

C. E. BILLINGS.

Dies for Making Blanks for Ship-Hooks.

No. 138,471.

Patented May 6, 1873.

Fig 1. x

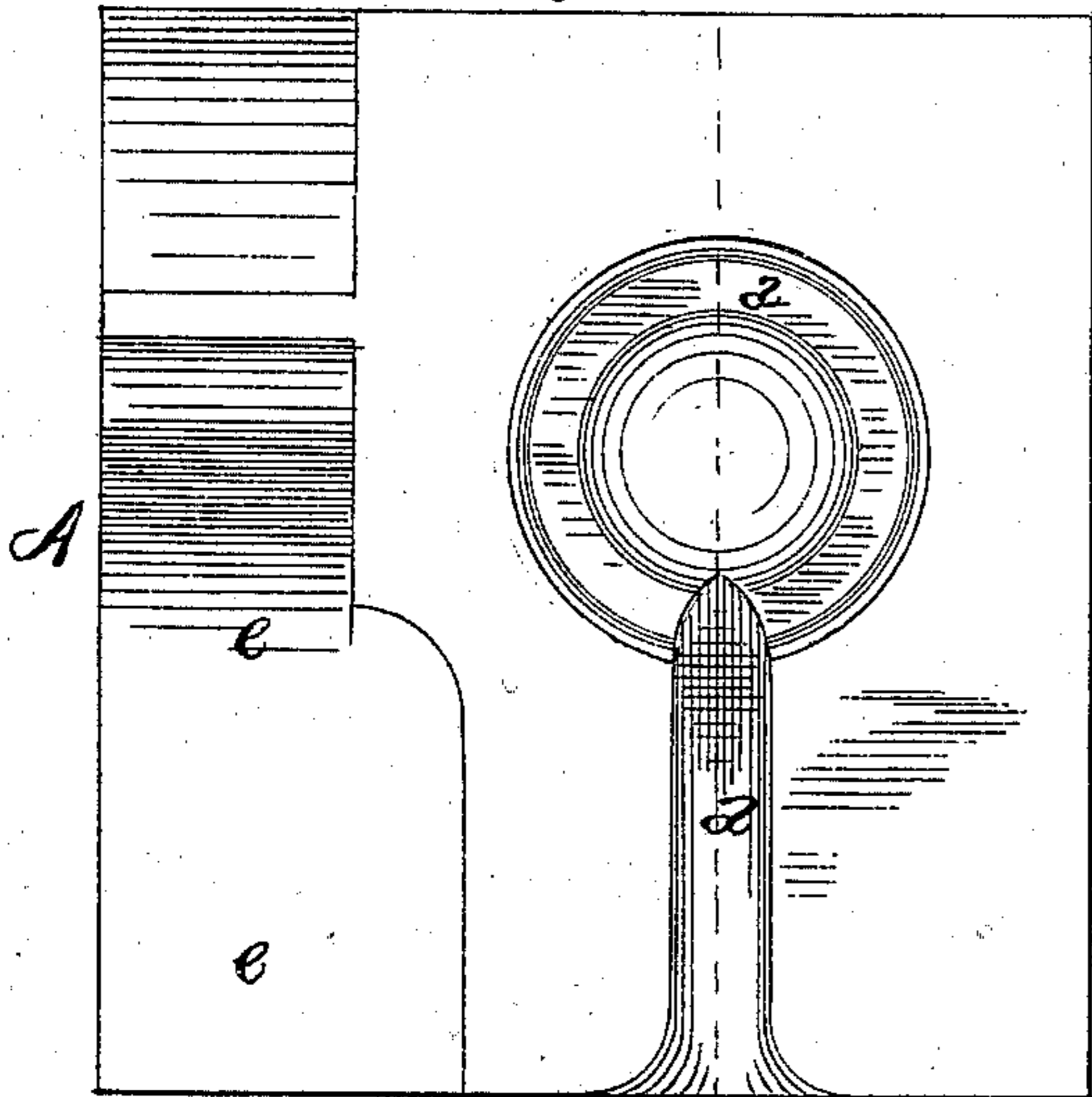


Fig 2. x

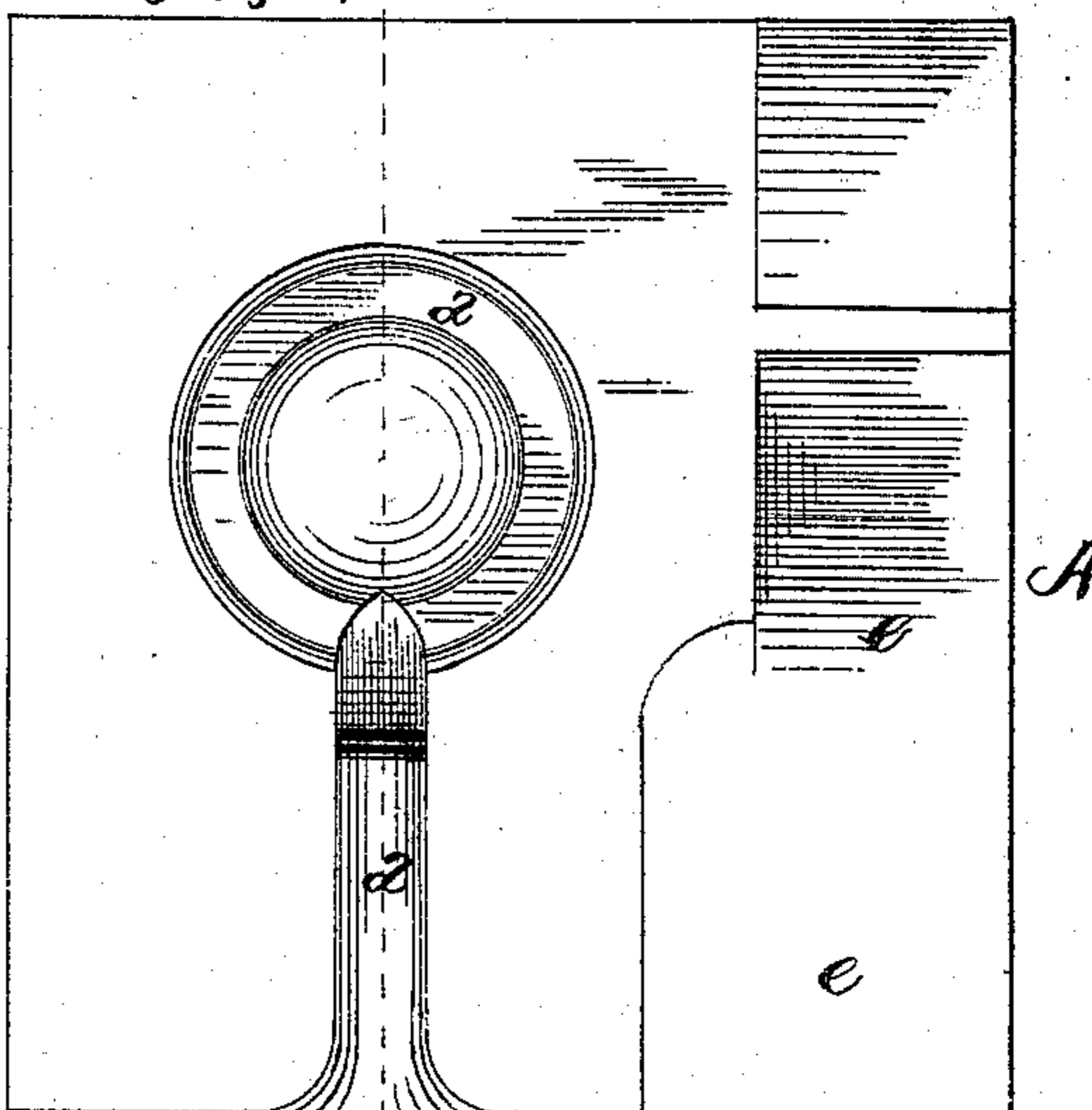


Fig 3. x

