

PEEPS INTO THE FAMOUS



**HIGHAM**  
**Band Instrument**  
**FACTORY.**



With some notes on the manufacture of the  
"Patent Clear Bore" Instruments.

**JOSEPH HIGHAM, Ltd.**

127 STRANGWAYS, MANCHESTER, England.

A DAY IN THE FAMOUS . . .

# HIGHAM

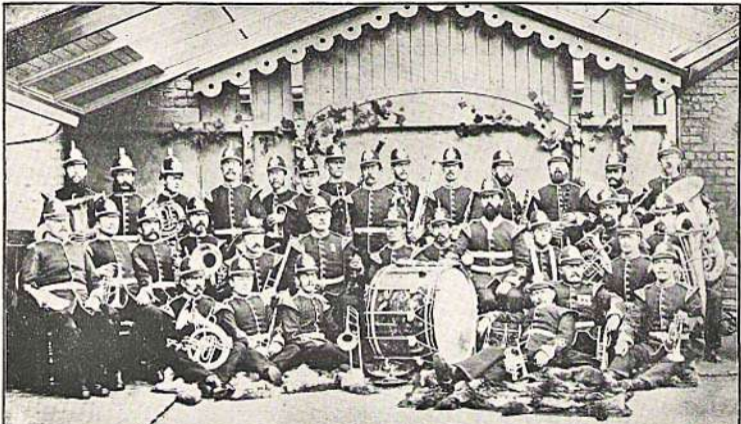
Band Instrument Factory,

WITH SOME NOTES ON THE MANUFACTURE OF THE

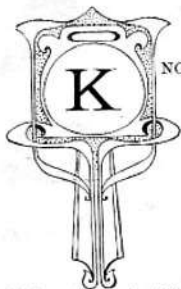
"Patent Clear Bore"

Instruments, . . .

HOW THEY ARE MADE and WHAT BECOMES OF THEM.



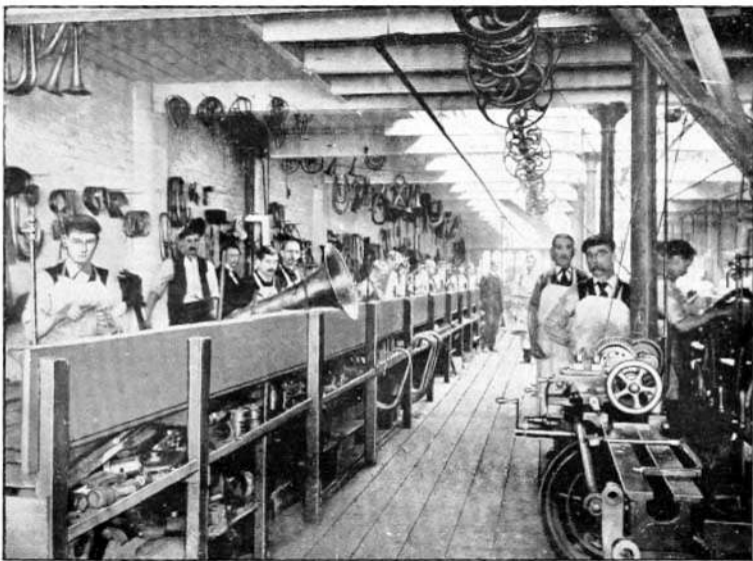
HIGHAMS' (THE FAMOUS 1<sup>ST</sup> MANCHESTER VOL<sup>S</sup>) BAND IN 1881.



*Reprinted from the London "Military Mail,"  
Aug. 19th, 1904.*

KNOWING the universal reputation enjoyed by the Higham firm as makers of high-class band instruments, we had always felt a great desire to go through their old established works and acquaint ourselves with the various processes through which an instrument must go on its journey from a flat sheet of metal to that beautiful creation of the maker's art—the finished Patent Clear Bore Instrument. We knew that at the Higham Factory we could see the whole process from beginning to end, and believing that an account of the manufacture of band instruments could not fail to be interesting to the majority of our readers, we accordingly put ourselves in communication with Messrs. Joseph Higham, Limited, of Manchester, and made known our wishes to them. We received a courteous reply, intimating that we were at liberty to go through their works at any time to suit our own convenience. Accordingly we journeyed up to Cottonopolis, and made our way to 127 Strangeways.

