ruler and a set of plastic rods. The suitable rod is selected after calculating the off-set between the bell diameter and the bore diameter at the point of reference (starting point for measuring bell length). This set of rods was made for the Edinburgh University Collection of Historic Musical Instruments by the workshop of the School of Physics, of the University of Edinburgh. The set of rods and the steel ruler are also used for calculating internal bore diameter at the bell and as far into the tubing as the instrument's wrap allows. The minimum diameter and diameter in the mouthpiece receiver are calculated by using a set of small-hole gauges and a caliper. The caliper is also used for calculating external bore diameters at various points in the instrument's tubing. Afterwards the double-wall thickness is subtracted and the internal diameters are used for calculating the various diameters. The only other points where internal bore diameter can be taken is at the valve slides or at the tuning slides when the instrument's condition allows. For plotting a satisfactory bore profile

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<sup>27</sup> Arnold Myers, Raymond Parks, "How to Measure a Horn", *Galpin Society Journal* 48 (March 1995): 193-94.

<sup>28</sup> Ibid.

of a brass instrument more diameter points need to be taken than would normally be taken for calculating parameters.

## **1.5 Thesis outline**

Chapter Two will examine some secondary material relevant to the study of musical instruments, material which is considered influential for the development of brass instrument making in the areas in question. Some of the factors which influenced the brasswind production and development in France and Britain are discussed here. The main points of discussion will be European nineteenth-century patent law, with a focus on patent legislation in France and Britain. Makers of musical instruments, as other inventors of that time, were well-aware of copyright law and tried to use it to their advantage. These conditions allowed a strong interaction, especially between makers in these two countries. Some facts regarding trade, and instrument trade in particular in France and Britain, are also discussed.

Chapter Three examines the brasswind production of Adolphe Sax as a whole. The main purpose of the chapter is not only to give an overview of Sax's production but mainly to identify the way Sax was influenced by other brass instrument makers and the way he in his turn affected makers outside and within the French borders. It appears that British makers were not only influenced by Sax but in many cases they directly copied him, taking advantage of the inefficiencies of British copyright law of the time. Evidently there was a trade between France and Britain in the instrument making terrain mostly as regards imports of instruments and instrument parts from France to Britain. Sax's patents other than those regarding saxhorns and saxotrombas are discussed here. His developments to various valve systems are also examined.

Chapter Four deals with the thesis's focal point: the saxhorns. The family's development is looked at in detail, and an overview of each pitch group as made by Sax is given. Instruments made by licensed makers are also examined. The saxtuba as made by Sax is also discussed. Some information regarding the transitional period, after Adolphe-Edouard Sax, Adolphe's son, took over the workshop is presented here. Main sources of information are primarily the surviving instruments, and

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secondarily the relevant patents, lawsuit documents, instrumental tutors, music of the time, etc.

Chapter Five deals with a very controversial subject: the saxotromba. Saxotrombas have been considered so far to be a complete family analogous to saxhorns, of a narrower bore, but today extinct. The ambiguous instrument dimensions given by Sax in his 1845 saxotromba patent have been used to identify surviving instruments as saxotrombas, something previously unattainable. Saxotrombas as an extensive family are considered to only be a fiction, whereas some models are shown to have existed and to have been the ancestors of certain instruments of the present day brass band.

Chapter Six looks into the dissemination of saxhorns outside France. Britain and the United States, where saxhorns had a broad use, are looked at in more detail. The role of the Distin family is re-examined. Issues of terminology and nomenclature are also discussed. The use of saxhorns in other countries is also reviewed here but very briefly.

Chapter Seven looks at the development of intermediate bore profile instruments related to saxhorns. Instruments and evidence for instruments which existed or claimed to have existed before the appearance of saxhorns are examined. A number of instruments especially in the intermediate register emerged after the appearance of saxhorns, most of them trying to compete with or improve the tenor saxhorn. Very often these were made in other-than-tuba forms, such as circular or s-shaped. The former were also trying to offer alternatives for the French horn whereas instruments such as the latter were attempting to attract attention, suggest innovation through their peculiarity or by their resemblance to the saxophone. Very few of them have survived to the present day, and in most cases they have been used as amateur or school band instruments.

In Chapter Eight, measurements of surviving instruments from the Sax workshop, from workshops of licensed makers and other makers, contemporary and later than Sax are discussed after evidence from primary sources have been discussed in previous chapters. The saxhorns' development as a family is examined, and also saxhorns are examined comparatively to other related instruments, mainly those discussed in Chapter Seven. Early saxhorns are also compared to later instruments by



other makers in various countries so as to investigate the place of Sax's production in the broader brass instrument making scene.

## 1.6 Conventions

The term “intermediate bore-profile” is mentioned frequently here when describing instruments studied in this thesis. It is used for instruments whose bore is not predominantly cylindrical, such as the trombone, or predominantly conical such the bugle (fr. *clairon*), but is intermediate between cylindrical and conical.

The term “evolution” when applied to a group of instruments signifies the existence of certain trends in the shape of their bore profile, observed in the group of instruments over the course of time, for example a continuous change in the values of parameters discussed in Chapter Eight. The term “development” is used to describe such characteristics when no obvious trends are shown.

A very critical dimension for the calculation of brassiness potential parameter is the minimum bore (subsequently called in this thesis  $D_{\min}$ ), usually located a few millimetres in from the mouthpiece receiver, and in very few cases of historic instruments right at the beginning of the mouthpiece receiver. It should be clarified that although in some instruments the actual minimum bore might be located further down their tubing, for example at the beginning of the valve section, the parameter  $D_{\min}$  (present in the definition of brassiness potential parameter) refers to the initial minimum bore, near the mouthpiece receiver which is taken as local minimum. The abbreviation  $D_{\text{mid}}$  refers to the diameter at the half-way point of the air column.

In Chapter Eight, where there is often discussion of graphs, the phrase “linearly separable” is used. The term is derived from analytical geometry, where two sets of points in a two-dimensional plane are called “linearly separable” if a single line can be drawn on that plane, dividing it into two half-planes such that all points of one set lie on one half-plane and all points of the second set lie on the other half-plane. In the same chapter, the term “outlier” is used in the description of graph results so as to describe a point which, while belonging in a group of points, is distant from the rest of the group. The term derives from statistics, where distance is defined in a mathematically rigorous manner; here, the term is used in a rather intuitive way.

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The term “wrap” is preferred here over the term “shape” for the description of the external form of brass instruments, and in particular the way their tubing is folded, since the term “shape” often also denotes the bore-profile, that is the dimensions of the tube intersections.

For saxhorns in 6-ft F or 6½-ft E-flat, Adolphe Sax used both the terms “alto” and “tenor” interchangeably over the years. The present author has preferred to use the term “alto” which appeared more often in nineteenth-century sources. Although it is shown that the alto saxhorn is in fact the alto saxotromba, the term “saxhorn” has been retained here for the description of the particular model, since this term has been established in modern and historic terminology. Similarly, the term “baritone saxhorn” is used instead of the term “baritone saxotromba” for the narrow-bore instrument in 8-ft C or 9-ft B-flat of the saxhorn group.

In some cases of instruments which have been measured, some (or all) of the original shanks and crooks or slides for alternative pitches are missing. When an essential part for calculating an instrument’s nominal pitch is missing, its length is postulated. This procedure is followed, only when we know with confidence from similar surviving instruments the dimensions of the missing part. In any case, when this procedure has been followed this is always stated in brackets (for example postulated F tuning-slide).

The “American standard” or “Note-octave notation” system has been chosen for the description of pitch in this thesis. In this system the lowest C on a piano keyboard is named C<sub>1</sub> and each subsequent C is named C<sub>2</sub>, C<sub>3</sub>, etc. Middle C is, thus, called C<sub>4</sub> in this system. All notes of an ascending octave beginning with a C are named using the same number, e.g. C<sub>2</sub>, C#<sub>2</sub>, D<sub>2</sub>, etc.

### 1.7 Published work

As the University of Edinburgh encourages research students to publish before submitting, the author has published some of the material appearing in this thesis in journals specializing on the study of musical instruments:

- Eugenia Mitroulia, with Géry Dumoulin and Niles Eldredge, “On the Early History of the Périnet Valve” *Galpin Society Journal* 61 (April 2008): 217-29, 255.

- Eugenia Mitroulia, with Arnold Myers, “Adolphe Sax: Visionary or Plagiarist?” *Historic Brass Society Journal* 20 (2008): 93-141.
- Eugenia Mitroulia, “The Saxotromba: Fact or Fiction?” *Journal of the American Musical Instrument Society* 21 (2009): 123-49 (for this publication the author was awarded the Clifford Bevan Award for Excellence in Research, by the International Tuba and Euphonium Association).
- Eugenia Mitroulia with Arnold Myers, “The Distin Family as Instrument Makers and Dealers” *Scottish Music Review* 2 (January 2011). Available at: <http://www.scottishmusicreview.org/index.php/SMR/article/view/20>.

Some research material was read in conference and symposia papers:

- Eugenia Mitroulia, “Adolphe Sax’s Bigger Brasses”, 35<sup>th</sup> Annual Meeting of the American Musical Instrument Society, University of South Dakota, Vermillion, 19-23 May 2006.
- Eugenia Mitroulia with Arnold Myers, “Adolphe Sax: Visionary or Plagiarist?”, Meeting of the Historic Brass Society, Musée de la musique, Paris, 29 June -1 July 2007.
- Eugenia Mitroulia, “The Elusive Identity of the Smaller Saxhorns” meeting of the Historic Brass Society held at the Musée de la musique, Paris, 29 June -1 July 2007.
- Eugenia Mitroulia, “The Saxotromba: Fact or Fiction?”, 37<sup>th</sup> Annual Meeting of the American Musical Instrument Society, Cantos Music Foundation, Calgary, 28 May - 1 June 2008 (for this paper the author was awarded the Frederick R. Selch Award for the best student paper).
- Eugenia Mitroulia with Arnold Myers. “The Distin Family as Instrument Makers and Dealers”, 38<sup>th</sup> Annual Meeting of the American Musical Instrument Society, University of Michigan, Ann Arbor, 21-24 May 2009.
- “France and Britain: Crossroads of Brass Instrument Making”, Joint Meeting of the Galpin Society and the Historic Brass Society, London and Edinburgh, 7-11 July 2009.
- Bruno Kampmann with Eugenia Mitroulia, “Instruments made by Adolphe Sax and his Son: evolution during the transitional period”, Joint meeting of the International

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Committee of Musical Instrument Museums and Collections, Galpin Society, American Musical Instrument Society, Historic Brass Society, Florence-Rome, 6-12 September 2009.

- Arnold Myers with Eugenia Mitroulia, “What We Learn From Measuring Instruments”, Joint meeting of the International Committee of Musical Instrument Museums and Collections, Galpin Society, American Musical Instrument Society, Historic Brass Society, Florence-Rome, 6-12 September 2009.

## **Chapter Two**

### **Some aspects of nineteenth-century brass instrument making**

The nineteenth century was a time when perhaps the greatest developments occurred in brass instrument making. During that time growing concern regarding the existence and protection of intangible property, namely intellectual property, led to reforms which formed the basis for copyright law. Study of patents on musical instruments, and brasswinds in particular, shows that makers were very well aware of patent law and they tried to exploit it fully. The different characteristics of the law from country to country meant that the activities of makers in each country had to adapt to local circumstances. A brief overview of the main aspects of patent law in France and Britain will be discussed in this chapter. Afterwards a concise outline of the law in Germany and Belgium, mainly for comparison, will be presented.

Duties on imported products in France and Britain and the trade policies of the two countries during the nineteenth century will be examined in this chapter as an influential factor regarding musical instrument trade. Initially a summary on issues regarding the political situation in major European countries will be given, as well as a very brief discussion of musical life and musical instruments.

#### **2.1 Brief introduction in nineteenth-century Europe**

##### **2.1.1 Outline of social, political and economical facts**

The French monarchy had fallen not long before the beginning of the nineteenth century. In 1799 Napoleon Bonaparte (Napoleon I) had assumed authority, and for the period 1804-14 he was the Emperor of the First Empire. The July Revolution of 1830 resulted in a period of liberal constitutional monarchy under the reign of King Louis-Philippe. This came to an end in 1848, when a new revolution led to the Second Republic which lasted until 1852. In 1852, Louis-Napoleon Bonaparte (Napoleon III) became emperor in what is known as the Second Empire. France's defeat in the Franco-Prussian war in 1870 resulted in Napoleon losing his position and the Second Empire being followed by what is known as the

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Third Republic. Throughout the century, France continued industrial development, with the United Kingdom and Germany being ahead in that sector.

The United Kingdom led the way in the industrial revolution at the end of eighteenth century. Especially after the end of the Napoleonic Wars (1815), the United Kingdom was among the major economic centres of the world. London, for most of nineteenth century, was the world's largest city. The British Empire in the nineteenth century was one of the world's most dominant powers with very significant financial prosperity. The development of trade in the United Kingdom throughout the century was considerable, and the expansion of the Empire created a widespread market for British products.

In Germany, a league of thirty-nine states was formed in 1815, the German Confederation, with Austria as a leading member. Austria's defeat in the Austro-Prussian war resulted in Austria being excluded by the confederation in 1866. The North German Confederation was formed after Austria's exclusion, and Prussia then became the leading state. Prussia's subsequent victory in the Franco-Prussian war led to the formation of the German Empire in 1871, under the German Emperor William I. Although Britain led the way in the industrial revolution, Germany successfully followed becoming a strong competitor for Britain.

### **2.1.2 A few facts about musical life and instruments**

The nineteenth century as regards brasswind musical instruments is characterized by improvements in certain instruments with the application of valves, and the emergence of new groups of instruments, such as the saxhorns. Several factors contributed to developments, not least that during the nineteenth century musical instruments became accessible by a larger and more varied part of the general population. Advancements in music printing resulted in a large number of scores and instrumental tutors being available to the public. Often, instrument makers (such as Adolphe Sax) incorporated publishing houses in their shops. The opening of the Paris Conservatoire in 1795 and of other conservatories and music academies in

Some aspects of nineteenth-century brass instrument making major European cities from the beginning of the nineteenth century resulted both in the dissemination of music and in its professionalization.<sup>1</sup>

Concert life in the biggest cities, was characterized by great diversity. In London, Paris and Vienna, many kinds of concerts were taking place, throughout the year, accessible to people from different classes. On one hand were concerts organized by major institutions, such as the concerts of the *Société des Concerts du Conservatoire* (from 1828 onwards),<sup>2</sup> or the concerts of the Philharmonic Society organized in London. These mostly were on a subscription basis. Additionally, individuals, such as promoters, or artists organized benefit concerts. Mostly, these concerts appealed to the upper middle class, mainly due to the ticket prices.<sup>3</sup> On the other hand, many concerts existed which were accessible by the lower middle-class. Concerts by amateur orchestras, concerts of amateur musical societies, such as those of the Orpheonic movement in France, open-air band concerts, the Musard's Promenade concerts, Jullien's concerts and many others, were some of the choices for less affluent sections of the population. In some cases, instrument makers established their own small concert halls, both to promote their instruments and to increase their publicity. Among them were Adolphe Sax, Pleyel, Erard and Herz.<sup>4</sup> The orchestra's size and identity changed, and larger orchestras became the norm, mainly due to people's changing taste, the appearance of new instruments, the development of the already existing instruments, the emergence of larger concert halls, the outdoor concerts, and others.

The national and international exhibitions (with London's 1851 International Exhibition being the first), aided the dissemination of ideas regarding the design of musical instruments, and together with better transportation means, opened the way for the development of large instrument-making businesses. The competition between makers was often fierce, and resulted in a bewildering variety of instrument models, sometimes even within the same instrument families. Instrument nomenclature became more complex. Makers made the most of the developing

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<sup>1</sup> John Rink, "The Professions of Music" in Jim Samson, ed., *The Cambridge History of Nineteenth Century Music* (Cambridge: Cambridge University Press, 2001), 82.

<sup>2</sup> Jeffrey Cooper, *The Rise of Instrumental Music and Concert Series in Paris 1828-1871* (Ann Arbor, Michigan: UMI Research Press, 1983), 21-22.

<sup>3</sup> Rink, "The Professions of Music", 63.

<sup>4</sup> Cooper, *The Rise of Instrumental Music*, 17.

patent law, since it became apparent that the protection of their inventions was unavoidable.

## 2.2 Patent law in major European countries

### 2.2.1 French patent law

French patent law has its origins as far back as 1762.<sup>5</sup> Among early acts that had a great influence on modern French patent law was the Act of 5 July 1844, passed during the reign of Louis-Philippe.<sup>6</sup> This act was further modified by the Ministerial Circular of 26 December 1854.<sup>7</sup>

Among the major aspects of French patent law was that patents were “delivered to the applicant at his risk and peril, without preliminary examination”.<sup>8</sup> Patents were subject to preliminary examination only in the case of opposition regarding their novelty. Thus, patents were granted without the government’s guarantee (*sans garantie du gouvernement*) and at the applicant’s own risk; this regarded all aspects of the patent, such as novelty, reality of the subject or accuracy of the description.<sup>9</sup> This was stated both on the patent application and in some cases the initials “S. G. D. G.” (*sans garantie du gouvernement* – without the government’s guarantee) were included in the instrument inscriptions. If anyone became conscious of any reasons why a patent’s validity should cease, they could only resort to law. Adolphe Sax is a prominent example; he was involved in various lawsuits for many decades. Legal actions were initiated by his rival makers who accused him of having copied the ideas of other makers and they managed to annul his patents for some time. Later, Sax in his turn took his competitors to court seeking compensation after which his patents became valid again. Such occurrences were not frequent in the world of musical instrument making since long lasting court cases could harm the makers financially and in some cases lead to loss of reputation. Sax himself went

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<sup>5</sup> James Fraser, Esq., *A Handy-Book of Patent and Copyright Law English and Foreign for the Use of Inventors, Patentees, Authors, and Publishers* (London: Sampson Low, 1860), 96.

<sup>6</sup> Brian C. Reid, ed., *Sweet & Maxwell’s European Patent Litigation Handbook* (London: Sweet & Maxwell, 1999), 95.

<sup>7</sup> Fraser, *A Handy-Book of Patent and Copyright Law*, 96.

<sup>8</sup> Sir Thomas Barclay, *The Law of France Relating to Industrial Property, Patents, Trade Marks, Merchandise Marks, Trade Names, Models, Patterns, Designs: & Colonial, Algerian and Tunisian Regulation* (London: [n.p.], 1889), 2.

<sup>9</sup> *Ibid.*, 2-5.



Some aspects of nineteenth-century brass instrument making bankrupt three times despite the enormous saxhorn and saxophone sales his monopolies had warranted. Moreover, the law ensured that whoever violated the rights of patentees or sold counterfeited objects would be prosecuted. The penalty could be either monetary, and if the offense was repeated it could even lead to imprisonment. The same applied to workmen of patentees who gave away information regarding patented objects whose patent was still under protection.<sup>10</sup>

The patent duration in France was established for either five, ten, or fifteen years; the duration of a patent could not be prolonged. Adolphe Sax is the only instrument maker known to have managed to extend the duration of his patents beyond their original expiry date. His main argument was that for the period his patents had been annulled, he had suffered financial losses and his instruments were copied by his rivals leading to further financial difficulties. The patent fee in France after 1844 was lowered and was fixed to five hundred, ten hundred and fifteen hundred francs for a five, ten and fifteen-year protection period, respectively.<sup>11</sup> After approval, patents were valid from the application date and not from the issue date.

A patent could only have one principal object, designated in the title, and described in detail. The accompanying drawings were to be presented according to a metrical scale.<sup>12</sup> The inventor had the right to apply for a *certificat d'addition* (certificate of addition) to the main patent, for any alterations or improvements to the main subject; this could be applied provided that the patent protection had not expired. The certificate of addition would then expire with the main patent. The cost of such a certificate was only twenty francs, which was much lower than the cost of an original patent.<sup>13</sup>

There were some restrictions regarding the originality of subjects for which inventors could take out patents. In France it was not allowed to issue patents on subjects that had been previously published (within the country or abroad), in such detail that could allow execution of the patented object.<sup>14</sup> This regulation differs from British patent law, as it will be mentioned later, in what regards the “imported inventions”. No one, but the original patentee, could issue a patent in France for a

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<sup>10</sup> Fraser, *A Handy-Book of Patent and Copyright Law*, 102.

<sup>11</sup> Ibid.

<sup>12</sup> Ibid., 97.

<sup>13</sup> Ibid., 99.

<sup>14</sup> Ibid.

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subject that had originally been patented by the inventor in their own country. The only restriction was that the patent in France could only be issued before the expiry of the original patent in the patentee's country of origin, and the expiry of the French patent would be the same as that in the patentee's country of origin.<sup>15</sup>

French patent law required that the patented invention or discovery should have been put into execution in the country within two years from the date of the patent registration.<sup>16</sup> Also, if the subject of the patent was put into execution within two years and for any reason its production stopped for two consecutive years, the patent again would be considered void.<sup>17</sup>

### 2.2.2 Important aspects of British patent law

In Britain, intellectual property legislation was not as lenient as in France, but also not as strict as in Germany.<sup>18</sup> The earliest English patent known was granted in 1331 to a weaver who was encouraged to import the secrets of his art.<sup>19</sup> Early patents had as their main purpose the encouragement of various craftsmen to immigrate to the country.<sup>20</sup> The parliament of England issued in 1623 the Statute of Monopolies; this statute recognised that patents could be an exception to the newly introduced regulation against monopolies;<sup>21</sup> it restricted the duration of patents to fourteen years, and is accepted today as the origin of patent law. The objective was not to protect the inventor's intellectual property, but to encourage the country's general production.<sup>22</sup>

Initially no written specification was required, but by 1718 a specification started being necessary.<sup>23</sup> Efforts to improve the patent system started during the Industrial Revolution, but it was not until the Patent Law Amendment Act of 1852 (this came into effect on 1 October 1852) when a major reform occurred, although

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<sup>15</sup> John Paxton Norman, *A Treatise on the Law and Practice Relating to Letters Patent for Inventions* (London: Butterworths, 1853), 39.

<sup>16</sup> James Johnson, *A Treatise on the Law and Practice of Patents for Inventions* (Malden: Forbes Press, 2009), 39.

<sup>17</sup> Ibid.

<sup>18</sup> Barclay, *The Law of France Relating to Industrial Property*, 4.

<sup>19</sup> Kathy Bowrey, "Art, Craft, Good Taste and Manufacturing: The Development of Intellectual Property Laws", *Law in Context* 15, no. 1 (1998): 80.

<sup>20</sup> Ibid.

<sup>21</sup> David Bainbridge, *Intellectual Property* (London: Pittman Publishing, 1999), 320.

<sup>22</sup> Bowrey, "Art, Craft, Good Taste and Manufacturing", 80-81.

<sup>23</sup> Bainbridge, *Intellectual Property*, 321.

Some aspects of nineteenth-century brass instrument making some alterations of minor importance took place in 1835, 1839 and 1844.<sup>24</sup> Prior to 1852 the patent system seemed inefficient and not capable of coping with the increased needs the industrial revolution brought. Often, patentees had to go through long bureaucratic procedures before managing to be granted a patent.<sup>25</sup> Thus, the 1852 Act was seen as a long needed reform. Dutton (1984) reports that between 1750 and 1851 the total number of British patents regarding musical instruments ranked in the twenty-third place among ninety-seven general subjects, with a total number of 255 patents, out of 17,101 patents taken in total for various subjects.<sup>26</sup>

An important aspect of British patent law concerning musical instrument making, was that regarding the cost of a patent. Before 1852 a patent could cost up to £400.<sup>27</sup> The total amount depended on the geographical coverage of the patent. Before 1852, an inventor had to issue different patents for England, Scotland and Ireland. An English patent alone could cost up to £120.<sup>28</sup> The number of patentees granted patents ensuring protection in all three kingdoms of England, Scotland and Ireland was very small, compared to those granted English patents only. After the 1852 Act a single patent could be issued for the United Kingdom. The cost of patent would be £180 and this could be paid in three instalments.<sup>29</sup> This amount was more than what an English patent cost before 1852, but was much lower compared to what a patentee needed to pay before 1852 for a patent valid throughout the United Kingdom. On the other hand, the cost of British patents remained much higher than French patents.

The Law Officers had the right to examine the technical description of patent applications, but very few were ever examined. Thus, the patent system of Britain was essentially a system of registration, similar to that of France and Belgium, with a relative leniency towards inventors.<sup>30</sup>

One of the most important aspects of British Intellectual property law which affected musical instrument making in Britain (at least around the middle of

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<sup>24</sup> Harold Irvin Dutton, *The Patent System and Inventive Activity during the Industrial Revolution 1750-1852* (Manchester: Manchester University Press, 1984), 34.

<sup>25</sup> Ibid., 34-35.

<sup>26</sup> Ibid., 206-07.

<sup>27</sup> Ibid., 35.

<sup>28</sup> Ibid.

<sup>29</sup> Ibid., 63.

<sup>30</sup> Ibid.

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nineteenth century) was that regarding “imported inventions”. Contrary to France, in Britain it was lawful to take out a patent or register a design for a product previously patented or known “outside the realm”. The “invention” would be still considered valid and the patentee would be still considered a “true inventor”. The law stated that “the person to whom letters patent are granted must be the first person to make the invention known here”.<sup>31</sup> As Norman (1853) stated, the objective “was not so much for the purpose of securing to inventors a reward for their ingenuity, as to stimulate the trade and manufactures of the kingdom. It mattered little for this purpose whence an improvement came.”<sup>32</sup> In very few cases of patents regarding brass instruments that have been studied did British patentees acknowledge the original patentee or inventor. Moreover, the system in practice did not distinguish between “patents of invention” and “patents of importation”. Only patents of invention were issued, even in cases where the patented subject had been imported from abroad.

Although this right had been established back in the seventeenth century, the Act of 1852 temporarily annulled it. The Act stated that prior use or publication elsewhere equalled publication within the realm; thus, a patent could not be granted for such a subject. However, this clause was removed during the same year (1852) by the House of Commons,<sup>33</sup> retaining in the United Kingdom circumstances conducive for patentees to profit from imported inventions.

### 2.2.3 Registered designs

An alternate way for protecting inventions, which was very popular among musical instrument makers in Britain, was registering designs. Design law in Britain originated from the Calico Printers Act 1787.<sup>34</sup> With this act, new and original patterns printed on linens, calicos, muslins and cottons, were protected for a few months. With the Copyright of Designs Act 1839, the protection of designs was extended beyond fabric designs to designs of three-dimensional objects. This act did not only protect patterns or prints, but the general shape and configuration of

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<sup>31</sup> John Paxton Norman, *A Treatise on the Law and Practice Relating to Letters Patents for Inventions* (London: Butterworths, 1853), 44.

<sup>32</sup> Ibid.

<sup>33</sup> Ibid., 37-39.

<sup>34</sup> Bainbridge, *Intellectual Property*, 453-54.

Some aspects of nineteenth-century brass instrument making objects.<sup>35</sup> The protection period ranged from a few months to three years, depending on the nature of the protected design.<sup>36</sup> Moreover, this act introduced, for the first time, the procedure of registration. Only if designs had been registered prior to publication, could they be protected.

In the early 1840s there was a distinction made between ornamental and utility designs (the latter also called non-ornamental designs). The Ornamental Designs Act 1842 protected the designs which added something to the appearance of the object. The Utility Designs Act 1843 protected the non-ornamental features of an object, its shape and configuration.<sup>37</sup> After the design registration, designs could receive a maximum protection of three years.<sup>38</sup>

Kathy Bowrey (1998) points out that the main difference between patents and registered designs was in that the designs had to be new and original “unlike patent law’s expectation that novelty meant that the idea had not been previously published”.<sup>39</sup> Although the design system was fundamentally different from the patent system, in practice it offered musical instrument makers a less expensive alternative to British patents. Around the middle of nineteenth century, the registration of a utility or non-ornamental design (this was the design category musical instrument designs belonged to) cost only ten pounds for three years. The fundamental difference between the two systems was that designs merely protected the form of a subject, whereas patents additionally protected the whole idea behind an invention.<sup>40</sup> Sherman and Bently (1999) point out that “the particular ‘imperfection’ or ‘problem’ which the 1842 Act was designed to remedy was that the subject matter of the 1839 Designs Registration Act had become confused in popular opinion with ‘the subject matter of letters patent’”.<sup>41</sup>

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<sup>35</sup> Brand Sherman and Lionel Bently, *The Making of Modern Intellectual Property Law: The British Experience, 1760–1911* (Cambridge: Cambridge University Press, 1999), 64.

<sup>36</sup> Ibid.

<sup>37</sup> Bowrey, “Art, Craft, Good Taste and Manufacturing”, 95-96.

<sup>38</sup> Ibid.

<sup>39</sup> Ibid.

<sup>40</sup> Lionel Bently, “Visuality and Textuality in Nineteenth Century Intellectual Property Law: The Utility Designs Act 1843” *Intellectual Property Forum* (Journal of the Intellectual Property Society of Australia and New Zealand), no. 29 (May 1997): 29.

<sup>41</sup> Sherman and Bently, *The Making of Modern Intellectual Property Law*, 80.

Although registered designs were available to inventors in France it has not been noticed that they were particularly useful to musical instrument makers, possibly due to the lower cost of French patents compared to British ones.

### 2.2.4 Patent law in other European countries

Nineteenth-century patent law in Belgium bore many similarities to the French system. The patent system in Belgium was as lenient as the French, if not more so. An important difference was the maximum duration of a patent, which had been established as twenty years.<sup>42</sup> Patent taxes were much lower than the British, and even the French ones, and certificates of addition were granted without charge. No preliminary examination was needed and, as in France, patents were issued without the guarantee of the government. In addition to patents of invention, patents of importation were allowed. There was only one restriction for imported inventions; they should not have been used commercially in Belgium prior to the patent application.<sup>43</sup>

In the various states of the German Confederation patent law was very strict. James Fraser reported the following regarding the procedure for granting a patent in Prussia:<sup>44</sup>

Experts are to examine the applications, and report thereon to the Minister of Commerce and Public Works as to the object, the extent, and duration of the patent. This minister is to execute and deliver the patent, and to control the custody of models, drawings and specifications.

Although patents of importation were allowed in the various states of the Confederation, the long procedure and strict preliminary examination the patent application had to go through possibly prohibited foreign instrument makers from patenting their inventions in the various German states, and an interaction similar to that of British and French makers has not been noticed between instrument makers of Germany and any other country. Moreover, patents granted in one state were valid

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<sup>42</sup> Fraser, *A Handy-Book of Patent and Copyright Law*, 104.

<sup>43</sup> *Ibid.*, 106.

<sup>44</sup> *Ibid.*, 118.

Some aspects of nineteenth-century brass instrument making only in that state.<sup>45</sup> Thus, a patentee willing to patent an invention throughout the Confederation had to apply individually in each state and pay taxes in each country.

### 2.2.5 Discussion

Owing to the above idiosyncrasies of intellectual property law of the European countries, and in particular of France and Britain, it has been noticed that many British patents and British registered designs around the middle of the nineteenth century drew from French patents of the time. Sax was possibly the most copied French maker, as far as both patents and instruments made by British makers are concerned, although it has been noticed that products of other French makers such as Gautrot and Besson inspired subjects for British patentees.

The leniency of patent law regarding imported inventions in Britain was the reason why many British instrument makers registered designs in the United Kingdom or issued patents on developments in the construction of instruments or their parts that had been imported from France. In many cases the patentee refers to the original invention, but in some cases the patent subject had been slightly altered so as not to closely resemble the original French invention. In France according to the law “no discovery is held new, which previous to the date of the deposit of the petition, has received publicity in France, or in a foreign country, sufficient to enable anyone to execute it”.<sup>46</sup> Also a patentee in France “shall be deprived of his rights [...] if he introduces in France objects made in a foreign country similar to those protected by his own patent”.<sup>47</sup>

The relatively lower cost of patents in France had as a result that more patents were being granted in this country than Britain and other countries. This regarded both the general number of patents and patents of musical instruments in particular. Only Belgium had more patents issued. Figure 2.1 shows a comparative table published in 1860 regarding the total number of patents taken in major countries and the number of patents granted per million of inhabitants in each country.<sup>48</sup> Here it is

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<sup>45</sup> James Johnson and J. Henry Johnson, *The Patentee's Manual Being a Treatise on the Law and Practice of Letters Patents Especially Intended for the Use of Patentees and Inventors* (London: Longmans, Green, Reader, & Dyer, 1866), 357.

<sup>46</sup> Johnson and Johnson, *The Patentee's Manual*, 331.

<sup>47</sup> Ibid., 332.

<sup>48</sup> Fraser, *A Handy-Book of Patent and Copyright*, 217.

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apparent that a greater number of patents per million of population were granted in France compared with most European countries, and even the United States. In the author's view, the lack of preliminary examination in France and Belgium, also, played an important role in the increased number of patents. Additionally, the very low patent fees in Belgium, compared with France and Britain, resulted in Belgium ranking first in the number of patents issued annually.

Countries.	Population.	Patents per annum.	Cost of Patent.	Patents per million of inhabitants.
	Millions.			
FRANCE . . .	36	5820	£4 per annum for 14 years	162
UNITED STATES . . .	23	3668	£6 total cost	160
To citizens . . .	. . .	20	80 " "	
To British subjects . . .	. . .	22	60 " "	
To other aliens . . .	. . .			
GREAT BRITAIN . . .	30			
(Provisional Protection) . . .	. . .	3000	£5	100
Sealed . . .	. . .	1950	25 additional	65
At end of 3 years . . .	. . .	550	50 "	18
At end of 7 years . . .	. . .	100	100 "	3½
BELGIUM . . .	4½	1406	{ 8s. first year, and increasing progressively for 20 years up to £8 for last year	312
AUSTRIA . . .	36½	703	{ £10 for first 5 years 20 for second 5 years 40 for third 5 years	19
			{ 8s. 4d. per year paid at once	
SARDINIA . . .	4½	171	{ £1 12s. per annum first 3 years	35
			{ 2 12s. " " second 3 "	
			{ 3 12s. " " third 3 "	
			{ 4 12s. " " fourth 3 "	
			{ 5 12s. " " fifth 3 "	
SAXONY . . .	2	107	{ £4 10s. for first 5 years	54
			{ 8 second 5 "	
SWEDEN . . .	3½	64	{ Fees not fixed, and expenses of advertising	18
VICTORIA ( <i>Australia</i> ) . . .	½	53	{ £7 4s. 6d. for first 3 years	106
PRUSSIA . . .	17	49	{ £20 and upwards from 6 months to 15 years	3
BAVARIA . . .	4½	41	{ £2 for first year, increasing by degrees annually to £23 for 15 years	9
NETHERLANDS . . .	3½	39	{ £12 10s. for 5 years.	12
			{ From £25 to £33 for 10 years	
			{ " 50 to 62 15 "	
RUSSIA . . .	70	26	{ £14 10s. for 3 years	½
			{ 24 " 5 "	
			{ 72 10s. " 10 "	

Figure 2.1 Table showing the number of patents issued annually c. 1860 in major countries from James Fraser, *A Handy-Book of Patent and Copyright Law*, 217.

The high cost of patents, and the sometimes lengthy procedures involved, prompted patentees and brass instrument makers in particular to neatly avoid one



Some aspects of nineteenth-century brass instrument making rule regarding the issue of patents. Patentees were required to include only one invention in each patent, and this would be stated in the patent title which would make specific the nature and subject of the patent. Patents of brass instrument makers that have been studied, issued both in France and Britain, show that patentees tried to make the most of each patent they applied for. Most descriptions are vague such as “brass instrument valves”, or “improvements in brass instruments”, or even “improvements in musical wind instruments” in some cases. The specifications of these patents mostly included more than one improvement and some French patents are even one hundred pages or more long. Most of the inventors, especially in France, took advantage of the law’s provision for granting certificates of addition at lower prices. Often these certificates bear little or no relation to the subject of the original patents.

Regarding British patents, Figure 2.1 also shows something that is apparent when one reads nineteenth-century British patent applications at the British Intellectual Property Office. There were many cases of British inventors who first applied for a patent, then decided not to proceed to the next stages. These patents only received provisional protection and were not sealed. Henry Distin is a prominent example: there are copies of all his unsuccessful patent applications that never reached the final stage of approval. James Fraser describes the situation in Britain: around the middle of the nineteenth century of the 3,000 British patent applications, only 1,950 proceeded to the final stage and were sealed.<sup>49</sup> The main reason for the 1,050 patent applications becoming void was the inability or unwillingness of inventors to pay the patent fees. Again, of the sealed patents, only 550 continued to be valid three years after, since for the others the appropriate fee was not paid by the patentees. Fraser states that only about one hundred were expected to be valid at the end of the seventh year, always for the same reason.<sup>50</sup> A number of British musical instrument makers thus took advantage of the 1843 Designs act for non-ornamental designs and registered their inventions as designs, and not patents. They were prompted to do so by the lower cost of a design registration, although the protection their invention received was not comparable to that of a patent.

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<sup>49</sup> Fraser, *A Handy-Book of Patent and Copyright Law*, 218.

<sup>50</sup> Ibid.

The above conditions also resulted in more British inventors/makers, such as Henry Distin, applying for French patents. There were not as many French makers applying for British patents. Adolphe Sax, for example, was granted only one British patent (in 1860), and this was substantially his 1859 French patent. He probably chose the particular patent which was one of his lengthiest, covering various subjects.

### 2.3 Musical instrument trade

It appears that the increased general trading activity between France and Britain<sup>51</sup> resulted in a growing trade of musical instruments in an already existing common market. Discussing the trade between the two countries, Nye (2006) states:<sup>52</sup>

Trade formed a much larger proportion of British production than it did in France for most of the century. This fact coupled with the much larger absolute level of total British trade, was bound to make British trade policy seem more important to the world at large. Given the high starting level of British tariffs would seemed doubly impressive to outside observers focusing on government action that affected very large volumes of trade. In contrast, much of France's commerce was internal and, to the extent that the economy developed or was retarded, was more seriously affected by domestic economic developments than by trade policy. Tariff reform was a prominent accomplishment of Napoleon III [...]

In the United Kingdom, in the 1840s, a high proportion of brass instruments, unlike pianos, were imported from France and other countries. In the early 1840s the imports of all kinds of brass instruments amounted to about £12,000 per year.<sup>53</sup> In the beginning of nineteenth century the importation taxes were very high and reached even fifty percent of the instruments' starting value. In 1828 they dropped to twenty percent, and in 1842 to fifteen percent. A further step was taken in 1846, when the abolition of Corn Laws opened the way for a freer trade in the United Kingdom. Then, the duty of imported instruments dropped to ten percent and this reduction made musical instruments more accessible. In 1846, Sax's collaboration with the Distin family commenced. The higher importation duties prior to 1846 might have

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<sup>51</sup> *Hunt's Merchant's Magazine* reports increased imports into Britain from France and exports to France in the early 1840s, with the balance being in favor of France. See, "The trade between France and England", *Hunt's Merchant's Magazine* 3 (July 1840): 354.

<sup>52</sup> John Vincent Nye, "The Myth of Free-Trade Britain and Fortress France: Tariffs and Trade in the Nineteenth Century" *The Journal of Economic History* 51, no. 1 (March 1991): 32.

<sup>53</sup> William Waterstone, *A Cyclopaedia of Commerce, Mercantile Law, Finance, Commercial Geography, and Navigation* (London: Henry G. Bohn, 1844), 485.

Some aspects of nineteenth-century brass instrument making been one of the reasons why the Distins did not become Sax's British agents in 1844, when they first met the maker in Paris, and perhaps why the importation of instruments by other dealers or makers in Britain, such as Jullien, increased during the same period.<sup>54</sup> From 1860 musical instruments could be imported in the United Kingdom without tax. Table 2.1 shows the duties on musical instruments imported into Britain in the first half of the nineteenth century.

**Table 2.1 Duties on musical instruments imported into the United Kingdom.**

Year	Rates of duty on imports of musical instruments into the United Kingdom
1827	50%
1828	20 %
1840	15%
1846	10%
1860	0%

Table 2.2 shows data regarding the imports of musical instruments into the United Kingdom during the 1840s and until 1860.<sup>55</sup> It also shows that a percentage of imported instruments was re-exported. Of the instruments imported, the biggest percentage was brass instruments.<sup>56</sup> Exports of British musical instruments consisted mainly of pianos, which were exported in large quantities.<sup>57</sup>

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<sup>54</sup> See, Chapter Six, pp. 256-57.

<sup>55</sup> Braithwaite Poole, *Statistics of British Commerce. Being a Compendium of the Productions, Manufactures, Imports and Exports, of the United Kingdom, in Agriculture, Minerals, Merchandise, &c.* (London: W. H. Smith, 1852), 230, and *Paris Universal Exhibition of 1867: Catalogue of the British Section, Containing a List of the Exhibitors of the United Kingdom and its Colonies, and the Objects Which they Exhibit* (London: Spottiswoode, 1867), 172.

<sup>56</sup> Waterstone, *A Cyclopaedia of Commerce*, 485.

<sup>57</sup> Poole, *Statistics of British Commerce*, 230.

**Table 2.2 Total value of musical instruments imported in the United Kingdom in the period 1844-1850. A percentage of imported instruments was re-exported.**

Year	Imported Value	Re-exported Value
1844	£12,000	Not known
1847	£50,812	£10,082
1848	£51,070	£12,549
1849	£42,022	£6,315
1850	£45,831 or £55,000 (according to a difference source) <sup>58</sup>	£9,643
1860	£170,000	Not known
1865	£243,813	£12,551

The gradual reduction in import duties led to a gradual increase in instrument imports. The very high duties during the first four decades of the nineteenth century were a concern since they also imposed high prices on British musical instruments. An interesting publication includes a report of a committee appointed to address the issue of the high import taxes of several commodities.<sup>59</sup> The select committee called and examined a London piano manufacturer, James Hanley, regarding the potential lowering of importation duties on musical instruments. Importation duties on musical instruments in Britain at that time were twenty percent *ad valorem* (namely in proportion to the total value and not per item). Hanley stated that the duty on musical instruments prevented British trade from developing further. He believed that if the duties were abolished, the range of people using musical instruments and receiving musical education would extend, creating thus a larger market for instruments. Regarding brass instruments in particular, it was stated that most of them, unlike pianos or harps, were imported, although brass instrument industry was increasing at the time. The best military bands were mainly using imported brass instruments.

Enderby Jackson in his series of articles titled “Origin and Promotion of Brass Band Contests” published in the *Musical Opinion & Musical Trade Review* in

<sup>58</sup> See Thomas Ellison, “On the Progress of the Commerce in Great Britain during the Ten Years, 1850 to 1860” *Journal of the Society of Arts* 10, no. 485 (7 March, 1862): 245.

<sup>59</sup> *The Sessional Papers Printed by Order of the House of Lords, or Presented by Royal Command, in the Session 4o and 5o Victoriae (26<sup>th</sup> January – 22<sup>nd</sup> June) and the Session 5o Victoriae (15<sup>th</sup> August – 7<sup>th</sup> October) (1841)*, 25:36-43.

Some aspects of nineteenth-century brass instrument making  
1896 and 1897 presents his own views regarding the reasons for the large quantities of imported musical instruments:<sup>60</sup>

About 1850 official returns did not afford great facilities for studying the political commercial relations of music, the attention of our British government not being directed to that point. Music at that time in Great Britain was not considered in a national commercial light; yet it has been found that the return of governmental duty paid on musical instruments imported in the year 1850 rose up to an aggregate sum of £45,828. Wind instruments predominated, the bulk being chiefly made of brass; and it may reasonably be presumed that they were imported in consequence of their being cheaper, and partly again through prejudices in favor of foreign articles. Near fifty years ago it is seen that brass instrument making had advanced smartly all round as a science and flourished from that into a keen manufacturing art – closely verging on a fine art – besides acting as a recognized social and beneficent agent to the working population. Yet no governmental recognition has yet been awarded to assist the fostering of so powerful an agent, even when specially employed in civilizing and enlightening the hard workers of districts known to be difficult of access to the ordinary spread of knowledge and religion.

Pontecoulant (1861) presents a comparative table of total value of imported instruments in France and United Kingdom in 1853, 1854 and 1856 (Figure 2.2).<sup>61</sup> For 1854 and 1856 he gives specific information regarding the types of instruments imported in the United Kingdom. The greatest percentage, as expected, regards various instruments (not including pianos or organs), among which brass instruments are included.

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<sup>60</sup> Enderby Jackson, “Origin and Promotion of Brass Band Contests”, *Musical Opinion & Musical Trade Review* 20, no. 234 (March 1897): 386.

<sup>61</sup> Adolphe Le Doucet marquis de Pontécoulant, *Organographie: Essai sur la facture instrumentale. Art, industrie et commerce* (Paris: Castel, 1861), 2:544

		importation	consommation	
1853	{ Angleterre,	2,970,678 <sup>f</sup>	2,462,071 <sup>f</sup>	ou 89 %.
	{ France,	123,580	41,240	33
1854	{ Angleterre,	2,929,316	2,358,760	80
	{ France,	189,490	29,000	15
1856	{ Angleterre,	3,614,312	3,134,980	86
	{ France,	1,221,560	28,150	2
En 1854.	Pianos,	287,950 <sup>f</sup>	255,750 <sup>f</sup>	ou 88 %.
—	Orgues et harm.	343,746	339,570	98
—	Instr. divers,	2,297,772	1,763,440	76
En 1856.	Pianos,	388,700	381,500	98
—	Orgues et harm.	788,320	746,250	94
—	Instr. divers,	2,437,392	2,005,230	82

Figure 2.2 Comparative data concerning musical instrument imports in France and United Kingdom from Pontecoulant's *Organographie*.

## FABRICATIONS.

OUVRAGES EN MATIÈRES DIVERSES (Suite).		Par navires français.	Par navires étrangers et par terre.
		fr. c.	fr. c.
<i>Instruments de Musique :</i>			
Cors, serpents, trompes, trompettes et trombones	la pièce	3 francs	
Clarinettes et hautbois	la pièce	4 francs	
Vièles simples	la pièce	5 francs	
Basses, contre-basses, chapeaux chi- nois et grosses caisses	la pièce	7 francs 50 cents.	
Épinettes, harmonica, vièles or- ganisées et orgues portatives	la pièce	18 francs	
Harpes	la pièce	36 francs	
Forte-piano, carrés	la pièce	300 francs	
„ à queue ou en buffet	la pièce	400 francs	
Orgues d'église	la pièce	400 francs	
non dénommés	la pièce	Mêmes droits que leurs analogues.	
Fifres, flageolets et galoubets	la pièce	63 centimes	
Flûtes, poches et triangles	la pièce	75 centimes	
Sistres, mandolines, psaltérions et luths	la pièce	1 franc 50 cents.	
Tambours, tambourins, timbales, tympanons, et cymbales (la paire)	la pièce	1 franc 50 cents.	
Altos, violes, violons, bassons, gui- tares et lyres	la pièce	3 francs	
Serinettes	la pièce	3 francs	

Figure 2.3 List with duties on musical instruments imported in France published in 1855 by G. W. Yapp in *The Duties on Imports into France*.

Some aspects of nineteenth-century brass instrument making

Figure 2.3 shows French import duties on musical instruments in the mid-1850s.<sup>62</sup> At that time the tax, which was very high, was charged per item, and not per total value. As mentioned earlier, France was more geared towards internal trade. Moreover, the higher production rate of musical instruments meant that French musical instrument makers were very much concerned with exporting, rather than importing musical instruments. For example, out of sixty-six instrument makers that participated in the French section of the 1862 International Exhibition held in London, forty-one stated that they were exporting instruments (among them six brass instrument makers).<sup>63</sup> Their exports amounted to between ten and seventy percent of their production. Gautrot, the well-known brass instrument maker was exporting at the time seventy percent of his production.

A very important step regarding the trade activity between France and Britain was taken in 1860 when the Anglo-French treaty of Commerce was signed. Article five of the treaty stated that Britain abolished importation duties on musical instruments coming from France.<sup>64</sup> Regarding British musical instruments imported into France, from 1 November 1860, the importation duty was designated to ten percent *ad valorem*, instead of charging a specific amount per item.<sup>65</sup>

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<sup>62</sup> George Wagstaffe Yapp, *The Duties on Imports into France, Compiled from the Official Tariff, with the Latest Modifications, and English Translation, and Index* (London: Edward Stanford, 1855), 168.

<sup>63</sup> *Exposition Universelle de 1862 à Londres. Section Française. Catalogue officiel publiée par ordre de la commission impériale* (Paris: impr. Impériale, 1862), 122-24.

<sup>64</sup> Erastus B. Bigelow, *The Tariff Question: Considered in Regard to the Policy of England and the Interests of the United States* (Boston: Little, Brown, 1862), 178-79.

<sup>65</sup> H. Reader Lack, *The French Treaty and Tariff of 1860; with an Historical Sketch of the Past Commercial Legislation of France* (New York: Cassell, Peter, and Galpin, 1861): 105.

## **2.4 Conclusions**

Many issues which at first glance might seem unimportant to musical instrument making appear to have affected progress in this area. Intellectual property law and in particular patent legislation was such in France and Britain at the time that favoured both plagiarism and exchange of ideas regarding instrument manufacturing and design. The relatively lenient patent systems in both countries (more in France) seem to have promoted interaction between makers of both countries. The stricter patent system of Germany posed barriers for most French or British makers in pursuing patent protection of their products there. Britain's rates of brass instruments imports were higher due to their lower production rates compared to France. The gradual lowering of importation duties during the first half of the nineteenth century led to a freer trade of musical instruments, making instruments more accessible to a larger part of the British population and even spurring the increase of the local production.



## Chapter Three

### The brasswind production of Adolphe Sax

This chapter will present an overview of Sax's brasswind production, and issues relating to various innovations and modifications he introduced through his patents will be discussed. Sax's developments concern both improvements in instrument design and various valve systems.<sup>1</sup> However, instead of providing merely an account of Sax's inventions, a comparative study is attempted, trying to identify the influences Sax accepted for his developments and the way he in his turn influenced the field of brass instrument making in and outside France. Sax's developments seem to have influenced British makers more, and this could be expected, taking into consideration copyright law in Britain and France at that time, as already discussed in Chapter Two. It was characteristic of Sax's brasswinds patents that new developments were, where possible, applied to all types of brass instruments, thus exploiting a patent protection to the full.

A scheme for dating all numbered Adolphe Sax instruments will be proposed. The earliest dating scheme was that of Haine and De Keyser (1980).<sup>2</sup> Robert Howe (2003) proposed a new scheme based mainly on the examination of saxophones.<sup>3</sup> New data that has recently come to light has led the present author to propose a revised scheme, which takes into consideration new information coming from archival documents and the inscriptions on a large number of both brass and woodwind instruments. Sax followed a common numbering system for both his brasses and his saxophones, so combining data from brasswinds and woodwinds is essential.

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<sup>1</sup> Sax's modifications to the Berlin valve will be discussed extensively in Chapter Four since they are closely connected to the 1843 patent and the saxhorns discussed in the same chapter.

<sup>2</sup> Malou Haine, Ignace De Keyser, *Catalogue des Instruments Sax au Musée Instrumental de Bruxelles* (Brussels: Musée Instrumental, 1980).

<sup>3</sup> Robert Howe, "The Invention and Early Production of the Saxophone, 1840-55" *Journal of the American Musical Instrument Society* 29 (2003): 97-180.

### 3.1 Sax's brasswind patents

Sax was granted seven patents and several certificates of addition to main patents relating to brass instruments. Many of his main inventions are included in certificates of addition and some of these bear little relevance to the subject of the main patent. In such cases, he tried to take advantage of the considerably lower cost of certificates of addition compared with the cost of issuing a new patent. Sax's first two patents regarding brass instruments were granted in 1843 and 1845 and these concern mainly saxhorns and saxotrombas. These patents and aspects of later patents regarding saxhorns, saxotrombas and saxtubas, will only be mentioned here briefly since they are discussed more extensively in Chapters Four and Five.

**Table 3.1 A general outline of Sax's French<sup>4</sup> patents regarding brass instruments.<sup>5</sup>**

Date <sup>6</sup>	Patent number	Short description as appears on the patent application
13 June 1843	15364	For a system of chromatic instruments.
13 October 1845	2306	For a musical instrument called Saxotromba, whose construction, by means of light modifications, could be applied to saxhorns, cornets, trumpets, and trombones.
5 May 1849	8351	For provisions applicable to wind instruments, concerning particularly the <i>clairons</i> of the <i>chasseurs d'infanterie</i> .
20 August 1849	First certificate of addition to main patent 8351	Additions which are particularly linked to trombones and slide trumpets.
23 April 1852	Second certificate of addition to main patent 8351	For provisions applicable to wind instruments, concerning particularly the <i>clairons</i> of the <i>chasseurs d'infanterie</i> .
1 October 1852	14608	For provisions applicable to musical wind instruments, particularly brass.
3 January 1859	39371	For provisions applicable to brass musical instruments.
30 April 1859	First certificate of addition to main patent 39371	For provisions applicable to brass musical instruments.
31 December 1859	Second certificate of addition to main patent 39371	For provisions applicable to brass musical instruments.
19 May 1862	54212	For modifications applied to valved musical instruments
1 April 1867	75861	For various optimizations applied to brass musical instruments.
8 May 1881	141575	For modifications on musical instruments.

<sup>4</sup> Belgian, or British patents are not included here, since these were some of the patents granted in France which Sax also took out in Belgium and Britain for extra protection.

<sup>5</sup> All the patents, except the 1843, were granted for fifteen years. The 1843 patent was valid for five years only. The original title of patents in French can be found in the Bibliography section.

<sup>6</sup> Patents were valid from the application date, and not from the issue date. The application date is, thus, noted here.

### 3.1.1 Inventions or modifications regarding brass instruments except saxhorns, saxotrombas and saxtubas

#### 3.1.1.1 Compensator

Among the main provisions of Sax's 1843 patent was the use of spring slides: springs acting on the tuning slide, which could be adapted to all valved brass instruments. They had a dual function: the execution of glissandi and the improvement of the intonation when valves were used in combination. Sax in the patent's main text failed to comment on the latter, whereas in court he put this forward as the slide's main function.<sup>7</sup> In the supporting patent drawings the only instrument equipped with such a slide is a valved trumpet.

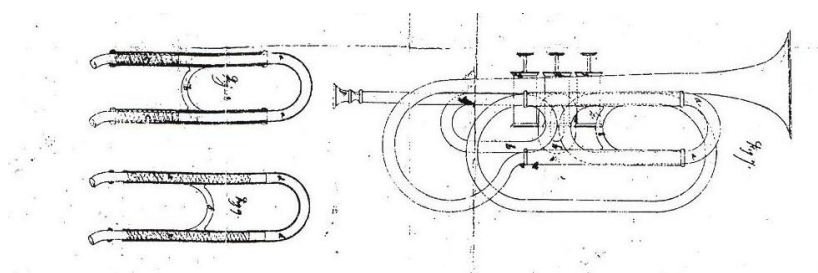


Figure 3.1 Trumpet with three Berlin valves and spring slide from Sax's 1843 patent.

In Sax's later *Méthode complete pour saxhorn et saxotromba* (1847),<sup>8</sup> a cornet with a spring slide called *cornet compensateur* is depicted (Figure 3.2). Sax gave instructions for its use. For the performance of descending glissandi the slide should be gradually pulled out, and for the ascending it should be gradually returned to position. Examples were given in all tonalities for the glissando performance of the interval between the leading note and the tonic. Examples were given additionally for the usage of the slide in the performance of trills (Figure 3.3), another point not mentioned in the 1843 patent. Whereas certain trills are difficult with the ordinary instruments, they become easier to perform with the assistance of the slide, according to Sax.

<sup>7</sup> *Affaire Sax. Rapport d'expertise dans le procès de déchéance intenté contre les brevets Sax, par MM. Raoux, Halary, Gautrot, Gambaro, Buffet etc., délégués des facteurs français* (Paris: impr. Édouard Proux, 1848), 10.

<sup>8</sup> Paris: Brandus et Cie.

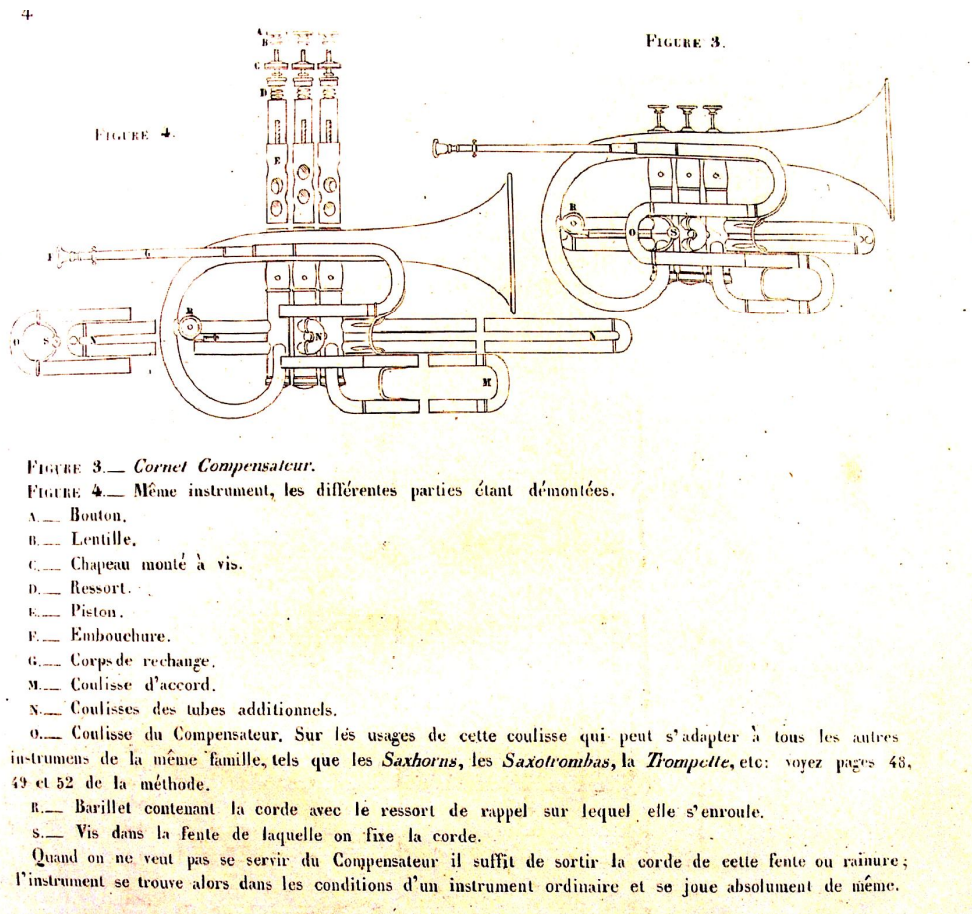


Figure 3.2 *Cornet compensateur* from Sax's method.

The spring slide, although it seems ingenious, never received a general adoption. It only had a limited use, especially on the cornet. There is only one surviving instrument by Sax known with this kind of spring slide; this is a cornet (serial no. 37787), today in Brussels (inventory no. 2009.029).

Various testimonies reported that this slide was impracticable. The *Rapport des expertise* which addressed the validity of Sax's patents was in favour of Sax and pointed out the innovation for the usage of such slide in non-cylindrical instruments.<sup>9</sup> After an instrument with a spring slide was played on in court the experts commented favourably on the results. Regarding the feature's practicability, it was stated that indeed special studies were required, but it was not impossible to use as asserted by Sax's opponents.<sup>10</sup> The lapse of two years after the patent during which Sax did not implement this slide (which according to law was on itself a reason for a

<sup>9</sup> Ibid., 12.

<sup>10</sup> Ibid.

The brasswind production of Adolphe Sax patent's annulment),<sup>11</sup> was not used against Sax by the experts, since it was thought that it was caused by the performers' reluctance. According to a letter by Spontini, Sax even admitted having manufactured a small number of such instruments by 1847.<sup>12</sup>

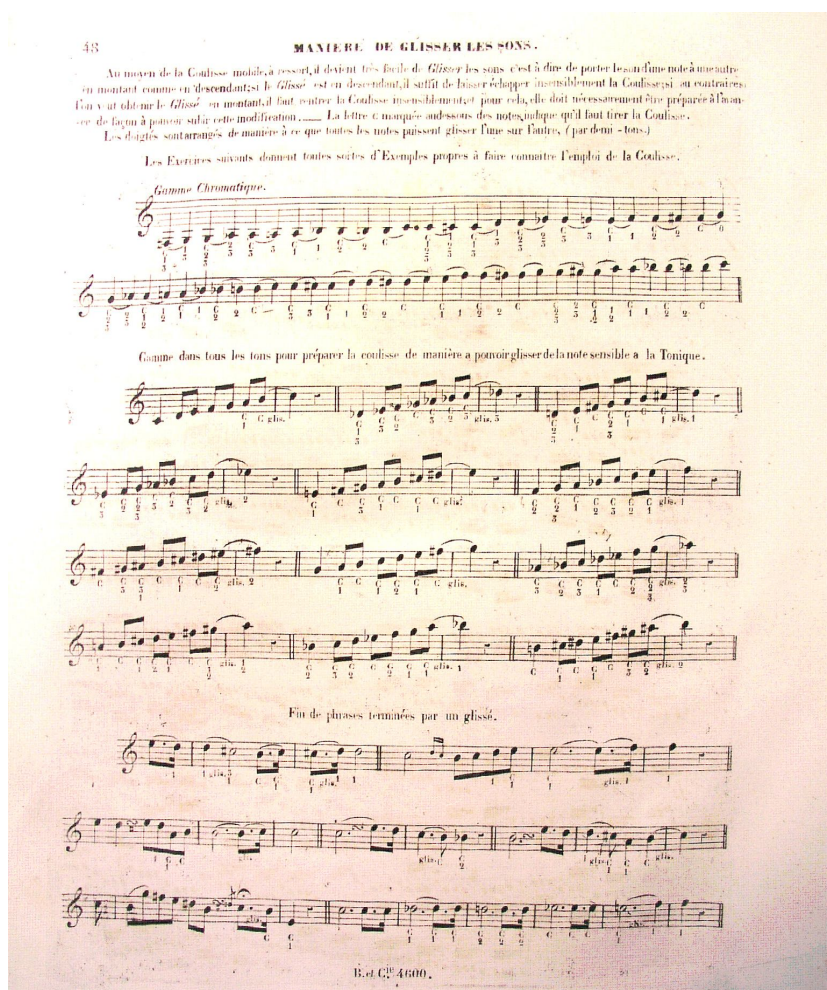


Figure 3.3 Extract regarding the use of the spring slide from Sax's method.

Other testimonies for the impracticability of the compensator were also included in the report of the Juries for the 1855 Paris international exhibition. It was reported that the compensator derived from Haltenhoff's tuning slide, and was without any doubt a means of correcting the intonation of instruments. However, the artists found difficult to use rapidly and especially in combination with valves.<sup>13</sup>

<sup>11</sup> See Chapter Two, p. 26.

<sup>12</sup> *Nullité de brevet. Instruments et brevets Sax. Tribunal correctionnel de la Seine, 6me Chambre. Affaire Rivet contre Sax. Documents* (Paris: Dondey-Dupré, 1855), 57.

<sup>13</sup> *Exposition Universelle de 1855. Rapports du jury mixte international publiés sous la direction de S. A. I. le Prince Napoléon Président de la commission impériale* (Paris: impr. Impériale: 1856), 2:668.

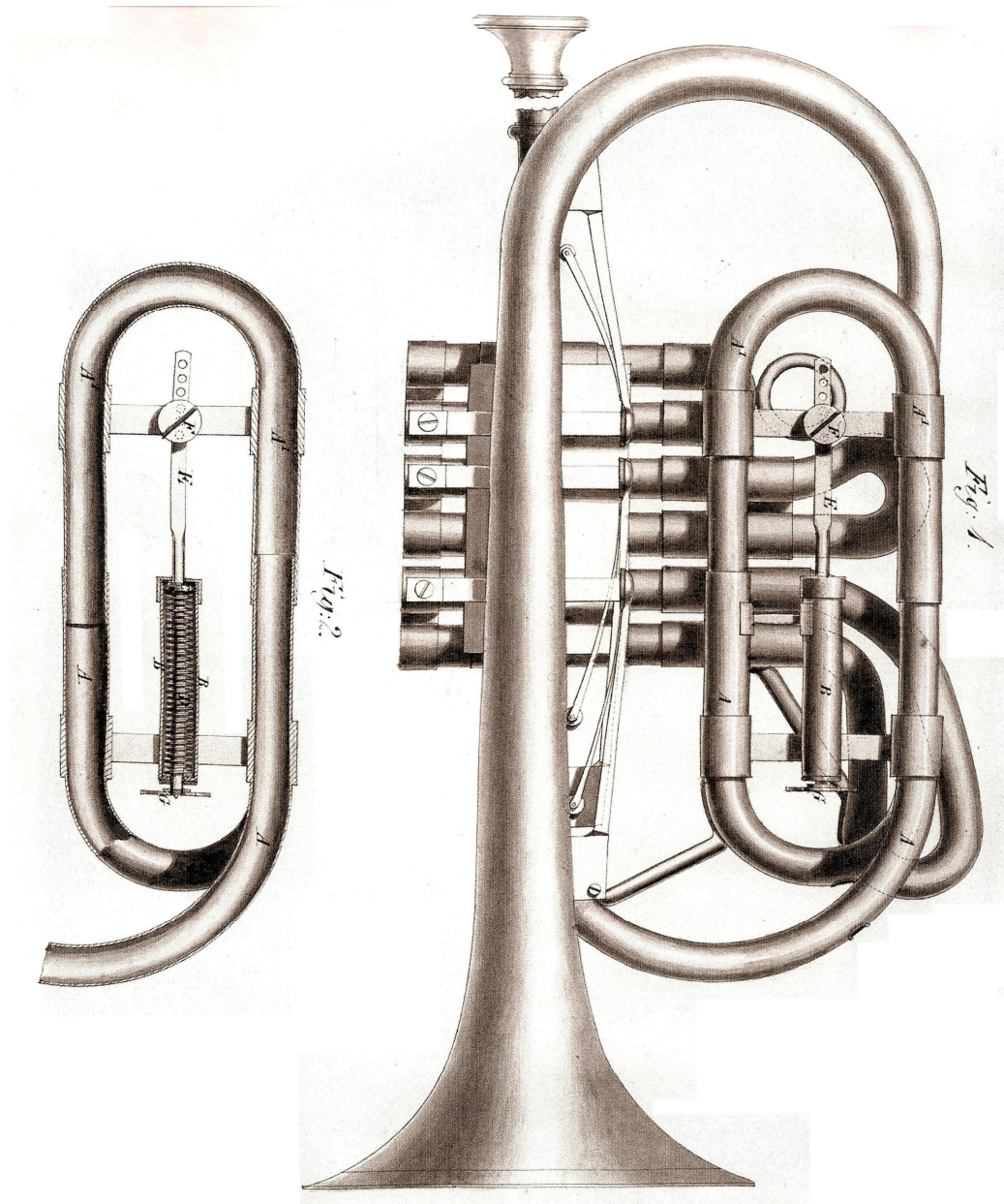
## Chapter Three

Although it had a limited adoption, it seems that a few makers tried to employ it. Distin in his product catalogue of the early 1850s advertises a cornet-à-pistons with what is called a “patent slide” (see no. 21 of Figure 6.4, Chapter Six). James Balthazar Ziegler, an obscure maker, registered in the United Kingdom, as early as 1847 a design for a cornet with double-piston valves and a spring slide. As described by Ziegler in his registered design the object of this spring slide was:

[...] to give to the performer on Cornets or other valve instruments the power to sharpen or flatten any one or a given number of notes in the scale with facility while playing on such instrument. With the exception of the change in the form which this improvement involves the instrument is precisely similar to those of its class as now ordinarily used. [...] It is well known that the pitch of this class of instrument is regulated by elongating or shortening the passage for the wind; if thereof this effect can be momentarily produced, any note in the piece of music may be flattened or shortened as required; and if from continuous exertion, the performer finds it an increased difficulty to play in perfect tune, he may by this improvement be considerably assisted.

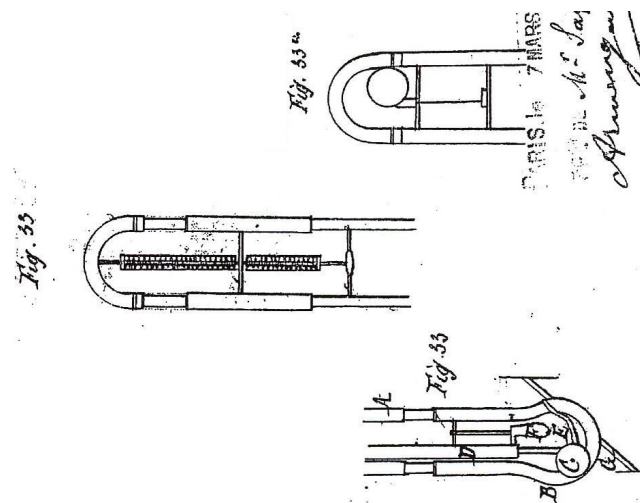
No mention is made to the possibility of performing glissandi, as in the case of Sax’s spring slide. The cornet is equipped with double-piston valves of the old Mainz model. The spring slide is made in the following way: a tension spring is enclosed in a barrel; a rod passing through a piston enclosed in the barrel is secured at one end on a screw that is connected with the movable part of the tuning slide and at the other on a thumb piece. When the slide is pulled out with the help of the spring the length of the instrument is increased and the pitch is lowered; when the slide is pressed inwards with the help of the thumb piece the pitch is sharpened.





**Figure 3.4** The accompanying drawing of a cornet with a spring slide from James Balthazar Ziegler's registered design of 1847. The National Archives, United Kingdom (BT45/6/1059).

In 1881 Sax patented a similar device. There, he admitted that the spring slide in its initial version was not completely adopted by musicians since it required extra study. The “new” spring slide was introduced so as to address intonation issues from a different viewpoint. Sax referred to the problems of equal temperament and the enharmonic notes. The spring slide was employed so as to deal with different harmonic attractions, adjusting the note's role. He also added the slide's possible additional usage for the execution of portamento.



**Figure 3.5 Drawings of spring slides from Sax's 1881 patent.**

A later trumpet of c.1885 by Mahillon in the Edinburgh University Collection of Historic Musical Instruments (inventory no. 2321), and a trombone by D. & P. Le Brun (inventory no. 3219) present a similar spring slide (Figure 3.6). Sax's spring slide could have served as an inspiration for the trigger devices met in modern trumpets for correcting the intonation of the valves.



**Figure 3.6 The valve section with the spring slide from a bass cavalry trombone in B-flat & F, made by D. & P. Le Brun, Brussels c. 1919. Edinburgh University Collection of Historic Musical Instruments (inventory no. 3219). Photograph by Raymond Parks.**



### 3.1.1.2 *Clairon with valve attachment*

In 1849 Sax was granted a patent for improved bugles (fr. *clairon*) for the infantry. His development was to make the instrument in such way that certain parts of it could be detachable. It would allow the addition of crooks – where needed – and of a valve section, so as to transform the natural instrument into a chromatic one. It would allow players to both give the signals and to form small groups for the performance of duets, trios, etc.

Sax provided the drawings of his bugles in four different pitches; the ordinary bugle in B-flat, and subsequently the bugles in lower pitches: in A-flat a tone lower, in E-flat described as the tenor, and the one in B-flat as the bass. He mentioned the option of having a soprano instrument in E-flat, without appending its drawing. In all the valve attachments Sax used Berlin valves. No valve tuning slides are present (see Figure 3.7) something that allowed Sax to give the valve loops the form of the perfect and elongated circle patented in 1843.<sup>14</sup>

These instruments were exhibited during the 1851 London International Exhibition and figured on the first shelf of his showcase (Figure 3.8). They were also exhibited in the Paris 1855 International Exhibition where the jury's reported the primary motivation behind Sax's invention: an official prohibition for any changes that would affect the instrument's overall shape.<sup>15</sup> The movable valve section when detached did not affect the instrument's external appearance. In this report the *clairons système Sax* were presented as a complete family made in alternating pitches of B-flat and E-flat.<sup>16</sup> According to the same report, about one year before the exhibition the sixth battalion of the infantry tested these instruments with success and their general adoption was decided.<sup>17</sup>

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<sup>14</sup> See Chapter Four, p. 108.

<sup>15</sup> *Exposition Universelle de 1855*, 2:671.

<sup>16</sup> *Ibid.*

<sup>17</sup> See also Appendix E with information on the various military decrees concerning the composition of French army bands.

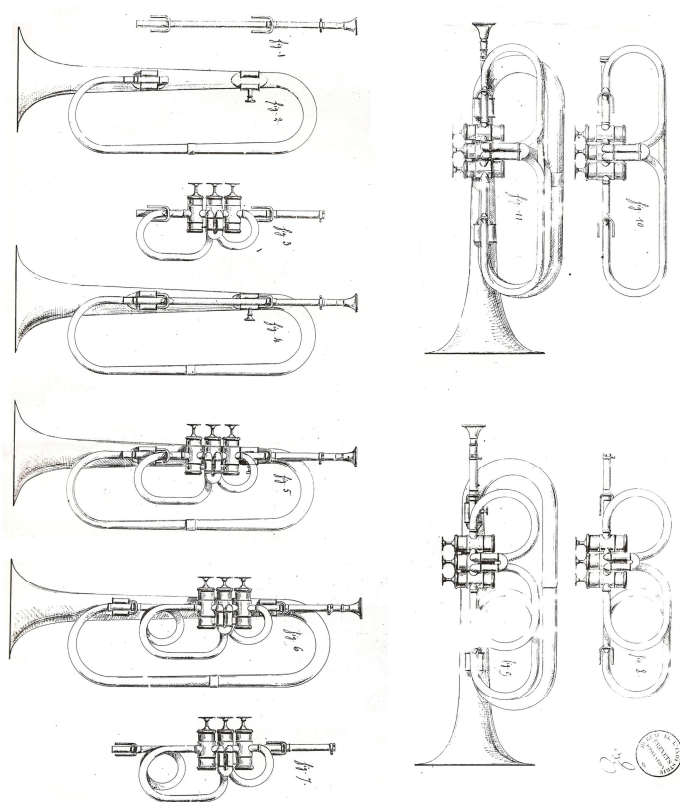


Figure 3.7 Bugles with detachable valve sections from the drawings of Sax's 1849 patent.

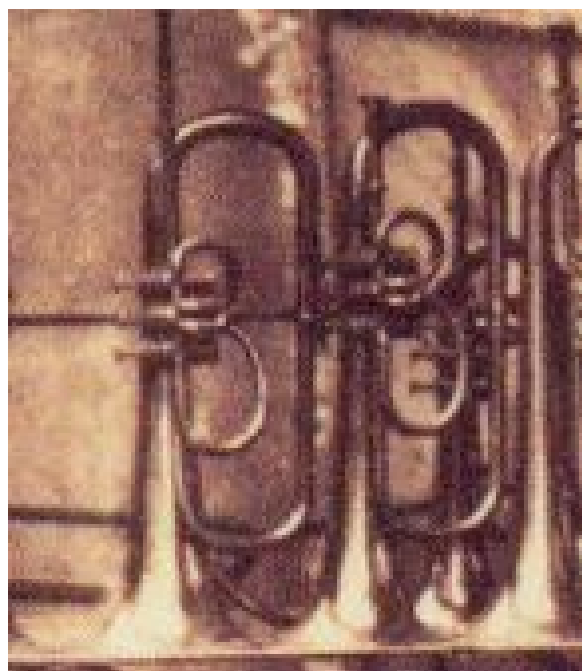


Figure 3.8 *Clairons* with valve attachment from Sax's showcase from the 1851 London International Exhibition. Detail photographed from original photograph by Raymond Parks.

Three instruments of this kind appear to have been part of Sax's private collection. According to the collection's catalogue they were indeed adopted with a ministerial decision in 1854.<sup>18</sup> Of all Adolphe Sax's surviving brasses, only one instrument is known to bear the inscription "clairon Sax". This is today in Brussels (inventory no. 2009.028). However, the instrument's valve section is not detachable as in those patented in 1849.

In the British domain, in 1854, in an advertisement of Boosey & Sons in *The Musical World*,<sup>19</sup> bugles with the familiar valve attachment were offered for sale. These are evidently instruments based on the same concept.<sup>20</sup> In 1855, Distin took out a patent for what appears to be the same provision.<sup>21</sup> A valve section was added to both the single and double-coiled bugle. The configuration was slightly different from that of Sax's, but it was based on the same idea. The valve section protruded from the rest of the instrument, and Périnet valves were used, instead of Berlin as in Sax's instrument.

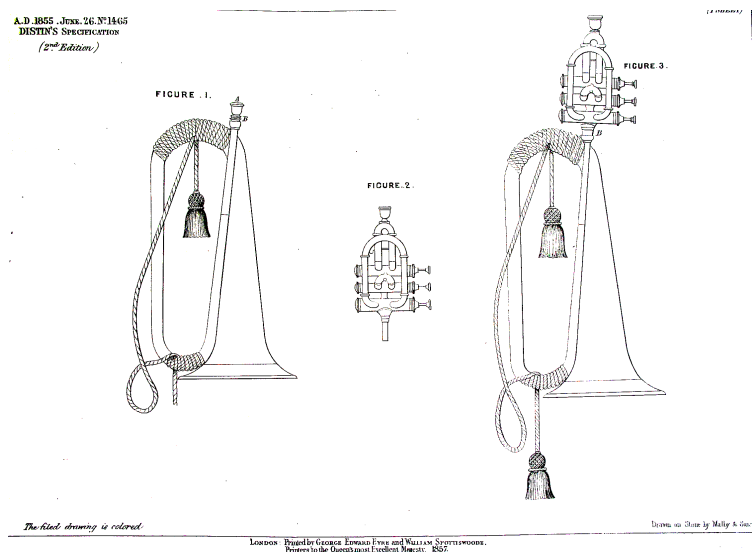


Figure 3.9 Drawing from Distin's 1855 patent.

<sup>18</sup> *Catalogue du musée instrumental de M. Adolphe Sax. Collection unique d'instruments de musique de tous temps et de tous pays* (Paris: impr. de Ves Renou, Maulde et Cock, 1877).

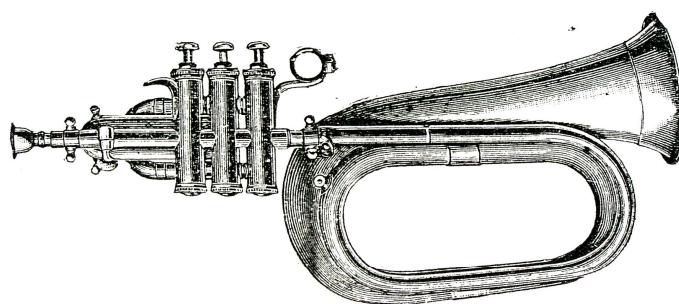
<sup>19</sup> "Advertisements" *The Musical World* 32 (18 March, 1854): 187.

<sup>20</sup> The appearance of bugles with a valved attachment in this advertisement before the issue of Distin's patent of 1855, encourage the possibility of Distin being the maker of the instruments offered for sale by Boosey and sons in their early days.

<sup>21</sup> British letters patent no. 1465 for "improvements in the means of rendering the ordinary field or regulation bugle chromatic" (26 June 1855) by Henry John Distin.

## Chapter Three

Although Sax patented the idea five years prior to Distin, it was Distin who became known in the British press as the inventor of the bugle with “chromatic attachment”. The instrument (after Distin’s design) was also included in later catalogues of various French and British makers, such as Gautrot aîné et Cie,<sup>22</sup> Hawkes & Son<sup>23</sup> and Besson.<sup>24</sup> According to Baines it was used for some time in *Chromatic Bugle Bands*, but apart from that it was not a success.<sup>25</sup> That could be ascribed to the strong similarity of the valved bugle’s bore profile to that of a flugelhorn or a contralto saxhorn. It is also probable that the inconvenience caused to the performer by having to carry extra instrument parts, and the vulnerability of an assembled instrument, worked against the instrument’s general adoption and survival.



C Duty Bugle. Regulation Pattern. No. 161.  
(Showing B♭ Chromatic Valve Attachment).

**Figure 3.10 Bugle with valve attachment from Besson’s catalogue.**

<sup>22</sup> *Catalogue des instruments de musique de la manufacture générale de Gautrot aîné et Cie* (Paris: Typographie Ch. Oberthur & Fils, 1867), 81.

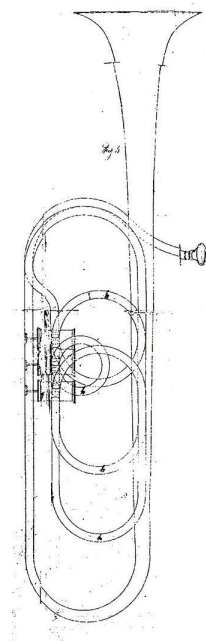
<sup>23</sup> *Illustrated Price List of the Hawkes Military Band Instruments* (London: Hawkes & Son, [n.d.]), 57.

<sup>24</sup> *Besson & Co. Ltd. 196-198 Euston Road, London* (London: Langley & Sons, Euston Press, [n.d.]), 35.

<sup>25</sup> Anthony Baines, *Brass Instruments: their history and development* (New York: Dover, 1993), 157.

### 3.1.1.3 Modifications to the trombone, trumpet and cornet

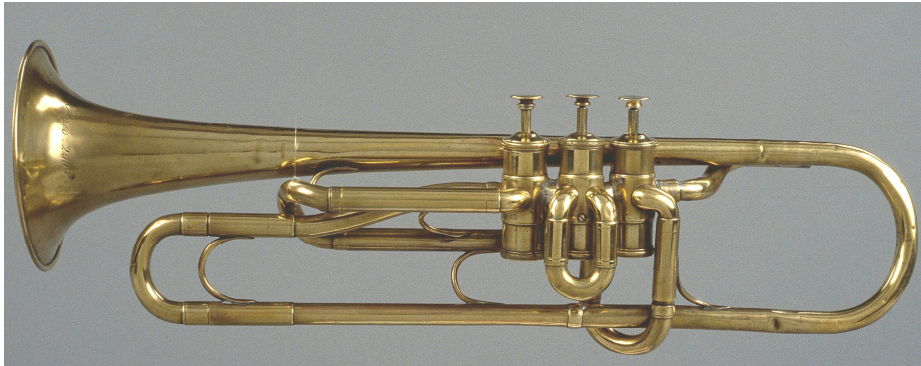
The earliest depiction of a trumpet designed by Sax comes from the 1843 patent where a deep-bodied trumpet equipped with three Berlin valves and a spring slide appears. In the same patent is depicted a *trompette-ténor* in B-flat, in upright form, of which no surviving instrument is known.



**Figure 3.11 Tenor trumpet from the 1843 patent drawings.**

Already in the 1840s Sax was producing the trumpet advertised in his later product catalogues as *trompette système Sax*. This is the only model of a trumpet—in the bell-front form—equipped with Berlin valves illustrated in Sax’s various advertisements; this trumpet had a more elongated form compared to the trumpet with the spring slide depicted in the 1843 patent. It was equipped with three Berlin valves and in the 1848 and 1850 advertisements was called *trompette à cylindres avec les tons Infanterie*. In later handbills it was called *trompette système Sax*. A specimen exists today in the collection of the Musée de la musique (inventory no. E.727, Figure 3.12). This was part of the collection of Sax. In the collection’s catalogue it is called *trompette longue à pistons*. Exactly the same drawing was used by Kastner in his *Manuel Général de Musique Militaire* (plate XXIV) and was described as *nouvelle trompette à cylindres en sol, forme infanterie*; a set of crooks and shanks was also depicted. This model also appears to have reached Britain; it was included in Distin’s handbill of the early 1850s where it was described as a Sax-

*valve trumpet* (See no. 15, Figure 6.4, Chapter Six). In the firm's product catalogue of 1857 it had already disappeared.<sup>26</sup>



**Figure 3.12** *Trompette système Sax* or *Trompette à cylindres Infanterie* made in 1846 by Ad. Sax. This was part of Sax's private collection. Musée de la musique, Paris (inventory no. E.727). Photograph by Thierry Ollivier.

Kastner in the *Supplément*<sup>27</sup> (1844) of his instrumentation treatise<sup>28</sup> discussed the *trompette à cylindres*. The instrument is being presented as forming a complete family comprised of the following instruments:

*Petite trompette en mi<sup>b</sup> aigu*

*Trompette en ut (aigu)*

*Trompette en sol*

*Trompette tenor en ut*

*Trompette basse en si<sup>b</sup>*

*Trompette contrebasse en fa*

The highest in pitch of the above instruments, according to Kastner, was Sax's invention and did not exist before him; it was pitched an octave above the *trompette ordinaire* in E-flat or else *trompette de cavalerie*.

Certainly Sax was not the first to apply the Berlin valve to the trumpet; Berlin valves had been applied to trumpets in Germany long before Sax. Berlioz in his *Memoirs* already in 1843 frequently reported the use of the *trompette à cylindres* during his trips in Germany. He mentioned that these instruments had long been

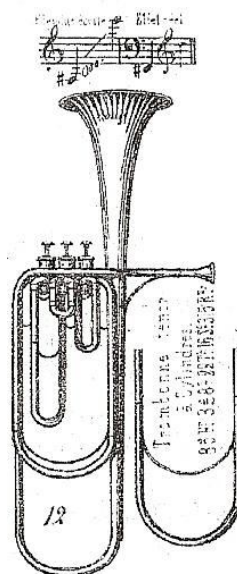
<sup>26</sup> *Complete Catalogue of Military Musical Instruments Manufactured by Henry Distin* (London: Henry Distin, 1857).

<sup>27</sup> Jean-Georges Kastner, *Supplément au Traité général d'instrumentation* (Paris: [n.p.], 1844), 31-32.

<sup>28</sup> Kastner, *Traité général d'instrumentation, comprenant les propriétés et l'usage de chaque instrument, précédé d'un résumé sur les voix, à l'usage des jeunes compositeurs* (Paris: [n.p.], 1837).

The brasswind production of Adolphe Sax established in Germany, but musicians in Paris were still reluctant to use them, and preferred the *cornets-à-pistons*, instead. He also praised the quality of those made by Sax in Paris.<sup>29</sup> Extant trumpets with Berlin valves made by Sax can be found in the *List of Adolphe Sax Instruments*.<sup>30</sup>

In the same way, Berlin valves were also applied to the trombone, and this was also combined with the saxotromba form (namely the bell-up form). This was the instrument advertised by Sax as *trombone à cylindres*. This model was imported into Britain and as the *trompette système Sax* was also included in the handbill from Distin's workshop dated from the early 1850s, where it was called "Valve tenor trombone in C and B-flat" (no. 8 Figure 6.4, Chapter Six). An identical model was also included in later catalogues of the maker Pelitti.<sup>31</sup> In his c.1850 handbill Sax also included a *basse trombone à cylindres en Fa et Mi♭* and a *trombone contre basse en Si♭ système Sax* both in saxotromba form.



**Figure 3.13** *Trombone à cylindres* from Sax's handbill c. 1850.

<sup>29</sup> Hector Berlioz, *Memoirs of Hector Berlioz from 1803 to 1865, comprising his travels in Germany, Italy, Russia, and England*, transl. Rachel (Schott Russell) Holmes, Eleanor Holmes, ed. Ernest Newman (New York: Knopf, 1932), 292, 307-08.

<sup>30</sup> Eugenia Mitroulia and Arnold Myers, *List of Adolphe Sax Instruments*, at <http://www.galpinsociety.org/gdsl.html>, accessed 23 October 2010.

<sup>31</sup> See, *Giuseppe Pelitti. Fabbrica nazionale fondata 1720 [1870?]* in: Renato Meucci, "The Pelitti Firm: Makers of Brass Instruments in Nineteenth-Century Milan", *Historic Brass Society Journal* 6 (1994): 316.





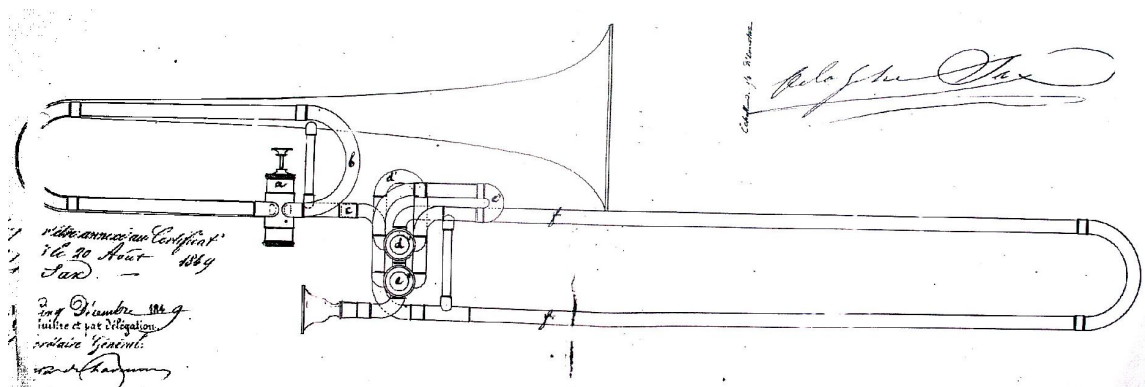
**Figure 3.14 Trombone in form saxotromba with three Berlin valves, made by Ad. Sax in 1858. Musée de la musique, Paris (inventory no. E.1694). Photograph by Thierry Ollivier.**

In 1852 Sax was granted another certificate of addition for modifications to the slide trombone and slide trumpet. With these new specifications he addressed the performers' difficulties in using the bass and contrabass trombones in F or E-flat. Sax pointed out that the use of the handle to assist the player to reach the lower slide positions was particularly inconvenient, especially for musicians of marching bands. This also made the execution of legato challenging, especially for amateur musicians. In his view the valved trombone could definitely not compensate for it.

He decided to combine the advantages of both instruments in his own version. An ordinary tenor trombone was equipped with a larger bell, and a valve was placed close to the joining part of the bell and slide section; this extended the instrument's range in the lower register. The slide part was also equipped with another two or three valves, which could be used for the easier execution of musical passages, especially in the higher register of the instrument. These "new" features could be either used separately or in combination. It appears that exactly the same model with the thumb valve was produced by Sax long before it appeared in the 1852 patent. It was included in the handbill of his workshop of c.1850 where also an extract from a letter sent from Meyerbeer to Distin praising the instrument's qualities with the instrument's drawing were reproduced. Exactly the same model was

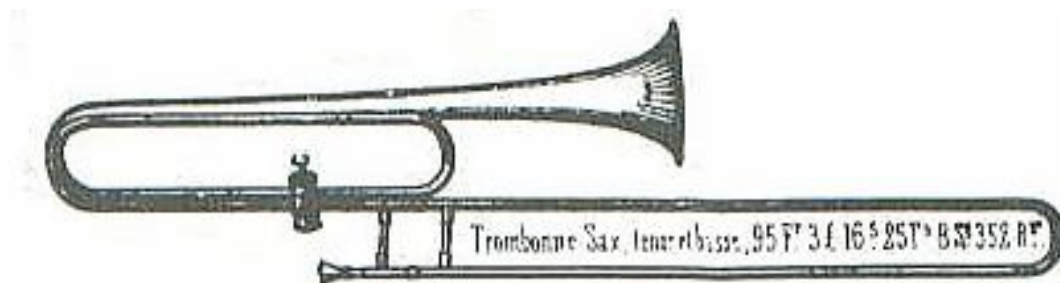


The brasswind production of Adolphe Sax exhibited by Sax in the 1862 London International Exhibition and continued to be advertised until later in the century as *trombone Sax ténor et basse*. Distin advertised this model in Britain in the early 1850s.



**Figure 3.15 Trombone with the new modifications from Sax's 1852 certificate of addition.**

Already in 1849, Thomas Key, a British maker, registered a design in Britain for a similar model (trombone with a thumb valve). Key used one valve, which was of Sax's Berlin valves, but of a shorter length than that of Sax's thumb valve.<sup>32</sup> In 1846, the maker had also registered a design for the application of a third valve to the french horn. The instrument depicted in the design is a horn with three Berlin valves called by the maker "Sax valves".<sup>33</sup>



**Figure 3.16 Trombone Sax from Sax's handbill c. 1850. The same instrument appears in Distin's handbill from the early 1850s.**

Sax was not a pioneer in applying the thumb valve to the trombone to bridge the gap. Sattler employed a rotary valve for that purpose as early as 1839. The difference here is that Sax's applied a Berlin valve, instead of a rotary one. It is

<sup>32</sup> Design 2121 registered by Thomas Key on 15 December 1849 for the "Double Keyed Slide Trombone". The National Archives, United Kingdom (BT45/11). For an illustration see John Webb, "Designs for Brass in the Public Record Office" *Galpin Society Journal* 38 (1985): 48-54, 50.

<sup>33</sup> Design 699 registered by Thomas Key on 15 April 1846 for a "Sax valve French horn". The National Archives, United Kingdom (BT45/04).

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probable that Sax applied the thumb valve to a narrow bore tenor, typical French model, instead of a wide-bore instrument as in Sattler's case. However, this cannot be said with certainty since it is an observation based only on drawings.

Under the same principle, Sax added to the slide trumpet, which he called *trompette Anglaise*, a valve to lower its pitch by a tone and a half. There is a surviving instrument of this kind in the Musée de la musique in Paris (inventory no. E.725). This instrument was also once part of Sax's private collection.

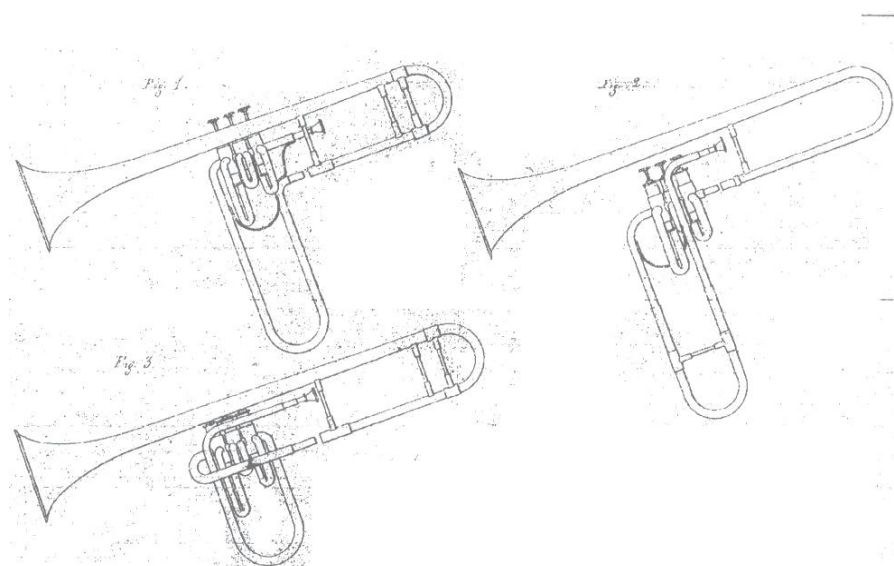


**Figure 3.17** Slide trumpet with one Berlin valve made in 1856, according to the specifications of Sax's 1852 patent. Musée de la musique, Paris (inventory no. E.725). Photograph by Thierry Ollivier.

A better-known model of a trombone by Sax is that developed in 1859.<sup>34</sup> This is the cavalry valved trombone. According to Sax's patent, it combined both the advantages of the saxotromba form and those of the bell-front models; the instrument could be supported under the left arm, but the bell faced on the front as in the bell-front model, so that the sound could be directed to the marching soldiers. Initially three different versions were described by Sax, with variations in the valve dispositions (Figure 3.18). The bell section in all three versions was detachable and according to Sax it was made in a way that it resembled the same section of a slide trombone. All three versions were equipped with three Berlin valves. Figure 3.19 shows a surviving instrument of this kind with three Berlin valves.

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<sup>34</sup> Certificate of addition of 30 April 1859 to the main patent of 3 January 1859 (no. 39371).



**Figure 3.18 Drawings of the cavalry trombone constructed in three different ways according to the certificate of addition of 30 April 1859.**

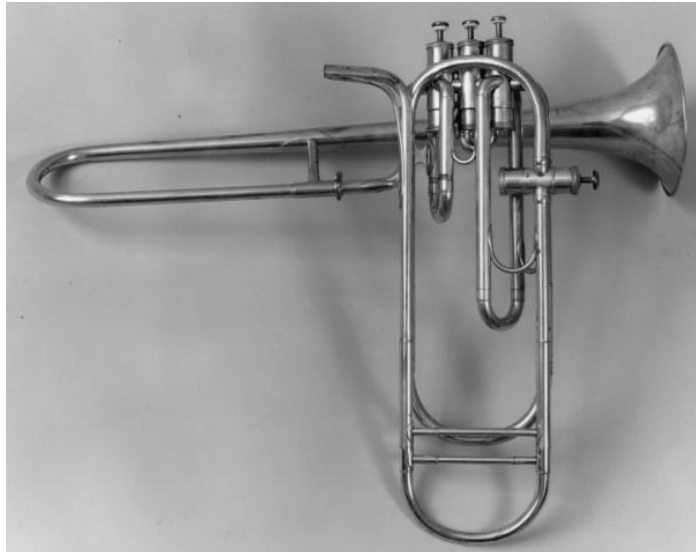
Later, through a second certificate of addition,<sup>35</sup> Sax added a fourth and a fifth valve. The fourth one was to lower the pitch by two tones, and the fifth by two tones and a half. There is a surviving specimen in Edinburgh with four valves (inventory no. 3199, Figure 3.20). These extra valves could also be used as transposing valves. The three-valve model was made in large numbers and was sold by Distin in Britain, and after 1868 by his successors Boosey & Co.<sup>36</sup>



**Figure 3.19 Cavalry trombone with three Berlin valves. Offered for sale by Jean Michel Renard. Serial number 35561, made in 1871.**

<sup>35</sup> Certificate of addition of 31 December 1859 to the main patent of 3 January 1859 (no. 39371).

<sup>36</sup> Arnold Myers, "Brasswind Innovation and Output of Boosey & Co. in the Blaikley Era" *Historic Brass Society Journal* 14 (2002): 410.