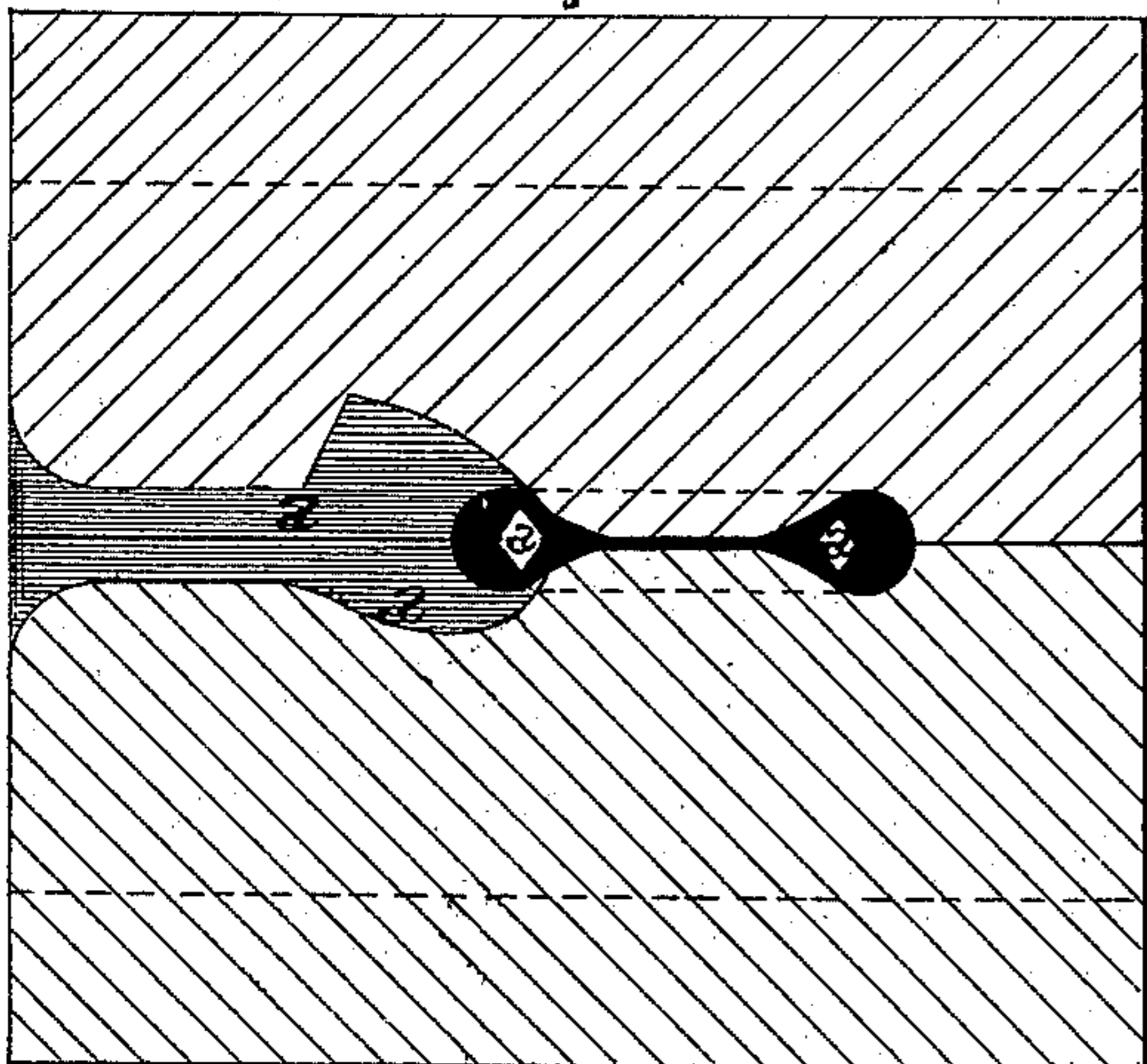


Fig 4. x

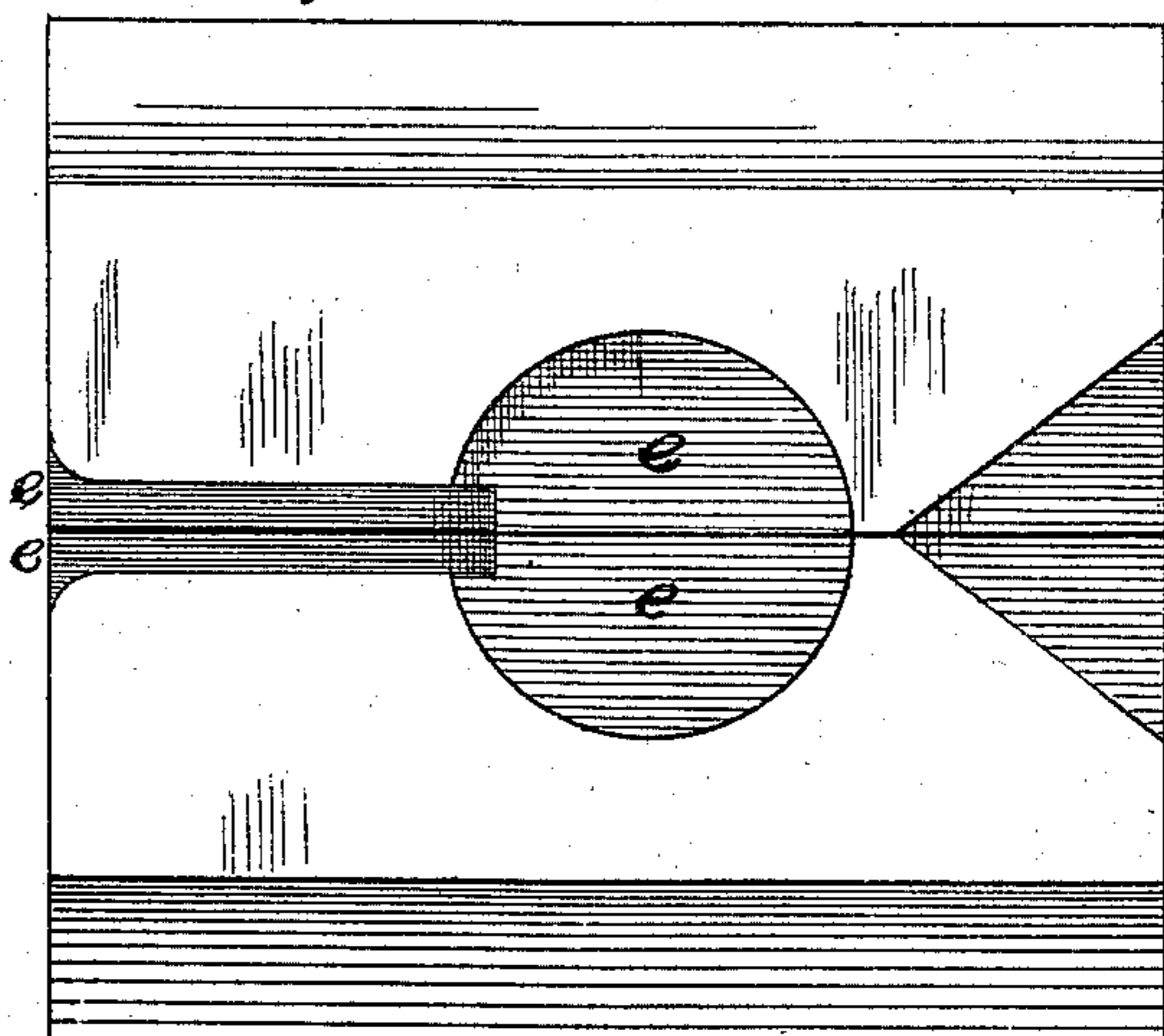


Fig 5.

