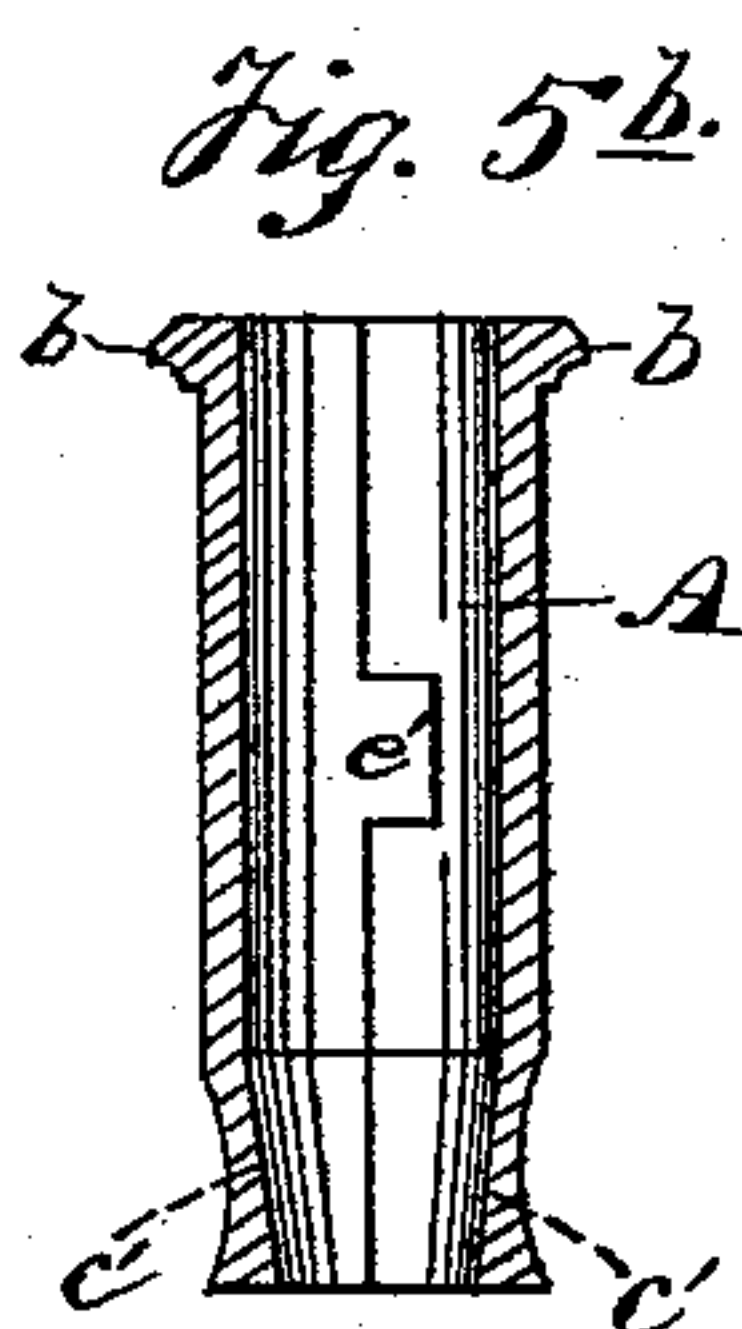