**Figure 3.20 Cavalry trombone in C and G with four Berlin valves. Edinburgh University Collection of Historic Musical Instruments (inventory no. 3199). Photograph by Antonia Reeve.**

The only other model of a trombone which had a lasting influence was Sax's trombone with six independent valves (discussed in more detail later in this chapter).

Already in the 1840s Sax applied his version of the Berlin valve to the cornet. His cornet was called *cornet à cylindres système Sax* or just *cornet système Sax* and had a characteristic wrap which can be seen in Figure 3.21. The earliest surviving cornets of that kind date from 1846. This model of cornet was usually equipped with a set of shanks and crooks to change from B-flat usually to A, A-flat, G, F, E and E-flat. The instrument was also advertised by Distin in Britain in the early 1850s and specimens following Sax's configuration by British and French makers also exist in various collections.<sup>37</sup>



**Figure 3.21 Cornet à cylindres système Sax.**

<sup>37</sup> For more on the development of the cornet by Sax see, G ry Dumoulin, "Sax et le cornet : le cornet   pistons dans la production d'Adolphe Sax, 1814-1894" *Actes du colloque Paris : un laboratoire d'id es, facture et repertoire des cuivres entre 1840 et 1930* Cit  de la musique / Historic Brass Society – 29 juin /1 r juillet 2007, accessed 15 November 2010, [http://www.citemusique.fr/pdf/musee/colloques\\_factures/sax.pdf](http://www.citemusique.fr/pdf/musee/colloques_factures/sax.pdf).

### 3.1.1.4 Turning bell or *pavillon tournant*

In Sax's 1859 patent, among the innovations announced was that of the *pavillon tournant*, or turning bell (Figure 3.22).<sup>38</sup> The already known feature of the detachable bell was introduced by Sax to his instruments, with the extra feature that the bell could be turned to different directions at will. In surviving instruments there are three screws in the joint of the bell with the rest of the instrument, so there are three possible positions of the turning bell.

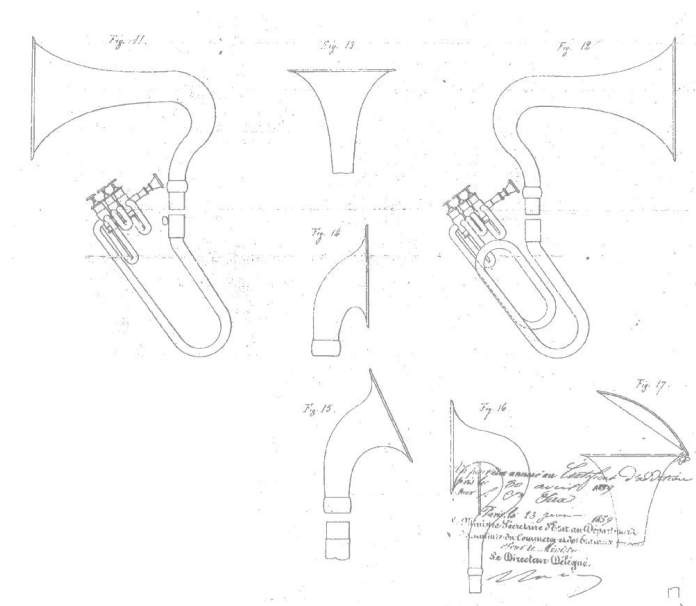


Figure 3.22 Drawings from the 1859 certificate of addition regarding the turning bell.

To make the alteration of the direction of the bell feasible, its shape was changed. The bell was bent and was directed to the side; it took the shape, as described by Sax, similar to that of the bell of the saxophone. Several instruments with a bell of this kind were exhibited in the 1890 Royal Military Exhibition. One in particular was described as parabolic funnel-shaped.<sup>39</sup> This reminds us of the bell with parabolic curve of 1855, described by Halary and mentioned later which, though, was not movable (see Figure 3.30).

<sup>38</sup> Certificate of addition of 30 April 1859 to the main patent of 3 January 1859 (no. 39371).

<sup>39</sup> Charles Russell Day, *A Descriptive Catalogue of the Musical Instruments Recently Exhibited at the Royal Military Exhibition, London, 1890* (London: Eyre and Spottiswoode, 1891), 207.





**Figure 3.23** Contrabass saxhorn with *pavillon tournant* made by Ad. Sax in 1864, Musée de la musique (inventory no. E.0705). Photograph by Thierry Ollivier.

Although this development was introduced in 1859, the earliest numbered instrument equipped with a *pavillon tournant* is a trombone in Bruno Kampmann's private collection dating from 1863 (inventory no. 201). This feature was used mostly in saxhorns of different sizes and was usually, but not exclusively, combined with the six independent valves system, in the *nouveau* instruments. An even more extravagant development was introduced in 1867, especially for the bigger instruments of the saxhorn family (Figure 3.24); this was the combination the turning bell with a more cumbersome overall wrap of the instrument, indented for the instruments of the symphony orchestra. The instrument's tubing rests on the floor without burdening the performer. A bell of a similar kind appeared in the last known product catalogue of Sax's workshop. In this, instruments were offered with the extra feature of a *pavillon renversée* with an additional price.<sup>40</sup>

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<sup>40</sup> See reproduction in Appendix I.

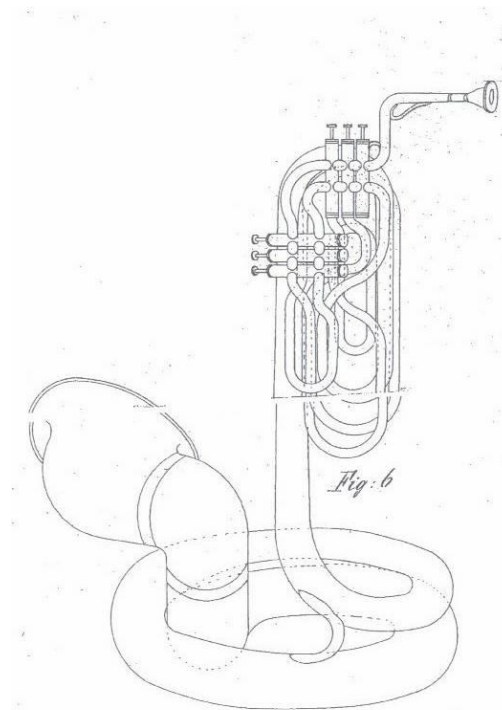


Figure 3.24 New design for orchestral instruments from Sax's 1867 patent.

Instruments with a similar feature appear to have been patented by Besson in Paris in 1856,<sup>41</sup> three years before Sax's patent (see Figure 3.25). The bell could be rotated in two different directions. Later Besson applied this feature on circular instruments, which became known as *neoform horns*.<sup>42</sup>

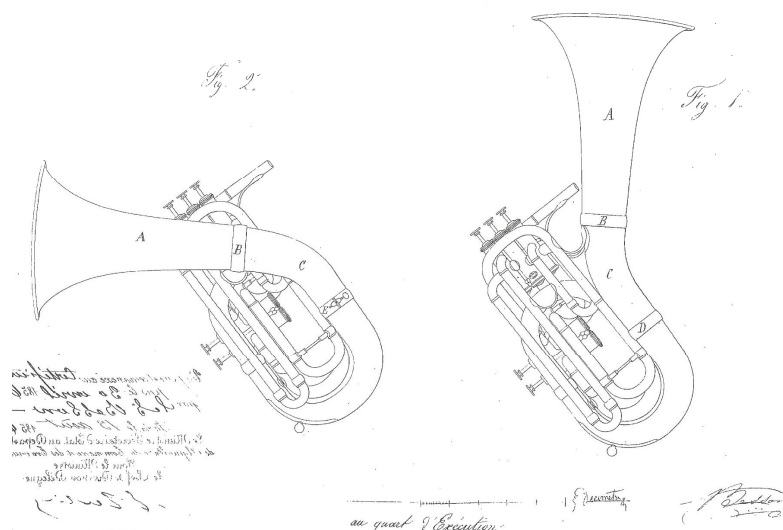


Figure 3.25 Drawings from Besson's 1856 patent.

<sup>41</sup> Certificate of addition of 30 April 1856 to the main patent of 18 January 1855 (no. 22072) issued by Besson "pour des perfectionnements aux instruments de musique de tous genres en cuivre".

<sup>42</sup> See Chapter Six, pp. 262-63.

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Very soon after Sax's 1859 patent the feature of the *pavillon tournant* was patented in Britain by George MacFarlane, William Edward Newton and Richard Carte. The patent,<sup>43</sup> granted in 1860, among others introduced means for pointing the instruments' sound in any desired direction.<sup>44</sup> The bell was bent over, as in Sax's version of this feature, and the bent part was made moveable. By means of a collar of spring clip and a thumb screw, the bell could be secured in any desirable direction, thus differing from Sax's *pavillon tournant* where the bell could be turned in a limited number of different directions. To display the application of the feature three instruments were included in the accompanying patent drawings: a saxhorn-type instrument in the bell-up form, a cornet in the bell-front form, and a circular cornet, all three equipped with Périnet valves. A surviving cornet made with these features is today in Stuttgart, in the private collection of Martin Schmid (Figure 3.26).



**Figure 3.26** A surviving cornet made by Rudall, Rose, Carte & Co. c. 1872-78 with a movable bell after MacFarlane's, Newton's and Carte's 1859 patent. The instrument in addition to the usual Rudall, Rose, Carte & Co. inscription bears an extra inscription on the bell collar "MACFARLANE/INVENTOR/5". Private collection Martin Schmid, Stuttgart. Photograph by the author.

<sup>43</sup> British patent no. 2967, 3 December 1860 "for improvements in wind musical instruments".

<sup>44</sup> Other specifications included in the British patent influenced by Sax were the addition of an ascending valve to brass instruments, and the *movable cap or hood*, a direct copy of Sax's *reflecteur sonore* of the 1859 patent.



The practicability of this development is an issue, especially in the case of bigger instruments, such as the contrabass saxhorns. Nevertheless, it corresponds to the nineteenth-century makers' obsession with the direction of the sound. This feature was later re-introduced by Sax's son, Adolphe-Edouard (Sax fils), in his later saxhorns. Besides the uses in the Opéra banda, instruments with this feature might have been used by Adolphe-Edouard in his collaboration with the composer Eric Sarnette in studio recordings of the time. It is known that Adolphe-Edouard Sax and Sarnette had a small orchestra of fourteen performers using instruments with special bell features to overcome problems of early recordings.<sup>45</sup>

### **3.1.1.5 The Aida trumpet and the application of parabola to brass instruments**

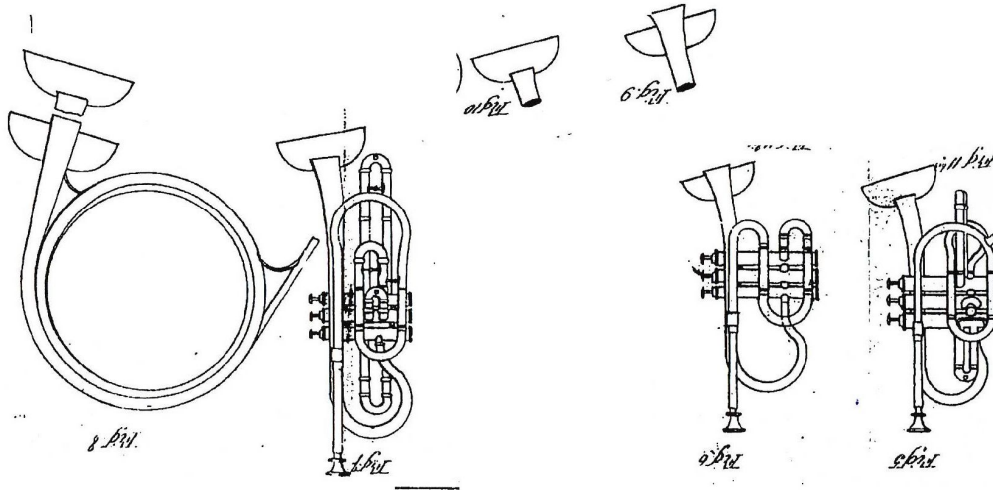
The reflective properties of a parabola regarding both light and sound are well-known. Many nineteenth-century instrument makers attempted to exploit the parabola's properties. The saxophone was seen by Sax as having the shape of a parabolic cone, as described in his saxophone patent. This is contested today. Boehm described the head joint of his flute in his patent as being parabolic. Sax in 1866 was granted a patent for a concert hall in parabolic shape.

After applying the parabola –or at least attempting to– in woodwind instruments and after proposing its application to the design of concert halls, it was natural to ask if and how the parabola could be applied to brass instruments. It is interesting that although Sax explored brass instruments to the extent that some of his proposals were superficial and fanciful, the application of the parabola came almost last.

In his last patent concerning brass instruments, taken out in 1881, amongst other things, Sax suggested the application of a parabolic bell to instruments in addition to their existing bell. Depending on the point where this parabola was applied, the timbre would be affected accordingly.

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<sup>45</sup> Arno George Huth, *La radiodiffusion, puissance mondiale*, reprint (New York: Arno Press, 1972), 383.



**Figure 3.27** Parabolic bells from Sax's 1881 patent.

Only one kind of extant instrument, the Aida trumpet, appears to meet the above specification. It has been described as a double-bell trumpet, or a trumpet with a fake bell, made in such way so as to resemble ancient instruments. However, it appears to be a realisation of the application of parabola to brass instruments. Surviving Aida trumpets of this type are part of the collections in Edinburgh, Bad Säckingen, and the Musée de la musique in Paris.

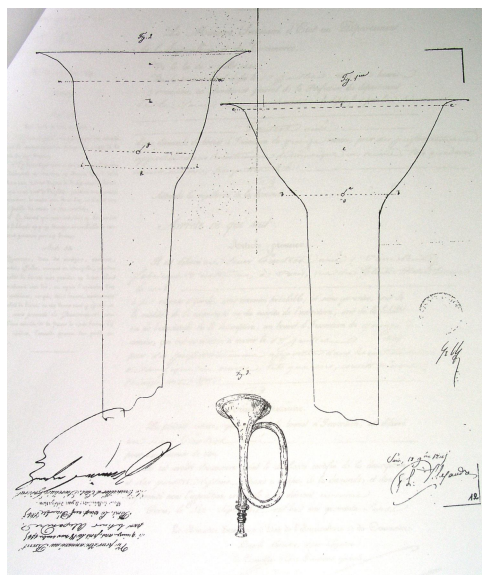


**Figure 3.28** Aida trumpet in B-natural, Ad. Sax, Paris 1883. The instrument is made with one Berlin valve and an extra parabolic bell. Edinburgh University Collection of Historic Musical Instruments (inventory no. 3344). Photograph by Antonia Reeve.

Two variations are met in the surviving Aida trumpets for the positioning of the parabolic bell: in some instruments the parabolic bell is placed a few centimetres before the actual bell, and in some others it is attached at the very end of the regular bell. According to Sax's patent text, the sound would be different in each case. Aida

The brasswind production of Adolphe Sax trumpets with the parabolic bell are made with an internal bell that is very narrow compared to that of a normal trumpet. Their internal bell resembles that of a sackbut or a *Swedish kornett*. The parabolic bell is made of a very thin sheet of metal that is very flexible.

However, was Sax a pioneer in the application of parabola to brass instruments? An engineer, Alexandre (Théodore Lambert Prosper), in 1845 was granted a patent for the application of the parabola to the trumpet and the bugle (fr. *clairon*).<sup>46</sup>



**Figure 3.29 The drawings from Alexander’s 1845 patent.**

A later patent of 1855, filed for by Halary, was based on a similar idea.<sup>47</sup> The parabola was applied in two ways. Firstly, the instrument’s bell was directed to the front and included a parabolic section. Secondly, an instrument with a parabolic bell was further equipped with a “paraboloid” that was inserted into the bell. Both designs were thought to help the better reflection of sound.

Similar instruments were offered for sale by Couturier in his catalogue dating from 1865-70. They were called *instruments à pavillons courbés dits paraboliques*.<sup>48</sup> These were saxhorn-type instruments in various pitches. Trombones were also offered for sale in this form. No surviving instruments of this kind are known, and

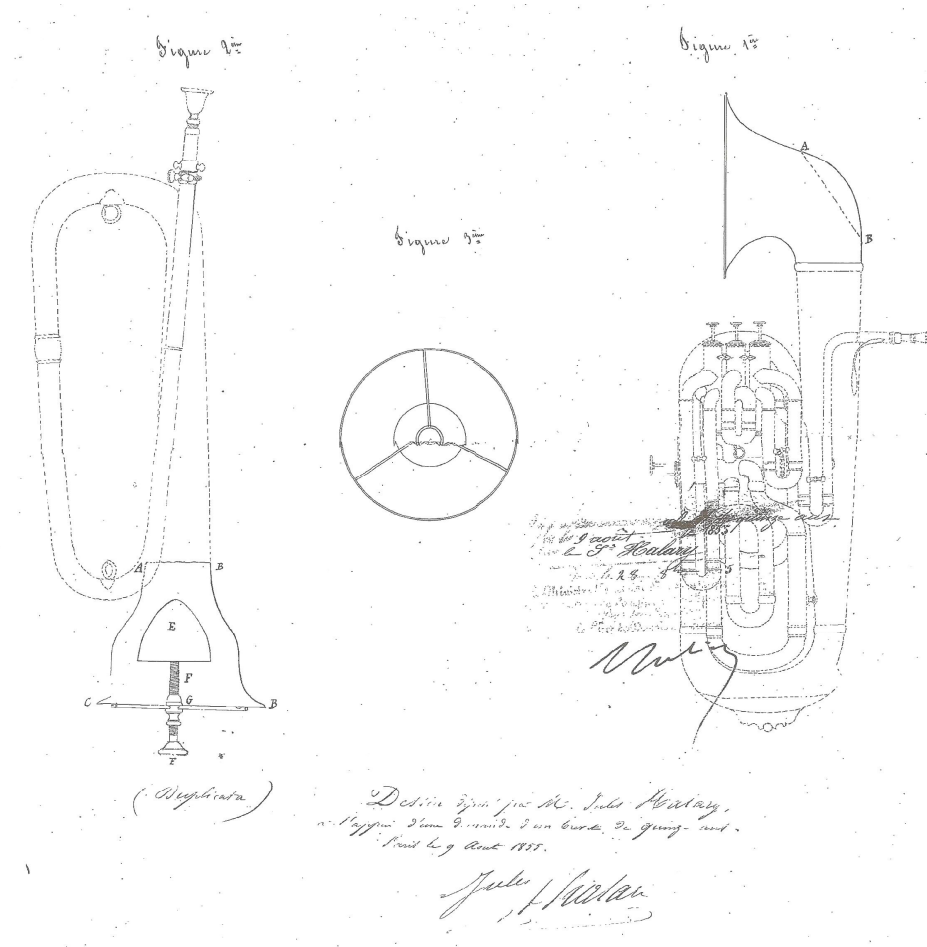
<sup>46</sup> French patent no. 2493, 18 November 1845 “for the application of parabolic and elliptical bends, on a mathematical basis, on the form of the bell of wind instruments”.

<sup>47</sup> French patent no. 24419, 9 August 1855 “for bells with parabolic section applicable to musical instruments”.

<sup>48</sup> *Maison fondée en 1812. Manuf<sup>e</sup> d’instruments de musique Couturier* ([n.p.], [1865-1870?]), 18-19.

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this design must have had a limited commercial production. This is expected when taking into consideration the great difficulties that the manufacturing processes would involve.



**Figure 3.30** The drawing section from Halary's 1855 patent.

Although not leading the way in the application of the parabola to brasswinds, Sax's external parabolic bells seem to be of an innovative nature. It is probable, though, that a bell of this nature has little to contribute acoustically. It looks as if the internal, narrow bell, typical for ancient Egyptian trumpets, would affect more the quality of the sound. It is hoped that future tests will give the answers.<sup>49</sup>

<sup>49</sup> A copy of an ancient Egyptian trumpet, today in the Musée de la musique (inventory no. E.762), once part of Sax's private collection must have been Sax's inspiration. The author is grateful to Thierry Maniguet for drawing her attention to this particular instrument.

Verdi initially was against the idea of ordering the trumpets for the premiere of *Aida* in Cairo in 1871 from Sax.<sup>50</sup> Pelitti of Milan was commissioned instead. The composer originally intended to use a straight valveless trumpet. However, not all the desired notes could be produced on a valveless instrument, and thus the addition of the valve, which would be concealed from the audience, was discussed.

For the 1881 Paris premiere, although Verdi had made arrangements for trumpets to be sent from Italy, it was decided instead to order them from Sax since a large number of instruments were needed for the Paris Opéra production.<sup>51</sup> An impressive picture from the Bibliothèque de l'Opéra, in Paris, depicts six different *Aida* trumpets and a five-valve alto saxhorn, used during performances by the Sax banda in the Opéra. The trumpets are not only equipped with the parabolic bell, but also with other devices, which is believed that added more to the instrument's external appearance, than to the actual sound.<sup>52</sup>



**Figure 3.31** *Aida* trumpets with all sorts of different bells. The picture comes from *Le dossier d'artiste Adolphe Sax* at the Bibliothèque de l'Opéra in Paris.

<sup>50</sup> Hans Busch, *Verdi's Aida: the history of an opera in letters and documents* (Minneapolis: University of Minnesota Press, 1978), 32-33.

<sup>51</sup> *Ibid.*, 417.

<sup>52</sup> The author is indebted to Thierry Maniguet for drawing her attention to the particular piece of information.

### **3.1.1.6 Instruments with double or multiple bells**

In the 1852 patent Sax dealt with possible ways to extend the range of instruments. In this patent for the first time he proposed to join together two instruments which would share the same bell and also the first half of their tubing. A version with two bells was also suggested.<sup>53</sup> Later in 1859, based more or less on a similar idea, he presented a double instrument where both instruments shared part of the same bell. He joined together two instruments of the same type but of different pitch; that would give the executant a wider range of sounds to choose from. Sax made the distinction between his development and duplex instruments of the public domain: he joined together instruments of the same family such as saxhorns and saxotrombas, in different pitches and not two distinct instruments such as a flugelhorn and a horn. The combination of instruments of the same pitch, but with different overall proportions, resulted in the instruments having the same range, but different timbres, which was not his objective.

In the same patent Sax presented many different examples of cornets which either combined both descending and ascending valves or combined two instruments of different pitch with a common bell or with different bells, and this again by employing all sorts of different valve combinations.<sup>54</sup> These instruments were mainly equipped with different combinations of independent valves.

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<sup>53</sup> Sax realised that the use of the same bell would affect the instrument's timbre, since as mentioned in the patent the size of the bell would have an important effect on the instrument's sound, and the bell might have been too large for the higher register.

<sup>54</sup> For example, independent valves and/or valves of the public domain, ascending and/or descending.



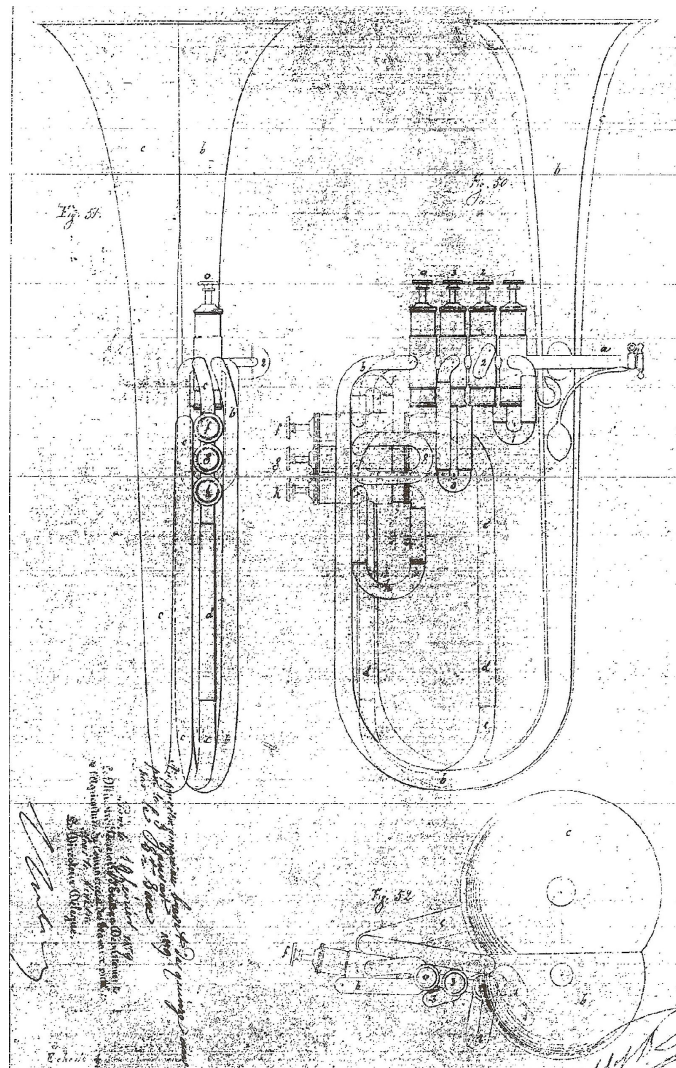


Figure 3.32 Double saxhorn from Sax's 1859 patent.

An example of the combination of both ascending and descending valves in one instrument followed. The valves were divided into two groups of three. The main tubing goes once through the first set of three valves and it continues through the second set from where it exits towards the bell. The instrument having this length would sound in A, and this is considered its nominal pitch. The first set of valves is the set with ascending valves and it is placed in the instrument's proximal half of the tubing. By pressing any of the three valves with his left hand the performer would isolate corresponding tube length so the pitch would be raised by a semitone with each valve. By pressing any of the three valves of the second set the performer would add corresponding tube length and the pitch would be lowered by a semitone with each valve resulting in playing:

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- C with valve no. 1
- B with valve no. 2
- B-flat with valve no. 3
- A with no valves pressed
- A-flat with valve no. 4
- G with valve no. 5
- F-sharp with valve no. 6

In the case of double principle instruments presented afterwards two sets of valves were also used, which could arrive at a different bell resulting in having two different nominal pitches, meaning two different instruments which share the same leadpipe/mouthpiece. This could be achieved with the means of a seventh valve, which could change the direction of air to either bell according to the desire of the performer. The valves were equipped with tuning slides to adjust their length each time the performer wanted to switch instruments.

In the general observations mentioned at the end of this patent, Sax commented that one can pitch the instruments in different intervals at will and that this system could be applied to all instruments. Sax made a special note regarding narrow-bore instruments: one should avoid joining together two instruments having a difference in pitch of two tones.

Two duplex instruments were depicted, among other instruments, in the official catalogue of the French section in the London 1862 International Exhibition.<sup>55</sup> One was a cornet, probably based on the principle described above, and the other most possibly an instrument combining a contralto and an alto saxhorn in one that did not share part of the same bell as previously described, but each of them had a separate bell. It appears that already in 1851 a British maker, James Gisborne from Birmingham, had exhibited double instruments in the 1851 London International Exhibition.<sup>56</sup> This was described as a “saxhorn in A-flat alto and E-flat tenor”, where the performer by using an extra valve with his left hand could switch

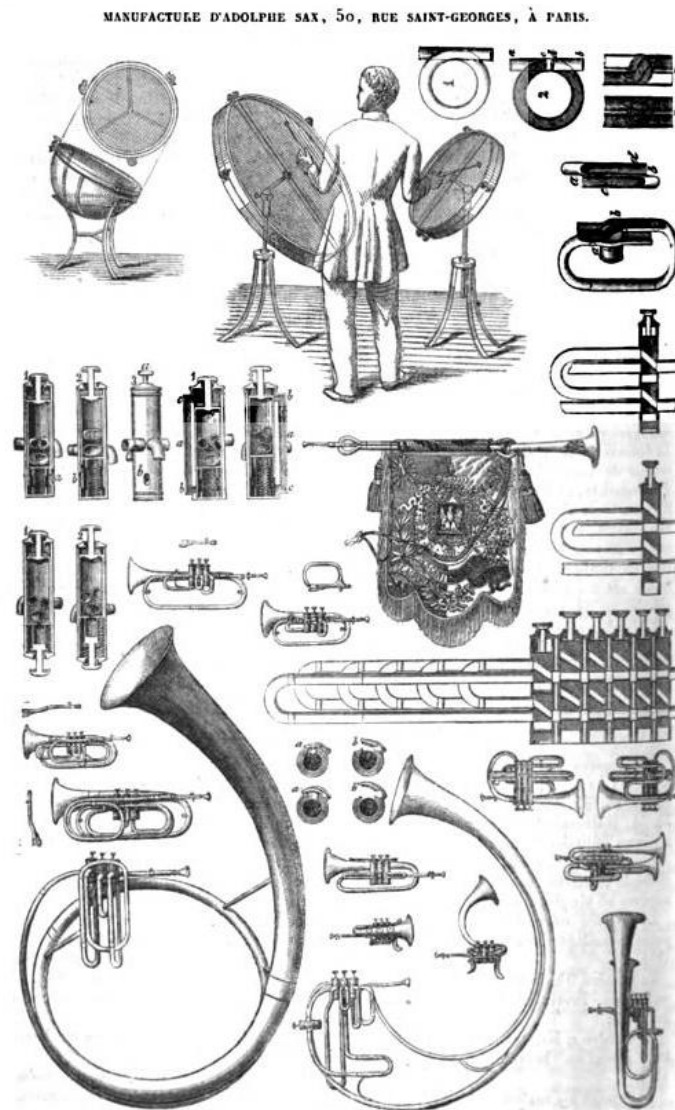
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<sup>55</sup> “Appendice. Renseignements annexés aux catalogue” in *Exposition Universelle de 1862 à Londres. Section Française. Catalogue officiel publié par ordre de la commission impériale* (Paris: impr. Impériale, 1862), 116.

<sup>56</sup> Peter and Ann Mactaggart, eds., *Musical Instruments in the 1851 Exhibition* (Welwyn: Mac & Me, 1986), 69.



The brasswind production of Adolphe Sax from one instrument to the other.<sup>57</sup> Pelitti of Milan had been making duplex instrument since the late 1840s.<sup>58</sup> Sax's principle of two instruments sharing part of the same bell seems ingenious and would solve at least the problem of carrying a heavy instrument when two different bells are used, but there is no evidence as for its actual realisation. The more usual combinations in duplex instruments by makers were those of a bugle with a trumpet and double-bell euphoniums. There is even a surviving specimen by Sax, today in Leipzig, combining a bugle in B-flat and trumpet in E-flat, made in 1857 (inventory no. 1672).

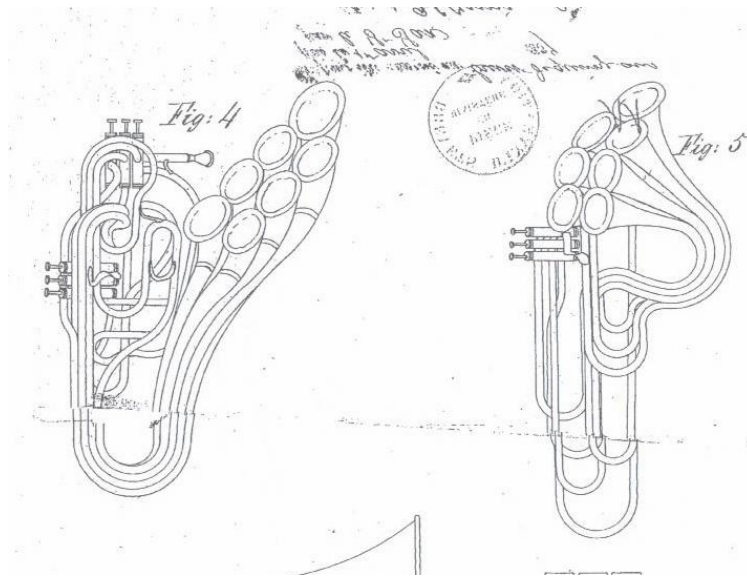


**Figure 3.33 Duplex instruments (bottom right) and other instruments from the 1862 exhibition *Catalogue Officiel*.**

<sup>57</sup> Robert Ellis, *Official Descriptive and Illustrated Catalogue of the Great Exhibition 1851* (London: Spicer Brothers, W. Clowes and Sons, 1851), 1: 468.

<sup>58</sup> See Clifford Bevan, *The Tuba Family* (Winchester: Piccolo Press, 2000), 475 and Meucci, "The Pelitti Firm": 312, 317.

Another area where Sax seems to be a pioneer and has connected his name with is that of instruments with multiple bells. This principle had already been patented in 1852. A small number of surviving instruments with multiple bells survive. The majority are in Brussels today; all of these are equipped with six independent valves and seven bells.<sup>59</sup> Each valve is connected to a bell, and with the valves at rest the longest tube is employed. In his 1867 patent Sax re-introduced instruments with multiple bells made in form saxotromba for greater convenience, since as he mentioned, in their original form these instruments were impossible to manage.



**Figure 3.34 Drawings of instruments with multiple bells from Sax's 1867 patent.**

An instrument of an even more ingenious design is part of the Selmer collection in Paris. This is a trumpet in 4-ft C with thirteen bells, with sounding lengths spaced at a distance of a semitone. There are six independent valves and two of Sax's version of the *registre* (see below in this chapter). Through the two *registres* the function of the six independent valves is doubled, so that they can control the twelve of the bells; the longest tube (8-ft C) sounds when no valves are pressed.

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<sup>59</sup> They were all made in the 1870s.



**Figure 3.35 Unsigned trumpet in 4-ft C with thirteen bells, probably made by Adolphe Sax. (Henri Selmer collection, Paris)**

An instrument with multiple bells is known to have been made by Distin. It was exhibited in the Royal Military Exhibition in 1890 and was later described by Day as a tenor saxhorn with seven bells, an extra echo bell, and six independent valves.<sup>60</sup> This, with the exception of the echo bell, appears to be a direct copy of Sax's instruments.

This multiple-bell principle deals very well with acoustical problems, since valves can end in proportionally extended flaring section. However, both the fingering difficulties and the considerable weight prevented their general adoption.

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<sup>60</sup> Day, *A Descriptive Catalogue*, 223-24.

### 3.2 Inventions or modifications regarding various valve systems

Sax continued to furnish his saxhorns with Berlin valves until the late 1870s. As discussed in Chapter Four, he preferred Berlin valves for the saxhorns; but saxhorns with Périnet valves started appearing in the 1850s. The earliest surviving brass instrument with Périnet valves known to the author was so far a cornet made by Sax in 1844, in the Kampmann collection (inventory no. 22) whose wrap imitates that of cornets with Stölzel valves. This model was called by Sax *dit Périnet*. Périnet's patent was valid between October 1838 and October 1843. No other surviving instrument with Périnet valves made before 1844 and after 1838 was known, although recently a horn with three Périnet valves made by Halary dating from 1838 (according to its inscription) was reported by Bruno Kampmann as being part of a private collection.<sup>61</sup> The scarcity of instruments with Périnet valves was not understood so far. The Périnet valve eventually became very successful and today is the standard for many types of brass instruments, although its adoption was not immediate. In the *Note pour messieurs les conseillers* Sax discussed the early (unknown so far) history of the Périnet valve<sup>62</sup> and provided information that partly explains the non-immediate general adoption of the valve. Périnet had established a license agreement with certain Parisian makers. Courtois, Halary, Labbaye and others had to pay Périnet royalties for every set of valves they bought from Sassaigne, an independent piston maker, a situation described by Sax as a monopoly.<sup>63</sup>

A few cornets made by Sax and other makers equipped with Périnet valves and made in the late 1840s or early 1850s survive. Instruments with Périnet valves were offered for sale during that time, but they may not have been performers' first choice. During the same period there were three deep-bodied models of piston-valve cornets dominating the marketplace: cornets with all three valves of the Stölzel type,

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<sup>61</sup> Personal communication to the author, November 2010.

<sup>62</sup> For more on the early years of the Périnet valve see, Eugenia Mitroulia, Géry Dumoulin, Niles Eldredge, "On the Early History of the Périnet Valve", *Galpin Society Journal* 61 (April 2008): 217-29.

<sup>63</sup> "MM. Halary, Labaye [sic], Courtois et autres, ont payé tous à Périnet une rétribution convenue, par chaque jeu de pistons acheté chez Sassaigne le fabricant, et cela pendant toute la durée du brevet Périnet." See Adolphe Sax, *Note pour Messieurs les conseillers* (Paris: H. Simon Dautreville, 1850), 4, 10.

The brasswind production of Adolphe Sax cornets with the first and third valve of the Stölzel type and the second of the Périnet type (hybrid model), and cornets with all three valves of the Périnet type. The number of surviving early instruments with Périnet valves is considerably lower than the number of instruments with all three valves of the Stölzel type.

Although the Périnet valve became the standard valve later in the nineteenth century, Sax did not include any improvements to this type of valve in his patents, and his improvements dealt mainly with his version of the Berlin valve, the independent valves and other types of valves mentioned below.

### **3.2.1 The independent system valve**

In 1852 Sax took out a patent (1 October 1852) where he addressed<sup>64</sup> the problems resulting from the use of valves in combination. Initially he suggested joining together seven instruments with the same mouthpiece; six valves would be employed. Each of them when pressed would engage the instrument with which it was connected (see Figure 3.36). The same result is achieved in a less cumbersome way; Sax introduced the system that became known as the independent valve system. He replaced six of the instruments with an additional tube each. Each of them would be engaged by a valve. Supposing the instrument's pitch in B-flat, by pressing the first valve would sound B-flat, with the second would give A, the third A-flat, the fourth G, the fifth F-sharp, and the sixth F. With no valves E would sound. The instrument's nominal pitch is given by the depression of the first valve. The valves are ascending since they do not add extra tubing, but each of them isolates different amounts of the total instrument tubing. Sax noted that if the instrument was required to change pitch, the additional tubes could be supplied with tuning slides.

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<sup>64</sup> The first is considered the spring slide.

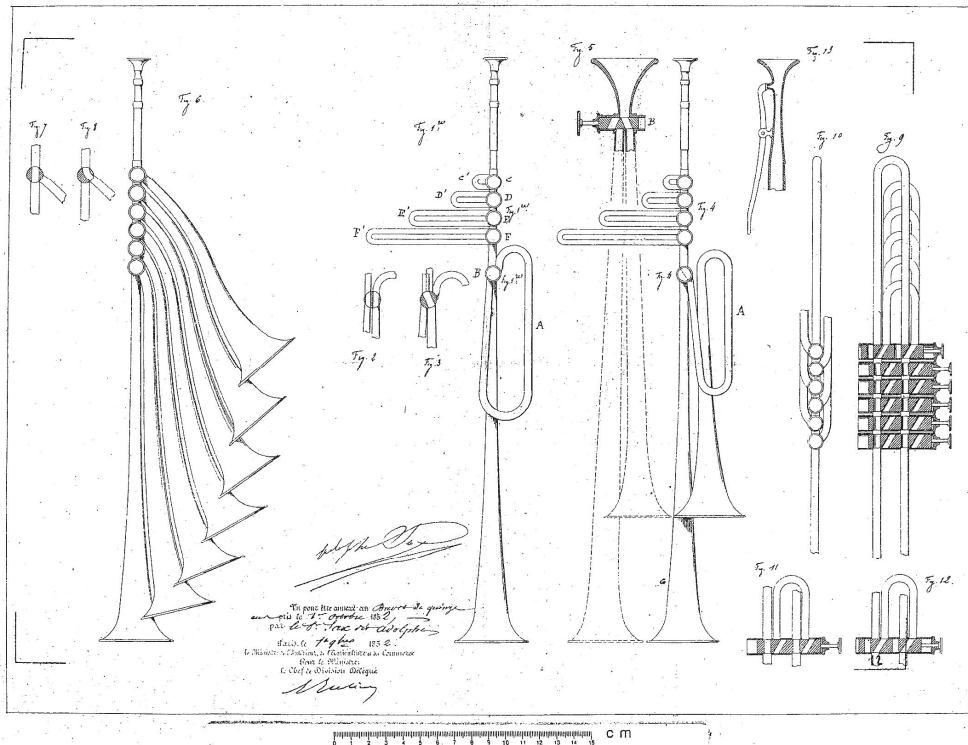
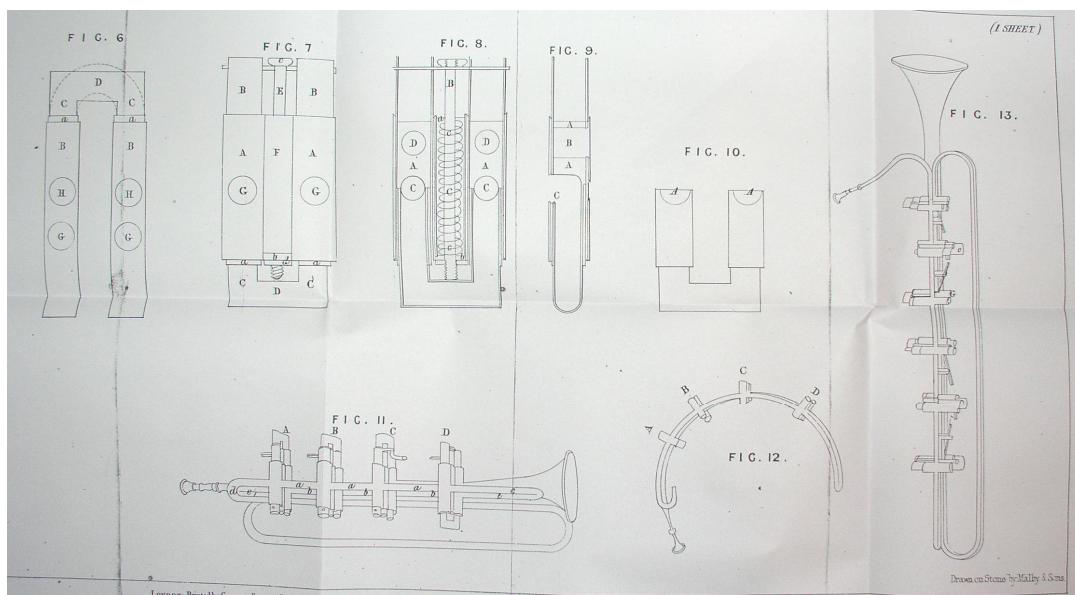


Figure 3.36 Sax's 1852 patent drawings.

Before discussing in more detail the further developments of this system, it is considered essential to look at previous attempts for valve systems with independent and ascending valves so as to examine the originality of Sax's idea. The first known recorded attempt, comes from an English maker John Shaw who was granted a patent for a similar system twenty-eight years before Sax.<sup>65</sup> Shaw's patent dealt with transverse spring slides, which could be applied to all brass instruments. What Shaw described as a slide was not an actual slide but a very early form of double piston valve. In the example given, a trumpet, Shaw used four valves in total, three ascending and one descending, all independent; the ascending valves raised the instrument's pitch by a semitone each by cutting off corresponding tubing, and the descending lowered it by a semitone by adding corresponding length. The valves were not furnished with valve slides. An example of a six valve trombone was discussed. Depending on different needs, various numbers of valves could be employed, six at the most.

<sup>65</sup> British patent no. 5013, 7 October 1824.



**Figure 3.37** The drawing section of Shaw's patent.

Although no surviving instruments with this type of valve exist, Sax might have known of the existence of the patent, since, especially during the 1851 London Exhibition, he travelled to Britain very often.

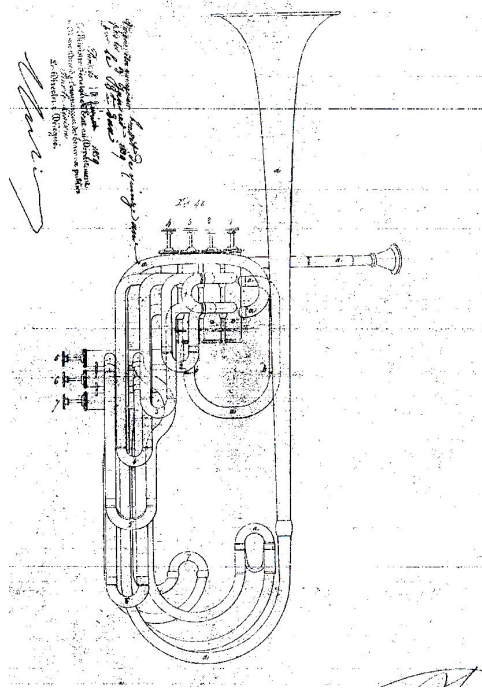
Although the first patent of the independent valve was granted to Sax in 1852, the first surviving numbered instrument with independent valves dates from 1864. It was not before 1859, when through his patent of that year Sax announced the application of the system to his brass instruments of saxotromba form. The usual number of independent valves in surviving instruments is six, usually divided in two groups, three for each hand (some instruments with a smaller number of valves exist and french horns have six valves in a line).

In his 1859 patent Sax discussed the example of a seven-valve trombone with independent valves. The valves are divided in two groups, of four and three. The instrument's pitch was in C (when the first valve was engaged), B was given by the second valve, B-flat with the third, A with the fourth, A-flat with the fifth, G with the sixth, G-flat with the seventh, and F with all valves at rest. With no valves pressed, the instrument's main tubing crosses the valves twice; it enters the first valve, exits the seventh valves, re-enters the seventh valve and exits the first valve, from where it continues towards the bell. Each time a valve is pressed, corresponding tubing is isolated and the instrument's pitch changes accordingly. In this way Sax believed that he achieved a mathematically accurate intonation. He added that the trills and



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intervals which would normally be difficult to play with ordinary valves could be more easily achieved with independent valves.



**Figure 3.38 Trombone in saxotromba form with seven independent and ascending valves from Sax's 1859 patent.**

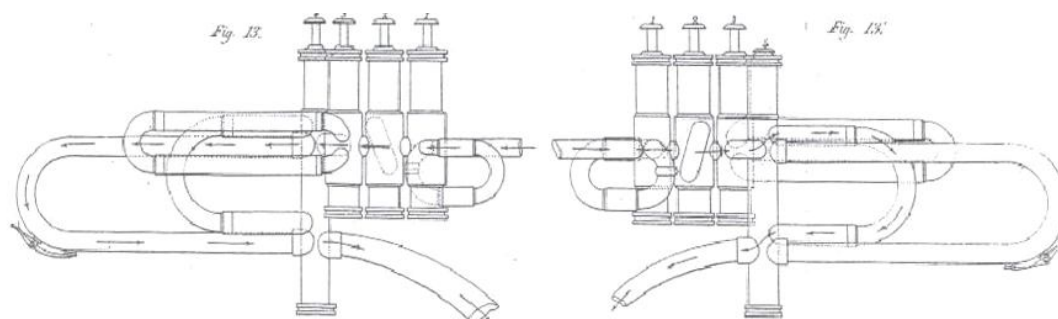
The example depicted in the drawing section is equipped with both a main tuning slide and valve tuning slides. Valve slides could be omitted, but Sax considered it as an essential feature. Similar examples of instruments with six valves, divided in two groups of three, were also presented. Instruments with six valves have the range of instruments with three regular valves. The seventh valve in the previous example would only have the extra advantage that the player would be able to play on it a trombone part.

Further provisions appeared in this patent concerning the employment of both independent and regular valves. There is one example included in the 1859 patent which combines two Berlin valves with four independent valves.

There is an extant contralto saxhorn, in the Musée de la musique, originally part of the Sax private collection (inventory no. E.744), with a combination of three regular valves (valve one is of the Berlin type, and valves two and three hybrids Périnet and Berlin) with one ascending valve. This model was included in the illustrated catalogue of the London 1862 International Exhibition (see Figure 3.33



The brasswind production of Adolphe Sax (above), and was advertised by Sax at least as late as 1867. The addition of a fourth ascending valve to instruments with three regular valves was described by Sax in his 1862 patent.



**Figure 3.39** Drawing showing the addition of a fourth ascending valve to instruments with three regular valves from Sax's 1862 patent.



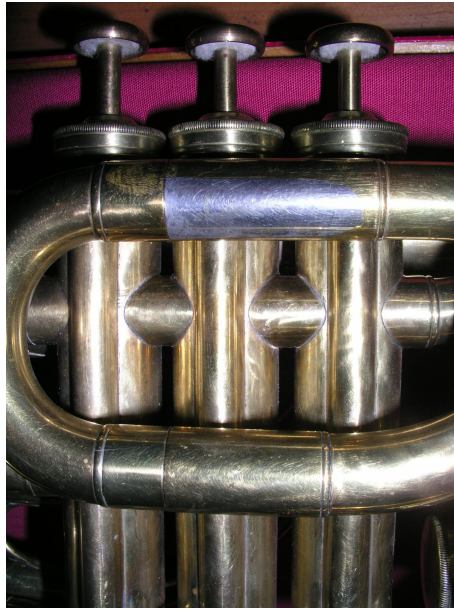
**Figure 3.40** Contralto saxhorn with three regular and one ascending valve following the exact specification of the patent.

In the case of the independent descending valves a similar idea to the ascending valves is followed; the instrument's tubing enters the first valve, passes twice through the six valves and exits again from the first valve. The only difference is that the instrument's nominal pitch is given with no valves pressed and not by the depression of the first valve as in the ascending valves. The six valves are descending of a semitone each. For example, if the instrument is pitched at C (all valves at rest), then it would sound B with the first valve, B-flat with the second valve, A with the third valve, A-flat with the fourth valve, G with the fifth valve, G-flat or F-sharp with the sixth valve.

Sax also announced improvements in the construction of valves. A narrow tube was attached along the exterior of the valve casing. Its role was to prevent dust from entering the valves, and thus extended the instrument's durability. This small

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tube was used in place of the perforated bottom cap of common valves. Whereas it permitted the air to escape when the piston was depressed, it avoided the intrusion of dust. This feature can be found in most, if not all instruments with the independent system valves. An example exists where this feature is applied to regular Périnet valves; this is a cornet by Sax offered for sale by Jean Michel Renard. As also mentioned in the sales website this is the only known example where the external tubing is not soldered to the valve casing, but is detached instead.<sup>66</sup>



**Figure 3.41** Valve section with external tubing from a *nouveau* bass saxhorn made by Sax in 1870. Edinburgh University Collection of Historic Musical Instruments (inventory no. 3115). Photograph by the author.



**Figure 3.42** Detail of the valve section of a cornet made by Sax in 1866, offered for sale by Jean Michel Renard.

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<sup>66</sup> See <http://www.renard-music.com/selectficheinstrument.php3?1000114>, accessed 23 October 2010.

In 1867 through a new patent, the system of independent valves was applied to the valve attachment of the *clairons d'ordonnance* and *trumpets d'ordonnance*. Sax noted that this system could be also applied to the trumpet, horn, trombone and other instruments. For the horn in particular, the valves could be placed on a detachable part, so that the instrument could be used both with and without valves.

Further developments to improve the ergonomic aspect of the six independent valve instruments were announced. A detachable holding device for the firmer holding of the instrument (Figure 3.43) and a handle attached to the valve casings (Figure 3.44) were proposed for increasing stability. There are no surviving instruments known to the author with the detachable holding device; however, some few extant instruments in various collections are equipped with a handle.

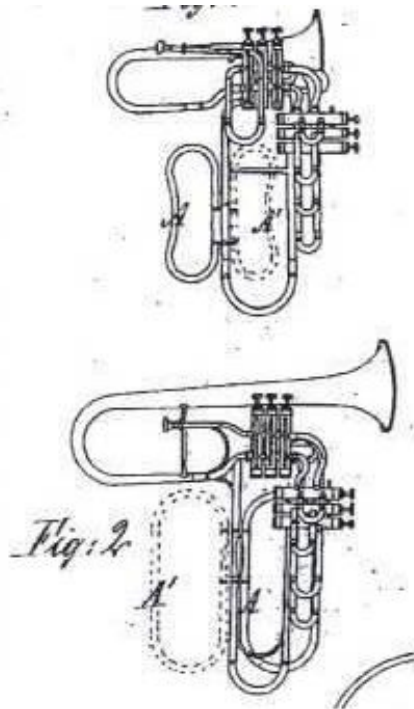


Figure 3.43 Detachable holding device for instruments with six independent valves.

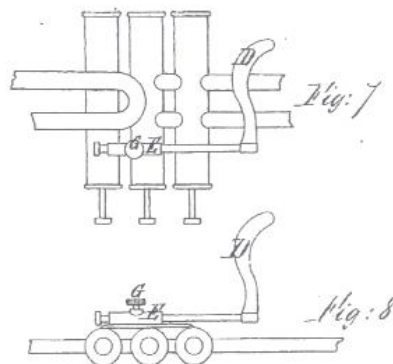


Figure 3.44 Handle for instruments with six independent valves.

More specifications regarding this system were announced in 1881 through Sax's last patent concerning brass instruments. Sax dispensed with the valve tuning slides. He pointed out that this was the only disadvantage of his system. The new provision resembled, he said, the function of side holes in certain woodwinds, such as the flute and the clarinet. This "new" arrangement, though, looks identical to that of a cornet made by Richardson in Boston about thirty years earlier, today in Edinburgh, (inventory no. 4466), and can certainly not be considered new, though Sax may not have known about this American cornet (Figure 3.45).



**Figure 3.45** Cornet in C, "Bayley's American Cornet" Richardson, Boston c. 1860. Edinburgh University Collection of Historic Musical Instruments (inventory no. 4466). Photograph by Raymond Parks.

As already mentioned, this system required a completely different fingering, a factor which contributed to the players' reluctance to adopt it. The performer only needs to press one valve at a time; even if more than one valve is used, only one, the shortest, will sound. Forestier's method for instruments with six independent valves, published in 1870,<sup>67</sup> referred to what he called "the preparation of the fingers". Although the valves can only sound independently, they can be pressed "in combination" at will for the preparation of the fingers; this would make the fingering more convenient and would save the performer from moving his fingers all the time. There can be various combinations, and each performer should find the more suitable. Both the trombone with this system and the lower saxhorns were taught for

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<sup>67</sup> Joseph Forestier, *Monographie des instruments à six pistons et tubes indépendants, Etudes pratiques et Théoriques pour le nouveau système de Mr. Adolphe Sax* (Paris: Adolphe Sax, 1870), 12.



The brasswind production of Adolphe Sax some time in the Paris Conservatoire, and the technique mentioned above seems to have been preferred by Sax. Three tablatures prepared especially by Sax for this class have survived.<sup>68</sup> Among them there is a general one titled *Tablature des nouveaux Instruments à six pistons et à tubes correspondants* including sections on the chromatic range and fingering, the individual fingering and chromatic series of each valve and exercises with scales; all examples are in C major and are written in the treble clef (Figure 3.46). The second is titled *Tablature du nouveau Trombone à six pistons et à Tubes indépendants* that includes the same material as the previous one with one difference, all examples are written in the scale of B-flat major and in the bass clef (Figure 3.47). The last one is titled *Tablature pour la nouvelle Base [sic] sib Contre-basse mi♭ et Contre-basse sib grave* (Figure 3.47). This approach reminds us of similar techniques in string instruments, where the fingers can continue pressing the strings that do not sound, to be in position when needed.

The system of independent valves was used by Sax more for saxhorns and the trombones than for other brasswinds. The same can be said about later instruments made by Adolphe-Edouard Sax. In general, however, it was not successful in the long-term, probably mostly due to the difficulties that the different fingering system added. Instruments of this kind are also considerably heavier than instruments of the same size with regular valves, and more expensive.

Other makers outside France also made independent valves following Sax's system; the system survived for a long time in Belgium, where it was used for trombones and was taught in the Brussels Conservatoire. A couple of examples are two instruments in Edinburgh, both made in Belgium by Le Brun (inventory nos. 3219 and 4111). According to the Royal Military Exhibition catalogue, even Besson had manufactured instruments with this valve system.<sup>69</sup>

The dispute between Adolphe Sax and his brother Alphonse, over the "ownership" of the invention of the ascending valves is generally known. Alphonse Sax already in the late 1840s had patented a system of valves called *perce conique*, which would preserve the instrument's conical bore throughout the pistons. The initial patent was for three descending pistons, and later in the mid-1850s he applied

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<sup>68</sup> Bibliothèque Nationale de France, Département de Musique.


<sup>69</sup> Day, *A Descriptive Catalogue*, 208-09.

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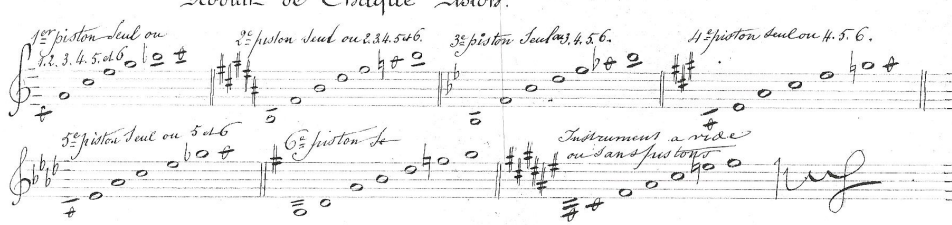
the conical bore principle to ascending pistons. Adolphe had already patented the ascending valves in 1852 and there is no evidence to support Alphonse's claims to be the first to invent the ascending valve.

*Tablature des nouveaux Instruments à Six pistons et à Tubes correspondants.*

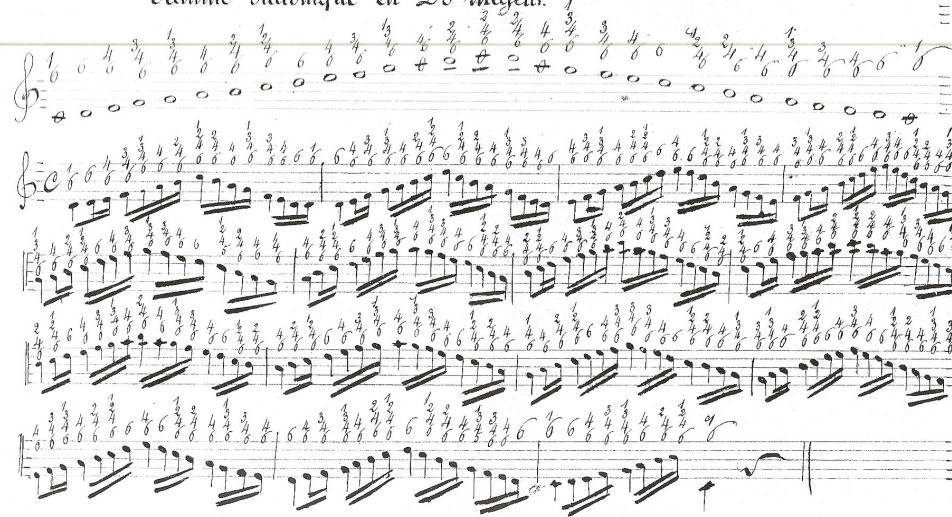
*Gamme Chromatique doigter le plus Simple et le plus Ordinaire.*



*Produit de Chaque Piston.*



*Gamme diatonique en Do majeur.*



*chez Monsieur Adolphe Sax  
Sous le nom de Georges  
à Paris*

*Imp. Lefebvre, Paris, Du Centre 26-28.*

Figure 3.46 *Tablature des nouveaux Instruments à Six pistons et à Tubes correspondants*, Adolphe Sax 1865 (Bibliothèque Nationale de France).

Tablature du nouveau Trombone à six pistons et à Tubes indépendants.

Gamme Chromatique doigt le plus simple et le plus ordinaire

Produit de Chaque piston

Gamme Diatonique en Si b majeur

Tablature pour la nouvelle Base sib Contre-basse mib et Contre-basse sib grave.

Gamme Chromatique doigt le plus simple et le plus ordinaire

Produit de Chaque piston

Gamme Diatonique en Do Majeur

Figure 3.47 *Tablature du nouveau Trombone à six pistons et à tubes indépendants and Tablature pour la nouvelle Base [sic] sib Contre-basse mib et Contre-basse sib grave, Adolphe Sax 1865 (Bibliothèque Nationale de France).*

### 3.2.2 Other compensating means

The first provision of the 1859 patent dealt with means of compensating for the use of the fourth valve in the bass saxhorns. Earlier, in 1845, bass saxhorns were equipped with a fourth Berlin valve that would lower the pitch by a fourth. This valve was used both as a regular valve and as a transposing valve. The second option presents severe intonation problems. By adding a fifth valve parallel to the fourth and perpendicular to the first three, extra valve tubing could be engaged for when the transposing valve is in use. Distin copied this system, and there is an instrument at Horniman Museum from the Boosey collection with this type of valve (inventory no. 2004.827). A similar system made by Higham of Manchester, was mentioned by Day and was exhibited in the Royal Military Exhibition.<sup>70</sup> This system is very similar to Besson's *registre* patented three years earlier, in 1856, and improved in 1857. In his 1881 patent Sax admitted that this system was not successful either, because of the extra study its use required. Although he proposed means for its improvement, the system had no success.

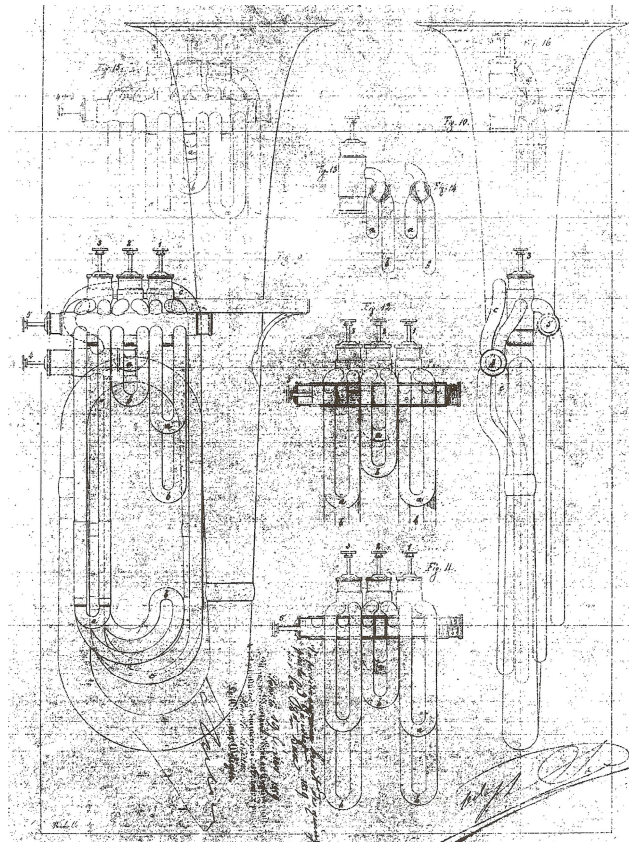


Figure 3.48 Sax's version of Besson's *registre*.

<sup>70</sup> Day, *A Descriptive Catalogue*, 213.



### 3.2.3 Brass instruments with valves and keys

The first mention of the application of a key to brass instruments by Sax was made in 1852. There he included the provision of a key close to the mouthpiece for facilitating the production of sounds in the higher register, inspired by the application of a similar key to his bass clarinet in 1838. In 1859 Sax revisited the application of keys to valved brass instruments. His reasoning was based on the view that keys facilitate the performance of trills; they do not interrupt the main tubing as the additional tubing of the valves does, and their use offers additional timbres to brass instruments.

The keys which Sax suggested to add to valved brass instruments raised the pitch of a tone, of two tones and of a tone and a half. He suggested that when the performer played the lower notes with the keys open, the sound of the instrument would be improved in sonority and would acquire a different timbre, more or less similar to *le son bouché* of the horn. The same notes could be played in two or three different ways, which would offer great musical advantages to the artists. Eight different drawings of what appear to be contralto saxhorns with added keys were depicted in the patent's drawing section. There is a great variety in the number of keys and the position of the keys or holes.

Instruments with valves and keys were exhibited for the first time in the 1862 London International Exhibition. The French section of the exhibition's official catalogue included illustrations of cornets, saxhorns, and a saxotromba with valves and keys.<sup>71</sup> The last surviving catalogue from Sax's workshop offered a great range of instruments with valves and keys; these were listed with three valves and one key. However, it was noted that all instruments could be supplied with two, three, four or five keys with an additional fee.<sup>72</sup>

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<sup>71</sup> *Section Française. Catalogue officiel*, 114-15.

<sup>72</sup> For a reproduction see Appendix I.

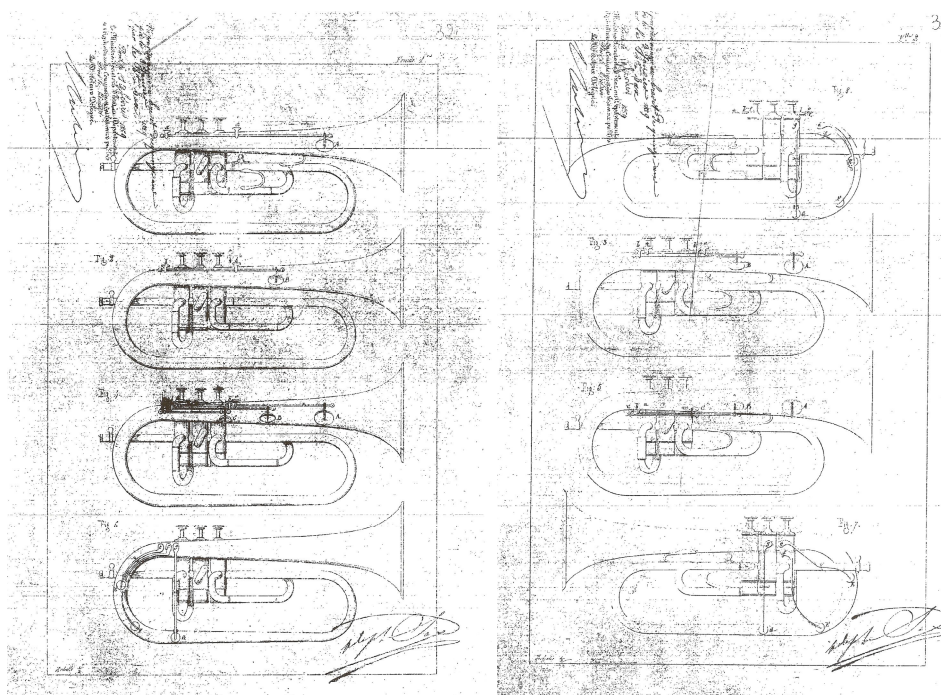


Figure 3.49 Drawings of saxhorns with valves and keys from the 1859 patent.

Very few instruments made with both valves and keys by Sax have survived; it appears that performers did not share Sax's views on the usefulness of keys in combination with the valves. Elwart in 1864 emphasized on the availability of two distinct timbres in instruments with valves and keys;<sup>73</sup> he pointed out that keys become more convenient in melodic passages and for the trills, whereas the valves are more appropriate for fast passages and certain kinds of music.

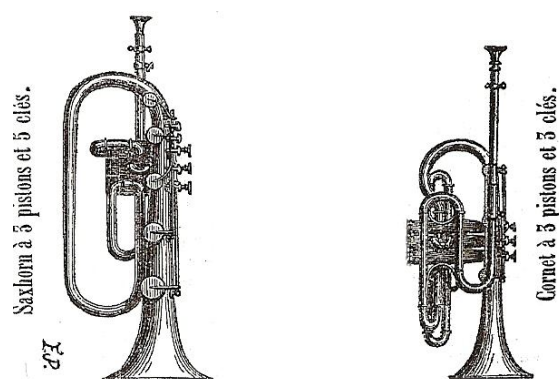


Figure 3.50 Contralto saxhorn and cornet with valves and keys from Elwart's *Histoire des concerts populaires de Musique classique* (1864).

<sup>73</sup> Antoine Aimable Élie Elwart, "Guide de l'amateur de musique dans Paris" in *Histoire des concerts populaires de musique classique* (Paris: Librairie Castel, 1864), XXXIX.

### 3.2.4 Adolphe Sax and the double-piston valve

The first evidence of Adolphe Sax actually equipping his instruments with double piston valves comes from the famous lithograph of the Distin family with the instruments that Sax made for them (see Figure 6.1). There, William Distin, holds what was called by Adam Carse a *German* or *Austrian Flugelhorn*.<sup>74</sup> Carse considered it possible that Sax was the maker of that instrument, but never presented the evidence. It appears that Sax was indeed the maker. Instruments of a similar or identical design were exhibited during the 1851 London International Exhibition, where at least four instruments with double piston valves were shown (see Chapter Four, Figure 4.13). Also, the catalogue of Sax's private collection referred to a trombone with double-piston valves which was described as the first trombone of that kind made by Sax. There is only one known surviving instrument made by Sax which is equipped with double-piston valves. This is an unnumbered trumpet in A-flat in the Musikinstrumenten-Museum Berlin (inventory no. 3098).<sup>75</sup>

Sax's 1862 patent dealt almost exclusively with the development of various valve systems. Sax mentioned that he had imagined a valve system for the execution of various musical passages with greater facility and rapidity. This was the system of double-piston valves with spiral springs in boxes. The drawing he provided depicts the type of double-piston valve known today as the *système belge*. Sax asserted that this system was modified in Germany for a more advanced rapidity with the use of touch keys. However, this system was too complicated to make, very fragile and too expensive, and had all the disadvantages caused by the angles of the windways of the early version of the double piston valve.

It is not very clear who was the inventor of the *système belge*. Jacques Cools<sup>76</sup> gives an account of the various patents taken out by Belgian manufacturers for the improvement of the system; the earliest of them is a patent taken out by Ferdinand van Cauwelaert in 1847 for the application of the system to the horn, but no answer is given to the question of the system's parenthood. Cools points out the

<sup>74</sup> Adam Carse, "Adolphe Sax and the Distin Family" *Music Review* 6 (November 1945): 193-202.

<sup>75</sup> Dieter Krickeberg, Wolfgang Rauch, *Katalog der Blechblasinstrumente: Polsterzungeninstrumente* (Berlin: Staatliches Institut für Musikforschung Preussischer Kulturbesitz, 1976), 158.

<sup>76</sup> Jacques Cools, "A propos des cylindres droits ou pistons dits 'belges'" *Larigot*, no. 36 (October 2005): 12-20.

system's German origin. According to Robert Eliason,<sup>77</sup> Isaac Fiske might have been the original inventor; this type of valve was made in the 1840s by American makers.<sup>78</sup> Another early instrument equipped with a similar type of valve is illustrated by Herbert Heyde.<sup>79</sup> This is a trumpet called by Heyde *Hanoverian model*, and is equipped with a similar version of the double piston valves.<sup>80</sup> This model of trumpet started to be made in 1835 by J. H. Zetsche in Hanover. Nevertheless, the question of who was the inventor of the particular type of valve is still pending. However, there is no evidence that Sax was its inventor.

### 3.2.5 Rotary valves in Sax's production

This is perhaps the only valve system that Sax never claimed to have modified. In his 1862 patent he reported all the drawbacks of the rotary valve. In his view this action, although it removed the sharp angles of the early versions of the double piston valve, was noisy and very fragile. However, a small number of instruments with rotary valves were made in Sax's workshop. Only a trumpet with rotary valves made by him was part of his private collection, although instruments by other makers with this type of valve were included. At least one such instrument was exhibited in 1851 in London, and very few are extant. The rotary valve was not favoured in France at the time. It was probably the foreign market that Sax aimed for.

## 3.3 Manufacturing practices of the Sax workshop

Very little is known regarding the way Sax's workshop was organized, and relevant information is scarce in primary sources. Commetant provided some information regarding the division of labour in the Sax workshop. He reported that contrary to the established practices in other Parisian workshops at the time of Sax's arrival, Sax chose to organize his workshop in a different way.<sup>81</sup> According to Commetant, Sax wanted to control all parts of the procedures in the making both of

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<sup>77</sup> Robert Eliason, *Early American Brass Makers* (Nashville: Brass Press, 1981), 36-67.

<sup>78</sup> There is a surviving bugle in E-flat dating from c. 1848 that has the characteristic of having the shortest valve first.

<sup>79</sup> Herbert Heyde, *Das Ventilblasinstrument* (Leipzig: VEB Deutscher Verlag für Musik, 1987), 45, 196.

<sup>80</sup> Trompetenmuseum Bad Säckingen (inventory no. 14403).

<sup>81</sup> Oscar Comettant, *Histoire d'un inventeur au dix-neuvième siècle: Adolphe Sax, ses ouvrages et ses luttes* (Paris: Pagnerre, 1860), 20-21.

The brasswind production of Adolphe Sax the woodwinds and brasswinds. The keys and parts of woodwinds were made and assembled by Sax himself. In the same way, in brass instruments the welding of the tubes, the making of the bells, valves (piston and cylinder valves), mouthpieces and all parts of the procedure were controlled by Sax.<sup>82</sup> He added that this practice brought Sax against the various specialist makers of instrument parts of the French capital.

However, in the same work, further on, Comettant reported an incident that contradicts the above. Sax had made an agreement with an external manufacturer of instrument parts to manufacture his then newly-invented valves.<sup>83</sup> Although in the beginning there were no problems in this collaboration, Comettant writes that with time, the external maker showed a different face, accused Sax of plagiarism and broke the agreement. The maker, whose name was not mentioned, decided to produce Sax's valves independently. The present author suspects that the maker of instrument parts was Sassaïgne, who testified in court a number of times as a witness against Sax. In one of the lawsuit minutes it was reported that even Sassaïgne himself had a case against Sax over financial differences; it is possible that these arose from the broken agreement concerning the making of the early Berlin valves.<sup>84</sup> Sassaïgne was well known among Parisian brass instrument makers. Based at rue Saint-Maur 128, he was the maker who manufactured Périnet's valves during the protection period of Périnet's patent (1838-43), and from whom Périnet's licensees had to purchase valves for their instruments. He was succeeded in the 1850s by Drouelle, who provided Sax's licensees with valves. Among Drouelle's customers were the French makers Besson, Courtois, Labbaye, Halary Raoux, Roth and many others, also Distin and Key & Co. from England.<sup>85</sup>

It would be expected that due to the opposition Sax experienced from his contemporary makers, and after the failed partnership with the valve maker, he would have limited his collaboration with external makers of instrument parts. It is possible that the discretion over his inventions required that most of the work was performed in his own workshops, but there is no information on this subject.

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<sup>82</sup> Ibid.

<sup>83</sup> Comettant most possibly means Sax's version of the Berlin valve.

<sup>84</sup> See *Nullité de brevet*, 25-26.

<sup>85</sup> *Affaire Drouelle contre Sax. Renvoi devant la Cour impériale de Rouen après cassation* (Paris: impr. Renou et Maulde, 1866), 5.

### **3.4 New proposed scheme for dating all numbered Adolphe Sax wind instruments**

Dating historic instruments is an issue with many problematic aspects for researchers. The problems arise due either to insufficient documentation in the makers' workshops or the loss of the documentation – when it exists, or even the lack of the existence of a standard system of instrument inscriptions and serial numbers. In most cases inscriptions do not provide adequate information. Adolphe Sax's output that has survived to the present day has many advantages compared to that of other makers of his time. Most of his surviving instruments (the majority of brasswinds and saxophones) bear serial numbers that appear to run consecutively. The information from Sax's inscriptions varies from time to time, reflecting the various events, such as the changes of address, and the various distinctions he was awarded. Consequently, certain inscriptions can be used as landmarks and signify the beginning or end of certain periods of his production. Thanks to Malou Haine's work on Sax's biography, certain facts in Sax's professional life can be dated with precision and can be used in combination with the information found in the inscriptions to create a dating system of Sax's production.

The initial work for dating Adolphe Sax's instruments was done by Haine and De Keyser in 1980 with the publication of the *Catalogue des instruments Sax au Musée Instrumental de Bruxelles*.<sup>86</sup> Considering the information available in 1980 and the Sax instruments known at the time, this work is thorough and well-organised. Haine and De Keyser took into careful consideration all information coming from inscriptions, such as addresses, titles awarded to Sax throughout the years and additional stamps that appear in a limited number of instruments (denoting in most cases the year when a specific instrument entered the possession of a certain organization or a person). Haine also had access to the primary sources which she had consulted in completing her doctoral dissertation, which later led to the publication of the first extensive and thorough book on Sax's life, *Adolphe Sax : 1814-1894 : sa vie, son oeuvre et ses instruments de musique*, also published in

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<sup>86</sup> Malou Haine, and Ignace De Keyser, *Catalogue des instruments Sax au Musée Instrumental de Bruxelles* (Brussels: Musée Instrumental, 1980).

The brasswind production of Adolphe Sax 1980.<sup>87</sup> Their dating system places instrument production in some cases into particular years, and sometimes into longer periods.

In 2003 Robert Howe in his article “The Invention and Early Production of the Saxophone, 1840-55” published in the *Journal of the American Musical Instrument Society* suggests a slightly different scheme for dating Sax instruments based mainly on information coming from nineteenth-century documents and careful examination of surviving saxophones made by Sax.<sup>88</sup> The present author believes that Howe’s scheme has refined the dating of Haine and De Keyser for the very first years of Sax’s production, up until the early 1850s. However, new information that has recently come to light and has been considered by the present author, shows that this system is unreliable after about 1853; a discrepancy has been noticed in one case of a brass instrument made before 1853 (1849). Howe assumed steady production rates and differentiated between good and bad months. In many cases he was not aware of instruments originally dated by additional stamps. Moreover, the fact that he only took into consideration saxophone production, although Sax was using a common numbering system for all instruments he produced, is in itself a limiting factor.

The present author has considered both schemes, has detected drawbacks of both and in combination with the new data that has come to light has proposed a new dating scheme of Adolphe Sax instruments. A checklist of all known Adolphe Sax wind instruments was published in the internet by the present author and Arnold Myers in 2006 at <http://www.galpinsociety.org/gdsl.html>. Since then, a great deal of new information regarding extant instruments has been communicated to the authors and the checklist is being updated on a regular basis. The nature of such publication has proved extremely useful. New entries and especially information on instrument inscriptions, and extensive archival research are the main sources of information that have led to the need for a new dating scheme of Sax instruments. To establish a new dating system of all Adolphe Sax instruments, various attributes should be taken into consideration. The most important factors are 1) the consistency of the addresses in the inscriptions and various award titles, 2) the additional stamps on instruments

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<sup>87</sup> Bruxelles: Editions de l'Université de Bruxelles, 1980.

<sup>88</sup> *Journal of the American Musical Instrument Society* 29 (2003): 97-180.

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which denote a date, and 3) references to specific instruments and their date of manufacture in original documents coming from the Sax workshop.

Haine and De Keyser (1980) assumed that Sax's numbering system did not start at 1, but around the number 2000. As already mentioned by Howe (2003) this does not appear to be accurate and it would appear more logical that the system started from 1, or a much lower number than 2000. Howe in his dating system took 1 as the starting point. Although, in 2003 this appeared to be just an assumption, brass instruments that became known after 2003 confirm Howe's belief. The earliest known numbered instrument is an alto saxhorn with serial number 668, which is part of a private collection in France. Some instruments have a date inscribed on their bell. As already mentioned by Haine and De Keyser the year inscribed is not necessarily the year of manufacture, but is usually the year that the instrument entered the possession of a certain organization or a person, which according to evidence, in many cases coincides with the year of manufacture. This is suggested by the fact that this stamp is usually separate from the main inscription. It is obvious that a stamp with a date later than the suspected year of manufacture is not a problem for us; it is an issue when a stamp denotes a year prior to the supposed manufacturing date. In a few cases the month is also stamped. This additional stamp could be complete with all four digits for the year, or incomplete, with just the last two digits of the year. Table 3.2 shows in chronological order instruments with a date inscribed.



**Table 3.2 Instruments with an additional inscription of a date.**

<b>Date</b>	<b>Serial number</b>
1854	10583
1854	11926
1855	12444
1855	12464
1857	<b>14792</b>
1856	15511
1857	16149
1858	16722
1858	16870
1859	18046
1859	18838
1859	19095
1860	19170
1860	20200
1861	20846
1861	21307
1861	21401
1861	21452
1861	21678
1862	<b>22685</b>
1861	23049
1862	23969
February	
1862	24401
1862	24426
1863	26047
1864	28259
1870	<b>30176</b>
1867	<b>31648</b>
July 1865	<b>36458</b>
1866	32114
1867	32876
1868	33355
1870	35504
1880	40663

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In five instruments from the above table the date appears not to correspond to the production time (marked with bold). In instruments with serial numbers 14792, 22685, 30176, and 31648 this does not cause a major problem, since it is probable that the instrument was inscribed later than the production year. With instrument 36458, however, there is confusion, since the instrument according to its inscription was donated to the Société de Musique of the Bar-le-Duc in July 1865. The regular inscription, though, of the Sax workshop, containing its serial number and usual information dates it to c.1870. This instrument is also a landmark, since it is the last instrument known to bear the inscription “F<sup>teur</sup> de la M<sup>son</sup> M<sup>re</sup> de l’Empereur”. Napoleon III, the President of the French Second Republic and the Ruler of the Second Empire, awarded Sax the above title on 7 April 1854. It is to be expected, thus, that Sax stopped using the distinction in the inscriptions with the end of the Second Empire, 4 September 1870. The saxophone bears a third inscription “MM / 1”, which stands for “Musique Militaire”, Paris department. It appears, thus, that the instrument at different points had been the property of two organizations. It is possible thus (as Sax’s official stamp is later than the stamp regarding its donation to Bar-le-Duc) that either the saxophone initially bore a different serial number, and after leaving the first owner’s property was re-stamped, possibly at the time it became property of the military or that part of it was re-used and the initial donation stamp was not removed, or that the wrong serial number was initially inscribed on the instrument. Table 3.3 shows instruments whose dates are not inscribed but they are known through archival documents, or they are assumed as they are landmarks from known events in Sax’s life.

**Table 3.3 Serial numbers of instruments with the date inferred from archival documents, major events and others.**

Serial number	Inferred date
7086	1849
13817	1855
20294	20.6.1860
21219	1861
21337	1861
21338	1861
21452	1861
21453	1861
21476	1861
21566	1861
36458	1870
40151	1878
41655	1885

The instrument with serial number 7086 is a four-valve contralto saxhorn for which it was noted in Sax's collection catalogue that it was exhibited during the Paris National Exhibition of 1849.<sup>89</sup> 13817 is the serial number of the saxhorn bourdon in 26-ft E-flat exhibited by Sax during the 1855 Paris International Exhibition. Saxophone 20294 was entered in the workshop books on 20 June 1860, according to Haine and De Keyser (1980), and up to that point Sax had manufactured 945 saxophones.<sup>90</sup> Seven contralto saxhorns (serial nos. 21219, 21337, 21338, 21452, 21453, 21476 and 21566) according to a letter in the Département de musique of the Bibliothèque Nationale de France (sent from Sax to the Director of the Paris Conservatoire on 13 March 1861) were sent to the Conservatoire for approval. Thus, these instruments were made in the beginning of year 1861, or a little bit earlier. Instrument 36458 (tenor saxophone in B-flat that was mentioned above to carry an extra problematic inscription) is the latest known to bear the inscription "F<sup>teur</sup> de la M<sup>son</sup> M<sup>re</sup> de l'Empereur" that for reasons explained above is considered to have been made around September 1870. The tenor trombone (serial no. 40151) is the earliest numbered known to have Sax's new addresses "26 rue de Rocroy & 39 rue de Dunkerque", and is the first known to have the "Ad. Sax & Cie, Paris" stamp. According to Haine and De Keyser (1980), Sax after his 1877 bankruptcy, constituted a company with his nephew Henri Sax on 11 January 1878. Instruments

<sup>89</sup> Information deriving from the catalogue of Sax's private collection is most of the times accurate, although in some cases some mistakes have been noticed. Information from the catalogue is always

<sup>90</sup> Malou Haine & Ignace De Keyser (1980), 222.

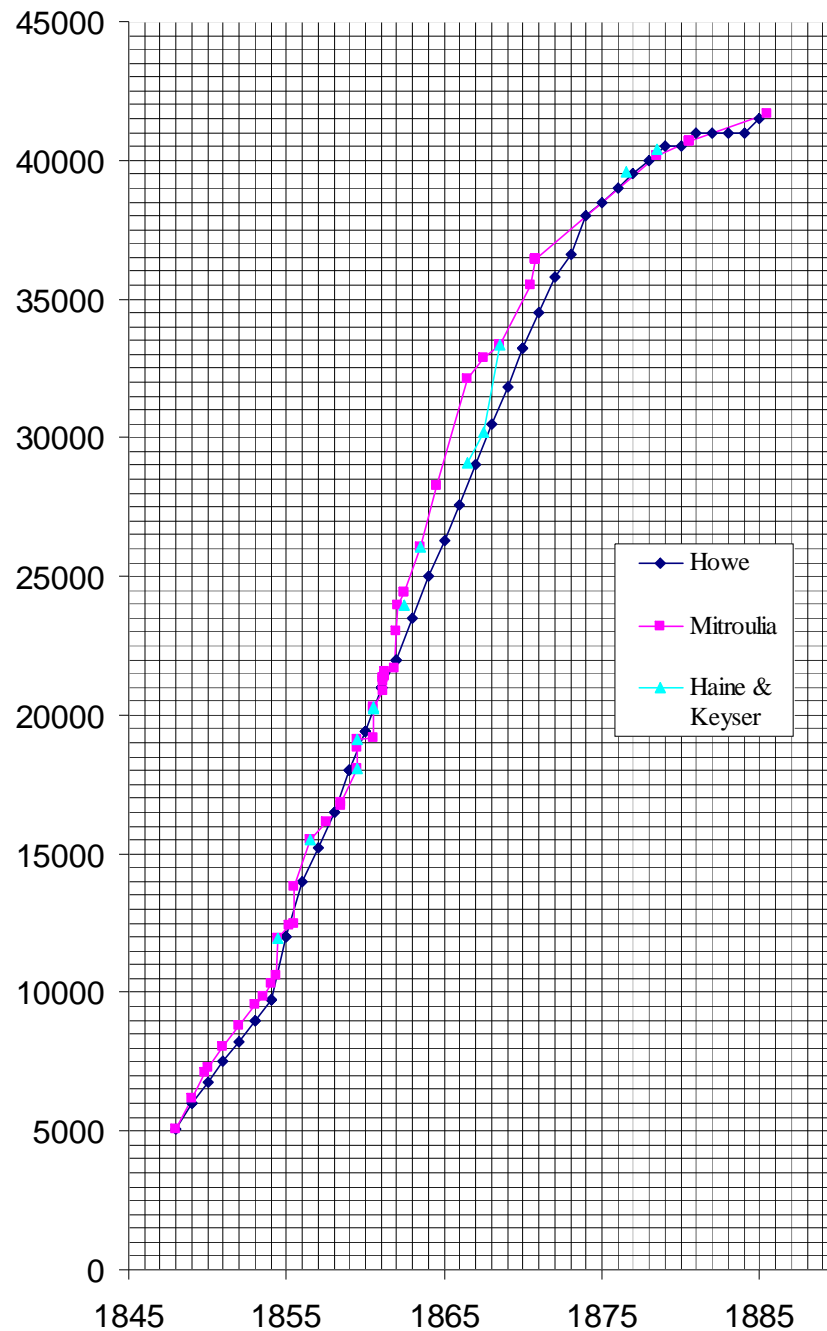
### Chapter Three

coming from this partnership are stamped “Sax & Cie” and with the address “39 rue de Dunkerque”. This partnership lasted until 1886. Concurrently, Sax constituted a second company. Instruments coming from this second partnership were stamped as “Ad. Sax & Cie” and with two addresses “26 rue de Rocroy & 39 rue de Dunkerque”. As mentioned by Haine and De Keyser the second contract does not survive. Instrument 40151 comes from this second partnership and is the first known to bear these two inscriptions. Thus, its date of manufacture is considered to be after January 1878. The latest known to be stamped with Sax’s previous address “50, rue Saint George” is cornet 39913. Thus, the gap between the two is not very large, and consequently the error in calculating dates of surviving instruments is not considerable.

Another landmark is Sax’s next change of address to rue Laffitte in 1885. The earliest known instrument with “56, rue Laffitte” stamped on its bell is a bass saxhorn in the private collection of Bruno Kampmann in Paris (inventory no. 721). Although the data of Haine and De Keyser (1980) and that of Howe (2003) present the serial number sequence going up to 41000 series, recent information shows that it goes at least into the 44000 series. The latest numbered surviving instrument known is a trombone with six independent valves and has the serial number 44731; this was located in the past in an instrument seller’s shop, but its present location is not known. This instrument cannot be dated precisely; it was made between 1885 and 1890, but since there is no other information regarding the late period of Sax’s brasswind production, a more specific date of manufacture cannot be suggested.

One instrument that was considered to be landmark by Haine and De Keyser is a saxophone with number 29082. This was the first known at the time (1980) whose name inscribed on the bell was not followed by the term “breveté”, as was the case for earlier saxophones. Haine and De Keyser assumed that Sax used this term directly after the name and type of saxophone inscribed on the bell during the patent protection period, which ended on 21 March 1866. Haine and De Keyser assume, therefore, that 29082 was made around March 1866. We can definitely say now that this is not accurate as some saxophones with higher serial numbers that have since come to light have the term “breveté” inscribed next to their name. The latest known is a soprano saxophone with serial number 31473 in a private collection in Spain.

Although this has not been taken into consideration by the author in creating the new dating system, since the usage or not of the term “breveté” in saxophones after 29082 is not consistent, its year of manufacture according to the author’s system is 1866.



Graph 3.1 The three different dating schemes of Haine & De Keyser (1980), Howe (2003), and Mitroulia (2010).

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After information from all possible sources was gathered, and all the above was taken into consideration, it was plotted in a graph where the x axis shows the year of manufacture and y axis the serial number (Graph 3.1). When there was additional information regarding the month, this was added to the graph. When only the year was known, the serial number(s) was considered to have been produced in the middle of the year.

Graph 3.1 shows the three dating schemes of Haine and De Keyser (1980), Howe (2003), and that of the present author. This graph enables us to detect where major differences arise and where the various schemes coincide. The major deviations occur in the 1860s where the graph indicates a greater divergence from Howe's scheme. Although for some years, such as 1861, there is abundance of information regarding the dating of instruments, for some years there is no evidence. After the existing data values of dated instruments were plotted then the resulting graph was interpolated manually so as to get estimates for the serial numbers corresponding to the beginning of each calendar year. The new proposed scheme for dating all Adolphe Sax numbered instruments can be seen in Table 3.4

Table 3.4 shows that Sax's production reached its peak around 1860, and remained at its peak throughout the 1860s. This is to be expected considering the issue of the military decree of 26 March 1860, which declared Sax's instruments (brass and woodwinds) suitable for use both in infantry and cavalry bands. The drop in production numbers is obvious after 1871. Sax went bankrupt for a second time in 1873. His third bankruptcy is also apparent in the table, where production numbers drop even more dramatically after 1871.

**Table 3.4 The new proposed scheme for dating all numbered Adolphe Sax wind instruments after 1848.**

<b>Year</b>	<b>Serial number</b>
1848	5085
1849	6181
1850	7277
1851	8040
1852	8803
1853	9566
1854	10500
1855	12300
1856	14700
1857	15900
1858	16500
1859	17500
1860	19200
1861	21000
1862	23200
1863	25200
1864	27100
1865	29000
1866	31000
1867	32500
1868	33100
1869	33900
1870	34900
1871	36600
1872	37100
1873	37600
1874	38100
1875	38600
1876	39100
1877	39600
1878	40100
1879	40400
1880	40600
1881	40800
1882	41000
1883	41200
1884	41400
1885	41600
1885-1890	44731

### **3.5 Conclusions**

From early in his career, Adolphe Sax demonstrated a serious and methodical approach to instrument design and a significant effort to resolve the imperfections of instruments through a more scientific approach and with the employment of principles of the science of acoustics. His thought through the years shows a development and he reached views that comply with those present-day acousticians. A number of his brasswind inventions were not completely original. However, Sax proved himself to have had a resourceful mind: taking as his starting point already existing designs, he developed and refined them to the utmost. He was well aware of patent legislation and he used this knowledge to his advantage. Throughout the biggest part of his career he seems to have favoured the Berlin valve and tried to apply it to almost all known brass instruments. Some of his developments, such as the independent valve, the compensator, and the instruments with multiple bells, seem superior from the acoustical point of view; however, the performers' reluctance to put into practice new fingering systems together with difficulties of their ergonomical aspects has prevented their general adoption.

Instruments made in his workshop show very high standards of workmanship. Sax was definitely a visionary; as for the lack of original innovation in many of his developments it can be said that borrowing in music and musical instrument making has been as old as music itself.





## Chapter Four

### The saxhorn

As already mentioned in Chapter One, saxhorns were valved instruments of intermediate bore-profile (between cylindrical and conical) made by Adolphe Sax from c. 1843 onwards. Instruments of similar nature were already known, especially in Germany, such as Moritz's and Wieprecht's *Basstuba* in 12-ft F, early *tenorhorns* in 6½-ft E-flat, and *flügelhorns* in 4½-ft B-flat. This is not contested and is an accepted fact. However, Sax through the introduction of his saxhorns created a homogenous family, with more standardized members, with same fingering, and alternating pitches between the various models of C/B-flat and F/E-flat, and he also promoted same treble clef notation. Here Sax's 1843 and 1845 patents, which were intended to protect these instruments, are discussed. On 22 April 1845 during an open air contest which took place in the Champs de Mars in Paris, Sax's band with his newly developed saxhorns competed against that of Michele Carafa, the director of the *Gymnase de musique militaire*.<sup>1</sup> Sax was the winner of the competition and this led to the issue of a ministerial decision with which the composition of military bands of the cavalry and infantry would include the whole family of saxhorns in their brass sections. The development of the family in the Sax workshop, by licensed makers and other makers is examined, through surviving instruments and primary sources.

#### 4.1 The 1843 patent

On 17 August 1843<sup>2</sup> Adolphe Sax was granted a five-year patent, his first regarding brasswinds. The subject was the invention and the improvement of “un nouveau système d'instruments chromatiques”, namely a new system for chromatic instruments. The patent is composed of two parts: the description, including the specifications and the description of the figures, and the drawing section.

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<sup>1</sup> For more see Oscar Comettant, *Histoire d'un inventeur au dix-neuvième siècle: Adolphe Sax, ses ouvrages et ses luttes* (Paris: Pagnerre, 1860), 102-10.

<sup>2</sup> For which he had applied on 13 June.

The modifications concerned three main points which according to Sax were:

- adaptation of slides for the performance of the “sons glissés”, that is the glissandi,
- adaptation of valve slides,
- modifications to the valve tubing.

Although at a first glance this patent does not directly regard saxhorns, it is discussed in this section, as it has for many years been associated with saxhorns, and for the first time some of the instruments which later became known as saxhorns were illustrated in the patent’s drawing section. Some researchers even consider this patent as the actual saxhorn patent. This patent had been discussed in many court hearings as the court minutes reveal, even though not as thoroughly as the 1845 saxotromba patent. The main reason for that was considered to be its vagueness and the fact that it did not bear a close connection to a particular instrument. The 1843 patent had been even described as “preparatory patent” to the 1845 patent,<sup>3</sup> for the evident reason that it is difficult to draw a line between the two.

At first Sax summarised two of the patent’s aims: the introduction of the spring slides to produce the glissandi (that is the compensator which was not called as such in this patent and was described explicitly in Chapter Three)<sup>4</sup> and the construction of the valve slides in a way that sharp angles were eliminated and the instruments retained their sonority when valves were operated. A third point discussed in the patent as novelty was the “introduction” of valve tuning-slides. Although this was not new at the time, Sax commented that in many cases when the instrument’s pitch is altered with the use of a crook or shank the valves do not get a corresponding addition and they play out of tune. For that he used valve slides, a feature already known at that time.

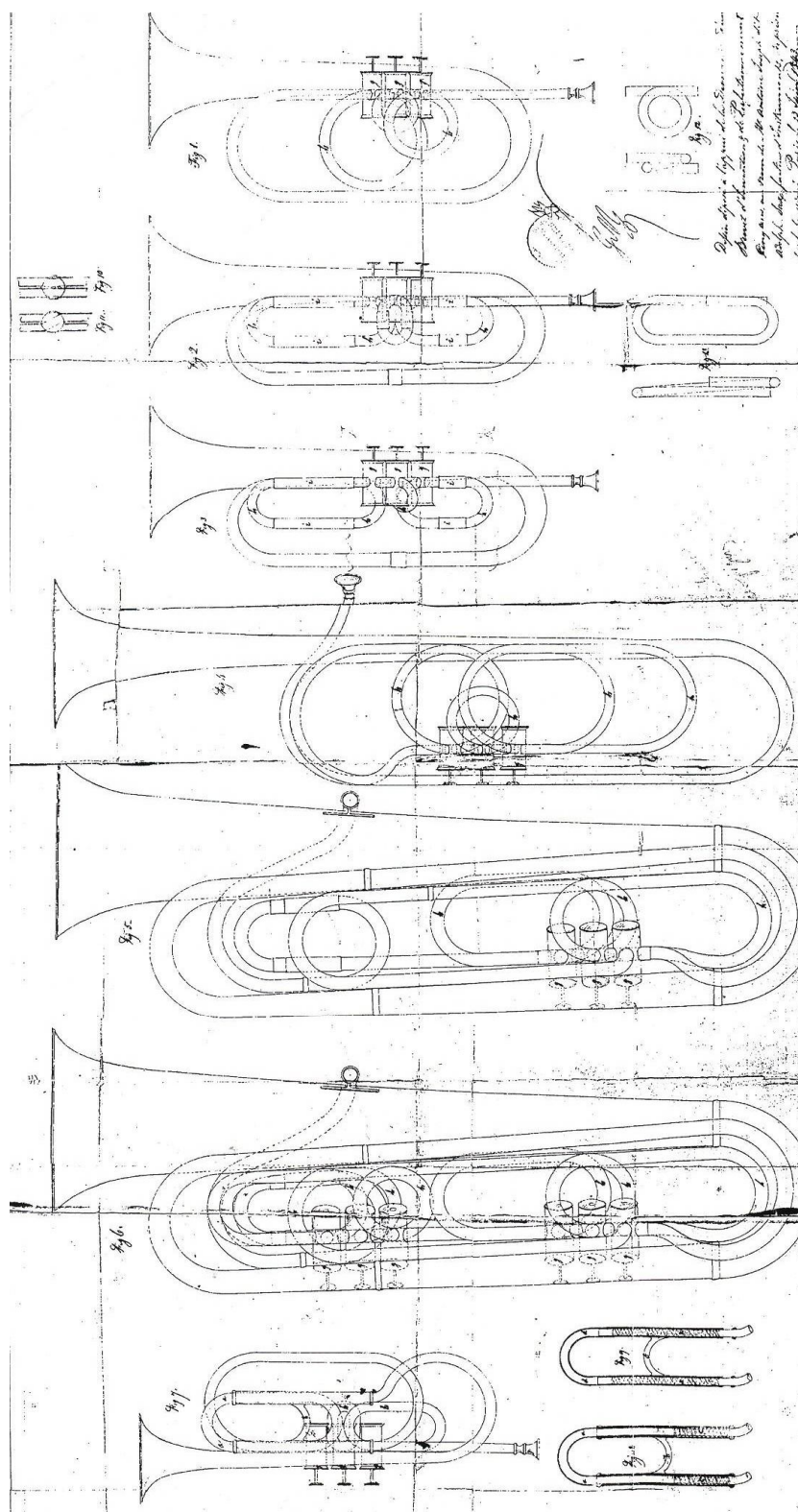
Further on he discussed the use of the spring slides. These could be used for producing “les notes coulées”, namely “slipping notes”, possibly meaning both the appoggiaturas and connecting notes. He noted that the pressure needed for exerting the slide was not considerable at all and that when the spring slide was employed the

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<sup>3</sup> “[...] c’était un brevet préparatoire de celui de 1845 [...]”. See, *Prolongation des Brevets Sax. Observations sur le rapport fait au nom de la Commission* (Paris: impr. L. Guérin, 1860), 7.