We were fortunate enough to find Mr. Camden, the manager, "at home," and having introduced ourselves, we learned in the course of a short conversa-



GENERAL VIEW ON THE MAKERS' SIDE—Higham Factory.

tion that the house was founded in 1842 by Mr. Joseph Higham, who besides being a clever and successful inventor and manufacturer of the special instruments that have made his name famous throughout the world, was an enthusiast, and an acknowledged authority on all matters relating to bands and band instruments. Mr. Higham was one of the pioneers of brass band contests, and had much to do in bringing them about. His inventions and improvements resulted in the Higham instruments taking first rank—a lead which they have maintained and still enjoy to-day. The fame of the Higham instruments spread with such rapidity that orders came pouring in from all parts of the world. To cope with the demand a much larger factory had to be erected, and the already large staff of workmen had to be augmented. These were divided, and the factory kept working night and day. About this time, 1880, it was again found necessary to resort to the builder, and the present commodious and well-equipped workshops at the rear of the offices, 127 Strangeways, Manchester, were erected. The splendid record of the house from its foundation to the present day, its deserved successes and triumphs in competition at the World's Great International Exhibitions, is too well known to bandsmen all over the globe to need more than a passing reference here; besides our space is limited, and we have not yet commenced our tour of the factory. Our guide is ready, however, and we make a start.

First we descend to the store room in the basement. Here we find in racks thousands of sheets of beautiful gold-coloured metal in all thicknesses, from the thin sheet brass used for making the valve tops, to the heavy thick



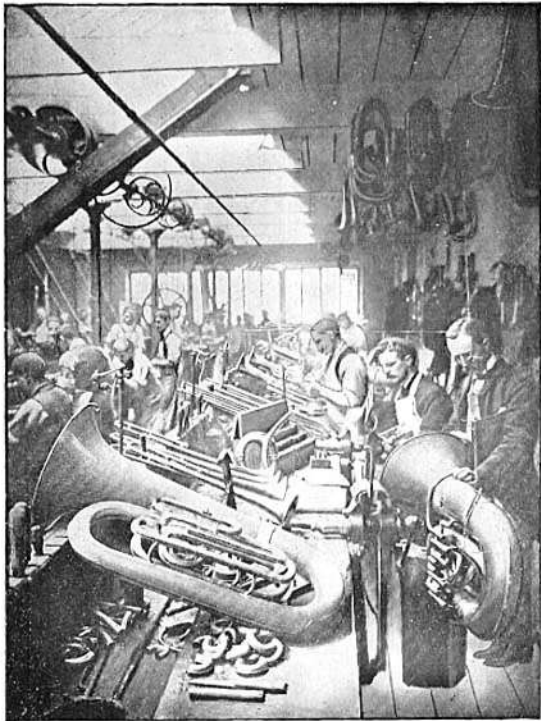
BELL MAKING AND SPINNING—Higham Factory.

metal of which the plates and guards of the large instruments are made. This sheet metal is a special preparation, and differs widely from the ordinary brass of commerce in quality, composition, and price. It is a special production expressly made for brass musical instruments, and from it are made all the brazed parts of the Higham band instruments, viz., the bells of cornets, trumpets, trombones and flugels, and the bells and large branches of tenors, baritones, euphoniums, and basses.

The next is a pile of copper sheets used in the manufacture of bugles and post horns. Then we come to sheaths of solid-drawn seamless tubing, all drawn to the required diameter and requisite degree of hardness for mouth-pipes, slides and bows. Further on in drawers and glass cases are contained valves and fittings and small parts of every description, all these made on the floor above and put into "stores," to be drawn upon by the instrument makers as required.

Having examined in general the "raw material" department, we make our exit by another door past the boiler house and ascend to the main floor of the factory. "What a splendid workshop!" is our first exclamation. Commodious, lofty, lighted direct from the top, well ventilated, and deliciously cool even in this hot weather, and to judge by the healthy, cheery, and smart appearance of the workmen we should imagine it to be one of the healthiest and most desirable of workshops. Down the whole length of the centre of the shop are a number of lathes, all driven from overhead by the usual shafting and gearing, and on each side of the shop are arranged the vices (over





MAKING AND STAMPING—Higham Factory.

forty-five in number) with a presiding workman at each. At the bench of each man we noticed a curious assortment of odd-shaped tools, each having its special office. There is also for every workman a mechanical blow-pipe, the blast for which is obtained from a large compressed air reservoir. By an arrangement of pipes and taps to control the supply of air and gas a flame of any intensity can be obtained at will.

