

J. WHYSALL, Jr. & C. M. MERRICK.

MODE OF FINISHING HORSESHOE NAIL BLANKS.

No. 176,911.

Patented May 2, 1876.

Fig 1.

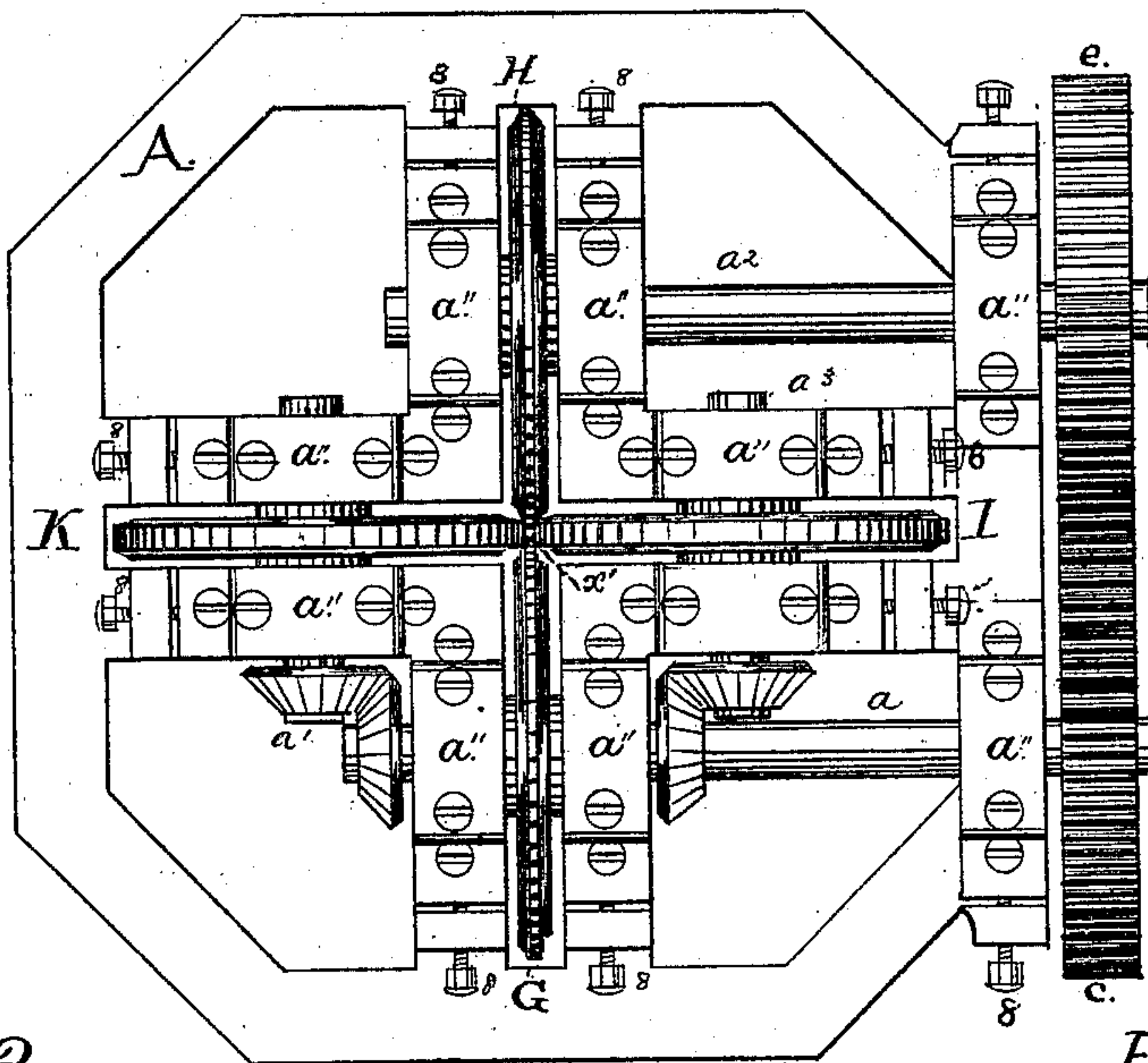


Fig: 3.