<sup>4</sup> See Chapter Three, pp. 43-48.

instrument's familiar fingering was not altered. Once pulled out, the spring retained the slide open until the finger brought it back to its initial position.



**Figure 4.1** The drawing section of Sax's 1843 patent. From top to bottom there are depicted: instruments 1-3 bugles, instrument 4 trumpet, instruments 5-6 *contrebasses d'harmonie* in F and E-flat, instrument 7 trumpet with spring slide.

He did not discuss further any of the patent specifications and commented briefly on the drawings attached. Instruments 1, 2 and 3 of the accompanying drawings depict bugles (see Figure 4.1). Bugle number 1 of Figure 4.1 is made in way distinctively different from 2 and 3. It is not fitted with valve slides, and the valve tubing of valves 1 and 3 is made in the form of a perfect circle, which according to Sax was one of the patent's main developments. He noted that he was inspired to give to the valve slides the form of a circle inspired by the crooks. He considered this advantageous due to the lack of angles which he thought that affected sound quality. All these bugles are instruments which later became known as "contralto saxhorns". Instruments 5 and 6, the *contrebasses d'harmonie* in F and E-flat respectively, are considered the precursors of the contrabass saxhorn in F and E-flat, although, as discussed further in this chapter no surviving instruments made similar to these drawings are known to exist. These were very similar to the *Basstubas* of Moritz and Wieprecht. Sax's modifications regarded the number of valves, which are three and six (as opposed to five in the *Basstubas*) and modifications to the valve tubing, which will be more explicitly discussed in a following section. The tenor trumpet (instrument 4) and the trumpet with the spring slide (instrument 7) are not connected to saxhorns in any way. It should be mentioned that instruments discussed above were not called saxhorns in the patent, although the bugles in particular are almost identical to surviving contralto saxhorns in bell-front form. Sax also failed to discuss and identify his developments which regarded the alterations to the Berlin valve. These are also discussed in detail in section 4.6.

### 4.2 Saxhorns in the 1845 patent

Two years after the 1843 patent, in October 1845 Sax applied for a new patent for the introduction of the saxotromba as an instrument and as a form. This form could be also applied to already existing instruments, such as saxhorns, horns, trumpets, trombones and cornets (see Figure 5.1, Chapter Five). Although the main subject of the patent is the saxotromba, more saxhorns than saxotrombas were depicted in the accompanying patent drawings.

The following saxhorns were included:

*petit* saxhorn in E-flat  
 saxhorn in B-flat  
 four-valve saxhorn in B-flat  
 saxhorn in A-flat  
 four-valve [alto] saxhorn in E-flat  
 four-valve [bass] saxhorn in B-flat  
 contrabass saxhorn in E-flat.

In this patent Sax noted that all his instruments could be now fitted with valve slides. Thus, the valve slide form of the perfect circle shown in the previous patent has been abandoned. A fourth valve could be added to instruments that needed an extension of their compass. This fourth valve became common in the bass saxhorn. As discussed in Chapter Five, the alto saxotromba in E-flat and the baritone saxotromba in B-flat are essentially what came to be known as the alto and baritone saxhorns, respectively. Consequently, almost the complete family of saxhorns as it came to be recognised (the contrabass in C/B-flat was still missing at that point) is depicted in this second patent.

As Sax pointed out later during the lawsuits, the main innovation of his patent was the uniformity of fingering in all his instruments, and uniformity of timbre. The latter was achieved by the proportions of his instruments. Although he gave some bore widths of saxotrombas appearing on the patent and of some saxhorns made in saxotromba form (upright form), he never clarified the exact use of proportions. Sax emphasized that the law of proportions was what gave to each species their distinct character, and not the external appearance, as was alleged by many of his rivals.<sup>5</sup> As explained, the real essence of his invention was that this uniformity could work as an advantage for the performer. A brass player with just two days work, said Sax, could move from one instrument to the other. In this case the mouthpiece was a light problem, which could be overcome with little practice. Sax said that since the

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<sup>5</sup> *Note pout M. Sax, appellant, contre MM. Raoux et consorts intimes* (Paris: impr. Simon Dautreville et Cie, 1854), 14-15.

invention of the saxotromba, musicians could play all instruments, from the highest to the lowest.<sup>6</sup>

### 4.3 The question of the saxhorn patent

There are many contradicting issues concerning Sax's 1843 and 1845 patents. In the existing limited literature regarding saxhorns there is a disagreement regarding the actual saxhorn patent. Some academic researchers regard the 1843 patent as the saxhorn patent; others regard the 1845 patent as the saxhorn patent.

When studying the two patents more thoroughly some issues arise:

- the name "saxhorn" (as mentioned) did not appear in the 1843 patent,
- almost none of the models presented in 1843 appeared intact in the 1845 patent,
- no extant instruments by Sax correspond to most of the 1843 drawings. There is only information on a contrabass instrument which used to be part of the Sax collection whose present location is unknown. According to the collection's catalogue there used to be a *contrabass d'harmonie* corresponding to the contrabass instruments included in the drawing section of the 1843 patent,<sup>7</sup>
- both the term "saxhorn" and the instruments (more or less as we know them today) appeared in the 1845 patent,
- all the models presented in the 1843 patent were not new – they were already existing models equipped with the valve modifications mentioned explicitly below in section 4.6. Bugles and *contrabasses d'harmonie* were present before 1843 and they were definitely not invented by Sax. This might explain why some scholars considered the 1845 as the saxhorn patent.

On the other hand, more saxhorns than saxotrombas appeared in the drawings of the 1845 saxotromba patent. Was this an attempt by Sax to entrench the wider range of saxhorn family, by publicly illustrating so many different models? Likewise,

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<sup>6</sup> Ibid., 16.

<sup>7</sup> See, *Catalogue du musée instrumental de M. Adolphe Sax. Collection unique d'instruments de musique de tous temps et de tous pays* (Paris: imp. de Ves Renou, Maulde et Cock, 1877).

is the frequent presence in the text of the term “saxhorn” an attempt to officially establish it? Saxhorns by 1845 were already used and were established as a distinct species of instruments; they were mentioned in the 1845 patent together with other instruments, a cornet, trombone and trumpet, without a definition; no reference was made to saxhorns in the introductory part where Sax describes the new inventions; the main invention of this patent is the saxotromba, both as an instrument and as a form that could be applied to other species, including saxhorns. This would explain why other scholars have considered as the saxhorn patent the 1843 patent.

In the author’s view none of the two patents can be accepted as the actual saxhorn patent. It is probable that Sax’s idea of creating a complete family of brass instruments with his modifications developed shortly after the 1843 patent, when he obviously saw how successful these modifications were. By 1845, the time of the second patent, saxhorns had already been established and could not be patented as something new. According to article 31 of law of 5 July 1844: “Any discovery, invention or application, which in France or abroad, and previously to the date of the deposit of the demand, has received sufficient publicity to enable it to be worked, shall not be reputed to be new.”<sup>8</sup> However, Sax needed a way of shielding his ideas; that might explain their abundant presence in the drawings of the second patent. Sax’s adversaries opposed the novelty of the saxotromba as an instrument and as a form. Saxhorns are scarcely mentioned in the lawsuit documents. This might be another indication for the non-existence of an actual saxhorn patent.

#### **4.4 The origins of the term “saxhorn”**

No mention of the term “saxhorn” is made in the 1843 patent; this appeared officially for the first time in the 1845 patent. It cannot be said with absolute certainty where or whom this term originates from. A great part of the scholarly community so far suggested that it was John Distin who first used the term, after seeing Sax’s instruments in Paris in 1844. It was mainly Henry Distin’s, John’s son, the responsibility for the spread of this information. In the beginning of 1845, a “foreign artist resident in London” sent a letter to the weekly British journal the

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<sup>8</sup> See, Benjamin Vaughan Abbott *The Patent Laws of All Nations* (Washington: Charles R. Brodix, 1886), 1: 189.



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*Musical World* complaining about a recent concert of the Distin family in London.<sup>9</sup> He called the attention of the public to the fact that the instruments used in this concert were the saxhorns, invented by M. Sax. According to various biographers of Sax, this artist was Sax, who was indeed in London at the time. The following week Distin replied with an extensive letter which – among others – mentioned that the name “saxhorn” was given to the instruments by him and his family, since Sax called his instruments “cylinder bugles”.

In 1896, more than fifty years after the *Musical World* articles mentioned above, another British music journal, the *Musical Opinion*, published a series of articles by Enderby Jackson titled “Origin and Promotion of Brass Band Contests” where the author quotes from a letter by Henry Distin, son of John Distin, resident in the United States at that time. Among others Distin mentions about his visit in Paris in 1844:<sup>10</sup>

Our family quintet was playing one night at a grand concert given by a famous singer. On that occasion, to my great astonishment, I heard a new brass instrument – entitled on the programme “Sax horn” – played by a French artist whose name I have forgotten.

During that concert the Distins had the first encounter with the “new” instruments, and if the “sax horn” was described as such in the programme it is not possible that the Distins were the originators of the term. Haine suggested that it was probably Sax’s friends, artists and theorists that suggested the name “saxhorn” for Sax’s valved bugle. This is also mentioned in one of the lawsuit documents and seems more convincing. Furthermore, in the official catalogue of the French section at the London 1862 exhibition the following is mentioned:<sup>11</sup>

In its grateful equity for this useful and beautiful invention, the public itself spontaneously gave the name of its inventor, and called saxhorns the instruments of this system.

The “sax” prefix had already been used prior to its use in the saxhorns, in the saxophone; Robert Howe dates the first known appearance of the

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<sup>9</sup> For more details see Chapter Six, pp. 240-42.

<sup>10</sup> Enderby Jackson, “Origin and Promotion of Brass Band Contests” *Musical Opinion & Music Trade Review* no. 226 (July 1896): 674.

<sup>11</sup> “Appendice”, *Exposition Universelle de 1862 à Londres. Catalogue Officiel. Section Française publié par l'ordre de la commission impériale* (Paris: impr. Impériale, 1862), 115.

term “saxophone” in June 1842.<sup>12</sup> If Howe’s information is accurate, it is then less probable that the Distins were the originators of the term “saxhorn”.

It is worth pointing out the use of “horn” instead of the equivalent French term “cor” as the second element of the compound “saxhorn”. Whereas it can be argued that this might support the view that the Anglophone Distins were involved in the formation of the term “saxhorn”, it is reasonable that Sax would have opted for a word other than “cor”, so as to avoid confusion with the french horn. Sax’s french horns with Berlin valves were called by the maker and were advertised as “Sax cors”. Even in the later introduction of the term “saxotromba”, the Italian word “tromba” was chosen as the compound’s second element, probably to avoid confusion with the trumpet, although in some instances the saxotrombas have been mistakenly referred to as “sax trumpets”, mainly by English-speaking writers. Whatever the Distin family’s involvement in the invention of the term, there is no doubt that they promoted its institutionalization.

Other versions of the name which appear in various nineteenth-century sources are “sax-horn” or “saxehorn”. It has been noted that in some occasions in Britain the term “saxhorn” has been also used in a more generic term, for indicating instruments other than the saxhorns. An indicative example comes from *Cassell’s Illustrated Exhibitor*, an illustrated album of the 1862 London International Exhibition with commentary. The section devoted to brass instruments is exclusively preoccupied with Distin’s brass instruments and is titled “Mr Distin’s Sax Horns”.<sup>13</sup> However, none of the four instruments illustrated is a saxhorn; they were a ventril horn, a Koenig horn, a saxophone and an echo cornet.

#### 4.5 Early references to saxhorns and adoption

Castil-Blaze published in August 1843 in *La France Musical* an article about Sax, just a few days after Sax’s patent was granted. Whereas most of the article dealt with the development of the woodwinds, a small paragraph was devoted to brasswinds. He mentioned that Sax had added *cylindres* to the trumpet and trombone,

<sup>12</sup> Robert Howe, “The Invention and Early Development of the Saxophone, 1840-55”, *Journal of the American Musical Instrument Society* 29 (2003): 110.

<sup>13</sup> “Brass Instruments in the Exhibition”, *Cassell’s Illustrated Exhibitor containing about three hundred illustrations, with letter-press descriptions of all the principal objects in the International Exhibition of 1862*, (London: Cassell, Peter & Galpin, 1862): 91.

and that the same additions had occurred to the *bugle*, whose sound had been transformed from uncouth to pleasant.<sup>14</sup> In another article in the same issue it was reported that Dauvernet and Schiltz heard Sax's trumpet, cornet and trombone à *cylindres* in the orchestra of the *Academie Royale de Musique* with very good results.<sup>15</sup> In a following issue of the same year (September 1843) a new advertisement for the new Sax instruments appeared.<sup>16</sup> The brass instruments mentioned were *trompettes à cylindres*, *Cor*, *trombonne*, and what appear to be the members of the later saxhorn family: *bugles à cylindres*, *ténor-basse*, *basse*, *contrebasses d'harmonie à trois, quatre, cinq ou six cylindres*. What is not clear from the above is the identity of the instrument with the combined name *ténor-basse*. This could be either the later alto saxhorn or the baritone, but it is probably the alto, as also discussed further down.

During the same period (September 1843) Henri Blanchard published an article in *La Revue et Gazette musicale de Paris* on Sax's instruments.<sup>17</sup> The author admitted that Sax did not invent the bugle. He stated, though, that even though Sax did not invent it, he extended its family and presented the following family members: *petit bugle* in E-flat, *bugle* in B-flat, *bugle ténor ou baryton* in E-flat, *bugle-basse*, *bugle-contre-basse* and *ophicléide-trombone*. The latter instrument's identity is again obscure. The absence of the baritone member of the family here is noteworthy.



Figure 4.2 The earliest known advertisement to promote members of the instrument family which later became known as the “saxhorns”, which appeared in *La France Musicale* in September 1843.

<sup>14</sup> “Les mêmes additions, faites au bugle, en ont rendu la voix agréable de sauvage qu’elle était.” See, Castil-Blaze, “Adolphe Sax”, *La France Musicale* 6, no. 35 (27 August, 1843): 277-78.

<sup>15</sup> “Nouvelles. Paris”, *La France Musicale* 6, no. 35 (27 August, 1843): 292.

<sup>16</sup> *La France Musicale* 6, no. 39 (24 September, 1843): 316.

<sup>17</sup> Henry Blanchard “Adolphe Sax” *La Revue et Gazette musicale de Paris* no. 37 (10 September, 1843): 314-16.

Blanchard also mentioned Sax's improvements on the valve systems. He wrote that Sax had improved the valve systems in use in Vienna, Berlin and Brussels, with his two new *systèmes à cylindres*. The use of plural here is a surprise since we are aware of only one new valve system that Sax introduced at that time: the modifications to the Berlin valve which will be discussed later in this chapter. One possibility is that Blanchard also referred to the spring slide (later known as the compensator) as a valve system; this was referred to soon after as a means of correcting the intonation of non-cylindrical instruments.

More family members appear in the above article and the advertisement than in the patent which was issued about a month prior, in August 1843. The patent depicted only bugles and *contrebasses d'harmonie*, and conventional brasses with Sax's valves. Sax would not have advertised in September 1843 all instruments appearing in the press clipping of Figure 4.2 if they had not been available at that time. On the other hand it is difficult to understand why he did not include them in the patent in August 1843.

A later article in the same journal (*La France Musicale*) in January 1844 described the bugle family (complete this time).<sup>18</sup> The family ranged from the *petit* in E-flat to the *contrebasse* in E-flat. The author noted that the family member in B-flat played by Arban, was also known as "bugle Sax".

Kastner in the *Supplement* of his *Traité* published in 1844 discussed the family of *bugle à pistons ou à cylindres (flügelhorn)*.<sup>19</sup> The term "saxhorn" was not used here either. Kastner reported that the bugle in B-flat (with three *pistons* or *cylindres*) was an instrument already known in Germany. However, he praised Sax for manufacturing a complete family. The family members were: *petit bugle à trois cylindres* (E-flat), *bugle* (C or B-flat), *bugle ténor* (F or E-flat), *bugle basse* (B-flat), *bugle contrebasse* (E-flat). It was noted that, although, the standard type bugle was fitted with three valves, Sax made instruments with four and even five valves, and consequently with more extended compass, and that his system of *cylindres* (that is, the Berlin valve) was improved compared to that of Germans. Kastner closed the section by expressing his preference to Sax's bugles. It is strange that again the

<sup>18</sup> Escudier, "Les nouveaux instruments d'Ad. Sax", *La France musicale* no. 1 (7 January, 1844): 431-32.

<sup>19</sup> Jean-Georges Kastner, *Supplément au Traité général d'instrumentation* (Paris: [n.p.], 1844), 35-37.

baritone member of the family is missing here. The section following discusses the *saxotromba chromatique* (as also discussed in more detail in Chapter Five). Again, here the narrow-bore instrument in 8-ft C/9-ft B-flat is missing, although the term “baryton” is also used together with the term “tenor” for the instrument in 6-ft F/6½-ft E-flat. It appears that most possibly, the narrow-bore instrument, which later became known as the baritone saxhorn, was a later addition to the family, and second last before the contrabass in B-flat.

*La France Musicale* published an article about Sax’s successes with the Royal family in the beginning of 1845.<sup>20</sup> The term “sax-horn” was used in this article and the following family members appeared: *soprano*, *ténor-contralto*, *ténor*, *basse*, and *contrebasse*. This time a composite name was used for the later contralto, and the group was still lacking the baritone.

By the beginning of 1845 the terms “saxhorns” and “bugles-Sax” or “bugles à cylindres” were used interchangeably. The term “saxhorn” had not yet become standard. An article in *La Presse* on 21 April, referred to the “bugles-Sax” that were divided into four groups analogous to that of the range of the human voice (soprano, alto, tenor and bass).<sup>21</sup> A week later, another article in the same journal mentioned “les saxhorns, les bugles-Sax”.<sup>22</sup> The use of both terms shows the lack of standardisation in nomenclature. On 1 April 1845 Berlioz wrote in the *Journal des Débats*:<sup>23</sup>

His [Sax’s] new instruments, the *bugles à cylindres* especially, which he calls the *sax-horns*, are of a rare accuracy and sonority.

In the same article Berlioz listed Sax’s proposal for the reorganization of French military bands. The terminology, as used by Berlioz, in describing instruments of the saxhorn family is interesting; the soprano saxhorn in E-flat, is called *petit sax-horn ou bugle à cylindres*, the contralto, alto, baritone and bass saxhorns are called, *grand saxhorn en si bémol*, *grand sax-horn ténor and mi bémol bas*, *grand sax-horn baryton en si bémol bas*, and *grand sax-horn basse en si bémol bas*, respectively. The contrabass saxhorn is termed “*contrebasse d’harmonie (tuba)*”

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<sup>20</sup> “Nouvelles”, *La France Musicale* 8, no. 10 (9 March, 1845): 77.

<sup>21</sup> Théophile Gautier, “Concerts”, *La Presse* no. 3281 (21 April, 1845): n.p.

<sup>22</sup> Théophile Gautier, “Concerts”, *La Presse* no. 3288 (28 April, 1845): n.p.

<sup>23</sup> Hector Berlioz, “De la réorganisation des musiques militaires”, *Journal des Débats* (1 April, 1845): 1.

as it was called by Sax in his 1843 patent<sup>24</sup> and a baritone was now included in the group.

The adoption of Sax's saxhorns and saxotrombas was immediate. Already in 1846 Sax's instrument were taught in the *Gymnase de musique militaire*.<sup>25</sup> In an article published in *La Tribune dramatique*<sup>26</sup> it was noted that in the class of contralto saxhorn, the saxhorn in A-flat and the saxotromba in E-flat would be taught additionally (although as a later article shows, a different instructor was eventually chosen for the saxotromba). The class of the four-valve bass saxhorn also included the baritone saxhorn and the alto in E-flat. The journal *Le Ménestrel* on November 1846 announced the following as the winners of the competition for the position of professors for the Sax brasses at the *Gymnase militaire*:<sup>27</sup>

Baneaux (saxotromba)

Arban (contralto saxhorn)

Lecomte (four-valve bass saxhorn)

Dautonel (contrabass)

Sax used all possible ways to advertise his instruments. In the beginning of 1847 he built a concert hall in his workshop in rue St. Georges—known as *salle Sax*—where performances on his instruments (but not only his) were given and were advertised in the daily press, often by the wind band he had organised which was called *Société de la Grand Harmonie*. Berlioz even devoted an article in his column in the *Journal des débats* on Sax's new hall.<sup>28</sup> However, the most decisive factor for the dissemination of saxhorns in France was the ministerial decision of 1845 when Sax's saxhorns became obligatory for French military bands. This decision was

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<sup>24</sup> Ibid., 2.

<sup>25</sup> The *École de Musique de la Garde* was created in France in 1792 for the members of the various corps, and this became the *Conservatoire Nationale* in 1795. In 1836 the *Gymnase de musique militaire* was founded for the military bandsmen by the French Government (the first director was Friedrich Berr who died in 1838 and was succeeded by Michele Carafa). During the Second Empire the *Gymnase* was abolished and military bandsmen were taught music in the six corresponding classes of the *Conservatoire National* until 1870 when these classes were closed down. See, *Conservatoire Militaire de l'Armée de Terre* [http://www.cmmat.info/?page\\_id=83](http://www.cmmat.info/?page_id=83) (accessed 27 April, 2010).

<sup>26</sup> See "Macédoine", *La Tribune dramatique et des beaux-arts, littérature, arts, theatres, modes, etc.* (6 September, 1846): 126.

<sup>27</sup> See "Nouvelle diverse" *Le Ménestrel*, no. 245 (1 November, 1846): n. p.

<sup>28</sup> Hector Berlioz "Nouvelle salle de concertes d'Ad. Sax" *Journal des débats politiques et littéraires* (14 February, 1847): 1-2.

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reversed in 1848 with a new ministerial decree after the political changes in France during that period, and the “sax” prefix was removed from instruments designated for military bands; the term introduced by the military authorities was “clairon chromatique”.<sup>29</sup> As also discussed in Chapter Five essentially it was only the instrument names that changed, but not the instruments themselves. In 1854 a new official decision brought back the “sax” prefix and officially Sax’s instruments into use in military bands. The saxhorns were thus widely adopted. Major French makers were selling numerous imitations of them, despite Sax’s efforts to monopolise production. As discussed by Rauline (2004) French army bands, the bands of the Imperial and later Republican Guard served as an exemplar regarding their composition for amateur music societies of the time, such as those of the orpheonic movement.<sup>30</sup> The adoption of Sax’s saxhorns in these bands was extensive. Saxhorns became the standard instruments in the compositions of brass and wind bands throughout the country and there was a class for saxhorn in many provincial schools of music.<sup>31</sup>

Although the use of saxhorns in the orchestra was not great, and they never managed to acquire a permanent position in the orchestra there are a number of orchestral works written at the time by composers, most of which, such as Berlioz, were in Sax’s social circle. A more regular use of Sax’s instruments was that in the Paris Opéra. Sax was the director of the stage band, known as *banda*, for many years (1847-92), a position held by his son afterwards.<sup>32</sup> There he had the opportunity to introduce many of his new instruments.

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<sup>29</sup> For a list of all ministerial decisions known to regard saxhorn see Appendix E.

<sup>30</sup> Jean-Yves Rauline, “19<sup>th</sup>-century Amateur Music Societies in France and the Changes of Instrument Construction: Their Evolution Caught Between Passivity and Progress”, *The Galpin Society Journal* 57 (May 2004): 237.

<sup>31</sup> See for example, Henri Marechal & Gabriel Parès, *Monographie universelle de l’Orphéon, sociétés chorales, harmonies, fanfares, avec documents inédits recueillis par les représentants de la France à l’étranger* (Paris: Librairie Ch. Delagrave, 1910), 208, 217-34.

<sup>32</sup> See for more, Ignace de Keyser, “Adolphe Sax and the Paris Opera” *Brass Scholarship in Review. Proceedings of the Historic Brass Society Conference, Cité de la Musique, Paris 1999* (New York: Pendragon Press, 2006), 133-69.

## 4.6 Sax's modifications to the Berlin valve

The greatest number of surviving Adolphe Sax instruments are equipped with Berlin valves, but not the type found in instruments of Germanic origin. Although Sax's Berlin valves are visibly different from those found in German instruments, Sax's modification to the valve has not so far been the subject of a thorough study. Sax's rivals within and outside the French borders believed that Sax merely copied the Berlin valve and applied it to his instruments. This is mainly due to the inventor's failure to describe explicitly his invention in his 1843 patent, where brasses with his modified Berlin valves appeared. This led to misinterpretations by both his contemporary makers and by present-day scholars. Sax in his 1843 patent stated that his improvement "suppresses the angles in the tubing added to the *cylindres* or *pistons*, so as to preserve in the wind instruments their initial sonority."<sup>33</sup> This is where the maker refers to the additional valve tubing which after his improvements is less angular than that made by other makers. The additional valve tubing is made in the form of a perfect circle or an elliptical form as the patent drawings show. Although Sax failed to acknowledge the pre-existence of the Berlin valves in Germany, neither did he claim to have invented them.

At the time the circular or elliptical valve loops seemed as an improvement, but they later became the subject of dispute, since instruments with valve tubing in that form could not be fitted with valve slides. This was noticed by Sax's opponents and was mentioned during the lawsuits: according to Sax's rivals, his instruments were impractical.<sup>34</sup>

The *Revue scientifique et industrielle* discussed the progress of science shown through the various exhibits in the 1844 Paris National Exhibition. Among others, Sax's exhibits are discussed and the following was reported regarding Sax's Berlin valves:<sup>35</sup>

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<sup>33</sup> "Il [le système] supprime aussi les angles dans les tons ajoutés aux cylindres ou pistons, de manière à conserver aux instruments à vent leur sonorité première."

<sup>34</sup> *Note pour M. Sax, appelant, contre MM. Raoux et consorts*, 9.

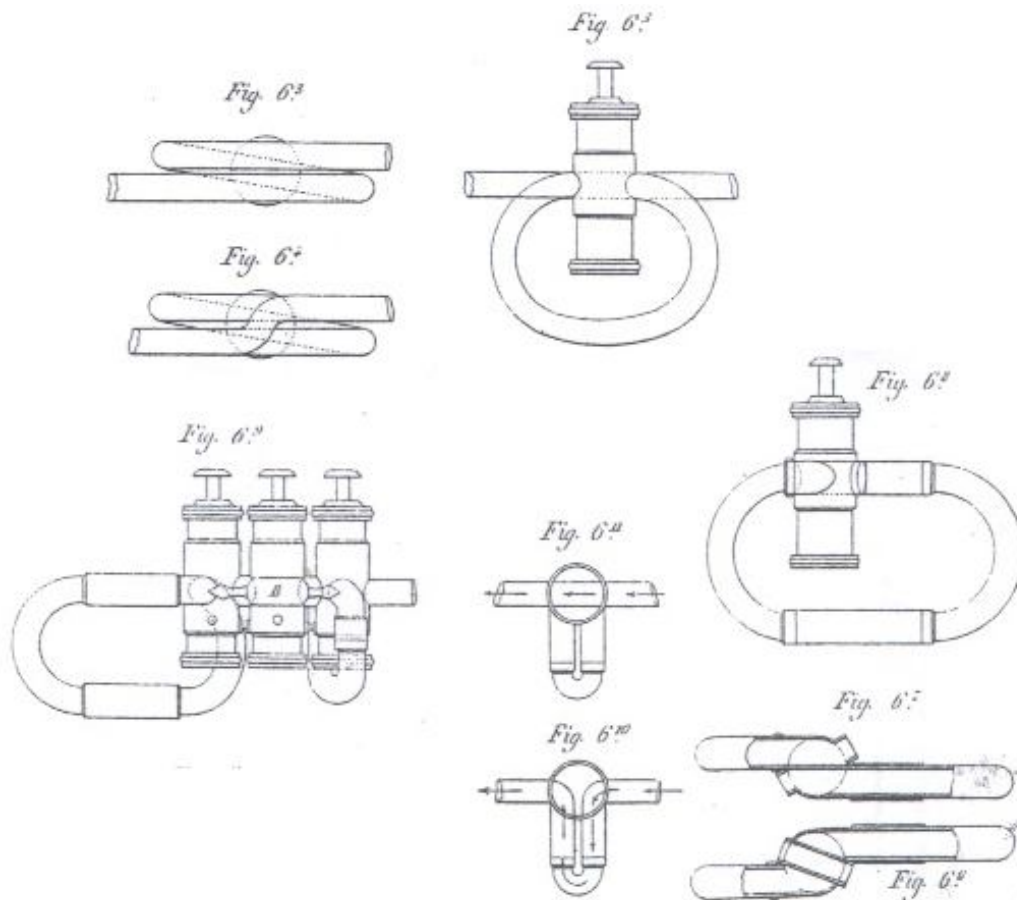
<sup>35</sup> "M. Sax a paré à ces inconvénients, en remplaçant les pistons par des cylindres percés de trous qui viennent se placer devant les orifices des allonges, de manière que la colonne d'air ne fasse pas en ce point d'angle tranché. Ses allonges elles-mêmes ne présentent que des courbes très douces, qui ont beaucoup moins d'influence sur la qualité des sons que les courbes à très petit rayon ordinairement employées." See *Revue scientifique et industrielle sous la direction du Docteur Quesneville* (Paris: Louis Colas, 1844), 1: 427.



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Mr. Sax has confronted these disadvantages by replacing the pistons with the cylinders bored with holes that come to be placed in front of the openings of the lengthening pieces, so that the column of air does not make in this point a sharp angle. These lengthening pieces themselves only present soft curves, which have a much smaller influence on the quality of the sounds than the curves with a very small radius usually employed.

The emphasis here is given again on the valve loops in relation to the pistons and the angle of this connection. Sax in his 1862 patent referred briefly to his 1843 modifications to the Berlin valve: “I patented the disposition of the additional valve tubing”, showing clearly that his modifications related to the valve tubing. Figure 4.3 shows a part of the 1862 patent drawing where the 1843 patent valve modifications are drawn in greater detail than in the actual 1843 patent. He repeated that with his 1843 system he had not been able to give to the valve tubing of the second valve the appropriate form due to its short length. As a result, even in his system sharp angles were created in the valve tubing of the middle valve.



**Figure 4.3 Sax's improved Berlin valve. The diagram comes from his 1862 patent, where the developments of 1843 regarding his modifications to the Berlin valves are more explicitly described.**

Only Herbert Heyde (1994) has proposed a theory regarding Sax's modifications to the Berlin valve. Heyde assumed that in Sax's valves the actual modification is to the valve ports, which deviated from the right angle of the German instruments and were placed at angles of 75° and 105°. <sup>36</sup> This was based on measurements taken solely from an alto saxhorn at the National Music Museum, University of South Dakota. Heyde also proposed that Sax model instruments made in other factories would have a disposition of the valve ports at slightly different angles and that this would help identify their makers. The latter would also be very difficult, if possible at all, since according to recent research the common practice of the time was that many makers had their valves made by independent valve makers. <sup>37</sup> This was the case for Sax and other well-known French and even some British makers. The present author took measurements and studied a great number of pistons of relevant instruments. Research showed that in Sax valves there is definitely a tendency for a deviation from the right angle; however, no specific angles are followed, as suggested by Heyde, and therefore, Heyde's hypothesis cannot be confirmed. Instruments following the German tradition have their valve ports indeed placed at right angles (see Figure 4.4). Sax's valves and valves of French instruments made by makers other than Sax and even some Berlin valves of British instruments deviate from the right angle.

Looking at surviving instruments from the Sax workshop and through patent drawings the following remarks can be made regarding the valve sections of early instruments:

- instruments from the 1843 patent whose valve loops are made in the form of a perfect circle or in a rounded form (such as instruments 1, 3, 4, 5 of Figure 4.1) are not fitted with valve tuning slides and have the valve loops passing under the valves and not around them as in most instruments of the German tradition. The valves in these instruments are placed perpendicular to the bell axis in a manner similar to that of instruments of the German tradition,

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<sup>36</sup> Herbert Heyde, "The Early Berlin Valve and an Unsigned Tuba at the Shrine to Music Museum" *Journal of the American Musical Instrument Society* 20 (1994): 54–64.

<sup>37</sup> Mitroulia et al., "On the Early History of the Périnet valve," *Galpin Society Journal* 61 (April 2008): 217–29, 255.

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- the loops are inclined in the same direction (in instruments with no tuning slides),
- in instruments of the bell-front type which are fitted with valve tuning slides, the loops pass under and around the valves but are inclined (with the exception of the middle valve) in different directions (instruments 2, 3 of Figure 4.1).



**Figure 4.4** Valve section of a *Basstuba* in 12-ft F, made by Zetsche Söhne, probably c. 1850-75. The valve ports are placed at right angles and the valve tubing passes around the valve. Edinburgh University Collection of Historic Musical Instruments (inventory no. 4091). Photograph by Raymond Parks.

In later instruments by Sax, and later drawings either published in Sax's patents or in handbills of his workshop it can be observed that:

- Sax abandoned giving the valve loops the form of the perfect circle,
- after the introduction of the saxotromba form, the valves were placed parallel to the bell axis in a way that became strongly associated with Sax; the first and third valve loops in the higher pitched instruments are inclined towards different directions to leave space for the middle valve loop whose inlet and outlet are on the same side of the valve (see Figure 4.5), whereas in the lower pitched instruments all valve loops are inclined towards the same direction.
- In some of the later contralto saxhorns (made after 1861) in saxotromba form the inclination of the valve tuning slides is not so pronounced, and the valve loops are inclined towards the same direction.

The inclination of the valve loops is something that Sax failed to mention in his 1843 patent, although this appears to be one of the major differences between his version of the Berlin valve and Berlin valves of the German tradition. By having emphasized the circular form of the valve loops he created a false impression that this was his main modification to the Berlin valve. It should be noted, though, that in Wieprecht's Berlin valves the loops were also made in a round form, but their position in relation to the piston differed.

On several occasions through the minutes of the lawsuits that were brought against him by rival makers, Sax expressed the opinion that his valves were improved compared to Périnet valves, because in his valves the valve tubing had fewer angular loops.<sup>38</sup> Both his valves and those of Périnet were seen as improvements to the defective Stölzel valve.<sup>39</sup> Sax believed that Berlin valves made by Wieprecht did not achieve the goal of the elimination of sharp angles since the additional tubing of each valve "returns completely to itself," by which he probably meant the right angle.<sup>40</sup> He explained that the inspiration for giving the valve loops a circular form came from the form of crooks, which, according to Sax, due to the regularity of their form does not disturb the instrument's sonority. Initially he

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<sup>38</sup> See for example, *Note pout M. Sax, appellant, contre MM. Raoux*, 9-10.

<sup>39</sup> Ibid.

<sup>40</sup> Adolphe Sax, *Note pour Messieurs les conseillers*, (Paris: H. Simon Dautreville, 1850), 4.



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defended himself against accusations that his instruments were impractical due to the lack of valve tuning slides by saying that valve slides become necessary only when the performer wishes to change the pitch of an instrument by using a crook.<sup>41</sup> However, he confessed that later he had to abandon the perfect circle, but even so, the additional valve tubing in his pistons was not as angular as in those by Périnet. As a result, one of the major advantages claimed for his version of the valve was lost, although the inclination of the valve loops was retained for some time.

Some of the later small saxhorns with Berlin valves present a peculiar feature; their second valve is of the Périnet type (see Figure 4.5 left). However, the piston diameter, external appearance, height, and other features are identical to those of the Berlin valve. The difference is detected in the piston's internal tubing which was constructed in a manner similar to those of Périnet valves, as was the external valve tubing. This is also the case in many surviving contralto saxhorns depicted in Sax's 1859 patent.

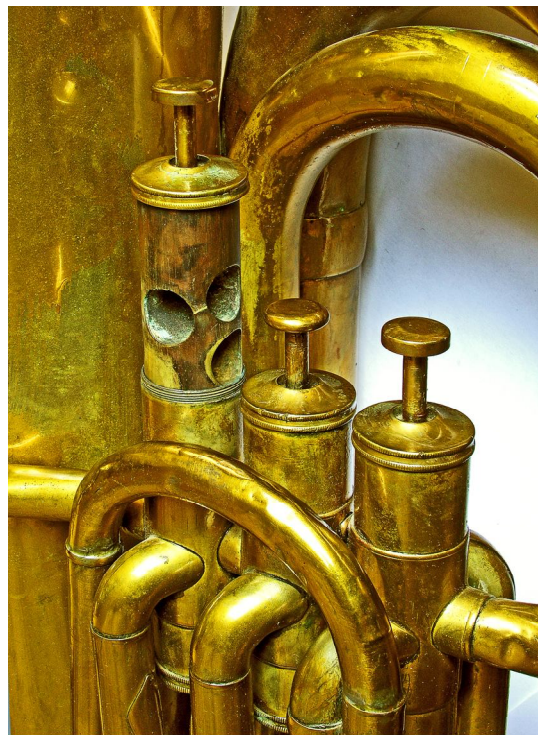


**Figure 4.5 Left: valve section of a contralto saxhorn in 4½-ft B-flat, made by Ad. Sax in 1865. The middle valve is a hybrid, sharing characteristics of the Périnet valve, but made in dimensions of Berlin valves. Edinburgh University Collection of Historic Musical Instruments (inventory no. 4253). Right: valve section of an alto saxhorn in 6½-ft E-flat, made by Ad. Sax in 1855. The valve loops of the first and third valve are inclined towards different directions. Edinburgh University Collection of Historic Musical Instruments (inventory no. 4543). Photographs by Raymond Parks.**

<sup>41</sup> This was particularly usual in Germany. To support his view he presented at court four instruments from his private collection: a *Basstuba* by Moritz, and a *Tenorhorn*, a trumpet and a *Basstuba* by Heiser.

Sax never revealed why he started making the second valve with additional vertical tubing, as in Périnet valves, but it is speculated that he considered the Périnet-type valve more efficient for the middle valve, which he always regarded as problematic in the smaller instruments and tried to find a way of using it which would not be very distinct.

Another deviation from the regular Berlin valve in Sax's instruments is that found in some contrabass saxhorns. At first glance, the valves appear to be regular Berlin valves, but looking carefully at the pistons it appears that these valves are in fact a hybrid, between the Périnet and Berlin type. Again the width, height, and external appearance resemble that of the Berlin valves. What is different in this case is the arrangement of valve ports in a manner deviating from the regular Berlin valve in all three valves. The inlets and outlets of the additional valve tubing at the two sides of pistons are not placed on the same level, but they are positioned at different levels. The difference in height, however, is less pronounced than on the majority of the Périnet valves: it is about half the diameter of the valve port (see Figure 4.6).



**Figure 4.6** Valve section of a contrabass saxhorn in 18-ft B-flat made by Adolphe Sax in 1868. All three valves are hybrids, resembling regular Berlin valves, but with features of Périnet valves. The inlets and outlets of valve ports are not placed at the same level as in Berlin valves. Edinburgh University Collection of Historic Musical Instruments (inventory no. 3229). Lent by the National War Museum of Scotland. Photograph by Raymond Parks.

The lack of standardization in the valves used by Sax could be also attributed to the fact that he probably was using different suppliers of valve sets over the years. It is possible that Sax had realised the advantages of the Périnet valve, and found indirect ways of employing some aspects of it in his valves.

### 4.7 Saxhorns by makers other than Sax before 1855

As Sax testified a number of times during the various lawsuits between him and his rival instrument makers, the majority of the Parisian makers took advantage of the annulment of his patents during the period 1848-1853 and were making instruments similar to his saxhorns and saxotrombas causing him great financial losses. This is also verified by the minutes of the various lawsuits which eventually condemned Sax's contemporaries for copying Sax's saxhorns and saxotrombas. In December 1854, Sax himself seized instruments he found in some makers' workshops which he believed were copies of his instruments, so as to present in court as evidence. Although this confiscation was later judged illegal, due to Sax being a foreigner and not having legal permission for this act, it is known that some makers subsequently tried to alter the form of their instruments. Besson, for example who was selling saxhorns illegally to the army and was calling them "Besson-forme" after December 1854, according to his wife's testimony, changed the direction of the bell so that his instruments deviated from the saxotromba form.<sup>42</sup> Gautrot's 1859 catalogue next to license saxhorns shows instruments whose valves were placed perpendicular to the bell, and which could be sold as his own instruments. Similar practices were followed by other makers (see for example Figure 4.7) who were making saxhorn copies, and were also inscribing them with their workshop's name and the adjective "breveté", or "breveté, à Paris", without having been granted any patents.<sup>43</sup> See also Appendix H<sup>44</sup> for a photograph of an instrument made by Röehn between 1853-56 (and before the maker signed a license agreement with Sax) which is identical to Sax's alto saxotrombas in 6-ft F.

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<sup>42</sup> "Art. 580. Brevets. – Instruments de musique – Saxo-tromba. Description. – Dessins. – Essais. – Contrefaçon. – Preuve. Confiscation." *Annales de la propriété industrielle, artistique et littéraire. Journal de législation, doctrine et jurisprudence Françaises et étrangères* (Paris: 1860): 6:251.

<sup>43</sup> Ibid.

<sup>44</sup> p. 542.



**Figure 4.7 Saxhorn by Halary made c. 1850. The position of the valves in relation to the bell plane has been altered, possibly to deviate from the saxotromba form. Edinburgh University Collection of Historic Musical Instruments (inventory no. 4448). Photograph by Raymond Parks.**



**Figure 4.8 Alto saxhorn in E-flat by Gautrot made c. 1850-55 resembling altos made by Sax. J.C. Verdié private collection, Toulouse. Photograph courtesy of the collector.**



As surviving instruments from that early period made by makers other than Sax are rare, and even in the case of surviving instruments their dating is dubious, there is little evidence to indicate the types of intermediate brass instruments made in the various workshops. Two surviving instrument catalogues cast some light. The first, today at the Berlin Musikinstrumenten-Museum, is a catalogue of Beauboeuf frères<sup>45</sup> which dates from c. 1849-53, and the second is a catalogue of the Gautrot aîné et Cie published in 1850.<sup>46</sup>

The Beauboeuf prospectus shows that the majority of brass instruments offered for sale by the firm were exact copies of Sax's brasswinds (see Figure 4.10) and were also furnished with Sax's Berlin valves. The firm did not use the term "saxhorn" since the official terminology designated by the 1848 ministerial decision for instruments of the kind was "clairon chromatique". Instruments of the saxhorn group in 3¼-ft E-flat and 4½-ft B-flat were called *bugles* and *bugles chromatiques*, both in the bell-front form and the bell-up form. Instruments in 6-ft F and 6½-ft E-flat were called *altos* and *altos chromatiques*, baritones and basses in 8-ft C and/or 9-ft B-flat were called *barytons* and *basses chromatiques* respectively, and contrabasses are called *contrebasses*. Besides the saxhorns, the catalogue also illustrates trumpets, and trombones in saxotromba form (identical with Sax's corresponding models) and a cornet *système Sax* which was called *cornet à cylindres 7 tons*. Next to the four-valve *basse chromatique*, which is essentially a bass saxhorn, appeared a similar model with four valves of the Périnet type instead of Berlin. This was called *basse chromatique système Périnet*. The catalogue's front page announces that the firm owned premises in London besides their premises in Paris. It is, thus, likely that they also imported copies of Sax's brasses into Britain during the period when Distin was Sax's only appointed agent for selling saxhorns in Britain.

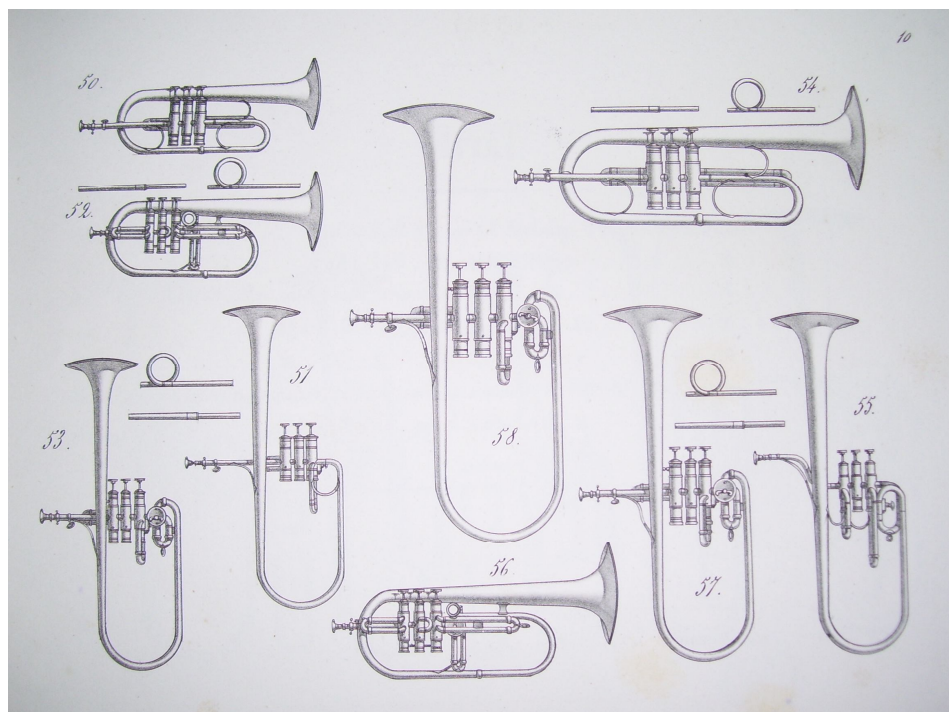
Gautrot aîné's catalogue shows most of Sax's models; additionally most instruments were offered in the *système Gautrot* version for an additional price. Instruments of this system were equipped with Gautrot's *transpositeur* patented in

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<sup>45</sup> *Manufacture d'Instruments de Musique en cuivre et en bois de toutes espèces. Paris Beauboeuf frères* (Paris: n.p., [c.1849-53]).

<sup>46</sup> *Manuf<sup>e</sup> d'Instruments de Musique. Rue S<sup>t</sup> Louis 64 au Marais. An<sup>ne</sup> Maison Guichard. Gautrot aîné et Cie. Album & Catalogue 1850* (Paris: Plista, 1850).

The saxhorn 1847,<sup>47</sup> which facilitated changing the pitch without the need to use shanks and crooks (Figure 4.9). Gautrot used the official terminology *clairon chromatique* for the saxhorn group and there is a clarifying note on the corresponding catalogue page; it was noted that the flugelhorns or sax-horns were called by the *Gymnase militaire* and in the various army regiments “*clairons chromatique*”. Hence, they were designated as such in the catalogue.<sup>48</sup> Although his instruments are shown with Périnet valves, it should be noted that both Berlin and Périnet valves were considered at the time to be improved versions of the Stölzel valves, and in some primary sources they were both described as “*gros pistons*” (namely large valves).

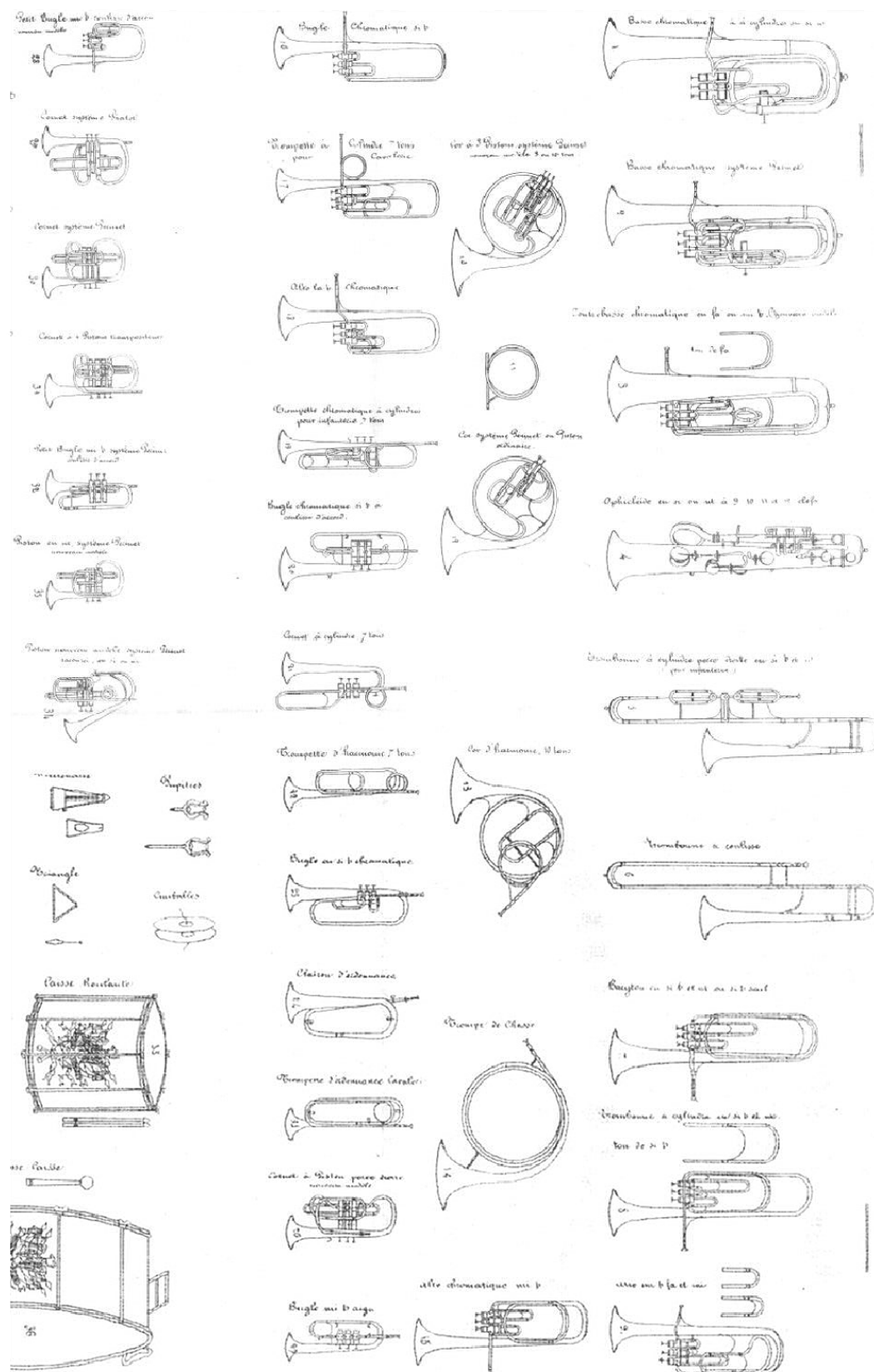


**Figure 4.9** Some of the instruments offered for sale by Gautrot in 1850. All are similar to Sax’s saxhorns. In some instruments Gautrot’s *système transpositeur* was added, but these were also similar in their form to Sax saxhorns.

<sup>47</sup> French patent no. 5874 of 1 July 1847 “pour des perfectionnements apportés dans instruments de musique en cuivre, tels que cors, cornets-néocors, trompettes &c”.

<sup>48</sup> “Les flugelhors ou les sax-horns sont appelés par le *Gymnase Militaire* & dans les Régiments de l’armée, sous le nom de *clairons chromatique*, nous leurs donnons dès à présent cette dénomination”. See, *Manuf<sup>e</sup> d’Instruments de Musique*, 10.

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**Figure 4.10 Instruments offered for sale by Beauboeuf frères (c. 1849-53) among which many saxhorns identical to those made by Sax's are depicted.**

In the London 1851 International Exhibition, other makers, such as Gisborne and Oates from England, and Gottlieb Glier from Markneukirchen exhibited instruments which were described in the exhibition catalogues as “saxhorns”, and others exhibited similar instruments where the term “saxhorn” was not used. For example in the case of Koenig & Pask from London it was reported that they showed “brass horns with valves (soprano to contra bass)”.<sup>49</sup> A more detailed discussion on the dissemination of saxhorns in the United Kingdom is given in Chapter Six. It appears, though, that around the middle of the nineteenth century various instruments similar to saxhorns were circulated in the United Kingdom. Also, already in 1847, Mahillon exhibited similar instruments in the national exhibition of Belgium. There were reported to be a *bass-tuba* or *contrebasse d’harmonie en fa*, a *tenor-tuba en si bémol* to replace the ophicleide, a *tenor-horn* or *bugle-tenor en si bémol* to replace the horn in cavalry bands, and an *alt-horn en mi bémol alto*, all offered in the market for sale at moderate prices.<sup>50</sup> During the Paris 1855 International Exhibition, similar instruments were exhibited by makers such as Besson, who exhibited bugles in various pitches, and even *bugles à tubes fines* which were an imitation of the saxotromba, as mentioned in the exhibition’s report.<sup>51</sup> Antoine Courtois showed, among other instruments, a bass saxhorn, a contrabass saxhorn and a *saxtromba*, F. Michaud fine quality saxhorns and a *saxtromba*<sup>52</sup> and Gautrot showed saxhorns together with his other instruments,<sup>53</sup> as also Raoux who exhibited a series of similar instruments.<sup>54</sup>

Some surviving instruments from around the middle of the century were still made with the outdated Stölzel valve (Figure 4.11), perhaps for both providing a cheaper option to instruments with regular valves, or even for deviating from the Sax norm of using Berlin valves.

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<sup>49</sup> Robert Ellis, *Official Descriptive and Illustrated Catalogue of the Great Exhibition 1851* (London: Spicer Brothers, W. Clowes and Sons, 1851), 1:468

<sup>50</sup> *Rapports de jury et documents de l’Exposition de l’industrie belge en 1847* (Brussels: M. Hayez, Imprimeur de l’Académie Royale, 1848), 2: 360-61.

<sup>51</sup> *Ibid.*, 419.

<sup>52</sup> *Ibid.*, 419-20.

<sup>53</sup> “L’Exposition universelle à vol d’Oiseau” *L’univers musical journal et abonnement musical* (1 August, 1855): 117.

<sup>54</sup> *Note pour M. Sax en réponse à la nouvelle note de M. Raoux* (Paris: impr. E. Brière, 1860), 4.



**Figure 4.11** Baritone in 8-ft C/9-ft B-flat by Auguste Courtois made c. 1847-1860 with four Stölzel valves. Edinburgh University Collection of Historic Musical Instruments (inventory no. 3352).



**Figure 4.12** Alto saxhorn in 6-ft F made by Halary probably before 1859, which resembles a lot the saxotromba form. Edinburgh University Collection of Historic Musical Instruments (inventory no. 6000). Photograph by Raymond Parks.

#### 4.8 The development of the various members of the saxhorn family

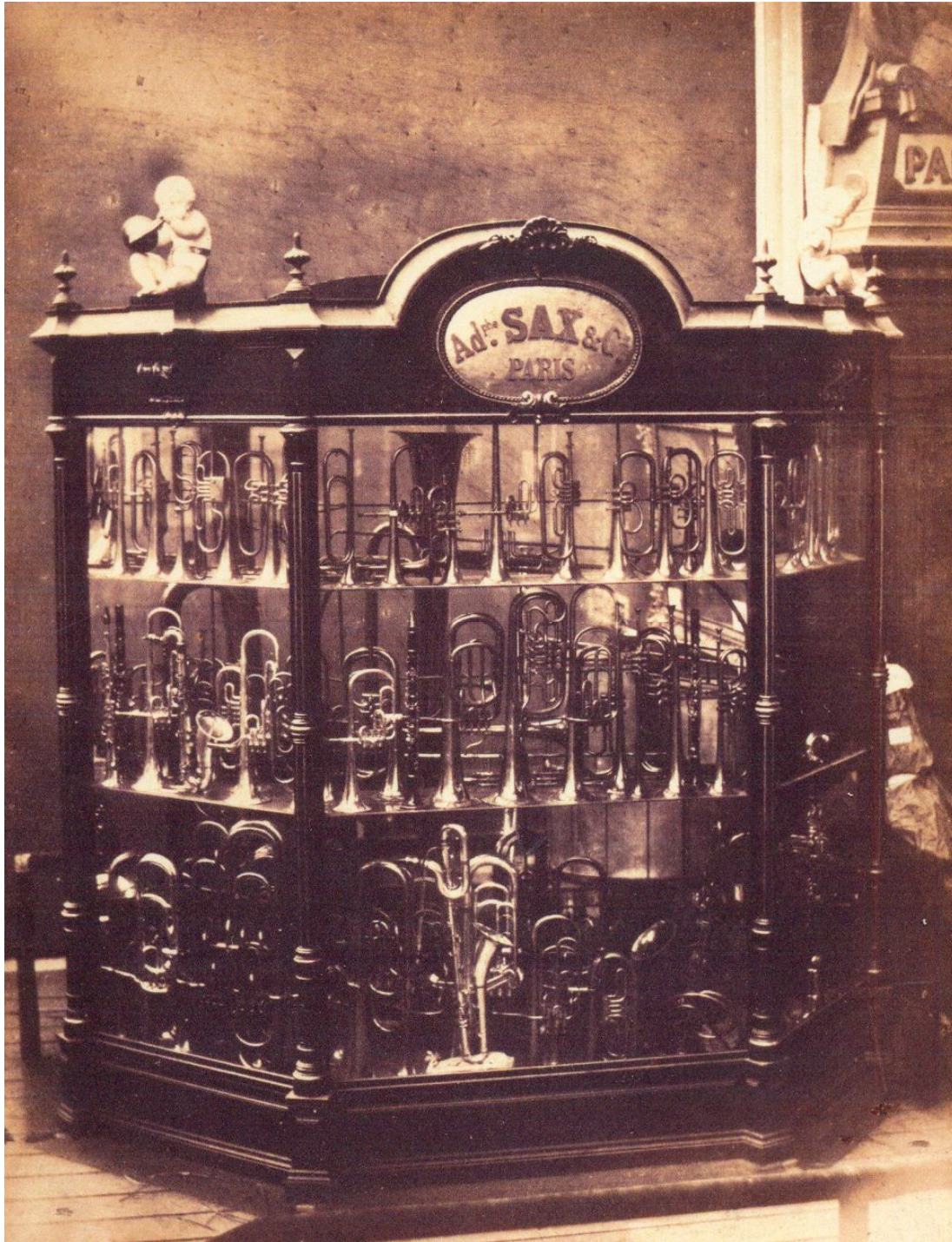
Adolphe Sax promoted his instruments energetically. One common way for makers to promote their products was through national and international exhibitions. Sax participated in the Paris National Exhibition of 1849 exhibiting among others saxhorns. His showcase during the 1851 exhibition was very impressive as a surviving photo confirms. Figure 4.13 was discovered by the author in the Kodak archive, and is the earliest known surviving picture of any Adolphe Sax instruments. In this picture, in which saxhorns are abundant, can be distinguished among others, at least one soprano saxhorn in bell-up form (top shelf), many contralto saxhorns both in bell-front (top shelf) and bell-up form (top and middle shelves) with three or four valves, an alto saxhorn in bell-up form (middle shelf), valved *clairons* (possibly with detachable valve section) and valveless *clairons* (top shelf), contralto instruments (or flugelhorns as they would be called in their places of origin) with double-piston valves (all-three shelves), at least one baritone or bass saxhorn with rotary valves (middle shelf), and two large instruments at the back. Of these, one could be a contrabass in B-flat in long form as also early contrabasses in B-flat were made, and the second is most possibly the *bourdon saxhorn* in B-flat reported in various sources of the time. This picture is a valuable source of information because it provides information about valve types used by Sax at that time. Through this we know that Sax made saxhorns with double-piston and rotary valves, although such surviving saxhorns are either scarce or non extant.

Through the 1855 Paris International jury report we know that together among other instruments, Sax exhibited even saxhorns with his compensator, although there are no surviving saxhorns with this device.<sup>55</sup> The development of the various saxhorns according to information drawn mainly from surviving instruments is discussed below.

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<sup>55</sup> Ibid., 423.





**Figure 4.13** Adolphe Sax's showcase in the 1851 London International Exhibition. Science Museum, London. Kodak Archive.

#### 4.8.1 *Petit saxhorn aigu* in 2¼-ft B-flat

There is only one surviving instrument in 2¼-ft B-flat made in 1862, today in Brussels (inventory no. 1296). The instrument's year of manufacture coincides with the model's earliest depiction among Sax's handbills. The plate with Sax instruments published during the 1862 London International Exhibition (also used later as an advertisement) depicts such an instrument with Périnet valves.<sup>56</sup> There, it is called "petit saxhorn aigu" in B-flat, and is made in an upright form. It is not known if this instrument was ever made with Berlin valves. It was advertised until as late as in the 1880s, as Sax's last known advertisement shows. However, there, it is only offered in bell-front form (*forme horizontale*). Unlike the other members of the saxhorn family it has not been reported to have been offered for sale in C. The report of the jury of the London International Exhibition 1851 mentioned that this instrument was the only brass instrument known to be able to play the notes of the octave above the flute.<sup>57</sup> The ministerial decision of 1860 included such an instrument in the composition of cavalry bands.<sup>58</sup>

The repertory for this instrument is very scarce. Berlioz's *Te Deum* (completed in 1849) included a part for this instrument in the "Marche pour la présentation aux drapeaux". Théodore de Lajarte wrote that Arban played the part for this instrument during a performance in Saint Eustache in 1855 with a great success, and that the instrument was heard again during that year in concerts organized by Berlioz during the 1855 Paris International Exhibition.<sup>59</sup> As also mentioned later<sup>60</sup> Halévy had also scored for a *petite saxhorn aigu* in B-flat, or according to different versions of the score, for a *saxtuba aigu*.

The surviving instrument in Brussels is made in upright form. It has three Périnet valves, and three keys. Its peculiar feature is an extra piece of tubing, which is not part of the air column, which must also be the case in the instrument included in the 1862 exhibition plate (although there the copyist has drawn it in a way that this piece of tubing appears to be part of the air column). This is attached at the

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<sup>56</sup> For a reproduction see Appendix I.

<sup>57</sup> Comettant, *Histoire d'un inventeur*, 367.

<sup>58</sup> For an illustration see Appendix E.

<sup>59</sup> Théodore de Lajarte, *Instruments-Sax et fanfares civiles* (Paris: Librairie des auteurs et compositeurs, 1867), 13.

<sup>60</sup> See p. 172.



instrument's lower part, perhaps both to make it convenient to hold while playing, and to create the false impression of the saxotromba form.

This instrument has been included in other Parisian makers' product catalogues around the third quarter of the nineteenth century. However, the majority of product catalogues consulted by the author did not offer it for sale. It has been found with various names (besides the *petit saxhorn aigu* used by Sax and some other makers) such as *contraltino*, *bugle aigu*, *petit saxhorn suraigu* always in B-flat and in bell-front form. In 1878 Hervè wrote that at that time this instrument was not used any longer.<sup>61</sup> The great difficulty in producing the higher notes of its compass resulted in it being abandoned.



**Figure 4.14** *Petit saxhorn aigu* in 2¼-B flat with three Périnet valves and three keys made by Ad. Sax in 1862. Musée des Instruments de Musique, Brussels (inventory no. 1296). Photograph by the author.

#### **4.8.2 Soprano saxhorn in 3¼-ft E-flat**

Instruments of this group were also known in France as *petit bugles en mi bémol*. All known surviving soprano saxhorns from the Sax workshop are pitched in E-flat. The soprano saxhorn was depicted in Sax's 1845 patent where it was noted that the instrument could be supplied with a shank for D and a crook for D-flat. This is the earliest known depiction of the instrument and its form is upright. In this patent

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<sup>61</sup> A. Hervè, *Leçons élémentaires de musique instrumentale professées à l'association Polytechnique* (Paris: J. Dejeu et Cie, 1878), 144.

Sax called the instrument *petit saxhorn en mi bémol*. In the early brochures the instrument was offered for sale without the designation of its form. In the brochure of c. 1850 the instrument is illustrated in two forms, the bell-front, which is called *petit saxhorn en mi bémol infanterie*, and the bell-up, which is called *petit saxhorn en mi bémol cavalerie*. In the latter source, the instrument's compass is given as (sounding) A<sub>3</sub>-C<sub>6</sub>.

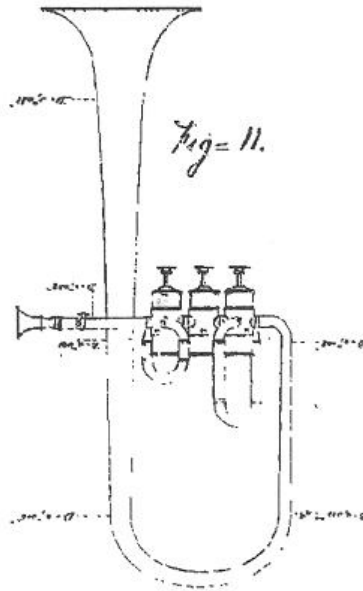


Figure 4.15 Petit saxhorn in E-flat from Sax's 1845 patent.

Théodore de Lajarte wrote in 1867 that this instrument could be of great help to the cornet, since the cornet's higher notes are in the medium register for this saxhorn.<sup>62</sup> However, the instrument's high notes should not be used excessively. Written F, or G could sound well, but they can be very tiring for the player's lips. He noted that this saxhorn could play very well in unison with the clarinet without changing its timbre. It could be very useful in small civilian *fanfares*, although it should be used with consideration and with frequent rests in its parts. It required very good *embouchure* and lots of practice.<sup>63</sup> Clodomir in 1873 reported that this instrument was missing from many bands, and that often it was replaced by cornets, which did not produce a similar timbre.<sup>64</sup> He also noted that brass bands which were lacking this saxhorn should be very careful when choosing repertory, so that the

<sup>62</sup> *Instruments-Sax et fanfares civiles*, 17.

<sup>63</sup> *Ibid.*

<sup>64</sup> P. Clodomir, *Traité théorique et pratique de l'organisation des sociétés musicales harmonies et fanfares* (Paris: Alphonse Leduc, 1873), 61.

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instrument's absence was not observed. Clodomir gave the composition of the various mixed wind bands (*harmonies*) and brass bands (*fanfares*) in France at the time. In mixed bands one such instrument was included, and only in large ensembles. One or two *petit bugles* were included in the *fanfares* depending on their size.

Surviving instruments from the Sax workshop are made in both bell-front and bell-up form. The three earliest surviving instrument were made with Berlin valves. These instruments have the characteristic for instruments of the early period disposition of the valve tuning slide of the middle valve: the inlet and outlet of the valve tubing are placed on the same level. The earliest surviving instrument with Périnet valves dates from 1859. Although there are relatively few surviving instruments it appears that Sax started making sopranos with Périnet valves in the mid-1850s. Although in his 1862 brochure soprano saxhorns are fitted with Berlin valves, it is possible that the lack of any surviving instruments with Berlin valves after 1854 shows that he did not prefer the Berlin valve for small instruments. Three instruments are fitted with a *pavillon tournant*, but without independent valves, as it was more common in larger instruments.

In Sax's last advertisement soprano saxhorns with dependent valve were offered for sale only in E-flat. However, saxtubas, saxhorns with dependent valves and keys, and saxhorns with independent valves were in addition offered for sale in F. In most product catalogues of other workshops of the second half of the nineteenth century the instrument was offered for sale only in E-flat. Gautrot's 1850 catalogue listed *clairons chromatiques* in F and E-flat.<sup>65</sup> His later catalogues listed soprano saxhorns in E-flat (with crooks for D-flat). Later in the century, these instruments were not made very much. They were superseded by soprano cornets and soprano flugelhorns.

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<sup>65</sup> *Manuſſe d'Instruments de Musique. Rue S<sup>t</sup> Louis 64 au Marais. An<sup>ne</sup> Maison Guichard. Gautrot aîné et Cie. Album & Catalogue 1850* (Paris: Plista, 1850).



**Figure 4.16** Left: soprano saxhorn with three Périnet valves in  $3\frac{1}{4}$ -ft E-flat made by Sax in 1859. Right: detail of inscription. National Music Museum (inventory no. 7307); Joe and Joella Utley collection (inventory no. 534).



**Figure 4.17** Soprano saxhorn in  $3\frac{1}{4}$ -ft E-flat with three Berlin valves made by Sax in 1854. Royal Pavilion Museum, Brighton (inventory no. 5773/44).

### 4.8.3 Contralto saxhorns in 4-ft C and 4½-ft B-flat

Contralto saxhorns made their appearance in Sax's 1843 patent where they were called bugles (instruments 1-3 of Figure 4.1). The contralto saxhorn appeared again in the 1845 patent. There the instrument is depicted in upright form, in two versions: the first with three valves and the second with four valves (Figure 4.18). The four-valve model was (as stated by Sax in the 1845 patent) made according to the same system as the wide-bore four-valve alto saxhorn. Similar to the four-valve alto, the four-valve contralto appeared in the drawings as having wider bore measurements than the three-valve instrument. Table 4.1 shows the difference proportions of the two contraltos in the 1845 patent drawings. The differences between the two are noticeable. It is odd that the last point near the bell (73mm) is wider than the last given diameter of the alto saxhorn (70mm) and the saxotromba (70mm) in E-flat. For the particular wider four-valve contralto Sax noted in the patent text that it was meant to play the second part. Its volume of sound was more considerable and it could descend as low as the lips allowed.<sup>66</sup>

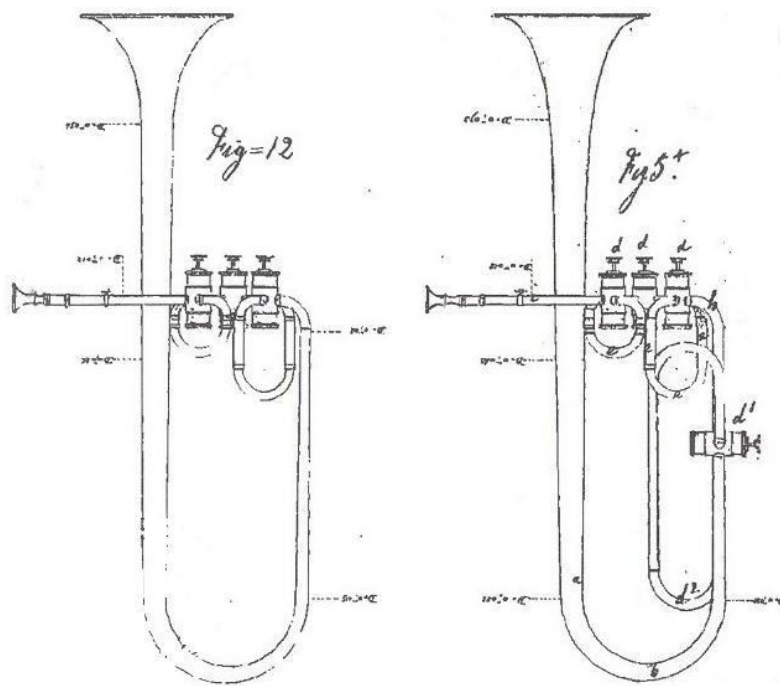


Figure 4.18 Contraltos from Sax's 1845 patent drawings.

<sup>66</sup> "Saxhorn à quatre cylindres, grande largeur, pour second partie ; cet instrument a un volume de son plus considérable, plus gros, si je puis, m'exprimer ainsi : il descend aussi bas que les lèvres le permettent."

**Table 4.1 Dimensions of the two upright contraltos published in Sax's 1845 saxotromba patent.**

Three-valve contralto saxhorn	Four-valve contralto saxhorn
12mm	12mm
12mm	16mm
15mm	21mm
19mm	28mm
26mm	43mm
54mm	73mm

Although very few examples with four valves have survived to the present day, surviving instruments with four valves do not present any difference at all in bore width. As discussed in Chapter Eight, Sax did not alter the bore design of those instruments throughout his lifetime, and surviving instruments present similar bore profiles. There is only one exception to the general rule, and this is an instrument, today in Brussels (serial number 34364, inventory no. 2462). The wider model at the pitch of 4½-ft B-flat appears to not have been produced commercially in large numbers. This is expected since there is not a major need for such a model whose lowest notes could be played on the alto saxhorn. The only piece of evidence mentioning contraltos being made in varied proportions is an article published in *La France Musicale* in 1846 where it was mentioned that two of the Distin family instruments were *altos* in B-flat (although contraltos are actually meant), of which one was of greater proportions.<sup>67</sup>

This instrument was also known in France as bugle. In many sources of the time the instrument is found as contralto saxhorn/bugle, or contralto saxhorn (bugle), or just contralto, but the term “bugle” was the one that eventually prevailed. Infrequently, it has also been found as soprano in B-flat. The majority of surviving instruments are pitched in B-flat, and some in C, and most of the time the instrument was offered for sale in both bell-up and bell-front form with three valves. In some instrument makers' catalogues it is mentioned that the instrument in B-flat was

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<sup>67</sup> “Les instruments employés par la famille Distin, se composent d’un saxhorn soprano en mi♭ ; de deux saxhorns alto en si♭, dont l’un dans des proportions grandes ; d’un saxhorn ténor en mi♭, et d’un saxhorn basse en si♭. [...]”. See, “La famille Distin”, *La France Musicale* 9, no. 3 (18 January, 1846): 18.

equipped with crooks for A-flat (and sometimes for G) and the one in C with crooks for B-flat. The compass of the three-valve instrument in B-flat as given by Sax in his c. 1850 handbill is (sounding) E<sub>3</sub>-B<sub>6</sub>.

Clodomir (1873) expressed the view that this instrument could be a great substitute for the cornet, of which he did not speak very highly.<sup>68</sup> In his view, there was an overuse of cornets in the various bands. Most of them could be replaced by bugles, which he described as the clarinets of the *fanfare*. Cornet players, he said, could switch very easily to using bugles, due to the similarities these two instruments present. However, differences in their bore profile resulted in the bugle having a better sound quality. To his dismay, in most cases, bugles were available in limited numbers in the various bands, contrary to cornets.<sup>69</sup> Similarly, Théodore de Lajarte wrote (1867) that this instrument was “the cornet’s rival and companion”. Certain passages when played on this instrument sounded more elegant than when played on the cornet.<sup>70</sup>

Examining surviving contraltos made in the Sax workshop in chronological order, one notices that the instrument’s wrap remained almost intact (with the exception of *nouveau* contraltos). Contralto saxhorns were mainly made in two forms, the bell-front and the bell-up form. In the 1843 patent only contraltos in the bell-front form were illustrated. Three-valve and four-valve contraltos in the bell-up form appeared in Sax’s 1845 patent. Some *nouveau* contraltos, although in upright form, present a different overall form; they are wrapped in S form (Figure 4.19), possibly to accommodate better the bulk of the six independent valves.

The main changes in these instruments over time regard details in the valve section. Most of the surviving contraltos are equipped with Berlin valves or Berlin-type valves, customarily three. The earliest known surviving contralto is at the Musée de la musique in Paris (inventory no. E.740). This is the sole surviving example whose valves are constructed in a way similar to that described by Sax in his 1843 patent (Figure 4.20). As this instrument shows early in his career Sax was making his saxhorns with rounded loops. The valve loops of the particular contralto

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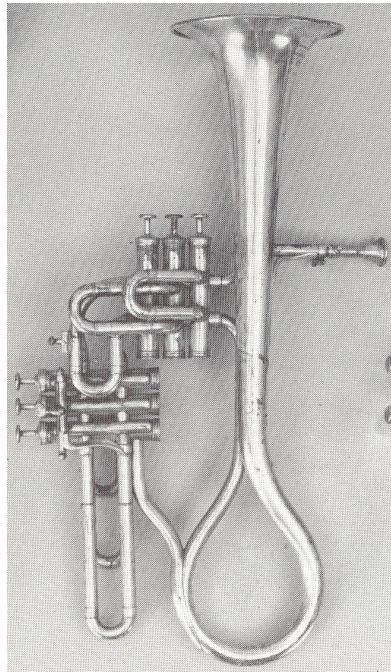
<sup>68</sup> *Traité théorique et pratique*, 62-63.

<sup>69</sup> *Ibid.*

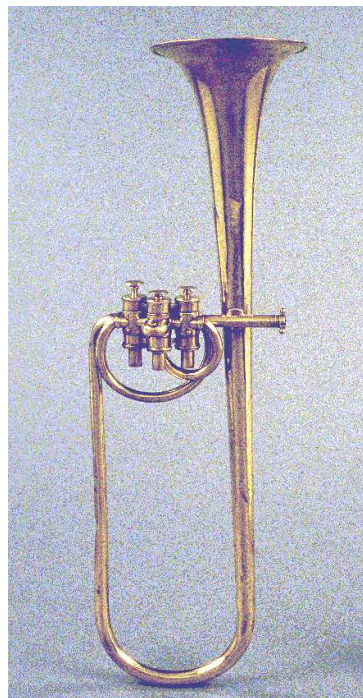
<sup>70</sup> De Lajarte, *Instruments-Sax et fanfares civiles*, 25.



–with the exception of the second valve tuning slide – are not made in the form of the perfect circle, but are rounded enough to preclude valve tuning-slides.



**Figure 4.19** Contralto saxhorn in B-flat with six independent valves made by Ad. Sax in 1865. Musée des Instruments de Musique, Brussels (inventory no. 2020). Picture taken from the *Catalogue des instruments Sax au Musée Instrumental de Bruxelles*.



**Figure 4.20** Contralto saxhorn with three Berlin valves (without valve slides) in B-flat, made by Ad. Sax in 1846. Musée de la musique, Paris (inventory no. E.740). Photograph by Thierry Ollivier.



A very characteristic change which occurred in the construction, which also helps to indicate the approximate period of making even in unnumbered instruments, regards the second valve tubing. In early instruments the second valve tubing's inlet and outlet are placed on the same level and the valve tubing is perpendicular to the valve piston (Figures 4.20, 4.21). In instrument with serial no. 21071 (Musée des Instruments de Musique, Brussels, inventory no. 2008.026) made in 1861 the tubing's inlet and outlet are not on the same plane, and the tubing is parallel to the piston of the valved (Figure 4.22). The construction of the valve thus resembles that of the Périnet valve. The diameter of the piston is the same as in Berlin valves, thus this valve is essentially a hybrid sharing characteristics of both valve types. As there is a gap in surviving instruments between the latest known with the second valve in the Berlin style (instrument with serial number 7086, made in 1850), and the earliest known with the second valve in the Périnet style (instrument with serial number 21071, made in 1861), it cannot be determined precisely when Sax altered the design of the valve, but in his 1859 patent some contraltos appear with their second valve of the hybrid type. In those instruments with the second valve of the Périnet type but only in those made in upright form, Sax has also altered the inclination of the valve tuning slides, which is not as pronounced as in earlier instruments, but has a tendency towards the right angle (for example, Figure 4.5 left), and the valve loops tend to incline towards the same direction.

Strangely enough, none of the survivors, either in bell-up or in bell-front wrap, is equipped exclusively with Périnet valves. The latest numbered surviving contralto (made in 1880) is in Brussels (serial no. 40693, inventory no. JT 0180, S28), and this, too has the first and third valve of the Berlin type, and the second valve of the Périnet type.

An uncommon model is the four-valve contralto at the Musée de la musique in Paris (inventory no. E.744), already mentioned in Chapter Three. The first valve is of the Berlin type, whereas the second and third are hybrid, between Périnet and Berlin; the fourth is ascending and on the "percé conique" principle. Pitched at B-flat, with the engagement of the fourth valve it could sound in C. This is the only model with the combination of ascending and descending valves which was produced commercially; it was included in Sax's handbills from 1862 onwards.



**Figure 4.21** Contralto saxhorn in B-flat with four Berlin valves made by Ad. Sax in 1850. In early contraltos the second valve's tubing inlet and outlet are place on the same plane. Musée de la musique (inventory no. E.745). Photograph by J. Marc Anglès.



**Figure 4.22** Bell-front contralto saxhorn in B-flat made by Ad. Sax in 1861, the earliest known whose second valve is a hybrid. Musée des Instruments de Musique, Brussels (inventory no. 2008.026). Photograph by the author.



**Figure 4.23** Valve section of a contralto saxhorn in B-flat made by Ad. Sax in 1863, with three regular and one ascending valve. Musée de la musique (inventory no. E.744). Photograph by the author.

A letter dated 13 March 1861, written by Sax and sent to the director of the Conservatoire of Paris casts some light on mercantile practices. This refers to seven contraltos in B-flat (serial nos. 21219, 21337, 21338, 21452, 21453, 21476, 21566) which were sent to the Conservatoire.<sup>71</sup> Sax mentioned that these instruments were approved by Arban (professor of the saxhorn class in the conservatoire). After their official approval by the Conservatoire, the initials “C.M.” (standing obviously for “conservatoire de musique”) would be inscribed on the bell. Additionally, the numbers from one to seven would be punched on the bell and mouthpieces. One of these instruments is today in the Musée de la musique (inventory no. E.1688, serial no. 21452).

### **4.8.4 Alto saxhorns in 6-ft F and 6½-ft E-flat**

As explicitly discussed in Chapter Five, it is believed that the alto saxhorn, as Sax presented it in the 1845 patent (with dimensions wider than the saxotromba), was probably never realised commercially (at least in large numbers), and if it was, it did not survive for very long. Instruments known today as alto saxhorns are essentially alto saxotrombas. Thus, instruments discussed in this section are in fact saxotrombas. However, since the term “saxhorn” has prevailed historically for the description of this instrument, this is the term used here. The variety of terms used in nineteenth-century music, and methods, are discussed in more detail in Chapter Five.

Sax used interchangeably the terms “alto” and “ténor” for instruments in 6-ft F and 6½-ft E-flat. It appears that no particular reason existed for the use of either term. The confusion prevailing in primary sources from Sax’s times is reflected on the use of the terms in catalogues of present-day collections; both terms are used interchangeably. The author has decided to use the term “alto” for the description of instruments in 6-ft F and 6½-ft E-flat, since, although both terms were used by Sax in the various primary sources, alto seems to have been the most prevalent. Also, in the period 1864-1870 when Sax included the instrument type in saxhorn inscriptions, he used the term “alto” exclusively.

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<sup>71</sup> Location Bibliothèque Nationale de France, Département de Musique.

Looking at primary sources in more detail the following observations can be made:

- The earliest official documents regarding the existence of the saxhorns and compiled by Sax, the 1843 and 1845 patents, did not use either terms. Although this can be expected for the 1843 patent where no instruments of this register appear in the drawing section, it is surprising for the 1845 patent where both a saxotromba and a saxhorn in 6½-ft E-flat appeared in the drawing section. These two instruments are described only by their playing pitch.
- Journals of the time mentioned earlier in this chapter, right after the patent was taken, make use of composite terms, such as *ténor-basse* or *bugle ténor ou basse*, in addition to the terms *alto* and *ténor*.
- Sax's own *Méthode complete pour saxhorn et saxotromba*, the term "ténor" was used throughout the text for the instrument in 6½-ft E-flat. In the product catalogue of the c. 1850 the term "ténor" was used.
- In the latest surviving source coming straight from the Sax workshop, the latest surviving brochure dating from the 1880s the term "alto" was used.
- Saxhorns and other intermediate bore-profile instruments at 6-ft F, or 6½-ft E-flat became known in France as "altos", especially during the second half of nineteenth century.

There are several surviving alto instruments in various collections made between 1844 and 1879; fifteen were examined closely. The earliest surviving alto instrument known, which is also the earliest known numbered instrument by Sax, is the alto saxhorn in the private collection of J.C. Verdié in France (serial no. 668). However, parts of the instrument are reconstructions, and according to information provided by its present owner only the valve section and bell are definitely original. This fact should not diminish its importance as – at least – a partial guide to the earliest version of Sax's alto instrument. Strangely enough, according to the present dating system of Adolphe Sax instruments, the instrument dates from 1844, which is a year before 1845, when alto saxotrombas which appear to be identical to alto saxhorns in upright form, were patented. This indicates that, as he did with the

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saxophone, Sax started making instruments in saxotromba form, long before the patent was filed.



**Figure 4.24** Earliest known numbered brass instrument by Ad. Sax (serial no. 668). Alto saxhorn in E-flat made in 1844. Private collection J.C. Verdié, Toulouse. Photograph courtesy of J.C. Verdié.

The majority are made in 6½-ft E-flat with a few made in 6-ft F. The instrument's compass is given by Sax as (sounding) A<sub>2</sub>-G<sub>5</sub> (for the three-valve instrument). Sources of the time report the instrument as being indispensable in mixed wind and brass bands. It was viewed as an easier replacement of the french horn. Clodomir stated that four altos were obligatory in all bands.<sup>72</sup> It was mainly used as an accompaniment instrument, although De Lajarte wrote that it could be very versatile in its use, and a very reliable instrument for composers to write for.<sup>73</sup>

Most of the surviving altos are made in the upright form and as with the contraltos they customarily have three Berlin valves. There is an alto at the Horniman Museum collection (inventory no. 47.5.47/91), made by Sax for Distin's depot in Britain which is made in the bell-front type and is equipped with rotary valves. The most common form among the surviving instruments is that of the saxotromba form. With or without Berlin valves this form was maintained for this

<sup>72</sup> *Traité théorique et pratique*, 63.

<sup>73</sup> *Instruments-Sax et fanfares civiles*, 25.

The saxhorn group of instruments – at least – until the early 1870s. As discussed in Chapter Five the characteristic feature of the particular form was the two turns – *deux tours* – that the tubing forms when it exits the valve section and before it terminates at the bell section, although some saxhorns, especially those made in F, were not made in the form with two turns. Instruments pitched in F with alternate crooks for E, and E-flat – intended to replace the horns as reported in primary sources– lack the “double turn” due to the smaller size of their tubing, but the overall form is not very different (see Figure 4.25).



**Figure 4.25** Left: alto in F, made by Ad. Sax in 1847. Right: crooks for E and E-flat, lyre and detail of piston. National Music Museum (inventory no. 4878).

In these instruments the valve section is found right after the mouthpiece receiver. There is only one instrument known which is an exception, an alto in Edinburgh (inventory no. 4620), made in 1854 (Figure 4.26).



**Figure 4.26** Alto made by Ad. Sax in 1854. Edinburgh University Collection of Historic Musical Instruments (inventory no. 4620). Photograph by Raymond Parks.

The first distinctive change of form is met in an alto made in 1874, today in Brussels (inventory no. 2008.023). In this instrument the tubing folds above the valves, a feature not typical for Sax instruments, but rather common in license instruments (Figure 4.27). In the author's view it is possible that the particular instrument was not made in the Sax workshop. It is possible that it was either not authentic or was made in a different maker's workshop and was later stamped with the Sax trademark. As mentioned by Haine some of the instruments made by Courtois seized by the legal authorities to be used as evidence during the lawsuits remained in Sax's property, even after the end of the court cases. Sax could then exploit them accordingly.<sup>74</sup>

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<sup>74</sup> Malou Haine, "Les licences de fabrication accordées par Adolphe Sax à ses concurrents 26 juin 1854 -13 octobre 1865" *Revue belge de Musicologie* 34/35 (1980/81): 202.



**Figure 4.27** Alto saxhorn made by Ad. Sax (?) in 1874. Musée des Instruments de Musique, Brussels (inventory no. 2008.023). Photograph by the author.

The two latest surviving altos – one of them in the Kampmann collection in Paris (inventory no. 349) and the other in the Stearns collection in Ann Arbor (inventory no. 900) – were made by Sax in the same year (1880) and they have consecutive serial numbers (40648 and 40649, respectively). The bell is inclined to the left, in the direction of valve section, and is not movable. These two instruments are the only specimens made by Sax known to the author with an inclined and not movable bell. These instruments have five valves in two sets (three and two). In the case of the Kampmann instrument all valves are of the Périnet type, whereas in the Stearns instrument the first three are of the Périnet type and the last two of the Berlin type. In the Kampmann instrument the fourth and fifth valves lower the sound by one tone and a semitone, respectively, and it is believed that their function was to facilitate the performance of trills. The picture coming from the *Dossier d'artiste Adolphe Sax* of the Paris Opéra library (Figure 3.32) in connection with the Aida trumpets, show on the side an alto identical to these instruments. It is therefore very possible that Sax especially made those instruments with the inclined bell for a particular opera production.





**Figure 4.28** Alto saxhorn with five valves made by Sax in 1880. Stearns collection, Ann Arbor (inventory no. 900). Photograph by the author.

The majority of the surviving altos are equipped either with three Berlin valves or with the six independent valves. The earliest known alto with Périnet valves is an alto in E-flat (serial no. 34754) in the Musée des Instruments de Musique in Brussels, made in 1871 (inventory no. 2008.020). Another alto made later that year is equipped with Berlin valves (serial no. 34867); it is possible, thus, that altos were made both with Périnet and Berlin valves for some time. Two instruments made in 1876 (serial nos. 39243, 39321) and one made in 1874 (serial no. 38362) were furnished with hybrid valves. Although at first sight valves one and three look like regular Berlin valves, they are not, since the exits of the valve tubing in the first and third valve are not in the same plane as expected (Figure 4.29). This feature, also found in some contrabass saxhorns, was probably made intentionally in this way, so that these instruments did not appear very different from saxhorns made with Berlin valves. In these instruments the middle valves are hybrids, too, between Berlin and Périnet.



**Figure 4.29** Alto made by Ad. Sax in 1876. Its valves are hybrid, although they are made in such way as to look like regular Berlin valves. Musée Départemental Albert Demard, Champlitte (inventory no. D-AT-P-98-40-2).

#### **4.8.5 The wider-bore alto**

The collection of the Horniman Museum in London has a unique instrument (inventory no. 2004.1134). This is a wide-bore alto instrument in 6-ft F. Much wider than other instruments of the same pitch, this can probably be identified as the *tenor euphonion* from the firm's stockbooks.<sup>75</sup> This instrument made by Distin c. 1858 is equipped with four rotary valves all in a row.

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<sup>75</sup> See Arnold Myers, "Brasswind Innovation and Output of Boosey & Co. in the Blaikley Era" *Historic Brass Society Journal* 14 (2002): 410.



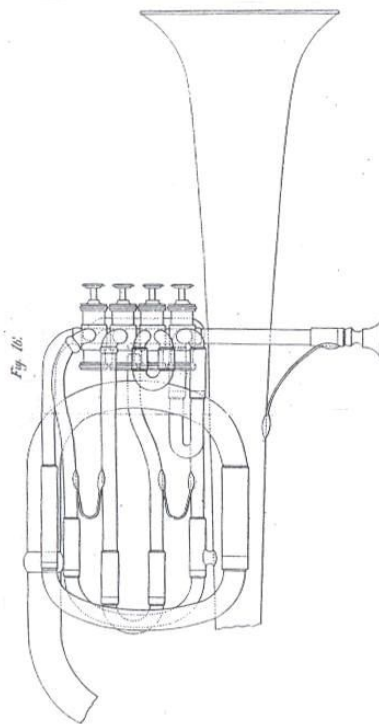
**Figure 4.30** Wide-bore alto instrument in 6-ft F, made by Distin & Co. c. 1858. This is probably the type of instrument included in the firm's stockbooks as the "tenor euphonion". The Horniman Museum, London (inventory no. 2004.1134).

Sax's 1862 patent dealt mainly with improvements to valves. There was only one exception; the introduction of an alto instrument in E-flat described as having new proportions. Through his writings it is assumed that a whole new instrument family could be made according the "proportions nouvelles" although no further details were given for the various family members. Sax provided bore diameters in various places throughout the instrument's tubing. These measurements were in greater detail than those in his 1845 saxotromba patent. Although the copy of the patent available to the public through the French Institut National de la Propriété Industrielle is not very clear, most of the measurements given by Sax were eventually read. It was noticed that the instrument described was an extremely wide-bore alto instrument. This was much wider than the wide-bore alto saxhorn described in the 1845 patent. The instrument is of dimensions comparable to those of Distin's tenor euphonion. In Chapter Eight the bore-profile of the Distin instrument and Sax's drawing are plotted (see Graph 8.16).<sup>76</sup> The instrument depicted in Sax's 1862

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<sup>76</sup> p. 360.

The saxhorn patent is equipped with four Berlin valves placed in a row unlike four-valve surviving Sax instruments, which normally have the fourth valve placed perpendicularly to the first three. However, although there are no surviving instruments made by Sax known to the author with all four valves placed in a row, instruments shown is Sax's showcase picture from the 1851 London exhibition present that feature (Figure 4.13). The tenor euphonion similarly has four Périnet valves placed in a row. There is only one other known surviving instrument of dimensions similar to those of Distin's tenor euphonion. This is an instrument by Couturier in Edinburgh (inventory no. 5967) (see Figure 4.32).



**Figure 4.31 Wide-bore alto from Adolphe Sax's 1862 patent.**



**Figure 4.32** Wide-bore alto by Couturier made c. 1860. The instrument is equipped with crooks for D and C, and most possibly there was originally a crook for E-flat. Edinburgh University Collection of Historic Musical Instruments (inventory no. 5967). Photograph by Raymond Parks.

#### **4.8.6 Alto saxhorn in A-flat**

Of all surviving saxhorns only one is pitched in A-flat. Sax advertised a saxhorn in A-flat, in some sources called alto saxhorn. Although this was advertised with three valves, the surviving saxhorn in the Musée de la musique has four valves (inventory no. 741). The 1845 saxotromba patent depicted two saxhorns in A-flat, in upright and bell-front form. The latter's form was identical to that of the contralto saxhorn's in B-flat bell-front version. Two additional tuning slides were also illustrated; these lowered the pitch, although Sax did not specify by how much. Two saxhorns in A-flat were included in the composition of cavalry bands according to the military decree of 1860. The instrument was included in Sax's handbills, although it is missing from the last one published in the 1880s. It must have had a very limited use, as is not included in methods or instrumentation treatises of the time. It could be very easily substituted by the contralto saxhorn, which was often offered for sale with crooks for A-flat.

#### 4.8.7 Narrow and wide-bore saxhorns in 8-ft C/9-ft B-flat

At these pitches, narrow and wide-bore instruments were made, the baritone and bass saxhorns, respectively. The baritone group is among the least populated groups, as far as surviving instruments are concerned. Many factors may have contributed to that. The first appearance of a narrow bore instrument in this register was in the 1845 saxotromba patent, where the instrument was called “saxotromba baryton”. As discussed previously in this chapter in most of the early advertisements and journal references the instrument was missing. It is possible that this instrument was one of the later additions to the saxhorn group. As in the case of alto instruments, as discussed in Chapter Five, it is believed that the baritone saxhorn is in fact the baritone saxotromba as described in the 1845 patent.

Made in C and B-flat, most surviving baritones were made in the characteristic for the saxotromba form “à deux tours” (Figure 4.33). The only exception was the *nouveaux* baritones with six independent valves and *pavillon tournant*. Elwart’s *Histoire* depicts a baritone saxhorn with *pavillon tournant*, albeit with Berlin valves.<sup>77</sup>



**Figure 4.33** Baritone in B-flat made by Ad. Sax in 1869. Musée de la musique, Paris (inventory no. E.1695). Photograph by the author.

<sup>77</sup> Antoine Aimable Élie Elwart, *Histoire des concerts populaires de musique classique* (Paris: Librairie Castel, 1864): XL.



Saxhorn-baryton à pavillon tournant.

**Figure 4.34** Baritone saxhorn with Berlin valves and *pavillon tournant* from Elwart's *Histoire des concerts populaires de musique classique* (1864).

None of the surviving instruments is made with Périnet valves. An instrument in the Kampmann collection has three hybrid valves, sharing characteristics of Périnet and Berlin valves (Figure 4.35).



**Figure 4.35** Valve section of baritone saxhorn made by Ad. Sax in 1866. The instrument's valves are hybrid, between Périnet and Berlin. Bruno Kampmann private collection, Paris (inventory no. 756). Photograph by the author.

In other Parisian makers' workshops of the time baritones were offered for sale usually in C and B-flat, although in some cases instruments pitched in B-flat were equipped with crooks for A-flat. It was usually offered with three valves, although four-valve instruments have also been listed for sale. The instrument in



Sax's handbills appears as having a compass (sounding) E<sub>3</sub>-D<sub>6</sub> (when in B-flat and with three valves). Although its role was to complete the harmony in accompaniments, it could have had in limited cases a role in playing melodic passages, although De Lajarte reported that its timbre was not very appropriate for that.<sup>78</sup>

Surviving bass saxhorns by Sax, on the other hand, are the second most populated group following the altos. Of the surviving instruments the majority are equipped with Berlin valves and in most cases with four valves. The four-valve bass saxhorn appeared for the first time in the 1845 saxotromba patent where Sax stated that the fourth valve was added to instruments which needed an extension in their lower register. However, the fourth valve became a regular addition only to the bass saxhorn, where it was placed perpendicular to the plane which the bell rim forms. The four-valve instrument's compass in B-flat was given by Sax as (sounding) B<sub>b1</sub>-D<sub>6</sub>. The four-valve bass is the only one depicted in Sax's advertisements, and appears to have been the standard bass made in his workshop. Sax's method on saxhorns mentioned basses with five valves which according to Sax had accuracy in their lower register not achieved with the four-valve instrument.<sup>79</sup> His last surviving catalogue offered for sale basses with up to six regular valves.