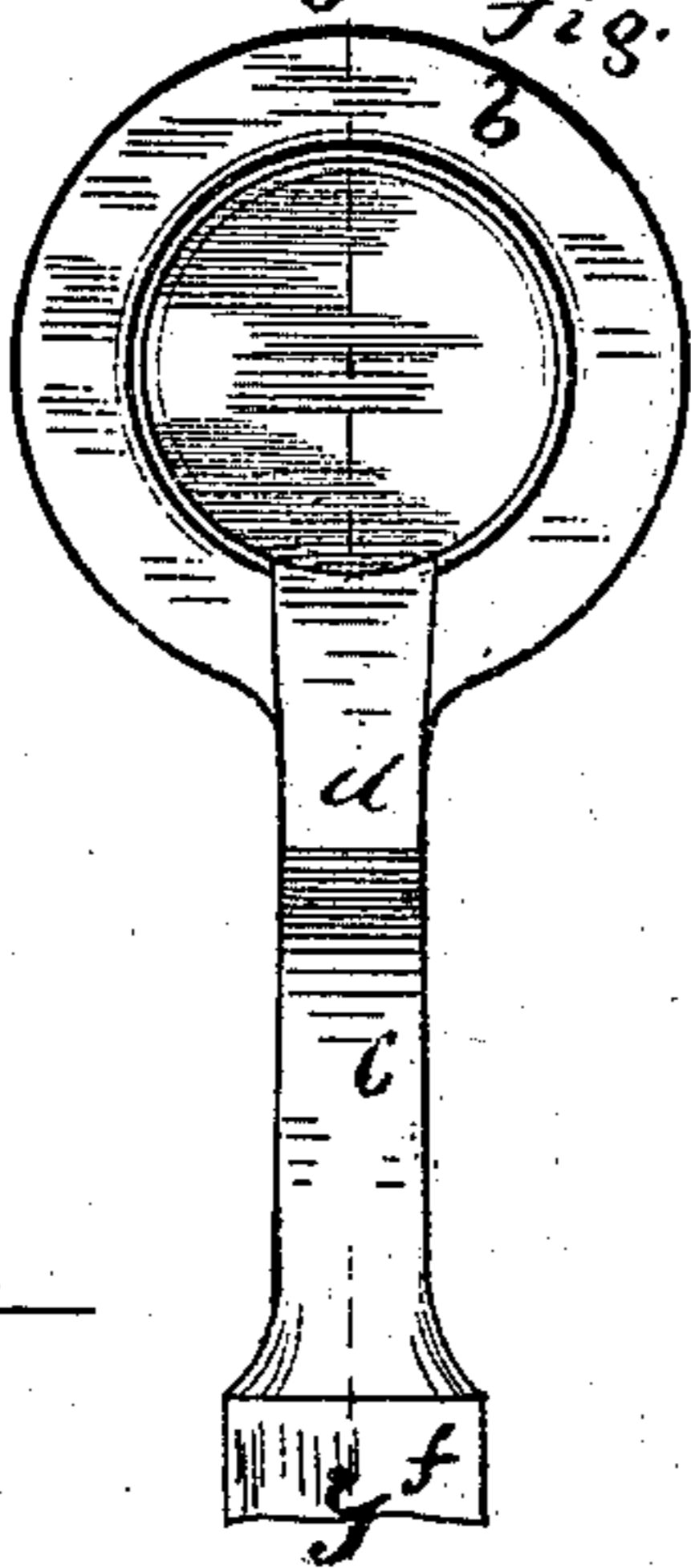
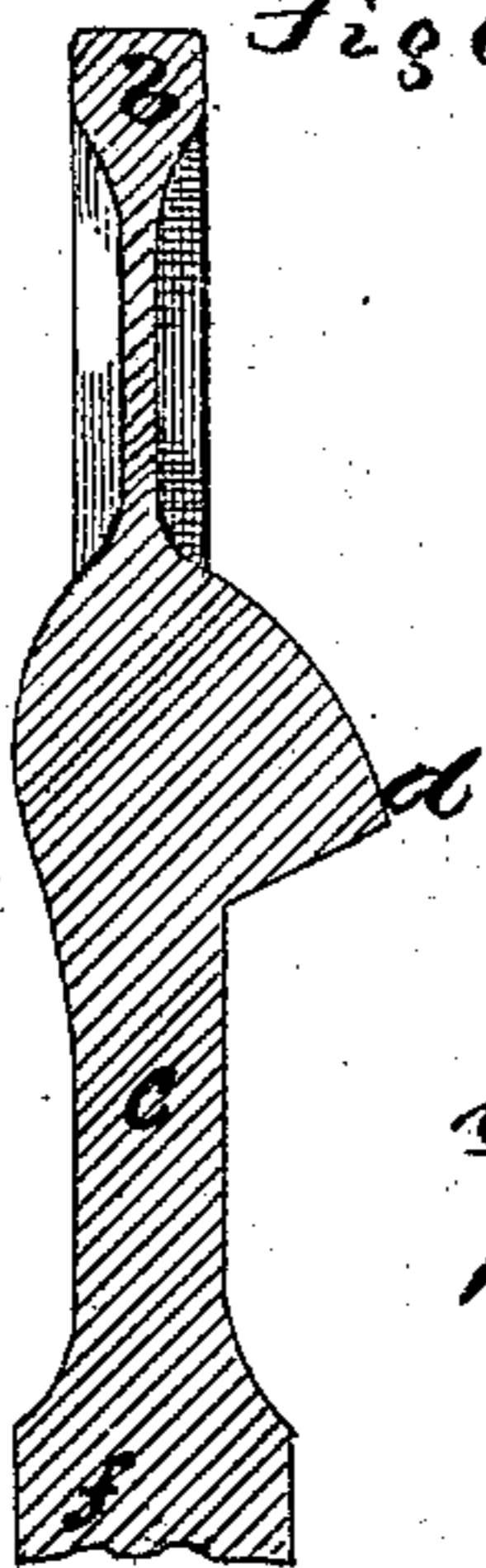


Fig 6.



WITNESSES.

John Pollitt  
John Keloy

INVENTOR.

Charles E. Billings  
By W. E. Simonds  
Atty.

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Fig. 7.

