

(No Model.)

C. B. MORSE.

Device for Swaging Cylindrical Bodies.

No. 238,421.

Patented March 1, 1881.

Fig 1.

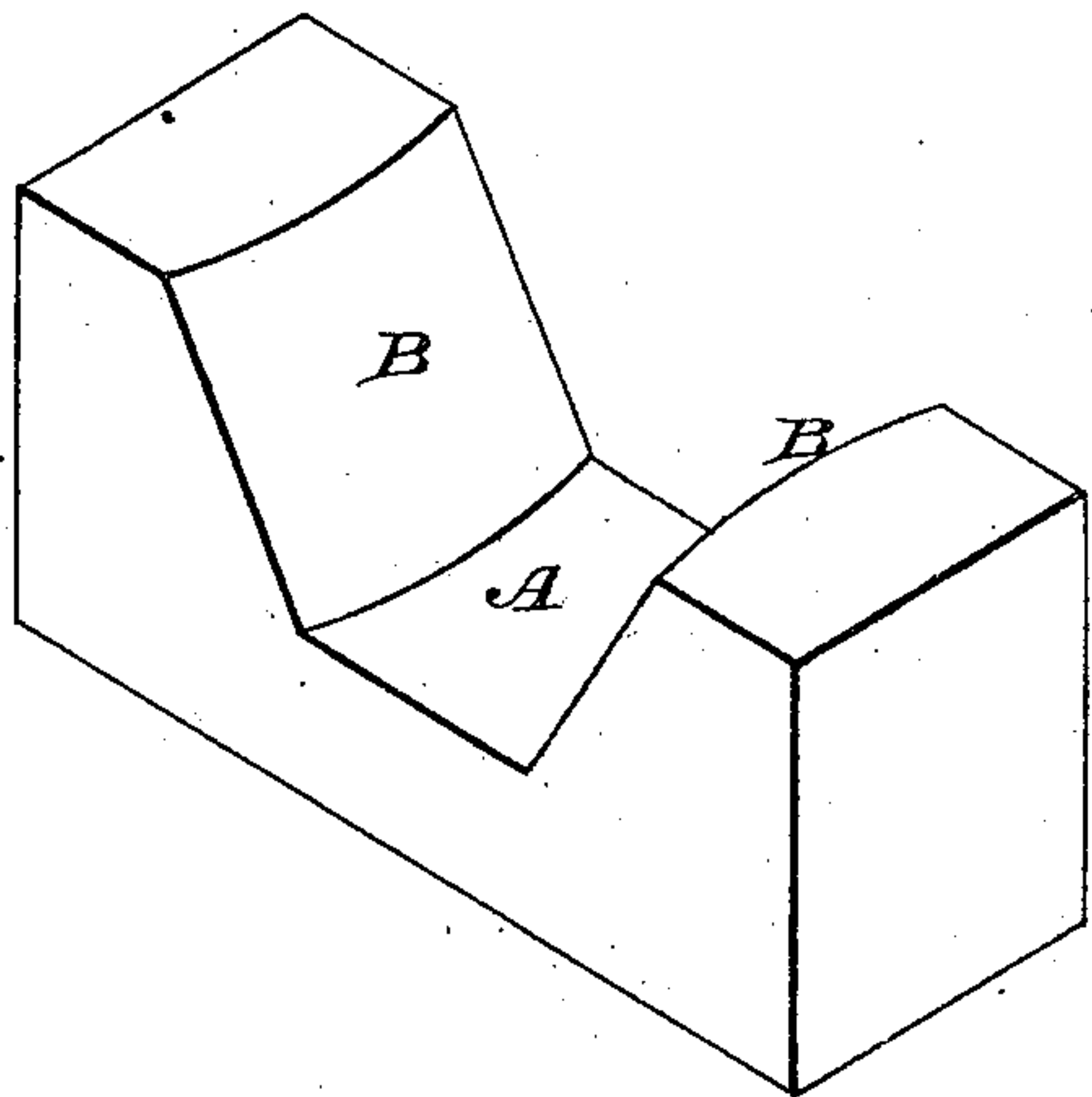


Fig 2.