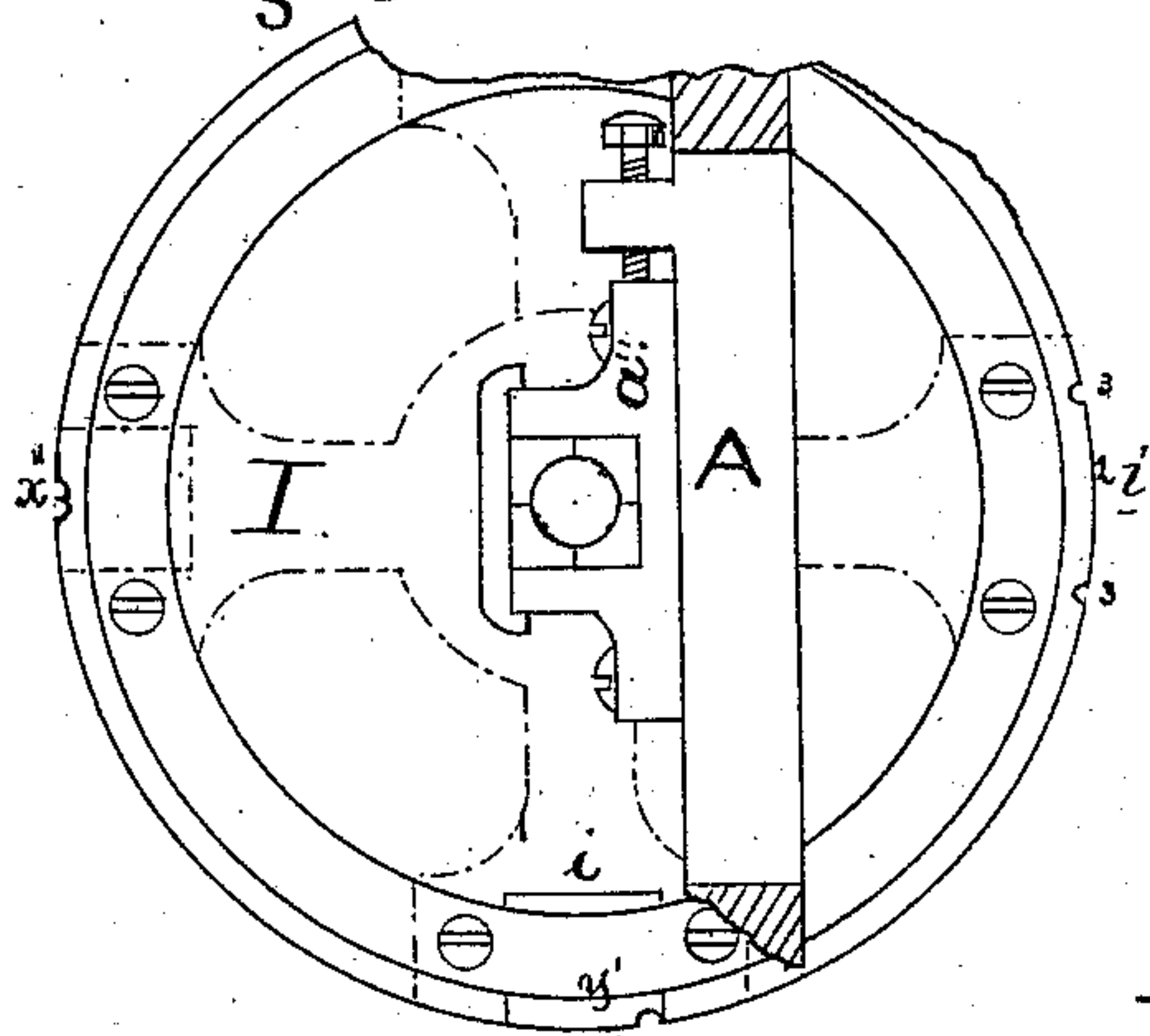


Fig: 2.