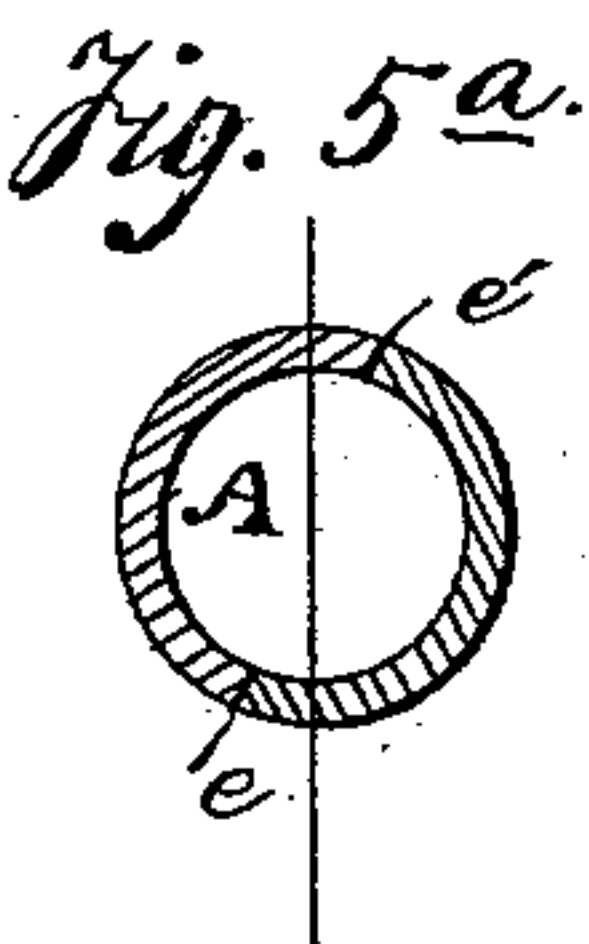
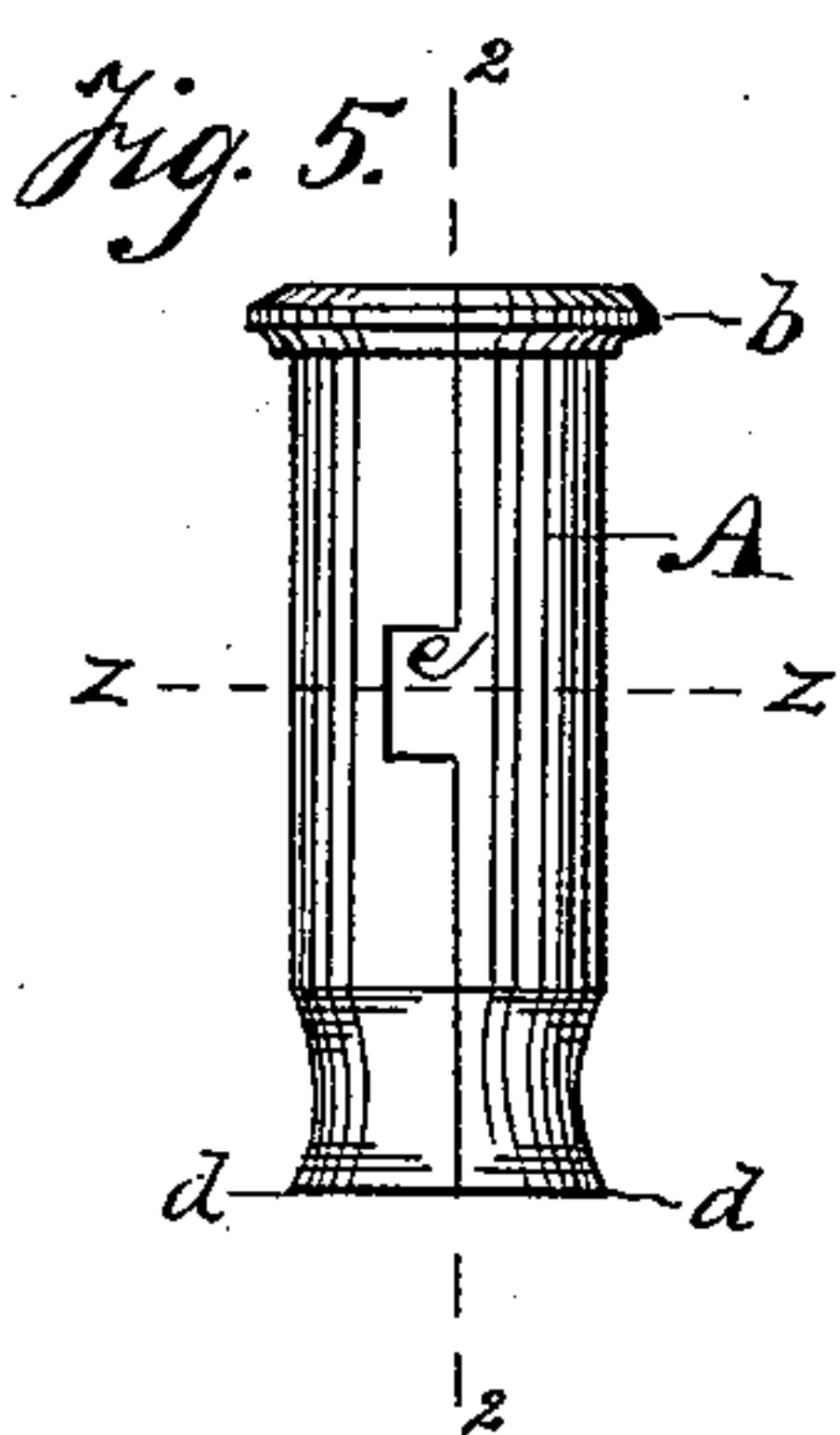