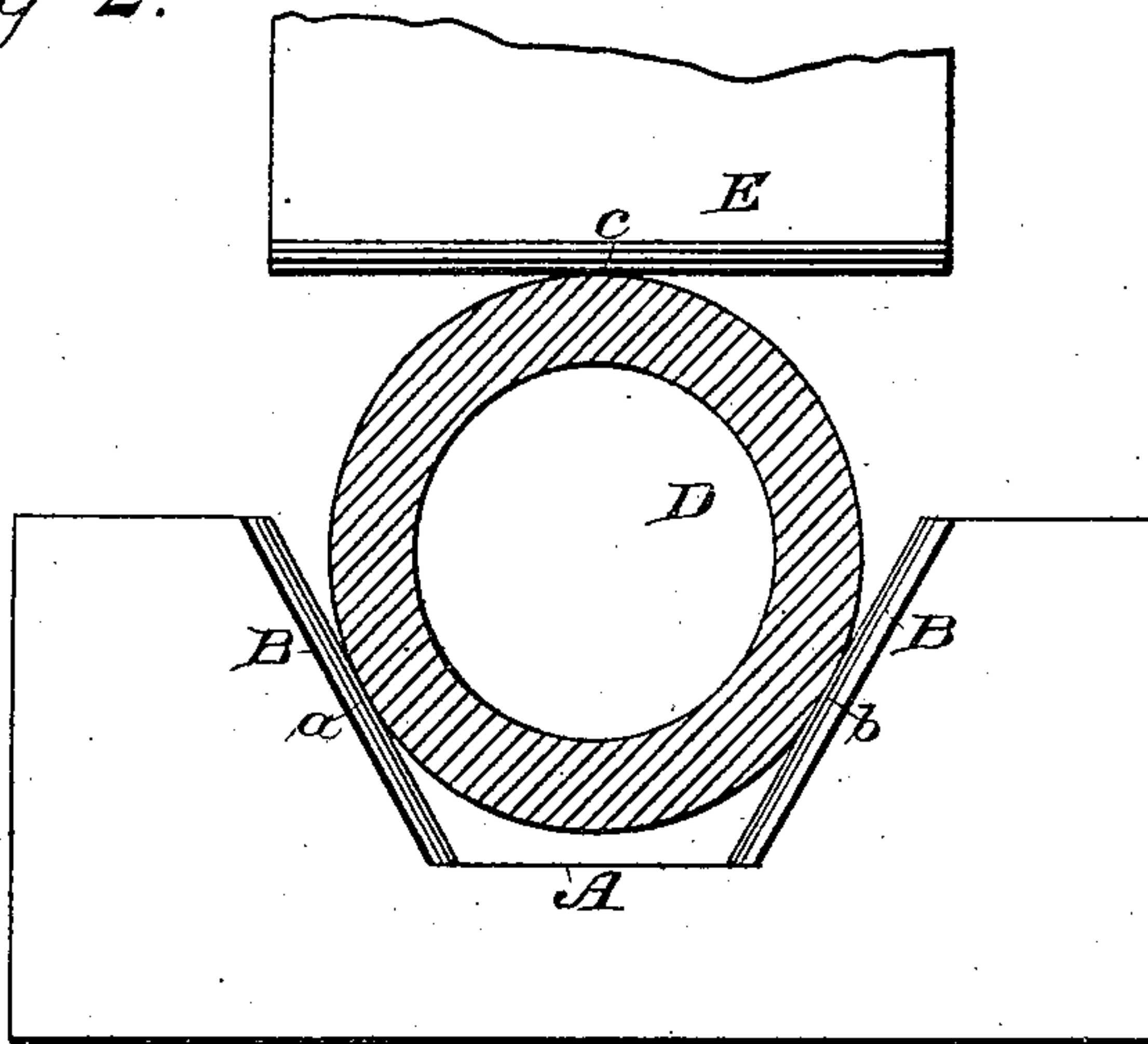


Fig 3.