A small number of basses are *nouveau* saxhorns with six independent valves, two have Périnet valves, and only one has three Berlin valves. As already discussed in other members of the saxhorn group, in basses too, there are a few instruments with hybrid valves, the earliest made in 1869 (Brussels, inventory no. 1992.016). One example is in the National Music Museum (inventory no. 3183), made in 1870. The picture of the valve piston shows clearly how it deviates from a regular Berlin valve. However, the inclination of valve tubing, as well as the valve dimensions has been retained so that the instrument did not differ very much externally from instruments with regular Berlin valves. The earliest example with Périnet valves which dates from 1868 is in the private collection of J.C. Verdié, Toulouse (Figure

<sup>78</sup> *Instruments-Sax et fanfares civiles*, 27.

<sup>79</sup> Adolphe Sax, *Méthode complète pour saxhorn et saxotromba, soprano, alto, ténor, baryton, basse et contrebasse à 3, 4 et 5 cylindres suivi d'exercices pour l'emploi de compensateur* (Paris: Brandus et Cie, [1847]), 8.



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4.36). It is odd that basses with hybrid valves were made by Sax after the first instruments with Périnet valves appeared.



**Figure 4.36** Bass saxhorn with four Périnet valves made by Ad. Sax in 1868. Private collection J.C. Verdié, Toulouse. Photograph courtesy of the owner.



**Figure 4.37** Left: Bass saxhorn with four hybrid valves, made by Ad. Sax in 1870. Right: detail of piston, where valve ports appear not to be on the same level as in regular Berlin valves (compare for example with Figure 4.25, where a regular Berlin valve piston is illustrated). National Music Museum (inventory no. 3183).

#### 4.8.8 Contrabass saxhorns in 12 ft-F/13-ft E-flat and 16-ft C/18-ft B-flat

The only contrabass instruments included in Sax's 1843 patent were two *contrebasses d'harmonie* with three and six valves (Figure 4.38). The three-valve instrument was pitched in E-flat, and the six-valve in F. These instruments looked very similar to Moritz's and Wieprecht's *Basstubas* pitched in F and equipped with five valves. Some differences are observed in the configuration of the valves between Sax's and Moritz's tubas. Sax did not comment at all on his contrabasses in the patent text, and except for the instrument's pitch no other information, such as for fingering, was provided. Pontécoulant wrote that, after arriving in Paris, Sax visited Berlin to study the manufacturing techniques of brasswinds.<sup>80</sup>

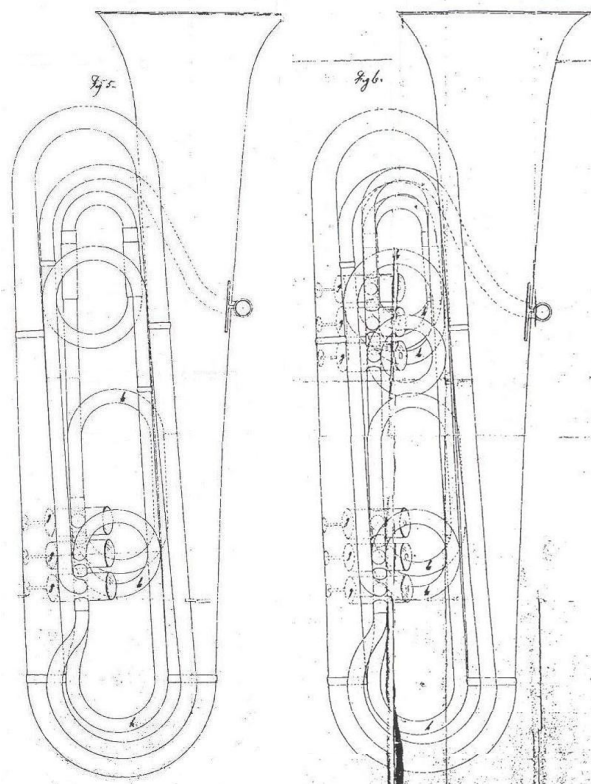


Figure 4.38 Contrabasses from Sax's 1843 patent drawings.

Berlioz, in an article at the *Journal des Débats* in 1844, after praising Prussian military bands, wrote about Sax's contrabasses and mentioned that Sax imported the tuba from Berlin, and improved the instrument's compass.<sup>81</sup> Sax made

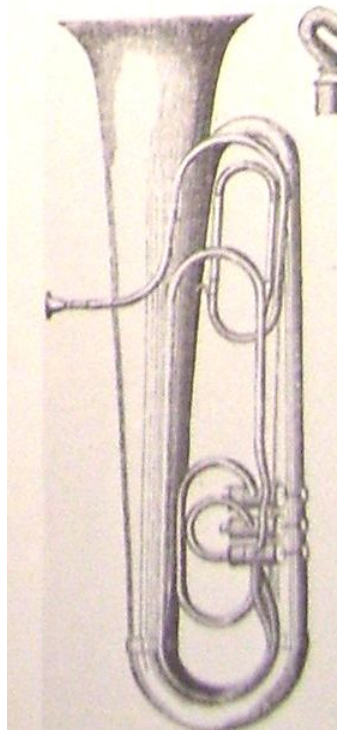
<sup>80</sup> Adolphe le Doucet marquis de Pontécoulant, *Organographie: Essai sur la facture instrumentale. Art, industrie, et commerce* (Paris: Castel, 1861), 2 :225.

<sup>81</sup> Hector Berlioz, "De la réorganisation des musiques militaires", *Journal des Débats* (1 April, 1845): 1.

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the instrument in E-flat instead of F and perfected its mechanism (Berlioz obviously meant the valve section). Sax also provided crooks for lowering the instrument's pitch in D, D-flat and C. The need for a lower contrabass instrument had obviously already occurred at that time, although contrabasses in C and B-flat appeared a few years later. In the same article Berlioz mentioned that Sax's contrabasses were essentially "trompettes gigantesques à cylindres". He praised these instruments' sound qualities, which he considered much superior to the ophicleide, which was not played in tune by most performers in Paris (he mentioned Caussin, a professor at the *Gymnase militaire*, as an exception).<sup>82</sup>

From the same year (1844) comes another illustration of a contrabass instrument. *L'Illustration* published an image of a brass instrument exhibited by Sax during the 1844 Paris National Exhibition, which was erroneously described as a "sax-tromba" in the newspaper article. This instrument appears similar to the three-valve *contrebasse d'harmonie* from the 1843 patent.



**Figure 4.39** Instrument exhibited by Sax during the Paris 1844 National Exhibition. This image was published in *L'Illustration* and was described as a "sax-tromba".

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<sup>82</sup> Ibid.

In the 1845 patent there was depicted a *contrabass* in E-flat which was made in saxotromba form and was equipped with Sax's Berlin valves (figure 10 of the patent drawings, see Figure 5.1). Next to it appeared a second saxhorn whose style is very similar to instruments described in the 1843 patent as *contrebasses d'harmonie* (although this one has four valves). This instrument was not mentioned at all by Sax and no further information was provided regarding its pitch. It could have been a contrabass instrument pitched in 12-ft F, but this cannot be said with certainty. In the general description it is grouped with the saxhorns made in saxotromba form, although the position of its valves deviates from the description of this form. This instrument was not included in Sax's later advertisements, and no surviving instrument corresponds to that design. Sax's c. 1850 advertisement depicted next to a three-valve contrabass in E-flat, another one with five valves, whose illustration was not included in any of the later catalogues.



**Figure 4.40** The earliest known surviving contrabass saxhorn in E-flat made by Sax in 1845. Edinburgh University Collection of Historic Musical Instruments (inventory no. 5969). Photograph by Raymond Parks.

There is no known surviving contrabass by Sax in 12-ft F; all his instruments are pitched in 13-ft E-flat, although in the 1880s Sax offered them for sale both in F

and E-flat. The regular type of E-flat contrabass from the Sax workshop was made with three Berlin valves until the 1860s. The last three known surviving instruments (from 1864 onwards) are all *nouveau* saxhorns, and there is no surviving instrument with Périnet valves.

The 1843 and 1845 patents did not include any contrabass saxhorns in 16-ft C or 18-ft B-flat. Contrabasses at this pitch were the last addition to the saxhorn group. An advertisement of Sax's instruments published in *La Presse* of Paris in December 1848 shows that contrabasses in C or B-flat were not available for sale at that point (Figure 4.41).<sup>83</sup> Kastner's *Manuel Militaire* that was published the same year (1848) and Sax's advertisement from c. 1850 (Figure 4.41) do not include instruments in 16-ft C or 18-ft B-flat either, although Gautrot's catalogue of 1850 lists a *clairon chromatique contrebasse bombardon en ut et si bémol*, and the catalogue of Beauboeuf frères (1849-53) lists, although it does not depict, *contrebasses* in B-flat with four valves. None of the 1848 military decrees (regarding cavalry or infantry bands) included contrabass instruments in C or B-flat, although the Austrian maker Václav František Červený had already started manufacturing contrabasses in C and B-flat in 1845.<sup>84</sup>

**BEAUX-ARTS.**  
Tableaux, Gravures, Musique, Objets d'art.

**INSTRUMENTS.** — M. A. SAX recevant chaque jour un très grand nombre de lettres pour s'informer si la baisse de prix annoncée jusqu'au 1<sup>er</sup> novembre sera maintenue ultérieurement, croit devoir prévenir ses clients que cette baisse est maintenue pour les instruments suivants :

Petit Saxhorn en mi B soprano.....	55 fr.
Cornet à cylindres et à pistons .....	70
Saxhorn en si B et en la B .....	60
Trompette à cylindres .....	75
Saxotromba ou Saxhorn en mi B tenor..	85
Trombone à cylindr. 85 f. ou à coulisses.	50
Saxhorn baryton.....	95
Saxhorn basse à 4 cylindres en si B....	100
Saxhorn contre-basse en mi B.....	100
Trompette d'harmonie .....	50
Trompette d'ordonnance.....	18
Saxophone.....	200

On trouve à la fabrique un prix courant donnant les prix des autres instruments, le dessin de tous les instruments, leur étendue, leur diapason et tous les autres détails nécessaires.

Figure 4.41 An advertisement of Sax's production in *La Presse* in 1848.

<sup>83</sup> See, "Beaux-arts" *La Presse* 4543 (3 December, 1848): 4.

<sup>84</sup> Herbert Heyde, *Das Ventilblasinstrument* (Leipzig: VEB Deutscher Verlag für Musik, 1987), 224.

During the 1851 International Exhibition, Sax exhibited contrabasses at this pitch. The report of the jury mentioned characteristically that “his Sax-Horns (double-bass in E-flat, and B-flat) have left ophicleides very far in arrears”.<sup>85</sup> The earliest known surviving contrabass in B-flat dates from 1854 and is an instrument in the Musée de la musique (inventory no. E.746, serial number 10868). These early instruments were made in a more elongated form with fewer bends in their tubing compared to later instruments. This was later changed, perhaps to make the instrument more convenient to hold. As already mentioned earlier in this chapter, contrabasses in B-flat made in the 1860s are found with a hybrid type of valve (Figure 4.6). Surprisingly there are no surviving contrabasses in E-flat after 1867 and contrabasses in B-flat after 1868. This might be by chance or an indication that the production of these instruments dropped after that point.



**Figure 4.42** Last known contrabass saxhorn in B-flat made by Ad. Sax in 1868. Edinburgh University Collection of Historic Musical Instruments (inventory no. 3229). Lent by the National War Museum of Scotland. Photograph by Raymond Parks.

<sup>85</sup> *Exhibition of the Works of Industry of All Nations, 1851. Reports by the juries on the subjects in the thirty classes into which the Exhibition was divided* (London: William Clowes, 1852), 332.



#### 4.8.9 *Nouveaux* saxhorns

The earliest surviving instrument with independent valves is a trombone (Guy Laurent collection, France) which dates from 1862. The earliest surviving saxhorn with such valves is a bass saxhorn in B-flat (serial no. 26395) in the Kampmann collection (inventory no. 318) which dates from 1863. It is not known, however, why Sax, having applied this valve system to trombones and saxhorns through his 1859 patent, started promoting commercially the first *nouveau* instruments (this is how instruments with independent valves were called by the maker) so late. The earliest surviving instruments coincide with press announcements regarding this new development. Sax started promoting these instruments through concerts which took place in his own concert hall, in rue St. Georges. An article published in May 1863 reported that a *séance* of military music took place in Sax's hall. There, Klosé directed some extracts from Kastner's *livres partitions* played by a regimental band. In the intervals Sax introduced a trombone and saxhorn (the pitch is not reported) with independent valves demonstrating the facility with which certain passages could be executed.<sup>86</sup> On June of the same year (1863) during a military festival, students from Sax's saxophone and trombone classes (the latter playing on the *nouveaux* instruments) played with Musard's orchestra in Pré Catelan.<sup>87</sup> It appears that Sax's promotion concerts continued for some time. Another long article published in *Le ménestrel* in July 1864 reported that Sax continued organizing concerts in his hall where music was performed almost exclusively on *nouveau* instruments.<sup>88</sup> One concert included the *Marche funèbre* composed by Litolff (in Meyerbeer's memory and performed by one trumpet, two trombones, a bass saxhorn, and two contrabass saxhorns all with independent valves), trumpet variations, various opera fantasies, and two duos for trombone and bass saxhorn, one based on themes from *Robert le Diable*, and the other from *Guillaume Tell*. Sax actively promoted these instruments dynamically through concerts, advertisements, and by negotiating for them to be taught in the Paris Conservatoire.

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<sup>86</sup> "Séance de musique militaire" *L'univers musical journal et abonnement musical* (7 May, 1863): 154.

<sup>87</sup> "Nouvelles diverses" *Le ménestrel* no. 30 (28 June, 1863): 239

<sup>88</sup> J. D'Ortigue, "Nouveau instruments à six pistons et à tubes indépendants" *Le ménestrel* no. 33 (17 July, 1864): 261-62.

According to the ministerial decision of 11 August 1873 (cited in a later document),<sup>89</sup> regarding the composition of military bands, the use of *nouveaux* trumpets and trombones was to become obligatory in the schools of the artillery which were to be created, whereas in the existing schools of the artillery and infantry bands, and in the *fanfares* of the cavalry, the use of all instruments with six independent valves (including trumpets, trombones, cornets, saxhorns from the *petit* in E-flat to the *contrebasse* in B-flat) would be optional. It should be noted that bass and contrabass saxhorns with independent valves were considerably heavier than instruments with regular valves and not very comfortable to hold, especially while marching, and this might have contributed to the brevity of their period of use. Also, as can be seen in Sax's last advertisement *nouveau* instruments were noticeably more expensive than regular instruments. For example, a contrabass saxhorn in C or B-flat with independent valve cost 400-450 F (or 500 with a *pavillon tournant*), whereas a three-valve instrument at the same pitch cost 300 F (350 with a *pavillon tournant*).

#### 4.8.10 Bourdon saxhorns

The *bourdon* saxhorn in 26-ft E-flat was made by Sax in 1855 for that year's Paris International Exhibition. Such an instrument survives in the Henri Selmer collection in Paris. There is reference to another *saxhorn bourdon* in the *Catalogue du Musée d'Adolphe Sax*, where the instrument with entry number 200 is a *saxhorn bourdon*. It was described as having a total length of seventeen metres, three valves, and diameter of the tubing towards the bell one metre. The particular instrument, which apparently has not survived, is obviously a different instrument since a length of seventeen meters would result in a pitch of 52-ft E-flat. An additional comment following the description of the instrument stated that:

This instrument is made by Mr. Sax to prove that people of small height can very easily play on big instruments, and that it is not the metal that gives the sound and the timbre.<sup>90</sup>

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<sup>89</sup> E. Charbonneau, *Recueil administrative a l'usage des corps de troupe de toutes armes ou code manuel* (Paris: Henri Charles-Lavauzelle, 1885): 273.

<sup>90</sup> "Cet instrument a été construit par M. Sax, pour prouver que des hommes de petite taille peuvent très facilement jouer de gros instruments, et que ce n'est pas le métal qui donne le son et le timbre."





**Figure 4.43** *Bourdon* saxhorn in 26-ft E-flat made by Ad. Sax in 1855. Henri Selmer, Paris. The picture is courtesy of Selmer, Paris.

The largest bourdon was exhibited in the London 1851 International Exhibition. In one source this instrument was described as a kind of monster ophicleide<sup>91</sup>. According to Pontécoulant, although at first one gets the impression that the instrument cannot be played by any human being, its proportions and valves were arranged in such way that the instrument was played in front of the exhibition's jury without difficulty by a person who had never played it before.<sup>92</sup>

Gautrot in 1858 claimed that he was the first to make a brass instrument of such enormous dimensions and an octave lower “than the instruments were usually made”, without clarifying if his instrument was in E-flat and B-flat.<sup>93</sup> He asserted that other makers copied his idea and made similar instruments in various proportions; Sax was one of them and only three months after Gautrot made his

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<sup>91</sup> William Newton, Charles Frederic Partington, eds., *The London Journal of Arts, Sciences and Manufactures and Repertory of Patent Inventions* 39 (London: W. Newton, 1852): 399.

<sup>92</sup> Pontécoulant, *Organographie*, 2: 424.

<sup>93</sup> See *Explication des perfectionnements faisant le véritable objet du brevet pris par Monsieur Sax, le 13 Octobre 1845*, (Paris: impr. Madame Veuve Dondey-Dupré, 1858), 14.

instrument he exhibited—presumably at the Paris 1855 International Exhibition—an instrument of a similar nature but of “gigantic proportions”.<sup>94</sup> In 1867 Couturier exhibited a sub-contrabass saxhorn in 26-ft E-flat in that year’s International Exhibition held in Paris.<sup>95</sup>

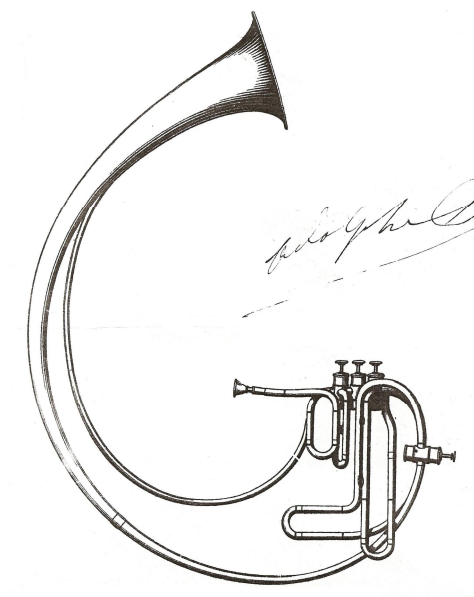
#### 4.9 The saxtuba

Saxtubas were patented in 1852, in a certificate of addition to the main patent of 1849. This certificate had very little in common with the main patent, but as already discussed in Chapter Two, it was common practice for French patentees to issue certificates of addition to main patents which bore little relation to the main patents, principally because the cost of a certificate was lower. Sax pointed out that the main feature of saxtubas related to the equality of the sounds of the various instruments of the military band and orchestra. He believed that because of the variety in forms of the various brass instruments, the sound was directed in many different directions, and the listener perceived their sounds without a balance, and according to where each instrument was positioned. His first aim was to correct this imbalance by changing the direction of the bell; he no longer made it with an upward direction, but made it parallel to the ground and to the front of the player, so that the listener perceived both the sound directly from the instrument, and its reflection from the ground. The characteristic of his patent is that only for the contrabass saxtuba Sax provides some measurements. As extensively discussed in Chapter Five and in a later section of this chapter, the first known patent with given measurements was Sax’s 1845 saxotromba patent. Here, Sax not only gives bore widths, as in the case of the 1845 patent, but also some general dimensions of the instrument, such as the distance between the valve tuning slides, distances between the valve tuning slides and the instrument’s main tubing, and others, not all of which are legible in the patent copies currently available from the Institut National de la Propriété Industrielle in Paris.

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<sup>94</sup>Ibid. “[...] proportions diverses et tout à fait gigantesques”.

<sup>95</sup> Pontécoulant, *La musique à l'Exposition universelle de 1867* (Paris: au Bureau du Journal l'Art Musical, 1868), 161.



**Figure 4.44 Saxtuba (probably bass or baritone) from Sax's 1852 certificate of addition to his main patent of 1849.**

The distinct feature of these instruments was their wrap. It resembled instruments from Greek or Roman antiquity. Sax thought that such instruments would add importance to public ceremonies. To reinforce their historic character the valves were positioned so that they were concealed by the player's hand and were not visible by the spectator. Sax was inspired by the representations of the Roman cornu at the Trajan column in Rome.<sup>96</sup>

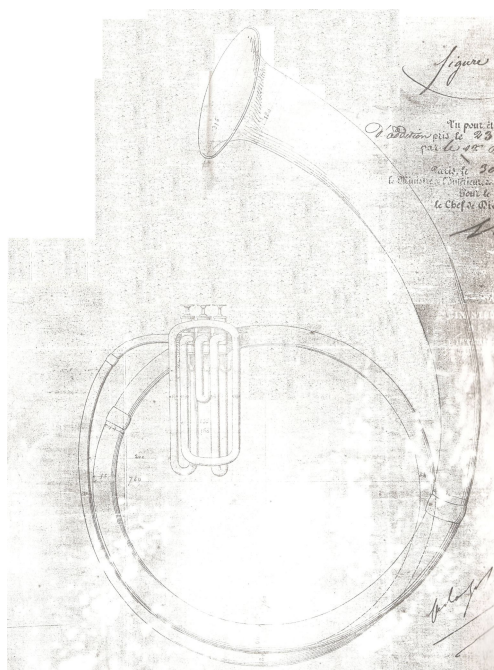


**Figure 4.45 Cornu players from Trajan's column in Rome, which were Sax's inspiration for creating his saxtubas.**

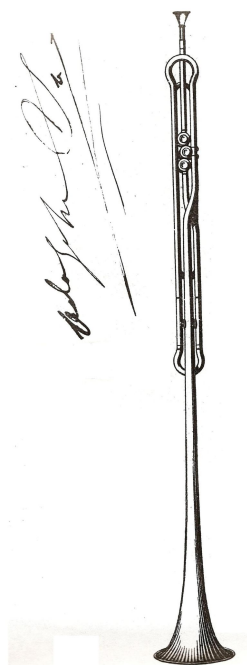
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<sup>96</sup> *Exposition universelle de 1855. Rapports du jury mixte international* (Paris: impr. Impériale, 1856), 2:672

Four instruments appeared in the drawing section of this certificate of addition. A straight trumpet, a saxtuba probably of the bass or baritone size (Figure 4.44), a saxtuba of the contrabass register; this last one had a circular wrap very close to that of the helicon (Figure 4.46). The last instrument depicted was a parade trumpet (Figure 4.47).



**Figure 4.46** Contrabass saxtuba from Sax's 1852 certificate of addition to his main patent of 1849 of which Sax gives some measurements.



**Figure 4.47** Parade trumpet from Sax's 1852 certificate of addition to his main patent of 1849.

The term “saxtuba” was not mentioned in the certificate’s text. There is evidence, though, that it was used long before the issue of the patent, even though associated with different instruments. In Britain in 1847 Distin advertised saxtubas and according to some concert announcements the famous quintet also played on what was called the sax-tuba. As discussed in Chapter Six, the term “saxtuba” was associated with the upright instruments of the saxhorn family.

As also mentioned in various sources these instruments were used in Halévy’s opera *Le Juif Errant* whose premiere took place on 23 April 1852. Clifford Bevan reports that the only manuscript of the opera, today in the Bibliothèque et Musée de l’Opéra, includes the complete family of saxhorns, from the *petite saxhorn aigu* in B-flat, to the *contrebasse* in B-flat, and not saxtubas.<sup>97</sup> Bevan assumes that this was due either to a miscommunication between Sax and the manuscript copyist, or due to the fact that saxtubas were made in the same pitches as the saxhorns, or an indication that the saxtubas were included in the last minute. However, according to sources of the time it was reported that according to a different manuscript the brass band score of the third act included the family of saxtubas from the *saxtuba si bémol aigu* to the *si bémol contrebasse*.<sup>98</sup>

Only two saxtubas made by Adolphe Sax have been located. Made in 1855, the instrument at the Metropolitan Museum of Art has three Berlin valves and is pitched in 13-ft E-flat (inventory no. 1109, serial no. 13802). A sax-tuba in alto size, also made in 1855, is in the Trompeten-museum Bad Säckingen (inventory no. 14602, serial no. 13809). As also discussed in Chapter Eight, only the contrabass saxtuba presents differences in bore profile from earlier instruments by Sax. The contralto instrument is identical in bore profile with contralto saxhorns. However, the time of manufacture of the contrabass instrument (1855) coincides with the beginning of a period when saxhorns of that pitch (13-ft E-flat) show a development toward larger bores.

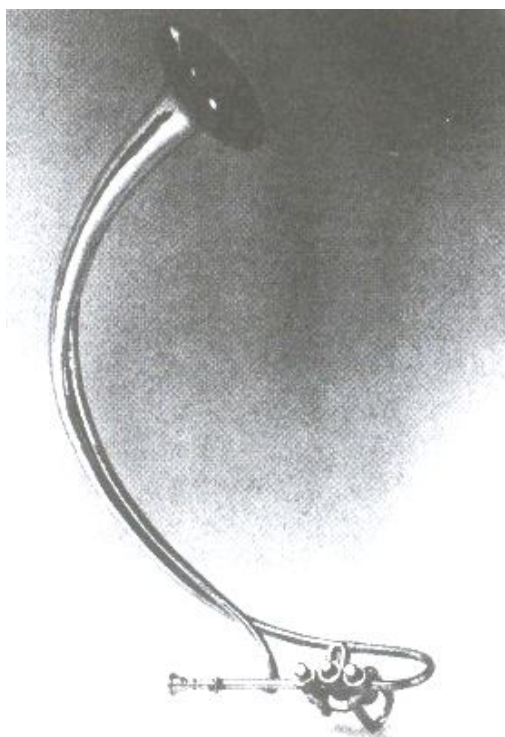
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<sup>97</sup> Clifford Bevan, “The Saxtuba and Organological Vituperation” *The Galpin Society Journal* 43 (March 1990): 135-46.

<sup>98</sup> See for example, Nestor Roqueplan, *Regain: La vie parisienne* (Paris: Librairie nouvelle, 1857): 281.



**Figure 4.48** Contrabass saxtuba in 13-ft E-flat made by Ad. Sax in 1855. Metropolitan Museum of Art, New York (inventory no. 1109). Illustration taken from C. Bevan's "The Saxtuba and Organological Vituperation" *The Galpin Society Journal* 43 (March 1990): 145.



**Figure 4.49** Contralto saxtuba in 4½-ft B-flat made by Ad. Sax in 1855. Trompeten-museum Bad Säckingen (inventory no. 10602). Illustration taken from Edward Tarr, "Eine Checkliste der Instrumente im Trompetenmuseum Bad Säckngen" *Musica Zeitschrift für Organologie*, Band 3 (Nürnberg: Germanischen Nationalmuseum, 2001).

Sax included the saxtubas in his 1881 patent. He applied to what was called a saxtuba his systems of six dependent piston valves and that of the six to twelve independent valves, as well as the section of parabola which could be added at the last part of the tubing. The form of the instrument was described as “écharpe en sautoir” meaning that it enfolded the musician’s body and the bell pointed to the front passing beside the musician’s head. What appears though in the illustration is nothing more what is known today as the helicon, called by Sax a “contrabass saxhorn known as saxtuba”. Sax also mentioned that instruments of this kind appeared for the first time in 1849 in the celebrations of the industry organized at the Champ de Mars in Paris, and for which occasion Sax was appointed as the director of music. Although he did not specify which celebrations he referred to, it is possible that he meant the ones organized to honour the exhibitors who were awarded prized during the 1849 Paris exhibition. In an article published in the *Revue et gazette musicale* it was reported that Sax’s new instruments which were exhibited during the 1849 exhibition and for which the maker was awarded the gold medal and the decoration of the “Légion d’honneur”, were heard in the various wind and brass bands organized under the supervision of Sax and conducted by Fessy and Schlotmann.<sup>99</sup>

According to Comettant, saxtubas were also used in the Champs de Mars on 10 May 1852; hundreds of musicians participated in the official ceremony when new flags were distributed to French regiments by Louis-Napoleon Bonaparte.<sup>100</sup> In the same patent Sax admitted that if these instruments were compared with the more up-to-date instruments with six valves they would definitely lack the accuracy and equality of sound of the latter.

The latest advertisement from Sax’s workshop, published in the 1880s, included sax-tubas in the list of instruments for sale. For the contrabass instruments in E-flat and B-flat the term “helicon” was additionally noted in brackets. In the explanatory text it was mentioned that this model of the saxtuba was later imitated in Germany with the name helicon.<sup>101</sup> It is obvious from these two pieces of

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<sup>99</sup> “Théâtre-Italien”, *Revue et gazette musicale de Paris* 16, no. 50 (16 December, 1849): 397.

<sup>100</sup> Comettant, *Histoire d’un inventeur*, 378.

<sup>101</sup> For a reproduction see Appendix I.

information that Sax was trying to claim the parenthood of the helicon, for which, however, there is a patent by Stowasser dating from 1848.

#### 4.10 Saxhorns made under license (1855-1865)

After a long series of litigations, many well known French instrument makers were allowed to manufacture Sax's saxhorns only by license and under certain conditions. Some were obliged to compensate Sax for his damages. The period when saxhorns were made under license was between 1855 and 1865. There are two recent sources providing information on Sax's licensees: the earlier is Malou Haine's article published in 1985 and titled "Les licences de fabrication accordées par Adolphe Sax à ses concurrents: 26 juin 1854-13 octobre 1865".<sup>102</sup> The later is Bruno Kampmann's article published in *Larigot*.<sup>103</sup> Haine's article deals exclusively with the contracts signed by the licensees, whereas Bruno Kampmann's article deals mainly with instrument inscriptions.

Haine (1985) lists the following makers as licensees of Sax:

Darche and his successors E. Henry et Martin, from 1 January 1855,  
 Denis-Antoine Courtois, from 1 February 1855,  
 J. Labbaye, from 14 April 1856,  
 Michaud from 7 July 1857,  
 Pierre-Louis Gautrot from 9 July 1859,  
 J.-A. Halary fils from 15 December 1859,  
 A. Lecomte & Cie from 10 January 1860.

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<sup>102</sup> *Revue belge de Musicologie* 34/35.

<sup>103</sup> Bruno Kampmann, "Licences accordées par Adolphe Sax à ses concurrents pour la fabrication des cuivres" *Larigot* 42 (September 2008): 9-17.



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Kampmann (2008) lists additionally the following instrument makers and dealers based on information coming from instrument inscriptions:<sup>104</sup>

*Barbet Granier*, Marseille  
*Beckner aine*, Paris,  
Besançon\*, Lyon,  
Buthod & Thibouville\*, Paris,  
*Carnaud*,  
*Carrion & Higo*, Vitoria,  
Couturier Jacques, Lyon,  
Daniel, Marseille,  
David, Paris,  
*Fischer G.*, Paris,  
*Grand*, Laval,  
*Grin La Chapelle*,  
*Grapin*, Auxerre,  
Husson & Buthod, Paris,  
*Jamin fils & Cie*, Chalon-sur-Saône,  
Millerau, Paris,  
*Nacmann*,  
Piattet Pierre, Lyon,  
*Ponfoort*, Gand,  
Rivet, Lyon,  
Roëhn, Paris,  
*Rollet*, Bordeaux,  
*Royet Christophe*, Toulouse,  
*Salf Toulon*,  
*Schneider*, Strasbourg,  
*Solas*, Sens,  
*Tessier Denizeau*,  
*Vasseilliere Hubert Eugène*, Charleville,  
*Walfoz*.

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<sup>104</sup> Instrument dealers are marked in italics, and instrument makers also appearing as dealers are marked with \*.

The present author has additionally found evidence that the following makers were also authorized licensees of Sax, of which though no surviving instrument is known:<sup>105</sup>

Association des ouvriers, Montmartre,<sup>106</sup>

Deschamps, Paris,

Paridaëns et Musard, Paris,<sup>107</sup>

Verron-Dericksen, Dunkerque.<sup>108</sup>

Two makers in Strasbourg, Roth and Finck, had already signed a license agreement with Sax long before the litigation processes. The former had signed in 1846. It is possible that even more makers and dealers were authorized to produce and sell Sax's instruments for which there is no evidence. To the above should be added the Distin family, Rousselot & Co. from 1851 onwards and Rudall Rose & Carte from 1853, all British agents of Sax.

These makers had to pay Sax royalties for each instrument they made, the amount depending on the instrument's pitch. The royalty for each small instrument (sopranino to alto) was five francs, whereas the fee for a baritone to a contrabass was ten francs. From 1859 there were three fees: five francs for the higher instruments, seven and a half francs for the medium register instruments and ten francs for baritone to contrabass saxhorns. There were minimum and maximum numbers of instruments which each maker could produce annually; these numbers were different for each maker. The makers had to pay Sax the corresponding royalties for the minimum number of instruments they had to produce (different for each maker), even when they had not sold as many instruments.

During the London 1862 International Exhibition, in addition to Sax exhibiting saxhorns and saxotrombas, according to Pontécoulant saxhorns and saxotrombas were also exhibited by Sax's licensees: Gautrot, Labbaye (successor of

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<sup>105</sup> "Nouvelles", *Revue et gazette musicale de Paris* no. 17 (26 April, 1857): 143.

<sup>106</sup> According to *The New Langwill Index of Wind Instrument Makers* there was only one association of wind instrument makers active in Paris, the *Association fraternelle d'ouvriers facteurs d'instruments de vent*.

<sup>107</sup> Jules Paridaëns had succeeded Désire Paridaëns as the firm's owner by 1857 according to *The New Langwill Index* (See, "Paridaëns", *The New Langwill Index*, 292). No other information was so far known on the collaboration of the firm with the renowned conductor and composer.

<sup>108</sup> *The New Langwill Index* does not record any maker with the name Verron.

Raoux) (no. 1642), Henri et Martin (successors of Darche, no. 1644), Lecomte et Cie (no. 1648), Buthod and Thibouville (no. 1666), and Courtois (no. 1667).

Interestingly, at the 1862 International Exhibition in London, Sax (exhibition no. 1701) and Gautrot (no. 1702) shared the same exhibition area. Pontécoulant comments positively on this juxtaposition which in his view could only be beneficial for the instrument making business.<sup>109</sup> Sax's showcase alone was five metres long and displayed over two hundred instruments, examples of his production over the past twenty years<sup>110</sup>.

The author has located a small number of instrument makers' catalogues published during the licence period. Among them there is a catalogue of Gautrot, published shortly after the licence agreement between Sax and Gautrot was signed on 9 July 1859. It is an exact reprint of Gautrot's 1858 catalogue with the addition of the three extra plates depicting the Sax instruments Gautrot was licensed to produce and sell.<sup>111</sup> One of the plates depicts saxhorns "forme saxotromba" offered for sale (Figure 4.50). Strangely enough, here there are also included two soprano saxhorns and a contralto made in bell-front form, and not in saxotromba form. None of these instruments is shown with Berlin valves; they are all made with Périnet valves.

There were also depicted duplex instruments made under licence (Figure 4.52). Two instruments of different kinds but at the same pitch were joined having a single mouthpiece and a valve to select the bell. The combinations were as follows:

- Soprano saxhorn and trombone in E-flat,
- Contralto saxhorn and cornet B-flat,
- Alto saxhorn and trumpet in E-flat,
- Baritone saxhorn and trombone in C or B-flat,
- Bass saxhorn and trombone in C or B-flat and
- Contrabass saxhorn and trumpet in F or E-flat.

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<sup>109</sup> Adolphe le Doulcet marquis de Pontécoulant, *Douze jours à Londres: voyage d'un mélomane à travers de l'exposition universelle* (Paris: Frédéric Henry, 1862), 30.

<sup>110</sup> *Ibid.*, 269.

<sup>111</sup> *Manufacture générale d'instruments de musique. Gautrot aîné, 60 rue St. Louis (Marais.) Paris* (Paris: impr. Plista, 1858).



Figure 4.50 Small saxhorns made under license by Gautrot in 1859.



Figure 4.51 Large saxhorns made under license by Gautrot in 1859.

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It is to be expected and surviving instruments verify so, that only the saxhorn part of the duplex instrument would be made under licence. Only two duplex instruments by Gautrot made under licence have survived, both at the Musée de la musique in Paris. The smaller of the two is a combination of a cornet and a saxhorn, both pitched in 4½-ft B-flat (inventory no. E.1170). The second is a combination of two instruments of the same kind but at different pitches: an E-flat alto and a B-flat baritone saxhorn (inventory number. E.1172).

It appears that regular instruments made in saxotromba form were also made under license (Figure 4.52). Gautrot's catalogue shows the following made under license when in upright form:<sup>112</sup>

Cornet in B-flat,  
Trumpet in G,  
*Cor alto* in E-flat,  
*Cor baryton* in C or B-flat,  
*Cor basse* in F or E-flat,  
*Cor contrebasse* in C or B-flat.

There is only one surviving trombone in saxotromba form in Brussels (inventory no. 96.025) sold by Beckner aîné. The instrument is inscribed "trombone forme saxhorn" which is odd since the particular form was known as "forme saxotromba" for many years. This is another indication of the confusion which prevailed even among makers of the time regarding the saxotromba's identity.

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<sup>112</sup> "[...] c'est-à-dire ayant les pistons parallèles au pavillon en l'air". See introductory text of *Gautrot 1858*.



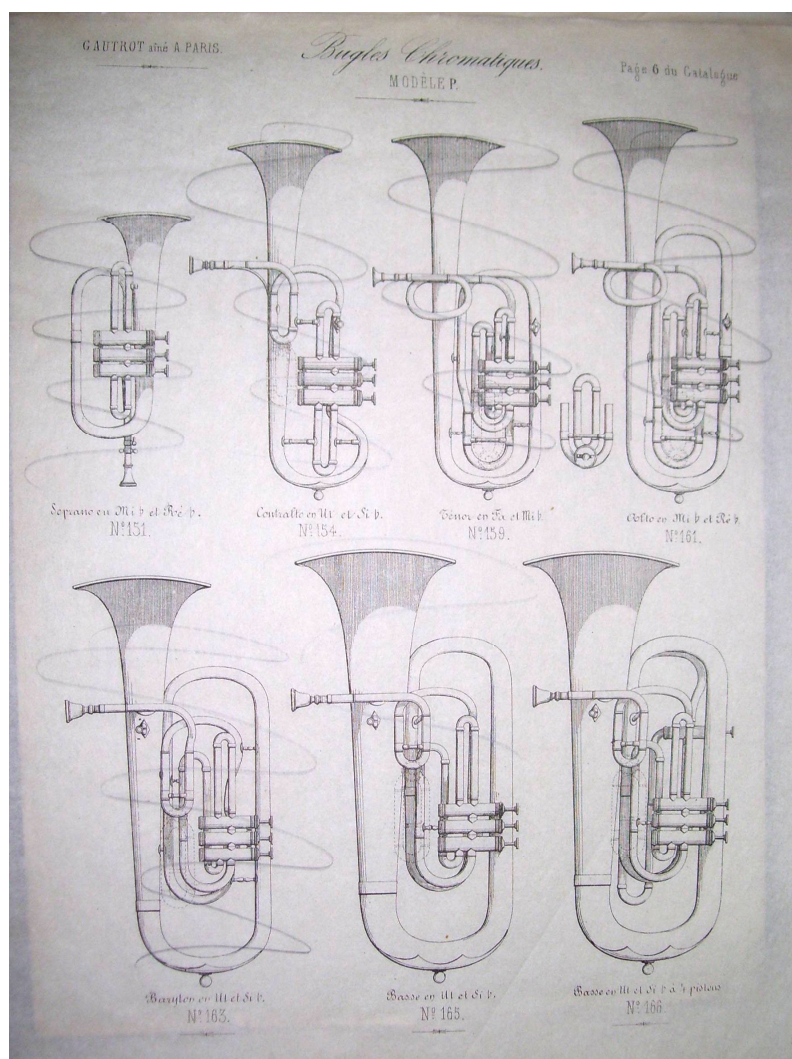
**Figure 4.52** Plate with instruments made under license by Gautrot and offered for sale in 1859. Here duplex instruments and cornets, trumpets, and horns in saxotromba form are depicted.

Gautrot's 1859 catalogue, after the three plates of instruments made under license, listed instruments made in his workshop but not under license. Interestingly these were called *bugles chromatiques* and were offered for sale in all sizes that saxhorns were (from soprano in E-flat to contrabass in B-flat). These instruments were furnished with Périnet valves, similarly to saxhorns made under license, although their position in relation to the bell was different: they were placed perpendicularly to the plane of the bell rim. In the present author's view this was done purposely so as to deviate from the saxotromba form, and so that Gautrot could sell instruments similar to Sax's without having to pay royalties. The same instruments were offered for sale with rotary valves; these were also called *bugles chromatiques*. A trombone in upright form with rotary valves was offered not under license. Obviously Gautrot, and other makers, who were forced to become Sax's licensees tried to find ways to promote similar instruments without having to face legal problems. Gautrot in his catalogue's preface indirectly prompted his clients not to only concentrate their orders on instruments made under Sax's system, so as to receive their orders without delay and to avoid having any kind of legal troubles! As



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expected Gautrot's catalogue of 1865, after the expiry of the license period, listed in his catalogue only instruments with their valves placed parallel to the bell.<sup>113</sup> Saxhorns with rotary valves were no longer offered, and only Périnet valves were used.



**Figure 4.53** Instruments with valves perpendicular to the bell offered for sale by Gautrot in 1859 called *bugles chromatiques*.

The catalogue of Husson-Buthod & Thibouville (c. 1862) lists saxhorns which are identical to Sax's models, and are all made with Berlin valves.<sup>114</sup> Another catalogue published during this period is Millereau & Cie catalogue of 1864.<sup>115</sup>

<sup>113</sup> *Catalogue des instruments de musique de la manufacture générale de Gautrot aîné* (Paris: impr. Édouard Blot, 1865).

<sup>114</sup> *Aux grand magasins d'instruments Husson-Buthod & Thibouville fabricants de cordes & d'instruments de musique rue St. Martin 254 à Paris* (Paris: n.p., n.d.).

<sup>115</sup> *Manufacture d'instruments de musique Millereau & Cie Fournisseurs de l'armée* (Paris: Roussaux, 1864).

Saxhorns in all sizes are depicted. Although their form is identical to Sax's brasses of the time, their only difference is that Millereau's saxhorns are only equipped with Périnet valves.

N <sup>o</sup>		Prix	Sacs	N <sup>o</sup>		Prix	Sacs	N <sup>o</sup>
1	Coruet à cylindres, rotation, 3 cyl	180	13	19	Saxhorn Baryton en Ut avec ton de si b 3 cyl	140	20	37
2	Coruet Extra, nouvelles proportions percer EM 3 cyl	130		20	d° d° en si b 3 cyl	135		
3	Coruet Extra en Ut d° d° d°	120		21	Les mêmes à 4 cylindres en plus	30		38
4	Coruet perfectionné percer P 3 cyl	110		22	Saxhorn Basse en si b 4 cyl	180	25	39
5	Coruet d° 3 cyl. modèle anglais	110		23	d° d° en Ut avec ton de si b	140		
6	Coruet petits pistons perfectionné 3 cyl	85		24	Les mêmes à 5 cyl en plus	15		
7	Coruet petits pistons ordinaire 3 cyl	65						40
8	Coruet ordinaire 3 cyl	55		25	Ophicleïde en Ut ordinaire	120		41
	Avec boîte, en plus 7 ou 10 f			26	d° en si b d°	120		42
					d° en Ut clefs à triangles	150		43
9	Trumpette à cylindres	135	15	27	d° en si b d° d°	150		
10	d° d° Ordonnance	18						44
11	d° d° renforcée	22		28	Saxhorn contrebasse mi b 3 cyl	180	24	45
12	Clairon d'Ordonnance	1750		29	d° d° en fa avec ton mi b	190	24	46
				30	d° d° en si b	300	30	
13	Petit Saxhorn aigu si b 3 cyl	85	10	31	d° d° en Ut avec ton de si b	310	30	
14	d° d° soprano mi b 3 cyl	90	12					
15	Saxhorn contralto si b 3 cyl	90	15	32	Cornebouc à 3 cyl en si b	120	15	
16	Saxhornbâ Alto la b 3 cyl	110		33	d° en fa avec ton de mi b 3 cyl	125		
17	d° Alto mi b 3 cyl	125		34	d° Ténor en mi b 3 cyl	130		
18	d° en fa avec ton de mi b 3 cyl	130		35	d° d° en Ut avec ton de si b 3 cyl	135		
				36	d° contrebasse en mi b 3 cyl	150	20	

Figure 4.54 Saxhorns offered for sale and made under license by Millereau & Cie in 1864, among other brasswinds.

Among the questions regarding the licence agreements between Sax and his rivals are those concerning the manufacturing processes. It is not known if Sax inspected his adversaries' products and if he did, what his criteria were for instruments made under licence and stamped with the special trademark containing the initials AS and having the "autorisé" stamped on stem of S, instead of Paris as in Sax's own trademark. Did Sax or his agents visit the licensed makers' workshops? Did he lend mandrels, other equipment, or drawings of his instruments with measurements? The answer is not known. However comparisons of bore profiles of Sax and licensed saxhorns (see Chapter Eight), and external appearances, do not suggest that Sax exercised tight control over the making of these instruments.



Some conditions regarding the making of instrument parts for licensed instruments reinforce this view. It is known through the minutes of the case *Drouelle contre Sax* that the licensees—at least a great part of them—were buying valve sets from the valve maker Drouelle. Drouelle provided Sax’s licensees with valves, keys and mouthpieces. The names of the licensees Roth of Strasbourg, Labbaye and Henry Martin and Michaud were mentioned.<sup>116</sup> It was also reported that Drouelle acted as an intermediary to provide Roth with bell sections from a Parisian bell maker.<sup>117</sup> Sax had brought a court case against Drouelle, accusing him of having manufactured valves (before the beginning of the license period) for his rivals. As also mentioned in Chapter Three, Drouelle’s predecessor was Sassaigne, the valve maker who probably first made Sax’s version of the Berlin valve under an agreement with Sax, but then withdrew from the collaboration and made Sax’s valves independently. Since Drouelle was making valves for the licensees, and was providing—at least some of them—with bell sections, it is unlikely that Sax would have been able to control the design of these components.

Most license saxhorns examined deviate from Sax-style saxhorns. The wraps of instruments do not follow the norms of the Sax workshop. Although most of them were made in upright form, albeit with different configuration from Sax’s saxhorns, there are also some surviving license instruments in circular form, which did not follow the configuration of the saxotromba form but were nevertheless licensed. In some other cases license instruments were equipped with valves not patented by Sax, but by his licensees. For example, there are some surviving saxhorns by Gautrot with his *équitonique* compensating system, for which he was granted a patent in 1858. Even in these cases the instruments were made under Sax’s license.

Kampmann’s article deals extensively with inscriptions of license saxhorns, and inscription issues will only be mentioned here briefly. Kampmann has compiled a list of all known instruments made under license. These instruments were inscribed as “saxhorns” and some, but not all, included the specific model in their inscription. A number was usually inscribed with the term “saxhorn” in an oval cartouche. These

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<sup>116</sup> *Cour impériale de Rouen. Drouelle contre Sax. Les amorces tombantes* (Paris: impr. Crété, 1866), 3.

<sup>117</sup> “[...] les pavillons trouvés chez lui étaient achetés pour le compte du sieur Roth, facteur à Strasbourg, licencié de Sax ; que Drouelle n’a été que l’intermédiaire entre le fabricant vendeur et l’acheteur ;” *Ibid.*, 4.

numbers in surviving instruments run from 5 to 9722. Kampmann assumes that these numbers run consecutively throughout. Instruments attributed to Gautrot have a second number inscribed: 10,000, 20,000, or 30,000, which is also a riddle with no convincing explanation hitherto. There are two surviving instruments with the same license number (2086), a baritone by Couturier (the location of which Kampmann does not report), and a bass sold by Grapin, in Kampmann's own collection (inventory no. 679). Also, the instrument with the lowest number known (5), which is a bass saxhorn in Edinburgh (inventory no. 4135) was made by Gautrot, who signed a license agreement with Sax, relatively late, in 1859. It would make better sense if the lowest number belonged to an instrument made by a maker who had signed a license agreement in 1855. Gautrot only was obliged to pay Sax annually at minimum the sum of 15,000 F for royalties; taking into consideration that for a medium register instrument he paid the fee of seven and a half francs to Sax, that equals an average minimum production number of 2000 instruments per year. The total number, thus, of licensed instruments produced between 1855 and 1865 by all licensees would be much larger than 9722. It appears, thus, less likely that these numbers ran uninterruptedly. It is possible that they ran annually, or that after reaching number 10,000 they started new sequences. This, however, does not explain why only instruments attributed to Gautrot bear the five-digit number. Since the details of the conditions regarding the production of license instruments remain mostly unknown, no safe conclusions can be drawn.



Figure 4.55 Inscription of a bass saxhorn made by Gautrot under license. The instrument is inscribed as “saxhorn basse” and the number 5 (the lowest known so far) is included in the oval cartouche. The number 30,000 which might denote a new sequence is also inscribed. The monogram trademark Adolphe Sax *autorisé* can be also seen. Edinburgh University Collection of Historic Musical Instruments (inventory no. 4135). Photograph by Raymond Parks.



Figure 4.56 Circular baritone saxhorn in B-flat made by Besançon under license. Edinburgh University Collection of Historic Musical Instruments (inventory no. 3697). Photograph by the author.



**Figure 4.57** Alto saxhorn in E-flat made by Husson-Buthod under license. Edinburgh University Collection of Historic Musical Instruments (inventory no. 5699). Photograph by Raymond Parks.

#### 4.11 The pitch of Sax instruments

As is widely known, in 1859 the *diapason normal* (A4=435 Hz) was adopted in France initially, and subsequently in other European countries. However, as surviving instruments show, it would be an overgeneralization to accept that all brass instruments, even in France, were made in *diapason normal* after 1859.

In 1858 a commission was appointed by the government in Paris to investigate issues concerning the continuously rising pitch in France and the establishment of a *diapason normal*, namely a standard musical pitch. The committee consisted of important figures, such as Meyerbeer, Halévy, Berlioz, and Ambroise Thomas and others mainly from the scientific world. The committee's report, presented early in 1859, determined that the playing pitch in France should be A4=435 Hz enforced from 1 July 1859. The committee's report discussed the causes of the continuous rise of the pitch in France: the groups mainly responsible were found to be those of instrument makers and instrumentalists, whereas composers and

singers were believed to have no responsibility.<sup>118</sup> The committee thought that an instrument's rise of pitch would make it sound more brilliant, which would benefit both makers and performers.

The various musical establishments in France did not adopt the new pitch simultaneously. According to the military decree of Napoleon published on 26 March 1860 regarding the composition of French military bands, all military bands were obliged to adopt the diapason normal.<sup>119</sup> As a report for the music life in Paris in the *Musical World* mentioned, already in July 1859 the new pitch was in force at the Paris Grand Opéra, but it caused serious problems, especially for bass singers.<sup>120</sup> In September of the same year the Italian Opéra in Paris was about to adopt it.<sup>121</sup> The Opéra's director, Calzado had already ordered the new instruments. At the same time the new pitch had been adopted in Lille where half of the artists' funds were spent on new instruments.<sup>122</sup> The French reporter of the *Musical World* reported in September 1860 that the Municipal Council of Lyon had approved a big sum (280 British pounds, 7000 francs) for the purchase of new instruments for the principal theatre orchestra. The journal correspondent wrote<sup>123</sup>:

Whatever scientific or artistic value the pitch reform may have, it is evidently highly advantageous to the instrument makers; and I hope our friend Adolphe Sax will reap such a harvest from the change as will help him to restore the losses he has suffered from lawsuits with piratical imitators.

It is puzzling that most instrument makers' catalogues published after 1859 do not mention pitch issues. The only exception is F. Besson's catalogue of 1868 or 1869. There it was mentioned that musicians could order their instrument with a special device, which could change the pitch of an instrument so that it could play both in the old and new *diapason*. This extra device could be applied at a small cost (five and ten francs for smaller and larger instruments, respectively).<sup>124</sup>

Unfortunately, there are no mentions of pitch standards in the various primary sources of the time discussing brass instrument making in the Sax or other Parisian

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<sup>118</sup> Fromental Halévy, *Souvenirs et Portraits, Études sur les Beaux-arts* (Paris: Michel Lévy frères, 1861), 341-45.

<sup>119</sup> "Les musiques militaires", *L'Année Musicale, ou Revue annuelle des théâtres lyriques et des concerts* (Paris: Librairie de L. Hachette et Cie, 1861): 317.

<sup>120</sup> "Music and Theaters in Paris", *Musical World* 38, no. 28 (14 July, 1860): 439.

<sup>121</sup> *Ibid.* no. 36 (8 September, 1860): 568.

<sup>122</sup> *Ibid.*

<sup>123</sup> *Ibid.*, 38, no. 35 (1 September, 1860): 552.

<sup>124</sup> *Manufacture d'instruments de musique F. Besson* (London and Paris: n.p. [1868-69]).

workshops. The only conclusive way to determine pitch standards is by playing tests on surviving instruments; this is limited to instruments in playable condition, and then only when museum policies allow. A few French instruments from the second half of nineteenth century at the Edinburgh University Collection of Historic Musical Instruments had their pitch determined by playing tests, and results confirm that not all instruments are made according to the same pitch standards. For instruments where playing pitch standards cannot be established by tests, the measured overall length can be a guide to the pitch standards, when it is compared with data from instruments which have been tested. Adolphe Sax saxhorns, before and after 1859, were found to follow different pitch standards. Although a number of instruments was made according to *diapason normal*, instruments at around A4=440Hz and at high pitch, around A4=450Hz were also found. This is expected if we consider that Sax was not only making instruments for the local market, but also for export.

#### 4.12 Saxhorn mouthpieces

Information on mouthpieces used on historic brass instruments is difficult to ascertain. This is mainly because when an instrument reaches a museum or a private collection it is very rarely accompanied by the mouthpiece with which it was originally supplied or used, and if it does, museums rarely hold sufficient documentation on mouthpieces (often museum instruments are fitted with a random mouthpiece for display purposes). Of all Adolphe Sax instruments examined by the author, only one instrument can be said with certainty to be accompanied by its original mouthpiece (signed by the maker), and this is the bourdon saxhorn in E-flat at Henri Selmer, Paris.

Some limited information can be found scattered in nineteenth-century sources. Clodomir<sup>125</sup> wrote that the mouthpieces of the soprano and contralto saxhorns were similar in their form, interior, and opening with a cornet mouthpiece. The mouthpiece of the saxotromba (here he means the alto instrument) was a little larger than that of the contralto, and its cup diameter was wider. The baritone's mouthpiece was of the same size as a trombone mouthpiece, but less conical in the

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<sup>125</sup> P. Clodomir, *Méthode élémentaire pour saxhorn soprano mi $\flat$  petit bugle et contralto si $\flat$  bugle à l'usage des Fanfares et des Collèges* (Paris: Alphonse Leduc, n.d.), 7.

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inside, and its cup diameter was narrower. The bass saxhorn mouthpiece looked like an ophicleide mouthpiece and that of the contrabass in E-flat was larger than that of the bass saxhorn.

Of all primary sources studied, only a tutor by Caussin, which was adopted by military bands in France in 1846,<sup>126</sup> titled *Solfège-Méthode progressif pour l'enseignement du cornet-à-pistons, de la trompette chromatique, saxhorns ou bugle à pistons, du sax-tromba ou trombone alto à pistons*<sup>127</sup> provides some mouthpiece dimensions for the cornet, trumpet, saxhorn contralto (called also *bugle à pistons* in the tutor) and the alto saxotromba in F or E-flat. It should be noted here that the tutor's title can be misleading since it mentions "Solfège-méthode progressif pour [...] du sax-tromba **ou** trombone alto à pistons". In the text Caussin clarifies that the saxotromba in F or E-flat can be considered to be equivalent to the alto trombone due to their identical sounding pitch, although the saxotromba is more sonorous, thus distinguishing the two. Caussin's mouthpiece dimensions are included in Table 4.2 below.

**Table 4.2 Dimensions of mouthpieces as given by Caussin in 1846.**

	<b>Cornet à pistons</b>	<b>Trompette chromatique</b>	<b>Bugle à pistons</b>	<b>Sax-tromba à pistons</b>
Longueur totale	65mm	95mm	65mm	75mm
Largeur du bassin	17mm	18mm	19mm	20mm
Profondeur du bassin	17mm	22mm	20mm	30mm
Epaisseur des Bords	4mm	5mm	4mm	5mm
Largeur du grain vers le bassin	5mm	5mm	6mm	6mm
Largeur vers l'extrémité	8mm	9mm	10mm	10mm

<sup>126</sup> Subille Bellamy-Brown, *Procès-verbaux de l'Académie des beaux-arts* 8 (1845-1849) (Paris: École des chartes, 2008), 497-98.

<sup>127</sup> Paris: Bureau Central de Musique, 1846.

### 4.13 Saxhorn inscriptions

Saxhorn inscriptions more or less followed the style of other inscriptions of brasses and saxophones made in the Sax workshop.<sup>128</sup> Inscriptions in earlier instruments are more concise than those of later instruments. The earliest known surviving instrument from the Sax workshop, the alto saxhorn with the serial number “668” (private collection Jean-Claude Verdié, Toulouse) dates from 1844. This is inscribed “Ad. Sax et C<sup>ie</sup> à Paris “668””, all in script. This inscription style is retained for most brasses and saxophones until about 1854 (see Figure 4.58). Already in 1845, Sax’s monogram trademark (including the initials AS with Paris inscribed on stem of S) started being added to most, but not all, of his instruments (Figure 4.58). The earliest known instrument with Sax’s trademark is a contrabass saxhorn (serial no. 1834) in the Edinburgh University Collection of Historic Musical Instruments (inventory no. 5969). Instruments made for Distin or Rudall, Rose, Carte & Co. have in addition the Distin or Rudall, Rose, Carte & Co. name added to the inscription. Inscriptions of instruments made for these makers are not uniform in style.



**Figure 4.58** Left: early style inscription. Right: Adolphe Sax’s monogram trademark (initials AS with Paris on stem of S). Contrabass saxhorn in E-flat made by Ad. Sax in 1846. Edinburgh University Collection of Historic Musical Instruments (inventory no. 4545). Photographs by Raymond Parks.

In 1854 the term “breveté” (patented) was added to the inscriptions (probably because of the court’s decision of that year to bring back Sax’s 1845 saxotromba patent on force), as was Sax’s title “maker to the military house of the emperor” (F<sup>teur</sup> de la M<sup>son</sup> Mil<sup>re</sup> de l’Empereur) (Figure 4.59).

<sup>128</sup> For more information regarding inscriptions of extant saxhorns see Appendix B.





**Figure 4.59** Left: inscription of an alto saxhorn in E-flat made by Ad. Sax in 1854. Right: Sax's monogram trademark and additional inscription probably punched by the dealer. Edinburgh University Collection of Historic Musical Instruments (inventory no. 4620). Photographs by Raymond Parks.

In 1864 Sax's address was added to the inscription. A contrabass saxhorn in E-flat (serial no. 28017) today in the Musée de la musique (inventory no. E.0705) is the earliest known with the "50 rue S<sup>t</sup> Georges" address included in the inscription.

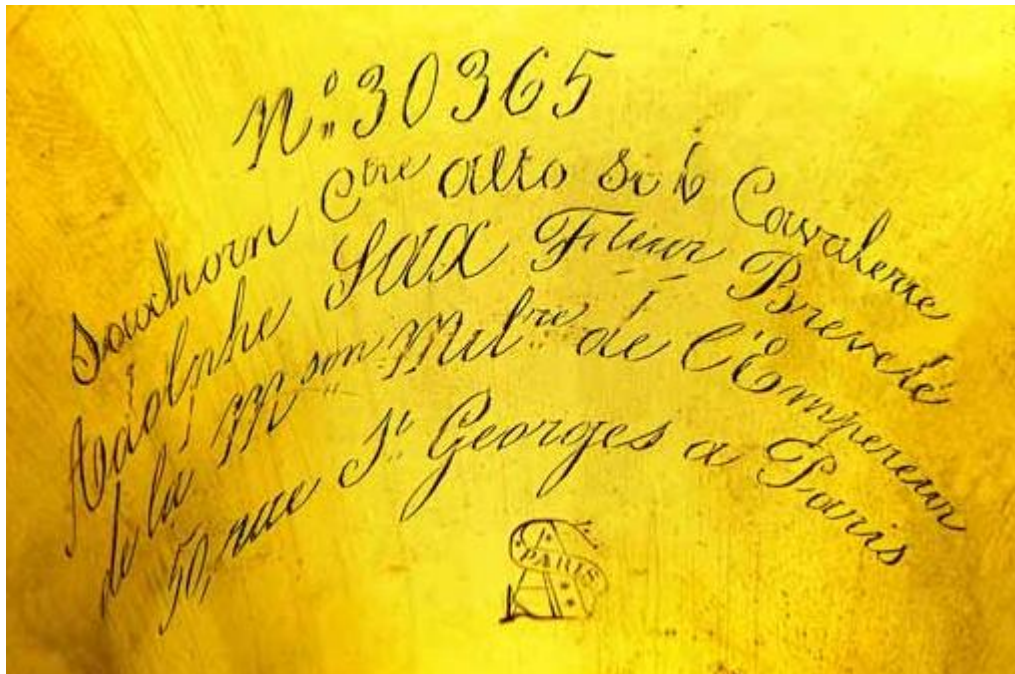
Sax's award at the 1867 exhibition was additionally inscribed on instruments as "SEUL / GRAND PRIX / 1867". Although it is met in instruments whose serial numbers date from the early 1850s, it was stamped consistently from the contrabass saxhorn with serial number 33312 and onwards. Its presence in a considerable number of instruments made before 1867 can be explained by a slow moving stock, at least in some types of instruments.

Sax inscribed the instrument type on his saxophones, throughout his career. There are saxophones with the instrument type and pitch inscribed on their bells from the late 1840s. Model types and pitches were inscribed on saxhorns only during the period 1864-70. One possible explanation could be that this was a way of further protection of his instruments, after the patent expiry in 1865, but this cannot be said with certainty. On the other hand, the majority of saxophones, and most of the licensed saxhorns had their model type inscribed, the former throughout Sax's career and the latter during the whole duration of the license period (1855-65).

The earliest known saxhorn with such an inscription is a nouveau contrabass saxhorn with serial no. 28150 (1864), in the Musée de la musique (inventory no. E.0853). The instrument type, the pitch, and in the case of sopranos and contraltos whether they were cavalry models (namely in upright form) or infantry models

(namely in the bell-front form), and in instruments with independent valves the adjective *nouveau*, were included in the inscriptions throughout that period. Only in a few other brasses from 1865 onwards he inscribed the model type and pitch (such as cornets, trombones etc.). The term “saxotromba” was not inscribed on any surviving instrument. Additionally, as also discussed in Chapter Eight, two saxhorns which according to their bore profile should be classified as basses had the term “baryton” inscribed on their bells, a fact creating some confusion.

A few saxhorns have a type of inscription distinctly different from Sax’s usual inscriptions with script. Such instruments are an alto saxhorn made in 1874 (Brussels, 2008.023) (Figure 4.61), and a baritone made in 1869 (Brussels, 2008.025). It is odd that other instruments which have serial numbers close to the above follow Sax’s usual style. It is not known why there is such a lack of consistency here.



**Figure 4.60** Contralto saxhorn in B-flat made by Ad. Sax in 1865, with the model type, pitch and “cavalerie” designation included in its inscription. Edinburgh University Collection of Historic Musical Instruments (inventory no. 4253). Photograph by Raymond Parks.

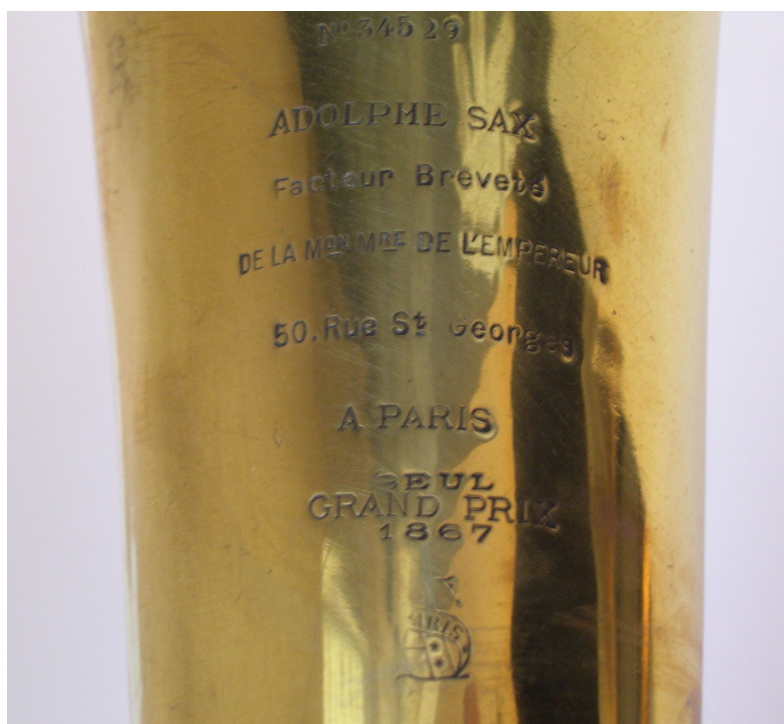


Figure 4.61 Different type of inscription with capital letters and lack of script found in some brasses. Photograph by the author.

#### 4.14 Instruments by Adolphe Sax's son Adolphe-Edouard (Sax fils)

Some brass instruments made during Adolphe Sax's last years of production and during his son's first years present some peculiar features. Some such as a *nouveau* trombone in the Kampmann collection (inventory no. 852), bear the father's address (rue Laffite) and the son's monogram (initials AS with Fils on stem of S). Some have the son's monogram and address (rue Blanche or rue Myrha) inscribed on the bell and the father's monogram on the valves. Among these are some saxhorns with *pavillon tournant* in Paris (inventory nos. E.0713, E.0813, E.0907). Other instruments have the son's address inscribed on the bell and the father's monogram, such as a bass saxhorn in B-flat in the Verdié collection.





Figure 4.62 Left: inscription of a bass saxhorn showing Adolphe-Edouard's address used together with his father monogram (initials AS with Paris on the stem of S). Private collection J.C. Verdié, Toulouse. Right: Inscription of a trombone where Adolphe Sax's address is used together with his son's monogram (initials AS with Fils on stem of S). Private collection Bruno Kampmann, Paris (inventory no. 852).

It is expected that for some time Adolphe Sax and Adolphe-Edouard Sax shared the same premises, as Adolphe Sax and his father, Charles Sax had done in Brussels. It is possible that when Adolphe Sax withdrew there could have been a stock of unsold instruments and instrument parts, which were sold after the son took over the business. Instruments with the father's address and the son's monogram might have been made during the father's time but were sold or made up after the son who then added his monogram. It is possible that when Adolphe-Edouard worked with his father had some instruments made under his responsibility but used his father address and monogram. For instruments bearing the father's monogram on the valve section, and the son's monogram and address on the bell, one explanation would be that these valve sections were made in the father's workshop.

According to Adolphe Sax's testimonies during the lawsuits, his workshop practices were that no instrument parts would be left as unused stock. The maker, even after his 1843 patent when he patented his new design of the Berlin valve, admitted having used some older valve section made before 1843, which did not conform to his new standards. This was to avoid any financial losses.<sup>129</sup> It appears that his son most possibly followed similar principles.

<sup>129</sup> *Cour impériale de Rouen. Drouelle contre Sax. Les amorces tombantes* (Paris: impr. Crété, 1866), 3.

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Instruments made by Adolphe-Edouard show that he abandoned his father's Berlin valves, and used the Périnet valve which were more common at that time. However, he continued using the independent valves for some time, albeit only for trombones. One group of instruments that have retained a strong "Adolphe Sax" style, made by Sax Fils, is that of saxhorns made with a *pavillon tournant*, similar to the father's saxtubas in wrap, but with a more modernized style overall (Figure 4.66).



**Figure 4.63** Adolphe-Edouard Sax playing on a saxhorn. Although, on the reverse of the picture it was noted that he played on a saxhorn made by his father, the instrument looks more like a Sax fils design. The picture which is part of the collection Viollet is a courtesy of Albert Rice.





**Figure 4.64** A view of Adolphe-Edouard Sax's atelier in Paris, c. 1920. The photograph which is part of the collection Viollet is a courtesy of Albert Rice.



**Figure 4.65** Instruments made by Adolphe Sax and his son Adolphe-Edouard being exhibited. The picture was probably taken towards the end of nineteenth or beginning of the twentieth century. Henri Selmer, Paris.



**Figure 4.66** Baritone saxhorn made by Adolphe-Edouard Sax c. 1895-1907. Musée de la musique, Paris (inventory no. E.0813).

#### 4.15 Methods for the saxhorn

A number of methods were published for the saxhorn and saxotromba from the 1840s.<sup>130</sup> Many of them were written by directors of military bands, who also composed a great deal of music for mixed wind and brass bands. The first known methods which included the term “saxhorn” in their title were published in 1846. Five methods only from that year are known. Some of the methods, particularly those regarding the smaller saxhorns, were also for the cornet. Fessy, who was the conductor of Sax’s band in the competition with Carafa’s band in 1845, besides composing some of the music played on that occasion published a method with Arban for the “alto et ténor” saxhorn, meaning the contralto and alto instruments.<sup>131</sup> Caussinus published a tutor which was adopted in 1846 by the military bands.<sup>132</sup> Sax himself published a method titled *Méthode complète pour saxhorn et saxotromba, soprano, alto, ténor, baryton, basse et contrebasse à 3, 4 et 5 cylindres suivi*

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<sup>130</sup> For a list of methods written for the saxhorn see Appendix F.

<sup>131</sup> Alexander- Charles Fessy, Jean-Baptiste Arban, *Méthode complète pour les saxhorns alto et ténor* (Paris: E. Troupenas & Cie, 1846).

<sup>132</sup> V. Caussinus, *Solfège méthode progressif pour l'enseignement du cornet à pistons, de la trompette chromatique, saxhorns ou bugle à pistons, sax-tromba, trombone alto à pistons en 2 parties* (Paris: Bureau Central de Musique, 1846).



*d'exercices pour l'emploi de compensateur*, most possibly in 1847. Although this tutor does not state the year of publishing it is believed that this was 1847, since Sax himself noted that date in his last workshop advertisement from the 1880s. This method was used in the Paris Conservatoire for some decades. After a short introduction on music theory, Sax described the parts of the saxhorn and those of a cornet with his compensator. He gave the compass of all members of the saxhorn family. Besides the usual exercises he included examples on the use of the compensator. His method concluded with some compositions of Kastner and Constant Fauconier for saxhorns. Through this method Sax introduced the usage of same treble clef notation for all saxhorns, even the lower ones, which was followed by some composers of music for *harmonie* or *fanfare*, but not all. Comettant reported that this method was translated into English in the United States without Sax's permission.<sup>133</sup> The tutor which had, and still has, a great impact on the teaching especially of the cornet and trumpet was that published by Jean-Baptiste Arban in 1864 under the title *Grand méthode complete pour cornet à pistons et saxhorn*. Arban was for a long time professor of the saxhorn in the Paris Conservatoire. This method has since been translated into many languages and published in many different countries.



**Figure 4.67** The cover of Blancheteau's saxhorn method published in 1864.

<sup>133</sup> Comettant, *Histoire d'un inventeur*, 525.



## 4.16 Conclusions

The production of saxhorns in the Sax workshop over nearly forty years did not show major changes. Saxhorns were made by Sax in ten sizes, although only seven were produced commercially in large numbers. The *petit saxhorn aigu* in B-flat and *bourdon* saxhorns were the extremes and had a very limited use. What characterized saxhorns were their strong family characteristics: same fingering, same treble clef notation, similar timbre, their uniformity in external appearance, and as reported by Sax's contemporaries their excellent sound qualities. Sax tried to create a homogenous family of instruments, so that brass players could easily switch from one instrument to another of different size. The main distinctive feature of these instruments was their valves, which were a version of the already existing Berlin valve, modified by Sax. By altering the direction and location of the valve tubing, Sax promoted his new valve as having a less defective sound due to the elimination of sharp angles. It appears that Sax was not keen to adopt the Périnet valve, perhaps because during the lawsuits he always claimed to having achieved better results than Périnet in improving the defective Stölzel valves. The Périnet valve appeared in similar instruments made by his contemporaries and was eventually the one which gained broad use. The fact that he found various ways to give a Périnet aspect to his valves by making hybrid valves indicates that he had noticed advantages in the Périnet valve. However, it appears that he wanted to retain this element of his saxhorns (the Berlin valve), since it was one of their distinctive features. His saxhorns were also characterised by their wrap: their bell directed upwards, and the valves were placed parallel to the plane of the bell rim. This wrap known as "saxotromba form" was introduced and promoted by Sax. It continues to the present day in instruments derived from the saxhorns and it is believe that it was evidently originated by Sax. The existence of an actual saxhorn patent is contested. However, Sax was aware of details of copyright law and used it to his advantage. He eventually managed to have many other makers as his licensees for over ten years. It appears that the Parisian brass instrument making scene evolved around Sax's instruments. Saxhorns dominated the market quickly, and became the standard instruments for military and amateur wind bands.

## Chapter Five

### The saxotromba

In 1845 Adolphe Sax was granted a patent for an instrument he called the saxotromba. The exact nature of the saxotromba has been unidentified so far. No extant instrument has to date been identified as a saxotromba with a certainty. In all literary sources references to saxotrombas are brief and they are mostly mentioned as an extinct family of instruments.

Among scholars who have written about the saxotromba were Curt Sachs (1913) who wrote that the saxotromba's bore profile was between that of the saxhorn and the trumpet, and its sound between the softness of the saxhorn and the brilliance of the trumpet.<sup>1</sup> He mentioned that the family extended from *B-Pikollo* to *B-Kontrabass* and that the instrument's range and notation corresponded to that of the saxhorn. Adam Carse (1939) described the saxotrombas as a family made in the same form and pitches as the saxhorn, but intended for use in cavalry bands, due to their upright form. He pointed out the narrower bore compared to that of the saxhorn and described their sound as similar to that of the trumpet or trombone.<sup>2</sup>

This chapter attempts to give an overview of the saxotromba "family" development and cast some light on the problematic aspects of the subject. Among the sources studied regarding the saxotromba are the saxotromba patent of 1845, minutes of the various court cases, illustrations and the introductory part of instrumental methods of the time, instrumentation treatises, and other instruction manuals such as Kastner's *Manuel général de musique militaire*,<sup>3</sup> and Albert Lavignac's *Encyclopédie de la Musique*.<sup>4</sup> The most reliable source is, surprisingly, extant instruments in various private and public collections.

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<sup>1</sup> Curt Sachs, *Reallexikon der Musikinstrumente* (Hildesheim; New York: George Olms, 1979), 335.

<sup>2</sup> Adam Carse, *Musical Wind Instruments* (Mineola, New York: Dover, 2002), 312.

<sup>3</sup> Jean-Georges Kastner, *Manuel général de musique militaire à l'usage des armées françaises* (Paris: E. Didot frères, 1848).

<sup>4</sup> Albert Lavignac, ed., *Encyclopédie de la Musique* (Paris: Librairie Delagrave, 1925).

## 5.1 Early references to the saxotromba

Most of the scholars in the twentieth century and onwards derive information regarding Sax's early brasswind production from Kastner's *Manuel général de Musique Militaire* (1848), a nineteenth-century source accessible to most scholars in the beginning of the twentieth century. It is likely that references to the saxotromba (which as mentioned are mostly brief) draw from Kastner. In Kastner's *Manuel général* in the text and illustrations saxhorns appear as a complete family. Regarding the saxotrombas, Kastner confines his remarks to just mentioning the (alto) instrument in E-flat with three valves which is used in military bands. Only in a footnote it is stated that Sax had created a complete family. In the drawing section three plates are included with saxhorn drawings and one plate with the drawings of instruments of the saxotromba family. This is the only source in which the saxotromba is illustrated as a complete family (see Figure 5.3). The saxotromba family members included in the drawings are the following:

*soprano* saxotromba in E-flat,

*contralto* saxotromba in B-flat,

*alto-ténor* saxotromba in E-flat,

saxotromba in F (E, E-flat),

saxotromba in F (E, E-flat), in a different wrap to the previous one,

*baryton* saxotromba in B-flat,

*basse* saxotromba in E-flat (with the comment that it can also be contrabass).

The earliest known references to the saxotromba date to 1844. According to an engraving published in the weekly newspaper *L'Illustration*<sup>5</sup> in 1844, among other instruments exhibited by Sax in the 1844 Paris National Exhibition was a "sax tromba". However, the instrument depicted does not share the external features of the later saxotrombas; it looks similar to the *contrebasses d'harmonie* from his 1843 patent which shares many external features with Wieprecht's *Basstuba*.<sup>6</sup>

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<sup>5</sup> H. Robert Cohen, ed., *Les gravures musicales dans L'Illustration, 1843-1899* (Québec: Presses de l'Université Laval, 1982-83), 1/47 (4 July, 1844), 296.

<sup>6</sup> For an illustration see Chapter Four, p. 161.



**Figure 5.1 Left: alto in 6½-ft E-flat, Adolphe Sax, Paris, 1855. Edinburgh University Collection of Historic Musical Instruments (inventory no. 4543). This is an example of an instrument with the characteristic wrap “à deux tours”.**

**Right: alto in 6½-ft E-flat, Adolphe Sax, Paris, 1854. Edinburgh University Collection of Historic Musical Instruments (inventory no. 4620). This is an instrument resembling the alto saxotromba in F, E and E-flat from Kastner and other iconographical sources. Both instruments have the wrap where the “valves are parallel to the bell”, as mentioned in nineteenth century sources. If an imaginary line was drawn to link the valve buttons this would be parallel to the plane of the bell rim. Photographs Raymond Parks.**

During the same year (1844) Georges Kastner published the *Supplément*<sup>7</sup> to his *Traité général d'instrumentation*, which had been published in 1837.<sup>8</sup> In the *Supplément* Kastner included entries on the novelties that had occurred since the publication of his *Traité*. Although the *Supplément* was published a year before the issue of Sax's 1845 saxotromba patent, Kastner devoted a section to the *saxo-tromba chromatique*.<sup>9</sup> There the saxotromba's sound was described as being between that of the bugle and the trumpet. The saxotromba, according to Kastner's description,

<sup>7</sup> Jean-Georges Kastner, *Supplément au Traité général d'instrumentation* (Paris: [n.p.], 1844).

<sup>8</sup> Kastner, *Traité général d'instrumentation, comprenant les propriétés et l'usage de chaque instrument, précédé d'un résumé sur les voix, à l'usage des jeunes compositeurs* (Paris: [n.p.], 1837).

<sup>9</sup> *Supplément*, 37-38.

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formed a complete family including the following instruments equipped with three or four *cylindres* (Berlin valves):

*soprano* in F and E-flat

*alto* in C and B-flat

*tenor* or *baritone* in F and E-flat

*basse* in C and B-flat

*contrebasse* in F and E-flat.

In the same *Supplement* the saxhorn family is called *bugle à pistons ou à cylindres* (*flügelhorn*), which ranges from the *petit bugle* in E-flat to the *contrabass* in E-flat. The term “saxhorn” is not used. The differences between the instruments appearing in Kastner’s *Manuel Général de Musique Militaire* and those listed in the *Supplement* concern mainly the instruments in 6-ft F or 6½ E-flat (which became known as alto or tenor, and are called *tenor* or *baritones* in the *Supplement*). In the *Manuel* three different models appear in the register of 6-ft F and 6½-ft E-flat (as opposed to only one mentioned in the *Supplement*): there is an instrument in E-flat with the characteristic wrap with the two turns (Figure 5.1 on the left), where the instrument’s tubing forms two circles after the end of the valve section and before the final expansion of the bell; two other instruments in F appear equipped with crooks to change the pitch to E or E-flat. Both of these are equipped with shanks and crooks and lack the characteristic wrap of the saxotromba with the two turns (Figure 5.1 on the right); this is an indication that the characteristic wrap is not a criterion here for the characterisation of an instrument as a saxotromba. The instrument with the leadpipe on the left side of the bell is according to Kastner destined to replace the horn.

NOUVEAUX INSTRUMENTS DU SYSTEME AD. SAX.

Pl. XX.

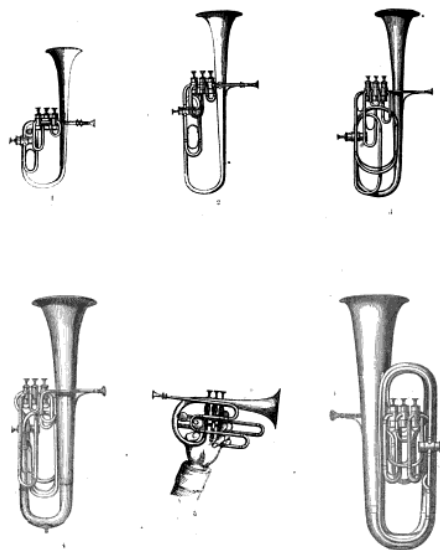


Figure 5.2 Plate XX from Kastner's *Manuel général de musique militaire*, depicting saxhorns equipped with valve tuning slides. From left to right: soprano saxhorn in E-flat (four valves), contralto saxhorn in B-flat (four valves), tenor saxhorn in E-flat (four valves), bass saxhorn in B-flat (four valves), cornet *compensateur*, contrabass saxhorn in E-flat (four valves).

NOUVEAUX INSTRUMENTS DU SYSTEME AD. SAX.

Pl. XXI.

NOUVEAUX INSTRUMENTS DU SYSTEME AD. SAX.

Pl. XXII.

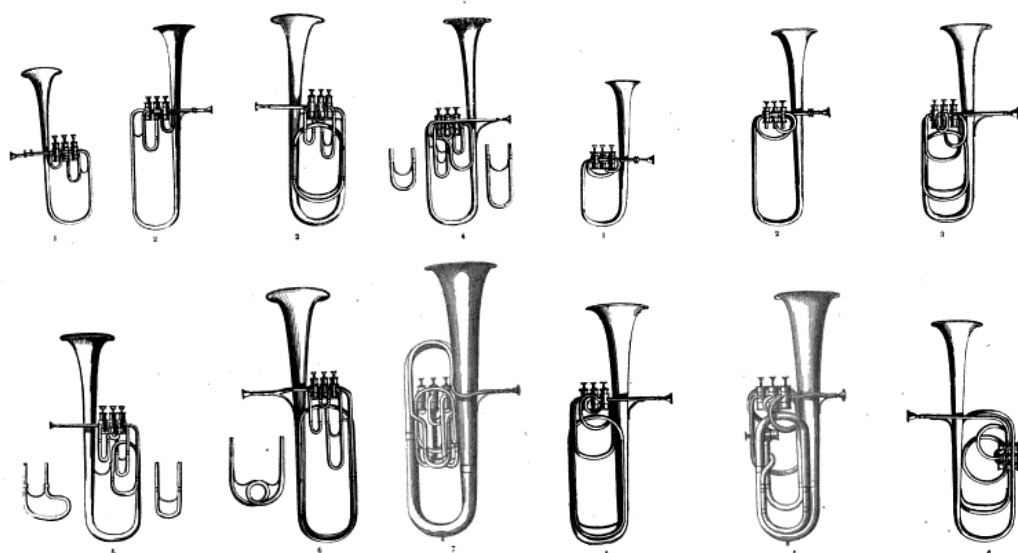


Figure 5.3 Plates XXI and XXII from Kastner's *Manuel général de musique militaire* depicting saxotrombas and saxhorns with and without valve tuning slides, respectively. Plate XXI, from left to right: soprano saxotromba in E-flat, contralto saxotromba in B-flat, alto-tenor saxotromba in E-flat, saxotromba in F (with crooks for E and E-flat) to play the horn part in cavalry bands, saxotromba in F (with crooks for E and E-flat) in different wrap, baritone saxotromba in B-flat, bass saxotromba in E-flat (if necessary contrabass). Plate XXII, from left to right: soprano saxhorn in E-flat, contralto saxhorn in E-flat, tenor saxhorn in E-flat, bass saxhorn in B-flat, bass saxhorn in B-flat (if necessary contrabass), valve trombone. The common form *à deux tours* can be observed in alto and baritone instruments in all three plates (XX, XXI, and XXII).

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Another reference to the saxotromba, prior to the 1845 patent, is that of the instrument maker Finck.<sup>10</sup> Pontecoulant in his *Organographie* has published a series of letters by various notable figures praising Sax's instruments. Among them is a letter by Finck, dated 14 October 1844, in which Finck comments highly on Sax's "new" instruments he had seen in Paris. Among the new instruments, mainly saxhorns, is listed a *sax-tromba* (without the designation of pitch).<sup>11</sup>

However, according to the testimony of a former workman of Sax, named Hubart,<sup>12</sup> it was on the Easter day 1845 (23 March) when the first saxotromba was made. The workman stated that Sax showed him the drawing of an instrument which Sax had designed; this instrument was designed with its tubing forming "two turns" (*deux tours*) instead of one.<sup>13</sup> Hubart testified working non-stop to finish the instrument. It was not before two or three o'clock in the morning when the instrument was finished. Sax was in such a hurry that Hubart was asked to finish the instrument without polishing it.<sup>14</sup> According to both the workman's and Sax's testimony, Sax needed to submit the instrument to the commission<sup>15</sup> on the following day and he did not deny having the workman working during the night and in secrecy.<sup>16</sup>

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<sup>10</sup> Finck of Strasbourg was one of the very early licensees of Sax who signed an agreement with Sax prior to the various court cases and court decisions that obliged the majority of Parisian makers to become licensees of Sax from 1855 onwards.

<sup>11</sup> Pontécoulant, *Organographie: Essai sur la facture instrumentale. Art, industrie, et commerce* (Paris: Castel, 1861): 2:234-35.

<sup>12</sup> Hubart was an instrument maker; he was thirty-seven years old in 1858. He was based in passage Chausson, 5, in Paris. Hubart was described by Sax's counsel for the defence as a small manufacturer and as one of those copying Sax's instruments. He worked for Sax during 1844-1848 and 1851-1855. He also worked for Besson. See, *Affaire Sax. Pièces justificatives contenant : 1 ° Les enquêtes et contre-enquête des 30 Juillet et 13 août 1858 ; 2 ° La contre-enquête du 27 Mars 1856 ; 3 ° Les déclarations, attestations, lettres, certificats et autres documents venant s'ajouter aux enquêtes* (Paris: N. Chaix, 1860), 13.

<sup>13</sup> *Défense de M. Besson contre M. Sax: Enquête, contre-enquête et jugement avant faire droit rendu par le tribunal le 13 août 1858* (Paris: H. S. Dodney-Dupré, 1858), 65.

<sup>14</sup> "Vous apporterez votre marteau demain. C'était un dimanche ; j'ai travaillé le dimanche, et il m'a dit : Vous finirez l'instrument dans le limer ni le gratter parce que j'en ai absolument besoin demain." See, *Défense de M. Besson contre M. Sax*, 39-40.

<sup>15</sup> This commission was organized in 1845 so as to invite instrument makers in Paris to suggest instruments appropriate for military bands which needed to be re-organized. On 22 April 1845, the band of Sax competed against that of Michele Carafa, the director of the *Gymnase de musique militaire* of Paris in the *Champ de Mars*. Sax organized his bands with instruments from his own workshop. Sax won the contest and this resulted in acquiring a monopoly of providing French military bands with musical instruments.

<sup>16</sup> *Défense de M. Besson contre M. Sax*, 39-40.

The workman's testimony contradicts the information on early references to saxotromba. It is possible that Sax had made different versions of the saxotrombas before the final model (which was made by Hubart) was presented to the commission in March 1845, and was later included in the drawings of the patent. Hubart's testimony does not specify the pitch and the exact size of the instrument he made. Finck's letter does not specify instrument size, either. Thus, it is possible that Finck's letters and Hubart's testimony referred to instruments of different sizes.

## 5.2 The saxotromba patent

A few months later, in October 1845, Sax applied for a fifteen-year patent concerning the invention of the saxotromba, whose form with small modifications could be applied to saxhorns, cornets, trumpets, and trombones.<sup>17</sup> The novelties of this patent, in Sax's view and as recorded in the patent text, were:

- The invention of the saxotromba, as an instrument and as a form. Saxotrombas were made for musicians of the cavalry. They were made in upright form (namely the bell pointing upwards). They could be held between the player's left arm and left side, and the bell was slightly tilted from left to right, so that the player did not risk being hit by the horse's head and vice versa. The right hand was free to operate the valves.
- The application of the saxotromba form to saxhorns, trumpets, cornets and trombones.
- All the instruments of this new system could be fitted with crooks and shanks to change the pitch, something that was not possible with all instruments of Sax's 1843 patent.
- The addition of a fourth valve to the instruments that needed an extension of their range in the lower register.

Although according to the patent's title the subject matter is the saxotromba, only two of the instruments included in the patent drawings are saxotrombas (figs. 1 and 3 of Figure 5.4). Most of them (nine) are saxhorns in various pitches (figs. 5, 5+,

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<sup>17</sup> French patent no. 2306, 13 October 1845, for "un instrument de musique dit Saxotromba, dont la construction, au moyen de légères modifications, peut être appliquée aux Sax-horns, cornets, trompettes et trombones."



6, 7, 8, 9, 10, 11, 12 of Figure 5.4). Three (previously known) instruments in saxotromba form are also depicted (cornet fig. 14, trumpet fig. 16, trombone fig. 17 of Figure 5.4).

This patent is more extensive than the 1843 patent and Sax comments on the drawings in more detail than in his previous patent. A very important aspect regarding the saxotromba is that Sax gives some measurements of bore widths of various points—not precisely specified—in the instruments presented in the drawing section. It is explained that saxhorns are wider than saxotrombas.<sup>18</sup> The two saxotrombas appearing in the drawing sections are an alto in (6½-ft) E-flat, and a baritone in (9-ft) B-flat. There is also a note concerning the contrabass saxhorn in E-flat (fig. 9 of the patent), according to which, this specific instrument is of wider proportions than the saxotromba of the same pitch. However, no drawing in this patent illustrates the contrabass saxotromba.

Sax did not specify on the instrument's tubing the exact points of given bore diameters. In various lawsuit documents he mentioned a number of times that since the scale is included in the patent it should not be difficult to determine the position of the points.<sup>19</sup> On the patent drawings Sax noted that instruments were drawn to scale 1:4 and valve details to scale 1:2, but there is no graphical scale included. Since the copies currently available to the public from the *Institut nationale de propriété industrielle* in Paris are not in the same size as the originals, the exact scale in today's copies cannot be derived. Also, in the patent Sax did not specify whether the diameters are external or internal. A couple of references appear in the *Rapport de M. l'expert Surville* (1860) concerning the diameters;<sup>20</sup> in this document a comparison is given between the drawing of instruments included in the 1845 patent and actual instruments made by Sax and other makers:<sup>21</sup>

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<sup>18</sup> Important aspects of this patent regarding the saxhorns are discussed in Chapter Four.

<sup>19</sup> See for example, *Rapport de M. l'expert Surville Ingénieur: Déposé le 18 février 1859 et dire de M. Sax* (Paris: impr. Centrale des Chemins de Fer de Napoléon Chaix et Cie, 1860), 27.

<sup>20</sup> Surville, an engineer was appointed by the court so as to deal with the originality of Sax's saxotromba patent and to examine whether other Parisian makers had manufactured copies of Sax's instruments.

<sup>21</sup> "Ces instruments seront groupés dans l'ordre donné aux prévenus par le jugement du 13 août, et examinés dans le même ordre. Ils seront comparés d'abord avec le saxotromba de M. Sax, au point de vue de leurs formes, de leurs dispositions et de leurs dimension intérieures." See, *Rapport de M. l'expert Surville*, 6.

These instruments are grouped in the order given by the defendants according to the judgement of 13 August, and are examined in the same order. First they will be compared with the saxotromba of Mr. Sax, from the point of view of their form, their arrangement and their interior diameters.

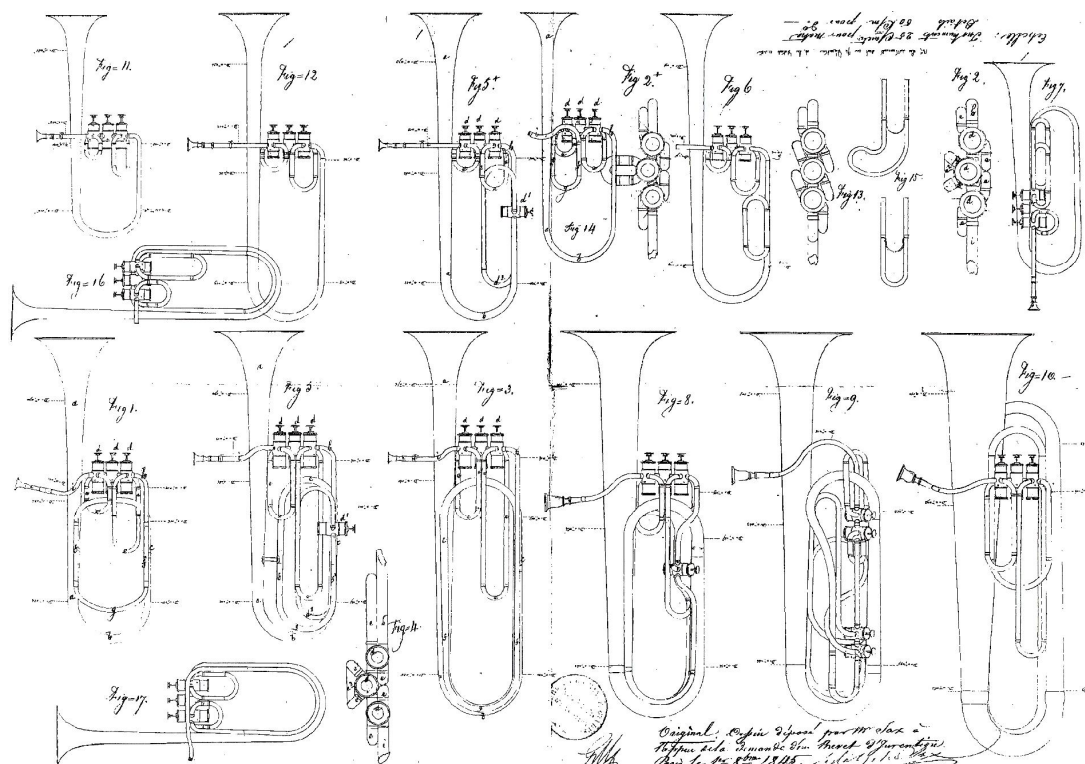


Figure 5.4 The drawing section of the 1845 saxotromba patent. From left to right: fig. 11 small saxhorn in E-flat, fig.12 contralto saxhorn in B-flat, fig. 5+ Contralto saxhorn with four valves, fig. 14 cornet in saxotromba form, fig. 2+ valve section with the middle valve tubing not bent, fig. 6 saxhorn in A-flat, fig. crooks for the saxhorn in A-flat, fig. 2 detail of the valve section, fig. 7 saxhorn in A-flat, fig. 16 trumpet in saxotromba form, fig. 1 saxotromba in E-flat, fig. 5 [alto] saxhorn with four valves, fig. 3 baritone saxotromba in B-flat, fig. 8 [bass] saxhorn in B-flat, fig. 9 saxhorn, fig. 10 contrabass saxhorn in E-flat, fig. 17 tenor trombone in B-flat in saxotromba form, fig. detail of valve section of the baritone saxotromba.

A few pages further in the document one reads:

These instruments were divided according to their length, and as indicated by the drawings accompanying the patent, so as to point out the diameters corresponding to those mentioned in the patent and those compared between them. The diameters thus were taken in the exterior of the tube; it was impossible to take directly these diameters in the interior. The comparison with the diameters indicated in the patent had to be done in this way, since these indications are those of the external diameters. The difference between these diameters and the interior diameters of which talks the judgment of 13 August 1858 appeared unimportant, since it would only be the double thickness of the metal sheet employed in the manufacture of the instruments, sheet that is the same for all and that does not have more than half a millimetre thickness.<sup>22</sup>

<sup>22</sup> "Ces instruments ont été divisés selon leur longueur, d'après la division indiquée au dessin joint au brevet, pour relever les diamètres correspondant à ceux portés dans le brevet et les comparer entre eux. Les dimensions ainsi prises ont été relevées à l'extérieur du tube ; il eût été tout à fait impossible de prendre directement ces dimensions à l'intérieur. La comparaison avec les diamètres indiqués au

Therefore, according to the latter the diameters included in the tables of comparison in the *Rapport de M. l'expert Surville* are considered to be the external.

Sax in the patent gives only measurements for the saxhorns and saxotrombas, and not for the cornet, trombone and trumpet of form saxotromba included in his drawings, since the proportions of these instruments were not altered. The proportions of a saxhorn in A-flat, in the bell front form, are not given either, but it is indicated that this instrument is made according to the conditions announced in the patent of 1843, with the additional feature of shanks and crooks for changing the pitch and tuning slides.<sup>23</sup> The number of points with given diameters are different for the alto and baritone instruments. For the alto saxotromba in E-flat there are seven points, and for the baritone saxotromba there are six. For the alto saxhorn there are seven as well. No baritone saxhorn is included in the patent.

Some issues concerning the alto saxhorn are unclear and should be discussed here. First of all, the term “alto saxhorn” is not used by Sax. For figure 5 of the patent drawing (see fig. 5 of Figure 5.4) he only uses the term “saxhorn”, without the definition of the pitch or exact instrument type. It is assumed that this is an alto instrument by excluding any other possibilities, and by the length of the tube and the size of the instrument overall, which is the same as that of the saxotromba in E-flat.