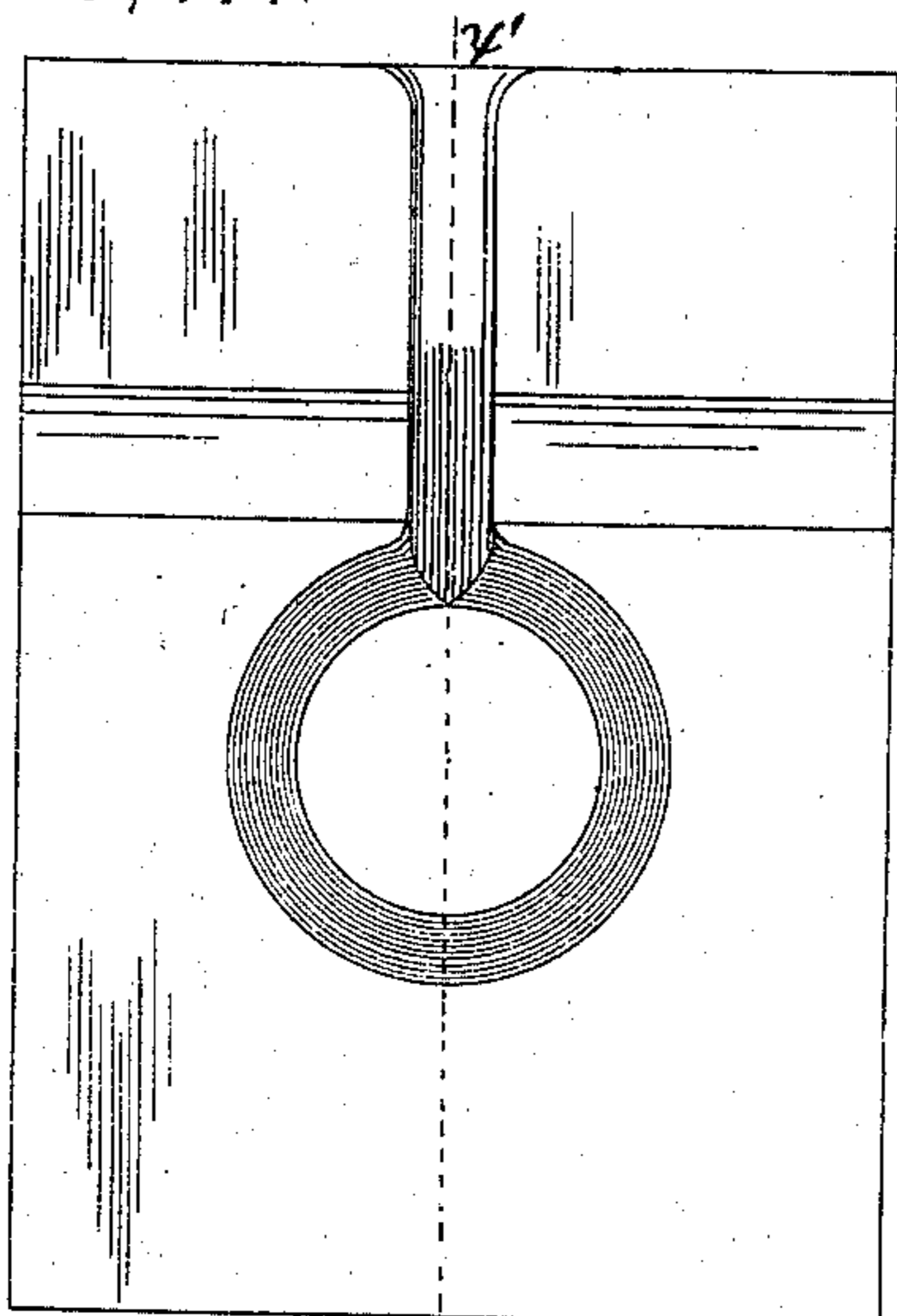


Fig. 8.