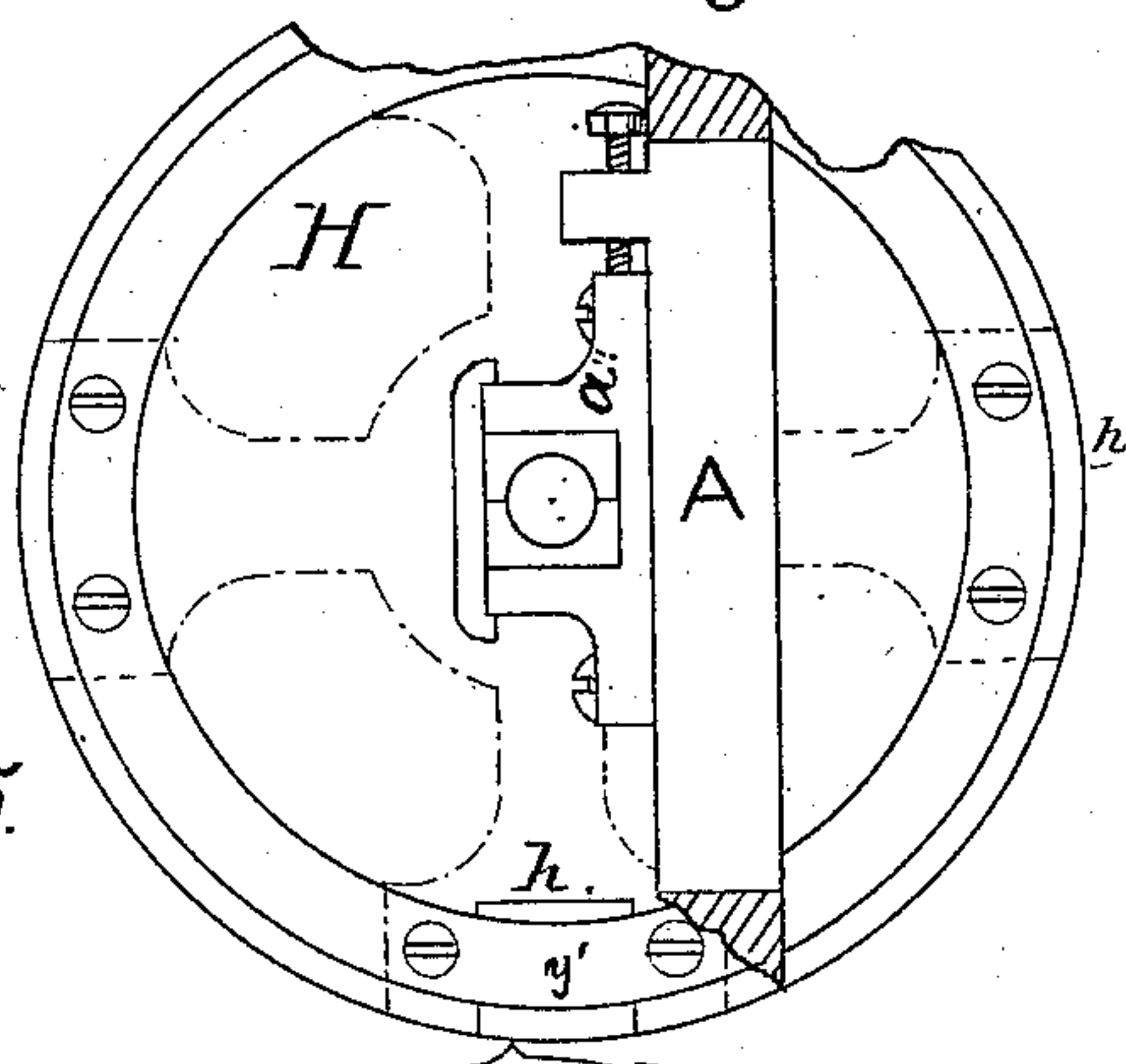


Fig. 5.