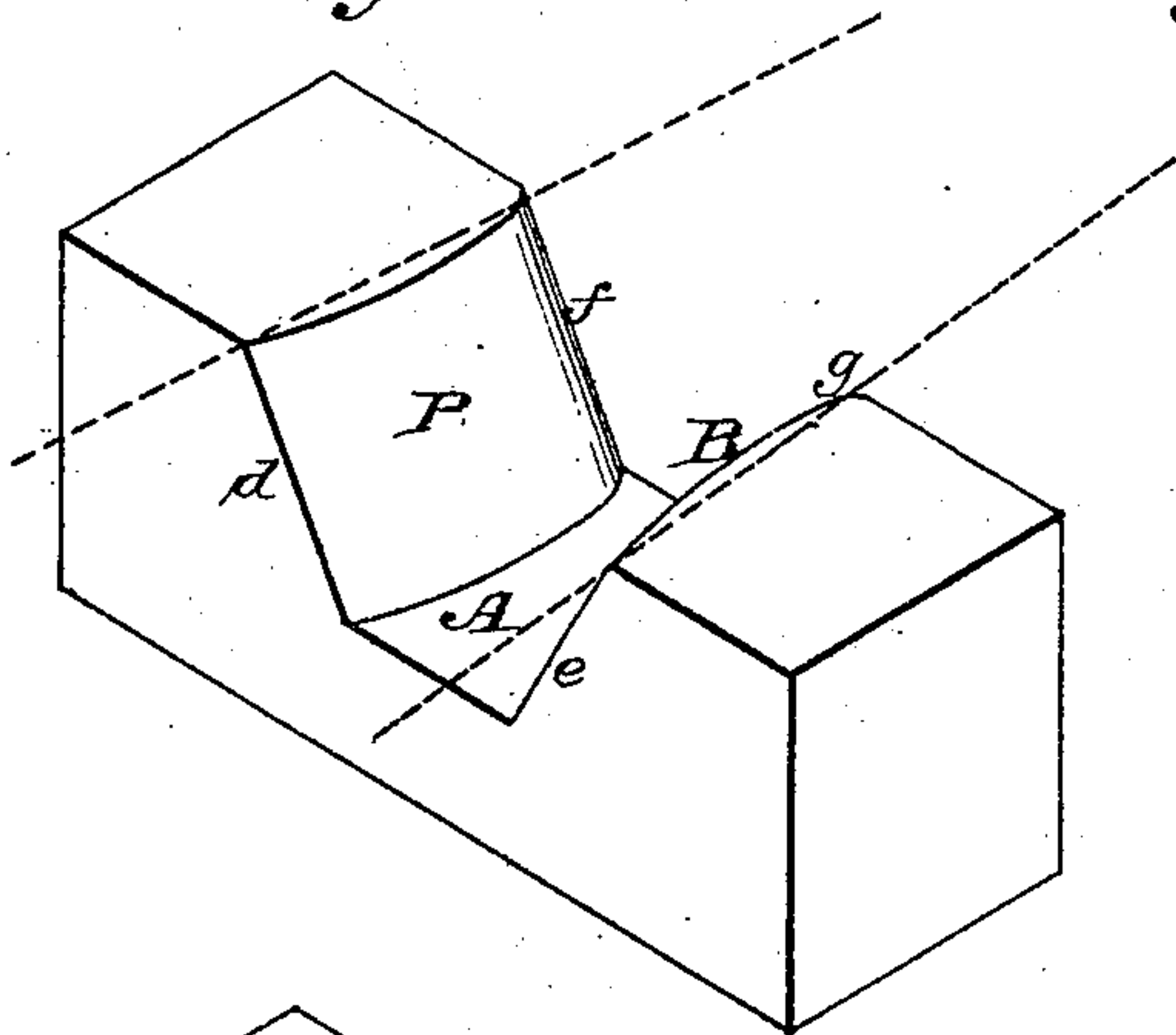


Fig 4.