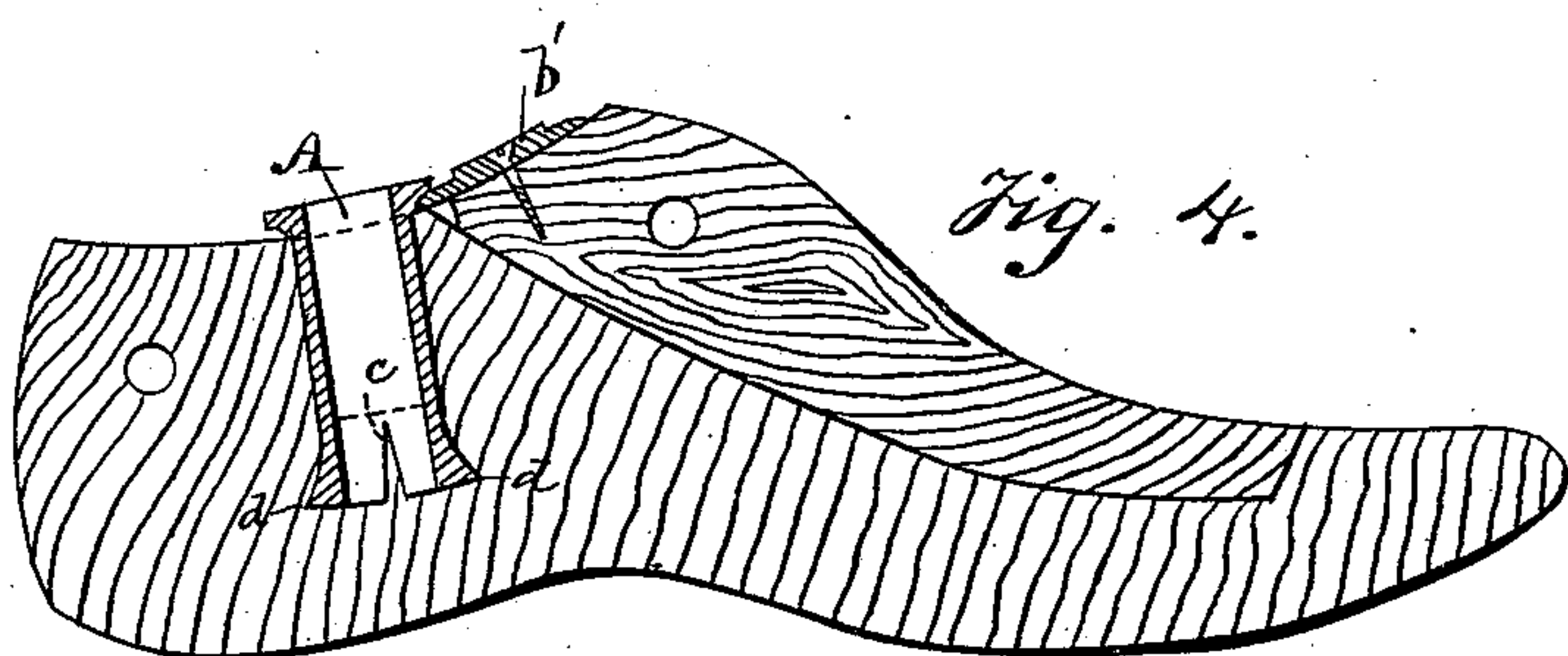