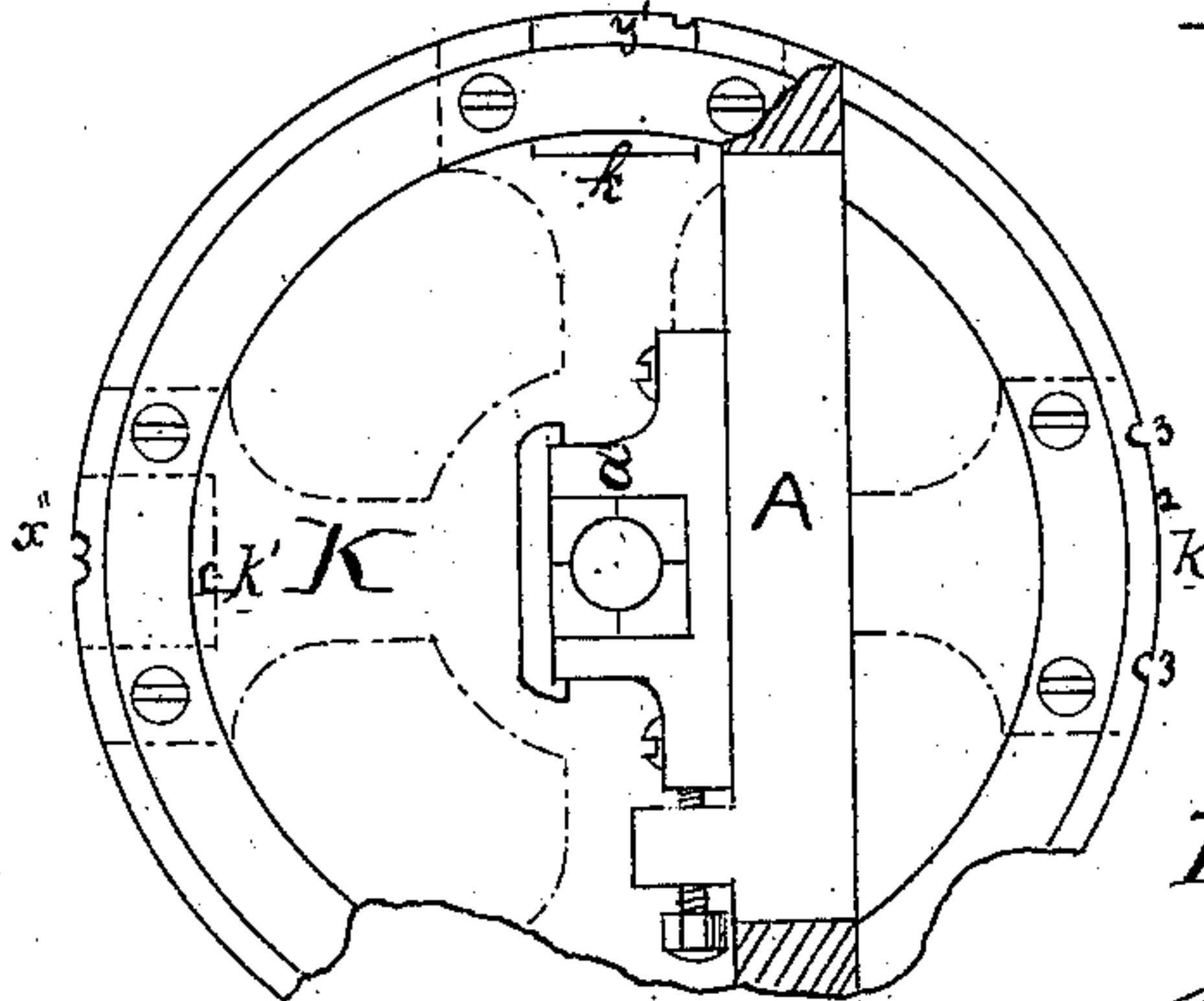
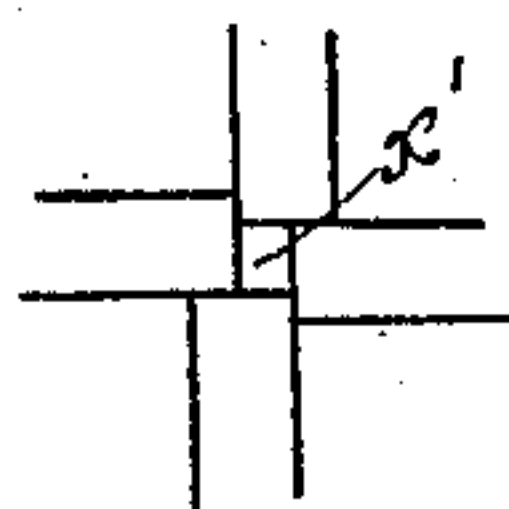
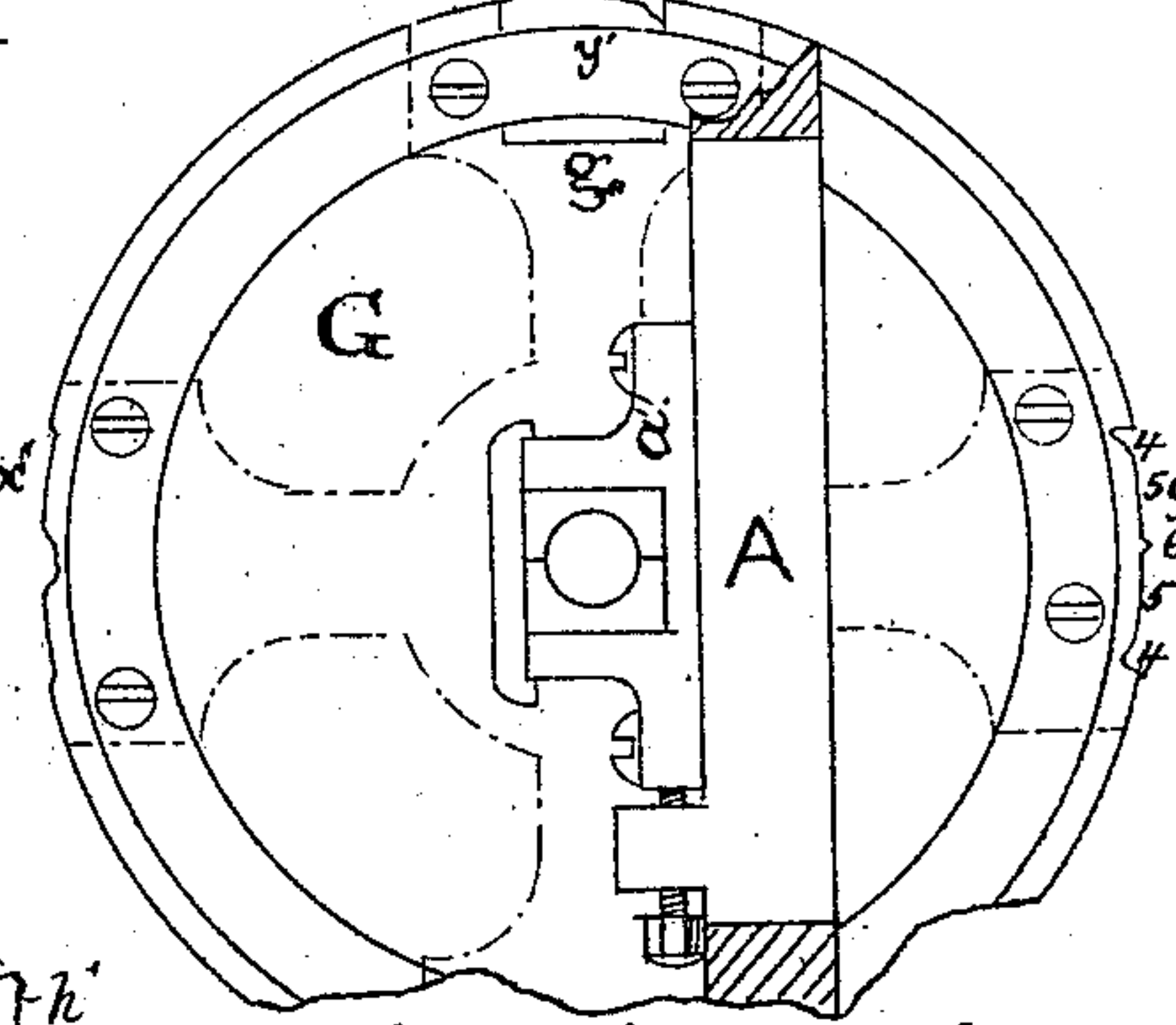
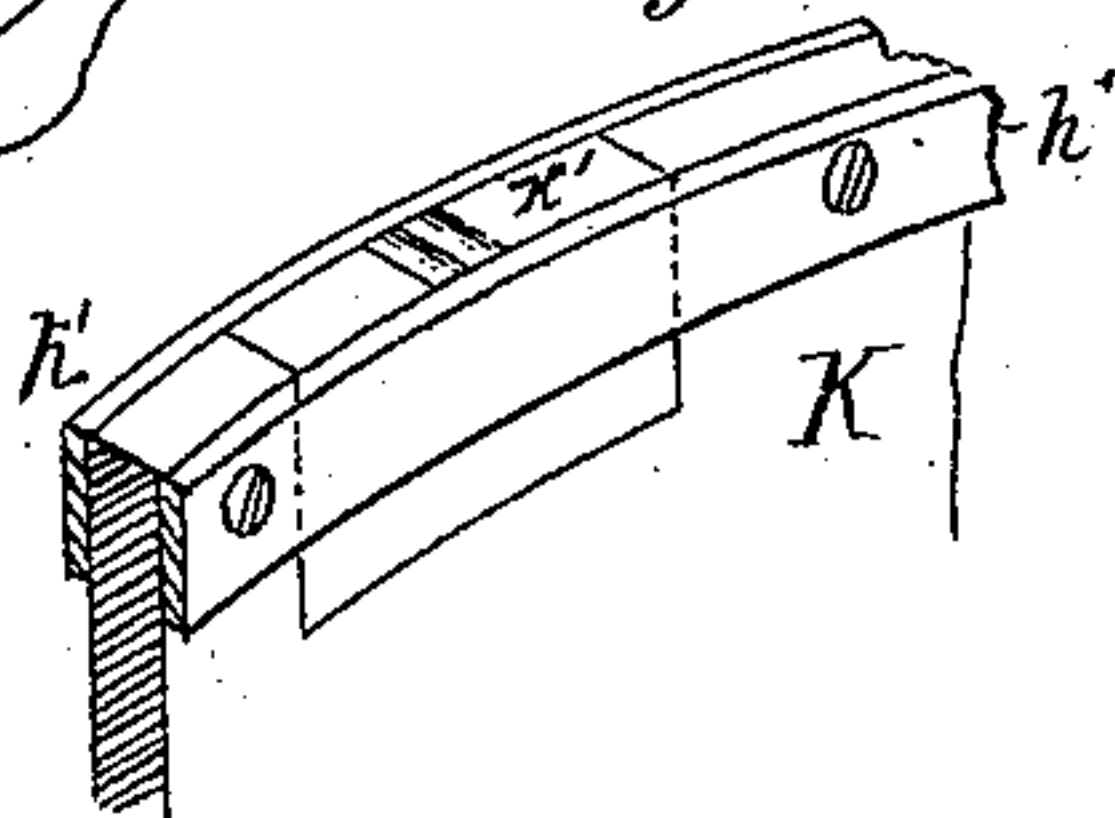


