(No Model.)

W. F. PATTERSON & J. J. ISHERWOOD.

METHOD OF SECURING PLUGS IN TUBULAR SKEINS.

No. 412,410. Patented Oct. 8, 1889.

Fig 1.

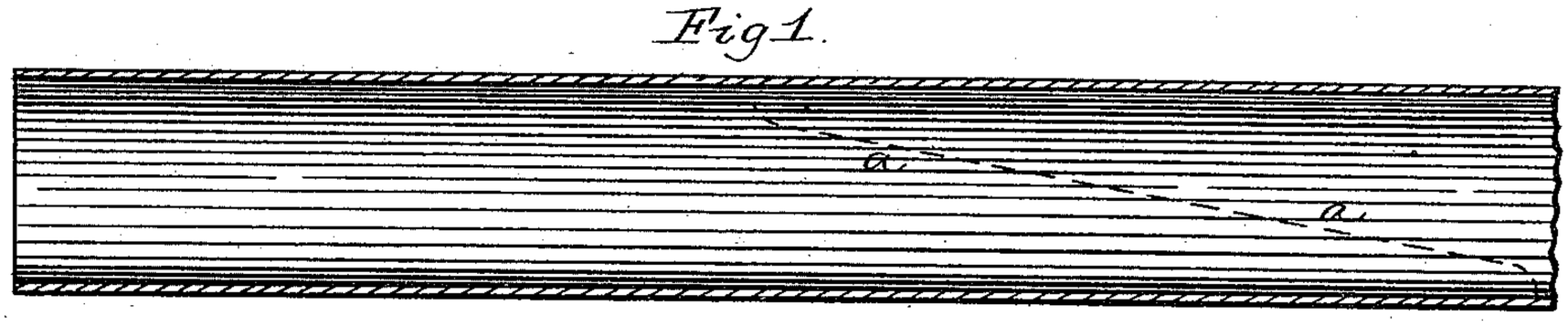


Fig 2.

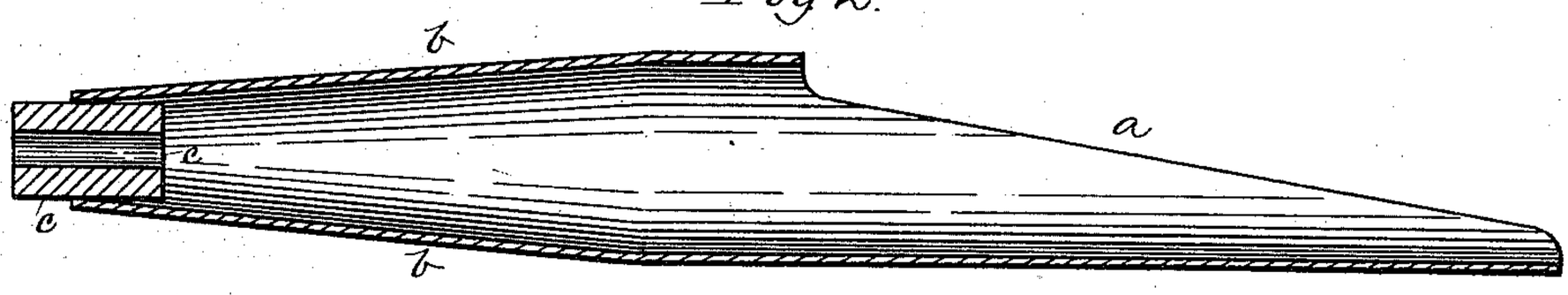


Fig 3.