To make our account as interesting as possible, we commence with the bell maker, who has a department to himself. The pattern for a bell is laid upon a sheet of brass of a suitable thickness according to the kind of bell required—from the thin metal used for the French horns to the thick and weighty brass used for the contesting basses—outlined with a pointer and cut from the sheet by hand. The piece of cut-out metal is then got into rough form by beating and pressing on a special steel shape. The longitudinal edges are then trued up and brought together slightly overlapping each other, charged with brass solder, and brazed. The large conical branches are made in a similar way. The rough bell is then put on a steel shape and tempered by hand beating with wood and metal hammers, until the required degree of hardness is obtained, and it approaches to some extent the shape required. This is a very important operation, and effects a wonderful change in the nature of the metal, changing it from a state of softness and pliability to a degree of hardness resembling steel, and giving off when struck that characteristic ring always present in a good hand-made bell.



VALVE MAKING—Higham Factory.

Following this it is placed with the steel mandril inside into a lathe, and there turned true with tools having steel heads something like ducks' bills in shape, held on a rest which can be moved right or left as required. When the bell end has been worked to a length somewhat longer than intended, the edge is turned up by a tool: while it is spinning round a brass or steel wire is put in and the edge turned down over it. In addition to this the wire is soldered in, thus ensuring a perfect adherence. The burnishing is done while on the lathe, and to polish the inside of the bell the cone is reversed, leaving the bell end open for the application of the burnishing tool. The test of a burnished tube or bell being true is that while revolving in the lathe it cannot be seen to move. The bell is now handed over to another workman to be bent to the required shape. This is done by filling the whole length of the tube or bell with molten lead. When cool it is placed on a large iron bending table of special construction, and by a system of levers and blocks is bent slowly and carefully to the shape we are accustomed to see on the finished instrument. It is then carefully planished and rounded, the lead being melted out and the bell handed over to the instrument makers.

The mouthpieces, tubing, branch work, and valves have now to be considered. The mouthpiece is turned from a solid casting, the outer rim of sterling silver fitted on and turned down with a tool.

Next comes the slide tubes, which are made from seamless tubing, and which must of necessity be mathematically circular and true. For a set of

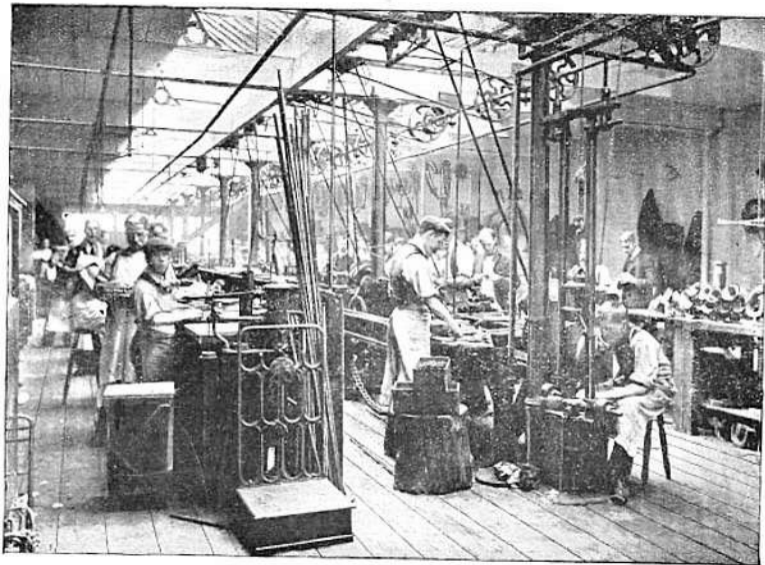


BELL AND TUBE MAKING—Higham Factory.

slides then a length of seamless tube of suitable diameter is selected and fixed on a steel mandril, a perfect round steel rod of the exact diameter of the bore of the tube, and is drawn by power through a series of steel dies until the exact size is obtained. The operation of drawing down tubes lengthens them also, and has the effect of producing a state of density and hardness obtainable by no other means (a pair of trombone slides were produced by this method for our edification). On removing the tube from the mandrill we found the inside and outside to be in a highly polished state.