Fig. 4.



Witnesses:

Courtney A. Cooper.
George Thom.



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By their atty.
Charles V. Foster

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Fig. 6. Fig. 7. Fig. 8.

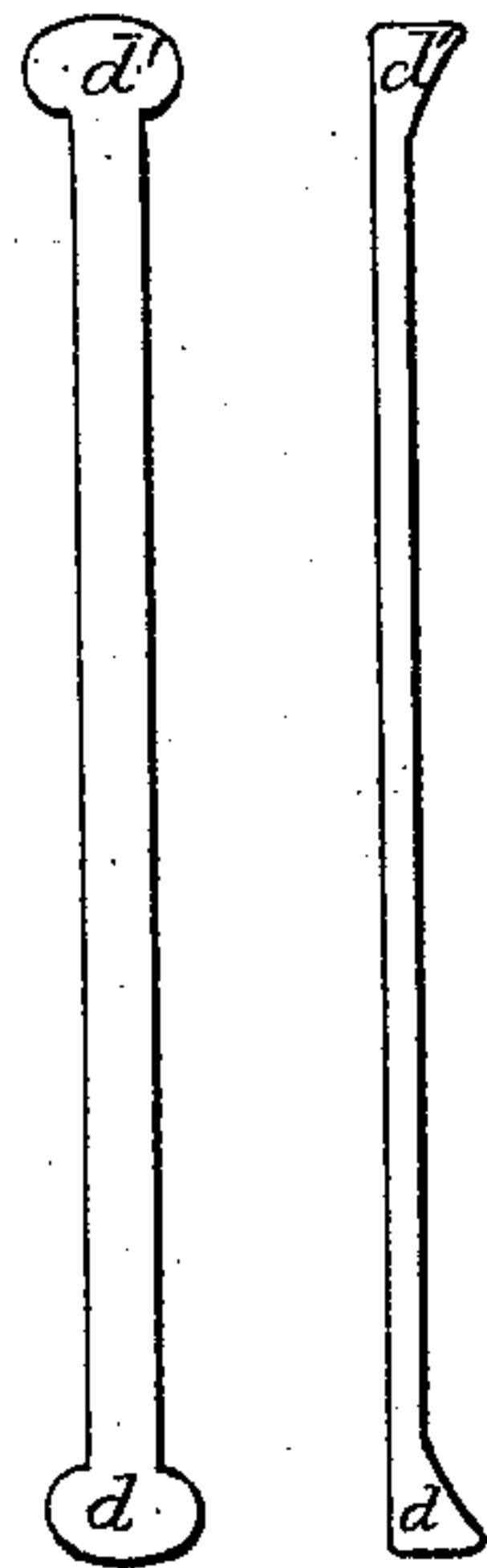


Fig. 9.