In Table 5.1 the diameters of the two alto instruments (a saxotromba and a saxhorn) are compared.<sup>24</sup> The differences in diameters between the two altos are considerable from about half way until about the ninety percent of total tube length. As a result, since the difference of diameter at mid-point length is so great, it may even be a sufficient criterion in itself for characterizing an E-flat instrument as saxhorn or saxotromba.

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brevet devait se faire ainsi, puisque ces indications sont celles des diamètres extérieurs. La différence entre ces diamètres et les diamètres intérieurs dont parle le jugement du 13 août 1858 a paru insignifiante, puisqu'elle ne serait que de la double épaisseur de la feuille métallique employée à la fabrication des instruments, feuille qui est la même pour tous et qui n'a pas plus d'un demi-millimètre d'épaisseur.” See, *Rapport de M. l'expert Surville*, 9.

<sup>23</sup> For more on the alto saxhorn in A-flat see Chapter Four, p. 156.

<sup>24</sup> The percentages have been rounded.

**Table 5.1** Diameters of the alto saxotromba and alto saxhorn from the 1845 patent drawing section. The locations of diameters have been calculated by the author.

Alto saxotromba		Alto saxhorn	
Location of given diameter (percentage of total tube length)	Diameter in millimetres	Location of given diameter (percentage of total tube length)	Diameter in millimetres
0.4%	11	1.4%	13
13%	12	13%	14
51%	16	53%	21
59%	20	61%	27
71%	24	73%	32
82%	34	85%	44
93%	70	94%	70

In the patents and during the various court cases, Sax often stated that the difference between the saxotromba and the saxhorn, as far as proportions are concerned, was the saxotromba's narrower bore.<sup>25</sup> It is not clear, though, whether the alto saxhorn would customarily have these particular proportions or if it is this particular type of instrument with the fourth valve that is constructed in such way. Sax notes in the patent that this is a "saxhorn with four valves great width, for the second part. This instrument has a volume of sound more considerable, fuller, if I can make my self clearer in this way: it descends as low as the lips allow."<sup>26</sup>

If the only criterion for differentiating between a saxhorn and saxotromba was bore diameter, then an inconsistency occurs: the contralto saxhorn is represented in the drawing section by two different models, a three-valve instrument, and a four-valve wide-bore instrument constructed, as described, after the same system as the four-valve alto saxhorn above. The analogy between the four-valve alto and the four-valve contralto is also shown by similar numbering of their figures (5 and 5+ respectively). Would not this mean that the narrow bore contralto should be called a saxotromba? It is not. Therefore, there must be an additional criterion for Sax for designating an instrument as a saxotromba.

The wrap of the instrument's tubing is probably another condition after which a saxotromba is defined, at least in this early period. The characteristic wrap with the two turns mentioned in Hubart's testimony, is observed both in the alto and baritone

<sup>25</sup> See for example in the description of the 1845 patent where he mentions that "saxhorns are of larger proportions than the saxo-tromba" ("les saxhorns ont des proportions plus larges que le saxo-tromba").

<sup>26</sup> "Sax-horn à quatre cylindres grande largeur, pour seconde partie. Cet instrument a un volume de son plus considérable, plus gros, si je puis m'exprimer ainsi : il descend aussi bas que les lèvres le permettent."

saxotrombas of the drawings. It therefore appears that in this early stage an instrument should be possibly classified as a saxotromba if both criteria of a narrow bore and of the characteristic wrap *à deux tours* occur.

Regarding the baritone saxotromba, it is observed that even in the 8/9-ft register there is a similar analogy: there is the narrow-bore baritone saxotromba and its wide-bore counterpart, the four-valve bass saxhorn. The baritone saxotromba presents both the features of a narrow bore, and the characteristic wrap with the double turn. Thus, in the same way as in the other registers, Sax presents a narrow-bore instrument and a wider-bore one with four valves; he creates an analogy similar to instruments of the alto and bass registers.

### 5.3 Information from later patents

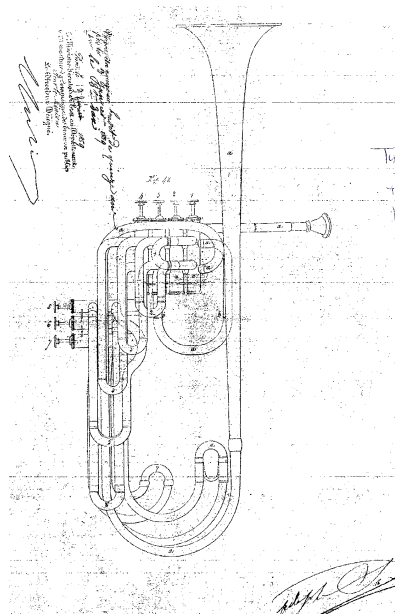
The term “saxotromba” is used by Sax a number of times in his patents after 1845, especially when he is discussing the saxotromba form, meaning instruments with upwards pointing bell, and the valves parallel to the bell (see Figure 5.1).

A number of times there is confusion: through Sax’s writings it is difficult for us to understand when he talks about instruments in saxotromba form or the actual instrument saxotromba. There is an example in his 1859 patent<sup>27</sup> where Sax discusses the application of the independent system valve to the instruments in saxotromba form. In a drawing description Sax mentions that the instrument illustrated in saxotromba form is equipped with seven valves, without specifying what kind of instrument this is. Later on referring again to the same instrument, which looks like a typical alto saxhorn with independent valves (see Figure 5.5) Sax calls it a “saxotromba” and not a saxhorn in saxotromba form.<sup>28</sup>

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<sup>27</sup> French patent 39371, 3 January 1858 for “dispositions applicable to brass musical instruments”.

<sup>28</sup> “La feuille 7, figure 42, représente un instrument forme saxotromba avec les sept pistons ascendants de mon système. Le 7eme piston qui existait dans les figures 42 et 43, n’avait pour but que de permettre d’arriver au fa naturel, et par conséquent, en donnant au Saxotromba les 7 positions du trombone à coulisses, de jouer la partie de trombone même sans rencontrer d’obstacle.”



**Figure 5. 5 Instrument from the 1859 patent described by Sax both as instrument in saxotromba form and as saxotromba.**

Further on in the same patent (as discussed more extensively in Chapter Three), Sax joins together two instruments of different pitch. The innovation is that the two instruments are joined together sharing part of the same bell. Discussing the example of a contralto and that of an alto he suggests joining them together giving them both a more extensive range and all the advantages of the saxotromba: facility of fingering and facility of playing both while marching or while on a horse. It is also stated that the saxotromba has almost the same mouthpiece as the two instruments discussed. Again here it is not clear what Sax meant by the term “saxotromba”; did he mean an instrument of certain proportions and form, or just an instrument in upright form?

## 5.4 Evidence from other sources

**The military band reforms.** Here, a summary will be given as for the nomenclature of the instruments of the alto/tenor and baritone register included in ministerial decisions regarding the various military band reforms.<sup>29</sup> Table 5.2 contains the nomenclature used for the description of the instruments at question as provided by the various sources.

**Table 5.2 The nomenclature used in the various military decrees for instruments of the alto/tenor and baritone register.**

	Infantry	Cavalry
<b>1845 Ministerial decision</b>	Alto saxhorns en mi bémol Saxhorns en si bémol (à trois ou à quatre cylindres)	Saxhorns en mi bémol, pour remplacer les cors Saxo-trombas Saxhorns en si bémol baryton (à trois cylindres)
<b>1848 Ministerial decision</b>	Clairon chromatique en si bémol (ténor) Basses chromatiques en si bémol à quatre cylindres	Clairon chromatique en mi bémol Clavicors en mi bémol (ténors) Basse chromatique en si bémol (baryton), à trois cylindres
<b>1854 Ministerial decision</b>	Saxotromba mi bémol Saxhorns barytons si bémol	Saxotrombas altos mi bémol Saxotrombas barytons si bémol
<b>1860 Ministerial decision</b>	Saxotrombas altos, mi bémol Saxhorns barytons, si bémol	Saxotrombas altos mi bémol Saxotrombas barytons si bémol
<b>1873 Ministerial decision</b>	Saxotromba alto Saxhorn baryton	
<b>1898 Ministerial decision</b>	Saxotrombas altos en mi bémol Saxhorn barytons	

It is worth pointing out that the competition between Sax's and Carafa's bands took place in April 1845. The nomenclature found in all sources for the description of the alto and baritone instruments of the particular contest does not include the term "saxotromba". All sources mention that Sax's band included alto and baritone saxhorns. As mentioned before, if Hubart's testimony was accurate, Sax should have had at his disposition –at least – the alto saxotromba, which had been completed by the end of March 1845, about a month before the open air contest. However, the final ministerial decision for the composition of the bands of the

<sup>29</sup> See Appendix E for the ministerial decisions regarding the usage of saxhorns in French army bands throughout the nineteenth century.

cavalry included both alto saxhorns and saxotrombas. The pitch of the saxotrombas was not defined.

After the political changes of 1848, and according to a new ministerial decision, the nomenclature changed again with a new decision so that it was not favourable to any particular maker. Here the term “clairon chromatique” was used for describing all members of the saxhorn family; this term, as will be discussed later, was adopted by some composers of the time and writers of instrumental tutors.

What was new about the ministerial decision of 1854 is the use of the term “saxotromba alto” for both the bands of the infantry and the cavalry. For the baritone instruments there was a differentiation between saxhorns and saxotrombas. The picture is the same in the decree of 1860. In April 1867 the French cavalry bands were eliminated as an unnecessary cost. In the decree of 30 May 1873, alto saxotrombas were still included in the military bands, whereas only baritones appear from the saxhorn group. The same applies to the ministerial decree of 1898.

**Evidence from the various instrumental tutors and music of the time.**<sup>30</sup> A great number of instrumental tutors (especially from the second half of nineteenth century) survive. Many are written for the complete family of saxhorns and are not specified for particular members of the saxhorn or saxotromba family. However, there is a small number written for specific instruments. A few characteristic examples will be discussed here. An attempt was also made through the study of the music written for brass bands to investigate further the problem and to study the nomenclature the composers of the time have used for the description of the instruments in question. A large collection of music for wind (*harmonies*) or brass bands (*fanfares*) can be found in the Département de Musique of the *Bibliothèque Nationale de France*, in Paris.

The picture is bewildering. A general observation is that different terminology is used depending on the period of publication. Most composers and authors of instrumental tutors tried to comply with the official nomenclature established by ministerial decisions. The same can be said for the various product catalogues.

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<sup>30</sup> See Appendix F for a list of methods about saxhorns and related instruments.



## Chapter Five

It appears that in 1846, shortly after the patent of October 1845, a number of methods on the saxhorns appeared. The information drawn from the instrumental tutors on the saxotromba's identity is confusing. In some cases saxotromba is considered as the version of the alto saxhorn with the bell up (without taking into consideration Sax's statement regarding saxotrombas' bore profile). Such an example is Forestier's *Méthode complète pour les saxhorns ou bugles en mi<sup>b</sup> aigu, soprano, en si<sup>b</sup>, contralto, en mi<sup>b</sup> grave alto ou ténor, ou saxtromba ou trombone alto à 3 cylindres* (1846).<sup>31</sup> In the section dealing with the instruments' form Forestier writes that the form given to the saxhorn is that of the *bugle ou clairon de voltigeurs et chasseurs d'Orléans*, a form particularly convenient for musicians of the infantry.<sup>32</sup> He adds that as this form is not very suitable for musicians of the cavalry, due to the bell extending near the head of the horse, and to avoid any accidents, an instrument with the bell up has been designed; this is the saxotromba. It is further explained that instead of the term "saxotromba", which could have been dispensed with, the term "saxhorn à pavillon en l'air" could have been used. This view, though, does not take into consideration Sax's statement regarding the bore profile difference between saxhorns and saxotrombas. In Forestier's later method written for the instruments with independent valves (*Monographie des instruments à six pistons et tubes indépendants*)<sup>33</sup> no mention of the saxotromba is made at all.

Another early method is one written by Victor Cornette (1846).<sup>34</sup> This is a collection of methods for the various members of the saxhorn family, but primarily a method for the soprano saxhorn in E-flat. The first page contains the one and only drawing in the book. The drawing is almost identical to the drawing of the alto saxotromba from the 1845 patent. The only addition is two supporting rings for the fingers, placed before and after the valve section (Figure 5.6). The name saxotromba is not mentioned at all either in the title or in the actual contents of the book.

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<sup>31</sup> Joseph Forestier, *Méthode complète pour les saxhorns ou bugles en mi<sup>b</sup> aigu, soprano, en si<sup>b</sup>, contralto, en mi<sup>b</sup> grave alto ou ténor, ou saxtromba ou trombone alto à 3 cylindres* (Paris: [n.p.], 1846).

<sup>32</sup> Ibid., 2.

<sup>33</sup> Joseph Forestier, *Monographie des instruments à six pistons et tubes indépendants. Etudes pratiques et théoriques pour le nouveaux système de Mr. Adolphe Sax* (Paris: Ad. Sax, 1870).

<sup>34</sup> Victor Cornette, *Collection de méthodes élémentaires de saxhorn* (Paris: Schonenberger, 1846).

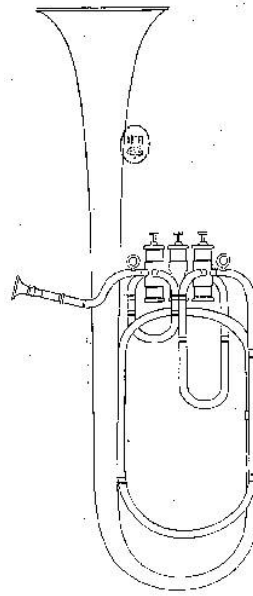
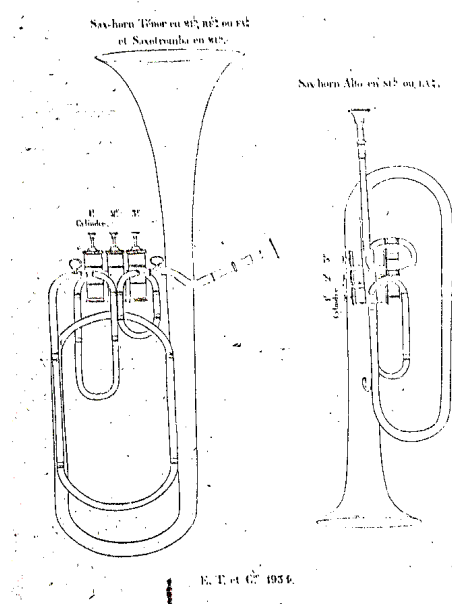


Figure 5.6 Alto instrument from Victor Cornette's method (1846).

The same year (1846) Alexander-Charles Fessy<sup>35</sup> and Jean-Baptiste Arban published a method titled *Méthode complète des saxhorns alto et ténor*. Here, the information drawn from the tutor's introductory section contradicts the illustrations. In the introduction it is stated that the method can be used both for the alto saxhorn in B-flat (he obviously means the contralto), which is at the same pitch as the cornet in B-flat, and for that in E-flat which is at the same pitch as the horns in E-flat. It is mentioned that the saxhorn in A-flat and the saxotromba are members of the same family as the preceding ones; therefore the method can be used for these instruments as well, implying that they are separate instruments, although they belong to the same family. This last statement becomes more ambiguous by the illustration which follows. Two instruments are depicted, a bell-front instrument in B-flat called *saxhorn alto* in B-flat or A (which is actually a contralto as already mentioned), and a bell-up model, identical to the alto saxotromba from the 1845 patent and to that from Cornette's method, described as *Sax-horn ténor en Mi♭, Ré♯, ou Fa♯, et saxotromba en mi♭*. The above implies that the tenor saxhorn and the saxotromba in E-flat are considered the same instrument.

<sup>35</sup> Alexander Fessy at the time was *Chef de musique* of the 5<sup>th</sup> Legion of the National Guard of Paris.



**Figure 5.7** The illustration from Fessy's and Arban's method.

Adolphe Sax himself published a method titled *Méthode complète pour saxhorn et saxotromba, soprano, alto, ténor, baryton, basse et contrebasse à 3, 4 et 5 cylindres suivi d'exercices pour l'emploi de compensateur* (Paris: Brandus et Cie, 1847). It is characteristic that besides its reference in the method's title, saxotromba is only mentioned a couple of times in the text in a very generic manner, and in the same way that other instruments are mentioned. No mention is made of the saxotromba when the list of instruments included in the saxhorn family is given together with details on their range. What is more, in a separate plate additional information is given on the tenor saxhorn; the illustration (Figure 5.8) depicts an instrument identical to the alto saxotromba but no mention is made of the saxotromba.

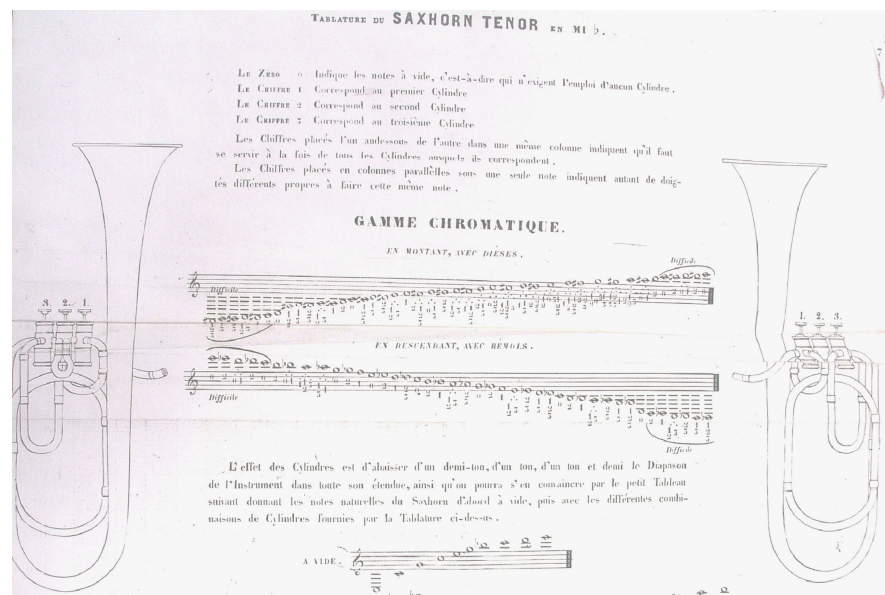


Figure 5.8 The illustration of the alto/tenor saxhorn from Sax's method.

A. Brick (1862) wrote a method for the instrument in  $6\frac{1}{2}$ -ft E-flat (Figure 5.9) with the title *Méthode de clairon chromatique alto mi $\flat$ , saxhorn ou saxotromba*. The introductory paragraph mentions that the *clairon chromatique alto en Mi $\flat$*  is meant to be used for the parts of the horn in the military bands; the *bugle alto mi $\flat$* , the *saxotromba*, the *clavicor mi $\flat$* , the *saxhorn alto mi $\flat$*  are all successively names in use for designating this instrument. The instrument depicted, though, does not have the characteristic wrap of saxotromba à deux tours and in general does not look like a typical Sax instrument.

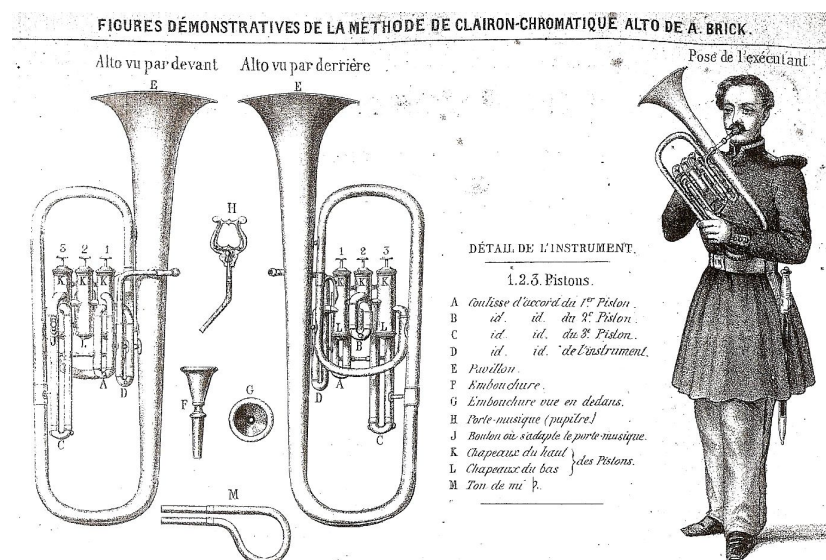


Figure 5.9 Drawing from Brick's 1862 method.

In Schiltz's *Méthode de clairons chromatiques ou sax-horns à pistons ou à cylindres* (Paris: Paul Dupont, 1852) the term "saxotromba" is not used at all. Six instruments are depicted as the members of the *clairon chromatique* family (Figure 5.10). The military decree of 1848 coming shortly after the political changes in France was not favourable to Sax. The War Minister Rumigny, a supporter of Sax, had no power anymore. Michele Carafa, Sax's rival, had connections with the republican government, and had some influence in that all instruments of Sax were excluded from the new band composition.<sup>36</sup> In the ministerial decision of 21 March 1848 the saxotromba was called *clairon chromatique*,<sup>37</sup> as well as all instruments of the saxhorn/saxotromba group. The "sax" prefix was removed from all instrument names.

The alto instrument in Schiltz's method has the characteristic wrap *à deux tours* although with Périnet valves. The picture from his works (see Table 5.3 below) is different. The term "clairon chromatique" does not appear at all, whereas all known names for the alto instrument in E-flat are used. It is odd, though, that four of his works included in the table were published in the same year and all four of them used four different terms for the instrument, among them the term "saxotromba".

Gautrot aîné et Cie in their 1850 product catalogue<sup>38</sup> make clear that all instruments of the saxhorn group were called *clairons chromatiques* which was the official term in use for saxhorns and *flugelhorns* in the *Gymnase de musique militaire* in Paris and all regimental bands. This explanation is probably added because musicians, composers and makers were not very familiar with the term "clairon chromatique". The study of various nineteenth-century British instrumental tutors revealed no mention of the alto or baritone saxotromba.

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<sup>36</sup> Haine, *Adolphe Sax*, 106.

<sup>37</sup> *Adolphe Sax demandeur en condamnation pour contrefaçon contre les sieurs Besson, Raoux, Halary, Buffet jeune, Buffet-Crampon, Tournier et Goumas, Martin frères, Beauboeuf, Victor Jacob, et autres. Audiences des 30 juillet et 13 août 1858, 5 août, 13, 22 et 29 décembre 1859, 5, 12, 19, 26 janvier, 2, 9 et 16 février 1860. Enquête, contre-enquête et plaidoiries. Audiences du 23 février 1860 : requisitoire de M. Mahler* (Paris: impr. centrale des Chemins de Fer de Napoléon Chaix et Cie, 1860), 69.

<sup>38</sup> *Manufacture générale d'instruments de musique Gautrot Aîné & Cie, Album et catalogue* (Paris: Plista, 1850), 10.



Figure 5.10 The first page of Schiltz's method depicting the members of the saxhorn family.

The picture from the compositions for brass instruments is equally confusing. Fessy in addition to the various saxhorn methods composed a number of military marches for wind band. He composed works performed by Sax's band in the 1845 Champs de Mars competition.<sup>39</sup> Three of these works were located and studied: *Pas Redoublé*, *Fantaisie*, *Deuxième Fantaisie*. All of them were composed in 1845 and were published by Sax's publishing house. The term saxotromba is not mentioned in any of the scores. Instead, for the instrument in 6½-ft E-flat the terms "Saxhorn en Mi<sup>b</sup>", "Saxhorn en Mi<sup>b</sup> alto" and "Saxhorn in E<sup>b</sup> ténore" are used. In his later compositions until 1854 the picture is the same, with the exception of one work of 1846 containing the term "saxotromba", and discussed further down. The term "saxotromba" appears in two works composed in 1857, and 1858, where it is specified that these works were composed for the new composition of the bands of the Imperial Guard of Paris according to the 1854 military decree. In *Les Maréchaux*

<sup>39</sup> See Appendix G for a reproduction of a work by Fessy.

*de l'Émpire*<sup>40</sup> the term “sax-tromba ténore” appears, whereas in the *Caroline Valse*<sup>41</sup> the hybrid term “Sax-horn Tromba en Mi♭” is used, probably indicative of the confusion among the composers themselves as for the instrument’s identity. Also, the term “alto” on its own was used often; this was observed both in some of the examples studied and was mentioned a number of times during the various lawsuits.

Kastner, in addition to his theoretical works mentioned earlier in this chapter, was active as a composer. Among others he composed nine *livres partitions* (extended essays followed by music inspired by the preceding text). Most of these were located and studied by the author.<sup>42</sup> The preference for Sax’s instruments by Kastner is an immediate observation. *Le voix de Paris* (1857) presents an important feature.<sup>43</sup> The extended essay on the literary and musical history of Paris is followed by a musical composition described by Kastner as *grande symphonie humoristique vocale and instrumentale* titled *Le Cris de Paris*. One part of this symphonic work is titled “Musique d’Infanterie”; there, along with woodwind instruments made by Sax, Kastner has scored for Sax’s brasswinds. The saxhorn band is comprised of saxhorns in all registers, from the *soprano saxhorns* in B-flat to the *contrebasse saxhorns* in B-flat. In the place of alto saxhorns appear two *Sax-trombas* in E-flat. In a following part titled “La marche –Musique de cavalerie” Kastner has only scored for a brass band. There, both alto saxhorns and alto saxotrombas appear. Most of the compositions studied contain parts either for the alto saxhorn or the alto saxotromba and only two have been located which include parts both for the alto saxhorn and the alto saxotromba. The other work known to contain parts both for the alto saxhorn and the alto saxotromba is Fessy’s *Bolero et Fanfare* written in 1846—as stated on the title page—“for the new instruments invented by Sax”.

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<sup>40</sup> The title page mentions: “À Monsieur Mongin Colonel du 1<sup>er</sup> regt de Voltigeurs de la Garde Impériale, Les Maréchaux de l’Émpire Pas Redoublé pour défilier avec tambours. Composé pour la nouvelle Ordonnance des Musiques de la Garde Impériale”.

<sup>41</sup> The title page mentions: “À Monsieur Douay Colonel du 2<sup>e</sup> Régiment de Voltigeurs de la Garde Impériale, Caroline Valse, pour Harmonie Militaire d’infanterie d’après de Nouvelle Ordonnance, 1857, Paris”.

<sup>42</sup> Copies of these works are part of the collections of the Glasgow University Library and the *Bibliothèque Nationale de France* in Paris.

<sup>43</sup> Jean-Georges Kastner, *Les voix de Paris: Essai d’une histoire littéraire et musicale des cris populaires de la capitale depuis le moyen âge jusqu’à nos jours, précédé de considérations sur l’origine et le caractère du cri en général et suivi de Les cris de Paris grande symphonie humoristique, vocale et instrumentale* (Paris: G. Brandus, Dufour et Cie, 1857).

As described above, Kastner in his *Supplement* presents the saxotromba as having a range more extensive in the upper register; in “Marche” of the *Cris de Paris*, contrary to what would be expected, and although for most of the time there is a blending and crossing of voices, there is a tendency for the alto saxhorns to play in a slightly higher register than the saxotromba. The same observations can be made for Fessy’s work as regards the way in which the composer deals with the instruments’ range.<sup>44</sup> In Table 5.3 terms met in nineteenth-century compositions for brass to describe the alto instrument in 6½-ft E-flat are summarised.

**Table 5.3** Here are summarised the terms used by various composers of several nineteenth-century works for the alto instrument in 6-ft F or 6½-ft E-flat throughout a period of about thirty five years. Fessy’s works *Pas Redoublé*, *Fantaisie*, *Chœur d’Eyryanthe* and *Deuxieme Fantaisie* were especially written for Sax’s band to be played during the competition between Sax and Carafa in April 1845. *Les Maréchaux de l’Émpire* and *Caroline Valse* were written for instruments announced in the military decree of 1854.

Composer	Work	Date	Nomenclature
Fessy A.	<i>Pas Redoublé</i>	1845	Sax-horn en Mi♭
Fessy A.	<i>Fantaisie</i>	1845	Sax-horn en Mi♭ alto
Fessy A.	<i>Six Grands Morceaux composé pour Musique de Fanfare</i>	1849	Saxhorn alto Mi♭
Fessy A.	<i>Chœur d’Eyryanthe</i>	1850	Saxhorn en Mi♭
Fessy A.	<i>Deuxieme Fantaisie</i>	1850	Saxhorns en Mi♭ Ténors
Mohr J.	<i>L’Alsacienne valse</i>	1851	Tromba
Mohr J.	<i>Le Parisien</i>	1851	Tromba
Mohr J.	<i>Ouverture d’Oberon</i>		Tromba
Fessy A.	<i>Prière Anglaise</i>	1854	Saxhorn Mi♭
	<i>No1 God Save the King,</i> <i>No2 Rulle[sic] Britannia</i>		
Fessy A.	<i>Les Maréchaux de l’Émpire</i>	1856	Sax-Tromba Ténore en Mi♭
Fessy A.	<i>Caroline Valse</i>	1857	Sax-horns Tromba en Mi♭
Kastner J. G.	<i>Le Cris de Paris</i>	1857	Saxtromba alto Saxhorn alto
Blancheteau	<i>Les Allies</i>	1857	Alto ou saxhorn Mi♭
Schiltz	<i>Le Tirailleur</i>	1858	Saxhorn ou alto Mi♭
Schiltz	<i>Le Camp de Salon</i>	1858	Alto Mi♭ and saxhorn Mi♭
Schiltz	<i>Marche Funèbre</i>	1858	Saxhorn contr alto Mi♭
Schiltz	<i>Marche de L’Étendard</i>	1858	Sax-horn ou alto Mi♭
Schiltz	<i>Le Bivouac</i>	1858	Saxotromba en Mi♭

<sup>44</sup> See Appendix G for reproductions of Kastner’s “Le Marche-Musique de Cavalerie”.



## Chapter Five

Blancheteau	<i>L'Alsacienne</i>	1864	Saxhorn alto Mi $\flat$
Mohr J.	? No 98	1867	Bugle Trombas Mi $\flat$
Mohr J.	<i>Polonaise</i>	1867	Bugle ? Mi $\flat$
Neukomm S.	<i>Domine Salvum Fac Imperatorem</i>	1868	Sax tromba Mi $\flat$
Schiltz (ar.)	<i>Marche Funèbre</i> de Beethoven	1868	Saxhorn alto Mi $\flat$
Schiltz (ar.)	<i>Roméo et Juliette</i> de Gounod	1868	Saxhorn alto Mi $\flat$
Schiltz	<i>Hymne de Garibaldi</i>	1869	Saxhorn alto Mi $\flat$
Boscher A.	<i>La lyre Villageoise, La Bohémien</i>	1870	Alto Mi $\flat$
Blancheteau	<i>Le Berger de Coulommiers</i>	1872	Alto Mi $\flat$
Blancheteau	<i>L'amboisien</i>	1876	Alto Mi $\flat$
Boscher A.	<i>La Lyre Villageoise, Léona</i>	1880	Alto Mi $\flat$

It appears that the composers and authors of tutors in many cases tried to comply with the standards in nomenclature set by the various military officials. This is anticipated since it probably helped to avoid confusion created by any discrepancies between the terminology used by the military officials for the description of the instruments and that used by composers in the actual scores and instrument methods.

### 5.5 Evidence from the measurements

As mentioned previously, the accompanying drawing section of the patent gives measurements of bore widths in various –not precisely specified– points in the instruments.

**Methodology.** The present author tried to develop tools for the effective use of the given measurements: the drawings of the saxotrombas illustrated in the patent were enlarged and measured with a tape measure in a similar way as actual instruments are measured. Then, it was calculated at which percentage of total tube length the points with the given diameters were located. Then the diameters were compared with measurements of existing instruments and with those of the saxotrombas whose measurements were discussed during the lawsuits. The bore diameter of surviving instruments was measured at various points as close as possible to the ones specified by Sax in his patent. The mouthpiece length was not taken into consideration for calculating the total instrument length from the drawings, although it is possible that

Sax took into consideration the mouthpiece when he gave the points. Since we have almost no evidence at all on the kind of mouthpieces used it was considered safer not to calculate the mouthpiece length in the total theoretical length of the instruments in the drawing. It is believed that this does not affect the quality of reliability of the measurements or the degree of the error since the same method was consistently followed for all drawings and instruments. Additionally, it should be mentioned that bore widths of actual instruments used for the comparison are the external ones due to reasons explained previously in this chapter.

The 1860 military decree, which designated the composition of the military bands, contained drawings of the proposed instruments; these drawings contained given diameters at only three points of the total tube length. It is surprising that the given points are only three, the first one near the mouthpiece receiver, and the two others at the last third of total tube length, exactly the part of the instrument that Sax maintained does not affect the timbre and quality of sound significantly.

### 5.5.1 Alto instruments

The measurements of the alto saxotromba and those of the alto saxhorn from the patent were compared with those of six surviving instruments; the measurements of two instruments presented in court are known through the *Rapport de M. l'expert Surville*. These were also used for the comparison. Table 5.4 shows the comparison between the known measurements from real instruments and the 1845 patent drawing measurements. Table 5.5 shows a comparison between the measurements taken from the 1860 military decree and those of the surviving instruments.

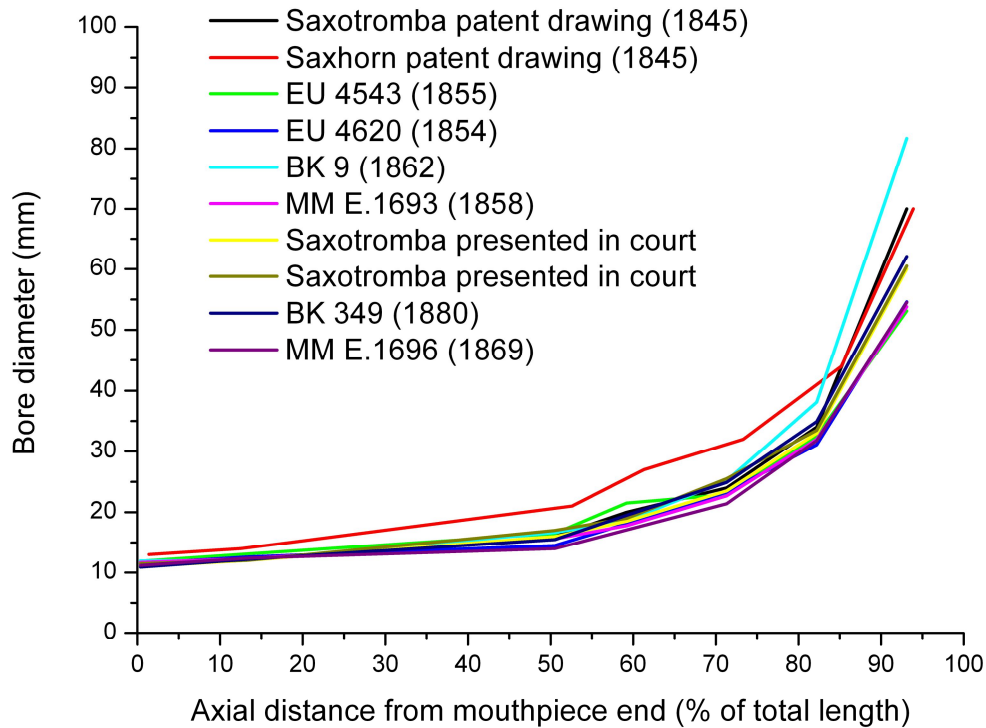
**Table 5.4 Comparison of dimensions of instruments included in the patent, alto saxotrombas presented in court and surviving alto instruments made by Sax. All dimensions are given in millimetres. The date of manufacture for the two saxotrombas presented in court derives from their serial number. We know, through the *Rapport de M. l'expert Surville*, the serial numbers of the two instruments examined, which were 16214 and 17312, placing them in 1857 and 1858 respectively.**

Saxotromba (1845 patent)	Saxhorn (1845 patent)	Saxotromba presented in court (1857-58)	Saxotromba presented in court (1857-58)	Alto EU 4620 (1854)	Alto EU 4543 (1855)	Alto MM E.1693 (1858)	Alto BK 9 (1862)	Alto MM E.1696 (1871)	Alto BK 349 (1880)
11	13	11	11.5	11.5	11.9	11.7	12	11.2	10.9
12	14	12	12	12.6	13.1	12.3	12	12.4	12.2
16	21	16	17	14.5	16.5	15.6	16.7	14	15.5
20	27	18.5	29	18.1	21.5	17.8	18.6	17.1	19.5
24	32	23.5	25.5	23.3	22.9	22.7	25.2	21.4	24.9
34	44	33	33.5	31.3	32.6	32	38.1	31.8	34.9
70	70	60	60.5	54.6	53.1	53.8	81.7	54.5	62.1

**Table 5.5 Comparison of dimensions of instruments included in the drawing section of the 1860 military decree and surviving instruments.**

Percentage of total tube length	Alto saxotromba in the 1860 decree	Alto EU 4620 (1854)	Alto EU 4543 (1855)	Alto MM E.1693 (1858)	Alto BK 9 (1862)	Alto MM E.1696 (1871)
0.7%	13	11.5	11.9	11.7	12	11.2
72%	24	23.2	23.2	23	25.7	21.4
89%	42	41.8	41.8	41.8	38.8	41.5

In both tables it is observed that measurements of surviving alto instruments, so far considered to be saxhorns, fit very well with measurements of the saxotrombas from the drawings; also, the alto saxhorn in the drawings appears to be too wide and it does not fit with measurements of surviving instruments thought to be alto saxhorns (see also Graph 5.1).



**Graph 5.1** Plot of bore profiles of alto instruments in 6-ft F and 6½-ft E-flat made by Adolphe Sax. Surviving instruments from the Sax workshop are being compared with instruments presented in court and the measurements of the alto saxhorn and alto saxotromba from the 1845 patent drawings. The difference between the alto saxhorn from the patent (red line) and the saxotromba (black line) from the patent is immediately obvious. The bore profiles of surviving instruments and those of the two saxotrombas examined in court are very similar to that of the alto saxotromba from the patent.

This, according to the present author's view, proves that alto saxotrombas are not actually extinct, as so far believed. It appears that either the alto saxotrombas were merged with the saxhorn family and even supplanted the alto saxhorns, if there was ever a clear distinction between the two, or there was never an actual distinction between the two as far as bore profile—at least—is concerned. No extant instruments made by Sax seem to fit with the measurements of the alto saxhorn drawing in the 1845 patent.<sup>45</sup> The existence of both a narrow and wide bore instrument in the 6-ft and 6½-ft register is expected. It is believed that the alto saxotromba was nothing more than the narrow bore alto instrument.

The measurements seem to be consistent in the first two-thirds of total tube length. There is a deviation in the last thirty percent of the instrument's tube. This is

<sup>45</sup> A few altos made by other makers later in the nineteenth century appear to be of wider dimensions. See Chapter Eight Table 8.15, pp. 359-60.

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the case both for instruments presented in court and surviving specimens. However, this is something that Sax was aware of. He had pointed out a number of times that the last part of the tube's expansion does not affect significantly the instrument's quality of sound.<sup>46</sup> Sax said that the bell could even be removed completely. This last part of the instrument can be modified without any disadvantages. He said that the last part of the instrument's tubing could be modified according to the taste of the customer. Deviations in the first two-thirds of the instrument are more critical; however, small variations might also occur in this part and these are attributed to the difficulties of manufacture.<sup>47</sup>

The location of the third point of given diameter in the patent is very close to the mid-point of total tube length, and it permits the use of the mid-point as a criterion on its own for the comparison between surviving instruments and the "ideal" instrument presented by Sax in the patent. In Table 5.6 there are compared alto instruments by Sax in 6-ft F or 6½-ft E-flat according to their diameters at mid-point of total tube length.

**Table 5.6** Here there are compared mid-point diameters of some surviving alto instruments by Sax in 6-ft F and 6½-ft E-flat with the mid-point diameters of the alto saxhorn and alto saxotromba included in the 1845 patent drawings. All diameters are given in millimeters.

Collection no.	Instrument	Pitch	Date	D <sub>min</sub>	D <sub>mid</sub>
-	Alto saxotromba-1845 patent	6½-ft E-flat	-	-	16.0
-	Alto saxhorn-1845 patent	6½-ft E-flat?	-	-	<b>21.0</b>
JV S1	Alto <sup>48</sup>	6½-ft E-flat	1844	11.1	14.9
V 7166	Alto	6½-ft E-flat	1848	11.0	15.6
LHC 91	Alto (with crook)	6½-ft E-flat	c. 1850	9.5	16.1
EU 887	Alto	6-ft F	c. 1850	11.4	13.0
EU 4620	Alto	6½-ft E-flat	1854	10.5	15.4
EU 4543	Alto	6½-ft E-flat	1855	10.9	16.2
MM 1693	Alto	6½-ft E-flat	1858	10.1	15.7
BK 9	Alto	6½-ft E-flat	1863	10.3	16.6
BM 2469	Alto	6½-ft E-flat	1865	10.8	16.3
JC 112	Alto	6½-ft E-flat	1866	9.0	16.0
MM 1696	Alto (E-flat slide)	6½-ft E-flat	1871	9.9	15.0
BK 349	Alto	6-ft F	1879	10.4	15.4

<sup>46</sup> Surville, *Rapport*, 50-51.

<sup>47</sup> Ibid.

<sup>48</sup> According to the owner this seems to be a very altered model.

As can be observed none of the instruments examined approaches the diameter at mid-point length of the alto saxhorn. Therefore, it can be argued that the present day tenor horn of the British brass band is the offspring of the saxotrombas and not of the alto saxhorn. Sometimes players in British brass bands just use the term “saxhorn” for the tenor horn, and this, as characteristically said by Clifford Bevan,<sup>49</sup> is an irony since this might be the instrument that is probably a saxotromba and not a saxhorn.

### 5.5.2 Baritone instruments

As mentioned earlier, the 1845 patent contained no drawing of the baritone saxhorn, but only one drawing of a baritone saxotromba. Table 5.7 presents the proportions of this instrument as given in the patent drawings.

**Table 5.7 Proportions of the baritone saxotromba from the 1845 patent. The percentages of total tube length where the diameters are given have been calculated by the author.**

Location of given diameters (percentage of total tube length)	9%	54%	66%	74%	89%	96%
Diameter in millimetres	14	17	20	26	40	74

A major problem with the baritone group is the small number of surviving instruments. Only five baritones of the surviving ones have been examined in an appropriate way for comparison. No baritones from the early period are known. Table 5.8 presents the comparison of the patent measurements with those of surviving instruments.

**Table 5.8 Comparison of measurements of surviving instruments and of the baritone saxotromba from the 1845 patent. All dimensions are given in millimetres.**

Saxotromba (1845 patent)	Baritone saxotromba presented in court in 1858 <sup>50</sup>	<i>Nouveau</i> baritone MM E.0803 (1866)	Baritone OB 662 (1867)	Baritone BK 756 (1866)	Baritone MM E.1695 (1869)	Baritone BK 721 (1885)
14	14	14.4	12.5	14.2	13.4	13.2
17	17	26.7	17.5	19.8	18.4	19.4
20	21	32.6	21.4	21.8	21.1	22.3
26	27	35.4	25.1	26.8	27	27.4
40	45	59.2	26.1	31.7	46.5	47.4
74	80	99	76	78	74	77.8

<sup>49</sup> Personal communication with the author, September 2007.

<sup>50</sup> The serial number of this instrument is known through the court minutes to be 17219, placing it, thus, in 1858.

The saxotromba patent (1845) included no baritone saxhorn in the drawings. In table 5.8 the *nouveau* instrument (instrument with independent valves) is very different from the other instruments and from the measurements given by Sax in the patent; this approaches the bore profile of the bass instruments of the same pitch. The other four instruments show a close proximity to the measurements of the patent. As observed in instruments of the alto group, at the distal end of the tube there is a great divergence. Table 5.9 shows the comparison between surviving instruments and the instrument included in the 1860 military decree.

**Table 5.9 Comparison of dimensions of the baritone saxotromba included in the 1860 military decree with those of some surviving baritone instruments.**

Percentage of total tube length	Baritone saxotromba/saxhorn 1860 decree	MM E.0803 (1866)	BK 756 (1867)	MM E.1695 (1869)	BK 721 (1885)
2%	13	13.4	12.6	12.5	12.9
73%	28	34.7	26.3	24.5	26.8
90%	54	60.1	47.1	46.9	48.1

Table 5.9 more or less presents the same picture as Table 5.8. A few issues arise on the interpretation of the above comparisons. Firstly, one of the baritone instruments that show proportions similar to the baritone saxotromba is stamped by Sax as “*Baryton saxhorn*”. In the 1860 military decree the same drawing with the same given diameters appears in the composition of the cavalry bands and those of the infantry as baritone saxotromba and baritone saxhorn, respectively.<sup>51</sup> This could have been a mistake of the copyist of the drawings or just another indication that there was never an actual difference in bore profile between the instrument called by Sax a baritone saxotromba in his patent and the instrument that later became known as the baritone saxhorn.

To conclude, evidence suggests that the alto and baritone saxotromba were the narrow-bore counterparts of the alto and bass saxhorn, respectively. Surviving instruments of the alto and baritone register fit very well with the patent measurements of the alto and baritone saxotrombas. The term “baritone saxotromba” appears to have vanished earlier than the term “alto saxhorn”. It is likely that the term “baritone saxhorn” was used instead of the “baritone saxotromba”, since as shown in the 1845 patent no baritone saxhorn was included at that time. Since there

<sup>51</sup> See Appendix E for a reproduction.

was already a wide-bore instrument at the 8-ft/9-ft register there was no actual reason for retaining both terms.

## 5.6 Inscriptions

Another source that could provide further information is inscriptions on instruments. As mentioned in Chapter Four Sax stamped the model type on his saxhorns between 1864 and 1870. Most surviving alto instruments whose name is stamped on their bell are *nouveau saxhorns* stamped “*Nouveau Saxhorn alto en mi♭*”. It appears that Sax preferred the term “saxhorn” for alto instruments with the independent system valve. There is one exception among the surviving instruments of an instrument stamped “*Saxhorn alto en mi♭*” which was part of the Karl Burri private collection (near Bern). Although this instrument was not accessible for close examination, through its picture we can tell that its external appearance is identical to other surviving instruments of that kind. If its measurements fitted with measurements of other surviving altos and consequently with the measurements of the alto saxotromba from the patent drawings, it would be a further proof of Sax’s not being consistent with instrument designation. No other alto instrument with regular valves from the period 1864-70 is known to survive. In the same way both surviving baritone instruments that come from 1864-70 are inscribed “*baryton saxhorns*”, even in cases where their measurements show that they are essentially saxotrombas and not saxhorns. As a result, instrument inscriptions can not be used as a criterion for distinguishing between saxhorns and saxotrombas.

## 5.7 Other supporting evidence for the identification of the alto saxhorn as the alto saxotromba

This theory seems to be supported by other evidence. The form of surviving alto instruments also fits with that of the saxotrombas of the drawings. In the surviving product catalogues from Sax’s workshop not a single saxhorn alto in E-flat is depicted, although they are included in the list of instruments for sale. Only alto saxhorns in A-flat appear. In contrast, there is an abundance of saxotrombas in this pitch.



In the last surviving product catalogue from Sax's workshop, dating from the 1880s, there are lists of instruments for sale and their prices. In the section of the saxhorns no alto saxhorn is included. Instead, alto saxotrombas appear for sale in the saxhorn list. The only alto saxhorns appearing in the catalogue are the *nouveau alto saxhorns*, saxhorns with independent valves, and alto saxhorns with valves and keys (patented in 1859). Surviving *nouveau* saxhorns, however, do not appear to have different proportions compared to alto instruments at the same pitch with ordinary valves (with the exception of the two *nouveau* baritones which are essentially bass saxhorns as discussed in Chapter Eight). It is possible that Sax used the name "saxhorn" more as a generic term and not as a term describing an instrument of certain proportions. The name "saxotromba" appears to have been preferred for instruments with the regular valves (as opposed to independent). Interestingly enough, in the first list saxotrombas are available for sale in two forms: instruments with the bell-up (*à pavillon en l'air*) and instruments in the bell-front type (*forme horizontale*). This contradicts the various sources considering the alto saxotromba as the version of the alto saxhorn with the bell up, and Sax's statements in the 1845 patent and elsewhere that the characteristic of the saxotromba was its special form of having an upright bell, which made the instruments particularly suitable for musicians of the cavalry. From this brochure comes an illustration of an alto saxotromba with a *pavillon tournant* and three Berlin valves (Figure 5.11). There is no mention in this advertisement of the term "baritone saxotromba".



Figure 5.11 Alto saxotromba *à pavillon tournant* from Sax's last product catalogue.

Also, Sax's orchestra in 1854 included no players of the alto saxhorn, only one player on the alto saxotromba. The composition of this ensemble was given in the *Musical World* as follows:<sup>52</sup>

M. Mohr : chef-d'orchestre and composer.

Flute: Brunot, solo; octave flute: Léon Magnier, solo.

Oboe: Barthélemy ; solo, J. Boulu.

Small clarinet: Weber, solo; Lépine, solo.

Clarinets: Mimart, solo ; Rouillon, Fabre, Parès, Lerouge, Limberger, Barbu, Boutmy, Leudé.

Saxophones: Auroux, soprano, solo ; Rose, basso solo.

New bass clarinet: Duprez.

Small saxhorns in E flat: Trien, solo, Cahen.

Sax horns contralto in B flat: Schlotmann, solo, Brick.

Sax-trombas in E flat: V. Bonnefoy, solo; P. Bonnefoy, F. Bonnefoy, A. Massart.

Sax-horns baryton in B flat: Bruneau, Cerclier, jun.

Bass sax horns in B flat: Holtzem, Moreau.

Contra-basso sax horn in E flat: Dantonnet.

Grand sax horn contra-basso in B flat: Dortu.

Cornet-à-pistons: Arban, solo, Ory, solo. Lallier.

Horns: H. Massart, Weber, jun.

Trumpets à cylindres: Guignery, Debarde, Raguet.

Trombones: François, Lecomte, Sauret.

Kettle-drums: Nicolle.

Big-drum and cymbals: Mohr fils. Castanets. Triangle, and tambourine.

The literature offers very little supporting evidence for the alto saxotromba's merging with the saxhorn family. The *Royal Military Exhibition Catalogue*<sup>53</sup> refers to the *saxtrombas* which "formed a complete family, but only that in E-flat or F,

<sup>52</sup> "Orchestra of M. Sax" *Musical World* 32, no. 1 (7 January, 1854): 11

<sup>53</sup> Charles Russell Day, *A Descriptive Catalogue of the Musical Instruments Recently Exhibited at the Royal Military Exhibition, London, 1890* (London: Eyre and Spottiswoode, 1891), 197-98.

which was used to replace the horn in military bands, remained in practical use.” Another reference appears in Lavignac’s encyclopaedia of 1925, which in essence expresses the same idea. Soyer wrote that “one of these individuals, the alto saxotromba in E-flat, still exists and will continue to exist perhaps until the end of time”.<sup>54</sup> He continued to describe what all other sources indicate. He said that the term “saxhorn alto” was used instead of the term “saxotromba alto” to describe the same instrument in the everyday language of musical instrument makers, musicians, conductors and others. It was in military circles that the term “alto saxotromba” continued being used for longer. However, with the abolition of the cavalry bands in France in 1867 even the limited use of the term stopped. This resulted in that a large number of brass instruments ended up in the bands of the infantry that had no need at the time of such a large number of instruments.<sup>55</sup>

## 5.8 Conclusions

The evidence for the saxotromba forming a complete family with members ranging from the highest to the lowest register is not convincing. As the patent suggests it is possible that Sax at first envisaged having in the contralto, alto and bass registers both narrow-bore and wide-bore instruments. The contralto register included the narrow and four-valve wide instruments, the alto register was comprised of the narrow-bore saxotromba and the four-valve wide-bore saxhorn (which appears to never have been produced commercially by Sax, at least in large numbers or for any extended period of time), and at last the bass register of the narrow-bore baritone saxotromba and the wide-bore four-valve bass saxhorn. In the beginning, it was probably necessary to have the combination of two attributes for denominating an instrument as a saxotromba: the narrow bore and the characteristic wrap of the instrument with the bell up and the two turns. Its usual appearance in the various nineteenth-century instrumental tutors was an alternative name for the alto saxhorn. In the music of the time the use of the term “alto saxhorn” or “ténor saxhorn”

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<sup>54</sup> “Pourtant, un de ces individus, le saxo-tromba alto mib, existe encore et continuer peut-être d’exister jusqu’à la consommation des siècles !” See, M.-A. Soyer, “Saxhorn”, in *Encyclopedie de la Musique et dictionnaire du Conservatoire*, ed. Albert Lavignac and Lionel de La Laurencie, “Des instruments à vent: De leur principe” (Paris: Librairie Delagrave, 1927), 3:1457.

<sup>55</sup> Charles Pilard, *Les inventions Sax dans les musiques militaires et à l’orchestre* (Paris: impr. Verl, 1869), 8-9.

predominates; the term “alto saxotromba” appears less often, whereas sometimes hybrid terms, combination of the two, such as “saxhorn tromba” or “bugle tromba” were used, probably indicative of the confusion prevailing among the composers themselves. The term “baritone saxotromba” has not been located in any of the compositions studied. The term “saxotromba” appears in 1845 in the ministerial decisions that designated the composition of the military bands, and particularly the composition of the bands of the cavalry. In 1848 both the term “saxhorn” and “saxotromba” were excluded from the nomenclature of the instruments used in the military bands, and were re-introduced in 1854 with a new ministerial decision; the term “saxotromba” was employed for alto instruments used both in the bands of the infantry and the cavalry and the baritone only when it was used in the cavalry bands. References to the baritone instrument became fewer with time, and the term “baritone saxhorn” appeared more often, until the term “baritone saxotromba” vanished. The exact time cannot be specified, but after 1867, when the bands of the cavalry were abolished, there was no real need for the term, especially since the evidence from the measurements (Tables 5.4, 5.5 and 5.8) shows no actual difference between the baritone saxotromba and the baritone saxhorn. Sax, though, retained and preferred the term “saxotromba” for the alto instrument until later in the nineteenth century. However, the use of the term became looser since, as seen in his last product catalogue, it was also used for instruments of the bell-front type, despite the original patent for both for its proportions and for the characteristic wrap with the bell up and the valves parallel to the bell. Although both the alto and the baritone saxotromba seem to have been the immediate predecessors of the tenor horn and the baritone horn respectively, only the term “alto saxotromba” seems to have been used to a greater extent throughout the nineteenth century. However, the confusion among makers, writers, musicians and composers appeared from the very first appearance of the instrument, since as it seems, Sax himself was never clear about the exact identity of the saxotromba. This problem recurs among nineteenth-century brass instrument makers since very often they attempted to introduce “innovations” that lacked originality. Consequently, the existence of a saxotromba family was definitely a fiction, although the existence of alto and baritone saxotrombas as individuals is

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definitely a fact. These survive in various public and private collections but are known as alto or tenor and baritone saxhorns.

## Chapter Six

### Saxhorns outside France

This chapter deals with the diffusion and usage of saxhorns outside France. Saxhorns became well-known in Britain through the Distin family, soon after their appearance in Paris around 1843. The popularity of the Distin family was a factor that made an unquestionable contribution to the popularisation of saxhorns in Britain and their subsequent establishment as important instruments in the composition of British brass bands. Another country where saxhorns became very popular was the United States of America. Although evidence shows that Sax-style saxhorns were being imported into the United States by the mid-1840s, the Distin family's arrival in that country in the beginning of 1849 resulted in the further promotion of the saxhorns, both as far as the actual instruments are concerned and the term. It was at that time that they started becoming known by the name "saxhorn", which eventually became associated with over-the-shoulder instruments, especially during the American civil war, even though Sax was never known to have made instruments in this form and saxhorns in this form were never known to have been used in France or elsewhere in Europe. Although, in Germany and Austria, instruments of the general type, such as flugelhorns and bass tubas pre-existed, saxhorns were made in these countries by a limited number of makers for export. In Italy, the country of the well-known maker Pelitti, saxhorns were not used either.

#### 6.1 Saxhorns in Britain

The spread of saxhorns in Britain is associated with John Henry Distin and his family's brass ensemble. Very little introductory information will be included here regarding the Distin family, since the story of the Distin family has been previously dealt with elsewhere.<sup>1</sup> John Distin, a fine trumpet player, together with his four sons (George, Henry, William and Theodore), formed a brass quintet that started touring Britain in 1837.<sup>2</sup> In April 1848 George Distin died and the quintet became a

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<sup>1</sup> Adam Carse, "Adolphe Sax and the Distin Family", *Music Review* 6 (November 1945): 197.

<sup>2</sup> "Provincial Concerts", *Musical World* 6, no. 66 (16 June, 1837): 14.

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quartet; the ensemble resumed performing and touring within a few months of George's death. According to a letter that John Distin sent to the *Musical World*,<sup>3</sup> he had to re-arrange all their music. William, who up until that time played the second contralto, took up the bass in the place of George.



**Figure 6.1** The famous lithograph by Bagniet depicting the Distin family in 1845. From left to right: George (baritone saxhorn), Henry (contralto saxhorn), John (soprano saxhorn), Theodore (alto saxhorn), and William (flugelhorn in B-flat). The lithograph is a courtesy of Arnold Myers.

Their tours in 1837 started in Scotland, but in the years to follow they travelled around the world. In 1844 they reached Paris. At this time the family had decided to start their own musical-instrument making business in London, so they hired an interpreter and visited all the well-known instrument makers of the French capital. In the spring of 1844 Berlioz organised a concert at the *Salle Herz* in Paris where an ensemble performed. The ensemble consisted of a trumpet, a cornet, a clarinet, a bass clarinet, a saxophone played by Sax and a saxhorn (improved bugle) played by the famous Jean-Baptiste Arban. John Distin was astounded by the saxhorn's sound and the day after the family visited Sax.<sup>4</sup> They borrowed three instruments from Sax, a soprano in E-flat, a contralto in B-flat and an alto in E-flat, tested them and were enthusiastic about the results. A new set was ordered, and soon

<sup>3</sup> "Original Correspondence", *Musical World* 21, no. 38 (16 September, 1848): 604.

<sup>4</sup> Carse, "Adolphe Sax and the Distin Family", 194.

they started performing on these instruments. From here the story is far from clear and has two versions. According to the Distins, it was Sax who begged them to promote his instruments since they were so successful in their concerts.<sup>5</sup> According to Sax's biographers, and especially Oscar Commetant, it was the Distins that begged Sax to allow them to use his improved instruments because their concerts had not been successful.<sup>6</sup> According to an article titled "The Famed Distin Family. Career of the Great Saxhorn Quintet" where Henry Distin's description of his family's history is quoted, it is mentioned regarding the Distin concerts after the employment of Sax's saxhorns that "from that time the Continental tour of the Distins, was a succession of triumphs".<sup>7</sup> No matter what the actual events, what it is important is that the Distins came back to Britain with a brand new set of saxhorns.

The English readership had already been informed on the Distins' connections with Sax and the "adoption" of the saxhorns before the Distins' arrival in Britain and while they toured in Germany.<sup>8</sup> The English correspondent wrote in October 1844:<sup>9</sup>

In February 1844, they [the Distins] met with a newly invented instrument, named a Sax-horn; so called from the maker, Mr. Adolphe Sax which they found capable of producing the most extraordinary effects. In consequence of this discovery, they gave up their old instruments, and in a short time, were able to perform upon the Sax Horn with such effect, that after playing at several great concerts in Paris, they were presented with two splendid silver medals [...] They afterwards had the honour of performing before his Majesty Louis Philippe, and other members of the royal family [...] we are informed that the "Sax horn" combines all the best qualities of the cornet, trumpet, and French horn, being capable of producing the most delicate piano, and the most tremendous, yet pleasing, tones.

According to all sources, saxhorns were first officially introduced in Britain by Sax himself in October 1844 in a series of concerts organised at the Royal Adelaide Gallery in London. Sax himself with Arban and Dubois, performed as part of a "saxhorn band" conducted by Laurent. According to previous scholars,<sup>10</sup> that first attempt was not very successful and for that reason Sax and his band did not

<sup>5</sup> Ibid., 196, and "Original Correspondence", *Musical World* 20, no. 7 (13 February, 1845): 76.

<sup>6</sup> Oscar Comettant, *Histoire d'un inventeur au dix-neuvième siècle: Adolphe Sax, ses ouvrages et ses lettres* (Paris: Pagnerre, 1860), 53.

<sup>7</sup> "The Famed Distin Family. Career of the Great Saxhorn Quintet", *New York Times* (7 August, 1881), n.p. Reproduced in a prospectus of the Henry Distin's American business, part of the Distin archive on loan to the Edinburgh University Collection of Historic Musical Instruments.

<sup>8</sup> For more on Distins' concerts and tour in Europe see Eugenia Mitroulia & Arnold Myers, "The Distin Family as Instrument Makers and Dealers, *Scottish Music Review* 2 [currently in press]

<sup>9</sup> "The Distin Family", *Derby Mercury* 5858 (16 October, 1844): n.p.

<sup>10</sup> See for example Wally Horwood, *Adolphe Sax 1814-1894 – His Life and Legacy* (Baldock: Egon, 1983), 60.



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complete the whole series of concerts and returned to France ahead of schedule. However, according to a short article published in *The New Sporting Magazine* the concerts of the “Sax-horn band” continued at least until November and they were successful.<sup>11</sup> A short mention in the magazine reads:

The Adelaide Gallery is re-opened under favourable auspices. The Sax Horn band is its greatest attraction to the holiday folks at present; M. Laurent, jun., well-known as the cornet-à-piston player, conducts the band with success.

On 3 December 1844 the Distins played on the saxhorns during one of Jullien’s Promenade Concerts in Covent Garden Theatre.<sup>12</sup> However, saxhorns were not named as such in the concert programme. During the same month the Distins performed on the saxhorns in a number of concerts. A concert advertisement published on 21 December announces that “The Distins, the original sax-horn players from Paris”, would perform in a series of concerts in St. James theatre in London.<sup>13</sup> In the same issue it was reported:<sup>14</sup>

This accomplished family were honoured with a command to play before Her Majesty, on Saturday night, at Windsor Castle. A suitable programme was provided, which enabled Her Majesty to hear the best effects of which the Sax-horn is capable, as well as to ascertain the great skill which the Distins have acquired in the management of the instrument. [...] Her Majesty was pleased to express the highest satisfaction at the performance and to command the repetition of the last piece, entitled “La Chasse,” in which the peculiar beauties of the Sax-horn were heard to singular advantage.

Correspondence between an anonymous writer and John Distin was published in the *Musical World* in the beginning of 1845. A “foreign artist resident in London” sent a letter to the editor of the *Musical World* titled “M. Sax and the Distin Family”.<sup>15</sup> The “foreign artist”, who most probably was Sax himself or someone acting on behalf of Sax, complained about the report of the performance of the Distins mentioned above and particularly for the facts that saxhorns had been not been named as such in the concert programme. He mentioned:

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<sup>11</sup> “Public Amusements of the Metropolis” *New Sporting Magazine* 8, no. 47 (November 1844): 346.

<sup>12</sup> Carse, “Adolphe Sax and the Distin Family”, 197.

<sup>13</sup> “Advertisements & Notices”, *Age and Argus* (21 December, 1844): 1.

<sup>14</sup> *Ibid.*, 11.

<sup>15</sup> “Original Correspondence”, *Musical World* 20, no. 4 (23 January, 1845): 41-42.

[...] When the Distin family, a short time since, were engaged to play at the concerts of M. Jullien, they announced their performance for the first time on certain instruments which had been presented to them by his majesty King Louis Philippe. It appears to me, that as a mere matter of justice, the Messrs. Distin should have let the public know that the instruments called (Sax horns) on which they were about to play, were the invention of M. Sax, from whom they (the Messrs. Distin) received them as a donation, - and by whose influence they (the Messrs. Distin) were enabled to perform before the King of the French, who presented them with five hundred francs for their pains. One of these same instruments (Sax horns) was offered in person by M. Sax to his royal highness Prince Albert, who honoured M. Sax by accepting it. These things should be made known, in justice to an artist of very great talent, and most unpretending manners.

John Distin replied through a letter in February 1845 stating:<sup>16</sup>

[...] When we [the Distins] were engaged by M. Jullien to perform at Covent Garden, we particularly requested M. Sax's name to be mentioned, and to call the instruments "saxhorns" (the name which we gave them, as M. Sax thought of calling them Cylinder Bugles). But the party who had the management of these concerts said, the name of Saxhorn should be omitted, as they had already (previous to our visiting London) been played by some parties at the Adelaide Gallery, and proved a failure. It will be seen that it was not by our wish that the name of Sax was left out of those bills; we have never, on any occasion, omitted his name in our concert bills. As regards the Sax horn presented by M. Sax to His Royal Highness Prince Albert, which "the foreign artist resident in London" designates "one of these same instruments", he is in error; as we have seen and tried it at Windsor Castle. It has not been the same mechanism, but it is a very old German or Italian invention, called the "double cylinder", not manufactured by M. Sax. We were the first who successfully introduced these instruments to the public in Paris; - we played at all the principal concerts throughout the season. During this time we assisted and perfected the tenor and bass instruments, making the set complete; and performed at the Great Concert of M. Berlioz, at the Opera Comique, and received the only "encore" during the concert. As a proof of our success, we were presented with silver medals by the "Conservatoire Royal de Musique" and "Society of Fine Arts"; and without egotism, we were the making of M. Sax's name as a manufacturer. We performed before His Majesty King Louis Philippe, though the interest of General de Rumigny. His Majesty conversed with us for some time, and said ". . . Are the instruments of English manufacture?" We answered - "No, your Majesty; they are the invention and manufacture of M. Sax". - At the same time turning round and introducing M. Sax to his Majesty, instead of M. Sax introducing us to him [...]

A second letter by J. Distin appeared in the *Musical World* the following week:<sup>17</sup>

Sir,

I shall be obliged by your correcting an error - probably a typographical one - in my letter on the subject of the *Sax horns*, inserted in last week's *Musical World*. In the following lines will be seen the mistake, by referring to my letter: - "*It is not the same mechanism, but a very old German or Italian invention, called the 'double cylinder', NOT manufactured by Mr. Sax.*" The word NOT should have been BUT, which makes a very material difference. I wish to give Mr. Sax credit for all he deserves, and by correcting this in the next number, you will confer a favour on sir,

Yours, very truly,  
JOHN DISTIN.

<sup>16</sup> Ibid., no. 7 (13 February, 1845): 76.

<sup>17</sup> "Original Correspondence", *Musical World* 20, no. 8 (20 February, 1845): 90.

This second letter clearly shows a completely different attitude compared to the previous one that questioned both Sax's reputation and the originality of his instruments. The bone of contention seems to have been a flugelhorn with double piston valves, probably the one depicted in the famous Bagniet lithograph (Figure 6.1), since John Distin talks about the "double cylinder". It is to be surmised whether Distin and Sax met in the meantime and resolved the disagreement or even reached an agreement for a future collaboration. A few months after the above correspondence the announcements of the Distins' concerts always emphasized the fact that they would "perform on the silver saxhorns". An article at the *Musical World* gives a view of how saxhorns were perceived:<sup>18</sup>

[...] The programme comprised selections from the music of Donizetti, Bellini, Meyerbeer, Beale, Arne, Balfe, and Rossini, which were played in the most effective manner on silver instruments, termed the Sax horns. These horns were originally the invention of a Frenchman named Sax, but they have been improved and perfected by the skilful Mr. Distin and his talented family. The horns supply a desideratum which has long been felt in the structure of brass instruments; every attempt previously made to perfect the *scale* of that class of instruments having invariably deteriorated the *metallic* character of their tone. The Sax horns, however, are both perfect in scale, and purely metallic; they combine all the *best* quality of the French horn, and cornet-à-pistons; and whilst they possess all the flexibility and power of these two instruments, their tone is fuller than that of the French horn, and not so harsh as that of the cornet-à-pistons. They are capable of producing wonderful crescendo power, and the tone can be subdued to the most delicate piano. The performances on Monday evening gave the greatest pleasure to the company present, and in two or three instances were encored. The Distins evidently know how to play their beautiful instruments to advantage.

The concert announcements throughout Britain are abundant and the Distins always received very good reviews. As the famous Bagniet lithograph shows, the first saxhorns used by the Distins were bell-front models. Later, though, the quintet incorporated bell-up saxhorns in their performances. According to an article in the *Revue et Gazette musicale de Paris* in July 1846, Sax provided the family with a new set of instruments described by the journal's correspondent as "saxotrombas" which they started studying immediately. As will be mentioned later, these upright saxhorns in form saxotromba were, from 1847 onwards, called by the Distins, at least in the beginning, saxtubas.

Although all evidence suggests that the Distins did not start manufacturing their own instruments before 1851, already on 1 January 1845 they had registered a

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<sup>18</sup> "Provincial Intelligence", *Musical World* 20, no. 41 (9 October, 1845): 490.

Saxhorns outside France design for a saxhorn at the British Intellectual Property Office.<sup>19</sup> Their intentions are not very clear, since as far as it is known they were not involved in any instrument making at the time. Moreover, the unfriendly tone of the first letters sent by John Distin and the “foreign artist resident in London” in the *Musical World* during the period when Distins’ design had already been registered, shows that most possibly the Distins had not received any approval from Sax for registering the particular design.

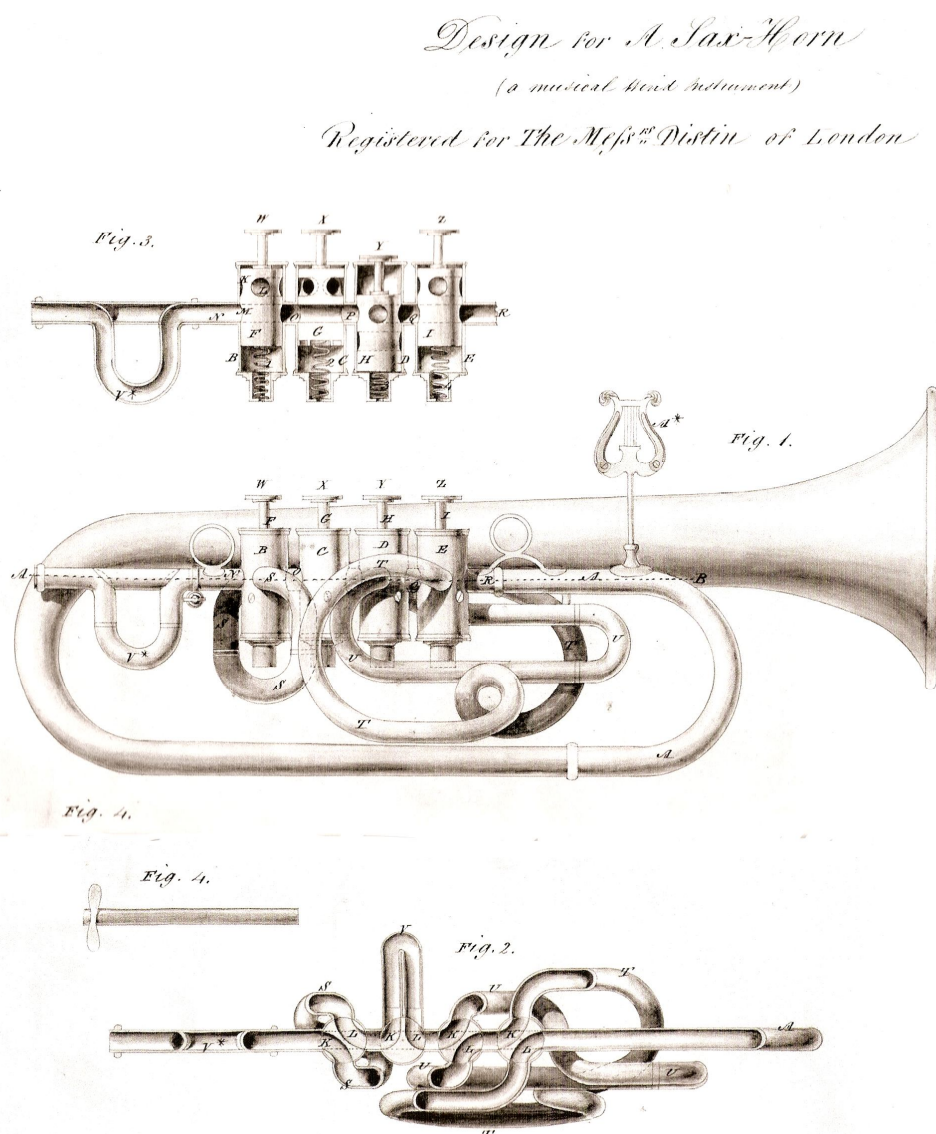


Figure 6.2 Distin & Sons’ design of 1845 for a saxhorn, registered on 1 January 1845.

<sup>19</sup> Design 345 “For a Sax-Horn (a musical wind instrument) Registered for the Messrs. Distin of London”, registered on 1 January 1845, The National Archives (United Kingdom), BT 45/02.

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No surviving instrument with the configuration of the Distins' four-valve contralto in the registered design is known. It is therefore not known whether this instrument was ever produced commercially or not. The practice of makers of the time is known: designs could be registered or patented by makers merely to prevent the products being produced or patented/registered by their competitors. This appears to most possibly be Distins' motivation, since when they opened their instrument warehouse they could advertise selling "registered" or "patented" saxhorns, sax cornets etc., without having ever been granted any kind of patent including specifications on the saxhorns or other Sax-related instruments. The first advertisement in the *Musical World* for Distin's music and musical instrument depot was in August 1846.<sup>20</sup>

*To Her Majesty's Army and Navy, and Amateurs.*

J. DISTIN AND SONS

HAVE OPENED THEIR

MUSIC AND MUSICAL INSTRUMENT WAREHOUSE,

29, Cranbourn Street, Leicester Square, London,

With a splendid stock of their Registered Sax-Horns, Sax-Cornets, Horns, Trombones, Trumpets, Bass Tubas, &c., &c. Every instrument at their establishment is warranted perfect, and may be heard singly and together before purchasing them. The Sax-Horn is universally allowed to be the finest instrument in the world for Military Bands. No band on the continent is considered complete without them. The MESSIEURS DISTIN are the ONLY APPOINTED Agents for Sax's instruments in England."

A soprano saxhorn in E-flat in a private collection in the United States made by Sax for Distin & Sons (serial no. 2047) bearing the inscription "registered" dates, according to the current dating system, from 1845, which is before the announcement of August 1846. This instrument looks like a typical Adolphe Sax bell-front saxhorn and does not correspond to Distins' registered design, although its inscription mentions the law under which the Distins managed to register the design in the United Kingdom: "Act 6 & 7 Vic. C. 65" which stands for the 1843 Designs Amendment Act that distinguished between ornamental and utility designs.<sup>21</sup> In 1845, before the Distins opened their Cranbourn Street depot (1846), they had started selling printed music and acted as dealers of musical instruments from their residence in Manchester Street, Manchester Square, London. An advertisement in the *Musical World* in May 1845 informed the public that registered saxhorns were

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<sup>20</sup> "Miscellaneous", *Musical World* 21, no. 31 (1 August, 1846): 368.

<sup>21</sup> See for more Chapter Two, pp. 28-30.

Saxhorns outside France available for sale from the above mentioned address.<sup>22</sup> It is possible that the Cranbourn Street depot opened in 1845, but besides the soprano saxhorn mentioned above there is no other evidence to prove it.

Seven brass instruments from Sax's partnership with the Distins survive in public collections, five of which are numbered with Sax's standard system (the other two instruments are not numbered at all), and all but one appear to be Sax's standard models. The silver alto saxhorn in E-flat from the Adam Carse collection (Horniman Museum, London, inventory no. 14.5.47/91) is in bell-front form, unlike all other surviving altos made by Sax, and has rotary valves, instead of Berlin valves (Figure 6.3).



**Figure 6.3** Alto saxhorn in 6½-ft E-flat made by Sax for the Distin family, inscribed “Le Famille Distin. T. Distin, London”. The Horniman Museum, London, inventory no. 14.5.47/91. (Source: The Horniman Museum London)

In 1850 John Distin's son, Henry, took over and the firm was called Distin & Co. Adam Carse states<sup>23</sup> that in 1850 Distin's depot started being advertised as a “manufactory” without mentioning his source for the information, although according to the Carse archive at Horniman Museum a great deal of his information derives from the *Musical World*. The author's own research does not confirm 1850 as the year when the Distins started calling their “depot” a “manufactory”; research in the *Musical World* issues of 1850 and 1851 shows that throughout 1850 the Distins still advertised their business as a “depot”. The first advertisement for the

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<sup>22</sup> “Advertisements”, *Musical World* 20, no. 21 (22 May, 1845): 250.

<sup>23</sup> Carse, “Adolphe Sax and the Distin Family”, 199.

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“sax horn manufactory” appeared in May 1851.<sup>24</sup> 1851 is the year that their collaboration with Sax ended and the year when the Distins started using their “euphonic horns”. According to the *New York Times* article (1881) mentioned previously, Henry Distin “set himself up in London as a manufacturer of brass instruments” early in 1850, but at first only as a manufacturer of mouthpieces.<sup>25</sup> The article reports that Distin started with twenty workmen but soon his workforce increased to eighty-five.

In November 1851 it was announced that Rousselot & Co.<sup>26</sup> would be the only appointed agents for selling saxhorns in Britain.<sup>27</sup> According to all biographers of Sax, Sax and the Distins ended their collaboration during the London International Exhibition of 1851 because the Distins had started making their own instruments. Adam Carse assumes:<sup>28</sup>

Perhaps it was Sax’s great success at the Great Exhibition in Hyde Park in 1851, when he was awarded a Council Medal for his exhibit of 85 instruments, that caused or nourished the estrangement, but whatever the cause, the outcome was that in 1853 the British agency for Sax’s instruments was transferred to Rudall, Rose & Co.

Review of Distins’ concerts published in the *Musical World* might throw some light on one possible trigger for the end of their collaboration. It appears that the Distins (in addition to the saxhorns) had started using their own made instruments called “euphonic horns”. The first known mention of the euphonic horns appeared in February 1851:<sup>29</sup>

The Distin family on Tuesday evening gave a concert at the Queen’s-rooms, in which their unrivalled performance on the euphonic horns excited the utmost delight and enthusiasm.

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<sup>24</sup> “Advertisement”, *Musical World* 28, no. 21 (24 May, 1851): 334.

<sup>25</sup> “The Famed Distin Family. Career of the Great Saxhorn Quintet”, n.p.

<sup>26</sup> *The New Langwill Index* erroneously mentions 1853 as the year of the end of the collaboration between Sax and the Distins. See, William Waterhouse, ed., “Distin (2) Henry” *The New Langwill Index* (London: Tony Bingham, 1993), 90.

<sup>27</sup> “Advertisements”, *Musical World* 26, no. 48 (29 November, 1851): 767.

<sup>28</sup> Carse, “Adolphe Sax and the Distin Family”, 200.

<sup>29</sup> “Provincial”, *Musical World* 26, no. 7 (15 February, 1851): 105.

Later articles also mention:<sup>30</sup>

The twelve concerts given by the Distin Family at the Adelaide Gallery, were brought to a close last night, after a successful and well-deserved “run”. Their reception has been highly gratifying, and the encores they have experienced nightly, especially as regards their judicious selection of good English glees, have been well merited. We have rarely heard glees so neatly sung. With respect to their execution on the Sax Horns, the Distins may be termed “exclusives” in their facile management of those instruments. The Euphonic Horns also (the Distins’ own invention) are remarkable for their combined power and brilliancy of tone, and have been heard to much advantage in the hands of their inventors.

And:<sup>31</sup>

The programme was an excellent one, commencing with a selection from *Der Freischütz*, and including the celebrated trumpet solo, “The soldier tired,” which was performed by Mr. Distin with all his accustomed vigour and expression, and was enthusiastically encored; a quartette, from the opera of *Belisario*, on the newly- invented patent “Euphonic” horns—names which the instruments well deserve, for anything more euphonious than the sounds elicited from them we never heard.

No patent or registered design exists for the euphonic horns, although in the above concert review they are mentioned as “newly-invented patent”, and no depiction or description of them is known to the author. Thus, no surviving instrument can be identified as a euphonic horn. Euphonic horns seem never to have gained popularity, although evidence shows that the Distins used them in their performances for sometime; the Distins continued being advertised as the “saxhorn performers”, even though after 1851 they were no longer Sax’s business partners. A concert programme in the Adam Carse archive at the Horniman Museum, London, was for a concert that took place on 8 August 1851 in the Queen’s Assembly Rooms during a short series of farewell concerts. Out of the six works performed during the concert, only one, a *Quartette* by Rossini was performed on the euphonic horns, whereas the rest of the program was performed on the saxhorns. Another concert, part of the above series, took place on 5 August and was announced in *Jersey Times*. According to Carse’s notes, the concert’s reporter stated afterwards—possibly in *Jersey Times*—that a selection from Donizetti was performed on the euphonic horns which though “we do not admire as much as the saxhorns”.<sup>32</sup> It is strange that during the same year (1851), another British maker, J. Jordan of Liverpool, appears to have exhibited a euphonic horn during the 1851 London International Exhibition, for

<sup>30</sup> “The Distin Concerts”, *Musical World* 26, no. 31 (2 August, 1851): 493.

<sup>31</sup> “Provincial”, *Musical World* 26, no. 42 (18 October, 1851): 667.

<sup>32</sup> Adam Carse Archive, The Horniman Museum, London, A1/12/11.



which no other information has been found.<sup>33</sup> The Distin family's promotion of their own make of instruments and their connections with other Parisian makers, rivals of Sax, were the main reasons for their collaboration with Sax coming to an end.

As mentioned, in November 1851 it was announced that Rousselot & Co. would be Sax's only appointed agents in Britain. No surviving instrument made and sold during this short-lived partnership is known. Most scholars state that the collaboration between Sax and the Distins ended in 1853 when Rudall, Rose & Co. became the agents for selling Sax's instruments in Britain. Even Carse has missed that information in his *Music Review* article (1945). The announcement in the *Musical World* was as follows:<sup>34</sup>

SAX MILITARY BAND INSTRUMENTS

COUNCIL MEDAL, Jury 10a, 1725. Messrs. ROUSSELOT & Co. beg to announce that being representatives of the eminent inventor of the Sax Horns, who has gained the sole Council Medal for the Military Band Instruments, they are able to provide purchasers with genuine Sax Horns, French Horns, Trombones, Cornets with or without patent slides, &c., at moderate prices. The admired Instruments from the Exhibition are now on view at 66, Conduit-street. List of prices forwarded on application. London, Rousselot and Co., 66, Conduit-street, Regent-street.

About a year and half after the above announcement, in June 1853,<sup>35</sup> Rudall, Rose, Carte & Co. this time announced that they were selling Sax's cornets, saxophones, saxhorns and other instruments. Emphasis was given that they were the sole appointed agents of Sax in Britain. In a following issue of the journal the advertisement is accompanied by a letter sent by Sax to the firm.<sup>36</sup> According to the letter, which is dated 28 May 1853, it was Rudall, Rose, Carte & Co. who proposed to Sax to become his agents. The main reason of this collaboration was to reduce the circulation of all saxhorn copies which according to Sax were sold in Britain at the time. From that point and on, the general public would know that only Rudall, Rose, Carte & Co. were permitted to sell Sax's instruments in the country. Although no mention is made of Rousselot & Co. one understands that at the time that the letter was written, there was no other official agent of Sax. It is possible that Sax's collaboration with Rousselot & Co. ended before Sax's new partnership with Rudall,

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<sup>33</sup> *Official Catalogue of the Great Exhibition of the Works of Industry of all Nations 1851* (London: Spicer Brothers, Wholesale Stationers; W. Clowes & Sons, 1851), 71.

<sup>34</sup> "Advertisements", *Musical World* 26, no. 48 (29 November, 1851): 767.

<sup>35</sup> "Advertisements", *Musical World* 31, no. 23 (4 June, 1853): 361.

<sup>36</sup> *Ibid.*, 31, no. 24 (11 June, 1853): 393.

Rose, Carte & Co. commenced; only four instruments made during that partnership are known today. These are a contrabass saxhorn (The Horniman Museum, London, inventory no. 2004.1183), a cornet (private collection, United States of America), a soprano saxophone (Horniman Museum, London, inventory no. 14.5.47/83), and a French horn (John Webb private collection, Britain). All four date from 1853. It is not known for how long Rudall, Rose & Carte were Sax's official British agents. The last known advertisement appeared in the *Musical World* in October 1854. There were so many copies of Sax's instruments circulating in Britain at the time that it is possible that the originals did not achieve high sales levels. It should be also mentioned that advertisements of Rudall, Rose, Carte & Co., before the announcement of their collaboration with Sax (1852) promoted cornets, saxhorns, trumpets, trombones, and other instruments imported from the French firms of Antoine Courtois, Besson and Gautrot.<sup>37</sup> According to information coming from the firms stock books in the Horniman Museum some Adolphe Sax instruments, saxophones and brasswinds (among which some contralto saxhorns) were still being sold in the late 1860s and early 1870s.<sup>38</sup>

There are two printed sources providing an insight on the instruments produced by the Distins in the 1850s. The earliest is a surviving brochure from the Distin manufacturing house at The Horniman Museum (Figure 6.4).<sup>39</sup> This cannot be dated with great accuracy, although it can be placed in the early 1850s. Distin has already become "Instrument Maker to Her Majesty's Army & Navy", thus placing the brochure after 1851. The bugle with "Distin's chromatic attachment" patented in 1855 is not included here, and it is thus assumed that the brochure was published after 1851 and before 1855. This brochure clearly shows the influence of Sax, although in many cases the "sax" prefix is absent from instrument names. The only instruments called "saxhorns" here are bell-front saxhorns:

Saxhorn soprano in E-flat,

Saxhorn alto in B-flat,

Saxhorn tenor in E-flat,

<sup>37</sup> "Advertisements" *Musical World* 30, no. 43 (October 1852): 297.

<sup>38</sup> The author is grateful to Arnold Myers for drawing her attention to this interesting piece of information.

<sup>39</sup> This is also partially reproduced in: Anthony Baines, *Brass Instruments: Their History and Development* (London: Faber and Faber, 1976), 256-57.

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Saxhorn baritone in B-flat.

Versions of the “saxhorns” mentioned above, with the bell-up are exclusively called “tubas.” This is not something new, since as mentioned previously, Distin already in the 1840s used the term “tuba” for the bell-up instrument, although at this time the “sax” prefix was used too, and bell-up saxhorn were probably called “saxtubas”. Bell-up saxhorns following Sax’s style included in this brochure are the following:

Soprano tuba in E-flat,  
Alto tuba in B-flat,  
Alto tuba in B-flat with four valves,  
Tenor tuba in E-flat,  
Tenor tuba in F and E-flat,  
Baritone tuba in B-flat,  
Baritone tuba in B-flat with four valves,  
Bass tuba in B-flat with four valves,  
Contrabass tuba in E-flat,  
“Patent euphonium in E-flat” (with four valves).

All the above “tubas” exactly follow the configuration of the Sax saxhorns and are equipped with Sax’s version of the Berlin valve. This is only mentioned in the case of a Berlin-valve trumpet which is called “Sax-valve trumpet” (no. 15 of Figure 6.4). The only case of an instrument deviating from the “Sax pattern” is that of the “tenor tuba” in E-flat: the instrument has been identified as the alto saxotromba as discussed in Chapter Five, which is not made in the characteristic wrap with the two turns (*à deux tours*). Its tube forms a U-shape before entering the valve section, so after leaving the valves there is only enough tubing for a very small circle and not a big turn which would result in the original characteristic wrap of the saxotromba. This version—with the U-turn—is met in a few surviving saxhorns made under licence. Aside from the absence of the second turn, the instrument is made in Sax’s style, as are its valves.

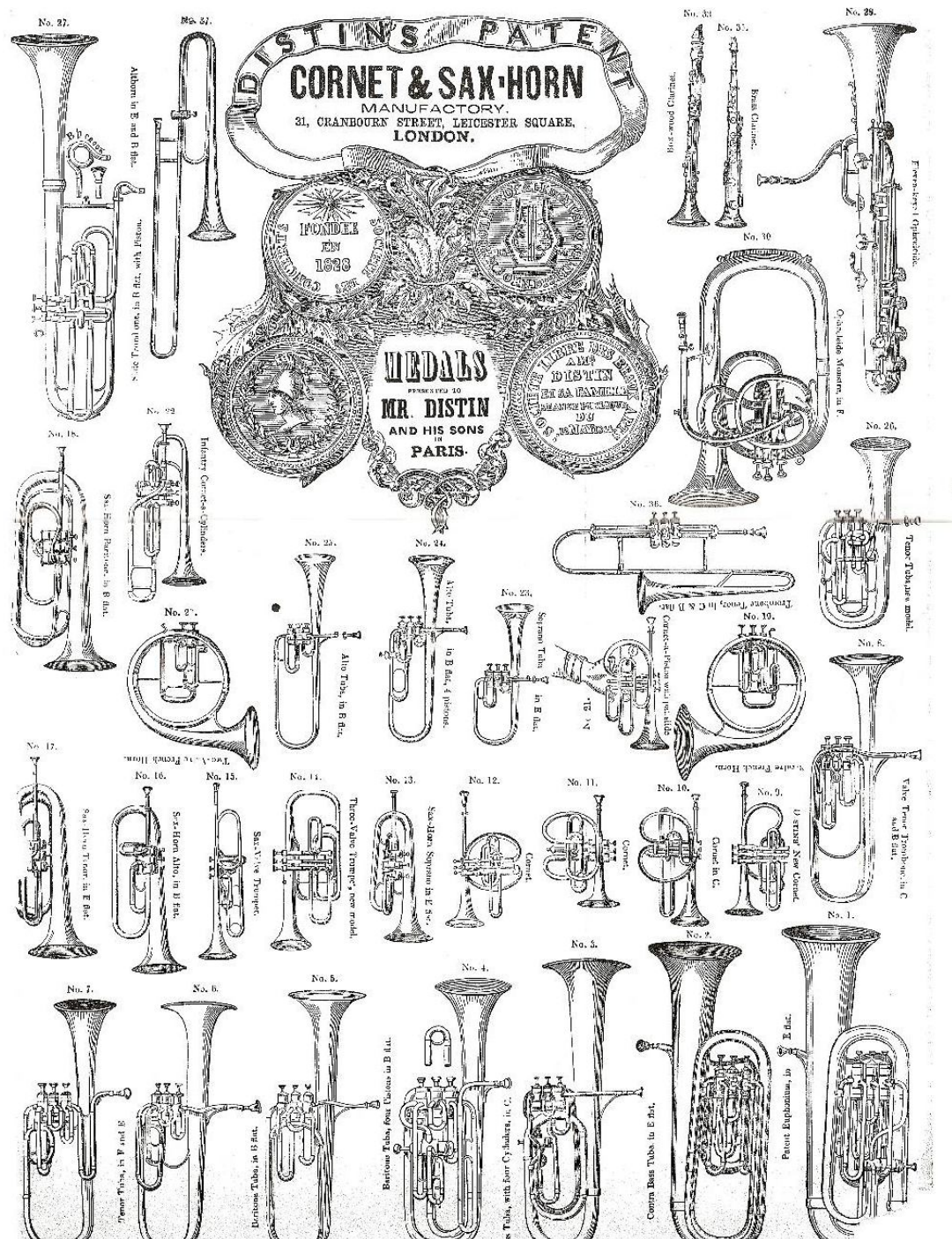


Figure 6.4 Brochure of Henry Distin's business c. 1851-55. (Source: The Horniman Museum, London).

The “baritone tuba” on the other hand looks identical to the baritone saxotromba with the two turns, and is offered in two versions, with three and four valves. Strangely enough the contrabass saxhorn in E-flat (no. 1 of Figure 6.4) is called “patent euphonium” in E-flat. Distin does not provide an explanation either for the use of the term “euphonium” for an instrument in 13-ft E-flat or for the addition of the term “patent”. This model is exactly the same as the “contrabass tuba” in E-flat (no. 2 of Figure 6.4) with the addition of a fourth valve, and not very different from Sax’s four-valve contrabass saxhorns in E-flat.

The majority of the saxhorns in either form are equipped with Sax valves. The only exception is an alto saxhorn in bell-up form called “tenor tuba, new model”. This is equipped with three Périnet valves, which is not typical for Sax instruments, at least in the early 1850s. At this time Sax, according to the surviving instruments and his product catalogues, was still using Berlin valves on his altos.

In 1857 the firm published a complete and detailed product catalogue, a copy of which is in the National Library of Scotland. There are many additions here in the models offered for sale and the style of instruments is distinctly different. Every instrument of this catalogue has a catalogue number, and wherever applicable (in a second column) catalogue numbers from older catalogues are given. According to a note, the old catalogue numbers refer to all previous catalogues published between 1846 and 1857. The old numbers have been merged from various catalogues without identifying exactly which catalogues the numbers come from.

Some general observations regarding the nomenclature in use, and pitch of instruments offered for sale are:

- all instruments in the 1857 sales catalogue made in the bell-front type and equipped with rotary valves were called by Distin “flügel horns”
- all instruments of the bell-front type equipped with Périnet valves are called “chromatic horns”
- instruments of the soprano, contralto, tenor and baritone register made in the bell-up form are called tubas regardless the type of valves they are furnished with. The only additional characterisation is that of their register, such as “tenor tuba”. This general rule is not followed in the bass register, where

upright instruments with rotary valves are called “bass euphonions” and upright instruments with Périnet valves are called “bass tubas”.

- the term “tuba” is not used at all in the contrabass register, where instruments are merely called “contrabasses”
- contrabass instruments in 16-ft C or 18-ft B-flat do not appear in any of the catalogues, although Sax in France had already introduced them by 1851 and the earliest surviving contrabass in 18-ft B-flat made by Sax dates from 1854 (Musée de la musique, Paris, inventory number E.746)
- instruments in 4-ft C or 4½-ft B-flat for which Sax used the term “contralto” are called in both catalogues “altos” and instruments of the actual alto group called by Sax “altos” or “ténors” (but more often “altos”), are called in both Distin catalogues “tenors”
- in the soprano family a very high member is included, the “piccolino soprano” in A-flat, an instrument pitched a semitone lower than Sax’s sopranino saxhorn. According to the product catalogue the piccolino “is admirably adapted for large brass bands, its object being to relieve the soprano in the extreme high notes”. As in the case of Sax’s instrument, this model never became popular.

Concerning the instruments’ construction, and the valves in particular, it can be observed that in 1857 Berlin valves have been abandoned entirely by Distin, unlike Sax who continue to use them until later in the century. Most instruments are offered for sale either with rotary or Périnet valves. Rotary valves are called “rotary-action cylinders”, whereas Périnet valves are just called “pistons”. Comparing the 1857 entries with their equivalents from the earlier brochure, instruments with Périnet valves from the 1857 catalogue are thought to be equivalent with those with Berlin valves from the earlier brochure. This reminds us of the French lawsuit minutes, discussed elsewhere in this thesis, where Périnet and Berlin valves were considered to be improved versions of the Stölzel valve.

All models in the 1857 catalogue made with the bell up and equipped with Périnet valves do not have their leadpipe placed adjacent to the bell section, but at the other extreme. Thus, the overall form of the instruments is distinctively different

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from upright instruments of the earlier brochure. Distin might have wanted to deviate from the “saxotromba form” and created this new arrangement of the tube wrapping, which besides looking peculiar to our eyes, is of doubtful efficacy.

As already mentioned, there is information that from 1847 onwards the Distins used the term “saxtuba” for instruments other than the actual saxtubas patented by Sax in Paris in 1852. The first mention known to the author appears in an article in the *Musical World* where it was reported that the Distins introduced their new instruments the *sax tubas*.<sup>40</sup> An advertisement in the *Musical World* in March 1847 advertised the concerts of Messrs. Distins “performers on the saxhorns and saxtubas”. At the bottom of the advertisement the family advertised instruments they sold, and among others are *sax horns* and *sax tubas*.<sup>41</sup> In July 1846 the *Revue et Gazette Musicale de Paris* reported that the Distin family in London had started practicing on the saxotrombas that were just sent to them by Sax.<sup>42</sup> Since, as shown in Chapter Five, there was never an actual difference between Sax’s saxotrombas and alto and baritone saxhorns made in upright form, it is believed that Sax sent the Distin family saxhorns in bell-up form on which they started practicing during summer 1846. It is possible that the term “saxtuba” was chosen by the Distins to replace the term “saxotromba” for denoting the bell-up saxhorns, since the suffix “tuba” sounds friendlier to British ears than the Italian “tromba”. In 1847 for the first time in the various concert announcements Henry Distin appears to have performed “solos on the sax tuba tenor”.<sup>43</sup>

Around 1855 Henry Distin, in addition to his instrument production, published a method for the saxhorn family titled *Distin’s tutor for alt-horn, tuba and cornet-à-pistons*<sup>44</sup>, perhaps influenced by Sax’s similar method published in 1847. Although the term “saxhorn” is not mentioned in the title, in the text the terms “saxhorn” and “saxtuba” are mentioned frequently, almost exclusively next to that of the “cornet-à-pistons”. It is also noted “it may be well to remark the “Distin’s Tutor”

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<sup>40</sup> “Provincial”, *Musical World* 22, no. 6 (6 February, 1847): 91.

<sup>41</sup> “Advertisements”, *Musical World* 22, no. 12 (20 March, 1847): 195.

<sup>42</sup> “Chronique étrangère”, *La Revue et Gazette Musicale de Paris*, no. 30 (26 July, 1846): 239.

<sup>43</sup> See “Portobello Concert Hall”, *Freeman’s Journal and Daily Commercial Advertiser* (12 May, 1847): n.p.

<sup>44</sup> Although the method’s preface is signed by “J. Distin & Sons” it is not very clear if John, Henry and/or other members of the Distin family are the authors. *Distin’s tutor for alt-horn, tuba and cornet-à-pistons containing the art of single & double tonguing* [sic] (London: Henry Distin, [c. 1855]).



applies to Sax Horn, Sax Tuba, Cornet, and all Piston Instruments".<sup>45</sup> This tutor was probably the same that was published later in the United States of America as "Distin's Tutor for the Saxhorn" by Oliver Ditson & Co. in Boston.<sup>46</sup>

TENORS.