The operation of bow making now claims our attention. These are made from seamless tubing, on a very ingenious and cleverly designed tube-bending machine, recently invented by Mr. T. C. Camden. The advantages of the employment of these seamless bows, together with seamless slides and mouth-pipes, in the construction of the Higham instruments, cannot be over-rated. It must add years to the life of an instrument, and we have no hesitation in saying that an instrument constructed in this manner, and with valves and valve cases hard soldered with silver solder (a speciality of the firm), should last a man a lifetime.

To make a bow, a length of seamless tube of the required diameter is selected and filled with a special composition. As soon as the molten metal has cooled sufficiently to allow of the tube being handled, it is cut with a rapidly revolving circular saw into suitable lengths, fed into the wheels of the machine and immediately bent to the desired shape. The composition is then melted



GENERAL VIEW ON THE FINISHERS' SIDE - Higham Factory.

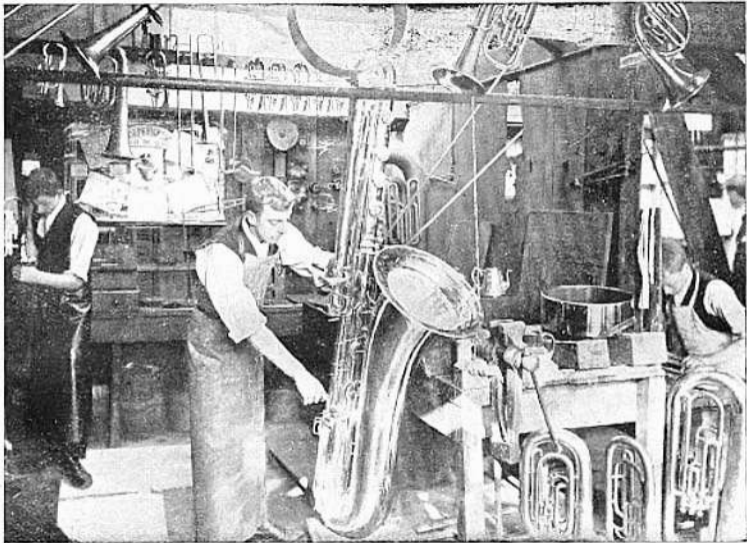
out, the bow placed in a clamp, and a series of steel balls pushed through by power. This ensures a perfectly round and even passage through the bend of exactly the same diameter as that of the tubes to which it will ultimately be attached when mounted on the valves.

Having got our bells, slides, and bows, we come to the finest and most delicate work of all—the valves. Every player of a valve instrument knows the value of a set of good valves. The main essentials are free action, perfect fitting (practically air-tight), lightness, the passages through the pistons of exactly the same diameter as the connecting tubes, each passage to be clear and free from lumps, and to register accurately with the corresponding apertures in the valve casings.

How this combination of virtues is secured in the Higham valves was demonstrated as follows:—

In order to cut the holes to form the passages through the pumps and their corresponding outlets in the cases, Messrs. Higham use a special machine invented for the purpose, in which the principle of the pantograph is applied. The pump tube to be cut is placed over the pointed end of two spindles, parallel to the pattern cylinder on which the exact position of all the holes are marked with a circle and spot centre. When the spot is brought directly under a pointer the pump is in position for the cutter to descend: a small lever connected with the driving gear starts the cutter on its downward journey; it rapidly descends on to the new pipe, makes its orifice, and retires.