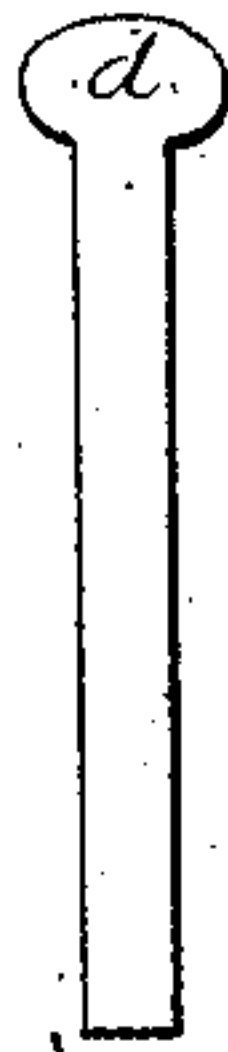


Fig. 10.

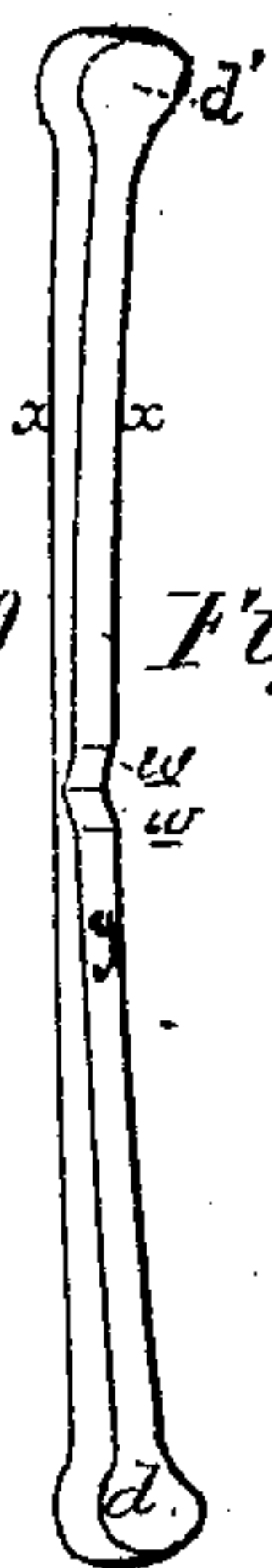


Fig. 11.

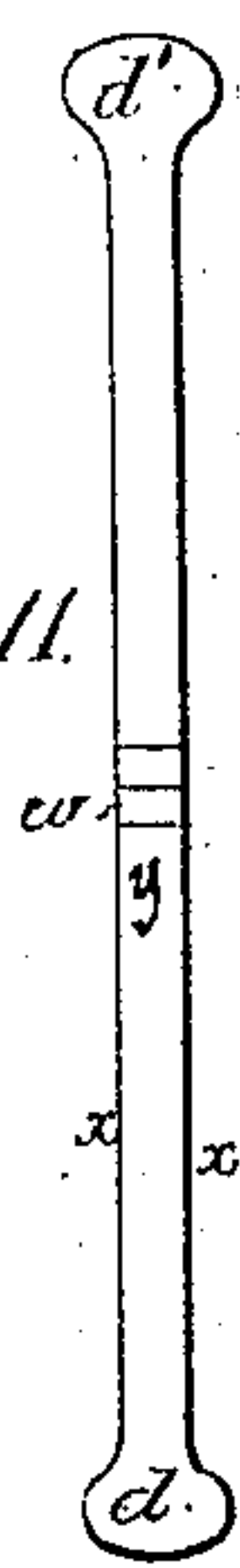


Fig. 12.



Fig. 13.