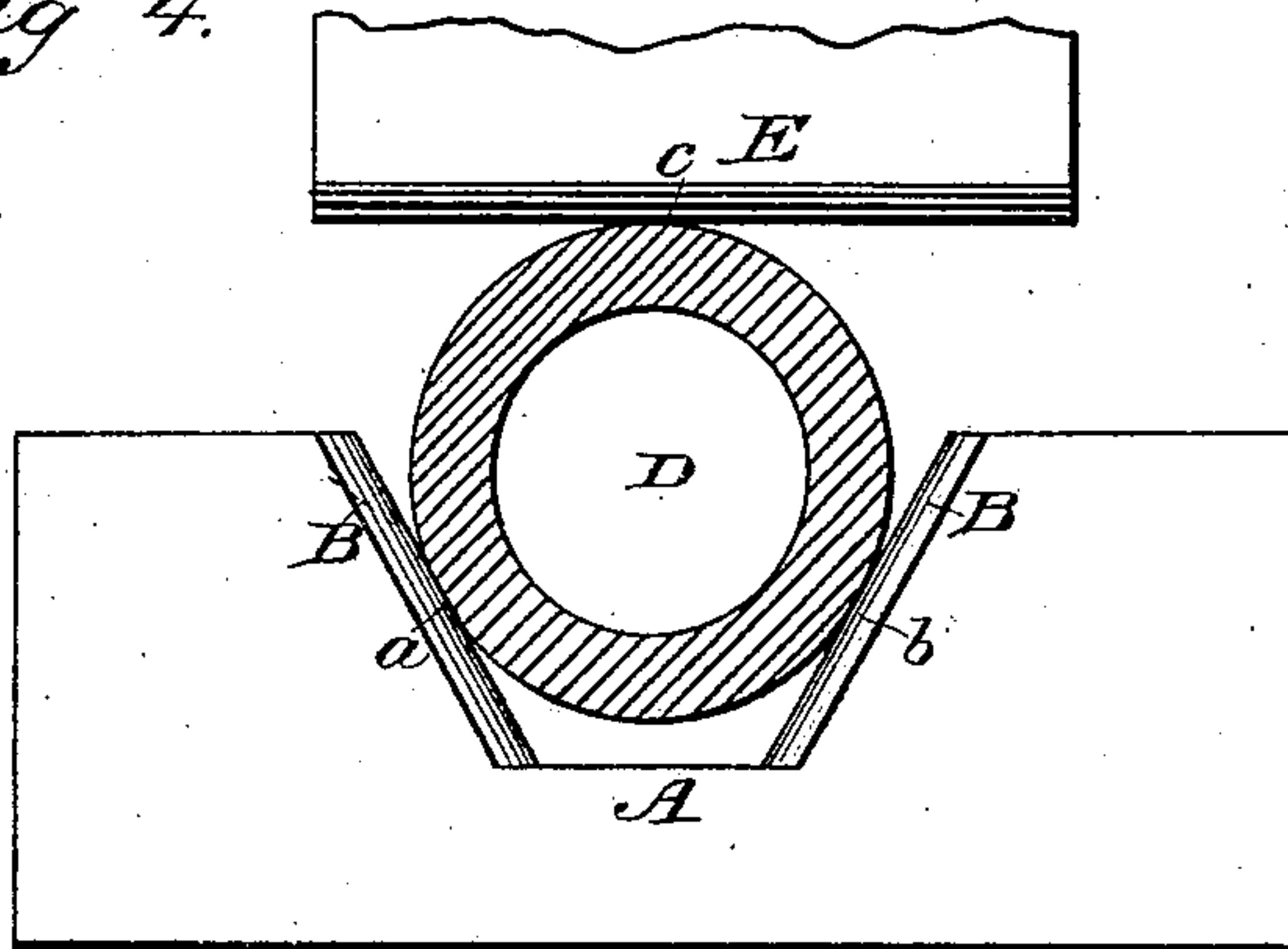


Fig 5.