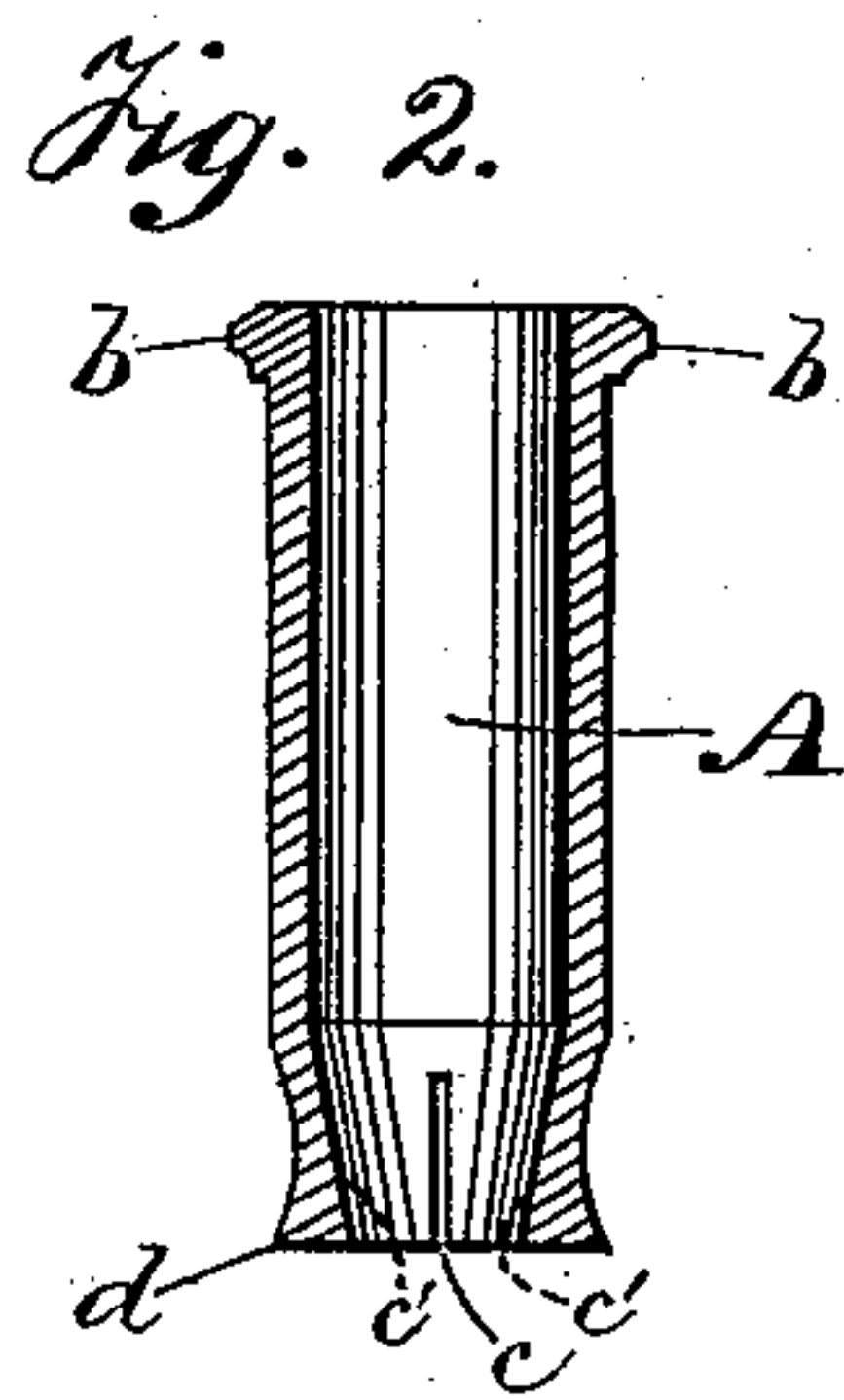
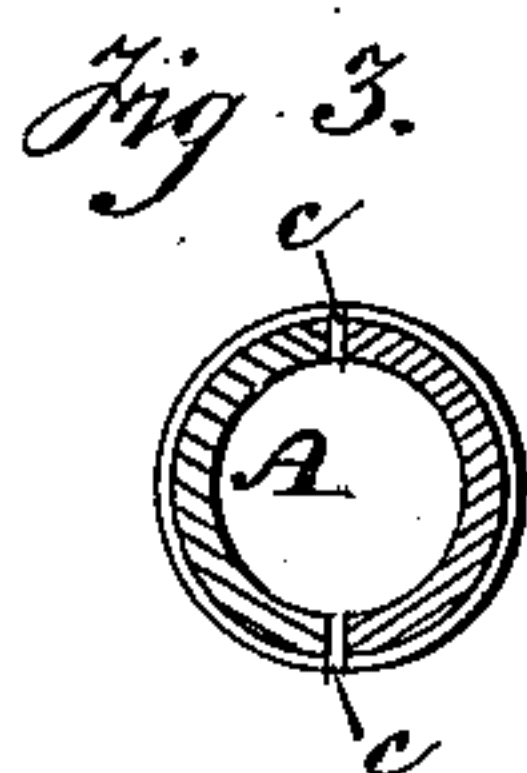