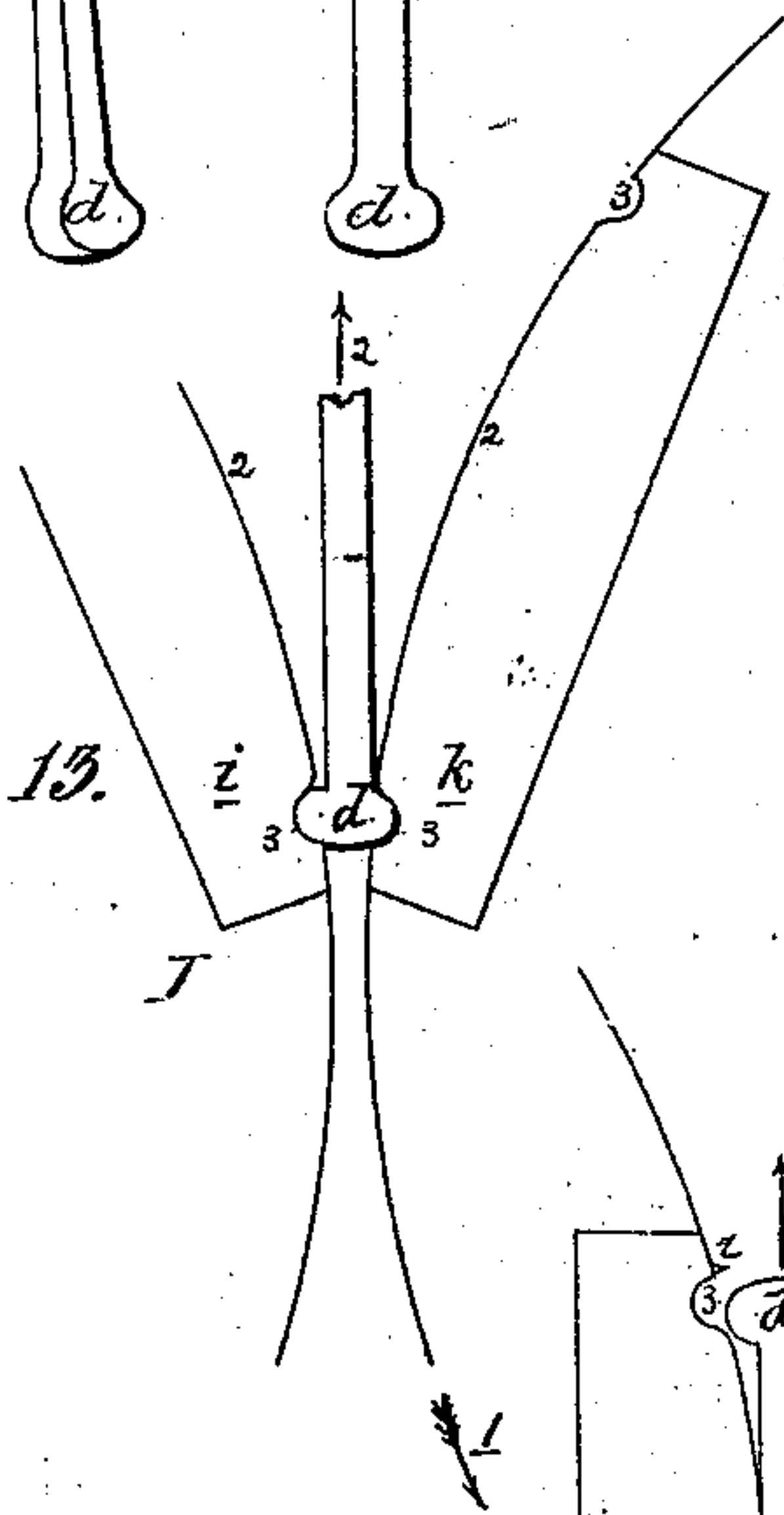


Fig. 15.

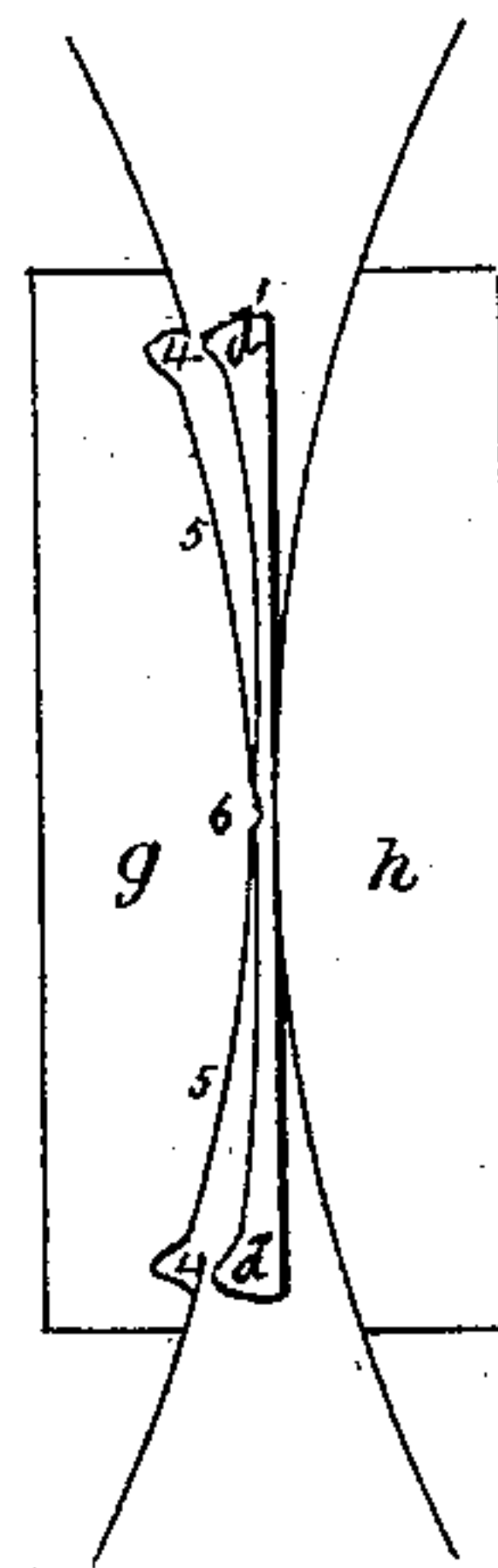
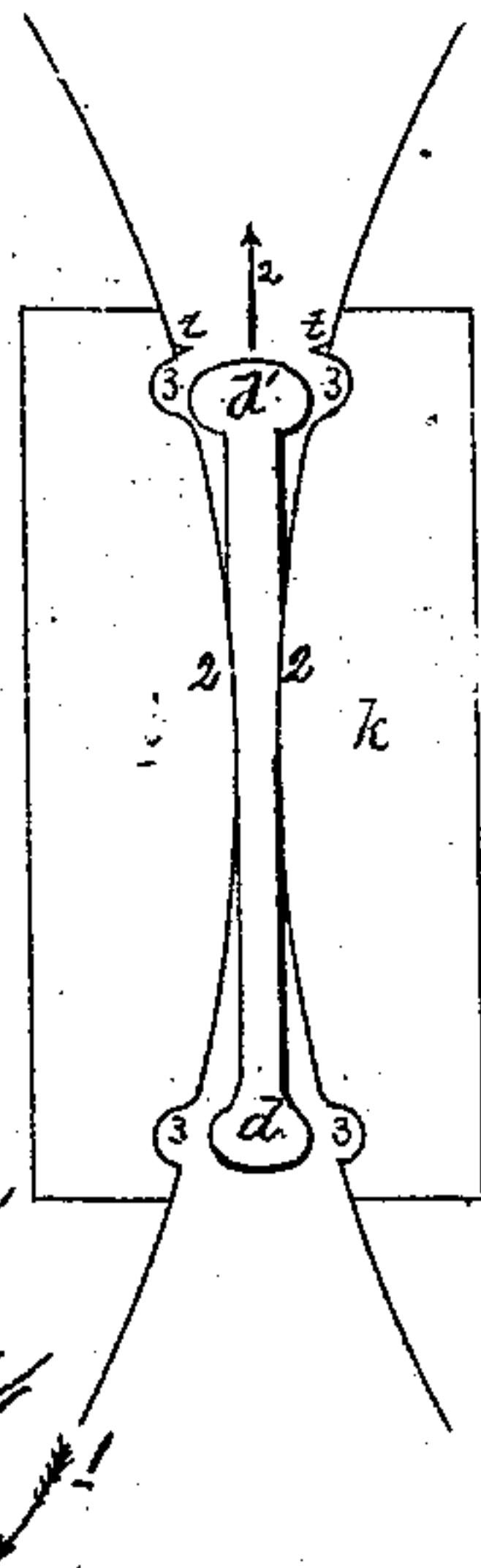