New No.	Old No.	Description	£	s.	d.
15	17	TENOR CHROMATIC HORN in F, 3 Pistons, with Slide Crooks for E and E flat, and card-holder - (This instrument takes the place of the French Horn, for Brass Bands, and has a tone similar to that instrument; but has Pistons instead of Rotary Cylinders. Sometimes called "Alt-Horn.")	11	0	0
16	17	TENOR CHROMATIC HORN in E flat, 3 Pistons, with Slide Crooks for D and D flat; and card-holder - (Sometimes called "Alt-Horn.")	11	0	0
17	13 B	TENOR FLÜGEL HORN in F, 4 Rotary-action Cylinders, with Crooks for E and E flat; with card-holder - (This has all the capabilities of No. 8, but is the same pitch as the French Horn, and has a soft and liquid quality of tone, very similar to the French Horn, without its defects. Excellent for either Brass, Reed, or String Bands.)	13	13	0
18	13 B	TENOR FLÜGEL HORN in F, 3 Rotary-action Cylinders, with Crooks for E and E flat; with card-holder - (The same capabilities, and equally good, as No. 17, but with fingering same as the Cornet.)	11	11	0
19	26	TENOR TUBA in F, 3 Pistons, with Crooks for E and E flat; and card-holder - (The same as No. 15, but with Bell upwards, and suitable for Cavalry Regiments, being easily balanced with one hand.)	11	0	0
20	26	TENOR TUBA in E flat, 3 Pistons, with Crooks for D and D flat; and card-holder - (The same as No. 16, but with Bell upwards, for Cavalry Regiments.)	11	0	0
21	..	TENOR TUBA in F, 3 Rotary-action Cylinders, with Crooks for E and E flat; and card-holder - (The same capabilities as No. 18, but with Bell upwards.)	11	11	0
22	..	TENOR TUBA in E flat, 3 Rotary-action Cylinders, with Crooks for D and D flat - (The same capabilities as No. 18, but with Bell upwards.)	11	11	0

\* N.B.—The numbers in the first column have reference to this Book, and those in the second column refer to the Lists published since 1846, up to the time of this work appearing; and it is particularly requested that, in ordering instruments, i.e. the numbers in the first column may be given, thereby preventing the possibility of any mistake.

\* The compass and actual sound of each instrument will be seen on the opposite page, placed under each drawing; but it is possible to produce higher notes, according to the strength of lip of the performer.

\* The Prices of String Military Cases (reamped with iron and lined and padded) for Instruments not already provided with them, may be ascertained by referring to the Classification of Instruments on the last page.

H. DISTIN, Military Musical Instrument Maker, No. 9, Great Newport Street, Cranbourn Street, London.

T E N O R S .

15. TENOR CHROMATIC HORN in F, 3 Pistons, with Slide Crooks for E and E flat, and card-holder. COMPASS ACTUAL SOUND.

16. TENOR CHROMATIC HORN in E flat, 3 Pistons, with Slide Crooks for D and D flat; and card-holder. COMPASS ACTUAL SOUND.

17. TENOR FLÜGEL HORN in F, 4 Rotary-action Cylinders, with Crooks for E and E flat; with card-holder. COMPASS ACTUAL SOUND.

18. TENOR FLÜGEL HORN in F, 3 Rotary-action Cylinders, with Crooks for E and E flat; with card-holder. COMPASS ACTUAL SOUND.

19. TENOR TUBA in F, 3 Pistons, with Crooks for E and E flat; and card-holder. COMPASS ACTUAL SOUND.

20. TENOR TUBA in E flat, 3 Pistons, with Crooks for D and D flat; and card-holder. COMPASS ACTUAL SOUND.

21. TENOR TUBA in F, 3 Rotary-action Cylinders, with Crooks for E and E flat; and card-holder. COMPASS ACTUAL SOUND.

22. TENOR TUBA in E flat, 3 Rotary-action Cylinders, with Crooks for D and D flat. COMPASS ACTUAL SOUND.

Figure 6.5 The section of tenor instruments from Henry Distin's 1857 catalogue.

In 1848, Distin & Sons started publishing *Distin's Journal for Sax-horn, Sax-tuba & Cornet-à-pistons, with Piano-forte accompaniment*, a series containing music arranged by John Distin. A very short review in the *Musical World* reports that each issue contained a selection from a popular opera.<sup>47</sup> It is not known for how long this publication lasted, but it is believed that it continued at least until the mid-1850s.

The Distins were not the only makers/dealers preoccupied with French brasses around the middle of the nineteenth century in Britain, as shown in Table 6.1.

<sup>45</sup> Ibid., 1.

<sup>46</sup> *Uniform Trade List Circular: Published for the Benefit of Publishers, Booksellers, News Dealers, and Stationers, and every branch of trade connected with these interests* 1, no. 6 (April 1867): 290.

<sup>47</sup> "Reviews of Music", *Musical World* 23, no. 21 (20 May, 1848): 332.



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**Table 6.1 Summary of British instrument makers' and dealers' preoccupation with saxhorns around the middle of nineteenth century.**

August 1846	<b>The Distins</b> advertised the opening of their music and musical instrument warehouse. Among other instruments, sax-horns, sax-trombas and sax-cornets were offered for sale. The Distins appeared as “the only appointed agents for Sax’s instruments in England”.
December 1846	<b>Jullien</b> was advertised as a supplier of military instruments. It was announced that each species of instruments is imported from different manufacturer, so as to always get the best product. Jullien imported saxhorns from Besson and these were tested by H. Koenig. <sup>48</sup>
December 1847	<b>Distin’s tutor</b> for the saxhorn and the cornet was first advertised in the <i>Musical World</i> . <sup>49</sup>
Summer 1847	The <b>Shapcott family</b> performed on their sax-horns. <sup>50</sup>
March 1848	The <b>Distins</b> advertised “genuine” Courtois cornets-à-pistons, the new Besson Cornet, Cornets by Sax, Distin’s Courtois model, Distin’s ventril cornet and Distin’s Patent improved Sax horns. <sup>51</sup>
December 1849	The <b>Distins</b> advertised their warehouse as the “saxhorn depot”.
November 1850	<b>Sommer</b> claimed the euphonium as his invention, made in Britain on his behalf by Pask & Koenig.
During the 1851 exhibition	<b>J. P. Oates</b> exhibited among other things “an improved saxhorn upon the equitone principle”. <b>James Gisborne</b> exhibited “alto” saxhorns in B-flat and “tenor” saxhorns in E-flat.
May 1851	<b>John James Haite</b> (London) sold “sax-tubas” in the following pitches: E-flat tenor, B-flat alto, B-flat bass, and contrabass.
November 1851	<b>Rousselot &amp; Co.</b> were advertised as Sax’s agents for selling “genuine sax-horns at moderate prices”.
1852	<b>Haite &amp; Leach</b> were advertised as <b>Halary’s</b> agents in London.
March 1852	In a concert announcement <i>The Musical Shapcotts</i> advertised sax-horns

<sup>48</sup> In the same announcement it is mentioned: “M. Jullien announces that instrument will be strictly examined by the celebrated artists connected with the Royal Musical Conservatory, whose public reputation will be a sufficient guarantee for the capabilities of testing the qualities of their respective instruments; thus- the flutes will be tried by Mr. Richardson, the clarionets by M. Lasarus [sic], hautboys [sic] by M. Barret, bassoons by M. Baumann, trumpets, sax horns, and cornets-a-pistons, by H. Koenig, trombones, clavicors, ophicleides, and serpentcleides by M. Prospere, drums cymbals and all other percussion instruments by Mr. Godfrey; and after having received their approbation will be stamped thus-“Approved of by Koenig, or Lasarus [sic], or Richardson, &c., (as the case may be) and warranted by Jullien”.” See ‘Jullien’s Military Musical Instruments’, *Musical World* 21, no. 51 (19 December, 1846): 664.

<sup>49</sup> This was later also published in the United States of America by Oliver Ditson of Boston. See, *Musical World & New York Musical Times* 7, no. 15 (10 December, 1853): 120.

<sup>50</sup> “Temperance Fete at Mount Edgecombe”, *People’s Journal* 4, no. 80 (10 July, 1847): 3.

<sup>51</sup> “Advertisements”, *Musical World* 23, no. 11 (4 March, 1848): 159.

	offered for sale by them at very low prices.
August 1852	Prince Peter of Oldenberg who arrived in London from St. Petersburg examined, among others, sax-horns at <b>Rudall, Rose, Carte &amp; Co.</b>
May 1853	<b>Rudall, Rose, Carte &amp; Co.</b> became the new sole agents of Sax in Britain. Sax cornets, Sax-trombas, Sax horns and Sax trombones were offered for sale.
June 1853	<b>Rudall, Rose, Carte &amp; Co.</b> published in the <i>Musical World</i> a letter by Sax proving that they were his sole agents in Britain.
January 1854	<b>Boosey &amp; Sons</b> dynamically entered the British instrument making scene by advertising the manufacture of military brass instruments.
February 1854	Sax's instruments could be supplied direct from <b>Rudall, Rose, Carte &amp; Co.</b> "at a price not higher than the numerous imitations of them".

A first observation is that around the middle of nineteenth century many British musical instrument makers and/or dealers imported brass instruments from France. As far as saxhorns are concerned, soon after their introduction in Britain, many makers started occupying themselves with these new instruments in one way or the other. A short article published in 1845 in *La France Musicale* confirms that the immense success of Sax's developments in brass instruments resulted in London makers buying large quantities of these instruments which they first dismantled so as to copy them.<sup>52</sup>

On one hand were the numerous imitations of them imported from Sax's Parisian adversaries, such as Besson and Halary and Courtois, and on the other hand were the local products, such as that of J. P. Oates who in the 1851 International Exhibition exhibited saxhorns "upon the equitone principle", or that of John James Haite who in 1851 sold "saxtubas".

Gustave Auguste Besson, one of Sax's strongest adversaries, entered the British market. At first, as mentioned elsewhere, from at least as early as 1846, Jullien acted as Besson's British agent, importing his saxhorn copies into Britain. Waterhouse (1993) states that in 1850 Besson opened a London branch of his Paris business at the address of Pask and from 1855 at the address of Jullien.<sup>53</sup> In 1858 Besson left Paris and moved to London, so as to avoid paying damages to Sax. The

<sup>52</sup> "Nouvelles", *La France Musicale* 8, no. 6 (9 February, 1845): 46.

<sup>53</sup> William Waterhouse, "Besson", *The Langwill Index*, 30.

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Paris business was run by his wife. An advertisement of a cultural occasion at *The Scotsman* in Edinburgh in April 1856 announced an art exhibition where a performance of a *Besson tuba band* would appear.<sup>54</sup> No reference of such an ensemble has been found in other sources of the time. This could be an attempt by the maker and his British collaborators to compete against the numerous saxhorn bands that were active in the United Kingdom at the time. As will be mentioned later the Shapcott family, originally saxhorn performers, in the 1860s advertised performances on Besson's *neoform horns*.

In the beginning of 1854, Boosey & Sons were advertised in the *Musical World* as "Military instrument manufacturers and music publishers to Her Majesty's Army", although hitherto known only as music publishers.<sup>55</sup> The firm advertised "althorns (baritones) with three valves in B-flat, E-flat or F, euphonions (bass) in B-flat or C, with four valves, bombardons (bass) in E-flat, or F, with four valves". It was further noted that these instruments were available either with valves or the new rotary cylinder action. The althorn was available either in the bell-up form, or in the bell-front form. For the euphonion it was noted that it was a new valve instrument, which was rapidly taking the ophicleide's place,<sup>56</sup> although the euphonium or euphonion was already known in Germany for some time, and in Britain, at least since 1850.

In 1850 the term "euphonium" became associated with Sommer's name who played on a such an instrument during performances of the *Great Exhibition Quadrille* at the Theatre Royal, Drury Lane, as a member of Jullien's orchestra. Sommer sent a letter to the *Musical World* complaining about a previous article of the journal which had mentioned that he played a solo on the bombardon invented by Sax. Sommer stated that the instrument he played on was the euphonium previously designed by him and made by makers in Germany. He added that the same instrument was made in Britain by Pask & Koenig who followed his instructions<sup>57</sup> and also that:

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<sup>54</sup> "Advertisements", *Scotsman* (30 April, 1856), 1.

<sup>55</sup> "Advertisements", *Musical World* 32, no. 4 (28 January, 1854): 62.

<sup>56</sup> "Advertisements", *Musical World* 32, no. 11 (18 March, 1854): 187.

<sup>57</sup> "M. Jullien's Concerts", *Musical World* 25, no. 47 (23 November, 1850): 753.

It appears in these days of Boehm flutes and flutes Boehmaire, that every man who bores a new hole, makes a minute puncture, affixes a bit of silver, and gives a droll name to an ancient instrument, straightaway takes out a patent and dubs himself an inventor. The bombardon is none the less the original idea of M. Sax, however, in spite of its name [...]

The euphonium and “sommerophone” which appears as such in some sources of the time were according to Bevan the same instrument, invented by Sommer around 1843-44.<sup>58</sup>

Boosey & Sons, mentioned above, were known as Boosey & Co. after 1864. In 1868 they bought Henry Distin’s instrument making business and with D. J. Blaikley as their manager they became one of the most flourishing wind-instrument making businesses in Britain.

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<sup>58</sup> Bevan, *The Tuba Family*, 225-26.

# JULLIEN & CO.,

MANUFACTURERS OF EVERY DESCRIPTION

OF

## MILITARY MUSICAL INSTRUMENTS

FOR MILITIA BANDS, &c.,

UNDER HERR KOENIG'S SUPERINTENDENCE.

I hereby beg to acquaint the public, that I have appointed Messrs. Jullien and Co., sole Agents for the sale of all Brass instruments manufactured by me, and unless my instruments, purchased after this date, be marked thus—"Sole Agents, Jullien and Co., approved by Herr Koenig," none are genuine.

Nov. 1, 1851.

(Signed) G. Besson,  
7, Rue des Trois Couronnes, Paris

I hereby beg to acquaint the public, that I have undertaken to examine and approve all instruments sold by Messrs. Jullien and Co., and that I am solely connected with their establishment. To prevent mistakes, the instruments will be marked thus—"Approved by Herr Koenig."

Nov. 1, 1851.

(Signed) HERMAN KOENIG,  
80, Percy Street.

I hereby beg to acquaint the public, that I have appointed Messrs. Jullien and Co. sole Agents for the sale of all Brass instruments manufactured by me, the whole of which will, in future, be marked—"Sole Agents, Jullien and Co., approved by Herr Koenig."

Nov. 1, 1851.

(Signed) ANTOINE COURTOIS,  
21, Rue du Caire, Paris.

### The following Selection of Instruments is the best for Brass Bands.

FOR THE CONVENIENCE OF PURCHASERS THE PRICE OF EACH  
INSTRUMENT IS ATTACHED.

#### FOR A BRASS BAND OF TEN PERFORMERS

	1st Class.	2nd Class.
1 SOPRANO SAXHORN, in E flat and D flat.....	24 4 0	23 3 0
2 ALTO ditto, in B flat, and A flat, each .....	4 14 6	3 13 6
2 CORNETS-A-PISTON, each.....	4 4 0	3 3 0
2 TENOR SAXHORNS, in F and E flat, each .....	7 0 0	5 5 0
2 BARITONE ditto, in B flat each.....	8 0 0	6 6 0
1 BASS ditto, C and B flat, with 4 Pistons.....	10 10 0	8 8 0
<hr/> 10 Performers.		

#### FOR A BRASS BAND OF TWELVE PERFORMERS.

1 SOPRANO SAXHORN, in E Flat and D flat .....	24 4 0	23 3 0
2 ALTO ditto, in B flat and A flat, each .....	4 14 6	3 13 6
2 CORNETS-A-PISTON, each .....	4 4 0	3 3 0
2 TENOR SAXHORNS, in F and E flat, each .....	7 0 0	5 5 0
1 TRUMPET, with 4 Pistons .....	7 7 0	5 5 0
2 BARITONE SAXHORNS, in B flat, each .....	8 0 0	6 6 0
1 BASS ditto, C and B flat, with 4 Pistons.....	10 10 0	8 8 0
1 CONTRABASSE, in E flat.....	11 11 0	9 9 0
<hr/> 12 Performers.		

Figure 6.6 An 1855 advertisement of Jullien & Co. showing that Jullien was offering for sale saxhorns in various sizes, having the support of Besson, Courtois and Koenig. See *The New Army List and Militia List*, no. 65 (London: John Murray, 1855): 368.

In Table 6.1 above the Shapcott family appears twice. The *Musical Shapcotts* were an English brass ensemble from Exeter, formed in the late 1840s by John Shapcott. His seven sons were the members of the group. Advertisements of their concerts appeared from 1849 onwards in the English press. The Shapcotts who appeared in the advertisements as forming a “saxhorn band” were closely linked to the Temperance movement. Information on their activities can be found through the family’s descendents (who were contacted by the author), also in the Adam Carse archive at the Horniman Museum, and in periodicals of the time.



Figure 6.7 The Shapcott family. (Source: Descendents of the Shapcott family)

As advertised, John Shapcott’s sons were self-taught performers of the saxhorns and concertinas (Figure 6.7). They appeared in many well-known playhouses of the time in England and Scotland. During their performances John Shapcott would lecture on his sons’ progress regarding their musical accomplishments attributing it to their “having made good use of their hours of leisure instead of devoting them to conviviality at the tavern.”<sup>59</sup>

<sup>59</sup> “The Shapcott Family”, *Nottingham Mercury* (3 May, 1850): n.p.

**CHARD ARMS HOTEL, CHARD,**  
**On Thursday, the 4th of March, 1852.**  
 Admission---Reserved Seats, 2s.---Second Seats, 1s.---Children Half-Price.  
 Promenade, 6d.

THE  
**MESSRS. SHAPCOTT,**  
 (SEVEN BROTHERS) OF EXETER,  
 Whose Performances were received with so much applause at the Theatre Royal, Drury Lane, London;  
 Town-hall, Birmingham; Free-trade-hall, Manchester; Music-hall, Edinburgh; &c., &c.  
 WILL GIVE  
**A Grand Sacred and Classical**  
**SAX-HORN**  
**CONCERT.**

**PROGRAMME.**

First Part.	Second Part.	
Here in cool Grots .....	Earl Marborough .....	Quartets---Les Deux Aramis .....
Grand Selection from Scenarhula .....	Belini .....	Drama Polka .....
Grand Ship .....	Loten .....	When thy Bosom .....
Grand Selection from Waps .....	Verdi .....	Grand Exhibition Quadrilles .....
Andrus---While Shepherd's Watch .....		NATIONAL ANTHEM .....
		Dr. Bull .....

ON THIS OCCASION  
**MASTER FRANK SHAPCOTT,**  
 The Infant Prodigy, only 5 years of age, will go through his Harwood-way Performance in JULIEN'S  
**Great Exhibition Quadrilles.**  
 This child received the Silver Medal for his great Musical Performance, when only Five years of age.

The following is but the echo of the opinions of thousands in England and Scotland, who have listened to this extraordinary Family.  
 JERSEY, MONDAY, AUGUST 2nd, 1850.  
 "Bring dearest that my family and pupils should have the gratification of listening to the celebrated Sax-Horn Band, I desired Mr. SHAPCOTT to attend with his Sons at Stow House, to give us a private Concert. The satisfaction they gave was universal; and a higher or a more intellectual and inspiring treat I think it is impossible for young people to have. The music was of the best kind, the execution surpassingly brilliant, and the effect thrilling in the extreme. In point of skill, I have never listened to instruments that can produce any thing at all approaching it."---E. L. B. BRAD, Principal of Stow House Academy.

"The Sax-Horn Band is a perfect acrobacy, and when arranged in the order in which the various members of it appear before an audience, might make a capital subject for a painter. Even before the auditory nerves receive the several and bewitching impressions of their mingling intonations, the eye seems to become sensible of a harmony and suitableness in their dispositions, varying from method to a child of five years old, but when the full cadence bursts upon the ear, and the mellow murmurs float through the spacious Hall, the thrilling quavering swelled in the last, were such as only good music properly performed could produce."---WEST OF ENGLAND CONSERVATIVE.

Doors Open at half-past Seven, to Commence at Eight o'clock.  
**Sax-Horns Sold by the Messrs. Shapcott, Cheaper than any House in the Kingdom.**  
*Bands supplied with Music arranged in a superior style.*  
 London: JACKSON and COOPER, Printers, 150, Fleet Street.

Figure 6.8 A poster advertising a concert of the Shapcott family playing on the saxhorns. (Source: Descendants of the Shapcott family)

According to a concert poster of 1852 (Figure 6.8), they even offered for sale saxhorns at very low rates. Since there is no evidence on the Shapcotts being active as instrument makers, it can be assumed that they acted as instrument dealers. In the early 1860s the band was re-formed by four of the sons of John Shapcott and was re-named *The Brothers Shapcott*. This time they appear to have changed to using Besson's *silver neoform horns* which were as characteristically mentioned in a

concert announcement “*expressly made for them by F. Besson*”.<sup>60</sup> Although no depiction of these instruments is known, F. Besson & Co.’s sale catalogue of c. 1867 (a copy is at the Musikinstrumenten-Museum, Berlin), informs us that *neoform* instruments were circular with movable bells. In general, the family’s activity seems comparable to that of the Distin family, although the Shapcotts never became as well known as the Distins. The Distins were so popular at the time as performers on the saxhorns that it is expected that others would try and benefit by the saxhorns’ popularity, too. No traces of their activity as a group could be found after 1863.

The Distin family led the way for numerous bands in the United Kingdom which started employing saxhorns, in some cases exclusively. Bands in various cities, towns and even villages started being called “saxhorn bands”. Also abundant were the “saxtuba bands” that started being formed around the middle of the century. A series of articles published by Enderby Jackson in *Musical Opinion & Musical Trade Review* over the course of two years (1896-97) with the title “Origin & Promotion of Brass Band Contests” casts some light on the early years of the brass band movement in Britain. In his first article of the series Jackson writes characteristically regarding the influence of the Distin family on brass bands of the time:<sup>61</sup>

Professional bands up to that period [1844] consisted of keyed Kent bugles (E-flat and B-flat), slide trumpets, French horns, trombones (alto, tenor, and bass), ophicleides and serpents. The perfection arrived at by the Distin Troupe aroused the interest of the leaders and members of amateur bands, of wealthy mill owners, and of the many supporters of local bands. [...] Markets were quickly found where to procure the most recent make of the new instruments, cornet-à-pistons being secured as the leading instruments. A demand arose for suitable alto Sax horns, also for basses furnished with the best modern application of the Sax valves or rotary actions; and these necessary instruments were quickly produced, although the alto horns and baritones proved distinctly inferior in purity of tone to the cornets and basses. [...] In a few years almost every village and group of mills in these districts possessed its own band.

Jackson emphasized that among the bands that became immediately popular were some mill, factory and foundry bands that were able to purchase full set of instruments of a single maker.<sup>62</sup> Some bands, such as the Mossley Brass Band

<sup>60</sup> Concert announcement for a concert of 22 May 1863 at the Assembly Room, George Hotel, Chard, given to the author by descendants of the Shapcott family.

<sup>61</sup> Enderby Jackson, “Origin & Promotion of Brass Band Contests”, *Musical Opinion & Musical Trade Review* 19, no. 222 (March 1896): 392.

<sup>62</sup> Ibid.



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ordered from Henry Distin full sets of Sax brasses.<sup>63</sup> The instrumentation of various brass bands in Yorkshire and Lancashire and of the well-known Cyfarthfa band just before 1847 as given by Jackson was the following:<sup>64</sup>

- 1 bugle in E-flat or D-flat (leading)
- 1 bugle in B-flat (repiano)
- 2 bugles in B-flat
- 1 cornopean in A-flat (solo)
- 1 second cornopean A-flat
- 2 trumpets in D-flat
- 2 French horns in D-flat
- 1 saxhorn in E-flat (solo)
- 2 tenor saxhorns in D-flat
- 1 baritone saxhorn in B-flat
- 1 alto trombone
- 2 trombones in B-flat
- 1 bass trombone
- 1 euphonion in A-flat
- 2 bombardons in E-flat
- 2 or 3 ophicleides

Small variations occurred due to the number of players available. According to Jackson's reports of Sax's models the ones appearing most often in bands of the early contesting era were cornets-à-pistons, alto saxhorns and bass saxhorns.<sup>65</sup> A few years later, in 1860, the typical instrumentation of bands at the Crystal Palace contest is the following as given by Arnold Myers (2000):<sup>66</sup>

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<sup>63</sup> Ibid. 20, no. 234 (March 1897): 235.

<sup>64</sup> Ibid. 19, no. 223 (April 1896): 224.

<sup>65</sup> Ibid. 20, no. 230 (November 1896): 102.

<sup>66</sup> Arnold Myers, "Instruments and Instrumentation of British Brass Bands" in: Trevor Herbert, ed. *The British Brass Band: A Musical and Social History* (Oxford: Oxford University Press, 2000), 171-72.

- 1-2 sopranos, mostly in D-flat, but also in E-flat
- 5 cornets, mostly in A-flat, but also in B-flat
- 0-1 alto saxhorns in A-flat
- 2-3 tenor saxhorns (or alt-horns), mostly in D-flat, but also in E-flat
- 1-2 baritones, mostly in A-flat, but also in B-flat
- 1 tenor trombone, mostly in C, but also in B-flat
- 1 bass trombone, mostly in G
- 1-2 ophicleides, mostly in C, but also in B-flat
- 1 Sax bass or euphonium, mostly in B-flat or A-flat, but also in C
- 1 contrabass saxhorns or bombardons, mostly in E-flat, but also in D-flat

Unlike later periods, in both lists above appear instruments in D-flat and A-flat. Except the alto saxhorn in A-flat which was indeed originally made by Sax at that pitch, it is not known for the rest of instruments in those pitches, if they were actually built in A-flat or D-flat. Myers presumes that crooks or shanks were used since most surviving instruments are actually built in F, E-flat, C or B-flat.<sup>67</sup> As for the choice of A-flat and D-flat he believes it was a matter of timbre choice, or range issues in the lower instruments.

Regarding nomenclature, it should be noted that with time the term “saxhorn” started being used less often for the corresponding band instruments. It was mostly used in association with the alto saxhorn in 6-ft F or 6½-ft E-flat, and the bass saxhorn or simply “sax”. It appears that a variety of terms of English, French and German origin were used with time, to denote the same instruments. This was also mentioned previously regarding Distin’s nomenclature choices, after the breach of his collaboration with Sax. Boosey & Sons (later Boosey & Co.) started advertising their wind instruments used the German terms “alt horn”, “euphonion” and “bombardon”.

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<sup>67</sup> Myers, “Instruments and Instrumentation of British Brass Bands”, 172.

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Band contest entry forms from the 1860s, at the Edinburgh University Collection of Historic Musical Instruments, show that the following terms were used for instruments of the saxhorn family:

**sopranos:** flugel horn

**altos:** tenor Sax, alto horn, sax horn, althorn, tenor, tenor horn

**baritones:** baritone

**basses:** euphonion, bass, euphonium, Sax bass,

**contrabasses:** bombardon, contra basses, double bass

The term “tenor sax” or “saxhorn”, for the same instrument, appeared more frequently than the term “Sax bass”. As Bevan (2000) reports, the alto saxhorn is the one “that is thought of as the saxhorn”.<sup>68</sup> Ironically, as demonstrated in Chapter Five, this instrument is actually a saxotromba.

From the 1870s the standard brass band contest instrumentation became fixed as follows:<sup>69</sup>

1 soprano cornet in E-flat

8 cornets in B-flat

3 tenor saxhorns (or tenor horns) in E-flat

2 baritones in B-flat

2 tenor trombones in B-flat

1 bass trombone in G

2 euphoniums in B-flat

2 basses in E-flat

2 basses in B-flat

To conclude, the influence of the Distin family in the dissemination of saxhorns in Britain was vital. The increased importation of instruments from France was also of great importance. Soon, in the brass instrument market there was abundance of various instruments, originals and copies, both from French makers and from local British makers who showed an increased interest in copying French saxhorns and others on improving them. These factors, in combination with the

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<sup>68</sup> Bevan, *The Tuba Family*, 247.

<sup>69</sup> Myers, “Instruments and Instrumentation of British Brass Bands”, 174.

usage of German-style instruments resulted in the British brass instrument market being a mosaic of different instruments and terms used, as the Distin's 1857 catalogue shows.

### **6.1.1 Repertory**

British brass and wind bands, and brass ensembles, as most wind bands of the time were mainly playing excerpts from operas and operettas transcribed by their bandmasters. Overtures, airs, instrumental parts of arias, popular instrumental solos, and dances such as quadrilles and waltzes were among the bands' first choices. Popular composers among bands were Verdi, Bellini, Donizetti, Meyerbeer, Rossini and others. The firms of Distin and later that of Boosey & Sons were publishing special journals which were a great source of repertory for the various bands, as did Carl Boosé in the 1840s and 1850s whose journal was also distributed in all parts of the British Empire. Pieces of sacred music were also included in band performances.

In some cases original compositions became popular among the bands. Often these were pieces composed by well-known conductors which very quickly became well-liked, such as works of Philippe Musard, and Louis Philippe Jullien. However, most compositions written originally for brass band came from composers of the end of nineteenth century and from the twentieth century, such as Eric Ball, Thomas Wilson, William Rimmer, Malcolm Arnold, Herbert Howells, Gustav Holst, and John Ireland.

## **6.2 Saxhorns in the United States of America**

The term "saxhorn" became very popular in the United States, after the middle of the nineteenth century, although it was mostly associated with a different type of instrument from that of the typical French saxhorn. Nowadays, the term "saxhorn" in the United States mostly denotes an intermediate bore-profile instrument made with the bell directed backwards, over the player's shoulder, also known as over-the-shoulder saxhorn. Evidence suggests that the term "saxhorn" was most probably introduced in the United States in the beginning of 1849 with the Distin family's arrival in the country for their quintet's tour.

The prevalent brass model in the United States, especially during the Civil War (1861-65), was the over-the-shoulder saxhorn. It was alleged that this type of instrument was a version of the *Ebor corno*,<sup>70</sup> which according to Bevan (2000) was first patented by Allen Dodworth senior in 1838,<sup>71</sup> whereas Waterhouse (1993) states that the *Nova ebor corno* or *New York horn* was invented – and not patented – in 1839 by Thomas J. Dodworth senior.<sup>72</sup> Allen Dodworth himself states that the over-the-shoulder instruments were introduced by his family in 1838 (he does not use the verb “patented” or “invented”).<sup>73</sup> According to Bevan, the instruments were manufactured by Uhlmann of Vienna in various sizes and large quantities following Dodworth’s design.<sup>74</sup> No patent of the *ebor corno* has been found by the author. Robert Eliason (1975) wrote that an instrument that fits the description of the *ebor corno* is an alto made c. 1840 by Graves & Co., Winchester, New Hampshire, part of the Pillsbury collection, today at the Henry Ford Museum in Dearborn Michigan.<sup>75</sup> This is a narrow bell-up instrument with double piston valves and similar to other American instruments coming from this early period. This instrument, however, appears to be part of a group of instruments made by Graves & Co. in the 1840s, known as *trombacellos*, and of which very few are known to survive.<sup>76</sup> Although most surviving trombacellos are baritones, Dodworth’s *Brass Band School* talks about both tenor and baritone trombacellos.<sup>77</sup> Trombacellos bear a lot in common with early bombardons, their European counterparts.<sup>78</sup>

If Dodworth’s invention was indeed an instrument of an upright form, then it is not clear exactly when the over-the-shoulder instruments appeared in America. It is possible, though, that both the *ebor corno* and the over-the-shoulder design came from Europe. It is also not possible to ascertain when over-the-shoulder instruments

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<sup>70</sup> Ebor was the Latin name of York.

<sup>71</sup> Bevan, *The Tuba Family*, 247.

<sup>72</sup> William Waterhouse, *The New Langwill Index*, 91.

<sup>73</sup> Allen Dodworth, *Dodworth’s Brass Band School* (New York: H.R. Dodworth & Co., 1853), reprint California 1980, 12.

<sup>74</sup> Bevan, *The Tuba Family*, 427-28.

<sup>75</sup> Robert Eliason, *The D. S. Pillsbury Collection of Brass Instruments* (Michigan: Greenfield Village & Henry Ford Museum, 1975), n.p.

<sup>76</sup> Graves & Co. exhibited one trombacello, whose pitch and size is not mentioned, in the fourth exhibition of the Massachusetts charitable mechanical association held in Boston in 1844. See, *The Fourth Exhibition of the Massachusetts Charitable Mechanical Association* (Boston: Crocker and Brewster, 1844), 129.

<sup>77</sup> Dodworth, *Brass Band School*, 19.

<sup>78</sup> See for more on the early bombardons Chapter Seven, p. 297-304.

started being called over-the-shoulder saxhorns and not *ebor cornos*. It is noteworthy, though, that Dodworth in 1853 differentiated between the two. He commented that instruments with the bell upward, like the saxhorns, should be adopted for general purposes, and not exclusively military.<sup>79</sup> It appears that during the Civil War the over-the-shoulder saxhorns were already known as such, and the term “ebor corno” had vanished by then.

The over-the-shoulder instruments presented the unique feature of their bell being pointed to the back, over the player’s shoulder, so that their sound was directed to the troops following the band. This feature of the bell pointing at the rear most possibly originates from the nineteenth-century trombone, which according to a small number of researchers appears to have already been made in that form in the sixteenth century.<sup>80</sup> Although the existence of the renaissance over-the-shoulder trombone is uncertain, it is a fact that trombones in that particular form had some limited use in France from the beginning of nineteenth century, but had vanished during the last quarter of the century.<sup>81</sup> It is believed that from there instruments in that form found their way in the United States, especially if taking into consideration Bevan’s information that the European maker Uhlmann was making Dodworth’s early instruments.

The tradition of brass bands in the United States of America presents an overall similarity to those of the British Brass Band movement. Initially the bands included both brass and woodwind instruments and generally the bass parts were played on ophicleides or bass horns.<sup>82</sup> The mid-1830s, as in Britain, was the period when the tuba was introduced and a great percentage of bands were playing almost exclusively on brass.<sup>83</sup> The Dodworths formed the Dodworth New York band, later also known as Dodworth saxhorn band, which was the first or one of the first all-brass bands in the United States of America. In 1834, they changed their instrumentation, abandoning woodwind instruments.<sup>84</sup> According to the Dodworths, their instruments’ proportions were very similar to those of saxhorns. Harvey

<sup>79</sup> Dodworth, *Brass Band School*, 12.

<sup>80</sup> See for example, Will Kimball, “Rear facing trombone”, accessed 20 December 2009, <http://www.kimballtrombone.com/tag/rear-facing-trombone/>.

<sup>81</sup> Bruno Kampmann, “Le trombone à pavillon avant ou arrière”, *Larigot* 24 (December 1999): 4-10.

<sup>82</sup> Bevan, *The Tuba Family*, 427.

<sup>83</sup> *Ibid.*

<sup>84</sup> *Ibid.*

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Dodworth claimed that his family had introduced the instrument prior to Sax's patent. He wrote in 1880:<sup>85</sup>

[...] Then my father, Thomas Dodworth, and my elder brother, Allen, invented a very powerful and effective instrument, to which they gave the name ebor corno, and it was identically the same subsequently brought out in France by Saxe [sic], and there christened saxe-horn [sic]. But my father and brother got it up, and we used it in the old National Band, years before the Frenchmen knew anything about it. Our band changed from the bugle to cornet principle, valves instead of keys in all its instruments, and those made for us to our order were on the principle of the Saxe [sic] instruments all the way through, except that the bells of ours were over the shoulder, and threw the sound back, instead of turned upwards. [...]

In the article of 1st February 1882,<sup>86</sup> re-published by the *Brass Band News* and originally appearing in *The New York Times*, titled "The Distin Family - Career of the great saxhorn quintet" there is a mention of saxhorns. In January 1849, the Distins arrived in New York and were engaged in a series of concerts throughout the United States. After a very successful concert at Castle Garden in New York, attended by thousands of people, the family was congratulated by the press. As it is quoted in the *Brass Band News* the daily press of the time wrote about them:

They did not play upon the old horns, but upon a lovely instrument invented by a M. Sax, and called after the inventor. The tone is exquisite and when the different qualities are combined they produce the most delicious and ravishing harmony.

As also mentioned in the *New York Times* article, according to the above mentioned extract, it appears that the Distins were "the first to introduce the Saxhorns to American knowledge" as it was already thought.<sup>87</sup> Allen Dodworth in his endorsement letter quoted in a brochure advertising Henry Distin's business in New York in November 1884, reports that he and Distin "together ransacked all the manufactories of Brass Instruments in Paris," and that "occasional visits to your [Distin's] large factory and warerooms in London made it quite evident that you thoroughly understood the originality and management of such business".<sup>88</sup> This testimonial reveals a previously unknown connection between Distin and Dodworth. Dodworth does not provide any information about the time of that trip, although it is

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<sup>85</sup> Harvey Dodworth, "Band Music Then and Now", *American Art Journal* (17 July, 1880), in: Robert Garofalo & Mark Elrod, *A Pictorial History of Civil War Era Musical Instruments & Military Bands* (United States of America: Pictorial Histories Publishing Company, Charleston, Virginia, 1985), 9.

<sup>86</sup> "The Distin Family – Career of the great saxhorn quintet", *Brass Band News* (1 February, 1882): 2.

<sup>87</sup> Ibid.

<sup>88</sup> Brochure of Henry Distin's New York business, dated November 1884. On loan to the Edinburgh University Collection of Historic Musical Instrument.

assumed that this trip was after Distins' visit in the United States in 1849. The same testimonial refers briefly to the family's 1849 visit and Dodworth reports that the visit "made known to us your great ability as an artist" which implies that this was the first meeting. The meeting in Paris could have taken place anytime after that, although Dodworth's familiarity with Sax's saxhorns in 1853, a fact revealed by the abundance of Sax's saxhorns drawings in Dodworth's *Brass Band School*, might suggest that the visit took place before the publication of the book (1853).

Over-the-shoulder saxhorns, as mentioned, were used during the Civil War and their pitches ranged from E-flat soprano to E-flat contrabass.<sup>89</sup> The models that predominated were the alto and tenor. As Bevan points out it was typical for the American brass bands the higher percentage of E-flat instruments from 1835 until the 1890s.<sup>90</sup> In a series of articles by Allen Dodworth in *The Message Bird*<sup>91</sup> (1849) regarding the formation of bands appears that during the same year that the Distins toured in the United States, saxhorns became known as such and enjoyed great popularity. Dodworth mentions that "most of the bands of the present day give preference to what is called the Saxhorn, which is made in all the different keys [...]".<sup>92</sup> In a later issue he wrote regarding the alto saxhorn in E-flat that:<sup>93</sup>

The E-flat Saxhorn partakes of the character of both the Bugle and Cornet, is sufficiently full in tone, not to be lumpy, and is flexible enough for all purposes. They are usually made with the bell upwards; the valves are what are called the Cylinder valve.

In the article concerning the B-flat instruments of the contralto register he reported that:<sup>94</sup>

Preference is given to the Saxhorn, in the formation of bands, for the Cornet is much better adapted for parlor playing, and also for Quadrille Bands, in which the Posthorn is sometimes used, but owing to its thickness of tone, and nasal twang, it is not so well liked as the Cornet.

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<sup>89</sup> Bevan, *The Tuba Family*, 428.

<sup>90</sup> Ibid., 427.

<sup>91</sup> The present author is grateful to Robert Eliason for drawing her attention to these *Message Bird* articles.

<sup>92</sup> Allen Dodworth, "The Formation of Bands", *Message Bird* 1, no. 1 (August 1, 1849): 9.

<sup>93</sup> Ibid., no. 2 (15 August, 1849): 25.

<sup>94</sup> Allen Dodworth, "Formation of Bands – Description of Instruments, &c.", *Message Bird* 1, no. 4 (15 September, 1849): 59.



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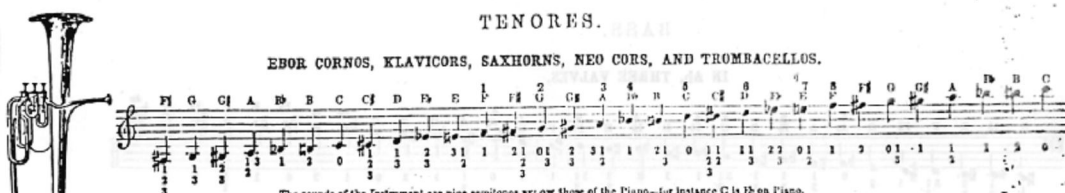
In his later *Brass Band School* (1853) Dodworth suggested instruments appropriate for the formation of brass bands; the main soprano instruments he recommended were in E-flat: E-flat bugles, E-flat Sax horns, and E-flat cornets.<sup>95</sup> The *ebor cornos* appeared only in the *tenores* [sic] section (see Figure 6.9), whereas saxhorns were present in all the groups from soprano instruments to contrabass.<sup>96</sup> He also emphasized that:<sup>97</sup>

In selecting the instruments, attention should be paid to the use intended; if for military use only, those with the bells behind, over the shoulder, are preferable, as they throw all the tone to those who are marching to it, but for any other purpose they are not so good.

**NAMES AND CLASSES OF INSTRUMENTS. SECOND PART** 19


**TENORES.**

**EBOR CORNOS, KLAVICORNS, SAXHORNS, NEO CORN, AND TROMBACELLOS.**



The sounds of the instrument are nine semitones below those of the Piano—for instance C is B on Piano.

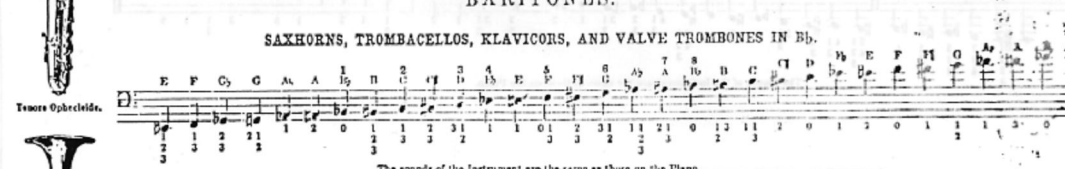
**TENORE OPHECLEIDE.**



The sounds of the instrument are nine semitones below those of the Piano—for instance C is B on Piano.


**BARITONES.**

**SAXHORNS, TROMBACELLOS, KLAVICORNS, AND VALVE TROMBONES IN Bb.**



The sounds of the instrument are the same as those on the Piano.

**SAXHORN—4 VALVES.**



The sounds of the instrument are the same as those on the Piano.

**Figure 6.9** Tenor and baritone instruments from Dodworth's *Brass Band School* (1853) among which saxhorns similar to Sax's models appear.

<sup>95</sup> Dodworth, *Brass Band School*, 11.

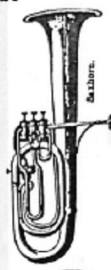

<sup>96</sup> Ibid.

<sup>97</sup> Ibid., 12.

20

NAMES AND CLASSES OF INSTRUMENTS. SAXHORN

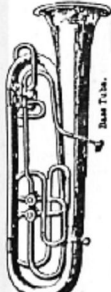

BASS. **SAXHORN**  
IN A<sub>♭</sub>, THREE VALVES.

The sounds of the instrument are the same as those on the Piano.

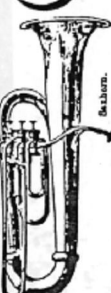

CONTRA BASSES.

BASS TUBAS, BOMBARDONES, TROMBACELLOS, AND VALVE TROMBONES IN F.

The sounds of the instrument are the same as those on the Piano.

SAXHORNS, BOMBARDONES, AND VALVE TROMBONES IN E<sub>♭</sub>.

The sounds of the instrument are the same as those on the Piano.

Figure 6.10 Bass and contrabass saxhorns from Dodworth's *Brass Band School* (1853). The four-valve bass saxhorn (top) depicted and the contrabass saxhorn in E-flat (bottom) share many common features with Sax's saxhorns.

Allen Dodworth in an article in *The Message Bird*, in New York in 1850, talked about low brass instruments in use at the time and mentioned that the contrabass saxhorn in E-flat was prevalent among other instruments of the same register, mainly due to its nominal pitch. He also pointed out that saxhorns in general were mostly preferred as they were “in better proportion than any other”.<sup>98</sup>

Already in the 1840s French instrument makers were exporting instruments to the United States. Sax was such an example. According to Berlioz, already in 1844 Sax's name was known beyond Europe. He had numerous orders for his instruments from the United States and the remote French colonies.<sup>99</sup> Another early case was that of a dealer based in New Orleans, called T. E. Benoit, who advertised selling

<sup>98</sup> Allen Dodworth, “Brass Bands”, *Message Bird* (15 June, 1850): 361, in: Bevan, *The Tuba Family*, 211.

<sup>99</sup> Hector Berlioz, “Exposition de l'industrie. Instruments de musique” *Journal des débats politiques et littéraires* (23 June, 1844), 2.

## Chapter Six

instruments of all kinds imported from France in a local newspaper.<sup>100</sup> Robb Stewart is the owner of a bell-front contralto saxhorn in 4-ft C, identical to one of Adolphe Sax's models, stamped on its bell "E.Benoit / New Orleans" (Figure 6.11). The instrument is equipped with three Berlin valves of the Sax type, and is probably a specimen imported by Benoit of New Orleans from France. A letter from what appears to be the same dealer (Benoit of New Orleans) is found among the lawsuit documents. The letter (dated 23 June 1843) was addressed to Sax's Parisian rivals Guichard and Gautrot requesting the purchase of various instruments, among which was a *bombardon à trois pistons*.<sup>101</sup> In the above document also appeared letters of Flot and Klemm & Bros., dealers from Philadelphia, ordering among others clavicors, bombardons and basses.<sup>102</sup> These are probably just a few examples of many similar cases.



**Figure 6.11** Contralto saxhorn in 4-ft C stamped on the bell "E. Benoit / New Orleans". Private collection Robb Stewart, United States of America. This is an example of instruments imported in the United States from France. Photograph by Robb Stewart.

The following saxhorns are depicted in Dodworth's *Brass Band School*: E-flat soprano saxhorn, E-flat tenor saxhorn, B-flat baritone saxhorn, four-valve B-flat bass saxhorn, and E-flat contrabass saxhorn. All these are identical to Sax models and are

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<sup>100</sup> "Advertisements", *Jeffersonian Republican* (17 September, 1846): n.p. The author is indebted to Robb Stewart for drawing her attention to the particular piece of information.

<sup>101</sup> *Nullité de brevet. Instruments et brevets Sax. Tribunal correctionnel de la Seine, 6<sup>me</sup> Chambre. Affaire Rivet contre Sax. Documents* (Paris: impr. Dodney-Dupré, 1855), 47.

<sup>102</sup> *Ibid.*, 48-49.

equipped with Sax's version of the Berlin valve, showing that Sax instruments made by Sax himself or copies made by other French makers were well-known in America at the time. It should be noted that there are depicted two contrabass instruments, one in F and the other in E-flat. Although the E-flat instrument is called contrabass saxhorn the one in F is called "bass tuba" and is virtually identical to Moritz's and Wieprecht's *Basstuba*.

It is believed that French-style brasses spread around the United States through imports during the first half of nineteenth century, and it is even possible that saxhorns were being sold in the country before the Distins' visit in 1849, although there is no evidence that the term "saxhorn" was known and used there before that time.

In 1852 Firth, Pond & Co., a New York firm, advertised in the *Musical World & the New York Musical Times* a complete series of saxhorns, among other instruments, both of their own make and imported, which they recommend for newly formed bands. It is noted that "the saxhorn is now the most fashionable, as it is probably the best, instrument for band purposes." The suggested composition of a twelve-member band that follows the exemplar of the regimental French bands is given as follows:<sup>103</sup>

- 3 E-flat soprano saxhorns
- 2 B-flat tenor [sic] saxhorns
- 2 E-flat alto [sic] saxhorns
- 1 B-flat baritone saxhorn
- 2 B-flat bass saxhorns
- 2 E-flat Contra Bass saxhorns

For a ten-member band, one alto and one bass should be omitted, and for an eight-member band one soprano, one alto, one bass and one contrabass should be omitted. The advertisements of Firth, Pond & Co. in the same journal in 1853 emphasized that imported saxhorns would cost five to ten percent less than those of the firm's own make.<sup>104</sup> One of the firm's advertisements in 1854 notes that:<sup>105</sup>

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<sup>103</sup> "Advertisements", *Musical World & the New York Musical Times* 4, no. 4 (25 September, 1852): 78.

<sup>104</sup> "Advertisements", *Musical World & the New York Musical Times* 5, no. 11 (12 March, 1853): 176.

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During the last twelve months, we have supplied over forty different Bands with Sax Horns of our own manufacture, or imported expressly for our House, and we have now contracted with a superior European maker for the sale of his new pattern Sax Horns, in Brass or German Silver, with the new Rotary Valve, which we can now recommend as the most perfect Valve yet introduced.

In 1854 other importers of saxhorns appeared, such as Bruno, Weissenborn, & Co. (New York)<sup>106</sup> and George P. Reed & Co. An advertisement of the latter appearing often at the *New York Weekly Review* (1854) promoted instruments made by Gautio [sic] & Co. of France (probably a misspelling of Gautrot). The following saxhorns were offered for sale:<sup>107</sup>

E-flat soprano leader

B-flat second tenor

E-flat alto

B-flat baritone

B-flat bass, 4 valves

E-flat contrabass

Saxhorns were offered for sale both in regular form and in over-the-shoulder version with an additional charge. This is the only advertisement known to the author that differentiates between regular saxhorns and over-the-shoulder ones. A surviving instrument by Gautrot in the private collection of Mark Elrod (United States) is perhaps a unique example, of an instrument made by a major Parisian maker in over-the-shoulder form (Figure 6.12). The instrument has a swiveling mouthpipe so that it can be played both in bell-up and over-the-shoulder form.<sup>108</sup>

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<sup>105</sup> “Firth, Pond & Co.’s column”, *New York Musical Review and Choral Advocate* 5, no. 1 (5 January, 1854): 16.

<sup>106</sup> “Advertisements”, *New York Musical Review and Choral Advocate* 5, no. 22 (26 October, 1854): 375.

<sup>107</sup> “Geo. P. Reed & Co.’s column”, *New York Musical Review and Choral Advocate* 5, no. 6 (16 March, 1854): 96.

<sup>108</sup> Robert Eliason, “Jesse’s Tuba”, *Newsletter of the American Musical Instrument Society* 39, no. 1 (Spring 2010): 11-14.



**Figure 6.12** Contrabass over-the-shoulder saxhorn in E-flat, made by Gautrot, Paris. Private collection Mark Elrod, United States of America.

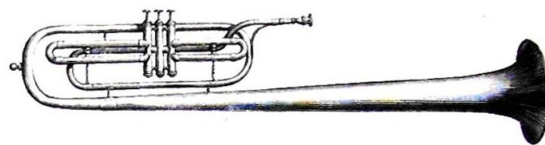
No evidence suggests that Adolphe Sax ever made instruments in over-the-shoulder form. There is evidence that other Parisian makers did make over-the-shoulder saxhorns. These instruments were destined for export only, since Sax dominated the local market, and were not included in the makers' catalogues; thus, evidence is hard to find. However, there is one exception: A. Lecomte & Cie. in their 1868 catalogue depicted among others, saxhorns (called "modèle A") in over-the-shoulder form.<sup>109</sup> These ranged from soprano in E-flat to contrabass in B-flat (Figure 6.13). The latter contradicts Bevan's (2000) statement that over-the-shoulder saxhorns were not made in the pitch of 16-ft C or 18-ft B-flat.<sup>110</sup> The above advertisements show that in the early 1850s, saxhorns had become popular in the United States. From the same period comes the first known tutor for the saxhorn: Burditt, B. A., *Preceptor for the sax-horn* (eight volumes, published by Oliver Ditson in Boston, c. 1852).<sup>111</sup>

<sup>109</sup> *Catalogue des instruments de la manufacture de A. Lecomte & Cie* (Paris: impr. de E. Martinet, 1868), 15.

<sup>110</sup> Bevan, *The Tuba Family*, 428.

<sup>111</sup> See, Orville Augustus Roorbach, *Bibliotheca Americana: Catalogue of American publications, including reprints and Original Works, from 1820 to 1852 inclusive together with a list of periodicals published in the United States* (New York: Orville A. Roorbach, 1852), 81.

## SAXHORNS MODÈLE A



215.

200.	Contrebasse en <i>si b</i> grave à 3 pistons.	135	»
201.	— <i>ut</i> et <i>si b</i> .	4	— 135 »
202.	— — — 3	—	120 »
203.	— <i>mi b</i> et <i>ré b</i>	4	— 123 »
204.	— — — 3	—	105 »
205.	— <i>fa</i> et <i>mi b</i>	4	— 115 50
206.	— — — 3	—	100 50
207.	Basse en <i>si b</i> et <i>la b</i> . . .	4	— 90 »
208.	— — — 3	—	75 »
209.	— <i>ut</i> et <i>si b</i> . . .	4	— 90 »
210.	— — — 3	—	75 »
211.	Baryton en <i>si b</i> et <i>la b</i> . . .	4	— 75 »
212.	— — — 3	—	60 »
213.	— <i>ut</i> et <i>si b</i> . . .	4	— 75 »
214.	— — — 3	—	60 »
215.	Alto en <i>mi b</i> et <i>ré b</i> . . .	3	— 57 »
216.	Ténor en <i>fa</i> et <i>mi b</i> . . .	3	— 54 »
217.	Contralto en <i>la b</i> et <i>sol</i> . .	3	— 42 »
218.	— <i>si b</i> et <i>la b</i> . . .	3	— 40 50
219.	— <i>ut</i> et <i>si b</i> . . .	3	— 39 »
220.	Soprano en <i>mi b</i> et <i>ré b</i> . .	3	— 33 »

Voyez la note à la page 2 au sujet des tons de rechange.

**Figure 6.13** Extract from the product catalogue of Lecomte & Cie, Paris 1868, depicting over-the-shoulder saxhorns offered for sale.

Interesting information regarding the usage of the saxhorns can be found in the correspondence section of some journals. The various questions of the readers addressed to the journal staff show the popularity of saxhorns in various pitches and in some cases the effort of various bandsmen or band leaders, especially those of newly formed bands, to become more familiar with the relatively “new” instruments. We learn for example that the E-flat soprano saxhorn was quite popular and that it came from France furnished with crooks for D-flat and C, which were never used in the United States.<sup>112</sup> Most of the queries regarded the way one should write for the saxhorns, and in most cases it appears that readers found it difficult to become familiar with transposed notation. The lack of a large number of tutors for the new instruments is a contributing factor, since it appears that except for Dodworth’s *Brass*

<sup>112</sup> “To correspondents”, *New York Musical Review and Choral Advocate* 5, no. 23 (9 November, 1854): 384.

*Band School* and Burditt's *Preceptor for the sax-horn* there was nothing else available in the local market. Some dealers imported methods from Europe, but it is believe that the language constituted an obstacle in their broad use.

It appears that American wind instrument makers did not manage to export their instruments to Europe during nineteenth century. Exports of American musical instruments, starting in the late 1860s, were almost exclusively, of pianos, organs and melodeons.<sup>113</sup> In the beginning of the second half of nineteenth century together with the numerous imports, the local production of saxhorns also increased. Makers such as Graves & Co. (Boston after 1850), Isaac Fiske (Worcester) in the early 1850s started producing instruments with various versions of rotary valves improved by American makers, such as those of Thomas D. Paine and Lathrop Allen, and these instruments gained more popularity than their European counterparts.<sup>114</sup> The effort of local makers to compete with European firms is apparent in some statements in various journal articles saying that the local makers' instruments rank with the very best makers of Paris.

A very interesting passage regarding the use of various valves in the country in the early 1850s appears in Dodworth's *Brass Band School* which also reflects the situation in the production of instruments; Berlin valves (which are called cylinders) found mainly in French-made instruments, were quite popular, but rotary valves with which mainly local products are furnished with were becoming more popular:<sup>115</sup>

The valve most in use at the present time is such as all Sax Horns have called "Cylinder;" these for common valves are preferable to any other, being durable and easily repaired. "THE VALVE ORDINAIRE," is such as attached to most French Cornets; the "PERRINET" [sic] valve, is some times attached to the same instrument, and somewhat resembles in appearance the "ORDINAIRE." The German double valve, is found on most German made Trumpets, Post Horns, &c. The Rotary valve is daily coming more into use, with many different arrangement of machinery to turn them, all possessing more quickness and activity than any other valve, but at the same time are much more delicate, and difficult to repair.

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<sup>113</sup> See for example "'Bradstreet' on American Exports of Musical Instruments", *Musical Opinion & Music Trade Review* 5, no. 53 (February 1882): 196.

<sup>114</sup> See for more, Robert Eliason, *Early American Brass Makers* (United States of America: The Brass Press, 1981).

<sup>115</sup> Dodworth, *Brass Band School*, 13.



In 1856, G. P. Reed & Co. mentioned previously, were advertised as the Boston agents of Graves & Co., no longer Gautrot.<sup>116</sup> In the same advertisement Graves & Co. promoted their new (more extended) series of rotary valve brass instruments which included: cornets (small bell), cornets (large bell), tenor instruments, baritone instruments, bass tubas and contra bass tubas. All but the first appear to be instruments of the saxhorn family.<sup>117</sup> This is an indication of what will be mentioned below: from the 1850s in most cases all soprano valved brasses were called “cornets”. A few months later in the same journal an anonymous journalist replied to a reader’s question:<sup>118</sup>

There are no better saxhorns manufactured than those of Graves & Co., sold by Geo. P. Reed & Co., Boston. A B flat tenor saxhorn, with four rotary valves, of their manufacture, will cost you \$70; it is a high price, but the instrument will be very superior. We can get you an ordinary rotary B flat tenor, a warranted article, for \$35. A B flat bass saxhorn, with four ordinary valves, will cost you \$15.

### 6.2.2 Nomenclature

As stated by Garofalo and Elrod, it appears that in the nineteenth century the terms “saxhorn” and “cornet” were used interchangeably for a number of soprano valved brass instruments of conical bore profile and different shapes;<sup>119</sup> by 1860 the term “cornet” suggested any soprano valved brass instrument that played the melodic part, and not a particular model.<sup>120</sup> Garofalo and Elrod added further to the nomenclature confusion by adopting the term “cornet” for all the bell-front and circular valved brass models, and the term “saxhorn” for all the over-the-shoulder and upright models that are depicted in their book. Further differences between the British/French and American nomenclature standards occur in the usage of terms regarding the pitch of instruments. Dodworth, in *Dodworth’s Brass Band School* uses standard French terminology. There is an exception, the usage of the term “alto” which is used for instruments in 4-ft C, or 4½-ft B-flat as would be used in Britain, in

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<sup>116</sup> “Advertisements”, *New York Musical Review and Gazette* 7, no. 3 (9 February, 1856): 47.

<sup>117</sup> Ibid.

<sup>118</sup> “To Correspondents”, *New York Musical Review and Gazette* 7, no. 21 (18 October, 1856): 329.

<sup>119</sup> Garofalo & Elrod, *A Pictorial History*, 9.

<sup>120</sup> The above mentioned authors cite their original source of information: William Buffkin, *Union Bands of the Civil War* (PhD. diss. The Louisiana State University, 1973), 170, 172.

place of the French term “contralto”. Other American makers use different terminology, see Table 6.2.<sup>121</sup>

**Table 6.2 Terminology used by Dodworth in *Dodworth’s Brass Band School* (1853) and by the majority of other American makers.**

Instrument pitch	Dodworth (1853)	Other American makers
3-ft F, 3¼-ft E-flat	soprano	cornet
4-ft C, 4½-ft B-flat	alto	cornet
6-ft F, 6½-ft E-flat	tenor	alto
8-ft C, 9-ft B-flat narrow bore	baritone	tenor
8-ft C, 9-ft B-flat wide bore	bass	bass, baritone
12-ft F, 13-ft E-flat	contrabass	bass
16-ft C, 18-ft B-flat	-	contrabass

To conclude, it is believed that three factors overall influenced the popularity of saxhorns in the United States of America, at least as far as the usage of the term is concerned: 1) European, and especially French, imports from the 1840s and on, 2) the Distins’ successful visit in 1849, and 3) Allen Dodworth’s visit to Paris and his association with the Distin family and the popularity of Dodworth’s saxhorn band in the country. Without more information regarding the *ebor cornos*, no firm conclusions can be reached about their actual identity and correlation with French intermediate bore-profile instruments of the second quarter of the nineteenth century. It is hope that information that might come to light in the future will shed some light on the subject’s dark areas.

<sup>121</sup> See for example, *Price List. Illustrated Band Instruments, Uniforms etc, for Sale by Lyon & Healy* (Chicago: Donnelley, Cassette, & Loyd, 1880), or *Busch & Dodworth Manufacturers of Band Instruments, 47 Lafayette Place, New York City* (New York: [n.p.], 1880).

### 6.3 Saxhorns in other parts of the world

Although, outside France, Britain and the United States were the main places where saxhorns had a broad use, there is evidence that they had a use and production elsewhere, although in many cases in a limited way. As might be expected, in Germany, Italy and Spain, due to the existence of the indigenous families of flugelhorns, flicorni and fiscorni, saxhorns were not used much, although as Heyde (1987) reports there was a somewhat limited of production of saxhorns in Germany destined for exportation.<sup>122</sup> The prospectuses of C. G. Herold (c. 1855) and Ferdinand Glier & Sohn (c. 1867) both based in Klingenthal, reproduced in Heyde (1987) show next to German models complete series of saxhorns. In Glier's prospectus, saxhorns and other Sax models with Berlin valves are abundant, and according to Heyde these were mainly destined for export to the United States.<sup>123</sup>

In Belgium, mainly due to its proximity to France and under the influence of the Sax family, many makers incorporated saxhorns in their production, and saxhorns were used in the various bands.<sup>124</sup> Already in 1846 it was reported that Sax's instruments were appreciated by his compatriots and were adopted by M. Bender "l'habile directeur de la musique de roi des Belges [...] pour la musique du régiment des guides".<sup>125</sup> Édouard Jacobs wrote in 1853 that the Société des Fanfares-Amateurs in Roeulx, one of the best bands in the country, consisted exclusively of Sax's valved brasses.<sup>126</sup> A surviving sales catalogue of 1860 of the Belgian maker Gummarus Van Engelen, based in Lierre, shows that his production included a variety of Sax-type saxhorns, which were called *bugles* or *bugle tubas*.<sup>127</sup> Among the most important

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<sup>122</sup> Herbert Heyde, *Das Ventilblasinstrument* (Leipzig: VEB Deutscher Verlag für Musik, 1987), 215.

<sup>123</sup> Ibid., 278.

<sup>124</sup> See also for more on the adoption of Sax's instruments in Belgian military bands Jean-Pierre Rorive, *-Sax, 1814-1894: Inventeur de génie* (Brussels: Racine, 2004), 77-81.

<sup>125</sup> "Macédoine" *La tribune dramatique et des beaux arts* (8 March, 1846): 400.

<sup>126</sup> Édouard Jacobs, *Nomenclature des sociétés musicales de la Belgique suivi d'une notice chronologique sur l'association royale de sociétés lyriques d'Anvers* (Anvers: impr. de G. van Merlen et fils, 1853), 99-100.

<sup>127</sup> See, Gwenny Vermote, Christel Baeten, *Harmonies, fanfares en brassbands in de provincie Antwerpen* (Gent: Snoeck-Ducaju & Zoon, 1992), 98.

Belgian firms of instruments making was that of Mahillon whose production was strongly influenced by Adolphe Sax.<sup>128</sup>

## 6.4 Conclusions

Saxhorns did not only have a wide and long-lasting use in France, but also beyond the French borders. The influence of the Distin family on the dissemination of saxhorns in the United Kingdom was great. Not only did the family make saxhorns well known in Britain, but they also became Sax's official British agents during the period 1846-51. From 1851 onwards the Distins started manufacturing their own instruments and their collaboration with Sax came to an end. Around the middle of the nineteenth century many saxhorns and saxhorn-type instruments were being imported from France into the United Kingdom and similar instruments started being made locally. Many brass bands emerged which incorporated the term "saxhorn" and "saxtuba" (used for saxhorns in upright form) in their names. Saxhorns became important instruments in the instrumentation of British brass bands. Already in the early 1840s French-style saxhorns were being imported in the United States from France, among other French brass instruments. The term "saxhorn" became well known in the country after 1849 when the Distin family visited the United States. Their influence was great for the dissemination of saxhorns in America. The connections of the Dodworth family with the Distins must have also played an important role in that. It has also been found that in the early 1850s saxhorns both in regular and over-the-shoulder form were being imported from France into the States, although there is no evidence that over-the-shoulder saxhorns were ever used in Europe, although they were made by at least two French makers. Eventually, the term "saxhorn" became connected to over-the-shoulder instruments especially during the American civil war. Belgium was another country where saxhorns seem to have gained use, due to the country's proximity to France and perhaps to the Sax family's connection with the country. In other European countries the manufacturing and use of instruments similar to saxhorns such as flugelhorns, flicorni, or fiscorni, meant the saxhorns had a more limited use.

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<sup>128</sup> See also Chapter Four, p. 131, for more on Mahillon's instruments exhibited in the 1849 National Exhibition of Belgium.



## Chapter Seven

### Intermediate bore-profile instruments other than saxhorns

With the appearance of Adolphe Sax's saxhorns and saxotrombas on the Parisian instrument-making scene, Sax's contemporary makers accused him of plagiarism since intermediate-bore profile instruments existed long before Sax's saxhorns. Several intermediate-bore profile models of instruments emerged in various wraps even after the appearance of saxhorns and saxotrombas, either in response to performers' demands, or as a result of the constant quest of makers for "novelties", which could conquer the marketplace. Each of these instruments followed its own route in the course of time. Some were used for some time, others were never produced commercially, and still more (or their offspring) are still in use today. This chapter will examine intermediate bore-profile instruments from the late 1830s until the beginning of the twentieth century appearing mainly in France and Britain. Their construction and usage will be discussed. Classification of various models will not be discussed here, as it will be examined thoroughly in Chapter Eight.

#### 7.1 Bell-up instruments

##### 7.1.1 Instruments of the clavicor and néocor group

**The clavicor.** According to all sources the earliest intermediate-bore profile valved instruments in French territory were instruments of the clavicor and néocor group. As early as 1838 Jean-August Guichard aîné<sup>1</sup> took out a five-year patent for an instrument called the clavicor.<sup>2</sup> As explained in the patent specification, the clavicor was intended to replace the alto ophicleide advantageously. Guichard presented a very detailed description of the instrument's construction in his patent specification.

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<sup>1</sup> Brass instrument maker based in Paris, from 1827. In 1835 his brother in law, Pierre-Louis Gautrot, joined the business, and eventually succeeded Guichard in 1845. See William Waterhouse, "Guichard", *The New Langwill Index: A Dictionary of Musical Wind-Instrument Makers and Inventors* (London: Tony Bingham, 1993), 151.

<sup>2</sup> French patent, no. 8962, 22 September 22 1838 "for a brass instrument called clavicor and able to replace the alto ophicleide with advantage".

## Chapter Seven

Every single component of a clavicor in 8-ft C was described meticulously. The instrument depicted was equipped with three Stölzel valves divided in groups of one and two; one for the left hand and two for the right hand. Also depicted were crooks to lower the instrument's pitch to A, G and F. No further information was provided concerning the use of the instrument or for the reasons behind the specific design.

The clavicor was not originally Guichard's idea, but it was based on an idea of H. Danays<sup>3</sup> who sold the idea to Guichard.<sup>4</sup> Danays imagined the instrument as a replacement for the alto ophicleide. With the use of the valves, the clavicor was easier to play than the alto ophicleide which was pitched a third higher.<sup>5</sup> Clavicors were exhibited for the first time by Guichard in the 1839 Paris Exhibition where the maker received honourable mention for his new instrument.<sup>6</sup> The jury noted that at the time clavicors were employed with success in the various military bands.<sup>7</sup>

Although Guichard in his patent described only the baritone instrument in 8-ft C, surviving instruments fall into two categories: baritone instruments in 8-ft C and tenor instruments in 6-ft F or 6½-ft E-flat, both of which are equipped with crooks to change the pitch. Strangely enough, Kastner in the *Supplement* (1844)<sup>8</sup> of his *Traité général d'instrumentation*<sup>9</sup> only mentions the *clavi-cors* in F and E-flat stating that the instrument's form is very similar to that of the alto ophicleide. It is odd that Kastner overlooked the existence of the clavicor in C/B-flat, for which Guichard had issued a patent. The exact time of the introduction of small clavicors is unknown.

Strange as it may seem the term "clavicor" might have been associated with a brass instrument a few years before Guichard's 1838 patent. The *Dictionnaire géographique de la province d'Anvers*, published in 1834, reports that during the national industrial exhibition of 1830 in Brussels, the maker Francois-Joseph van

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<sup>3</sup> According to Waterhouse, H. Danays was an inventor of brass instruments. In 1846 he was reported as a maker of cornets and clavicors in Paris. In addition to his connection with the clavicor patent he is known to have issued only one patent; this was a patent granted to him in 1851 for improvements in valves of brass instruments. See, Waterhouse, "Danays H." *The New Langwill Index*, 80.

<sup>4</sup> Pontécoulant, *Organographie: Essai sur la facture instrumentale. Art, industrie et commerce* (Paris: Castel, 1861), 2:393.

<sup>5</sup> Ibid.

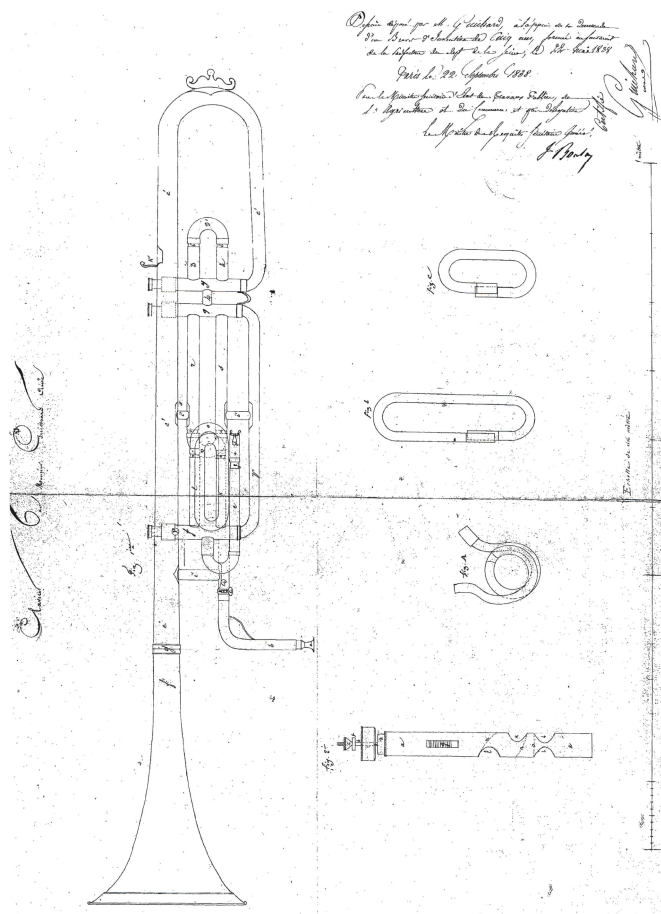
<sup>6</sup> Pontécoulant, *Douze jours à Londres: voyage d'un mélomane à travers d'Exposition universelle* (Paris: Frédéric Henry, 1862), 211.

<sup>7</sup> *Exposition des produits de l'industrie française en 1839. Rapport du jury central. Tome seconde* (Paris: Bouchard-Huzard, 1839), 360-61.

<sup>8</sup> Jean-Georges Kastner, *Supplément au Traité général d'instrumentation* (Paris: [n.p.], 1844), 48.

<sup>9</sup> Kastner, *Traité général d'instrumentation, comprenant les propriétés et l'usage de chaque instrument, précédé d'un résumé sur les voix, à l'usage des jeunes compositeurs* (Paris: [n.p.], 1837).

Intermediate bore-profile instruments other than saxhorns Engelen from Lierre, Anvers, exhibited a “clavicorn” together with an ophicleide, a *cor d’invention*, and a *trompette d’invention*. No description of the instrument was provided, or further information associated with it.<sup>10</sup>



**Figure 7.1** The drawing section from Guichard’s 1838 clavicorn patent.

A typical clavicorn is equipped with three Stölzel valves, although there are surviving instruments with other types of valves, such as rotary. In the earlier models the valves follow the pattern of the instrument depicted in the patent; they are divided in two clusters of two and one, although later models have all three valves in a cluster, to be played by one hand (see Figure 7.2). The instrument’s bell is detachable by a screwed joint, but not moveable, a feature facilitating the dismantling and storage of the instrument and even the easier repair or replacement of the bell in the case of an accident.

<sup>10</sup> Vander Ph. Maelen, *Dictionnaire géographique de la province d’Anvers* (Brussels:[n.p.], 1834), 252.





Figure 7.2 Left: clavicor in 6½-ft E-flat with valves in two groups (1+2), Jean, France, 1840-45 (inventory number 3045). Right: clavicor in 6½-ft E-flat with all three valves in a cluster. The second valve is of the Périnet type, whereas the first and third are Stölzel valves. Edinburgh University Collection of Historic Musical Instruments (inventory number 5974). Photographs by Raymond Parks.

Sax's private collection included a clavicor with four rotary valves (divided in groups of two) made by Guichard, today in the Musée de la musique in Paris (inventory number E. 747). In Sax' collection catalogue this instrument was described as "très riche".<sup>11</sup> The instrument is indeed very ornamented with bits of metalwork, patches of german silver and a bell painted with Asian motives. Clavicors with rotary valves are very rare.

**The clavicor in Britain.** The instrument –often in a slightly different form– found some use in Britain. Clavicors or *althorns* as they were also known in Britain were imported from France or made by makers in London, such as Pace or Köhler, and were included in bands in the middle of nineteenth century, as Baines states.<sup>12</sup> It

<sup>11</sup> *Catalogue du musée instrumental de M. Adolphe Sax. Collection unique d'instruments de musique de tous temps et de tous pays* (Paris: impr. de Ves Renou, Maulde et Cock, 1877), 18.

<sup>12</sup> Anthony Baines, *European and American Musical Instruments* (London: Chancellor Press, 1983), 151-52.

Intermediate bore-profile instruments other than saxhorns appears that clavicors were first introduced in Britain by the famous conductor and composer Louis Jullien in 1841. The first mention of the clavicor in the British press known to the author was in a short article reviewing Jullien's concert which was published in the *Preston Chronicle* in May 1841.<sup>13</sup> The reviewer wrote:

On Thursday evening last, this celebrated band gave a second concert in the Exchange Rooms to a numerous and fashionable attendance [...] The performance finished with "God save the Queen," M. Jullien playing the solo part on the clavicor—a poor substitute for the ophicleide, which, on this occasion we missed.

Subsequently in September 1841 the clavicor was used again by Jullien in his series of *concerts d'été* at the Theatre Royal at Drury-Lane, London. The second part of the programme commenced with a "Fantasia" from Donizetti's *Lucia di Lamermoor* with a solo on the clavicor, "en entirely new instrument", which as claimed in the concert notes had been invented by Jullien himself and played in Britain for the first time.<sup>14</sup> Jullien was obviously not the inventor, but he might have benefited from the law's tolerance that allowed one to consider themselves inventors—even when a product was already new outside Britain—when they introduced the product—in this case the clavicor—to Britain.<sup>15</sup> An article of the *Musical World* during the same month, commented on the "novelty of the week" referring to the introduction of the clavicor by Jullien.<sup>16</sup> The instrument there was described as being:

of the horn genus, and is played with the assistance of keys (as the name implies) —these keys of course facilitate the execution but impair the tone, giving it a Trombonish quality, and thereby destroying its orchestral usefulness; for who would dispense with the mellow *sostenuto* of the horn? As an addition to the brass choir, it may, perhaps, be profitably incorporated.

In December of the same year (1841), Jullien introduced the clavicor in Dublin during his series of concerts *Concerts d'hiver*. Subsequently, the instrument was introduced in Belfast in 1842.<sup>17</sup> It has been recorded that even the Distins used the clavicor. In March 1843 it was advertised that Henry Distin would perform on the clavicor, for the first time in Dublin.<sup>18</sup> No other performance of the Distins on this

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<sup>13</sup> "Jullien's band", *Preston Chronicle*, no. 1500 (29 May, 1841): n.p.

<sup>14</sup> "Theatre Royal, Drury-Lane.—Concerts d'été" *John Bull*, no. 1084 (18 September, 1841): 445.

<sup>15</sup> For more on the intellectual property legislation see Chapter Two.

<sup>16</sup> "Musical Intelligence. Metropolitan. Concert's d'Été at the Theatre Royal Drury Lane", *Musical World*, no. 287 (23 September, 1841): 203

<sup>17</sup> "Promenade and concert", *Belfast News-Letter*, no. 10971 (30 August, 1842), n.p.

<sup>18</sup> "Music Hall", *Freeman's Journal and Commercial Advertiser* (3 March, 1843): n.p.

instrument is known. Newspaper or journal articles mentioning the clavicor in subsequent years are scarce.

Henry Distin's handbill from the early 1850s (Chapter Six, Figure 6.4) depicted a three-valve clavicor with all three valves placed in a cluster; this instrument was called an "althorn". A couple of surviving examples made by Köhler are equipped with Shaw's disc valves; the three valves are all placed in a cluster.<sup>19</sup> During the 1851 International Exhibition in London, Köhler among others exhibited a four-valve "patent" clavicor in E-flat, although no patent is known to have been granted to the maker for such an instrument.<sup>20</sup>

**The Néocor.** Another intermediate bore-profile instrument that became associated with the clavicor was the néocor. During the long litigations against Sax by his contemporary makers, Sax's rivals attempted to prove that the néocor together with the cornet and the clavicor formed a complete family preceding that of the saxhorn and saxotromba.<sup>21</sup>

According to the testimony of Jean-Baptiste Tolbecque, Guichard had made the first néocor in 1841 after a design given to him by Tolbecque.<sup>22</sup> He also testified that he was motivated by the need for an instrument that could successfully replace the horn in the military and dance bands for which Tolbecque was composing a lot of music. This is also the reason why it was called a néocor: a new horn. However, the néocor did not provide a satisfactory solution and he immediately replaced it with the saxotromba when the latter became available. During the same court hearing Guichard confirms the information provided by Tolbecque adding that there was nothing new about the néocor since in 1838 or 1839 he had imported some from Italy. The same information is confirmed by a Professor of Music at the *Collège de Juilly*,<sup>23</sup> Dominique Bonange, to whom Guichard had shown the newly made

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<sup>19</sup> For an illustration see Anthony Baines, *European and American Musical Instruments* (London: Chancellor Press, 1983) Illustration section, fig. 792.

<sup>20</sup> See Robert Ellis, *Great Exhibition of the Works of Industry of All Nations, 1851. Official Descriptive and Illustrated Catalogue. By Authority of The Royal Commission* (London: Spicer Brothers, Wholesale stationers; W. Clowes and sons, 1851), 1:470.

<sup>21</sup> *Nullité de brevet. Instruments et brevets Sax. Tribunal Correctionnel de la Seine, 6me Chambre. Affaire Rivet contre Sax. Documents* (Paris: Dondey-Dupré, 1855).

<sup>22</sup> *Affaire Sax. Pièces justificatives contenant : 1 ° Les enquêtes et contre-enquête des 30 Juillet et 13 août 1858 ; 2 ° La contre-enquête du 27 Mars 1856 ; 3 ° Les déclarations, attestations, lettres, certificats et autres documents venant s'ajouter aux enquêtes. Mars 1860* (Paris: impr. N. Chaix, 1860), 8.

<sup>23</sup> Situated at the vicinity of Paris.

Intermediate bore-profile instruments other than saxhorns instrument in 1841. The néocor's connection with Italy is further supported by its presence in early Neapolitan scores. Renato Meucci reported that in the past he had seen the néocor scored for in nineteenth-century Italian scores, although none of the scores has proved possible to be retrieved.<sup>24</sup>

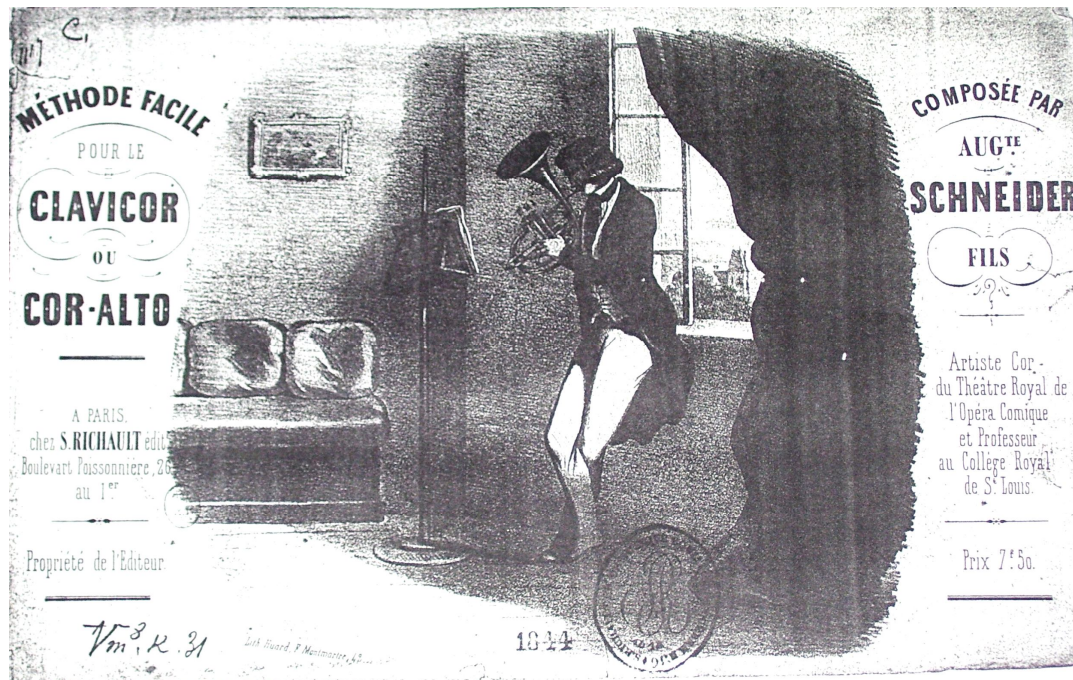


**Figure 7.3 Néocor by Schneider, Strasbourg c. 1840. Edinburgh University Collection of Historic Musical Instruments (inventory no. 3350). Photograph by Antonia Reeve.**

Information drawn from the lawsuit documents reported the existence of two methods for the clavicor and the néocor, both by Auguste Schneider. One of them, at the Bibliothèque Nationale, published in 1844 is titled *Méthode facile pour le clavicor or cor-alto* (Paris: S. Richault). Despite the title, the cover depicts a performer playing on a néocor (Figure 7.4). What is unusual in this method is the depiction of a néocor equipped with three Périnet valves. The majority of the surviving instruments of this kind have three Stölzel valves. In the method's introductory part it was stated that this instrument was perfected by one of the best Parisian makers, and its form was close to that of the horn, whose sound “lacks in accuracy” compared to that of the clavicor. According to Schneider composers treated it as a horn in their music, trying though to avoid the extremes in its upper range. It could also be used as a bass and *basse chantante* in military bands. Its mouthpiece was similar to that of the cornet with the difference of being deeper and with slightly wider cup.<sup>25</sup>

<sup>24</sup> In a communication with the present author.

<sup>25</sup> Auguste Schneider, *Méthode facile pour le clavicor or cor-alto* (Paris: S. Richault, 1844), n.p.



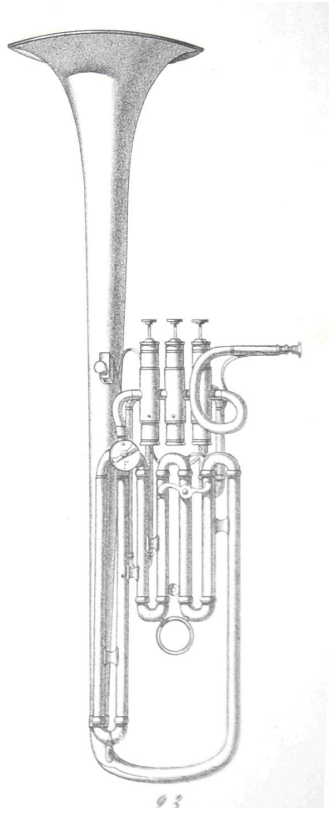
**Figure 7.4** Cover and title page from Schneider's method for the *clavicor* or *cor alto* (Paris: S. Richault, 1844).

During the lawsuits involving Sax and his opponents, the instrument depicted on the cover of this method was described as a “clavicor in form of a néocor”;<sup>26</sup> this shows confusion over the identity of the two instruments or an attempt to conceal the mistake obviously made by Schneider. The second method, according to information mentioned in the same document, was titled *Méthode pour le néocor* published again by Schneider in the same year as the previous one and by the same publishing house. The minutes<sup>27</sup> mention that this method was dedicated to Kunzé. The instrument depicted in this method is described as the one invented by Tolbecque; it was played with two hands, its valves were placed perpendicular to the body of the instrument, and the bell was inclined and it was impossible in this instrument to position the valves parallel to the bell. This description is not consistent since this instrument appears to share characteristics both of the clavicor and the néocor.

<sup>26</sup> “nous voulons parler du clavicor ayant la forme du néocor”. See, *Adolphe Sax demandeur en condamnation pour contrefaçon contre les sieurs Besson, Raoux, Halary, Buffet jeune, Buffet-Crampon, Tournier et Goumas, Martin frères, Beauboeuf, Victor Jacob, et autres. Audiences des 30 juillet et 13 août 1858, 5 août, 13, 22 et 29 décembre 1859, 5, 12, 19, 26 janvier, 2, 9 et 16 février 1860. Enquête, contre-enquête et plaidoiries. Audiences du 23 février 1860: réquisitoire de M. Mahler* (Paris: impr. centrale des Chemins de Fer de Napoléon Chaix et Cie, 1860), 14.

<sup>27</sup> Ibid.

The prospectus of Gautrot aîné et Cie published in 1850 is the only source known to the present author that depicts an instrument in upright form called “néocor”.<sup>28</sup> The instrument is described as “néocor en Fa, 3 cylindres, système Gautrot, en l’air, un cylindre transposant en 7 tons” (Figure 7.5), and it is obvious that its wrap is identical to Sax’s saxotrombas or bell-up saxhorns.



**Figure 7.5** An upright “néocor” from an 1850 product catalogue of Gautrot aîné et Cie.

No evidence for any use of the néocor in Britain is known, although it might have had some use without leaving any traces. There is evidence, however, that it was produced in at least one other European country, Spain. Two Spanish makers, Francisco Bernareggi in Barcelona and José Rámis in Madrid, are reported to have exhibited néocors in the 1845 Madrid Exhibition.<sup>29</sup> Both firms in some way show some French influence over the years. Bernareggi’s workshop which later changed from making wind instrument to pianoforte production was said to be organised in a

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<sup>28</sup> *Manuf<sup>re</sup> d’Instruments de Musique. Rue S<sup>t</sup> Louis 64 au Marais. An<sup>ne</sup> Maison Guichard. Gautrot aîné et Cie. Album & Catalogue 1850* (Paris: Plista, 1850), 3.

<sup>29</sup> *Catalogo de los productos de la industria española, por el orden que han llegado para la exposición publica de este ano 1845* (Madrid: Imprenta del Colegio del Sordo-mudos y Ciegos, 1845), 74, 81.

way similar to the Erard and Pleyel workshops in Paris.<sup>30</sup> Rámis on the other hand is reported to have been making military instruments of Sax's system in 1850.<sup>31</sup>

Another instrument which was presented as forming a family with the clavicor and the néocor was the cornet. The minutes of the case *Rivet contre Sax* contain two illustrations.<sup>32</sup> In the first one instruments of the supposed family of clavicors are depicted (Figure 7.6). Part of the family appears to be a cornet, which though is not made in the bell-front form, but in a bell-up elliptical form, similar to that of the néocor. The members of the clavicor "family" according to this drawing can be seen in Table 7.1.

**Table 7.1 Members of the clavicor "family" as described during the hearings of the court case of Rivet against Sax.**

Clavicor in [6-ft] F	Three valves
Clavicor in [6½-ft] E-flat	Three valves
Clavicor in [7-ft] D-flat	Three valves
Clavicor in [8-ft] C	Three valves
Clavicor [probably in 8-ft C] <sup>33</sup>	Three valves (2+1)
Clavicor in [9-ft] B-flat	Three valves and set of seven crooks and shanks
Néo-cor in [6-ft] F	Three valves and set of crooks and shanks

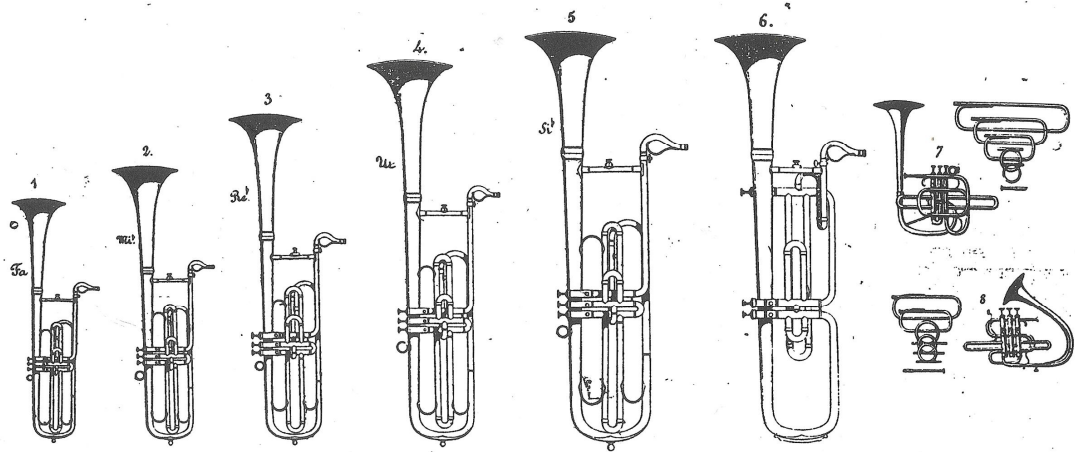
<sup>30</sup> *Exposition universelle de 1867: catalogue général de la section espagnole* (Paris: Ch. Lahure, 1867), 120.

<sup>31</sup> *Memoria presentada al Excmo. Señor Ministro de Comercio, Instrucción y Obras Publicas por la junta calificadora de los productos de la Industria Española reunidos en la Exposition Publica de 1850* (Madrid: Santiago Sananque, 1851), 324.

<sup>32</sup> *Nullité de brevet. Instruments et brevets Sax. Tribunal Correctionnel de la Seine, 6<sup>me</sup> Chambre. Affaire Rivet contre Sax. Documents* (Paris: Dondey-Dupré, 1855), Illustrations 1 and 2.

<sup>33</sup> Information added by the author.





*Famille de Clavicors créés de 1837 à 1844 du Tenor en Fa au Baryton en Si<sup>b</sup> ayant le Pavillon en l'air, se jouant sur la bouche droite.*

- N<sup>o</sup> 1. Clavicor 3 pistons en Fa  
 2. .... Mi<sup>b</sup>  
 3. .... Re<sup>b</sup>  
 4. .... Mi  
 5. .... Si<sup>b</sup>  
 6. .... non réunis tels qu'on les fabriquait de 1837 à 1840, la position des pistons arrangeait le doigt ordinaire pour entrer au milieu de l'instrument; en 1839, on réunis les 3 pistons; depuis cette époque, ils ont toujours été faits ainsi.  
 N<sup>o</sup> 7. Néocor en Fa, 3 pistons avec 7 tons de échange, ayant le pavillon en l'air ou les pistons réunis au pavillon.  
 N<sup>o</sup> 8. Cornet en Si<sup>b</sup> 3 pistons avec 7 tons de échange, ayant le pavillon en l'air.

**Figure 7.6** Clavicors from the minutes of the case *Rivet contre Sax*. From left to right: clavicor in F, clavicor in E-flat, clavicor in D-flat, clavicor in C, clavicor in B-flat, clavicor with the valves not in one cluster made as stated between 1837 and 1840, néocor in F, cornet in B-flat.

Of the six clavicors only no. 6 is depicted having the three valves in two groups of two and one. Its nominal pitch is not mentioned, although it is probably pitched in 8-ft C since it is in height between the instrument in D-flat and that of B-flat; instead, it is mentioned that the valves in this instrument are shown as they were placed between 1837 and 1840 when they were not “united” and prevented the instrument from becoming successful since this disposition harmed the fingering; since 1839 the three valves were united and the instrument had been constructed in this way ever since, as said. Elsewhere, it is mentioned that before 1845 the clavicor started having the three valves parallel to the bell.<sup>34</sup> This feature is met in a small minority of the surviving instruments.

What is interesting about the néocor and the cornet in elliptical form or néocor form included in the Figure 7.6 is that although the néocor is equipped with three Stölzel valves the cornet is equipped with Périnet valves. The cornet

<sup>34</sup> *Mémoire pour M. Rivet contre M. Sax* (Paris: Typographie et lithographie Maulde et Ranou, 1856), 43.



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additionally is equipped with a detachable and movable bell by means of a screw. This model is rare. However, according to a brochure of the firm Couesnon of 1912<sup>35</sup> the instrument's parenthood belonged to Courtois frères,<sup>36</sup> information not verified by other sources. An identical model appears in an advertisement from the Gautrot workshop which included various models of cornets made by Gautrot between 1828 and 1847.<sup>37</sup> Also included is a model with three Stölzel valves with a movable bell.

As Anthony Baines observed, the above mentioned illustration of the clavicor/néocor group found at *Nullité de brevet. Affaire Rivet contre Sax* are not convincing since the smaller instruments, especially numbers 1-5, seem to just have been scaled down on paper so as to show a complete family. This "family" only includes instruments from the contralto size (cornet in form néocor) down to the baritone in B-flat and it lacks any instruments in the upper and lower registers. The surviving instruments show only the existence of two clavicor models: instruments in F and instruments in C, adding further support in Baines' view. A few surviving examples of each of the above three mentioned instruments survive today in various public and private collections. The rarest of the three is the cornet in the bell-up elliptical form.

The clavicor and néo-cor had a limited use abroad as surviving handbills from instrument making workshops outside France show and other evidence suggest. They were even known in the United States of America; Dodworth in *Dodworth's Brass Band School* in 1853 mentions both *Klavicors* [sic] and *Neo Cors* where he talks about tenor instruments E-flat.<sup>38</sup> *Klavicors* also appear in the B-flat baritone instruments section. After the appearance of Sax's instruments in Paris these instruments gradually became extinct.

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<sup>35</sup> See Larigot, no. 6 (October 1988): 5.

<sup>36</sup> They were active in Paris between 1803 and 1845; see Waterhouse, "Courtois frères", *The Langwill Index*, 73.

<sup>37</sup> For a reproduction see Larigot, no. 6 (October 1989): 7.

<sup>38</sup> Allen Dodworth, *Dodworth's Brass Band School* (New York: H. R. Dodworth & Co., 1853), reprint California 1980, 19.

### 7.1.2 Instruments of the *néo-alto* and *bombardon* group

During the court hearings, Sax's opponents tried to prove that a second family of instruments predated Sax's saxhorns and saxotrombas; these were instruments of the *néo-alto* and *bombardon* group. Evidence for the existence of this group of instruments appears only in writing since no surviving instrument can be identified as belonging to this group. These instruments were strongly associated with the maker Rivet.

A short discussion on the term "bombardon" as it appears in connection with nineteenth-century brass instruments is necessary. Confusion is created by the inconsistent usage of the term even within the borders of the same country. According to Sachs (1913)<sup>39</sup> the term was first applied to the twelve-key bass ophicleide by Johann Riedl in the early 1820s in Vienna. This piece of information is confirmed by a short-lived French journal *Le Dilettante. Journal de Musique, de Littérature, des Théâtres et de Beaux-arts*. In the November 1833 issue appeared an article on the *Bombardon*.<sup>40</sup> There the instrument is described as newly invented by Riedl who managed to invent a satisfactory instrument to play the bass part of the orchestra played only by the trombones until then. It was mentioned that the instrument was made in B-flat and resembled the valved ophicleide, but had a distinct timbre. The unknown author added that it was made for the first time in Warsaw ten years before. However, according to Heyde the earliest evidence shows Wenzl Riedl to be associated with the introduction of the valved bombardon. Although it can not be said with certainty whether he was the inventor, the earliest information comes from the *Wiener Zeitung* of 1829 where Wenzel Riedl, a brass instrument maker in Vienna, advertised the newly invented *Bassbombardone* with twelve keys or valves. Later the term became associated with the three or four-valve contrabass instrument in 12-ft F or 13-ft E-flat, differentiated by the number of valves from the five-valve bass tuba of Moritz (1835).<sup>41</sup> Valved ophicleides appeared later, in the 1830s. In 1835 Guichard in Paris took out a patent for a three-valve ophicleide, equipped with Stölzel valves. About the same period Uhlmann in Vienna

<sup>39</sup> Curt Sachs, *Reallexikon der Musikinstrumente* (Germany: Olms, 1979), 54-55.

<sup>40</sup> "Bombardon", *Le Dilettante. Journal de Musique, de Littérature, des Théâtres et de Beaux-arts*, no. 3 (Paris: 5 November, 1833): 8.