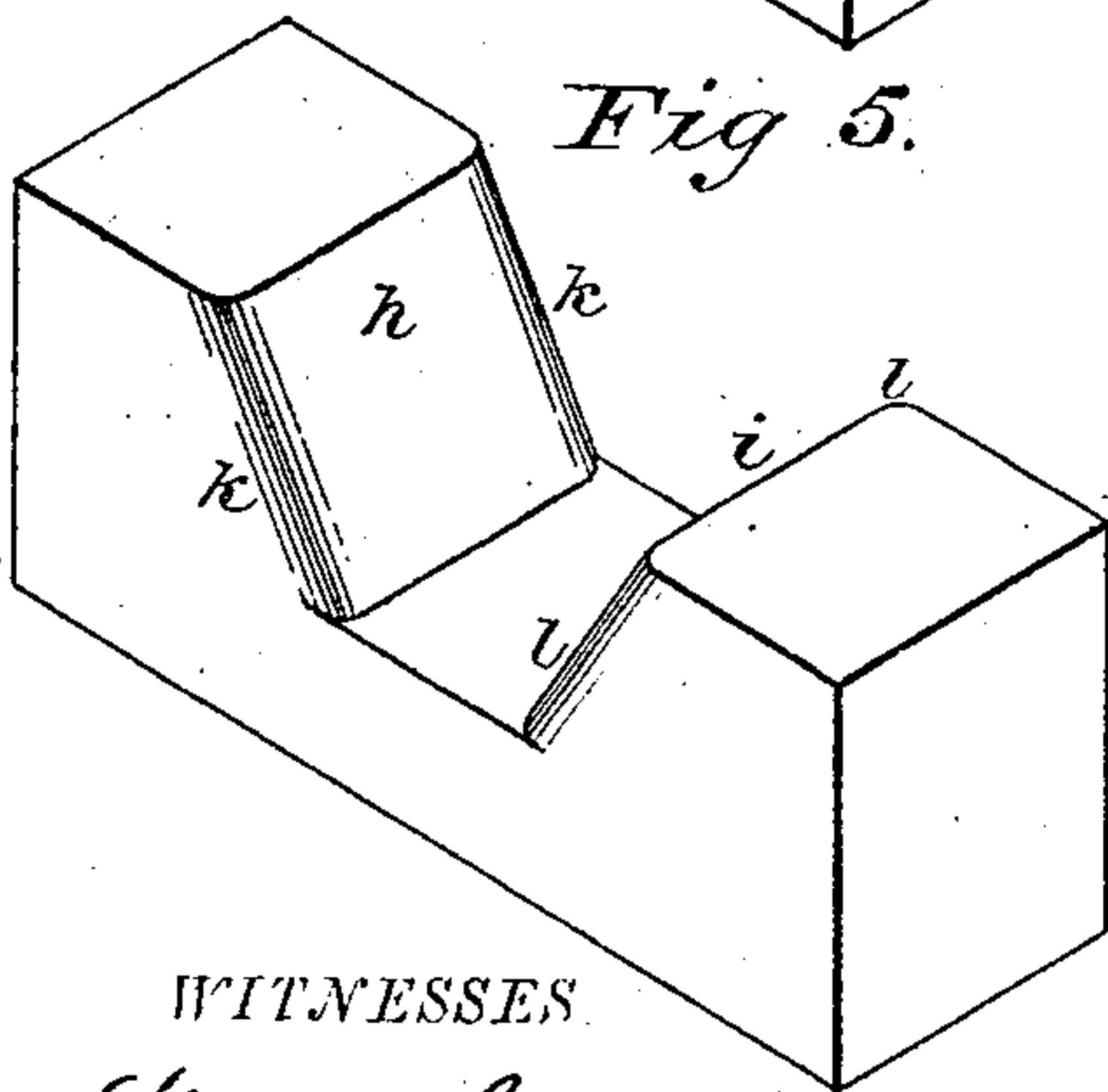