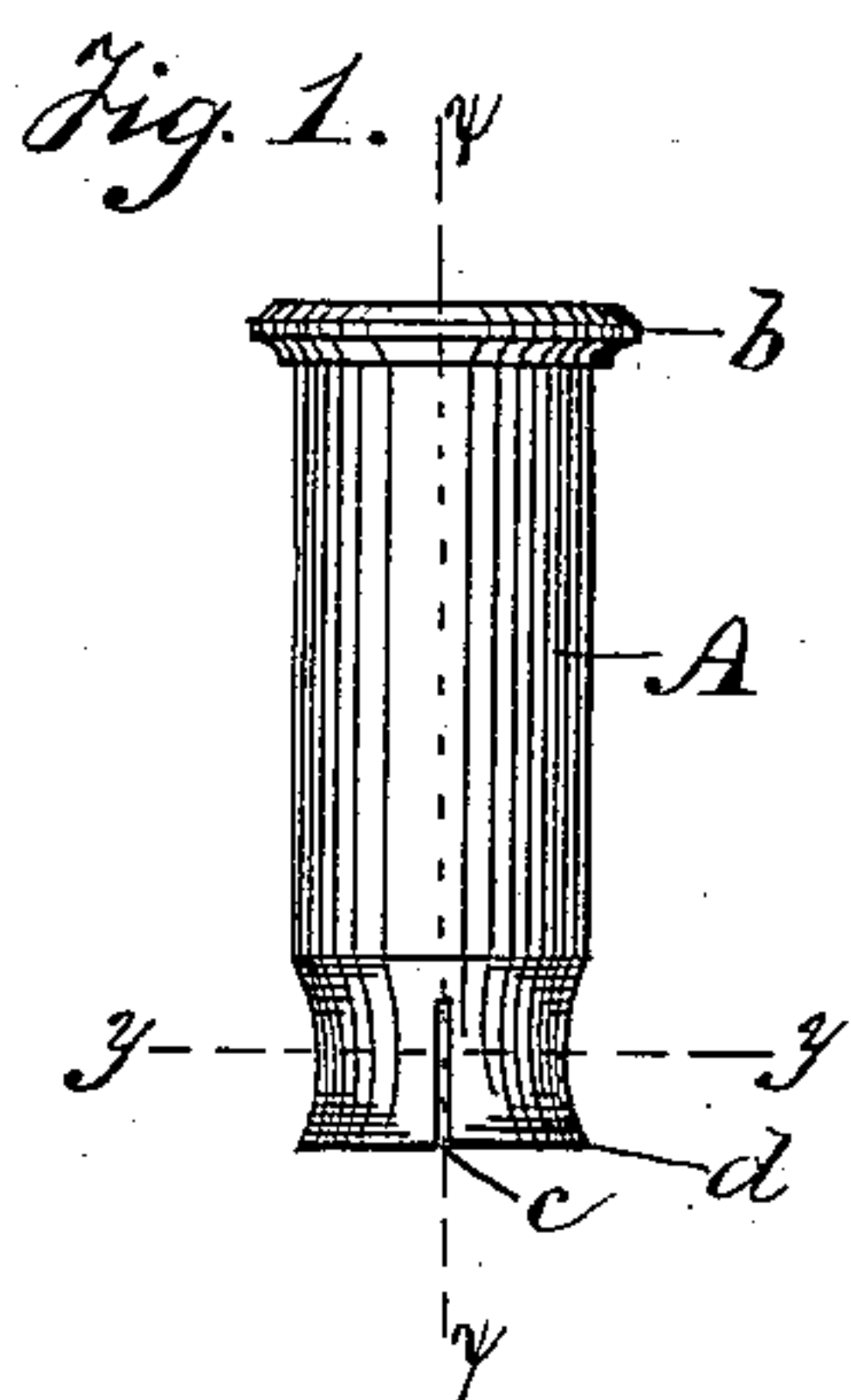