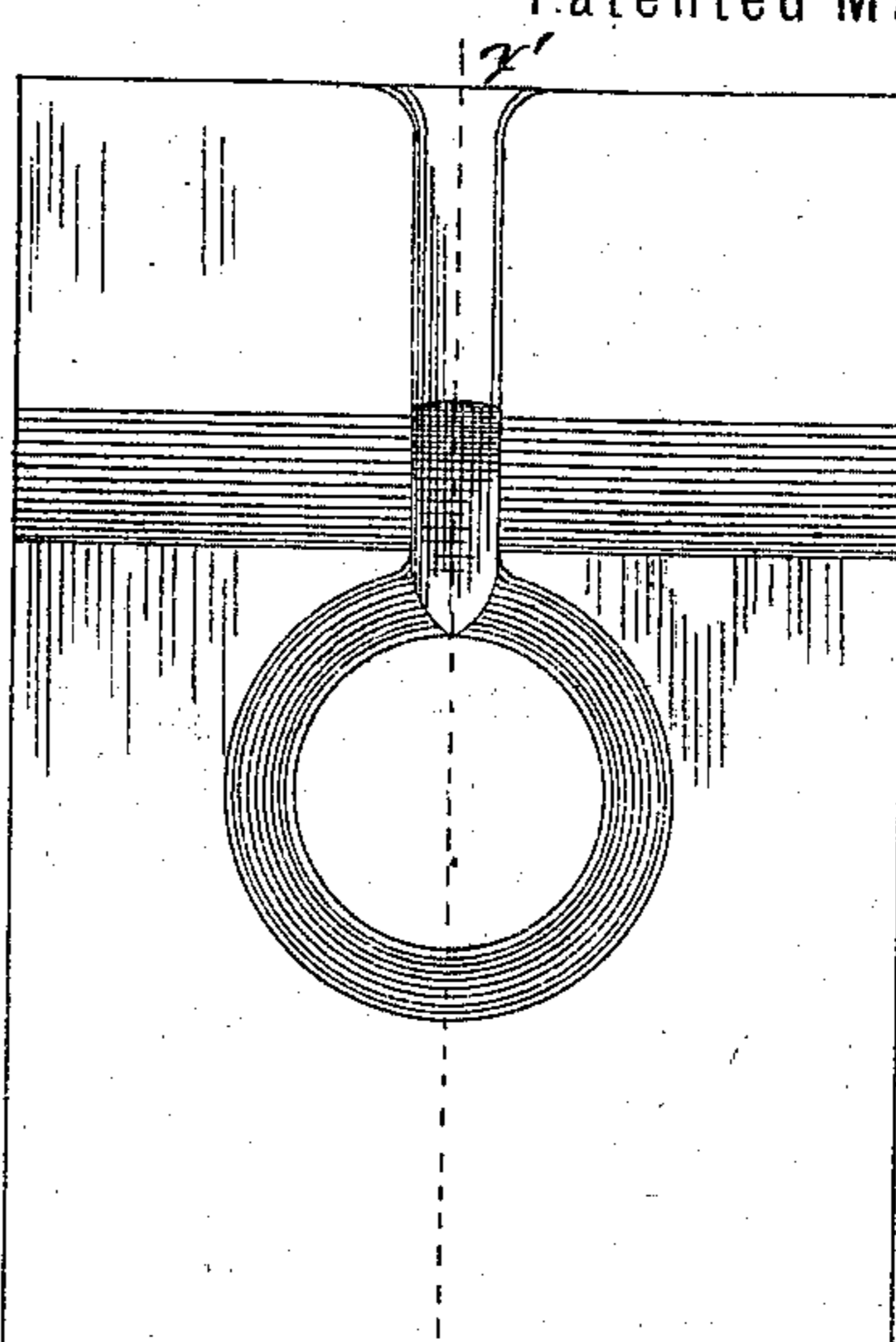


Fig. 9.

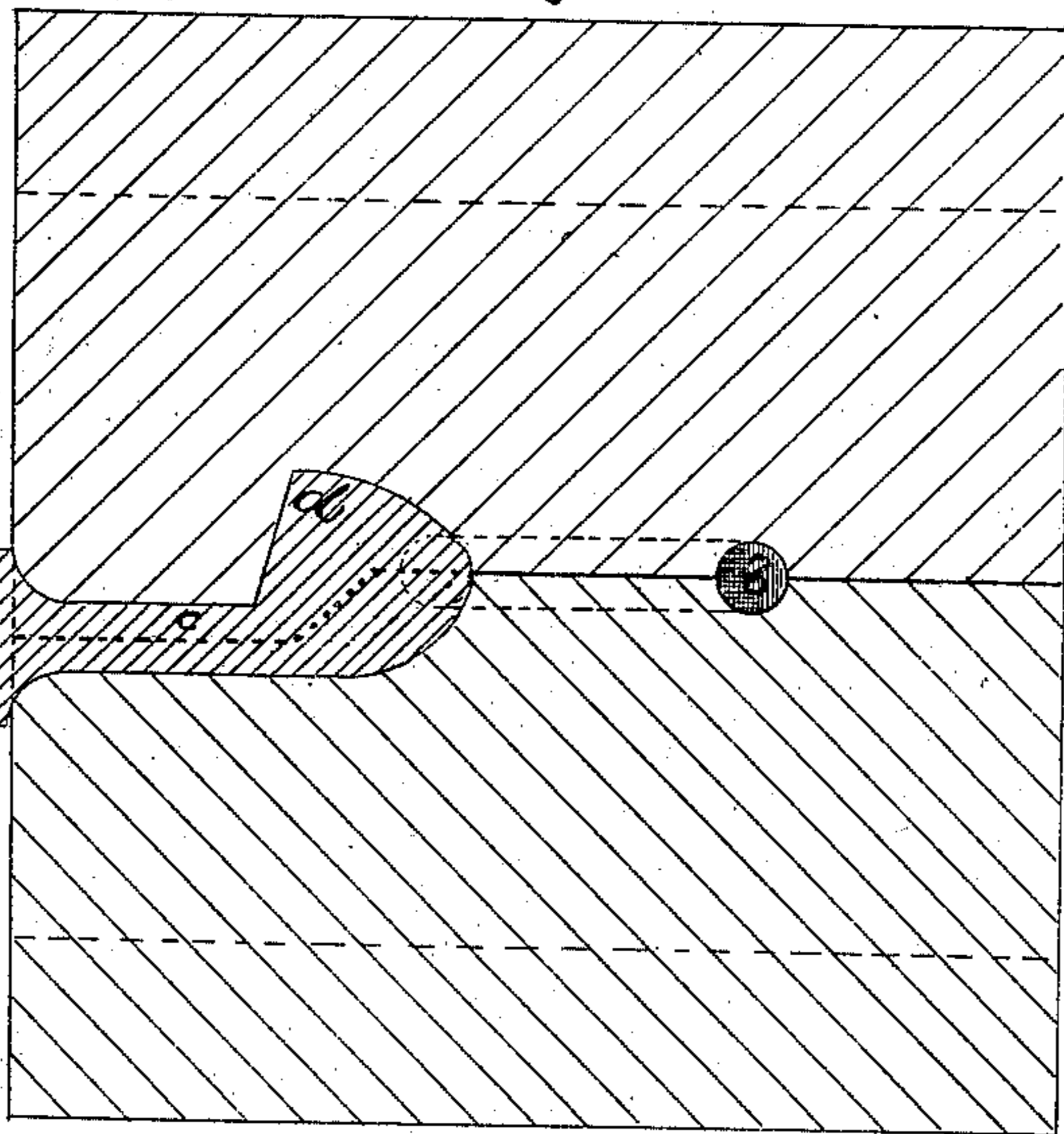


Fig. 10.