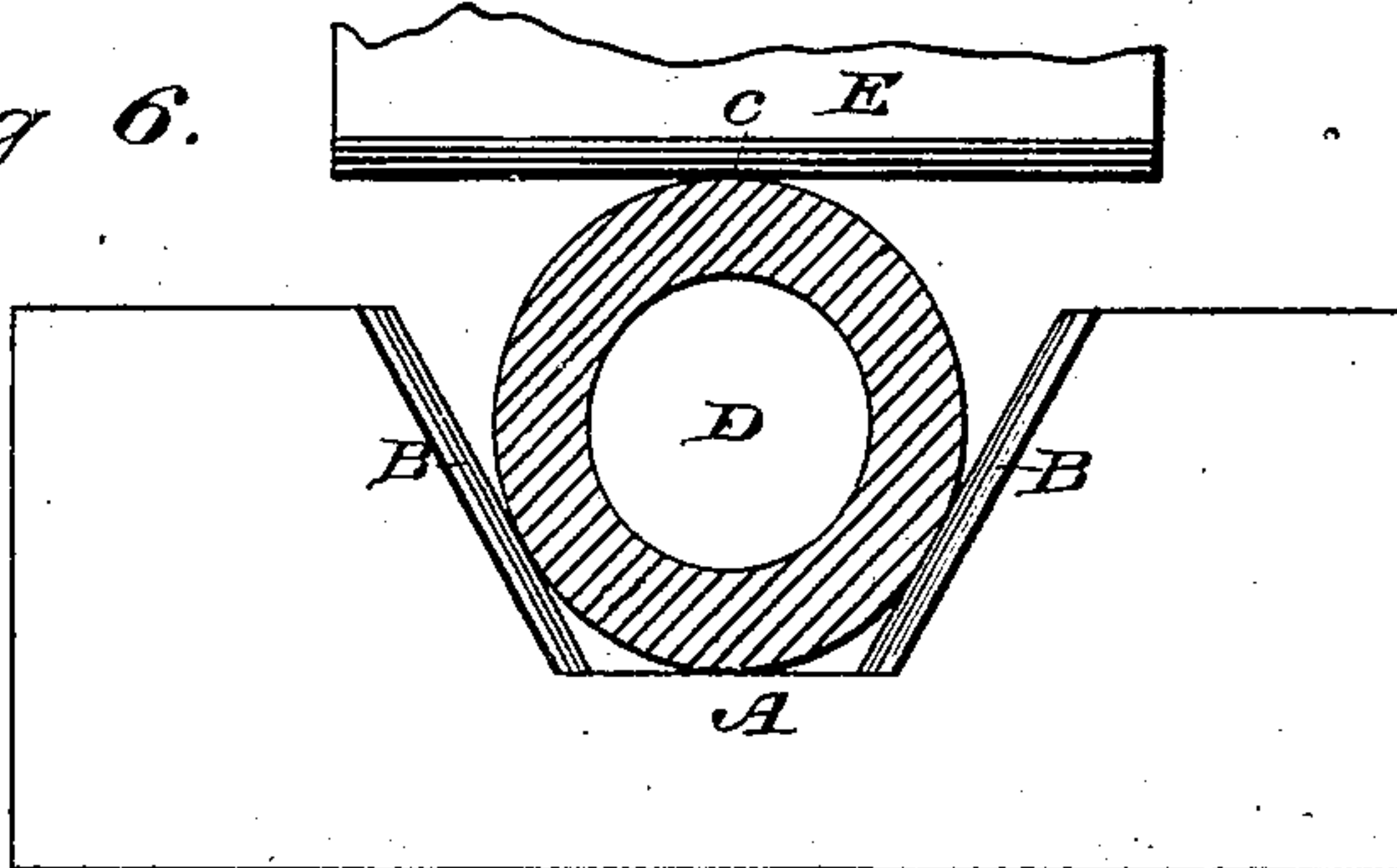