<sup>41</sup> Herbert Heyde, *Das Ventilblasinstrument* (Leipzig: VEB Deutscher Verlag für Musik, 1987), 222-23.

also advertised valved ophicleides equipped with double piston valves. In the early French models the valves are placed vertical to the bell, whereas in Uhlmann's specimens the valves are placed parallel to the bell, in a manner similar to Sax's later models made in saxotromba form. According to Lavignac's encyclopedia this was also the case with French valved ophicleides after 1839.<sup>42</sup> According to Heyde's evidence a few years intervened between the appearance of valved bombardons and that of the valved ophicleides and the term "bombardon" was also applied to valved ophicleides and in some case the two came to be considered alike.<sup>43</sup>

In the various lawsuit documents there is usually no distinction made between the "bombardon" and the "valved ophicleide". Kastner described the bombardon<sup>44</sup> in his *Traité d'instrumentation* (1837)<sup>45</sup> as the German term for the French *ophicleide monstre en F* that had already at that point been equipped with valves instead of ten or twelve keys. He also adds that this instrument is sometimes called *Corno basso chromatico*, a term that according to Meucci (1996) is associated with the Italian *cimbasso*.<sup>46</sup> Kastner also included two drawings of the contrabass ophicleide or bombardon since as he noted the instrument at that point was not very well-known in France, although it had been adopted in some military bands and had some use in the *musique d'harmonie* by providing a perfect bass missing until that point. One of them (instrument B in Figure 7.7) depicts an instrument in oval form with three double-piston valves and a forward-directing bell, and the other (instrument A in Figure 7.7) is an instrument in ophicleide-form equipped with three Stölzel valves. It is noted that the latter is more convenient for the cavalry. Both of them also appear in Kastner's *Manuel général de musique militaire* published in 1848; there both

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<sup>42</sup> Albert Lavignac, ed., "Des instruments à vent: De leur principe" in *Encyclopédie de la musique* (Paris, Librairie Delagrave, 1927), 3:1456.

<sup>43</sup> See for a description of the situation in Italy, Renato Meucci, "The Cimbasso and Related Instruments in 19<sup>th</sup>-century Italy", *Galpin Society Journal* 49 (March 1996): 143-79.

<sup>44</sup> He mentions that the term "bombardon" is used due to the instrument's force of tone (*à cause de la force de ce ton*).

<sup>45</sup> It is important to note that the *Traité* had been completed in 1835 and was published two years later, after Kastner received the approval of the *Académie de Beaux Arts*. It is also observed that this is a much underestimated treatise, since most of the scholars in the field of musical instrument research mainly use Kastner's later *Manuel général de musique militaire* (1848) for drawing information on instruments and forget this much earlier source.

<sup>46</sup> See Meucci, "The Cimbasso", 144-45.

Intermediate bore-profile instruments other than saxhorns instruments were called *bombardons* and for only the former the name *ophicleide monstre en F* was given as the French alternative.<sup>47</sup>

The *ophicleide monstre en F* was offered for sale in the 1850 Gautrot aîné et Cie<sup>48</sup> catalogue and the catalogue drawing is identical to the one appearing on Kastner's *Manuel*. What is even more interesting is that a valve ophicleide was called a *basse à trois pistons* or *bass-tuba* in Kastner's *Manuel* and an instrument identical to Uhlmann's ophicleide was called *bombardon* or *bass-tuba* as well, a misconception that has also been pointed out by Heyde (1987).<sup>49</sup>



**Figure 7.7** Illustration of valved ophicleides/bombardons from Kastner's 1837 *Traité d'instrumentation*.

As for the bass ophicleides in C and B-flat, Kastner in his *Traité* mentions only the keyed versions of the instrument; the only other term he reports as being associated with the instrument is that of the “basse d’harmonie”. In the *Supplement* to the *Traité* (1844), Kastner mentioned that the contrabass ophicleide in F is a completely unsatisfactory instrument that was rarely used in Paris.<sup>50</sup> He foresaw that

<sup>47</sup> See, Jean-Georges Kastner, *Manuel général de musique militaire à l’usage des armées françaises* (Paris: E. Didot frères, 1848), plate XVI.

<sup>48</sup> See *Manuf<sup>e</sup> d’Instruments de Musique. Rue S<sup>t</sup> Louis 64 au Marais. An<sup>ne</sup> Maison Guichard. Gautrot aîné et Cie. Album & Catalogue 1850* (Paris: Plista, 1850), 16.

<sup>49</sup> Heyde, *Das Ventilblasinstrument*, 223-25.

<sup>50</sup> Kastner, *Supplement*, 48.

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it would one day be abandoned and replaced by either instruments of the saxophone family or instruments of the *bugle à cylindres* family constructed by Sax (instruments that later became known as the saxhorns). He made special mention of the usage of the term “bombardon”:<sup>51</sup>

This name of the bombardon has remained to be applied to several bass instruments, inter alia the ophicleide, but this whose range we give here is the most generally indicated in Germany under this name. It is also called *basse-clappenhorn* (*cor basse à clefs*). Bombardons are also made where the keys are replaced by valves and very recently Mr. Sax fils has just made a new improvement to the instrument by substituting pistons by cylinders; the latter bombardons are infinitely preferable to the former as well as for the accuracy as for the beauty of the sound and the facility of execution.

The usage of instrument names in the lawsuit minutes, especially those associated with the case *Rivet contre Sax*, is bewildering. There is no standard nomenclature, especially for instruments of the bass or contrabass register. In the various letters and invoices that were presented as evidence for the existence of instruments in form-saxotromba before Sax’s 1845 patent during the hearing of the case Rivet against Sax, the following terms were used:

**6-ft F/6½-ft E-flat:** néo-alto en mi bémol, flugel-horn mi bémol alto

**8-ft C/9-ft B-flat:** bombardons en ut et si bémol, bombardon en ut et si bémol bas [sic], néo-alto en si bémol, ophicléide-basse à 3 pistons, flugel-horn basse à 4 pistons,<sup>52</sup> flugel-horn en si bémol ténor [sic]

**12-ft F/13-ft E-flat:** bombardon contrebasse, flugel-horn en mi bémol basse

The group of bass instruments is where one meets the greatest diversity. The term “bombardon” is used both in the bass and contrabass registers. Néo-altos and bombardons seem to be nothing more than French versions, with Stölzel valves placed parallel to the bell, of the German bombardons. The only source known to the author where these instruments are illustrated as a “family” is the minutes of the

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<sup>51</sup> Ibid. “Ce nom de Bombardon a été du reste appliqué à plusieurs instruments de Basse, entr’autres à l’ophicléide, mais celui dont nous donnons ici l’étendue est le plus généralement désigné en Allemagne sous ce nom. On l’appelle encore Basse Clappenhorn (Cor-basse à clefs) [...] On fabrique aussi maintenant des Bombardons, dans lesquels les clefs sont remplacées par des pistons et tout récemment Mr. Sax fils vient d’apporter une nouvelle amélioration à l’instrument en substituant des cylindres aux pistons ; ces derniers Bombardons sont infiniment préférables aux premiers tant pour la justesse que pour la beauté du son et la facilité d’exécution.”

<sup>52</sup> It is interesting that the term “flugelhorn” is used both by customers coming from France and by others coming outside France.

Intermediate bore-profile instruments other than saxhorns *Affaire Rivet contre Sax*.<sup>53</sup> Contradictory information expressed by the various witnesses appeared in court. According to the *Mémoire pour M. Rivet contre M. Sax*<sup>54</sup> the year of the family's creation was 1843. There it was mentioned that instruments of this group were sold during 1844 and 1845, before Sax's 1845 saxotromba patent, and they were exposed and played during the 1844 Paris National Exhibition.<sup>55</sup> This was supported by the submission to the court of letters by various purchasers and makers who ordered néo-altos, bombardons and other instruments in 1844 and 1845. In Figure 7.8 the names of the purchasers are listed in the table underneath each instrument. Some of the witnesses and particularly the makers Ehrsam and Kretzschmann mentioned the Germanic origin of the instruments. Kretzschmann also stated that all these instruments originated from Russian instruments whose bell rested on the performer's shoulder.<sup>56</sup> The members of the group according to the plate included in the minutes of the aforementioned case can be seen in Table 7.2.

**Table 7.2 Members of the néo-alto/bombardon family as presented in the case Rivet against Sax.**

<i>Néo-alto</i> or <i>Ténor</i> in [6-ft] <sup>57</sup> F	Three valves
<i>Néo-alto</i> in [6½-ft] E-flat	Three valves
<i>Néo-alto</i> in [8-ft] C	Three or four valves
Bass <i>bombardon</i> in [9-ft] B-flat	Three valves
Contrabass <i>bombardon</i> in [13-ft] E-flat	Three valves
Contrabass <i>bombardon</i> in [13-ft] E-flat	Four valves

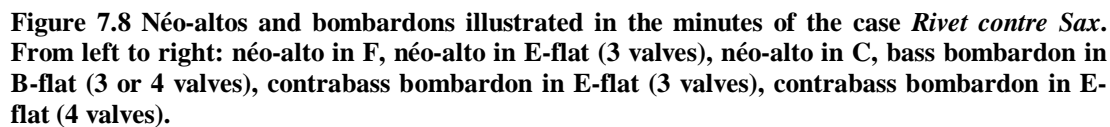
<sup>53</sup> *Nullité de brevet. Instruments et brevets Sax. Tribunal Correctionnel de la Seine, 6<sup>me</sup> Chambre. Affaire Rivet contre Sax. Documents*, illustration 2.

<sup>54</sup> *Mémoire pour M. Rivet contre M. Sax*, 43.

<sup>55</sup> *Ibid.*

<sup>56</sup> *Nullité de brevet. Instruments et brevets Sax*, 29-30.

<sup>57</sup> Detail added by the author.



The placement of the fourth valve perpendicular to the first three seems to be a direct copy of Sax's disposition introduced in 1845 in his patent of that year. Gautrot's catalogue of 1867 contains a section with *Instruments divers* where some

Intermediate bore-profile instruments other than saxhorns old models are included.<sup>58</sup> Together with the *néocor*, mentioned earlier, and the *buccin trombone*, a *bombardon* in C and B-flat is listed and depicted. This is described as *ancien modèle* and is equipped with three Stölzel valves described as *pistons ordinaires* and Gautrot's transposing system patented in 1855.<sup>59</sup> An example in the Musée de la musique (inventory no. E.0309), is erroneously described as a *trombone-basse* in the collection's online catalogue (Figure 7.9). This *bombardon* is very similar in design to the valved ophicleide for which Guichard, Gautrot's predecessor, obtained a patent in 1835.<sup>60</sup> This instrument looks like a valved ophicleide, which is what it would be called today in many museums.



**Figure 7.9 Bombardon in C and B-flat, Gautrot, Paris, third quarter of nineteenth century, Musée de la musique, Paris (inventory no. E.0309).**

It is strange that although various old models produced by Gautrot and Guichard were included in the catalogue, no *néo-alto* or *bombardon* (in the form depicted in the minutes of the case *Rivet contre Sax*) was included. Sax's rivals attempted to prove in court that a complete family with characteristics similar to those of Sax's saxhorns existed prior to Sax's patents. No evidence suggests that their claims had a true basis. The term "*néo-alto*" apart from being met in documents relevant to Sax's rivals lawsuits against him, is absent from primary sources of the time. The only iconographical evidence known is the illustration presented in court

<sup>58</sup> See, *Larigot* 10 Special (April 1999), 76-77.

<sup>59</sup> Ibid.

<sup>60</sup> French patent (4936) for an "*ophiclède à pistons*".



and published in the minutes of the case *Rivet contre Sax*. Even this illustration does not look convincing. The same regards instruments of the clavicor and néocor group. Only instruments in 6-ft F/6½-ft E-flat and clavicors in 8-ft C/9-ft B-flat ever existed. These instruments shared no common features with the saxhorns as far as external appearance is concerned. The disposition of their valves did not meet the definition of the saxotromba form, for which Sax issued his 1845 patent. As discussed in Chapter Eight, the early clavicors in C and B-flat present differences in bore profiles compared with saxhorns of the same pitch.

## 7.2 Intermediate-bore profile circular instruments

In the second half of nineteenth century, new instruments emerged, most in the tenor and baritone register, and the majority in circular form. In the limited literature concerning these obscure instruments it has been stated by some that they were seen as attempts to improve the alto saxhorn and by others as an attempt to replace the french horn.

### 7.2.1 Koenig horns and tenor cors

The earliest of the intermediate bore profile circular instruments in France with extant examples was the Koenig Horn, introduced by Antoine Courtois around 1855. This was named after and perhaps suggested by the famous cornetist Hermann Koenig. Its circular form with a downward directed bell imitates the form of the french horn, although the valves are operated by the right hand. According to Baines the first of these instruments imitating the french horn in wrap was the Bohemian maker's, Cerveny, *cornon* made according to Schafhäutl in 1844.<sup>61</sup>

Tenor Cors are instruments of a similar nature, normally in F, equipped with crooks for E-flat. They were described as newly invented instruments in *Distin's Brass Band Journal* in 1869.<sup>62</sup> There Boosey & Co. called the attention of the public to the instrument that “combines the mellowness of the French Horn and the fullness of the tenor horn”. The instrument had three valves and the same fingering as the cornet. It was also stated that “with this instrument a great desideratum is obtained,

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<sup>61</sup> Anthony Baines, *Brass Instruments: their history and development* (New York: Dover, 1993), 260-61.

<sup>62</sup> *Distin's Brass Band Journal* no. 6 (June 1869): n.p.

Intermediate bore-profile instruments other than saxhorns since the French horn vanished from the military bands owing to its fingering, which is totally different to that of the rest of the brass instruments". Mahillon in his 1923 product catalogue<sup>63</sup> called the tenor cor, *cor d'amateur ou pseudocor* in F and E-flat, an instrument intended to replace the horn and played upon with great facility. According to Baines the tenor cor was introduced by Besson c. 1860 and first as an instrument in 8-ft C (with crook for B-flat) and was later developed by Distin in London as a 6-ft instrument.<sup>64</sup> Besson advertised *ténor-cors* in C and B-flat as late as 1910. It is possible that these instruments were comparable to the earlier Koenig horns in 8-ft C by Courtois or the later ballad horns of Boosey. According to Myers, Boosey & Co. made "Koenighorns" and "Tenor Cors" side by side for some time and there these were considered two separate instruments.<sup>65</sup>

Day (1891) in the Military Exhibition catalogue mentioned that the tenor cor was an improvement upon the tenor saxhorn, its shank being between that of the french horn and the tenor saxhorn's.<sup>66</sup> The Koenig horn differed a little from the saxhorn of the same pitch since "a slight deepening of the mouthpiece and the position of the bell somewhat modified the tone."<sup>67</sup> Boosey & Co. in their 1902 product catalogue<sup>68</sup> offered for sale tenor cors, both in circular form and in the bell-up form with a much wider bell than the tenor horns.

The tenor cor in France was known as *cor alto*, although the reverse (*alto cor*) has also been met,<sup>69</sup> a term that had also been used in the early 1840s for the clavicor. Research through makers' handbills and product catalogues shows that in other traditions, besides the Distin/Boosey, the tenor cor and alto/tenor saxhorn were different species. In Besson's 1910 catalogue there are offered for sale *alto-cors* in F "pour fanfare ou harmonie" and *alto-cors* in F/E-flat "pour symphonie" and *altos* in E-flat *forme ronde* and *altos* in F/E-flat *forme ronde*.<sup>70</sup> According to Soyer<sup>71</sup> the term

<sup>63</sup> See reproduction in *Larigot* no. 26 (December 2000): 12-25.

<sup>64</sup> Baines, *Brass Instruments*, 260-61.

<sup>65</sup> Arnold Myers, "Brasswind Innovation and Output of Boosey & Co. in the Blaikley Era" *Historic Brass Society Journal* 14 (2002): 401.

<sup>66</sup> Charles Russell Day, *A Descriptive Catalogue of the Musical Instruments Recently Exhibited at the Royal Military Exhibition, London, 1890* (London: Eyre & Spottiswoode), 218-19.

<sup>67</sup> *Ibid.*

<sup>68</sup> *Illustrated Catalogue Military & Orchestral Band Instruments Manufactured Throughout by Boosey & Co.* (London: 1902), 7.

<sup>69</sup> See Besson's 1910 catalogue reproduced in *Larigot*, no. 5 (May 1989): 23.

<sup>70</sup> *Ibid.*, 22-23.

<sup>71</sup> Lavignac, *Encyclopédie de la Musique*, 1459-60.

“alto-cor” was used for an *alto* –that is an alto saxhorn – in circular form. The reverse (*cor-alto*) was used for an *alto* in circular form, but with a narrower leadpipe suitable for fitting a mouthpiece similar to that of the french horn. In the 1923 catalogue of the firm of Charles Gras (Lille and Paris) there were depicted on the same page an *alto forme ronde* and a *cor alto*, both in E-flat and with exactly the same configuration.<sup>72</sup> Their only difference is the bore width; the latter appears to have a narrower bore overall and a wider bell. It is interesting that in some product catalogues tenor cors form a separate section of their own, and in some others they are grouped with the french horns. The tenor cor’s American equivalent was the mellophone that found use in marching bands. Distin<sup>73</sup> also introduced the altophone which was advertised in the 1907 product catalogue as “an *altophone* in name and a french horn in tone quality” appropriate for use by military bands, but also for orchestras and smaller instrumental ensembles.<sup>74</sup> Buescher, the American maker, in 1909 advertised “true-tone”<sup>75</sup> ballad horns that not only were multi-pitch but also multi-character instruments. There was obviously a misconception here since the accompanying drawing shows a tenor cor and not a ballad horn. This instrument was pitched in 6-ft F accompanied by crooks for lowering the pitch to E-flat (high and low pitch) and C and was advertised as having the advantage of being used both as a french horn and as an *alto horn*. It is remarkable that most makers tried to market these models as being very close to the french horn, although their only resemblance to the latter is their wrap; their bore profile is closer to that of the tenor horn.

Instruments of a similar nature are known in Italy as *genis cornos*. Instruments of Italian make have also been used by amateur and professional bands and are still used in some amateurs bands in Greece where the Italian name for the tenor horn (*genis*) has also prevailed.

The earliest surviving Koenig horn, and probably the first of the kind ever made, is an instrument in 6-ft F; it was made by Courtois in 1855 for Hermann

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<sup>72</sup> See reproduction in *Larigot*, no. 31 (June 2003): 21.

<sup>73</sup> Already in 1890 Keefer had become successor of Henry John Distin’s factory in Williamsport known since 1890 as “Henry Distin Mfg. Co.”. In 1909 Keefer became proprietor. See *Langwill Index*, 90.

<sup>74</sup> *Distin, Henry MFG. Co. Descriptive Catalog “Highest-Grade” Band Instruments* (Williamsport 1909), 16.

<sup>75</sup> “True-tone” instruments were brass instruments by Buscher equipped with the epoch valve system. It was asserted that this valve system eliminated the sharp angles and the difference in sound quality between open and valved notes.

Intermediate bore-profile instruments other than saxhorns Koenig himself, according to the instrument's inscription (see Figure 7.10), and is today part of the Edinburgh University collection (inventory no. 4649). Very few other instruments of the kind by Courtois survive in other collections in 6-ft F with crooks for E and E-flat, and there is also a Koenig horn by Courtois in 8-ft C in Edinburgh (inventory no. 1710).



**Figure 7.10** Earliest surviving Koenig horn by Antoine Courtois in Paris in 1855. Edinburgh University Collection of Historic Musical Instruments, Edinburgh (inventory no. 4649). Photographs by Raymond Parks.



**Figure 7.11** Tenor cor in F/E-flat by J. Higham, Manchester, c. 1897. Edinburgh University Collection of Historic Musical Instruments (inventory no. 613). Photograph by Raymond Parks.

### 7.2.2 Ventil horns

In the 1869 issue of *Distin's Brass Band Journal* (no. 6), ventil horns are also advertised and depicted. These circular bell-up instruments, made by Distin & Co. were promoted as a complete family ranging from the soprano in E-flat to the bass in B-flat. The family in particular comprised the following members according the advertisement:

Soprano in E-flat and B-flat (3 valves)

Alto in B-flat (3 valves)

Tenor in E-flat (3 valves)

Baritone in B-flat (3 valves)

Bass in B-flat (3 valves or 4 valves)

The instrument's sound was described as mellow and rich, similar to that of the flugelhorn. Mention was made to the "pleasing effect" created by small brass bands composed exclusively by ventil horns.



**Figure 7.12** Tenor ventil horn in E-flat made by H. Distin in London probably c. 1860. Edinburgh University Collection of Historic Musical Instruments (inventory no. 576). Photograph by Antonia Reeve.

The exact date of their introduction cannot be identified since no patent exists. The earliest reference to these instruments known to the author comes from a concert advertisement in *Bell's Life in London and Sporting Chronicle* in 1859. It was announced that Distin's "distin-guished" Ventil Horn Union would appear in a concert in 10 October. The band's composition was given as follows:<sup>76</sup>

Solo alto ventil horn	M. Duhem
Solo soprano ventil horn	Mr. West (the celebrated cornet performer from Jullien's orchestra)
Second alto tenor horn	Mr. Prospere jun. (pupil of M. Boulcourt)
Solo tenor ventil horn	Mr. H. Distin
First tenor ventil horn	Herr Angyal
Second tenor ventil horn	Mr. W. S. Davies
Solo bass ventil horn	Mr. Sanders
Contrabass ventil horn	Herr Kurutz



**Figure 7.13 Ventil horn union depicted on a stereoscopic image card. Courtesy of Martin Schmid.**

<sup>76</sup> "Weston's Grand Music Hall", *Bell's Life in London and Sporting Chronicle* (9 October, 1859): 2.

It appears that Distin's Union was active for some years and appeared in concerts in the London area.<sup>77</sup> It is also known that in 1862 ventil horns were exhibited in that year's London international exhibition.<sup>78</sup> It is probable that Distin's Ventil Horn Union is depicted in a surviving stereoscopic image card in the private collection of Martin Schmid (Figure 7.13). It has been found that the union participated in music halls which took place in London Pavilion, one of the most popular places among the followers of this kind of popular entertainment. The union:<sup>79</sup>

will perform some favourite pieces in the course of the evening, and assist Madame Valkeneau, Madame Elisa, Mr Elton Williams, and other favourite vocalists, in the execution of a grand selection from the opera ERNANI. In other respects the programme will be both varied and amusing, and embrace the most extraordinary talent now in London.

Ventil horns were not the only circular instruments with the bell pointing upwards marketed in London at the time. In June 1859 Thomas Croger, a London based instrument maker, started advertising similar instruments. These instruments were initially called "new model circular saxhorns and tubas", made in soprano, alto, tenor, baritone and bass sizes—the tenor, baritone and bass available with four valves.<sup>80</sup> The advertisement stated:

After numerous experiments, the circular shape has been found the best model for these brass instruments; they are very handsome, light, and portable. They are extremely easy to blow, and the volume of tone which they send forth cannot be obtained from any of the old shaped ones.

It is obvious that the above was just a marketing trick, since it would seem improbable that just a change in the instrument wrap would make it lighter, or even more portable. A lengthy advertisement of circular instruments re-appeared in the same journal in February 1860. There T. Croger aimed at the volunteer rifle corps and other bands. Among the instruments marketed were saxhorns in many pitches. Cornets and horns were also advertised in circular form. The horns were offered in a range of sizes from the soprano to contrabass; the contrabass was a new addition.

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<sup>77</sup> "Conversazioni" *Journal of the Society of Art* 10, no. 503 (11 July, 1862): 539.

<sup>78</sup> "Brass Instruments in the Exhibition. Mr. Distin's Sax Horns", *Cassell's Illustrated Exhibitor 1862; Containing About Three Hundred Illustrations, With Letter-press Descriptions of All the Principal Objects in the International Exhibition of 1862* (London & New York: Cassell, Peter & Galpin, 1862), 91.

<sup>79</sup> "The London Pavilion", *Bell's Life in London and Sporting Chronicle* (19 January, 1862): 2.

<sup>80</sup> *Musical Times and Singing Class Circular*, no. 196 (1 June, 1859): 71.

Intermediate bore-profile instruments other than saxhorns. Although these were not french horns, as shown by an illustration published in a following advertisement (Figure 7.14),<sup>81</sup> but were intermediate bore-profile instruments, the “sax” prefix was now removed. Moreover, Croger called these instruments “patent”, although there is no evidence of the existence of any patent for these instruments.



**Figure 7.14 “Patent” circular horn offered for sale by T. Croger in 1860. Source: Advertisement in the *Musical Times and Singing Class Circular*, no. 205 (March 1, 1860): 237.**

### 7.2.3 Ballad horns and vocal horns

The most comprehensive source of information regarding circular intermediate-bore profile instruments was for a long time John Webb’s article *Notes on the Ballad Horn*.<sup>82</sup> Ballad horns were circular instruments with the bell usually directed downwards and were pitched in 8-ft C (with crooks for B-flat).<sup>83</sup> Instruments of a similar design introduced prior to ballad horns appear to have been the vocal horns and even earlier the Courtois Koenig horns pitched in 8-ft C. The first vocal horns were made by Rudall, Rose, Carte & Co. in Britain. Surviving vocal horns fall into two categories: instruments with narrow mouthpiece receiver and instruments with a wider mouthpiece receiver (see Figure 7.15). Although, according to surviving instruments’ serial numbers 1865 appear to be the possible year of their introduction, 1862 was reported as the year of the instruments’ introduction in the *Instruction Book for the Concert or Vocal Horn*, written by Giuseppe Tamplini and

<sup>81</sup> *Musical Times and Singing Class Circular*, no. 205 (1 March, 1860): 237.

<sup>82</sup> John Webb, “Notes on the Ballad Horn”, *Galpin Society Journal* 37 (March 1984): 57-61.

<sup>83</sup> Two specimens (ventil ballad horns) with upwards directed bells were made. See Myers, “Brasswind Innovation and Output”, 402.



published by Rudall, Carte & Co. in 1882. There, it was also stated that these instruments were also exhibited during the 1862 London International Exhibition. The tutor's text provided an insight into the utility of vocal horns in 8-ft C:<sup>84</sup>

As to the importance of these distinguishing features the great advantage may be pointed out, first of all, of the instrument being made in C, and its being permanently fixed in that key; which enables the performer to produce the actual notes, like the voice, and as produced on the pianoforte, the violin, the flute, and all non-transposing instruments – exactly as they are written on the staff. From this it follows that the voice part of songs, cavatinas, arias, duets, part-songs, &c., can be easily played on it; which makes an immense amount of music available for the instrument, or in other words, that almost the whole repertory of vocal music is within its capability. It was indeed the two-fold want of an easy brass instrument, not too loud nor too deep, to be played in a drawing-room, and which, at the same time, has music ready at hand to be played; or that can take the male voice part in a duet, a trio or part song, that first originated the Concert or Vocal Horn. It amalgamates beautifully in concerted vocal music. The cornet in C, which long ago was designed as a substitute for the treble voice, in songs, &c., for performance in the drawing-room, met with scanty success, chiefly on account of the power of lip and large amount of practice required to produce the tone and to play it in tune; but granted that any one could surmount these difficulties, the desideratum is not a brass soprano instrument, which however good it may be must necessarily sound loud and screamy; some of the wood instruments are better fitted for that purpose. The variety of voices in drawing-room music is greater on the male than the female side – the tenor being especially in requisition, - and this want, as far as an instrument can be a substitute for the voice, is supplied by the Concert or Vocal Horn.



**Figure 7.15** Left: vocal horn in C by Rudall, Rose, Carte & Co., London c. 1890 with wide-bore mouthpiece receiver. Edinburgh University Collection of Historic Musical Instruments (inventory no. 889). Right: vocal horn in C by Rudall, Rose, Carte & Co., London pr.1862 with narrow-bore mouthpiece receiver. Edinburgh University Collection of Historic Musical Instruments (inventory no. 3486). Photographs by Antonia Reeve.

<sup>84</sup> Giuseppe Tamplini, *Instruction Book for the Concert or Vocal Horn* (London: Rudall, Carte & Co., 1882), 2.

Intermediate bore-profile instruments other than saxhorns

For a long time 1856 was being reported as the year that Distin introduced the ballad horns, information drawn from John Webb's article mentioned above.<sup>85</sup> However, no evidence supports this information. On the contrary, it is known that the instrument came out much later. According to information derived from the Boosey & Co. archives by Arnold Myers, 1869 is the year of the ballad horns' introduction as the sales recorded in the Boosey & Co. stock books show. No mention of ballad horns is recorded on the stock books earlier than March 1869. These instruments although made by Boosey & Co., were stamped "Distin & Co.". In June 1868 Boosey & Co. bought Henry Distin's firm, but for a few years used the stamp "Distin & Co." in keeping with the deal they had made with Henry Distin. Distin might have had no actual involvement at the ballad horn's introduction. According to Myers, the first entries for "C Koenig horns" appeared in February 1869. Shortly after mention of "Koenig horn in C New Model" appeared which were followed by references to "Ballad horns" regarding instruments with the same serial numbers.



**Figure 7.16** Ballad horn in C, by Boosey & Co., London 1869. Edinburgh University Collection of Historic Musical Instruments (inventory no. 5836). Photograph by Dominic Ibbotson.

As expected, the earliest known advertisements of ballad horns date from 1869, and in particular May 1869; this was published in *Bell's Life in London and Sporting Chronicle*.<sup>86</sup> There, "Distin's Ballad Horn" was advertised as a new

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<sup>85</sup> John Webb, "Notes on the Ballad Horn", 57.

<sup>86</sup> See "Advertisements & Notices", *Bell's Life in London and Sporting Chronicle*, no. 2473 (5 May, 1869): 2.

## Chapter Seven

instrument for amateurs. Its advantages according to the source were the greater ease compared to the cornet with which the instrument could be played and the convenience with which it could be used for the performance of any vocal music “exactly as it is written without any transposition or change of key”.

Very little information was known for its usage in British music life. It was only known that it was used for vocal accompaniment. Research in the various newspapers and periodicals of the time showed that the ballad horn had also been used often as a solo instrument, with or without piano accompaniment, mostly played by cornet players. In one occasion it was found to have been used as part of a brass quintet additionally consisting of two Distin patent light valve cornets, a trombone and a *euphonion* (or bombardon).<sup>87</sup> On a few occasions ballad horn solos were advertised as being part of a more popular kind of entertainment, variety theatres, also known as “music halls”.<sup>88</sup> These became very popular in Britain during the second half of nineteenth century and the beginning of twentieth century. Ballad horn solos were included in Jolly John Nash’s music halls. These concerts were a melange of humorous songs, anecdotes, ballads and solos on instruments such as the cornet and concertina (with piano accompaniment), selected pieces played on the piano, and often speciality acts. The above events were usually accompanied by alcohol drinking.

Ballad horns might have also been originally associated with the London ballad concerts that became popular at the second half of the nineteenth-century. These were initiated by John Boosey in 1867 and continued until 1937.<sup>89</sup> Research by the author in various periodicals of the time, though, found no mention to ballad horns in the announcements of the ballad horn concerts. In 1871 Boosey & Co. published *Distin’s Tutor for the Ballad Horn*. Theodore Distin appears as the tutor’s

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<sup>87</sup> See “Advertisements and notices”, *Daily News* (5 June, 1872): n.p.

<sup>88</sup> See “The London Music Halls”, *Era* Saturday, no. 2484 (1 May, 1886): n.p.; “The London Music Halls”, *Era*, no. 2012 (15 April, 1877): n.p.; “Happy Evenings for the People”, *Bristol Mercury and Daily Post*, no. 13863 (17 October, 1892): n.p.; “Happy Evenings for the People”, *Bristol Mercury and Daily Post*, no. 13851 (3 October, 1892): n.p.; “Wallingford”, *Jackson’s Oxford Journal*, no. 7297 (28 January, 1893): n.p.

<sup>89</sup> Jeremy Boosey, “Beethoven, Bellini, Ballads and Bands”, *Tempo*, new ser. no. 78 (Autumn 1966): 3; William Boosey, *Fifty Years of Music* (London: Ernest Benn, 1931), 13-22.

Intermediate bore-profile instruments other than saxhorns author. The introductory paragraphs point out the purpose of the instrument's introduction.<sup>90</sup>

The design of this Tutor is to give the Amateur a sufficient insight into the method of producing a good, clear, round, and agreeable tone, with the addition of a pure "vocal style" as much is possible in a short series of Exercises and "Solfeggi;" as the Ballad-Horn is essentially an Instrument for the Drawing Room, and for the purpose of playing at sight such Compositions as may be desirable without the trouble of transposing the music; such as Operatic Airs, Ballads, Songs; also, Violin, Flute, and other Instrumental music which is written for Instruments standing in the key of C. The natural tone of the Ballad-horn approaches nearly to the human voice in its best and purest form. – And if the instructions contained in the next paragraph be carefully attended to, there is no doubt of the Student attaining in a very short time all the excellence of style of a finished Ballad Singer, provided he has a good musical ear combined with a knowledge of the Rudiments of the Art.

The introductory text of the tutor, which is very similar to that included in other instrumental tutors of the time, is followed by some "solfeggi" written or transcribed for ballad horn and piano, appropriate for practice. *Solfeggio No I, II, and III*, were written by Theodore Distin himself, and the rest of them were transcriptions of ballads or operatic parts. The repertoire for this instrument is very limited and other than Distin's *Solfeggi* the only known piece written for the instrument is *Fantaisie Originale* written for the euphonium, bassoon, or ballad horn, by Carnaud and published in 1876.

According to Arnold Myers,<sup>91</sup> between 1869, when the first instruments of the kind appeared in the stock books, and April 1871, over a hundred ballad horns were made. Myers also reports that they were made by Boosey & Co. until 1925, although already in 1923 they have disappeared from their product catalogues. Besson & Co. also advertised in 1934 *C Tenor Cors* that then claimed to have replaced the vocal horns and the Koenig horns and that were much easier to play.<sup>92</sup>

Instruments of a similar nature, pitched an octave higher, were the lied horns. These were introduced a few years later than the ballad horns; Myers mentions 1873 as the year when the first references to lied horns appear in the Boosey & Co. stockbooks.<sup>93</sup> Only a few examples were made overall and very few have survived.

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<sup>90</sup> Theodore Distin, *Distin's Tutor for the Ballad Horn* (London: Distin & Co., Boosey & Co., 1871), 1.

<sup>91</sup> Myers, "Brasswind Innovation and Output", 402.

<sup>92</sup> *Besson & Co. Ltd.* (London: 1934), 16-17.

<sup>93</sup> Myers, "Brasswind Innovation and Output", 403.



## 7.3 Intermediate bore-profile instruments in diverse forms

### 7.3.1 Antoniophones

Antoniophones were bell-up intermediate bore-profile brass instruments making their appearance in the instrument making scene of Paris in the second half of the nineteenth century. Their invention is credited to Antoine Courtois whom they were named after, following Sax in naming his creations after himself.

1867 is reported as the year of antoniophones' introduction. Günter Dullat in his *Fast vergessene Blasinstrumente aus zwei Jahrhunderten* has published a beautiful card dedicated by Antoine Courtois to Ch. Zabel, depicting an alto antoniophone in F with three valves (Figure 7.17).<sup>94</sup> According to the card, Courtois presented to the members of Jury an *alto* in E-flat called *antoniophone* and was awarded a *médaille d'honneur en argente* for his collection of instruments.

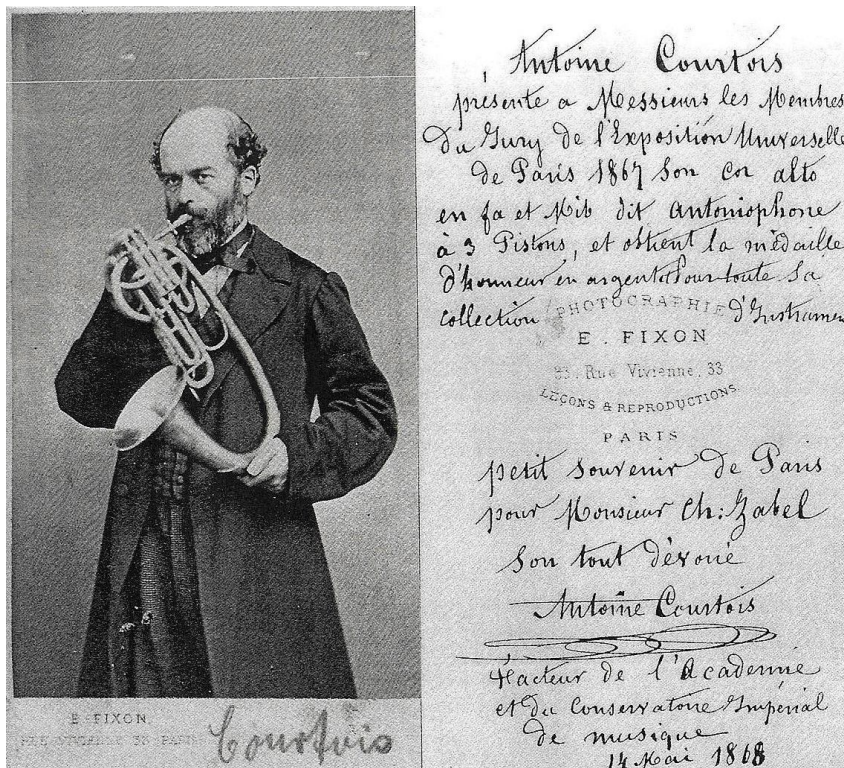


Figure 7.17 Card-postal sent by Antoine Courtois to Ch. Zabel, depicting an early antoniophone. Source: Günter Dullat, *Fast vergessene Blasinstrumente aus zwei Jahrhunderten*.

The above is probably the reason why in all sources 1867 is recorded as the antoniophone's year of introduction since there is not a patent or any other

<sup>94</sup> Günter Dullat, *Fast vergessene Blasinstrumente aus zwei Jahrhunderten* (Nauheim: Günter Dullat, 1997), 1.

Intermediate bore-profile instruments other than saxhorns supporting evidence for this date. The instrument depicted in the card-postal is of a slightly different wrap compared to a later s-formed four-valve bass example by Courtois which appeared for sale in eBay in 2005<sup>95</sup> and the even later s-formed Orpheons by Boosey & Co. A surviving specimen at Kneller Hall Military School of Music is of the same form as the above alto, but in bass size. It appears that Courtois made two versions of the instrument over time. The later s-formed instrument could be an attempt to imitate the form of the saxophone.



**Figure 7.18** Later s-formed antoniophone by Antoine Courtois. Source: <http://www.horn-u-copia.net/cgi-bin/yabb2/YaBB.pl?num=1120504417>.

According to the inscription of the s-formed antoniophone, the instrument was made by Courtois and was imported by J. Howard Foote to the United States of America.

It has been reported that even Sax made antoniophones; according to the Royal Military Exhibition catalogue, such a specimen was exhibited in 1890 (item 444). There, the instrument is described as an antoniophone or “snail model”, with the clarification that the instrument is nothing more than a curious looking ordinary bombardon. It is further specified that “the tubing is arranged so that the instrument may resemble a snail shell as much as possible, the valves, three in number, being in

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<sup>95</sup> Information appeared at <http://www.horn-u-copia.net/cgi-bin/yabb2/YaBB.pl?num=1120504417> (accessed March 10, 2008).

the centre of the coils”.<sup>96</sup> The instrument had a detachable bell, and as mentioned could be played either with the bell at top, or under the player’s arm. The above almost vague description probably matches more the instrument depicted in the card and the surviving specimen at Kneller Hall than the later s-formed example by Courtois.

The author has noticed a few articles in British journals mentioning the use of the antoniophone by Alfred J. Phasey. The earliest (1872) reports that during a concert that took place in Shoreditch (London) in aid of the funds of the Post Office Orphan Home, Phasey played a solo “on a new instrument termed antoniophone” that “excited considerable curiosity.”<sup>97</sup> The reporter describes the instrument as being “of the same pitch as the euphonium, but possessing the tone of the trombone”.<sup>98</sup> In 1884, Phasey himself communicated to the editor of the *Musical World* a review of his son’s appearance in Gilmore’s concerts in New York:<sup>99</sup>

The Manhattan programmes arranged by Mr Gilmore for afternoon and evening were of a very high standard of excellence, while the interpretation of the several numbers brought forth hearty plaudits. But the musical surprise was in the evening, when Mr Gilmore introduced the latest acquisition to his band, Mr Phasey, with his new instrument, the Antoniophone. This is to the brasses what the Vox Humana is to the organ. It has a pure human tone, and as the notes of Tosti’s “For ever and For ever” came from it, the audience could hardly believe but what some person was singing. So great was the success that Mr Phasey had several encores.

Arnold Myers provides information on the short-lived revival of the remodelled antoniophones or “orpheons” in the late 1880s by Boosey & Co. The firm provided a complete family of instruments ranging from the soprano cornet in E-flat to the contrabass in E-flat. According to the surviving instrument books of the Boosey & Co. archives, in 1887 there was an order from New York for a set of antoniophones (as they were called in the books). The name antoniophone does not appear on the bell inscriptions, where the term “Orpheon” was used instead. According to Myers only a small number of instruments (twelve) was made in total between 1887 and 1889, all with compensating pistons.<sup>100</sup> The first set of instruments was made for Gilmore’s band.

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<sup>96</sup> Day, *A Descriptive Catalogue*, 223.

<sup>97</sup> “Post Office Orphan Home”, *Musical Standard* 3, no. 438 (December 1872): 391.

<sup>98</sup> Ibid.

<sup>99</sup> “Mr Phasey Junr., in America”, *Musical World* 62, no. 30 (July 1884): 468, reporting an article published in *The World*, a New York newspaper on 16 June 1884.

<sup>100</sup> Myers, “Brasswind Innovation and Output”, 404-05.

Intermediate bore-profile instruments other than saxhorns

The *Musical Opinion & Music Trade Review* in June 1889 reports that a family quintet in Melbourne called the “Stoneham family”:<sup>101</sup>

performed high-class music on silver plate instruments (specially made to order by Messrs. Boosey & Co.) termed “Orpheons”—made for soprano, mezzo, alto, tenor, and bass. We feel sure that Messrs. Boosey & Co. must be satisfied with the amount of business transacted through their Melbourne exhibits, every instrument being sold and large orders obtained in addition.

This was probably the second and last set of orpheons made by Boosey & Co. The bore profile of antoniophones was not different from that of other intermediate bore-profile instruments of the time. A more detailed discussion on that can be found in Chapter Eight.



**Figure 7.19** Bass orpheon (antoniophone) by Boosey & Co., London 1888. Edinburgh University Collection of Historic Musical Instruments (inventory no. 4507). Photograph by Raymond Parks.

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<sup>101</sup> See, “Trade Jotting & Notes”, *Musical Opinion & Music Trade Review* 12, no. 142 (July 1889): 501.



### 7.3.2 The cornophone family

On 18 October 1890 William Lloyd Wise, a consulting engineer and patent agent, filed in the United Kingdom a patent for “a new family of brass musical instruments” on behalf of Adolphe Fontaine-Besson of Paris.<sup>102</sup> What makes this patent different from other patents of the time is the provision of detailed proportions of the “mouthpiece tube” (proximal part of the instrument’s tubing). According to the patent specification the main purposes for which the family of cornophones or cornons was introduced was so as to introduce a new timbre that as stated:

neither resembles that of brass nor that of wood musical instruments but is a kind of medium voice between that of these two types of instruments.[...] The tone is soft, round and velvety, and entirely free from the brassy ringing sound usually found in all brass wind musical instruments.

Also it was meant to present a new family of instruments appropriate for stage use by orchestras, chamber music ensembles etc. It was claimed that the alto and tenor instruments were very easy to learn how to play and manage, and could thus replace the french horn part in school or amateur bands. These two instruments could also double french horn parts in orchestras. Additionally the alto cornophone could replace the tenor horn in bands which according to the patent description was far from being satisfactory and its timbre was “striking out too distinctively from the rest of the band instruments, and therefore not blending harmoniously with them like the cornophone”. The tuba cornophone was intended as a church instrument since its timbre would be appropriate for sacred music and for leading choirs. The above patent material was probably used in an anonymous article which appeared in *Orchestral Times and Bandsman* in 1891 and mentioned by Myers and Eldredge.<sup>103</sup> As Myers and Eldredge state, there is no evidence for any specific usage of the cornophone in Britain.

According to various articles published in periodicals of the time, on 6 and 7 February 1893 a meeting of various French composers directed by Gounod and Joncières took place at Besson’s showroom in Paris. There it was agreed that

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<sup>102</sup> British patent no. 16358 for “a new family of brass wind musical instruments” filed by William Lloyd Wise, and communicated from abroad by Adolphe Fontaine-Besson. Date of application 14 October 1890; accepted on 8 August 1891.

<sup>103</sup> Arnold Myers & Niles Eldredge, “The Brasswind Production of Marthe Besson’s London Factory”, *The Galpin Society Journal* 59 (May 2006): 51.

Intermediate bore-profile instruments other than saxhorns Besson's *Cor tuba*, among others, would provide a more satisfactory solution than the saxhorns for the performance of the tuba parts in works of Wagner.<sup>104</sup>

According to the patent specification the family was comprised of five sizes that could be equipped with three or four valves, although further down it was stated that cornophones could be made in any key and with any desired number of valves:

Cornophone cornettino [in 4 ½-ft B-flat]<sup>105</sup>

Cornophone alto [in 6-ft F/6 ½-ft E-flat]

Cornophone tenor [in 8-ft/9-ft B-flat C]

Cornophone tuba [in 8-ft C/9-ft B-flat]

Cornophone contrabass [in 13-ft E-flat]

As for the range of the above instruments it was mentioned that the three larger sizes had a more extensive limit in their upper register compared to regular three-valve instruments, since their special bore profile allowed them to ascend a fifth higher. Fontaine Besson's catalogue, published most possibly in 1889 (before the issue of the relevant patent), listed three instruments of the "cornon" family:

*Cornon alto* in E-flat, three valves

*Cornon ténor* in B-flat, three valves

*Cornon basse* in B-flat, four valves

It was noted that the cornons were among the exhibits of the firm during the 1889 Paris International Exhibition. It was claimed that they doubled the horn in the big symphonic orchestras and were used in military bands. They were available for sale in all pitches. A later product catalogue of the firm published in the beginning of twentieth century after 1910 listed cornophones in the following sizes and pitches:

Cornophone alto in F, in F/E-flat, F/E-flat/D

Cornophone tenor in B-flat, C/B-flat, C/B/B-flat

*Cornophone-basse* or *Cor-tuba* in B-flat (three valves and four valves), C/B-flat (three and four valves), C/B/B-flat (three and four valves)

The cornettino and contrabass were no longer offered for sale at that point.

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<sup>104</sup> John Webb, "The Cornophone as Wagner Tuba", *Galpin Society Journal* 51 (July 1998): 193-94.

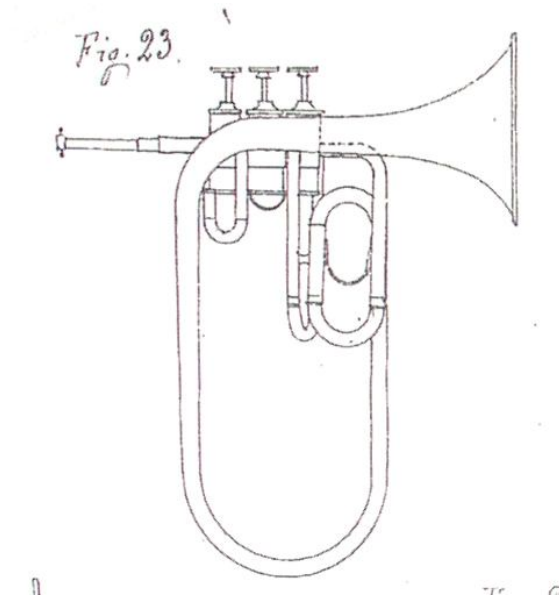
<sup>105</sup> Information added by the author.

## Chapter Seven

It is very interesting what was stated in the patent regarding the special wrap of the cornophones:

As these new instruments are intended chiefly for use in large rooms or halls for concert purposes, the bell E is made of the form shown, so that all the sounds shall be thrown forward, the bells of the different instruments all project in the same direction, and the tube D of each instrument is bent to approximately the form shown so as to enable the instrument to be easily held in the hand.

The wrap of the cornophone was not novel at all and the above description matches Sax's description of the new form of saxhorns meant for orchestral use introduced as early as 1859 through that year's patent, according to which no instruments are known to have been made.



**Figure 7.20 Saxhorn in new wrap for orchestral use from Sax's 1859 patent.**

The cornophone patent included some bore width measurements for the proximal part of the instruments' tubing. Two drawings were included (figures four and five in the patent drawings section in Figure 7.22). The mouthpiece tube or conoidal branch A of the instrument, as it is described is made according to specific dimensions, given for the first thirty centimetres of the instrument's tubing. Figure four of the drawing shows a mandrel whose external dimension would be the internal dimensions of the mouthpiece appearing in Table 7.3.

**Table 7.3 Measurements given by Besson in his patent for the first 30 centimetres of total tube length.**

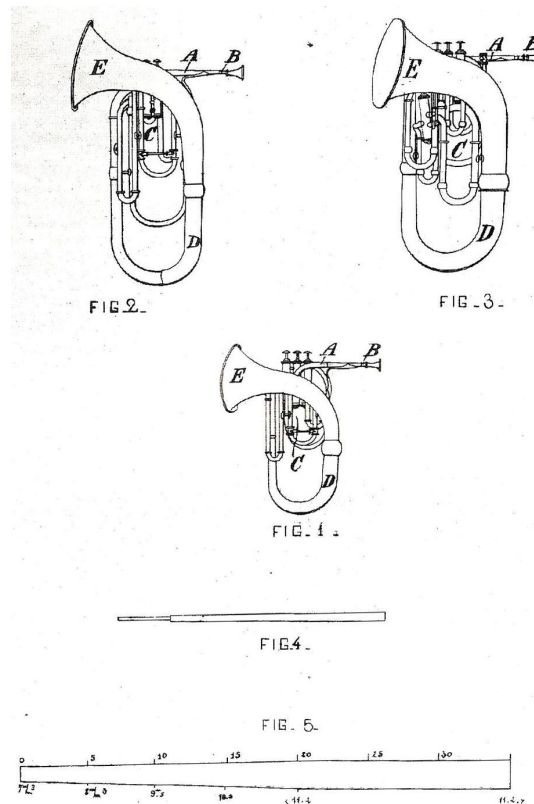
<b>Length (in cm)</b>	0	5	10	15	20	25	30
<b>Diameter (in mm)</b>	7.3	8.3	9.5	10.3	11.2	11.2	11.2



**Figure 7.21 Cornophone cornettino in 4½-ft B-flat made by Besson in London c. 1900. Frank Tomes private collection (inventory no. 052). Photograph courtesy of the owner.**

The minimum bore above is located in the beginning of the mouthpiece receiver, not the norm in surviving instruments since a taper at this point would make fitting a mouthpiece easier. It is mentioned that the minimum diameter is the same as that of a “harmony horn”, obviously a direct translation of the French term “cor d’harmonie”. A few points in the patent contradict each other. It is first stated that “it has been necessary to make these mouthpiece tubes of the special conoidal form and calibre or internal dimensions indicated” whereas later on in the patent it is mentioned that:

although it is preferred to employ mouth piece tubes having the internal dimensions stated [...] it is to be understood that this invention is not limited to these dimensions as they may be slightly increased or diminished to suit the requirements of each particular voice diapason, pitch, or other characteristic which the instrument is to possess.



**Figure 7.22 The drawing section from Besson's 1890 cornophone patent.**

Later cornophones have a wider mouthpiece receiver and would require consequently a larger mouthpiece replacing the french horn mouthpiece used originally. This change must have occurred as a need to facilitate the instrument's playing and/or make the instrument manageable by a larger number of performers. In a product catalogue by Besson published in the beginning of twentieth century in the section of cornophone models offered for sale it is stated that those models were "nouvelle proportions 1910".<sup>106</sup> However, according to the measurements of surviving instruments the mouthpiece receiver seems to have been widened at some point after the turn of the century, but definitely before 1910. The instruments with the new proportions would be played with mouthpieces appropriate for the saxhorn family. However, since the usage of a french horn mouthpiece was the cornophone's distinctive feature, when that ceased to exist the instrument lost its unique nature; this was probably one of the reasons for the instrument's short life.

<sup>106</sup> See *Larigot*, no. 5 (May 1989): 10.

## 7.4 Conclusions

It appears that the field of intermediate bore-profile instruments has to show perhaps the greatest proliferation in brass instrument design during the nineteenth century. Sax's rivals tried to prove that in France the clavicor and néocor as well as the néo-alto and bombardon formed complete families and pre-existed the saxhorns. For the néo-altos there is not even convincing evidence to support that they ever existed. Small clavicors were a later addition to the 8-ft C/9-ft B-flat clavicors patented in 1838 and their period of introduction remains still uncertain. Even though, this group does not include instruments in the variety of sizes that the saxhorn group does, and no strong family characteristics are shown.

The area with the greatest activity was that of instruments of the middle region that is instruments of the tenor and baritone register. To a great extent the "new" instruments were hybrids, trying to overcome difficulties of certain instruments by "borrowing" characteristics of some others. Most of them did not survive even into the twentieth century; others continued to be used during the first decades of the twentieth century, and in some cases a few, such as versions of the tenor cors, are being used even today in amateur or school bands. From some groups only very few examples have survived. Some of them were made in fanciful designs, such as the antoniophones, trying to compete with the saxhorns, whereas the majority was made in circular wraps superficially resembling the french horn. However, as characteristically expressed by La Palisse, "the only instrument that can really replace a horn...is another horn".<sup>107</sup> The instrument that was probably the least satisfactory for performers was the alto saxhorn since a number of hybrids were intended to replace it. However, history shows that so far none of its rivals was good enough to supplant it.

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<sup>107</sup> Lavignac, *Encyclopédie*, 1460.



## Chapter Eight

### Taxonomy of intermediate bore-profile brass instruments

A generally accepted fact regarding nineteenth-century intermediate bore-profile brass instruments is the disorder which characterizes this class of musical instruments and their nomenclature. As already discussed in previous chapters, numerous similar models emerged, especially around the middle of the nineteenth century, in various—sometimes peculiar—wraps, and with a variety of names.

The classification schemes currently in use by organologists, museum professionals, and by many studying musical instruments, have not proved very useful for the types of brass instruments examined in this thesis, mainly due to the generalizations which occur. In the past few years a new way of classifying brass instruments was introduced. Pyle and Myers have pioneered a parameter which seems to be more useful for the taxonomy of brass instruments, especially historic ones.<sup>1</sup> Calculating brassiness potential parameter (referred to subsequently as  $B$ ) and using it for taxonomic purposes is a safe way with satisfactory results. Measurements of minimum bore ( $D_{\min}$ ) and bore at mid-length ( $D_{\text{mid}}$ ) are used as additional criteria.

In most cases, museum policies, the fragility of historic instruments, the non-playing condition of many historic instruments, as well as the uncertainty regarding the exact types of mouthpieces which should be used, result in playing experiments not being possible to form part of examination procedures to determine the acoustical properties of instruments. External measurements, when performed with care, are harmless to historic instruments and can provide useful information which otherwise would not be manageable.<sup>2</sup>

The objectives of this chapter include the investigation of any evolutionary or developmental processes in the design of intermediate bore-profile instruments made

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<sup>1</sup> Arnold Myers, Joël Gilbert, Robert W. Pyle, D. Murray Campbell, “Non-linear Propagation Characteristics in the Evolution of Brass Musical Instrument Design”, *Proceedings, 19<sup>th</sup> International Congress on Acoustics, Madrid, Spain* (September 2007).

<sup>2</sup> The exact methods and tools used to take the measurements needed to obtain the parameters have been described in Chapter One.



## Chapter Eight

by Sax and other makers in the nineteenth century. The comparison of saxhorns with pre-existing instruments, such as néocors, clavicors, and valved ophicleides will be discussed here. This process will indicate whether there are any strong similarities which confirm Sax's rivals' views of Sax having copied pre-existing instruments when he designed the saxhorns and saxotrombas. It will also pinpoint the place of Sax's saxhorns within the greater picture of nineteenth-century intermediate bore-profile brass instruments. An attempt will be made to identify any geographical—or other—characteristics in intermediate bore-profile instruments which emerged after the development of the saxhorn, especially in those of the medium register. These will be classified from the organological viewpoint using taxonomic tools which take the bore profile into consideration, since categorization according to external appearance characteristics only, especially in intermediate bore-profile instruments, can be misleading.<sup>3</sup> In some cases all the measured specimens are included in the tables for comparison and in the relevant graphs. Such cases are those of saxhorns by Sax, licensed instruments and some of the more unusual instruments, such as tenor cors and vocal horns. In other cases, when the comparison regards instruments belonging to a more extended period of time, appropriate instruments from different countries or periods have been chosen to be included as typical examples.

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<sup>3</sup> Appendix C contains more detailed information regarding the measurements of some instruments which are considered typical examples of their size and pitch.

## 8.1 The saxhorns

### 8.1.1 Saxhorns by Adolphe Sax

Of all surviving Adolphe Sax saxhorns, seventy-five were accessible for research purposes and were measured. The data of Adolphe Sax saxhorns will be first examined individually before being compared to similar instruments by other makers, so as to discuss the existence or not of any family characteristics and to locate any developmental changes which might have been made by Sax through time. Table 8.1 shows values of measured saxhorns made in the Adolphe Sax workshop, divided according to instrument size and pitch, and placed in chronological order within each size group.<sup>4</sup>

According to Myers et al. (2007) in instrument families, parameter  $B$  values are similar among members of the family, albeit in different sizes.<sup>5</sup> A first look at Tables 8.1 and 8.2 shows that in saxhorns this is not observed, if saxhorns are considered one family. Soprano, contralto, alto and baritone saxhorns, and even the sole example of a sopranino saxhorn, share close values of  $B$ . Bass and contrabass saxhorns form a separate group with relatively lower values of  $B$  compared to higher saxhorns. The *bourdon* saxhorn is the sole surviving example in this pitch by Sax, and is considered merely an instrument made for publicity purposes and not part of any playing tradition.

The fact that saxhorns are essentially two families was first observed by Myers in 1998,<sup>6</sup> albeit based on the smaller number of relevant instruments examined at the time and the use of different taxonomic tools. The examination of a larger number of instruments and the use of parameter  $B$  for taxonomic purposes confirms this statement.

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<sup>4</sup> Unnumbered instruments, when possible are dated in approximation (a range might be given, or an approximate year of manufacture occurring from documentary sources).

<sup>5</sup> Myers et al., “Non-linear Propagation Characteristics”.

<sup>6</sup> Arnold Myers, *Characterization and Taxonomy of Historic Brass Musical Instruments from an Acoustical Standpoint*, 106.

## Chapter Eight

**Table 8.1 Saxhorns and saxotrombas made by Adolphe Sax, separated according to playing pitch, are placed in chronological order within group. Minimum diameter, diameter at mid-point length and parameter *B* values are given for all instruments. The two surviving saxtubas are also included in this table, as they share a similar bore profile with saxhorns. The saxhorn in 5-ft A-flat is grouped with the alto saxhorns, and not with the contraltos – although it is closer in pitch with the contraltos – due to the fact that Sax considered it, and advertised it as an alto instrument. Dimensions of columns four and five ( $D_{\min}$  and  $D_{\text{mid}}$ ) are given in millimeters.**

Collection no.	Instrument type and pitch	Date	$D_{\min}$	$D_{\text{mid}}$	<i>B</i>
<b>2¼-ft B-flat</b>					
BM 1296	Sopranino saxhorn in B-flat	1862	8.1	12.8	0.54
<b>3¼-ft E-flat</b>					
BNS 44	Soprano saxhorn in E-flat	1854	9.1	13.4	0.54
BM 3165	Soprano saxhorn in E-flat	1862	9.7	12.8	0.56
BM 2463	Soprano saxhorn in E-flat	1869	9.9	13.5	0.53
OB x616	Soprano saxhorn in E-flat	1869	10.1	13.7	0.56
BK 10	Soprano saxhorn in E-flat	1870	9.8	13.6	0.56
<b>4-ft C/4½-ft B-flat</b>					
MM E.740	Contralto saxhorn in B-flat	1846	10.1	16.5	0.55
OB x615	Contralto saxhorn in B-flat	1848	10.9	16.5	0.50
MM E.745	Contralto saxhorn in B-flat	1849	10.0	16.1	0.56
BS 14602	Contralto saxtuba in B-flat	1855	10.0	15.5	0.56
MM E.0796	Contralto saxhorn in C	a.1861	10.0	12.3	0.61
MM E.1688	Contralto saxhorn in B-flat	1861	10.1	15.9	0.55
B 2008.026	Contralto saxhorn in B-flat	1861	9.7	15.6	0.56
MM E.1689	Contralto saxhorn in B-flat	1862	10.1	15.2	0.59
ST 844	Contralto saxhorn in B-flat	1862	10.6	15.1	0.59
B 80.050	Contralto saxhorn in B-flat	1862	9.8	16.5	0.52
MM E.744	Contralto saxhorn in C	1863	9.8	16.0	0.52
BK 283	Contralto saxhorn in B-flat	1864	9.9	15.8	0.56
BM 2020	<i>Nouveau</i> contralto saxhorn in B-flat	1865	9.9	15.4	0.52
EU 4253	Contralto saxhorn in B-flat	1865	10.0	15.8	0.52
B 2008.022	Contralto saxhorn in B-flat	1865	9.9	14.9	0.55
BM 2462	Contralto saxhorn in B-flat	1869	10.0	19	0.51
BM 2461	<i>Nouveau</i> contralto saxhorn in B-flat	1869	9.8	14.3	0.55
<b>5-ft A-flat/6-ft F/6½-ft E-flat</b>					
JV S1	Alto saxhorn in E-flat	1844	11.1	13.9	0.60
V 4878	Alto saxhorn in F	1847	9.7	16.1	0.53
V 7166	Alto saxhorn in F (postulated tuning slide)	1848	11.0	16.3	0.58
EU 887	Alto saxhorn in F	1846-49	11.4	12.0	0.61
MM E.741	Alto saxhorn in A-flat	1849 or a.	9.8	13.7	0.59
LHC 91	Alto saxhorn in E-flat	a.1850	9.3	15.7	0.47
EU 4620	Alto saxhorn in E-flat	1854	10.5	14.4	0.59
EU 4543	Alto saxhorn in E-flat	1855	10.9	15.2	0.57
MM E.1693	Alto saxhorn in E-flat	1858	9.8	14.4	0.55
BK 9	Alto saxhorn in E-flat	1862	10.3	15.7	0.59
BM 2469	Alto saxhorn in E-flat	1863	10.8	15.3	0.54
JC 112	<i>Nouveau</i> alto saxhorn in E-flat	1865	9.0	15.0	0.49

# Taxonomy of intermediate bore-profile instruments

Collection no.	Instrument type and pitch	Date	D <sub>min</sub>	D <sub>mid</sub>	B
BM 2008.020	Alto saxhorn in E-flat	1869	10.3	14.0	0.59
MM E.1696	Alto saxhorn in E-flat	1869	9.9	14.0	0.57
MM E.1696	Alto saxhorn in F (postulated tuning slide)	1869	9.9	15.5	0.55
B 2008.023	Alto saxhorn in E-flat	1874	10.3	14.4	0.54
BK 349	Alto saxhorn in F	1880	10.0	13.8	0.58
ST 900	Alto saxhorn in E-flat	1880	10.0	12.1	0.57
<b>8-ft C/9-ft B-flat (narrow bore)</b>					
NC 385	Baritone saxhorn in B-flat	1861	11.6	15.5	0.57
MM E.0712	<i>Nouveau</i> baritone saxhorn in B-flat	1865	12.5	23.2	0.51
MM E.0803	<i>Nouveau</i> baritone saxhorn in C	1866	12.2	24.7	0.50
BK 756	Baritone saxhorn in B-flat	1866	10.8	18.4	0.51
OB 662	Baritone saxhorn in B-flat	1867	11.8	16.8	0.59
MM E.1695	Baritone saxhorn in B-flat	1869	11.7	16.8	0.59
BK 721	Baritone saxhorn in B-flat	1885	11.1	17.7	0.53
<b>8-ft C/9-ft B-flat (wide bore)</b>					
B 2008.024	Bass saxhorn in C	1857	12.5	23.3	0.52
BK 808	Bass saxhorn in B-flat	1860	12.2	24.5	0.50
EU 4470	Bass saxhorn in B-flat	1863	11.6	23.0	0.43
BK 318	<i>Nouveau</i> bass saxhorn in B-flat	1863	12.0	26.6	0.45
B 2008.025	Bass saxhorn in B-flat	1865	11.6	24.2	0.46
EU 4273	Bass saxhorn in B-flat	1865	12.9	24.5	0.51
BM 2464	<i>Nouveau</i> bass saxhorn in B-flat	1866	12.2	29.6	0.43
JV S2	Bass saxhorn in B-flat	1868	11.2	21.1	0.50
B 92.016	Bass saxhorn in B-flat	1869	11.9	25.2	0.44
EU 3115	Bass saxhorn in C	1870	11.8	24.6	0.48
V 3183	Bass saxhorn in B-flat	1870	11.4	26.1	0.44
<b>13-ft E-flat</b>					
EU 5969	Contrabass saxhorn in E-flat	1845	14.7	24.0	0.57
EU 4544	Contrabass saxhorn in E-flat	1846	14.5	24.4	0.57
JC 253	Contrabass saxhorn in E-flat	1848	13.2	24.1	0.53
LBH 741	Contrabass saxhorn in E-flat	1853	12.5	24.0	0.49
NB 1109	Contrabass saxtuba in E-flat	1855	13.8	33.0	0.44
MM E.0705	<i>Nouveau</i> contrabass saxhorn in E-flat	1864	14.0	28.1	0.48
BM 2460	<i>Nouveau</i> contrabass saxhorn in E-flat	1866	13.1	32.8	0.40
BK 200	<i>Nouveau</i> contrabass saxhorn in E-flat	1867	15.0	31.8	0.47
<b>18-ft B-flat</b>					
MM E.746	Contrabass saxhorn in B-flat	1854	14.6	48.8	0.34
BM 2459	Contrabass saxhorn in B-flat	1854	14.2	46.3	0.34
EU 3845	Contrabass saxhorn in B-flat	1855	14.0	50.1	0.33
MM E.853	<i>Nouveau</i> contrabass saxhorn in B-flat	1864	14.7	47.0	0.36
BM 1283	<i>Nouveau</i> contrabass saxhorn in B-flat	1865	14.6	48.8	0.41
BK 8	Contrabass saxhorn in B-flat	1866	14.2	45.4	0.34
EU 3229	Contrabass saxhorn in B-flat	1868	14.0	45.0	0.33
<b>26-ft E-flat</b>					
Selmer	Bourdon saxhorn in E-flat	1855	15.2	90.8	0.23

An additional factor is necessary here for distinguishing between different size groups. This additional factor can be the minimum bore of instruments,<sup>7</sup> most of the times located a few millimeters in the mouthpiece receiver. Myers et al. (2010) have investigated the influence of bore size on potential brassiness parameter, and although this is a research project in progress, they have shown that narrowing or widening an instrument's bore, in both instances, has an effect on brassiness potential.<sup>8</sup> Table 8.2 shows the ranges of values of minimum bore, bore at mid-length and parameter  $B$  for all Ad. Sax saxhorns included in Table 8.1.

**Table 8.2 Minimum bore and diameter at mid-point length ranges and parameter  $B$  values for saxhorns made by Adolphe Sax.**

Saxhorns made by Adolphe Sax			
Instrument type	$D_{\min}$	$D_{\text{mid}}$	$B$
Sopranino saxhorn in 2¼-ft B-flat	8.1	12.8	0.53
Soprano saxhorns in 3¼-ft E-flat	9.1-10.3	12.8-14.2	0.53-0.56
Contralto saxhorns in 4-ft C/4½-ft B-flat	9.8-10.9	12.3-19.0	0.50-0.61
Alto saxhorns in 5-ft A-flat/6-ft F/6½-ft E-flat	9.0-11.4	12.0-16.1	0.47-0.60
Baritone saxhorns in 8-ft C/9-ft B-flat	10.8-11.5	15.5-24.7	0.49-0.59
Bass saxhorns in 8-ft C/9-ft B-flat	11.2-12.9	21.1-29.6	0.43-0.51
Contrabass saxhorns in 13-ft E-flat	12.5-15	24.0-33.0	0.39-0.56
Contrabass saxhorns in 18-ft B-flat	14.0-14.7	45.0-50.1	0.33-0.41
Bourdon saxhorn in 26-ft E-flat	15.2	90.8	0.23

A first general observation regarding the measured instruments is that in most cases they do not cover the whole period of the production years of the Adolphe Sax workshop. In the above table, in the soprano, contralto, bass and contrabass saxhorns no specimens later than 1870 are included. In most groups surviving instruments after 1870 are scarce. If the lack of any surviving instrument is indicative of a limited or non-existent production of these groups of instruments after about 1870, we are considering a total production period of about thirty-five years. In general, it can be

<sup>7</sup> Myers et al., "Non-linear Propagation Characteristics".

<sup>8</sup> Arnold Myers, Robert W. Pyle, Joël Gilbert, Murray Campbell, "The Influence of Bore Size on Brassiness Potential" *Proceedings of the Second Vienna Talk, Sept. 19-21, 2010, University of Music and Performing Arts Vienna, Austria* [in press].

said that regarding bore profile no major changes occurred in the acoustical design of saxhorns as a whole as they were made by Adolphe Sax.

The only group displaying a gradual development is that of the contrabass saxhorns in E-flat, of which a relatively small number of surviving specimens is known. There is a tendency towards larger bores and lower values of parameter  $B$  with time, the latter marking a preference for more conical bore profiles. The contrabass saxtuba in E-flat is markedly wider compared with earlier instruments and overall has a more conical profile. Among surviving instruments at this pitch the saxtuba is the widest of all, and the first of what could be called “the second generation” contrabass saxhorns in E-flat. After about 1855, these saxhorns present larger bores and are generally more conical, and it is believed that the saxtuba’s developed design does not result from its external appearance. The sole surviving contralto saxtuba (see Table 8.1) does not present any differences at all in bore-profile from saxhorns at the same pitch.

An analogous development is not observed in contrabass saxhorns in B-flat. Their period of production was shorter since, as it was mentioned in Chapter Four, they were introduced c. 1850. Contrabasses in B-flat made in the Sax workshop present large bores throughout and low values of  $B$ .

In the smaller saxhorns which as mentioned share similar ranges of  $B$ , the use of minimum bore diameter as an additional factor for distinguishing between different size groups does not help. Here we observe that, as mentioned by Myers et al. “instruments of smaller basic tube length show less variety in brassiness, and fewer well-characterized species”.<sup>9</sup>

In the soprano saxhorns where surviving instruments are relatively few no major differences are observed. In contralto saxhorns a similar picture is observed. Small variation in the various values of parameters does not show a gradual change, but only differences which could be attributed to manufacturing difficulties or different customer demands. These small differences in some cases occur in instruments made during the same year (such as B 2008.022 and EU 4253, both made in 1865). Two instruments which show some greater variation are an instrument in Brussels (BM 2462) made in 1869 and an unnumbered instrument in

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<sup>9</sup> Myers et al., “Non-linear Propagation Characteristics”.

## Chapter Eight

Paris (MM E.0796), which was most possibly made before 1861.<sup>10</sup> The first is marked by a wider-than-normal bore at mid-point length not met in any other instrument of the group. The latter is a high-pitch instrument marked by narrow bore (to the extent that it better fits with soprano saxhorns in terms of mid-bore diameter) and a higher value of  $B$ , showing a tendency for a more cylindrical profile. This instrument was only inscribed with the extra stamp A <sup>1</sup> S and a three-digit number (795), which as explained in Appendix B was stamped only on some instruments, but without knowing with certainty for which purpose.

The groups with the biggest variation in values of  $B$  are those of the alto saxhorns and contrabass saxhorns in 12-ft F and 13-ft E-flat. These variations in the alto saxhorn group could indicate the need for the existence of both narrower and wider instruments within the same pitch group. Sax attempted to introduce the wider saxhorns and the narrower saxotrombas, but as discussed in Chapter Five only the latter group of instruments was viable.

### 8.1.2 Adolphe Sax saxhorns and saxhorns by licensed makers

As it has been discussed in Chapter Four, in the period 1855-65 saxhorns were made by other French makers under licence. As it has been stated, the instruments' wrap and the valves used are in some cases similar to those used by Sax, but in most cases they vary considerably. Judging from their external appearance only, saxhorns made under licence have very little in common with saxhorns made in the Sax workshop. There is no evidence that Sax performed strict control on instruments made by other makers and which bore the "Adolphe Sax autorisée" stamp. Table 8.3 below shows measurements taken from saxhorns made in the period 1855-65 by Sax's licensed makers.

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<sup>10</sup> According to the construction of the middle valve tubing. See, Chapter Four, p. 145.

**Table 8.3 Surviving measured saxhorns by licensed makers in various pitches and sizes.**

Collection no.	Instrument type and pitch	Maker	Place	Date	D <sub>min</sub>	D <sub>mid</sub>	B
<b>3¼-ft E-flat</b>							
BK 419	Soprano saxhorn (equitonique) in E-flat	Gautrot-Marquet	Paris	1859-65	9.4	12.5	0.66
<b>4½-ft B-flat</b>							
MM E.1170	Contralto saxhorn (one of duplex with cornet) in B-flat	Gautrot	Paris	1859-65	9.2	15.7	0.51
<b>6-ft F/6½-ft E-flat</b>							
BK 438	Alto saxhorn in E-flat	Couturier	Lyon	1855-65	10.7	18.1	0.51
MM E.743	Alto saxhorn in F	Kretzschmann	Strasbourg	1855-65	11.3	14.6	0.61
B 2008.016	Alto saxhorn in E-flat	Roëhn	Paris	1855-65	10.5	14.2	0.57
LBH 733	Alto saxhorn in E-flat	Gautrot	Paris	1859-65	10.1	13.5	0.56
EU 3945	Alto saxhorn in E-flat	Gautrot	Paris	1859-65	10.4	15.3	0.53
BK 671	Alto saxhorn in F	Courtois	Paris	1855-65	9.6	15.4	0.53
EU 4272	Alto saxhorn in E-flat	Daniel	Marseille	1861-65	9.7	15.8	0.51
EU 4621	Alto saxhorn in E-flat	Halary	Paris	1859-65	11.3	15.4	0.61
EU 5699	Alto saxhorn in E-flat	Husson-Buthod	Paris	1855-65	11.1	14.2	0.60
B 93.065	Alto saxhorn in E-flat	Schneider	Strasbourg	1855-65	10.4	15.4	0.56
B 95.031	Alto saxhorn in F	Piattet	Lyon	1855-65	10.5	18.2	0.54
MM E.1172	Alto saxhorn (one of duplex) in E-flat	pr. Gautrot	Paris	pr. 1859-65	11.1	15.9	0.61
<b>8-ft C/9-ft B-flat (narrow bore)</b>							
EU 3697	Baritone saxhorn in B-flat	Besançon	Paris	1861-65	10.4	18.1	0.54
EU 2939	Baritone saxhorn in B-flat	Couturier	Lyon	1855-65	12.2	20.6	0.55
EU 4443	Baritone saxhorn in C	Jamin fils	Paris	1855-65	10.2	16.5	0.52
BK 11	Baritone saxhorn in B-flat	Jamin fils	Paris	1855-65	11.4	16.4	0.57
B 82.022	Baritone saxhorn in B-flat	Henry & Martin	Paris	1855-65	11.3	16.5	0.56
MM E.0908	Baritone saxhorn in B-flat	Courtois	Paris	1855-65	12.9	19.5	0.59
MM E.1172	Baritone saxhorn (one of duplex) in B-flat	pr. Gautrot	Paris	1859-65	11.0	17.8	0.56
BK 790	Baritone saxhorn in B-flat	Besançon	Paris	1861-65	12.6	18.2	0.60



Collection no.	Instrument type and pitch	Maker	Place	Date	D <sub>min</sub>	D <sub>mid</sub>	B
<b>8-ft C/9-ft B-flat (wide bore)</b>							
BK 884	Bass saxhorn in B-flat	Halary	Paris	1855-65	11.8	23.5	0.45
EU 3812	Bass saxhorn in C	Fischer	Paris	1855-65	11.2	22.4	0.48
EU 4135	Bass saxhorn in C	Gautrot	Paris	1855-65	10.6	25.5	0.42
BM 2002.006	Bass saxhorn in B-flat	Besançon	Paris	1861-65	12.2	25.1	0.45
BK 679	Bass saxhorn in B-flat	Grapin	Auxerre	1855-65	11.0	24.1	0.48
<b>13-ft E-flat</b>							
EU 2107	Contrabass saxhorn in E-flat	Courtois	Paris	1855-65	12.6	32.7	0.43
<b>18-ft B-flat</b>							
BK 621	Contrabass saxhorn in B-flat	Lecomte	Paris	1860-65	12.8	35.5	0.41
JC 219	Contrabass saxhorn in B-flat	Couturier	Lyon	1855-65	14.9	44.7	0.38
JC 264	Contrabass saxhorn in B-flat	Besançon	Lyon	1861-65	13.3	41.0	0.37
EU 3883	Contrabass saxhorn in B-flat	Lecomte & Cie	Paris	1860-65	13.6	34.7	0.43
EU 2934	Contrabass saxhorn in B-flat	Rivet	Lyon	1855-65	13.5	39.5	0.42

Table 8.4 shows ranges of minimum bore diameter, mid-point length diameter and values of  $B$  for licensed saxhorns.

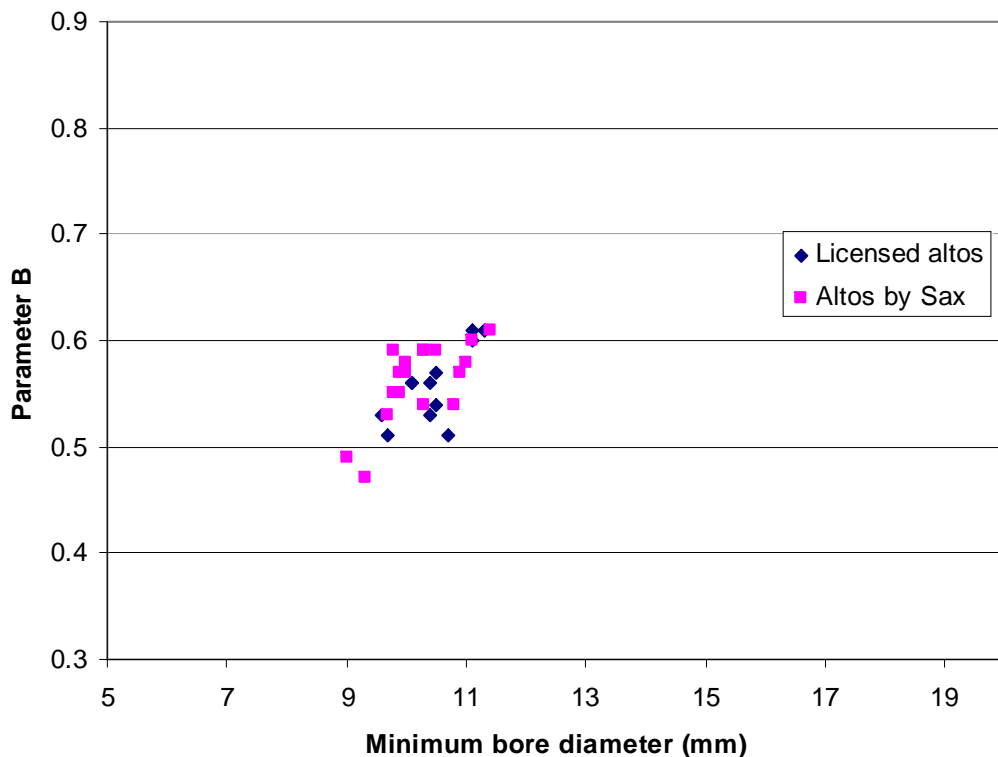
**Table 8.4 Ranges of minimum bore diameter, mid-point length diameters and values of  $B$  for license saxhorns.**

Saxhorns made by licensed makers			
Instrument type	D <sub>min</sub>	D <sub>mid</sub>	B
Soprano saxhorn	9.4	12.5	0.66
Contralto saxhorn	9.2	15.7	0.51
Alto saxhorns	9.6-11.3	13.5-18.2	0.51-0.61
Baritone saxhorns in 8-ft /9-ft B-flat	10.2-12.6	15.8-20.6	0.52-0.60
Bass saxhorns in 8-ft /9-ft B-flat	10.2-12.2	22.4-25.5	0.42-0.48
Contrabass saxhorn in 13-ft E-flat	12.6	32.7	0.43
Contrabass saxhorns in 18-ft B-flat	12.8-14.9	35.5-44.7	0.37-0.43

By examining the data presented in Tables 8.3 and 8.4 we can attempt to inspect whether the differences in external appearance are also reflected as

differences in bore profile. The only groups that are well represented in Table 8.3 above are the alto, baritone, bass, and contrabass in B-flat saxhorns.

Comparing the alto saxhorns made by Sax and those of his licensees we observe that on the whole there are no significant differences between the two. There is a tendency in some licensed altos to have larger bores, which, however still do not approach the dimensions of the wide-bore alto saxhorn of the 1845 patent discussed in detail in Chapter Five. A plot of values  $B$  and minimum bore diameters presented in Graph 8.1 shows that there are no significant differences between the two, and that we have one group with common characteristics. Thus, alto saxhorns by licensed makers are saxotrombas in essence, as are alto saxhorns made by Sax.

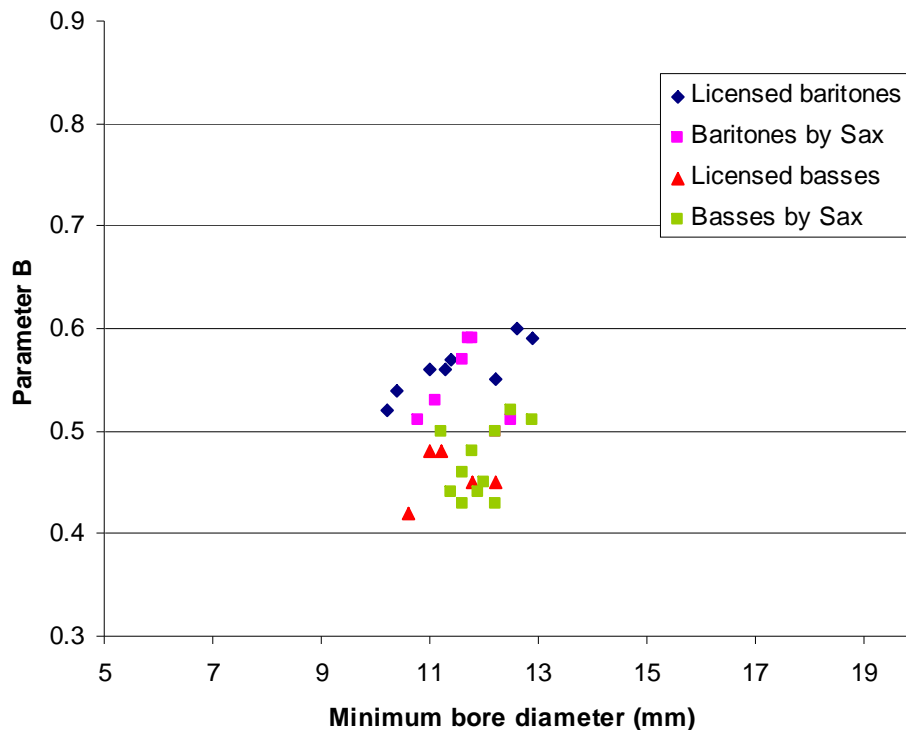


**Graph 8.1** Alto saxhorns by Adolphe Sax and licensed makers plotted according to minimum bore diameter and parameter  $B$  values.

Looking at all measured saxhorns in 8-ft C/9-ft B-flat made by Adolphe Sax and Sax's licensees we can see that according to Graph 8.2 there are two distinct groups linearly separable, the baritones and the basses. The two baritone saxhorns from the Musée de la musique collection made by Sax interfere in the bass saxhorn group and they are problematic (MM E.0712, MM E.0803). They are inscribed by the maker as baritone saxhorns, but they are in reality basses. If there was only one

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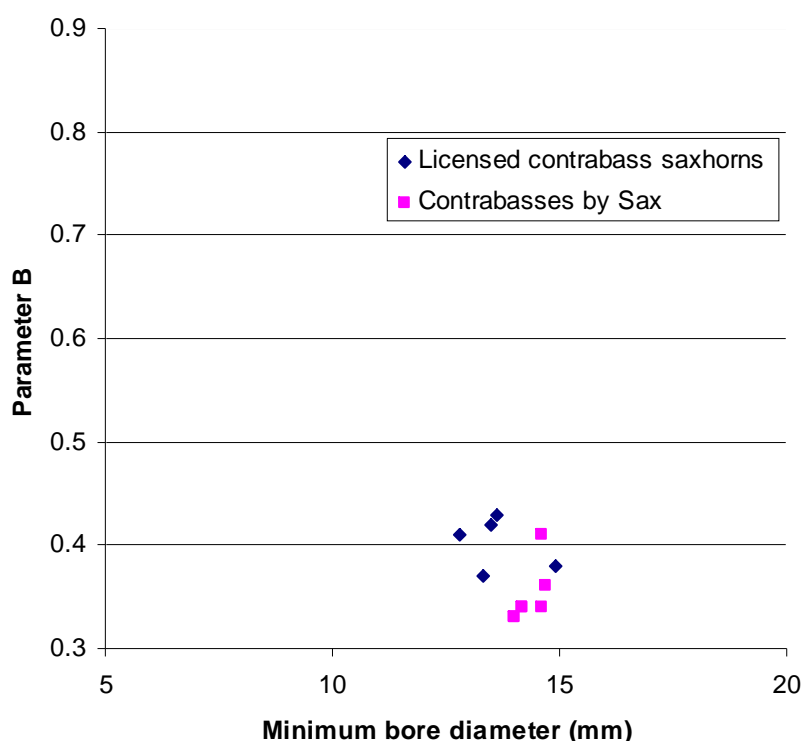
outlier the possibility of the wrong name having been inscribed on the instrument's bell could be considered, but in this case we have two examples which come from different years. Both instruments are *nouveau* saxhorns with independent valves, but this is the only case known where *nouveau* instruments are different in bore profile from ordinary saxhorns. The rest of the instruments are classified as baritones or basses based firstly on their inscription. Some of the licensed instruments have the designation of instrument type inscribed on their bell. The rest of licensed instruments are just inscribed "saxhorn". In Sax instruments whose inscriptions do not include the instrument type, the division is made according to external appearance characteristics, which are very specific in most Adolphe Sax saxhorns. For the licensed saxhorns where the type is not inscribed by the maker the classification is made according to the measured data. We can say, thus, that regardless of whether the makers designated and inscribed instrument types on instrument bells, there are clearly two different groups in 8-ft and 9-ft pitch, the wide basses and the narrower baritones.



**Graph 8.2 Bass and baritone saxhorns in 8-ft C and 9-ft B-flat by Ad. Sax and licensed makers.**

The picture is somewhat different when comparing contrabass instruments in 18-ft B-flat made by Sax and his licensees. Graph 8.3 shows that there are two

Taxonomy of intermediate bore-profile instruments distinct groups, with the exception of an outlier of the licensed saxhorn group which is sorted with the Sax instruments (instrument by Couturier, JC 219). Licensed contrabasses tend to have higher values of  $B$  and lower minimum and mid-length diameters. The minimum bore diameter differences are prominent, possibly demonstrating the requirement for different types of mouthpieces in Sax instruments. It should be noted that Adolphe Sax surviving contrabass saxhorns in 18-ft B-flat cover the period 1854-66 and license contrabasses the period 1855-65, so the differences observed cannot be attributed to different manufacture period, and, thus, to developments which have occurred over time.



**Graph 8.3** Contrabass saxhorns in 18-ft B-flat made by Adolphe Sax and licensed makers plotted according to parameter  $B$  and minimum bore diameter values.

Consequently, not all pitch groups present a consistent picture. Instruments in 6-ft F/6½-ft E-flat and 8-ft C/9-ft B-flat (narrow and wide-bore) made both by Sax and by licensed makers present more similarities than differences and cannot be distinguished according to bore profile. The only group where significant differences are observed is that of the contrabass saxhorns in 18-ft B-flat where two different groups are formed. The lack of consistency, regardless the similarities mentioned above, confirm what literary evidence suggests, that is the lack of any standard

procedures under which licensed makers were controlled by the Adolphe Sax workshop in producing instruments which bore the Adolphe Sax “autorisé” stamp.

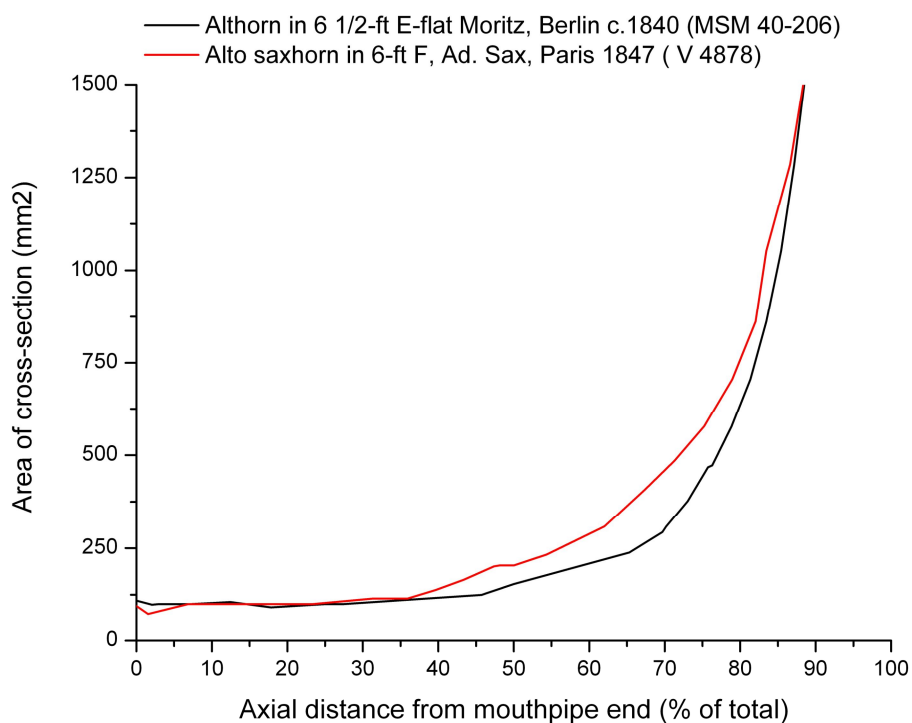
### 8.1.3 Early German instruments and saxhorns by Sax

As already mentioned previously, Sax did not only have adversaries within France, but also abroad. He was accused that when he made his saxhorns he copied pre-existing early German brasses. Here some surviving early German instruments are compared with early saxhorns.

Table 8.5 shows measurements of instruments in 6½-ft E-flat. A rare early *Althorn* by Moritz (Berlin c. 1840) when compared with early altos by Sax could provide interesting results.

**Table 8.5 An early *Althorn* by Moritz compared with Ad. Sax saxhorns in 6-ft F/6½-ft E-flat.**

Collection no.	Instrument type and pitch	Maker	Place	Date	D <sub>min</sub>	D <sub>mid</sub>	B
MSM 40-206	Althorn in E-flat	Moritz	Berlin	c.1840	11.3	14.0	0.66
V 4878	Saxhorn in F	Ad. Sax	Paris	1847	9.7	16.1	0.53
EU 4620	Saxhorn in E-flat	Ad. Sax	Paris	1854	10.5	14.4	0.59



**Graph 8.4 Comparison of Moritz’s early *Althorn* with an early alto by Sax.**

There are some differences from about thirty-five percent of total tube length. From that point the saxhorn becomes wider, whereas the *althorn* shows a more abrupt expansion at the second half of its total tube length. Although these measurements do not show that the later saxhorn is a copy of Moritz's instrument, more specimens would need to be examined so as to draw firm results. This becomes extremely difficult by the scarcity of surviving relevant early German brasses.

As mentioned in Chapter Four Sax's early low saxhorns—included in the 1843 patent and called *contrebasses d'harmonie*—resemble closely in external appearance the early *Basstubas* of Moritz and Wieprecht.<sup>11</sup> No such instrument made by Sax has survived to our present knowledge. A similar instrument is also depicted in *L'Illustration* as having been exhibited as a *sax-tromba* during the 1844 Paris Exhibition.<sup>12</sup> Sax's private collection of musical instruments included two German instruments, a *Basstuba* by Moritz and Wieprecht, today in Brussels (BM 1281), and a bombardon by Heiser, today in Paris (MM E.1468).

After having compared the alto instruments it would be interesting to compare the larger instruments. Table 8.6 contains measurement data of some early German *Basstubas* and for comparison, data concerning the two earliest surviving contrabass saxhorns in 13-ft E-flat by Sax. The Sax instruments present higher values of *B* compared to instruments made by Moritz, but similar to that of the Heiser Bombardon. Sax's brasswinds are a little narrower at mid-point length. It appears that Sax's early contrabasses were not direct copies of Moritz's and Wieprecht's *Basstubas*. The Heiser bombardon though has a value of *B* close to that of the saxhorns and is marked by a narrower mouthpiece receiver, and a narrower bore at mid-point length.

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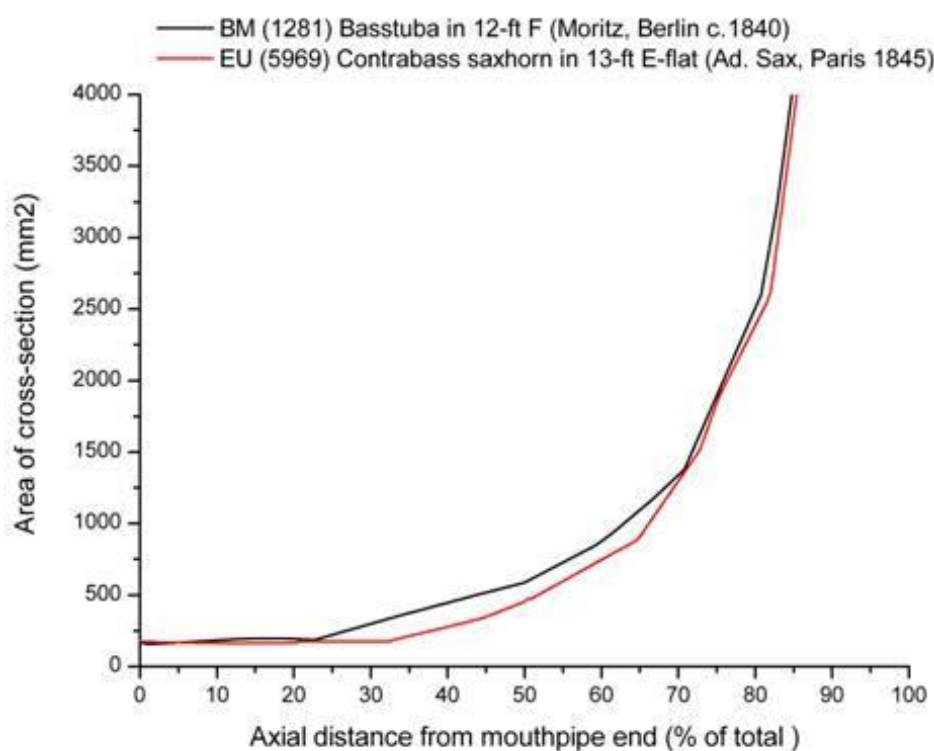
<sup>11</sup> See for more Chapter Four, pp. 108, 161-63.

<sup>12</sup> H. Robert Cohen, ed., *Les gravures musicales dans L'Illustration, 1843-1899* (Québec : Presses de l'Université Laval, 1982-83), 1/47 (July 4, 1844), 296. See Chapter Five, p. 203 for more.

**Table 8.6** Early German *Basstuba*s compared with two early contrabass saxhorns by Ad. Sax.

Collection no.	Instrument	Maker	Place	Date	$D_{\min}$	$D_{\text{mid}}$	$B$
BM 1281	Basstuba in 12-ft F	Moritz	Berlin	c.1840	14.1	27.3	0.48
BE 4456	Basstuba in 12-ft F	Moritz	Berlin	c.1840	14.1	27.5	0.50
SM 478	Basstuba in 12-ft F	Moritz	Berlin	1843	14.4	28.0	0.51
MM E.1468	Bombardon in 12-ft F	Heiser	Potsdam	m.19	14.0	21.8	0.56
EU 5969	Contrabass saxhorn in 13-ft E-flat	Ad. Sax	Paris	1845	14.7	24.0	0.57
EU 4544	Contrabass saxhorn in 13-ft E-flat	Ad. Sax	Paris	1846	14.7	24.1	0.57

Graph 8.5 shows bore profiles of the earliest known saxhorn in 13-ft E-flat (EU 5969) and the *Basstuba* (BM 1281). The main difference that results in a higher value of  $B$  for the contrabass saxhorn is the relatively larger proportion of cylindrical tubing that characterizes its bore-profile. The same is the case with the second earliest contrabass saxhorn (EU 4544).

**Graph 8.5** Comparison of bore profiles of an early *Basstuba* by Moritz and an early contrabass saxhorn by Adolphe Sax.

## 8.2 Clavicors and néocors

During the court cases in which Sax was involved, his adversaries contested the originality of his instruments. They claimed that he copied pre-existing instruments such as the clavicor and the néocor. In this section are examined measurement data of this “family” and they are also compared with the Sax saxhorn data. Table 8.7 below contains information on measured surviving clavicors and néocors. The instruments are divided in two groups. The first group includes instruments of the baritone register (7-ft D-flat/8-ft C/9-ft B-flat) and the second instruments of the alto/tenor group (6-ft F/6½-ft E-flat). The néocors are grouped with the smaller clavicors.