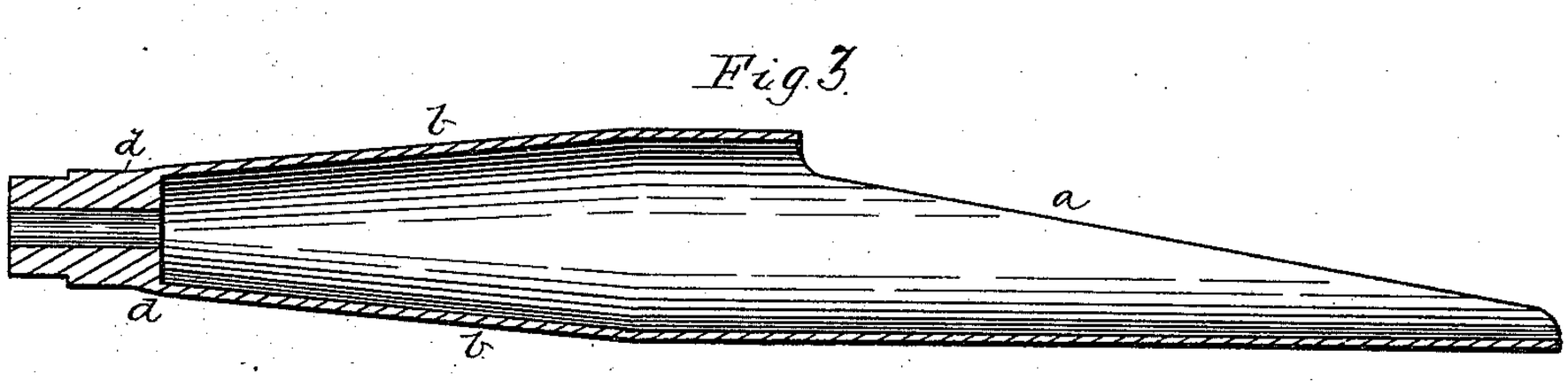


Fig 4.

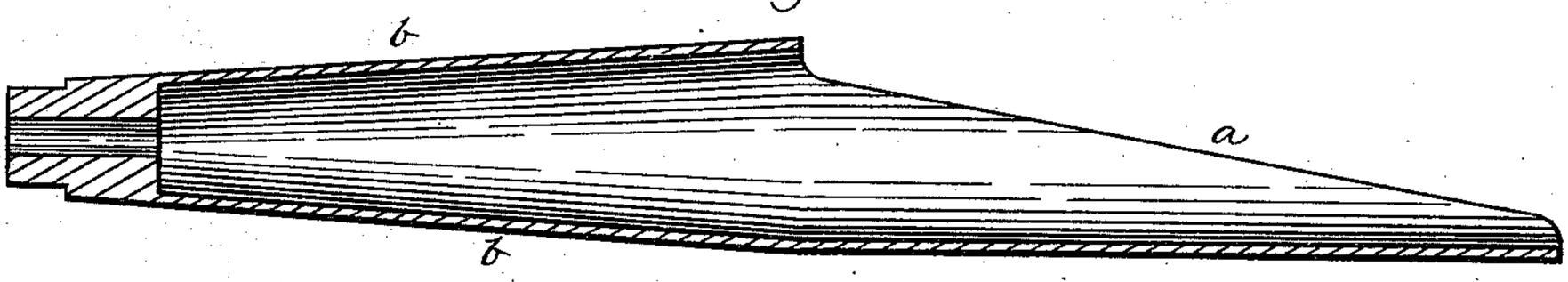
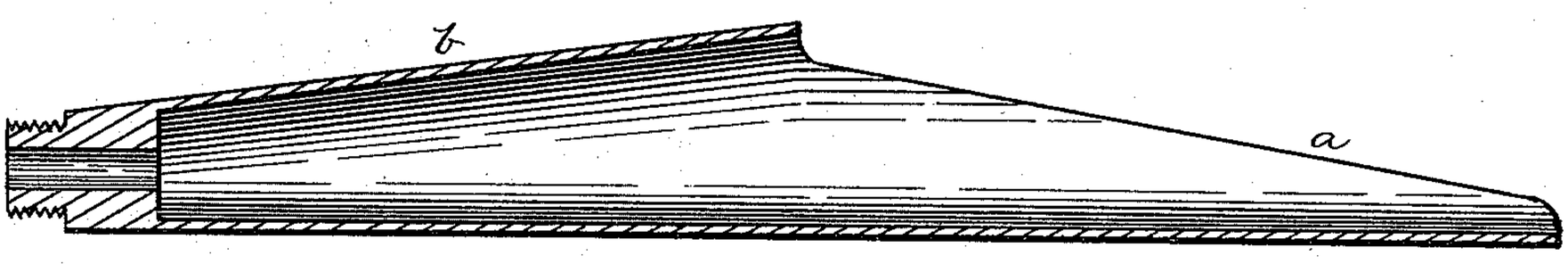


Fig 5.



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UNITED STATES PATENT OFFICE.

WILLIAM F. PATTERSON AND JOHN J. ISHERWOOD, OF ALLEGHENY, PENNSYLVANIA; SAID ISHERWOOD ASSIGNOR TO SAID PATTERSON.

METHOD OF SECURING PLUGS IN TUBULAR SKEINS.

SPECIFICATION forming part of Letters Patent No. 412,410, dated October 8, 1889.

Application filed February 25, 1889. Serial No. 301,118. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM F. PATTERSON and JOHN J. ISHERWOOD, residents of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Methods of Securing Plugs in Tubular Skeins; and we do hereby declare the following to be a full, clear, and exact description thereof.