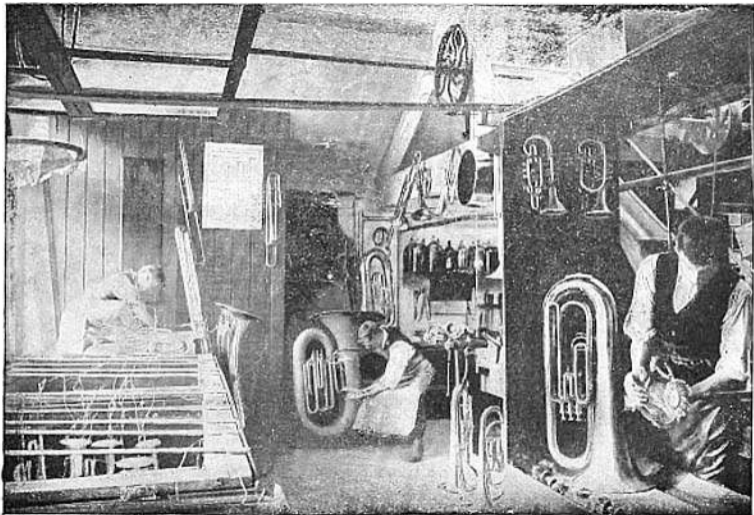


**ELECTRO-PLATING DEPARTMENT - Higham Factory.**

This is repeated until all the holes are cut. The holes in the valve casings are cut in precisely the same manner, and the inner and outer tubes, therefore, register with perfect accuracy. The air passages have now to be made through the pump. A piece of thin tubing is passed through two corresponding openings in the pump and hard brazed with silver solder. These passages we found to be clear and true, being free from lumps and excrescences, and the same in diameter as the valve tubing. The perfect valve passage, which is a special feature of the Higham valves, accounts in a great measure for the beautiful tone and easy blowing qualities of the "Patent Clear Bore" instruments, the valve notes being as free and pure as the open notes. Hence the term "Clear Bore." The valve passages having been brazed and the projecting edges cut off, the outside of the pump and the inside of the valve cases are ground to an exact fit. So accurately must this be done that although they be practically air tight, yet they must have free play and respond to the exertion of the springs when the downward pressure is removed.

We may here mention that all the pieces of tubing connected with the valve cases are brazed with silver solder, as well as the valve passages. Under these conditions they must last for many years, as the saliva, which is very destructive to soft soldered work, has no effect on silver.

After the three pumps have been ground in their outer cases, enclosed therein and fitted with the valve caps and bottoms, they are handed to another



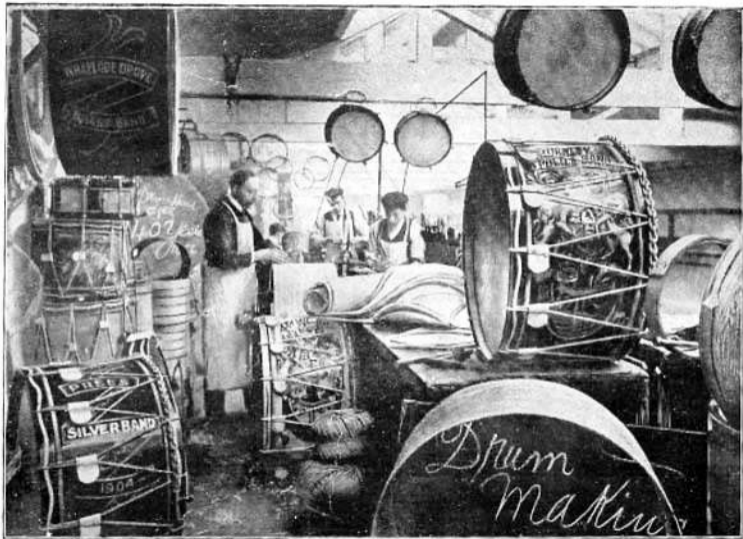
**ELECTRO-PLATING DEPARTMENT—Higham Factory.**

workman to have the slides and bows mounted, then to the makers, who assemble and fit all the parts together.

The instrument is then tested for pitch, and is invariably found to be true (all instruments are built Kneller Hall pitch, B flat, 479.3 double vibrations, and tested at a temperature of 68 Fah.) Any slight variation can be readily corrected. We are informed, however, that this is seldom required, owing to the various parts of the instrument being designed and put together with the greatest accuracy, and all are made to registered measurements. The testing and tuning is in the hands of experienced artists, and no instrument is sent out of the Higham Factory without its being certified as "true to pitch and in tune throughout."

After leaving the makers, the instrument is handed to the finishers and regulators for the final regulating and polishing, or for preparation for engraving, silver-plating, and gilding.