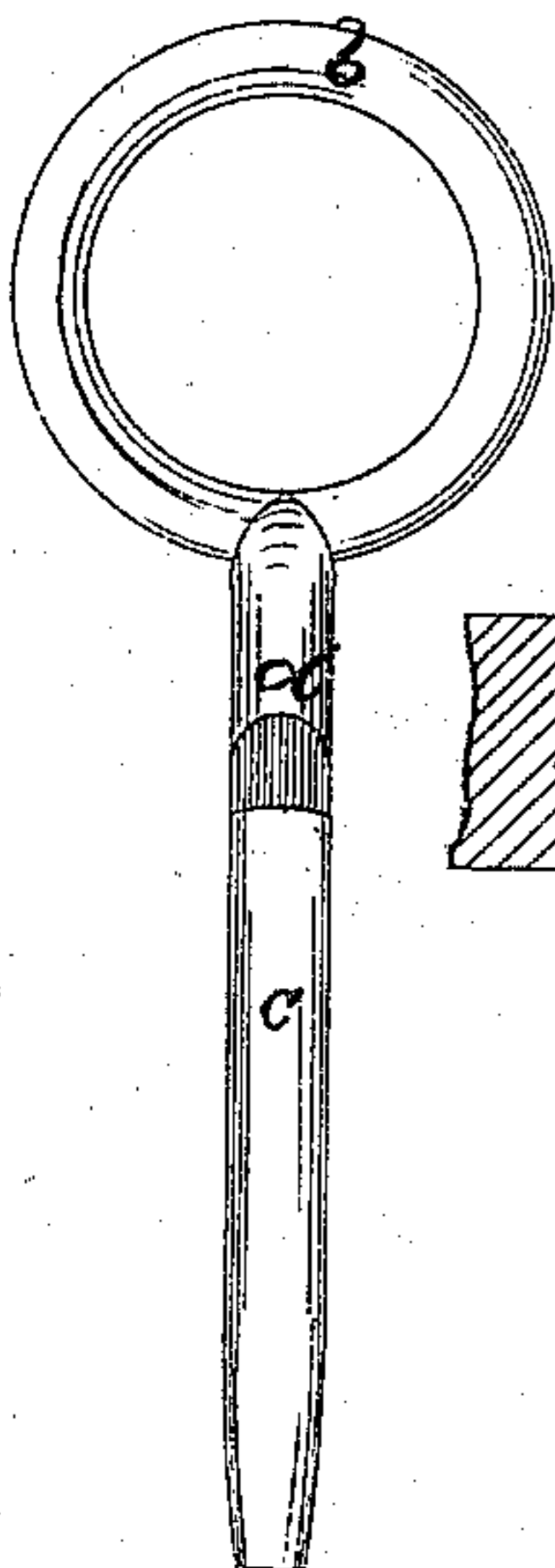


Fig. 11.

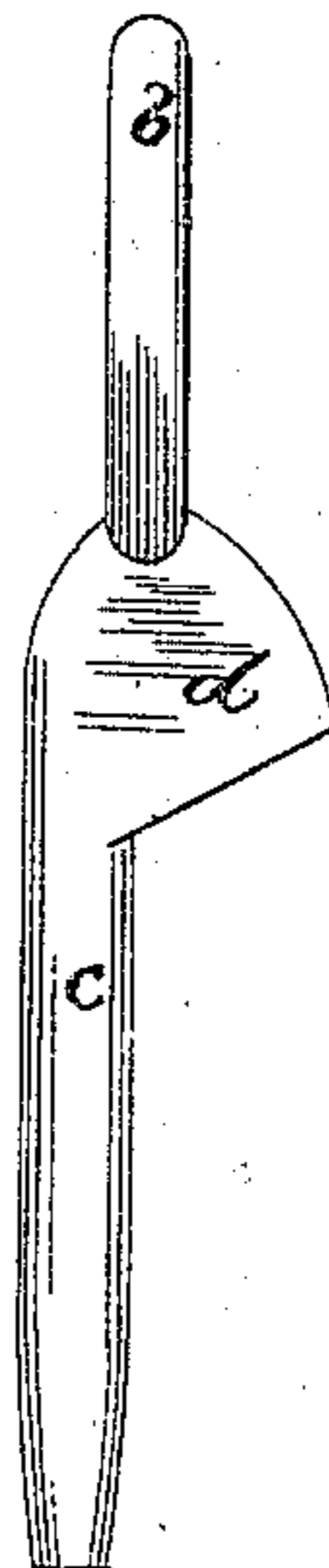
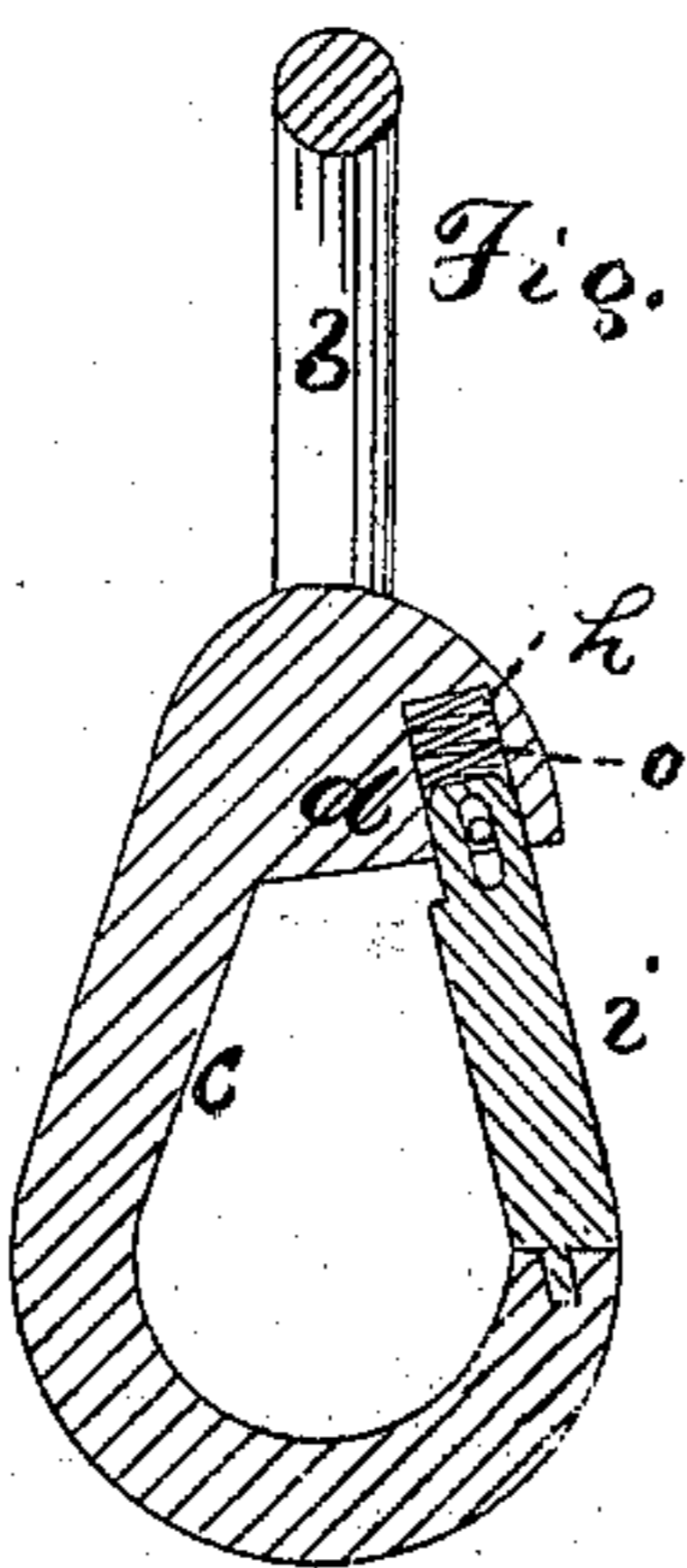