Our invention relates to the securing of plugs in the ends of axles or axle-skeins, its object being to provide an efficient method of securing said plugs in place in axles or skeins formed from wrought-metal tubes. Certain methods of forming axle-skeins from metal tubes are described in Reissue Letters Patent No. 10,776, granted to R. Gracey, November 2, 1886, and in Letters Patent Nos. 371,311 and 371,312, granted to said Gracey October 11, 1887; and the invention, as generally practiced under said patents, consists in tapering or reducing the part of said blank forming the spindle portion and setting the tail portion in proper line with the spindle portion. In making these axle-skeins from tubular metal difficulty has been found in the forming of the threaded ends for the reception of the nut or washer to hold the wheel on the axle, and our present invention is directed to the method of forming such threaded ends and finishing the spindle portion of the axle or skein.

It consists, generally stated, in first partially tapering or reducing the tubular blank from which the axle or skein is to be formed, then welding or otherwise securing the plug in the smaller end of the blank, and subsequently again tapering or reducing the blank, so firmly securing the plug in place and bringing the spindle portion of the blank to the proper size and shape.

To enable others skilled in the art to practice our invention, we will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is a view of the tubular blank from which the axle or skein is to be formed. Fig. 2 shows the blank partially tapered or reduced ready to receive the plug. Fig. 3 shows the blank with the plug secured in place. Fig. 4 shows the blank having the tapering or reduction of the spindle portion completed, and Fig. 5 shows the finished skein.

Like letters of reference indicate like parts in each.

In practicing our invention we generally employ wrought-metal tubing, either iron or soft or low-grade steel, and either a seamless tube or bent up and welded, as may be desirable. We prefer for the purpose a tube formed of soft steel, as it possesses greater strength and its surface is harder and will sustain more wear.

In forming the ordinary axle-skein according to our invention we generally cut the blank from the tube in such manner as to form the tail portion *a* of two skeins of the same length of metal, as indicated in Fig. 1. We then bring the spindle portion *b* of such a blank to the proper heat for tapering or reducing, and the blank is then placed between suitable reciprocating dies or other form of swaging or reducing apparatus, and is partially reduced, the reduction of the spindle portion not being completed, however, as is fully shown in Fig. 2—that is, the tubular blank is tapered or reduced from the plug end thereof part way up the spindle portion, leaving part of the blank which is to form the spindle portion of the skein or axle untapered and with its walls parallel. After this operation we insert the plug *c* within the smaller end of the spindle *b* and secure it therein in any desired way, it being found preferable to heat the plug and that end of the blank and weld the plug therein, as shown at *d*, Fig. 3. After the plug has thus been secured to the blank we reheat both the plug and the spindle portion of the blank and again place it in the reducing apparatus and complete the tapering or reduction of the spindle portion of the blank—that is, in this second reduction of the spindle portion we taper or reduce it for the entire length of the spindle portion, and so bring the spindle portion of the blank to its finished shape. This second reduction firmly secures the plug within the blank if it had not been welded thereto, and imparts the proper taper or contour to the spindle portion and the end thereof surrounding the plug, so that after the plug is inserted in place the blank is thus

brought to the finished shape, and there is no liability of the spindle portion being bent out of shape by the insertion of the plug, the true circular shape in cross-section of the spindle portion being obtained when it is brought to its finished condition. After the plug is thus secured in place and the tapering or reduction completed the tail portion *a* is brought into proper line with the spindle portion *b*, as described in said Patents Nos. 371,311 and 371,312, the collar secured upon the skein, and the plug turned and threaded, when the skein is ready for use.

Our invention may also be practiced in connection with the formation of what are known as "tubular axles," or of axles in which the thimble portion is formed of tubular metal tapered or reduced, and it may also be employed with other shapes and constructions of axle-skeins, such as the hooded skein described in application for Letters Patent filed by W. F. Patterson, one of the inventors herein, of even date herewith, Serial No. 301,119.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The herein-described improvement in the art of securing plugs in and forming the spindle portions of axles or axle-skeins, consisting in first partially tapering or reducing a tubular blank, then inserting and welding the plug in the end thereof, and then completing the tapering or reduction of the blank to bring the spindle portion to the finished shape, substantially as and for the purposes set forth.

2. The herein-described improvement in the art of securing plugs in and forming the spindle portions of axles or axle-skeins, consisting in first partially tapering or reducing a tubular blank, then inserting the plug in the end thereof, and then completing the tapering or reduction of the blank to bring the spindle portion to the finished shape, substantially as and for the purposes set forth.

3. The herein-described step in the art of securing plugs in the ends of and forming the spindle portions of axles or axle-skeins, consisting in inserting the plug in the hollow end of the blank, welding it therein, and then tapering or reducing the spindle portion of the blank and bringing it to its finished shape, substantially as and for the purposes set forth.

In testimony whereof we, the said WILLIAM F. PATTERSON and JOHN J. ISHERWOOD, have hereunto set our hands.

WILLIAM F. PATTERSON.
JOHN J. ISHERWOOD.

Witnesses:
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J. N. COOKE.