**Table 8.7 Clavicors and néocors.**

Collection no.	Instrument type and pitch	Maker	Place	Date	D <sub>min</sub>	D <sub>mid</sub>	B
<b>7-ft D-flat/8-ft C/9-ft B-flat</b>							
FT 122	Clavicor in D-flat	Pace	London	c.1840	11.0	12.0	0.68
LH 9250	Clavicor (althorn) in C	Köhler	London	c.1850	8.4	11.9	0.61
BNS 48	Clavicor (althorn) in C	Köhler	London	c.1851	8.4	11.9	0.60
LHC 206	Clavicor in C	Guichard	Paris	c.1840	10.6	14.6	0.57
EU 4647	Clavicor in C	Guichard	Paris	c.1840	11.3	15.6	0.61
SP 0580	Clavicor in C	Guichard	Paris	c.1838	11.0	15.8	0.59
OB 660	Clavicor in C	Guichard	Paris	c.1845	10.8	15.3	0.59
OB 660	Clavicor in B-flat	Guichard	Paris	c.1845	10.4	12.6	0.50
BK 28	Clavicor in C	Guichard	Paris	c.1850	10.7	15.0	0.58
MM E.747	Clavicor in C	Guichard	Paris	c.1840	10.7	13.7	0.59
<b>6-ft F/6½-ft E-flat</b>							
BK 323	Clavicor in E-flat	n/k	n/k	m.19	10.9	14.3	0.63
EU 5793	Clavicor in E-flat	Piattet	Lyon	m.19	9.2	13.8	0.53
EU 3045	Clavicor in E-flat	Jean	France	m.19	10.9	14.5	0.62
HM 2004.1159	Clavicor in E-flat	Gautrot	Paris	p.1845	9.2	12.1	0.56
MM E.2002.11.11.1	Néocor in F	n/k	n/k	m.19	9.2	11.4	0.63
EU 3350	Néocor in F	Schneider	Strasbourg	c.1840	9.4	11.8	0.62
ST 873	Néocor in F	n/k	n/k	m.19	8.6	12.3	0.57

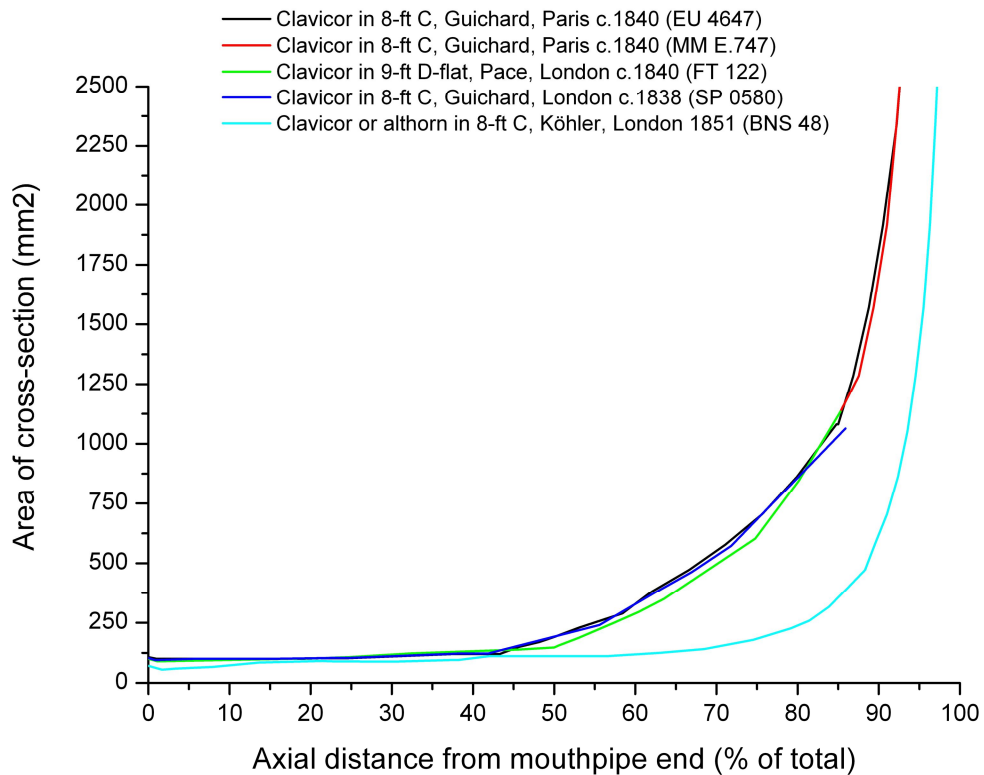
Firstly it should be noted that with current knowledge the dating of all instruments of the clavicor and néocor group is approximate. These instruments do not bear any datable serial numbers and in many cases they are unsigned. Signed instruments often bear inscriptions which were used by makers for extended periods of time, so they cannot always be of help in precise dating of instruments.



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As far as the instruments of the baritone group are concerned it can be observed that French instruments all have close values of minimum bore and bore at mid-length, indicating that this particular model did not change much. The lack of precise dating is an issue here, although it appears that the date, possibly due to the relatively limited time of the clavicor's existence compared with other instruments, is not a factor contributing to important changes. Instruments made in Britain by Pace and Köhler appear to have much narrower bore at mid-point length. Clavicors (or althorns) by Köhler stand out in that their minimum bore is much narrower compared with their British or French counterparts, possibly indicating the use of a different type of mouthpiece. Similar observation can be made regarding their values of parameter  $B$ , which for instruments by Guichard range between 0.58 and 0.61. The instrument by Pace shows a higher value of  $B$ , marking its more cylindrical profile compared with the rest of the clavicors.

Graph 8.6 below shows plots of four clavicors and an althorn by Köhler in the baritone register. It is immediately observed that bore profiles of all four instruments, even of the one made by Pace in Britain, are almost identical. The instrument by Köhler is distinctly different; it is almost cylindrical for the greatest percentage of its total length with the bell section expanding abruptly at about eighty percent of total length. It appears that it is a completely different instrument from the French clavicors and it shares with them only a similar wrap.

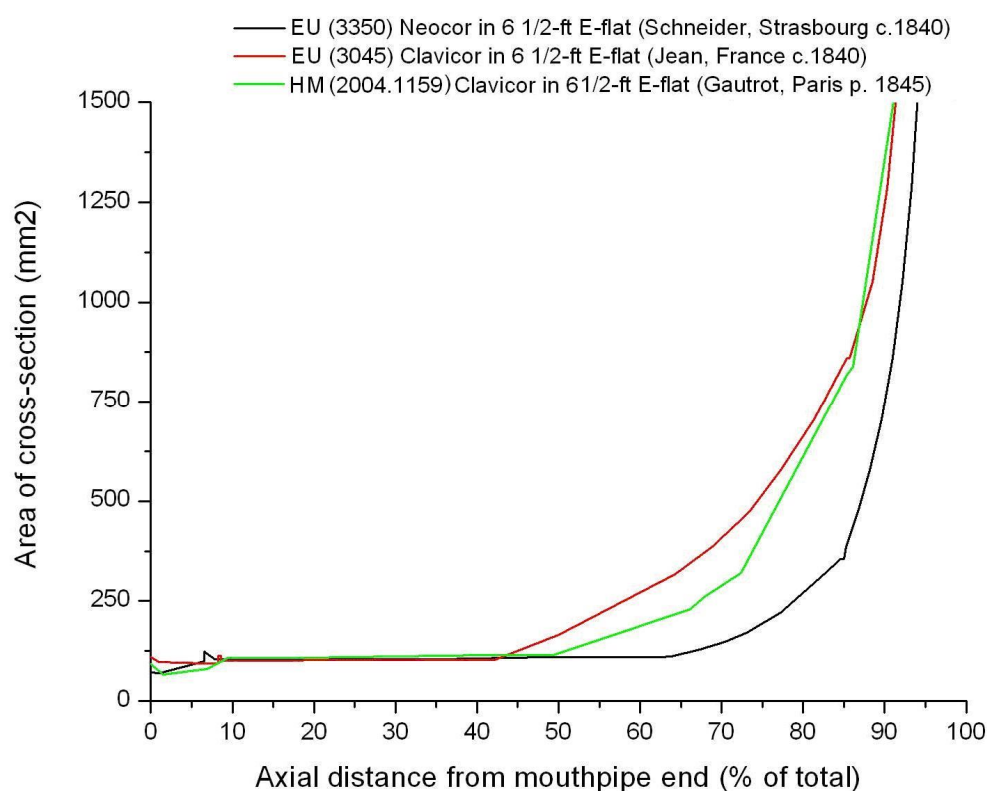


**Graph 8.6 Plots of bore profiles of low clavicors in 8-ft C.**

The second part of the table above includes clavicors of the alto register and two néocors at the same pitch. The picture here is more diverse; the Edinburgh clavicorn (EU 3045) by Jean differs from a later clavicorn by Gautrot at the same pitch. It presents a much wider bore at mid-length and a larger minimum bore compared to the Gautrot clavicorn in the Horniman Museum approaching the bore profile characteristics of the later alto saxhorns. The value of parameter  $B$  is higher bringing it closer to the néocors in terms of degree of brassiness potential. The difference in bore profile between the two clavicors might suggest either a development that occurred with time, moving from a wider bore profile to a narrower one which is not very likely since normally the opposite is observed, or variations between different makers, or differences in the design resulting from compliance with different customer needs, usage etc. The two néocors have values of  $B$  in the range 0.62 to 0.64; more néocors would need to be measured though to draw firm conclusion for the group. It has been suggested by researchers and Sax's rival makers during the

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court hearings that néocors were the alto counterparts of the cornet.<sup>13</sup> According to Myers et al. parameter  $B$  appears to be similar in members of the same instrument family.<sup>14</sup> Close values of  $B$  between néocors and French cornets of the same period confirm indeed the existence of family characteristics (albeit with less variety in instrument sizes compared to that of the saxhorn group), but the same observation made above regarding the low number of surviving néocors results in the same limited conclusions.



**Graph 8.7 Comparison of plots of bore profile of high clavicors and néocors in 6 1/2-ft E-flat.**

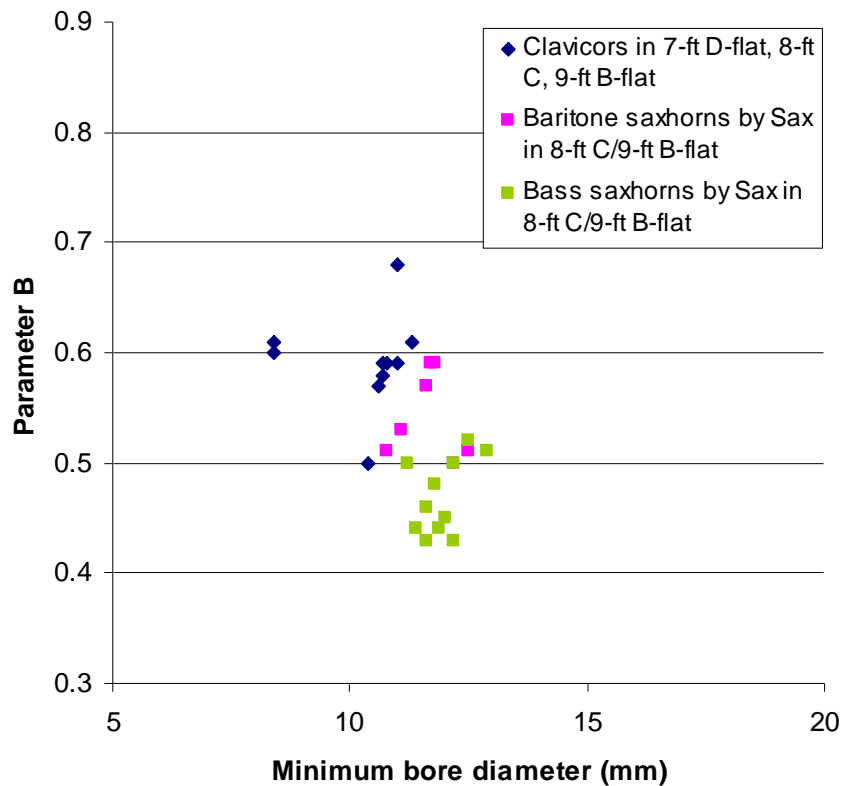
In Graph 8.7 there are compared bore profiles of the clavicors by Jean and Gautrot and the néocor by Schneider. The clavicorn expands rapidly from about forty-five percent of total length, with the néocor expanding from about sixty-five percent of total length, and remaining cylindrical for a bigger part of its total length.

<sup>13</sup> See for example, *Nullité de brevet. Instruments et brevets Sax. Tribunal Correctionnel de la Seine, 6<sup>me</sup> Chambre. Affaire Rivet contre Sax. Documents* (Paris: Dondey-Dupré, 1855), enfolded illustration.

<sup>14</sup> Myers et al. “Non-linear propagation characteristics”.

### 8.2.1 Saxhorns, clavicors, and néocors compared

An examination of Graph 8.8 where clavicors and saxhorns in 8-ft C and 9-ft B-flat are plotted according to parameter  $B$  values and minimum bore diameter is revealing.



**Graph 8.8** Low clavicors by various makers in Paris and London in 7-ft D-flat-9-ft B-flat, baritone and bass saxhorns by Ad. Sax in 8-ft C/9-ft B-flat plotted according to parameter  $B$  values and minimum bore diameters.

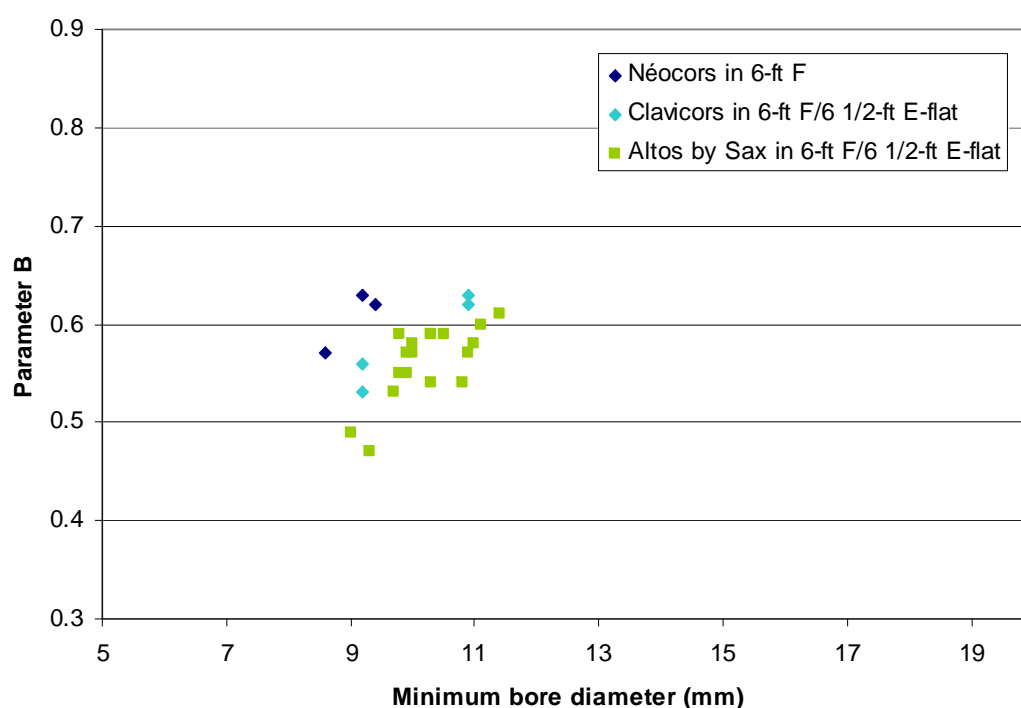
One can immediately notice three distinct groups naturally clustered (except for the two baritone saxhorns outliers that interfere with the bass saxhorns, as has been mentioned). The 8-ft/9-ft clavicors with their higher values of  $B$  are as a rule distinctly different even from the narrow-bore instruments of the register; the only exception is a clavicor made by Guichard (OB 660) which is distant from the mean of the rest of the clavicor group, and is in proximity to the baritone saxhorn group, without, though, overlapping with it. Thus, this graph suggests that Sax's brasses (baritone and bass saxhorns), are not direct copies of the pre-existing bass clavicors.

Clavicors in 6-ft F or 6½-ft E-flat were not included in Guichard's 1838 patent and although there is limited information regarding the exact period of their

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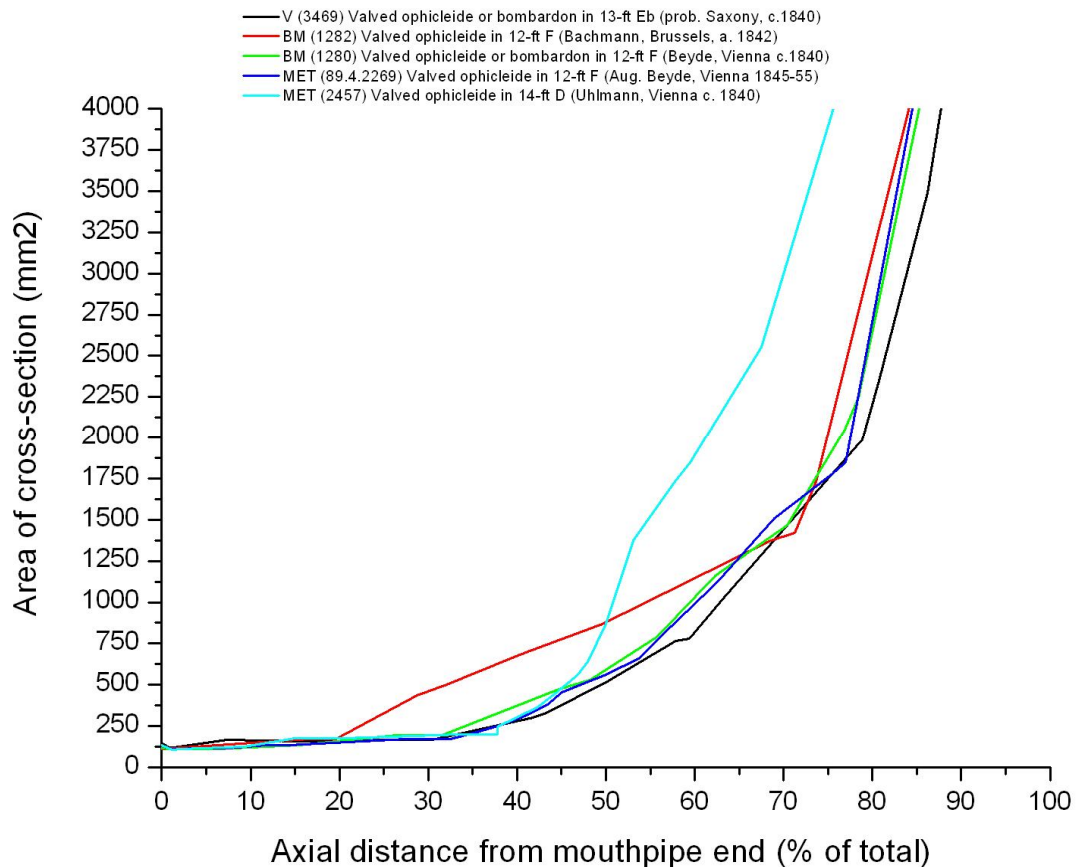
introduction it appears they are later than the 8-ft/9-ft instrument and were introduced in the early 1840s, around the same time as the néocors or later.

Graph 8.9 shows néocors, small clavicors and alto saxhorns plotted. We can observe that the group of néocors, in terms of  $B$  and minimum diameter is linearly separable from the 6-ft/6½-ft clavicors and alto saxhorns, and it approaches characteristics of the cornet family. Higher clavicors, unlike instruments of the lower clavicor group, cannot be safely distinguished from alto saxhorns of the same pitch on the basis of  $B$  and minimum diameter. Taking into consideration the lack of evidence regarding the exact time of introduction of higher clavicors we cannot say with certainty who copied whom, but it is apparent that the néocors (introduced in 1841 two years before the appearance of saxhorns) are distinctly different.



**Graph 8.9** Alto saxhorns made by Sax in 6-ft F/6½-ft E-flat, small clavicors in 6-ft F/ 6½-ft E-flat and néocors in 6-ft F plotted according to minimum diameter and parameter  $B$  values.

### 8.3 Bombardons and valved ophicleides



**Graph 8.10 Comparison of bore profiles of valved ophicleides and bombardons in 12-ft F, 13-ft E-flat and 14-ft D.**

Graph 8.10 above shows bore profiles of contrabass ophicleides and bombardons in 12-ft F/13-ft E-flat/14-ft D. The lack of standardisation in nomenclature is also apparent in bore profile. The two valved ophicleides by Beyde and the bombardon made in Saxony are very alike. The ophicleide by Bachmann is very different from all the other instruments; this is also reflected to the low value of *B*.

**Table 8.8 Measuring data concerning valved ophicleides and bombardons in 12-ft F to 14-ft D.**

Collection no.	Name	Maker	Place	Date	D <sub>min</sub>	D <sub>mid</sub>	B
MET 89.4.2457	Valved Ophicleide in D	Uhlmann	Vienna	c.1840	11.8	33.2	0.42
V 3469	Bombardon in E-flat	unknown	Saxony ?	c.1840	12.4	25.6	0.50
BM 1280	Valved ophicleide in F	Beyde	Vienna	c.1840	12.0	27.2	0.47
BM 1282	Valved ophicleide in E-flat	Bachmann	Brussels	p.1842	11.9	33.2	0.40
MET 89.4.2269	Valved ophicleide in F	Beyde	Vienna	c.1845-55	11.8	26.7	0.46

Values of *B* range from 0.39 to 0.49. Minimum bore ranges from 11.75mm to 12.4mm showing probably the usage of similar types of mouthpieces, whereas bore at mid-length ranges from 25.6mm to 33.2mm.

In valved ophicleides and bombardons of smaller size as shown in table 8.9 below the same picture appears. Minimum diameter appears between 11.1mm and 12.1mm whereas diameter at mid-length ranges from 23.3mm to 24mm. Values of *B* range from 0.40 to 0.52.

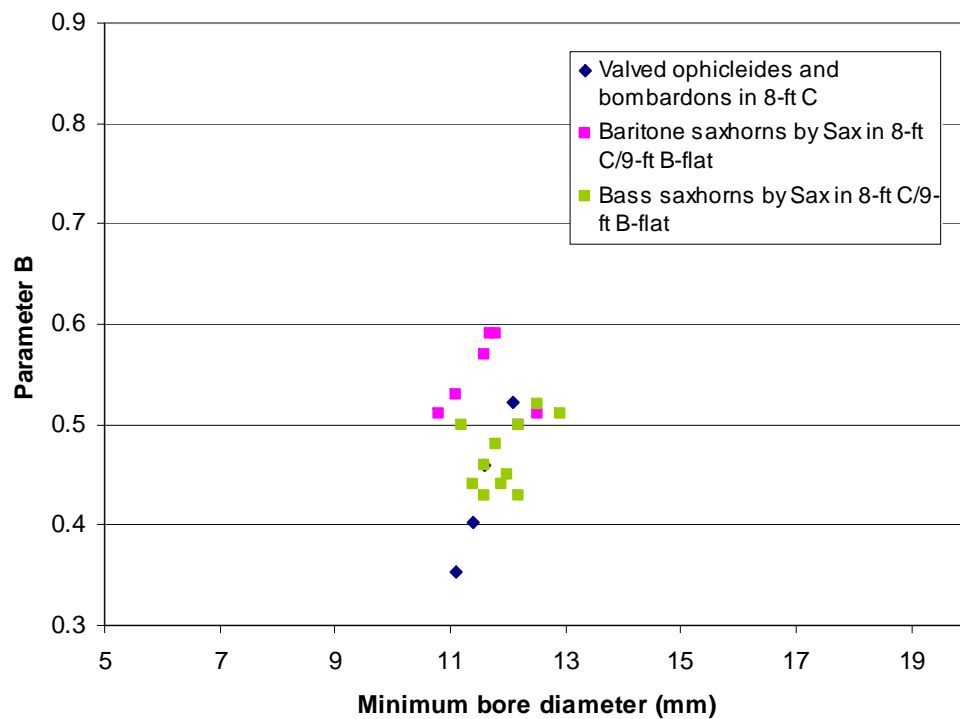
**Table 8.9 Measuring data concerning valved ophicleides and bombardons in 8-ft C.**

Collection no.	Name	Maker	Place	Date	D <sub>min</sub>	D <sub>mid</sub>	B
BM 1275	Valved ophicleide	Raoux	Paris	c.1844	11.1	30.5	0.35
BM 2021	Bombardon	Finke	Strasbourg	c.1850	11.4	31.0	0.40
MET 89.4.2460	Valved ophicleide	Leibelt	Innsbruck	c.1855	12.1	23.3	0.52
MM E. 0309	Valved ophicleide or bombardon	Gautrot?	France?	p.1855	11.6	24.0	0.46

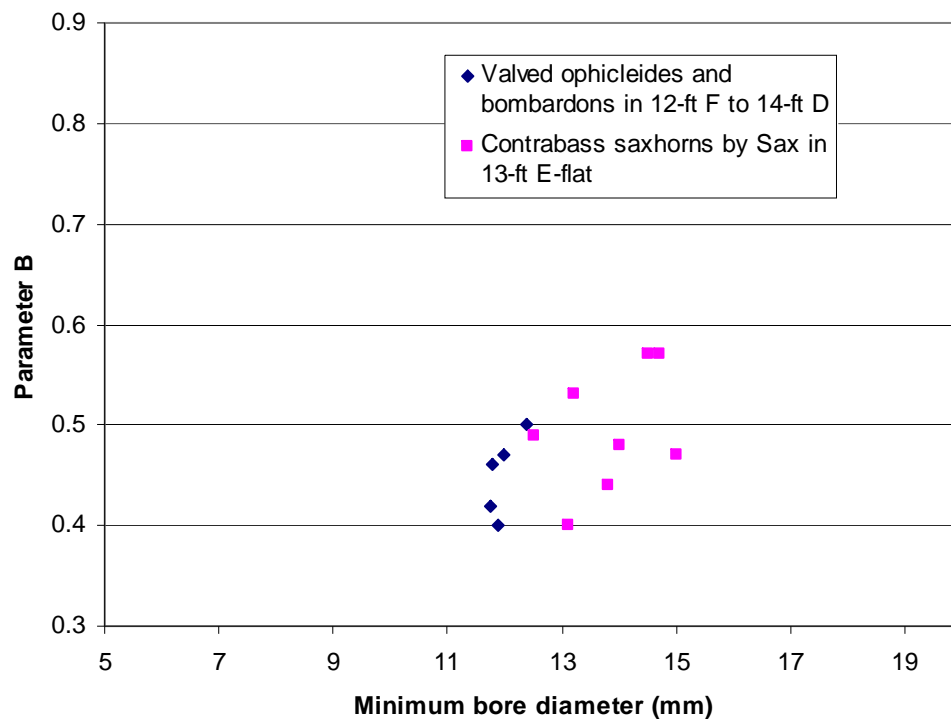
### 8.3.1 Valved ophicleides and bombardons compared with saxhorns

In Graphs 8.11 and 8.12 bass and contrabass valved ophicleides are compared with saxhorns of the same pitch. In Graph 8.11 of instruments in 8-ft C and 9-ft B-flat we observe that the ophicleides are spread in the bass saxhorn group, and although some of them are placed at the edges of the group they cannot be separated from the bass saxhorns. On the other hand, when looking at contrabass instruments we see that, although there is an overlapping area, the two groups are linearly separable due to minimum bore values, which are lower in ophicleides.

## Taxonomy of intermediate bore-profile instruments



Graph 8.11 Valved ophicleides in 8-ft C compared with baritone saxhorns and bass saxhorns in 8-ft C and 9-ft B-flat.



Graph 8.12 Contrabass saxhorns in 13-ft E-flat and ophicleides in 12-ft F to 14-ft D-flat.



## 8.4 Circular instruments of the second half of the nineteenth century

### 8.4.1 Koenig horns

Table 8.10 includes measurements of early Koenig horns and later tenor cors made in Europe at the end of nineteenth and beginning of twentieth century, a late mellophone by the American maker H.N. White and a mid-twentieth century tenor cor by Lafleur.

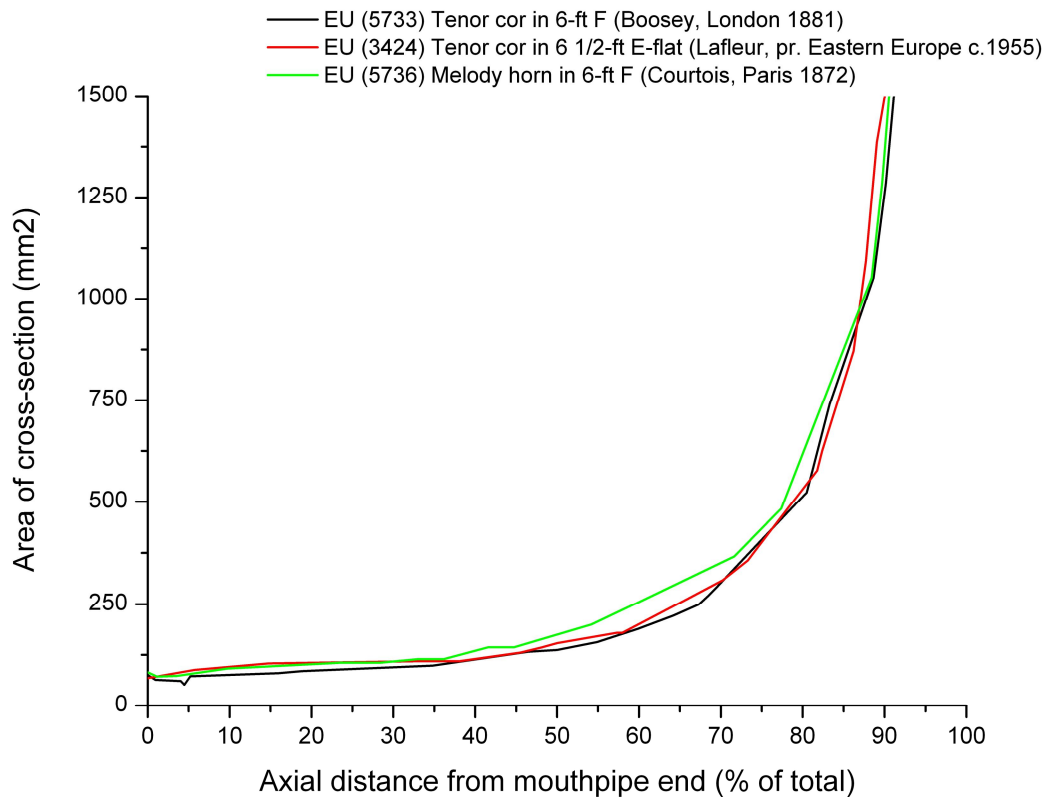
**Table 8.10 Circular instruments in 6-ft F and 6½ ft E-flat**

Collection no.	Instrument type and pitch	Maker	Place	Date	D <sub>min</sub>	D <sub>mid</sub>	B
HM 161	Koenig horn in F (postulated shank)	Distin	London	c.1860	9.0	14.5	0.50
MM E.978.6.1	Koenig horn in F (short mts)	Courtois	Paris	1862-70	9.8	14.7	0.55
MM E.1249	Koenig horn in F	Courtois	Paris	c.1865	10.9	15.0	0.58
EU 5736	Melody horn in F	Courtois	Paris	1872	9.5	14.8	0.55
EU 5733	Tenor cor in F	Boosey & Co.	London	1881	8.1	13.2	0.50
JW	Tenor cor in F	Boosey & Co.	London	1896	8.8	13.3	0.53 <sup>15</sup>
EU 613	Tenor cor in F	Higham	Manchester	c.1897	10.3	15.6	0.53
EU 4229	Mellophone in F	H.N. White	Cleveland	c.1924	8.4	13.4	0.53
EU 3424	Tenor cor in E-flat	Lafleur	pr. Eastern Europe	c.1955	9.3	14.0	0.54

A problematic aspect of Koenig horns is in some cases the absence of original shanks; in some examples measured so far the shank was postulated, obliging us to treat the measurement results with some degree of reservation. Some instruments measured by the author have not been used for this study due to this problem. A general observation when looking at values of parameter *B* in the above table is the relative proximity of most models. Greater variation appears in the minimum bore probably resulting by the fact that in some cases the instruments were considered as being closer to the alto saxhorn and in other cases as being closer to the french horn, as already mentioned in Chapter Seven. Thus, it is expected that different types of mouthpieces were used accordingly.

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<sup>15</sup> Based only on four points.



**Graph 8.13 Bore profiles of a melody horn and two tenor cors are compared.**

Graph 8.13 presents a comparison of bore profiles of two tenor cors and Courtois' melody horn. The similarities are apparent.

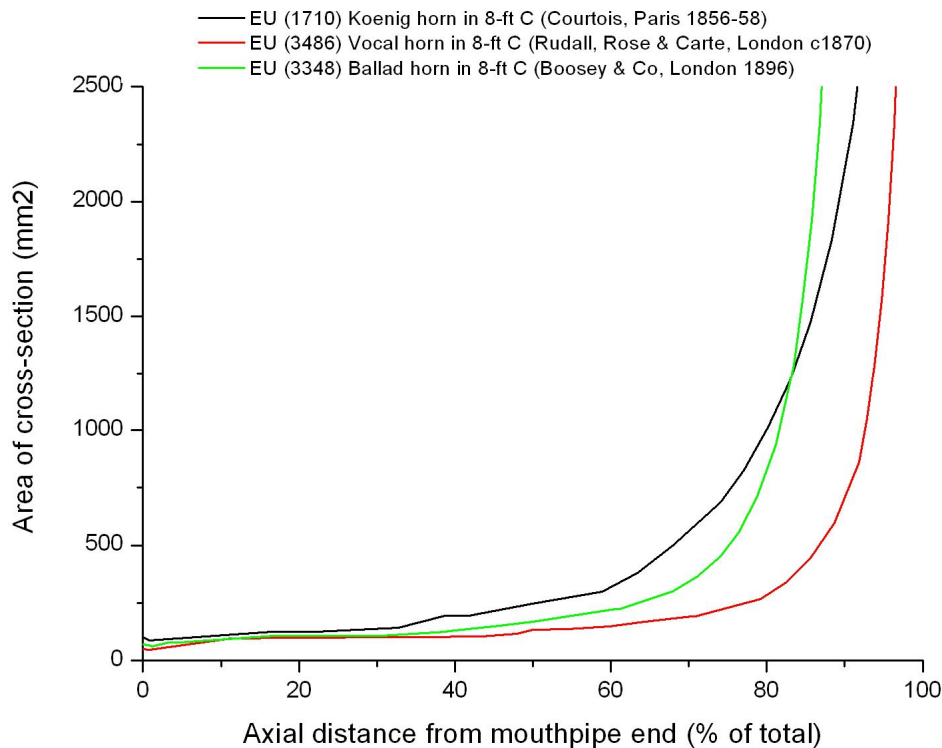
#### 8.4.2 Ballad horns

As already mentioned in Chapter Seven, in the late 1860s in Britain circular instruments pitched in 8-ft C were developed. Table 8.11 includes instruments measured. Most of them were made by Boosey & Co., either during the period when Boosey & Co. still used the “Distin & Co.” stamp (1868-74) or later. A sole example made by Köhler is also included. An early Koenig horn in 8-ft C, made by Courtois in Paris in the mid-1850s is also included in the table. A problem discussed in a previous section on the tenor cors also emerges here; in many cases the absence of original shanks obliges us to include in the table measurements of instruments whose shank is postulated (measurements of surviving shanks are used in instruments with missing shanks).

**Table 8.11 Circular instruments in 8-ft C and 9-ft B-flat.**

Collection no.	Name type and pitch	Maker	Place	Date	$D_{\min}$	$D_{\text{mid}}$	$B$
EU 1710	Koenig horn in C	Courtois	Paris	1856-58	10.5	17.8	0.51
EU 4086	Ballad horn in C	Distin & Co.	London	1869	8.9	13.1	0.54
EU 5836	Ballad horn in C	Distin & Co.	London	1869	9.0	13.8	0.53
EU 3486	Vocal horn in C	Rudall, Rose, Carte & Co.	London	c.1870	7.5	13.0	0.53
EU 3615	Ballad horn in C (postulated shank)	Distin & Co.	London	1872	8.9	13.1	0.49
KH	Vocal horn (in tenor cor form)	Rudall, Rose, Carte & Co.	London	pr.1865	7.4	11.7	0.51
EU 4288	Ballad horn in C	Köhler & Son	London	c.1875	9.1	14.0	0.54
EU 3348	Ballad horn in C	Boosey & Co	London	1896	8.8	13.8	0.54
MM E.2008.5.1	Cor vocal in C (postulated C slide)	Millereau	Paris	e.19	8.6	12.6	0.51

Ballad horns in the Table 8.11 present very uniform characteristics. Minimum bore ranges between 8.8mm and 9.1mm in ballad horns; the vocal horns which have been measured are narrower at 7.4-7.5mm; they take mouthpieces of french horn taper, although there are vocal horns with wider mouthpiece receivers. Bore at mid-length ranges between 12.6mm and 14mm and values of  $B$  between 0.51 and 0.53. No major changes are observed through time and it appears that this model retained almost constant features until the late 1920s.

**Graph 8.14 Comparison of bore profiles of circular instruments in 8-ft C.**

Graph 8.14 shows a comparison of bore profiles of the Koenig horn by Courtois, a later vocal horn by Rudall, Rose, Carte & Co. and a much later ballad horn by Boosey & Co. The Koenig horn and the ballad horn are closer, whereas the vocal horn stands out as not as conical throughout with a very abrupt expansion of its bell section after about eighty percent of total length.

## 8.5 Instruments of the second half of the nineteenth century in diverse forms

### 8.5.1 Antoniophones

Table 8.12 lists late Antoniophones (or orpheons) by Boosey & Co., the only early Antoniophone made by Courtois that could be accessed, and an anonymous instrument (DN) resembling in external appearance the Courtois Antoniophones.

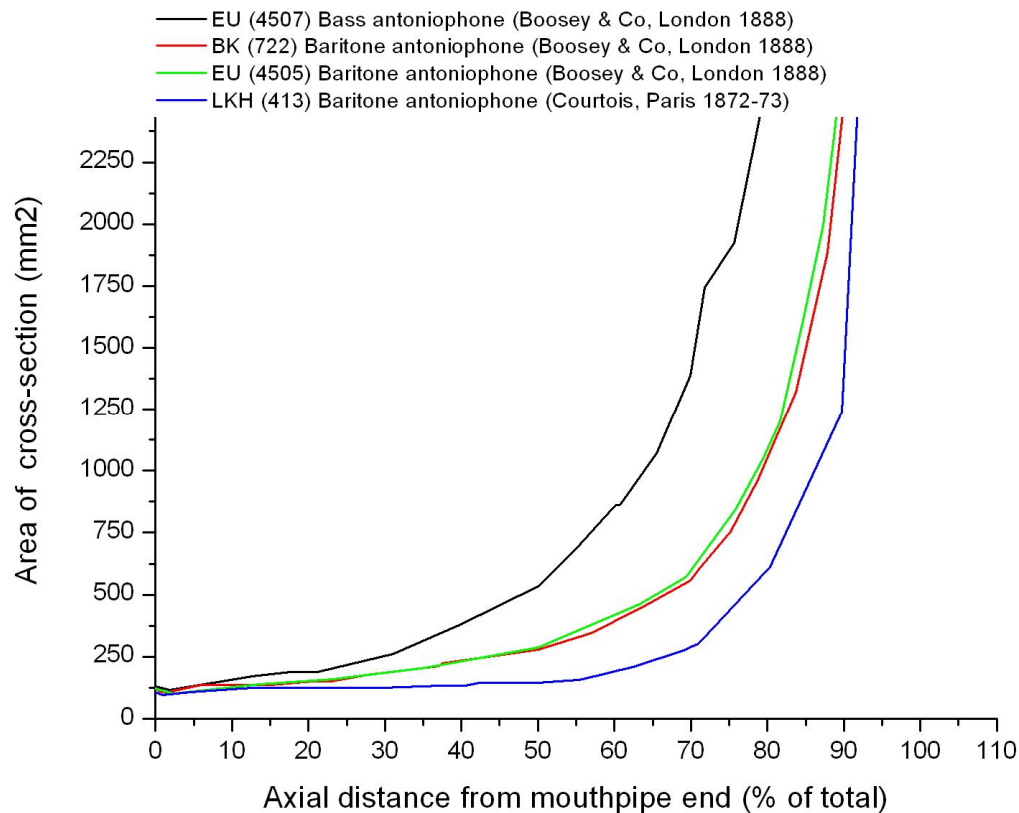
**Table 8.12 Early and later Antoniophones.**

Collection no.	Instrument type and pitch	Maker	Place	Date	D <sub>min</sub>	D <sub>mid</sub>	B
<b>4½-ft B-flat</b>							
EU 4501	Antoniophone (orpheon)	Boosey & Co	London	1889	10.1	16.5	0.53
<b>6½-ft E-flat</b>							
DN	Antoniophone	anonymous	n/k	n/k	10.7	17.1	0.53
V 7311	Antoniophone (orpheon)	Boosey & Co.	London	1887	10.2	15.1	0.53
EU 4503	Antoniophone (orpheon)	Boosey & Co.	London	1888	10.9	15.9	0.57
<b>8-ft C/9-ft B-flat narrow bore</b>							
LKH 413	Antoniophone in C	Courtois	Paris	1872-73	11.0	13.6	0.61
BK 722	Antoniophone in B-flat (orpheon)	Boosey & Co.	London	1888	11.5	20.0	0.53
EU 4505	Antoniophone in B-flat (orpheon)	Boosey & Co.	London	1888	11.4	19.1	0.53
<b>9-ft B-flat wide-bore</b>							
EU 4507	Antoniophone (orpheon)	Boosey & Co.	London	1888	12.2	26.1	0.48

An immediate observation is that instruments made by Boosey and Co. present overall family characteristics; these are both reflected in the values of parameter *B* and in the clear distinction between family sizes according to bore

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width. The exception is the early antoniophone in 8-ft C by Courtois which besides from having a slightly different wrap than the s-formed orpheons, is much narrower than its Boosey & Co counterparts; it is even narrower than the smaller tenor antoniophones by Boosey & Co and the altos in 6½-ft B-flat. Its value of  $B$  is higher than the majority of the narrow bore baritones. Comparing the two baritone instruments by Boosey with the bass antoniophone it is observed that the distinction between the two is pronounced and clear, a fact that is both reflected at the bore profiles plots and the values of  $B$ . Including the baritone antoniophone by Courtois in the comparison it can be observed that immediately three distinct types of bore profiles at the same register emerge. We can observe that this instrument had very little in common with the later antoniophones by Boosey & Co., and it was probably merely an inspiration for the overall form.



**Graph 8.15 Comparison of bore profiles of low antoniophones.**

### 8.5.2 Cornophones

Surviving instruments show a variety in bore profiles, mainly due to the changes regarding the later cornophones, made with a wider leadpipe. Table 8.13 contains information on the cornophones measured. An immediate observation is that the second generation post-1900 cornophones with the wider mouthpiece receiver have distinct values of  $B$  compared to their narrow bore counterparts. It is expected that such prominent differences in  $B$  mean that later cornophones had different acoustic properties. This was probably the reason why they did not survive for very long.

**Table 8.13 Cornophones in various pitches.**

Collection no.	Instrument type and pitch	Maker	Place	Date	$D_{\min}$	$D_{\text{mid}}$	$B$
<b>4½-ft B-flat</b>							
FT 052	Cornophone cornettino	Besson	London	c.1900	7.7	10.5	0.59
MM E.2006.3.3	Cornophone cornettino	Besson	Paris	c.1900	8.0	10.6	0.64
<b>6-ft F / 6½-ft E-flat</b>							
JC 150	Alto cornophone in E-flat	Besson	Paris	c.1900	7.1	14.5	0.43
EU 3050	Alto cornophone in E-flat	Besson	Paris	c.1888	7.7	13.2	0.45
LHC 312	Alto cornophone in F	Besson	London	c.1895	7.4	14.5	0.46
V 7309	Alto cornophone in E-flat	Besson	Paris	c.1895	7.2	14.1	0.48
MM 2002.11.10.2	Alto cornophone in E-flat	Besson	Paris	p.1900?	9.5	14.3	0.56
<b>8-ft C</b>							
EU 3758	Tenor cornophone	Besson	Paris	c.1890	7.3	20.0	0.36
KH	Tenor cornophone	Besson	Paris	c.1890-95	8.0	20.5	0.38
EU 4509	Tenor cornophone	Besson	Paris	p.1905	9.6	20.5	0.45
<b>13-ft E-flat</b>							
EU 4208	Contrabass cornophone	Besson	Paris	c.1892-93	10.0	19.0	0.47

## 8.6 Saxhorns and their counterparts from the second half of the nineteenth century and onwards

### 8.6.1 Instruments in 3½-ft D-flat to 4½-ft B-flat

The term “contralto saxhorn” was not used very much outside France from after the middle of the nineteenth century. Within France the term “bugle” was also used for this instrument. In Germany and Austria *flügelhorns* were used instead. This term was also used in Britain in instruments of this type. However, the part of music which in France would be played on contralto saxhorns, in Britain would be played on the cornets.

**Table 8.14 Instruments in 3½-ft D-flat/4-ft C/4½-ft B-flat by various makers from after the middle of the nineteenth century.**

Collection no.	Instrument type and pitch	Maker	Place	Date	D <sub>min</sub>	D <sub>mid</sub>	B
LBC 92	Alto (flugel horn) in C	Distin	London	c.1850	10.0	16.5	0.54
FT 225	Alto (flugel horn) in D-flat	Distin	London	c.1850	8.5	17.2	0.46
NC 122	Contralto saxhorn in C	Gautrot	Paris	c.1850	8.4	17.1	0.42
LBH 708	Alto (flugel horn) in C	Distin	London	c.1855	10.0	17.7	0.47
EU 4113	Bugle in C	Distin	London	c.1860	10.9	17.2	0.52
MS	Contralto saxhorn in C	Röeh	Paris	1870-90	10.2	17.4	0.52
EU 4530	Flugelhorn in B-flat	Seefeldt	Philadelphia	c.1875	11.6	17.1	0.58
MS	Contralto saxhorn in B-flat	Association gen. des ouvriers	Paris	1885-93	10.2	15.1	0.55
EU 3483	Flugelhorn in B-flat	Higham	Manchester	c.1893	9.5	17.0	0.47
EU 2943	Flugelhorn in B-flat	Salvation Army	London	c.1899	9.7	15.4	0.51
EU 3592	Flugelhorn in B-flat	Besson & Co.	London	c.1908	10.1	16.6	0.53
FT 227	Bugle in C	Collard	London	e.19	10.7	19.8	0.50
EU 4238	Flugelhorn, bell up model in B-flat	Gautrot	Paris	2.19	9.9	16.4	0.50
EU 3857	Flugelhorn in B-flat	King	Cleveland	l. 20	8.1	13.3	0.51
NB 2347	Contralto saxhorn in B-flat	Gautrot	Paris	p.1900	10.2	14.8	0.56
EU 1573	Flugelhorn in C	H. Löwin	Austria	c.1925	10.1	17.4	0.53
EU 3481	Flugelhorn in B-flat	Salvation Army	St Albans	m.20	9.1	14.7	0.50
EU 4654	Flugelhorn in B-flat	Boosey & Hawkes	London	1959	10.0	15.7	0.54

Looking at table 8.14 above we can observe that values of  $B$  for instruments included in the table varies greatly. The same can be said about minimum bore diameters and diameters at mid-point length. However, there is no tendency towards lower or higher values over time or according to geographical criteria; there are observed arbitrary changes which cannot be attributed to specific reasons, but rather individually to makers' choices.

### 8.6.2 Alto instruments in 6-ft F and 6½-ft E-flat

Looking at alto instruments in 6-ft F and 6½-ft E-flat made in various countries in the second half of the nineteenth century (Table 8.15) we observe that no major changes occurred (the early *althorn* by Moritz and an alto saxhorn by Sax have been added for comparison). In fact, there are cases where later tenor horns are very similar to Sax's alto saxhorns, which in essence are saxotrombas. It is thus further confirmed through the measurements that the tenor horn is the offspring of the alto saxotromba.

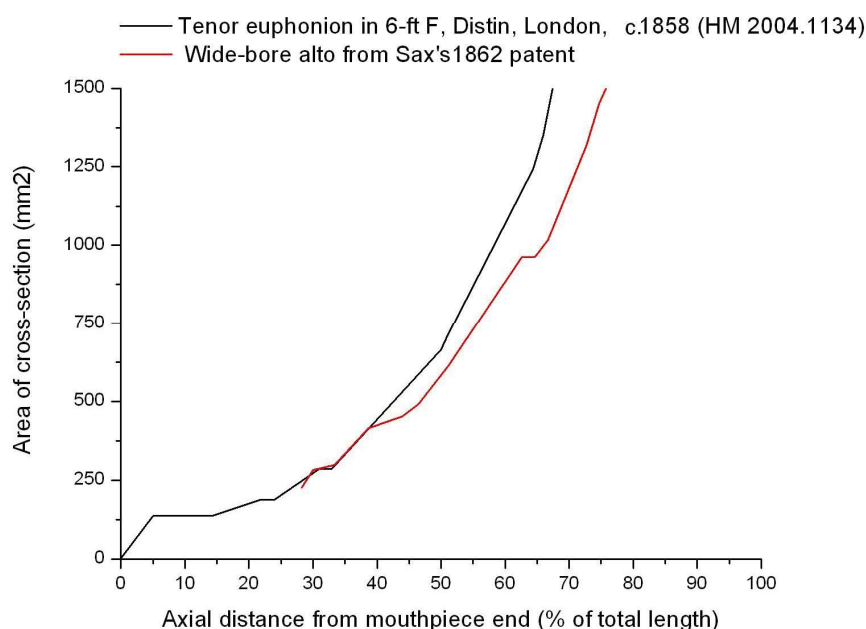
**Table 8.15 Instruments in 6-ft F and 6½-ft E-flat by makers in various countries between 1840-1962.**

Collection no.	Instrument type and pitch	Maker	Place	Date	D <sub>min</sub>	D <sub>mid</sub>	$B$
MSM 40-206	Althorn in E-flat	Moritz	Berlin	c.1840	11.3	14.0	0.66
EU 4448	Alto saxhorn in E-flat	Labbaye	Paris	1850	9.5	13.6	0.57
EU 4543	Alto saxhorn in E-flat	Ad. Sax	Paris	1855	10.9	15.2	0.57
HM 2004.1134	Tenor euphonion in F	Distin	London	1858	<b>13.2</b>	<b>29.1</b>	<b>0.42</b>
BK 458	Alto saxhorn in E-flat	Gautrot	Paris	m.19	10.3	14.7	0.60
JV G1	Alto saxhorn in F	Gautrot	Paris	1850-55	11.3	15.0	0.60
FT 282	Alto saxhorn in F (postulated slide)	Roëhn	Paris	1853-56	10.1	15.6	0.56
EU 6000	Alto saxhorn in F	Halary	Paris	a.1859	10.7	16.3	0.55
ST 867	Alto saxhorn in E-flat	Distin	London?	1860-68	10.3	13.7	0.58
EU 5967	Alto saxhorn in E-flat (postulated slide)	Couturier	Lyon	c.1860	11.0	<b>24.5</b>	<b>0.45</b>
V 0784	OTS saxhorn in E-flat	Seltmann	Philadelphia	c.1860	11.6	18.3	0.56



Collection no.	Instrument type and pitch	Maker	Place	Date	D <sub>min</sub>	D <sub>mid</sub>	B
EU 3945	Alto saxhorn in E-flat	Gautrot	Paris	c.1860	10.4	16.3	0.54
BM 93.065	Alto saxhorn in E-flat	Schneider	Paris	p.1865	10.4	15.4	0.56
HM 2004.1185	Alto saxhorn (E-flat slide)	Gautrot	Paris	c.1870	10.3	13.6	0.56
ST 869	Alto saxhorn in F	Auguste Courtois	Paris	1878-80	11.0	15.8	0.56
HM 2004.830	Tenor horn in E-flat	Hillyard	London	1880-86	10.1	14.4	0.56
EU 4656	Tenor horn in E-flat	Boosey & Hawkes	London	1962	9.6	17.8	0.48
EU 4277	Tenor horn in E-flat	Boosey & Co.	London	1896	10.2	15.3	0.57

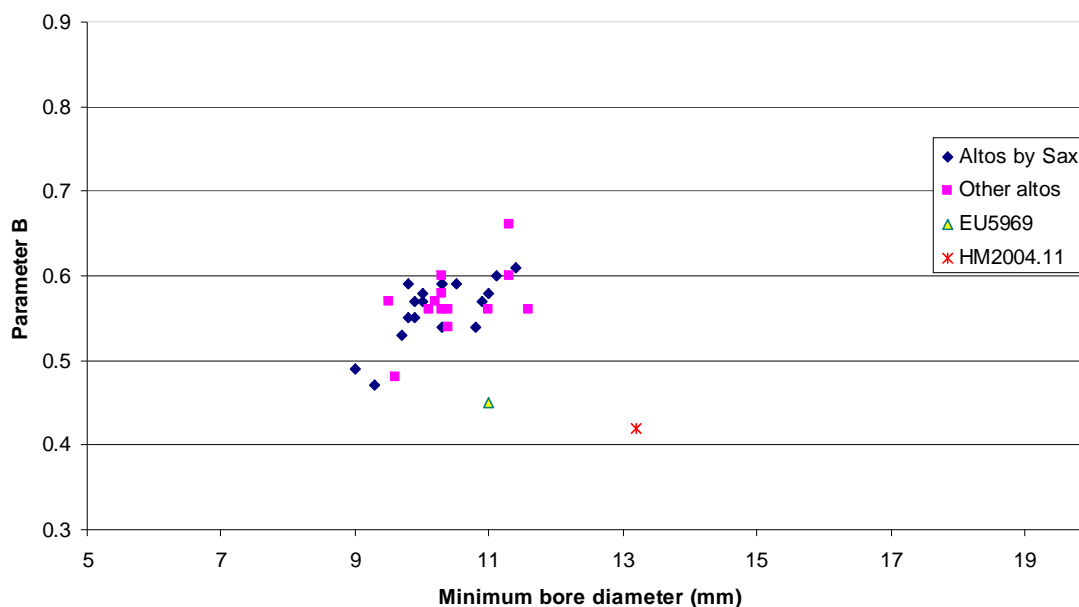
In this register Distin's tenor euphonion (HM 2004.1134), along with Couturier's saxhorn (EU 5967), and Sax's wider bore alto (of which no surviving specimen is known and its measurements were included in Sax's 1862 patent),<sup>16</sup> are among the few exceptional designs of very wide instruments, which, however, found no later followers (see Graph 8.16 for a comparison between the two). These are even wider than the alto saxhorn from Sax's 1845 patent. Two slightly wider instruments in the table are the Boosey & Hawkes tenor horn (EU 4656), and the over-the-shoulder saxhorn (V 0874). The latter is the only which is close to the dimensions of Sax's alto saxhorn from the 1845, than those of the alto saxotromba.



**Graph 8.16** Plots of the wide-bore tenor euphonion of the Horniman Museum collection and the alto instrument of new proportions proposed in Adolphe Sax's 1862 patent.

<sup>16</sup> See Chapter Four, pp. 153-56.

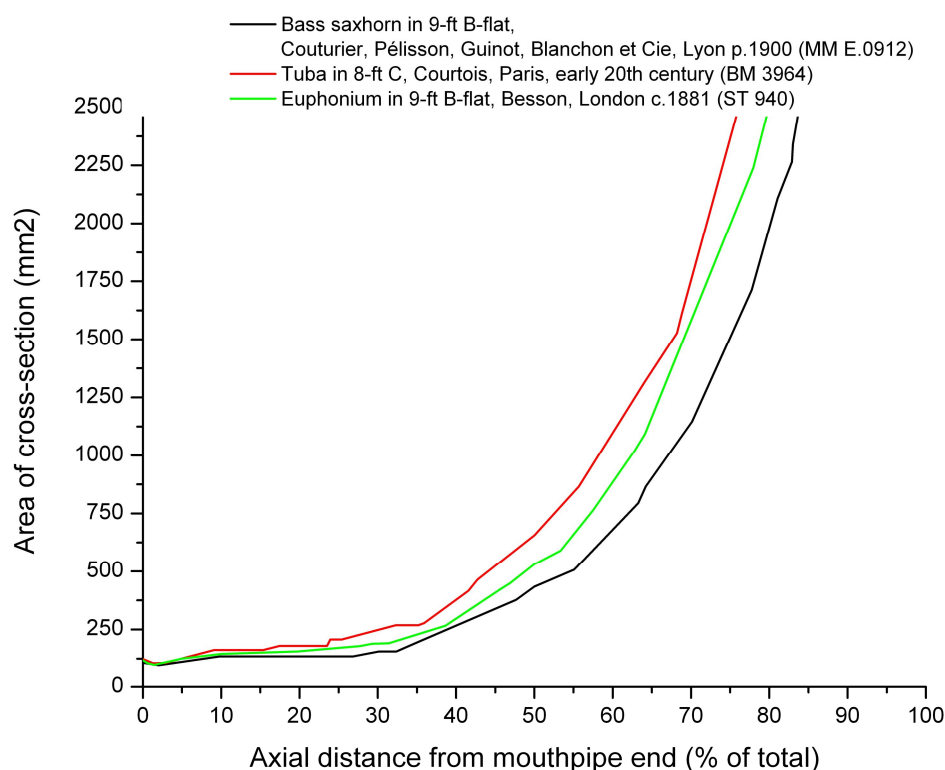
In Graph 8.17 below altos by Sax are compared with other altos by other makers contemporary to Sax and later, so as to show where Sax's altos stand in the greater picture. The outliers discussed above have been marked.



**Graph 8.17 Altos by Sax compared with instruments contemporary and later instruments made by other makers.**

### 8.6.3 Narrow and wide-bore instruments in 8-ft C and 9-ft B-flat

The general picture of instruments in this register later in the nineteenth century appears to be similar to the early situation. Narrow-bore baritones and wider-bore euphoniums have similar characteristics to earlier instruments, and grey areas where the two groups overlap and a distinction is sometimes difficult to make, continue to exist. The difference in the wider bore instruments is that some very wide models made their appearance. Such a very characteristic example is the *Kaiserbaryton* (EU 3412) by the Austrian maker Červený made in Königgrätz at end of the nineteenth century or the beginning of the twentieth. Other examples at 8-ft C are the small French tubas. Such an example is a tuba made by Courtois in the beginning of the twentieth century, today in Brussels (inventory no. 3964). Graph 8.18 shows the comparison of the wider Courtois tuba with a British euphonium and a French saxhorn all made in the end of the nineteenth century and the beginning of the twentieth.



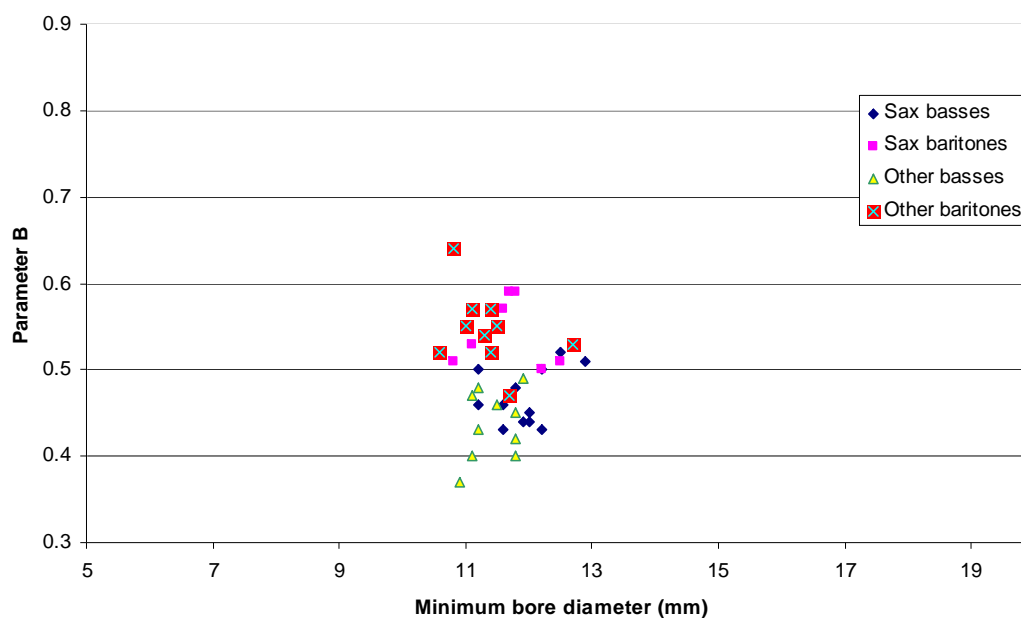
**Graph 8.18** Bore profiles of a small French tuba, a British euphonium and a French bass saxhorn.

**Table 8.16** Narrow-bore instruments in 8-ft C and 9-ft B-flat contemporary and later by makers other than Sax (a Sax baritone saxhorn has been included for comparison).

Collection no.	Instrument type and pitch	Maker	Place	Date	D <sub>min</sub>	D <sub>mid</sub>	B
LG 1753	<i>Tenorhorn</i> in C	Schneider	Augsburg	1846-50	10.8	14.0	0.64
V 0785	OTS saxhorn in B-flat	Stratton & Foote	New York	c.1860	11.1	16.2	0.57
BK 11	Baritone saxhorn in B-flat	Jamin fils	Paris	1855-65	11.4	16.4	0.57
V 5510	OTS saxhorn in B-flat	Slater	New York	1865-71	12.7	22.5	0.53
OB 662	Baritone saxhorn in B-flat	Ad. Sax	Paris	1867	11.8	16.8	0.59
BK 322	Baritone saxhorn in B-flat	Lecomte	Paris	p.1867	10.6	19.0	0.52
MM E.0813	Baritone saxhorn in B-flat	Ad.-Ed. Sax	Paris	1895-1907	11.0	18.2	0.55
MM E.1574	Baritone Arban in C	Bouvet	Paris	a.1899	11.5	17.9	0.55
EU 554	<i>Tenorhorn</i> or <i>Tenorflügelhorn</i> in C	Riedl	Nuremberg	c.1900	11.4	19.6	0.52
Selmer	Baritone saxhorn in B-flat	Ad.-Ed. Sax	Paris	1907-28	11.7	19.4	0.47
EU 3887	Baritone in B-flat	Boosey & Hawkes	London	1962	11.3	17.2	0.54

**Table 8.17** Wide-bore instruments in 8-ft C and 9-ft B-flat contemporary and later by makers other than Sax (a Sax bass saxhorn has been included for comparison).

Collection no.	Instrument type and pitch	Maker	Place	Date	D <sub>min</sub>	D <sub>mid</sub>	B
EU 3352	Bass saxhorn in C	Auguste Courtois	Paris	1847-60	11.5	21.3	0.46
BM 1277	Bass in B-flat	Aug. Hein Rott	Prague	2.19	11.9	21.3	0.49
BK 884	Bass saxhorn	Halary	Paris	1855-65	11.8	23.5	0.45
EU 4470	Bass saxhorn in B-flat	Ad. Sax	Paris	1863	11.6	23.0	0.43
EU 5989	Euphonium in C	Hillyard	London	1865-70	11.1	26.5	0.40
EU 5760	Euphonium in B-flat	Boosey & Co.	London	1894	11.8	26.2	0.42
ST 940	Euphonium in B-flat	Besson	London	p.1887	11.2	26.0	0.43
EU 3412	<i>Kaiserbaryton</i> in B-flat	Červený	Königgrätz	c.1900	10.9	34.0	0.37
MM E.0907	Bass saxhorn in B-flat	Ad.-Ed. Sax	Paris	1895-1907	11.2	20.6	0.48
EU 2950	Euphonium in B-flat	Besson & Co.	London	c.1899	11.8	28.5	0.40
MM E.0912	Bass saxhorn in B-flat	Pelisson, Guinot & Blanchoi	Lyon	p.1900	11.1	23.5	0.47
BM 3964	Tuba in B-flat	Antoine Courtois	Paris	p.1900	11.6	28.9	0.42

**Graph 8.19** Narrow and wide-bore instruments in 8-ft C and 9-ft B-flat made by Sax and other makers.

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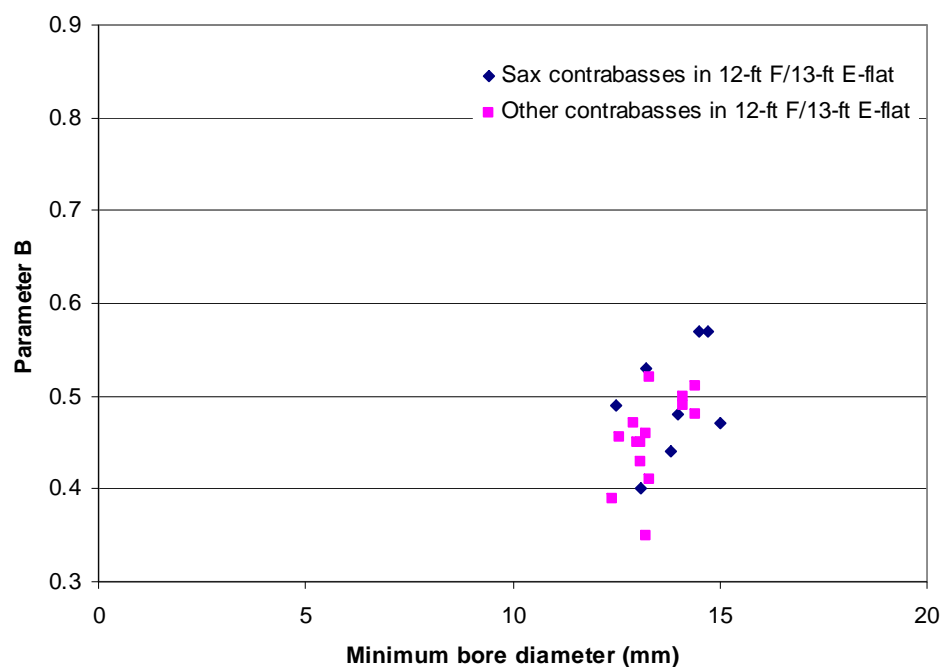
Graph 8.19 shows where Sax's 8/9-ft instruments stand compared with instruments by other makers. In instruments by other makers we observe that the group borders are wider compared with those of Sax, showing a tendency for instruments with lower values of  $B$ , a fact resulting from the presence of instruments with wider bore later in the nineteenth century. Although there are two distinct groups overall, separated by the narrow and wide bore, the baritone, and the basses, there is some overlapping present, and cases where it can be difficult to confidently characterize an instrument as a bass or baritone.

### 8.6.4 Contrabass instruments

A similar observation regarding both instruments in 12-ft F/13-ft E-flat and those in 16-ft C/18-ft B-flat is a tendency towards larger bores, and in general we notice lower values of parameter  $B$ . Narrow bore instruments are still present, and they were probably in use in non-professional environments, such as school or amateur bands. Graph 8.20 shows comparison of late instruments with some early contrabass saxhorns by Sax so as to demonstrate the level of variation between earlier and later models. This register probably shows the most profound changes with time.

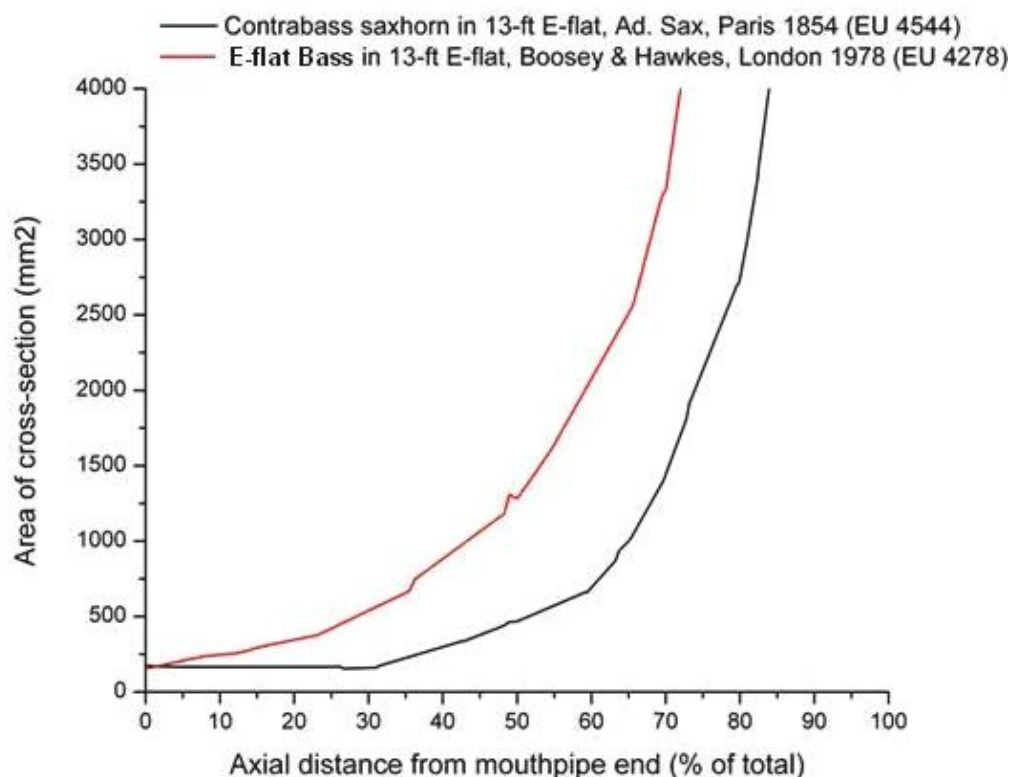
**Table 8.18 Contrabasses in 12-ft and 13-ft E-flat made between c.1840 and 1978.**

Collection no.	Instrument type and pitch	Maker	Place	Date	D <sub>min</sub>	D <sub>mid</sub>	B
BM 1281	Basstuba in F	Moritz	Berlin	c.1840	14.1	27.3	0.49
BE 4456	Basstuba in F	Moritz	Berlin	c.1840	14.1	27.5	0.50
SM 478	Basstuba in F	Moritz	Berlin	1843	14.4	28.0	0.51
BNS 49	Bombardon in E-flat	Wolf & Figg	London	1850-55	13.3	21.6	0.52
EU 4091	Bass Tuba in F	Zetsche	Berlin	m.19	13.2	28.1	0.46
EU 3421	OTS saxhorn in E-flat	Klemm	Philadelphia	c.1860	12.6	26.8	0.46
HM 2004.1206	Bombardon in E-flat	H. Distin	London	c.1860	12.9	28.0	0.47
BM 2023	Sonorophone in E-flat	Metzler	London	c.1860	13.1	29.8	0.45
CC F9	Bass Tuba in F	Selboe	Copenhagen	1837-73	14.4	25.7	0.48
LKH 431	Bombardon in F	Boosey & Co.	London	1895	12.4	31.3	0.39
EU 5970	Bombardon in E-flat	Boosey & Co.	London	1895	13.1	30.5	0.43
MM E.1576	Contrabass Arban in F	Bouvet	Paris	a.1899	13.3	43.8	0.41
EU 4048	Barlow tuba in F	Besson	London	c.1931	13.2	43.9	0.35
EU 4278	Bombardon in E-flat	Boosey & Hawkes	London	1978	13.0	40.4	0.45

**Graph 8.20 Sax contrabasses in 12-ft F/13-ft E-flat and contrabasses by other makers contemporary and later of Sax.**

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In Graph 8.21 where the bore profiles of an early contrabass in 13-ft E-flat by Sax and a late E-flat bombardon by Boosey & Hawkes are compared, the differences are immediately noticeable. The markedly more conical profile of the twentieth-century bass is also reflected in the difference in values of  $B$  which are 0.45 for the Boosey instrument and 0.57 for the early Sax instrument.



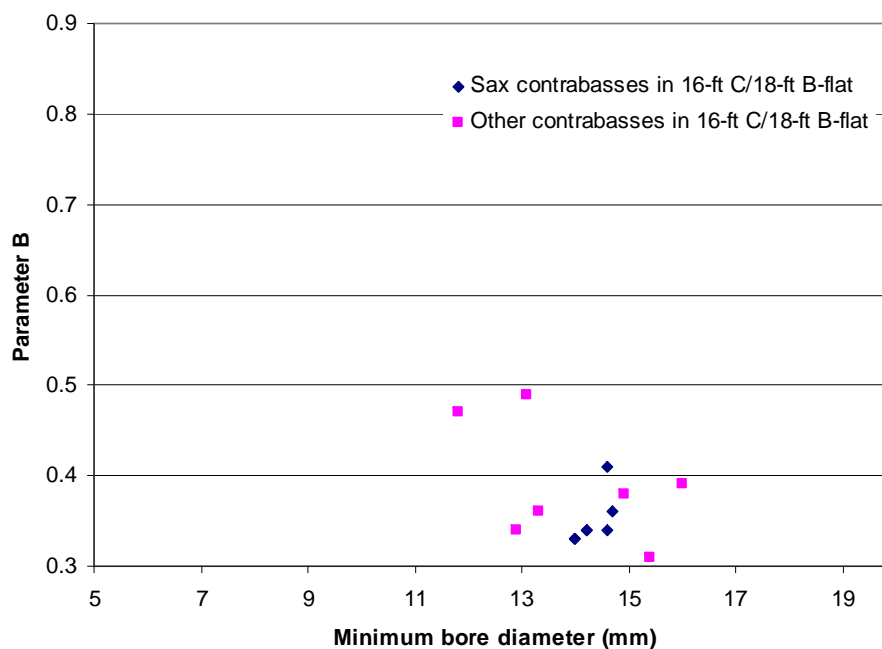
**Graph 8.21 Comparison of bore profiles of an early contrabass saxhorn by Adolphe Sax and a twentieth century E-flat Bass by Boosey & Hawkes.**

## Taxonomy of intermediate bore-profile instruments

In the 16-ft C/18-ft B-flat register the variation in bore width between earlier and later models is even more prominent. Diameters at mid-point length, as can be seen in Table 8.19, reach up to 69.5mm in the Sudre contrabass saxhorn (BM 16.159).

**Table 8.19 Contrabasses in 16-ft C/18-ft B-flat.**

Collection no.	Instrument type and pitch	Maker	Place	Date	D <sub>min</sub>	D <sub>mid</sub>	B
MM E.746	Contrabass saxhorn in B-flat	Ad. Sax	Paris	1854	14.6	48.8	0.34
JC 219	Contrabass saxhorn in B-flat	Couturier	Lyon	1855-65	14.9	44.7	0.38
JC 264	Contrabass saxhorn in B-flat	Besançon	Lyon	1861-65	13.0	41.0	0.37
LG 3603	Basstuba in B-flat	unsigned	Germany	c.1870	13.1	26.5	0.49
MM E.1577	Contrabass Arban in C	Bouvet	Paris	p.1899	12.9	50.5	0.34
MM E.0707	Contrabass saxhorn in B-flat	Ad.-Ed. Sax	Paris	e.19	15.4	60.6	0.31
BM 16.159	Contrabass saxhorn in B-flat	Sudre	Paris	c.1910	16.0	69.5	0.39
EU 2339	Tornister tuba in B-flat	Tomschik	Vienna	c.1910	11.8	23.8	0.47

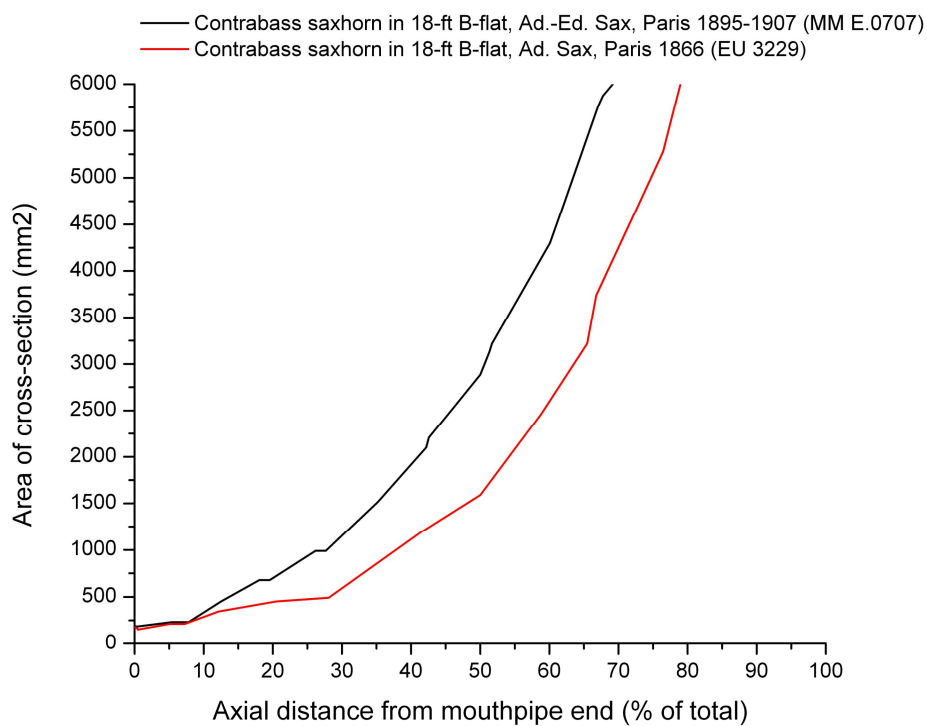


**Graph 8.22 Contrabasses by Adolphe Sax and other makers in 16-ft C/ 18-ft B-flat.**



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Graph 8.23 shows the comparison of a mid-nineteenth century saxhorn by Adolphe Sax and a later instrument by his son (Adolphe-Edouard Sax) at the same pitch, where the differences are striking.

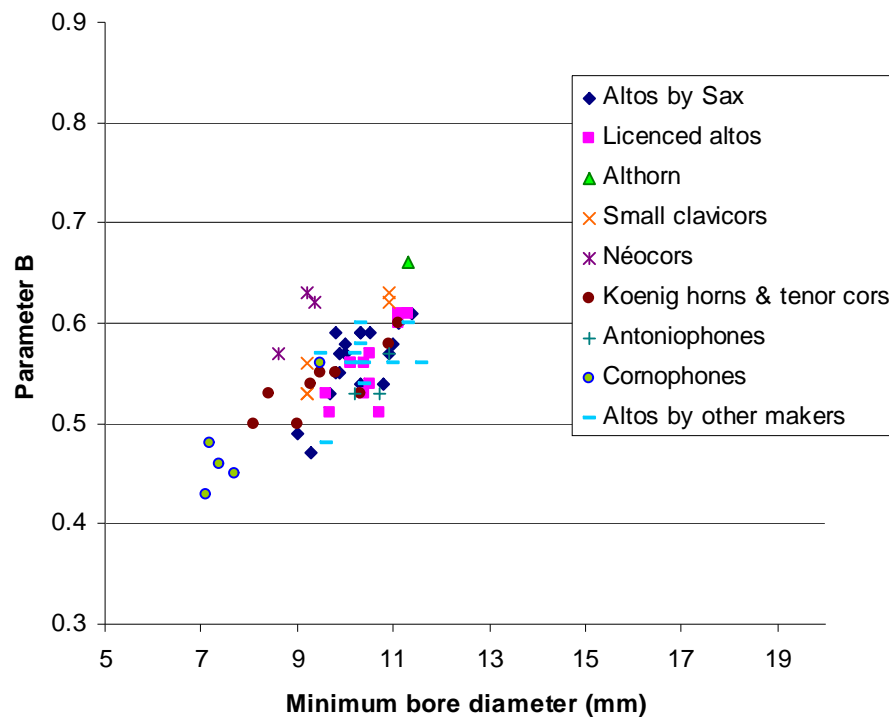


**Graph 8.23 Bore profiles of two contrabasses in 18-ft B-flat by Adolphe Sax and his son Adolphe-Edouard Sax.**

## 8.7 The greater picture

### 8.7.1 An overall comparison of 6-ft F/6½-ft E-flat intermediate bore-profile brasses.

It would be interesting to see the greater picture of all alto instruments in diverse forms discussed so far. Graph 8.24 presents all instruments mentioned in this chapter in 6-ft F and 6½-ft E-flat plotted according to minimum bore diameter and parameter *B* values.



Graph 8.24 Instruments in 6-ft F and 6½-ft E-flat.

It appears that of all alto instruments the early cornophones and the néocors stand out and form separate groups. The later cornophone with the wider mouthpiece receiver does not appear to differ in terms of brassiness values and minimum bore diameter from alto saxhorns. The rest of the instruments form a large relatively wide-ranging group, where no subgroups can be distinguished. Two instruments of the tenor cor/Koenig horn group (a later mellophone by White EU 4229, and a tenor cor by Boosey & Co., EU 5733) stand out due to their much narrower mouthpiece receiver, but they are the exception to rest of their group, which blends very well with the saxhorns. The *Althorn* by Moritz (MSM 40-206) presents the highest value

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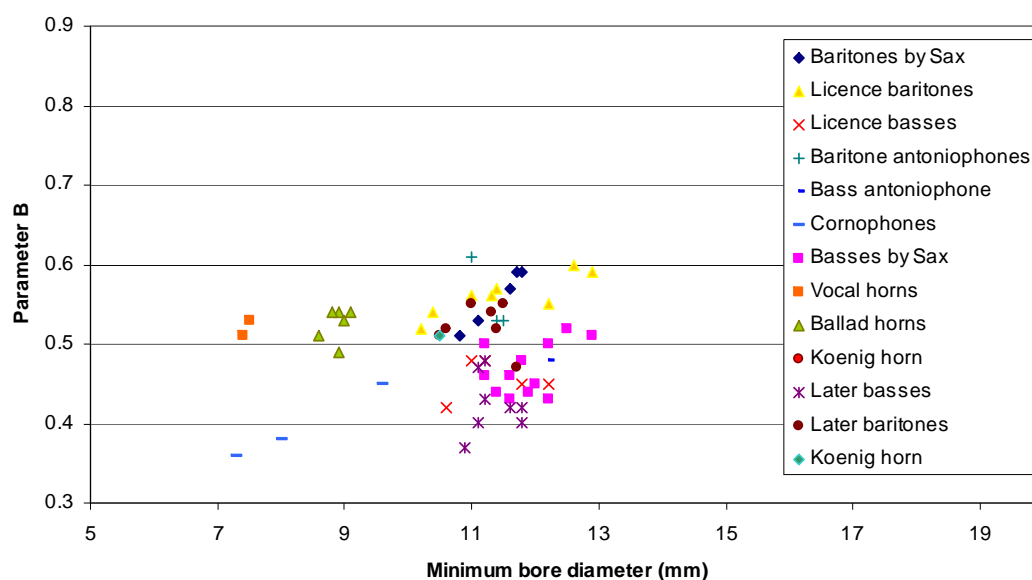
of  $B$  of all instruments included in the graphic representation, due to its highest proportion of cylindrical tubing. Although this instrument differs from saxhorns, more similar instruments would need to be measured so as to draw firm conclusions. Table 8.19 shows ranges of values of minimum bore diameter and parameter  $B$  for the three distinct groups of Graph 8.24.

**Table 8.19 Ranges of value of the three distinct groups in the alto register.**

Group	$D_{\min}$	$B$
Néocors	8.6-9.4	0.57-0.63
Saxhorns	9.0-11.4	0.47-0.63
Cornophones	7.1-7.7	0.43-0.48

### 8.7.2 An overall comparison of 8-ft C/9-ft B-flat intermediate bore-profile instruments

In Graph 8.25 instruments in 8-ft C/9-ft B-flat discussed earlier in this chapter are plotted against saxhorns so as to examine how distinct from saxhorns they really are.



**Graph 8.25 Instruments in 8-ft C and 9-ft B-flat.**

Looking at Graph 8.25 a picture similar to the alto instruments graph appears. The early cornophones again stand out and form their own separate group, with their later representative (EU 4509) being located closer to the baritone and bass saxhorn group than the bass cornophones. The ballad horns also form a separate group mainly due to their lower minimum diameter values. The vocal horns by Rudall, Rose, Carte & Co. (KH, EU 3486) are not part of the ballad horn group, but they form a separate group mainly due to their narrow mouthpiece receiver.

The Koenig horn by Courtois (EU 1710) as expected, is grouped with the baritone saxhorns and appears to differ only in wrap, and not in its bore profile, and consequently in its acoustic properties. Within the large group of the saxhorns there is a distinction between the baritones and the basses, and also the presence of an overlapping grey area including the latest surviving baritone saxhorn by Sax (BK 721) and the two baritone orpheons by Boosey & Co (EU 4505, BK 722).

## 8.8 Conclusions

A general observation is that the saxhorns made by Adolphe Sax do not present any characteristics that would show an evolution. The saxhorns from the taxonomic point of view are essentially two families, from the sopranino down to the baritone, and from the bass to the contrabass in 18-ft B-flat. Saxhorns made by Adolphe Sax during his workshop's productive years do not show any developments as a whole. The only group that could be said to show some evolutionary characteristics is that of the contrabasses in 13-ft E-flat, where there is a tendency towards larger bores and lower values of  $B$  over time from c.1855 which indicates the adoption of a more conical design. On the other hand, contrabasses in 16-ft C/18-ft B-flat made by Sax do not show analogous developments. The rest of the groups by-and-large retained stable characteristics throughout. A characteristic of instruments in the 8-ft C/9-ft B-flat register is although the distinction between the narrow-bore baritones and the wider-bore basses is prominent, certain choices of the maker regarding instrument nomenclature result in some cases in the names contradicting the true identity of the instruments.

Comparing surviving instruments from the Sax workshop with those made by licensed makers we observe that in some groups, such as the altos, no distinction can

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be made, whereas in other cases, such as the contrabasses in B-flat there are two different groups present with different bore profile characteristics. There is no strong evidence that Sax controlled in any way the design of instruments made by his licensees.

When baritone and bass saxhorns are compared with the earlier clavicors we observe that the clavicors form their own group with distinct bore-profile characteristics. We have shown that although clavicors might have served as an inspiration for Sax as they were introduced earlier than saxhorns, measurements show that saxhorns were not direct copies of the clavicors. In the alto instruments the only distinct group is that of the néocors, which have values closer to those of the cornets. The clavicor in 6-ft F/ 6½-ft E-flat was not included in Guichard's 1838 patent, and due to the limited evidence regarding the exact time of its introduction it is not easy to determine whether Sax copied the smaller clavicors when he introduced his alto saxhorns/saxotrombas, or vice versa.

In a similar way, Sax's altos and contrabasses do not appear to be directly copied from early German brasses. The *Althorn* by Moritz is more cylindrical, while the *Basstuba* by the same maker shows lower values of  $B$  showing a tendency for more conical designs. Here, the examination of a larger group of similar instruments would help in drawing firmer conclusions.

Of the many diverse designs of the second half of the nineteenth century, only the early narrower cornophones, the vocal horns with narrow mouthpiece receiver and ballad horns form really distinct groups. Other instruments such as the tenor cors or the antoniophones, appear to be saxhorns, albeit in different wraps.

A general observation regarding later saxhorns and their offsprings is that by-and-large major changes are only observed from the bass register to the contrabass. The changing taste during the second half of the nineteenth century is reflected in the development towards larger-bore and more conical instruments. These groups seem so far to be the ones with the greatest diversity in design.

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### Conclusions

This thesis has examined the brasswind production of Adolphe Sax through the maker's patents, primary sources and surviving instruments. The focal point has been Adolphe Sax's saxhorns. The existence of the saxotromba has also been the subject of careful examination. Factors which are thought to have had a major influence in nineteenth-century brass instrument making have been discussed. Saxhorns made by other makers and later similar instruments have also been examined and compared with saxhorns. The dissemination of saxhorns within France and in other countries has also been discussed, and in more detail the spread of saxhorns in the United Kingdom and the United States of America where saxhorns were used extensively. Instruments in diverse wraps, some of which were similar to saxhorns in bore profile, have also been looked at and an outline of their origin has been given. Finally, measuring data of saxhorns and relevant instruments have been examined from the taxonomic point of view.

One of the main factors which had a great influence on brass instrument making throughout the nineteenth century was intellectual property law which resulted in common features of brass instrument making between France and Britain. Musical instrument makers were aware of the law's weaknesses, which they took advantage of. The validity of patents only within the borders of the country where the patents had been issued, and the fact that imported inventions were allowed in Britain, resulted in many French patented inventions being brought to Britain, and patented by British makers. Many of Sax's patent specifications became the subject of British patents and registered designs. The lower patent fees in France compared with Britain and Germany was the main reason of an increased number of patents granted to instrument makers in France, while Belgium was even further in the lead regarding issued patents for similar reasons. The gradual lowering of import taxes in Britain during the second half of the nineteenth century led to an increased number of brass instruments being imported, especially from France.

Among the eight patents issued by Adolphe Sax and four certificates of addition to his main patents regarding brass instruments, few of his developments appear to have started with no prior background. Most of his patents show an adaptation and development of pre-existing inventions, although most of the time in an ingenious way. Some of his developments present a well-structured and scientific approach which is distinctive. Some of his patent specifications were extravagant, but this was a frequent occurrence in nineteenth-century patents. The independent system valve appears to have dealt effectively with acoustical problems caused by regular valves. However, the departing from the fingering which was already standard at the time of its invention, the extra study required, the bulk of extra tubing, the additional weight added to *nouveau* instruments, often destined to be played while marching or riding (since these instruments were mainly intended for band use), and the extra cost inhibited its long-lasting adoption. Its longer use on the trombone is justified by its conception being closer to trombonists' way of thinking. The same reasons accounted for the non-adoption of instruments with multiple bells.

Sax led the way among his contemporary makers into realizing the importance of the instruments' internal dimensions. He emphasized the importance of proportions, although never revealing how exactly these were applied on his instruments. His 1845 saxotromba patent is the earliest and to the author's knowledge for some time the only patent to specify bore diameters. Sax believed, and recent acoustical research confirms that the bore-profile of an instrument's proximal part of tubing, and not the distal part, plays the more important role, as far as its acoustical properties are concerned. His modified version of the Berlin valve tried to deal with sharp angles, a frequent subject in nineteenth-century patents. His main modification to this type of valve regarded the positioning of the external valve tubing and consequently that of the internal valve ports. Valve loops, and valve ports in Sax's valves appear to deviate from the right angle found in instruments of German origin. Valve loops are inclined in most Sax instruments so as to avoid creating right angles.

Not a single patent among those issued by Sax dealt exclusively with saxhorns. A saxhorn patent, as such, does not appear to exist. The 1843 patent dealt mainly with developments of the Berlin valve and with a compensator for correcting

intonation and performing glissandi. The 1845 patent title regarded the saxotromba, as an instrument and as a form which could be applied to already existing instruments. Among those were the saxhorns, which were treated in that patent as pre-existing, as were cornets, trombones, horns and trumpets. The instrument wrap as described in this patent involved an upright bell, and the valves to be placed parallel to the plane which the bell rim formed, so that an instrument could be played conveniently while riding. However, this form seems to have become standard, and not only for cavalry band instruments, and has had a long-lasting influence until the present day. Although this patent, strictly speaking, cannot be considered as an actual saxhorn patent, it had an important role. Sax presented a homogenous family with instruments in alternate pitches, two instruments per octave, same fingering and similar acoustical properties. Although instruments similar to saxhorns existed prior to his patents, in Germany in particular, Sax brought order, which had not existed previously. Through his saxhorn method, he promoted the same treble clef notation for all instruments of the saxhorn/saxotromba group. In his view, this would make possible that a musician with relatively little practice could play all the instruments of the group. Sax had realized the importance of creating instrument families, an approach which is thought to have had both pedagogical and marketing incentives. Saxhorns made in the Sax workshop do not present major changes through time. Their wrap remained almost constant. Berlin valves were used in the maker's saxhorns for a very long time. Although some of Sax's surviving saxhorns have Périnet valves, the majority have Berlin valves. However, Sax appears to have realized the efficiency of the Périnet valve, against which he talked frequently during the various court hearings. He found indirect ways of adopting aspects of the Périnet valves in his saxhorns, without altering radically the external appearance of his instruments. Not only did the wrap of saxhorns remain almost unchanged, the bore profile of instruments of the family also does not show any evolutionary changes throughout their period of production in the Sax workshop. The only exception is the group of contrabass saxhorns in 13-ft E-flat which, after the mid-1850s, appears to have evolved towards larger bores and more conical bore profiles demonstrated by lower values of the brassiness potential parameter. The first known specimen reflecting this evolution was the contrabass saxtuba. Saxhorn production numbers



must have dropped dramatically in the 1870s and 1880s, judging from the very low number of surviving instruments coming from that period and Sax's production must have focused on saxophones and regular brass instruments.

Sax's initial plan of creating two complete families, saxhorns and saxotrombas was either not fulfilled or was merely a commercial trick, which has now been revealed. We can now tell with certainty that the alto and baritone saxotrombas are those known today as the alto and baritone saxhorns, respectively. The alto saxhorn as presented in the 1845 patent drawings and its dimensions as given in the same documents was probably not produced commercially, and if it was (for which no evidence exists), it was not in large numbers or for a long period. With a couple of exceptions, surviving nineteenth-century instruments in 6-ft F or 6 ½-ft E-flat appear to have similar dimensions to his alto saxotromba, according to the latter's bore widths as they were delineated in the patent. The same regards surviving narrow-bore instruments in 8-ft C or 9-ft B-flat, known today as baritone saxhorns. The baritone saxhorn was not included in any of Sax's early brasswind patents; instead, a baritone saxotromba was included, with dimensions close to those of surviving instruments in this pitch, which are known today as baritone saxhorns. It is thus argued that the alto and baritone saxotromba are in fact the alto and baritone instruments of the saxhorn family. The complete family of saxotrombas was never realized. And in reality, the saxhorn family was lacking two members, whose place was filled by the alto and baritone saxotrombas. The confusion created by Sax is noticeable in most primary sources. Composers, theorists, and even musicians themselves seem not to have had a clear view of the subject.

The adoption of saxhorns was immediate and long-lasting. A major factor in this was their use by French military bands through official ministerial decrees (the earliest issued in 1845). This was described by Sax's competitors as a monopoly. They challenged the originality of his inventions, and temporarily annulled the 1845 and parts of the 1843 patent. However, Sax managed to put his 1845 patent in force again, and extend its validity for an extra five-year period until October 1865. During this time he took his competitors in court, accusing them of counterfeit. Numerous saxhorn copies were circulating within France and abroad, around the middle of the nineteenth century, as surviving instruments and primary sources show. Sax

eventually managed to oblige his competitors to sign license agreements which concerned the manufacture of saxhorns and regular instruments in saxotromba form, but not the saxophone. Hundreds of saxhorns were made by French makers for over ten years during which period Sax received royalties. Even though license instruments were made mostly with Périnet valves (not the standard for Sax's own brass instruments) and with variations in wrap, sometimes small, but some other times more pronounced, these were stamped as Adolphe Sax authorized (autorisé). Ironically, wraps met in license instruments rather than in saxhorns by Sax became the standard ones.

The visit of the Distin family brass quintet, who were well-known in Britain, proved a happy circumstance for Sax. The Distins returned to Britain with a new saxhorn set, and their success resulted in saxhorns becoming immediately known in Britain. The Distins became Sax's official agents in Britain and saxhorns became eventually the standard instruments in British brass bands. The term "saxhorn" and even that of "saxtuba" became in many cases part of bands' names. Despite Sax's efforts, saxhorn copies imported from French makers and saxhorn copies made locally, dominated the British market, although in time these instruments started being known by different names. Saxhorns became well-known even in the United States. Although Sax-style instruments were imported in the States from France already in the 1840s, the term "saxhorn" eventually became associated in the country with a different type of instrument. Over-the-shoulder saxhorns, which shared little with the actual saxhorn form, became the standard name for instruments used by bands especially during the American civil war (1861-65). The Distins' visit to the States in 1849 and Allen Dodworth's connections with the Distins must have played an important role in the institutionalization of the term "saxhorn" in the United States.

Around the middle of the nineteenth century, numerous instruments emerged, some times with peculiar names and wraps. Most of them were instruments of the medium register. These were expressing the makers' efforts to produce easy replacements for the french horn. These must also have resulted from makers' efforts to find ways to compete with saxhorns, without being at risk of legal trouble with Sax, at least while Sax's patents were still under protection. Most but not all of these

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instruments were in circular wraps. As measurements of surviving instruments show, and comparisons with saxhorns reveal, very few were essentially different from saxhorns. Ballad horns, some of the vocal horns and the earlier cornophones appear to have a distinct identity resulting mainly from their narrow leadpipe dimensions. A large number of instruments, including tenor cors, antoniophones, the latest orpheons, and many others, do not appear to be separate from saxhorns from the taxonomic point of view.

Measurement data used for taxonomic analysis show that Sax's rivals' views are not fully confirmed. Saxhorns do not appear to be copies of néocors, or of clavicors in 8-ft C or 9-ft B-flat, which in terms of bore profile appear to have more in common with cornets, as far as bore-profile properties are concerned. Clavicors in 6-ft F or 6½-ft E-flat, which were not included in Guichard's 1838 clavicor patent, share similar bore profile properties with saxhorns, but since the date of their introduction is still uncertain it is difficult to determine which of the two was the archetype. When creating his contrabass tubas Sax had in his collection two similar instruments of German origin. Measurement data comparisons appear to be inconclusive. The *Basstuba* of Moritz presents differences from contrabass saxhorns as early *tenorhorns* do when compared with alto saxhorns. It is thus confirmed that, even if his patents were based on pre-existing inventions, Sax managed to develop them further.

Of more than 45,000 brass and woodwind instruments made in the Sax workshop, there is information regarding only 580 of them. It is hoped that as more instruments become part of private or public collections or as they appear in auction houses, their detailed documentation could lead to a better understanding of some areas of Sax's brasswind production which still remain unclear. The dating of instruments, at least during the first decade of Sax's Paris production could be done in a more precise way. The exact procedures—if any—of the control of licensed saxhorns still remain unclear. Inscriptions on licensed instruments continue to be partly a puzzle. The appearance of more saxhorns, especially those made during the first years of their production and German instruments made during the same time could help in drawing firmer results regarding the degree of similarity between the two.

Saxhorns might have never become standard orchestral instruments, but their extensive use in mixed wind and brass bands is a fact. This was a result of many different circumstances, but not least due to Sax's strong vision for the development and perfecting of brass instruments.



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