(No Model.)

W. MILLER.  
Metallic Socket Bushing for Lasts.

No. 235,000.

Patented Nov. 30, 1880.



Witnesses:  
H. G. Madlin.  
J. F. Baldwin

Inventor:  
W. Miller  
by Wright Brown  
Atty.

# UNITED STATES PATENT OFFICE.

WILLIAM MILLER, OF BOSTON, MASSACHUSETTS.

## METALLIC SOCKET-BUSHING FOR LASTS.

SPECIFICATION forming part of Letters Patent No. 235,000, dated November 30, 1880.

Application filed April 7, 1880. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM MILLER, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Metallic Socket-Bushings for Lasts, of which the following is a specification.

My invention consists in a new and improved form of metallic bushing for insertion into a last to prevent the wear to which the same is subjected from the action of the jack-pin.

In the accompanying drawings, forming part of this specification, Figure 1 shows an elevation of my improved bushing; Fig. 2, a longitudinal section on the line  $x x$  of Fig. 1; Fig. 3, a transverse section on the line  $y y$ , Fig. 1, and Fig. 4 a last with my invention attached. Figs. 5 and 5<sup>a</sup> exhibit a modification of my invention, Fig. 5 being an elevation, and Fig. 5<sup>a</sup> a transverse section on line  $z z$ , Fig. 5, and Fig. 5<sup>b</sup> a longitudinal section on line 2 2, Fig. 5, of said modification.

In these several figures the same letters refer to the same parts.

It is well known that during the various operations which a shoe undergoes in making and finishing, and in which the last is required to be held in position by a jack-pin inserted in a socket in the top of the last, the action of the pin upon the wood will soon enlarge the socket and render it impossible to hold the last firmly in place.

It is already common to protect the socket by a plate screwed upon the top of the last; but my invention provides a bushing new in form, better adapted to resist the wear of the pin, and more conveniently affixed to the last than any now in use; and this bushing I will now describe.

My invention consists in the metallic tube A, having its inner end split, as shown at  $c$ . This tube is beveled internally at its inner end, as shown at  $c'$ , and its bore above the beveled portion is of sufficient size to receive the jack-pin. The inner end of the tube is also reduced externally, so as to form an acute angle at the edge  $d$ .

The construction of the inner end of the tube just described adapts it to be expanded

and cause the tube to become affixed to the last, as hereinafter explained.

The outer end of the tube is provided with a flange,  $b$ , which will project slightly above the surface of the last when the tube is inserted in its socket. This flange has a lip for the purpose of receiving a pivoted button,  $b'$ , placed upon the last-block and adapted to engage with the flange, in order to maintain the last-block securely in position. In affixing this bushing to the last the tube A is inserted in the socket, as shown in Fig. 4. A plug or mandrel is then driven into the socket thus protected, and by the action of this plug upon the beveled surface  $c'$  the lower end of the tube will be expanded, and the lower edge, having been reduced to an acute angle, will be forced into the wood, and thus hold the tube firmly in place when the mandrel is removed. By this means the socket of the last is readily provided with a metallic bushing at once secure and durable, and which will effectually prevent the wear to which an unprotected socket is now subjected in use. No screws are required to be put into the last, the simple driving of the mandrel being all that is necessary to affix the bushing in the socket.

It is obvious that my invention is applicable to all articles in which a similar bushing is required or may be useful.

The tube A may be cast in one piece or in two pieces, as may be found most convenient, and if cast in two pieces I make use of the modified form shown in Figs. 5 and 5<sup>a</sup> and 5<sup>b</sup>. The modification consists in the form of joint shown at  $e$  and  $e'$ , designed to prevent the separate halves of the tube from working out of the socket. In all other respects the characteristics of my invention are preserved, precisely as when the tube is cast in one piece, and the invention will be found equally efficacious for the purpose set forth whether the tube is cast in one or in two pieces.

I do not limit myself to splitting the lower end of the tube, as it is obvious that if the tube were not split it could still be expanded by driving the mandrel, the metal yielding to the mandrel, which might crack the beveled end, and so accomplish the same result as if the tube were split.



Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. As a new article of manufacture, a bush-  
5 ing for insertion into a last or other article,  
composed of a metallic tube beveled internally  
at its inner end, and thus adapted to be ex-  
panded at its inner end by the insertion of a  
plug or mandrel when the bushing is in its  
10 socket in the last.

2. A bushing composed of a tube beveled

internally at its inner end, and reduced exter-  
nally to form an acute angle at said inner end,  
substantially as and for the purpose described.

In testimony whereof I have signed my 15  
name to this specification, in the presence of  
two subscribing witnesses, this 31st day of  
March, A. D. 1880.

WILLIAM MILLER.

Witnesses:

H. G. WADLIN,  
C. F. BROWN.