The silver-plating department is on the second floor, and consists of the most modern and up-to-date plant for turning out the highest class of silver and gold-plating by electro deposition. Messrs. Higham inform us that for band instruments they do only one class of work, namely, Class "A." They claim to do the best plating in the trade, and that they stand in high esteem for the excellence of their work is amply proved by the number of letters we were permitted to see, in which pleased clients speak of the wearing



DRUM MAKING DEPARTMENT Higham Factory.

quality of the Higham plate and splendid condition of their instruments after many years of hard wear.

We noticed the boiling tanks and the depositing vats were full of instruments, from the small cornet to the BB flat bass. One large instrument has just received its quantum of silver and been removed from the vat to make way for another. We watch with interest the operation of scratch brushing and polishing of parts; the inside of the bell and the large ferrules, etc., are to be burnished, and for this purpose are sent through to another room.

Leaving the plating shop, we next find ourselves in the drum department. Here are drums of all kinds—Guards' pattern, military, ordinary, and orchestral side drums, tenor and bass drums, and kettledrums—and in all stages of manufacture. Some of these were being finished plain, and others decorated elaborately with Royal arms, regimental badges, crests, etc. The Higham drums are well known, and the firm manufacture largely both for home and export.

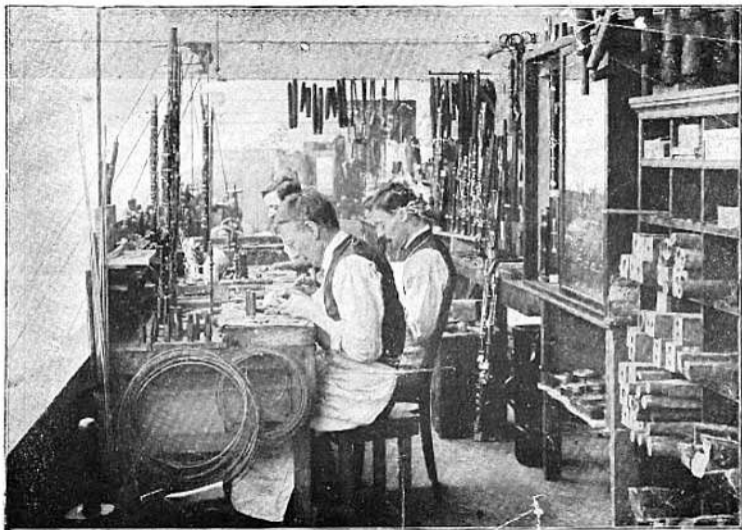
In reply to our query, "What becomes of the large number of instruments you turn out every year?" Mr. Camden replied, "The home demand for high class instruments for orchestras and brass bands, and for the Army, Navy, and Volunteer bands provides us with substantial orders. In addition we ship largely to the Colonies and United States, and, in fact, to all parts of the world, for orders are continually coming in from the most unexpected quarters,

Here are some of the names from our Order Book :—U. S. A., Mexico, Canada, Newfoundland, British Columbia, Australia, New Zealand, South Africa, Gold Coast, Malay States, India, Ceylon, Siam, Hong Kong, Bohemia, Norway, Holland, Channel Islands—in a word, we may safely say that wherever there is music there you will find Higham instruments. Their satisfactory and enduring qualities are appreciated by the professional and amateur musician alike. Bandsmen travel much now-a-days, and users of Higham instruments soon demonstrate to their less fortunate brother musicians the sterling qualities of the 'Patent Clear Bore.' Our best advertisements are recommendations from pleased clients.

"Are we right," we ventured to ask, "in supposing that the majority of your workmen are musicians and instrumentalists, and take an additional interest in their work on that account?"

"Yes, most of our men are instrumentalists and play the instruments they make; some of them are soloists of note and play in the best orchestras and military bands in this city."





WOOD WIND DEPARTMENT—Higham Factory.



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## WOOD WIND DEPARTMENT.

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*"Manchester Courier,"—Tuesday, May 22nd, 1906,*

"Eighteen months ago the Firm added a Wood Wind Department to those already in existence. Flutes, Clarinets, Oboes, and Bassoons are made from start to finish. The wood is made from the rough, and the mountings from forged German silver wire. Since its inauguration everything turned out from the department has given the completest satisfaction, nothing but the highest class work being undertaken."