Fig 6.



WITNESSES

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UNITED STATES PATENT OFFICE.

CYRUS B. MORSE, OF RHINEBECK, NEW YORK.

DEVICE FOR SWAGING CYLINDRICAL BODIES.

SPECIFICATION forming part of Letters Patent No. 238,421, dated March 1, 1881.

Application filed November 2, 1880. (No model.)

To all whom it may concern:

Be it known that I, CYRUS B. MORSE, of Rhinebeck, in the county of Dutchess and State of New York, have invented certain new and useful Improvements in Methods and Appliances for Swaging, Reducing, and Elongating Tubular or Cylindrical Bodies, of which the following, in connection with the accompanying drawings, is a specification.

The object of my invention is to overcome the difficulties hitherto experienced in swaging or hammering metallic tubular, annular, or hollow cylindrical bodies for the purpose of elongating or reducing them in diameter without changing their cylindrical shape or disturbing the equal thickness of the metal at opposite points of the structure. Rings, tubes, or hollow ingots hammered over a mandrel on a common anvil can be reduced and drawn out, although with considerable difficulty, but without an inner support they cannot be thus worked.

In order to accomplish the object of my invention, I employ peculiarly-shaped anvil-blocks having three-sided recesses, and such conformation that I can successfully reduce and draw out hollow tubes or ingots with or without mandrels, and readily secure an equal and uniform thickness of metal, and uniform strength and elasticity at all points.

In the accompanying drawings, Figure 1 represents a perspective view of my improved anvil having the horizontal face A and the two convex faces B B, inclined at an angle of about sixty degrees. This form is intended to be used to reduce and elongate parallel-sided tubes or hollow cylindrical ingots.

Fig. 2 is a side elevation of an anvil, represented in Fig. 1, showing a tube or cylindrical ingot, D, in place ready to be swaged, reduced, or elongated by the hammer E. It will be observed that there are three equidistant points of contact, *a*, *b*, and *c*, of the tube with the hammer and anvil, and the result is, in operation, that the circular form of the tube or ingot being swaged will be preserved and the thickness of the metal will be kept uniform. After each blow the tube or ingot should be rotated slightly, either by hand or by machinery, so that the points of contact with the anvil and hammer shall be constantly changed. If

the interior of the tube or ingot be supported by a fitting mandrel, the tube will be drawn out or elongated uniformly and equally. In varying the diameter of the structure at different points by swaging it, the same result is secured, and the thickness of the metal may be regulated, as desired, in any part.

Fig. 3 shows a form of anvil intended for swaging tapering tubes or ingots, as indicated in the dotted lines. It only differs from the anvil shown in Fig. 1 by presenting a wider opening upon the front side, at *d e*, than at the rear, *f g*, the two convex inclined faces B B diverging accordingly.

Fig. 4 is a front elevation of the anvil represented in Fig. 3, showing a tube or hollow ingot in position to be swaged under the hammer.

Fig. 5 shows a form of anvil differing from that shown in Fig. 1 only in having flat parallel faces *h i* and convex or rounded corners *k l*.

Fig. 6 shows an elevation of the anvil represented in Fig. 5, with a finished tube in place under the hammer, the tube having been reduced until it touches the horizontal face A of the anvil.

The illustrations embraced in Figs. 3 to 6, inclusive, present more minor modifications in the form of my recessed anvil, adapting it for special purposes, without departing from its substance or essential principle, which is to provide it with a three-sided recess of suitable size and surface conformation to do the work required. When a mandrel is used the metal will be closed tightly around it, and in order to loosen it readily I raise the structure out of contact with the anvil, when a slight hammering will serve to loosen the mandrel at once. The face of the hammer in each instance should correspond substantially with the convex inclined sides of the anvil used, as in Figs. 2, 4, and 6.

Instead of constructing anvils in the forms described, I might use ordinary horizontal-faced anvils and construct recessed hammers of the form specified; but it is preferable to employ recessed anvils and plane-faced hammers.

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

1. The method of reducing and elongating

5 tubular annular or hollow cylindrical bodies by supporting them at two points in a recessed anvil, as described, and operating upon them by a hammer at a third point, the three contact-points being equidistant, and the tubular body being slightly rotated after each blow, substantially as described.

2. The recessed anvil having two faces inclined at an angle of about sixty degrees,

whereby a blow from a hammer upon a cylindrical body in the recess will affect the body at three equidistant points simultaneously in the swaging operation, substantially as set forth. 10

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Witnesses:

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