Fig. 12.



WITNESSES.

J. Pollitt  
John K. Lacy

INVENTOR.

Charles E. Billings  
By W. E. Simonds  
Atty.

# UNITED STATES PATENT OFFICE.

CHARLES E. BILLINGS, OF HARTFORD, CONNECTICUT.

## IMPROVEMENT IN DIES FOR MAKING BLANKS FOR SHIP-HOOKS.

Specification forming part of Letters Patent No. **138,471**, dated May 6, 1873; application filed March 12, 1873.

*To all whom it may concern:*

Be it known that I, CHARLES E. BILLINGS, of Hartford, in the county of Hartford and State of Connecticut, have invented certain new and Improved Dies for Making Ship-Hooks, of which the following is a specification, reference being had to the accompanying drawing, in which—

Figure 1 is a face view of the lower or under die of the first set of dies made use of. Fig. 2 is a face view of the upper die of such first set. Fig. 3 is a view of the two dies of such first set put together in vertical section, such section cutting the two dies through the plane indicated by dotted lines *x x* in Figs. 1 and 2. Fig. 4 is a side view of the dies of the first set put together, showing the side A. Fig. 5 is a flatwise view of the forging produced by the first set of dies. Fig. 6 is a view of such forging in central section through the dotted line *y y*. Fig. 7 is a face view of the under one of the second set of dies used. Fig. 8 is a face view of the upper die of the second set. Fig. 9 is a view of the two dies of the second set put together in vertical section through the dotted lines *x' x'* in Figs. 7 and 8, with a forging in the dies. Fig. 10 is a flatwise view of the forging produced by the second set of dies, with the webs cut away and the tang finished up. Fig. 11 is an edgewise view of the forging, shown in Fig. 10. Fig. 12 is a view of the complete ship-hook in central section.

The ship-hook itself is an enlarged snap-hook, very much like those used about harnesses, and is made of wrought-iron, or it may be made of steel. Heretofore these hooks have been made in separate parts, welded together, the ring being formed of one piece and welded to the body of the hook. By means of my dies I am enabled to make the ring and the body all in one piece. I use two sets of dies. The first set, with the forging produced by them, are shown in Figs. 1, 2, 3, 4, 5, and 6 on Sheet 1 of the drawing. The second set and their product are shown on Sheet 2. The

dies shown in Figs. 1 and 2 have each two matrices. The matrix *a* spreads the iron, forms the general outline of the ring *b*, partly draws down the tang *c*, and roughly forms the projection *d*. The matrix *e* strikes the forging on edge and rounds up the ring *b*. It also helps draw out the tang *c*. The metal used for swaging is in the form of a bar, and is properly heated before being subjected to the action of the dies. The dies are, by preference, worked in a drop, although they can probably be worked in a press.

The bar, after being heated, is struck up in the first set of dies, being alternately subjected to the action of the two different matrices, *a* and *e*, until the product resembles the forging shown in Figs. 5 and 6, except that it is rather rougher in appearance than these two figures represent it. At this stage there is a web of metal across the inside of the ring *b*. The forging is now again heated and struck in the second set of dies which rounds up the ring *b*, also the tang *c*, and shapes and completes the projection *d*. At this stage the forging has a thin rough web around the outside of the ring *b* and a thin web across the inside of the ring. Both these webs are cut away, and, after a final striking up in the second set of dies, the forging is finished, so far as the dies are concerned. A forging thus finished is shown between the dies in Fig. 9. The lump *f* at the end of the tang *c* is now drawn out and rounded till the product is a forging like that shown in Figs. 10 and 11, after which the hole *h* is drilled and broached, the tang bent around into the shape shown in Fig. 12, the tongue *i* and spring *o* supplied, and the hook is complete.

I claim as my invention—

The two several sets of dies set forth and described.

CHARLES E. BILLINGS.

Witnesses:

WM. E. SIMONDS,  
JOHN K. SAX.