Fig. 14.



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UNITED STATES PATENT OFFICE.

JOB WHYSALL, JR., AND CHARLES M. MERRICK, OF NEW BRIGHTON, PA.

IMPROVEMENT IN MODES OF FINISHING HORSESHOE-NAIL BLANKS.

Specification forming part of Letters Patent No. **176,911**, dated May 2, 1876; application filed February 25, 1876.

To all whom it may concern:

Be it known that we, JOB WHYSALL, Jr., and CHARLES M. MERRICK, of New Brighton, Beaver county, Pennsylvania, have invented certain Improvements in the Manufacture of Horseshoe-Nails, &c., of which the following is the specification:

The object of our invention is to operate upon a partly-formed nail-blank, and condense, planish, and fashion the same, so that when superfluous metal is removed, by a subsequent shearing operation, a finished nail of the desired shape will be produced.

In the accompanying drawing, Figure 1 is a plan view illustrating mechanism we employ for carrying out our invention; Figs. 2 and 3, side elevations of the dies and carriers; Fig. 4, a detached perspective view, partly in section; Fig. 5, a diagram showing a modification; Figs. 6 to 9, views illustrating blanks of different forms; Figs. 10 to 12, views illustrating the finished blanks and the completed nail; and Figs. 13 to 15 diagrams illustrating the different stages in the process of finishing.

A is the frame of the machine, which may be suitably constructed in any manner to support the bearings of four shafts, $a^1 a^2 a^3$, geared together and arranged in pairs, preferably at right angles to each other. To the shafts are secured disks or segments G H I K carrying dies, the edges of which meet either in the manner shown in Fig. 1, or as shown in the diagram, Fig. 5, the object being to inclose a rectangular or other shaped space, x' , smaller in area than the blank transversely, through which the latter must pass. Four dies, $g h i k$, are required for operating simultaneously upon a blank, and are secured in the respective carriers G H I K, as described hereafter, so as to simultaneously approach each other.

The forms of the dies depend upon the form of the blank to be finished. In the diagrams we have shown them constructed to operate upon a "double" or "twin" blank, Fig. 6—that is, a blank with two heads or enlargements, $d d'$, at the opposite ends, constituting the heads of two nails when the blank is divided. To operate upon a blank of this form each die $i k$ is cut away at the edge to form two recesses, 3 3, and a curved edge, 2, coinciding in form with one side, x , of the finished

nail-blank, Figs. 10 and 11. The edge of the die h is of a uniform curve throughout, and that of the die g has two recesses, 4 4, two curved edges, 5 5, and a double inclined projection, 6, coinciding with the face y of the finished blank.

Fig. 13 illustrates the blank in the act of entering the machine, its lower head d in a position to enter the opposite recesses 3 3. The rotation of the disks I K in the direction of the arrow 1 carries the blank downward through the opening x' , and as said opening is smaller than the transverse area of the blank, the latter is condensed and elongated, the superfluous metal being either condensed or forced or "drawn" upward in the direction of the arrows 2, Figs. 13 and 14, the upper head of the blank being formed into the head d' in the second set of recesses 3 3, and cutters $t t$ being arranged on the edges of the disk to cut off the superfluous metal.

During the above operations the lower head d was shaped at the front by the inclined face of the recess 4, Fig. 15, in the die g , the thickness of the blank was gradually reduced toward the center from each end, and an indentation made in the center by the projection 6, without spreading the blank, forming two beveled faces, $w w$, which, when the blank is subjected to the final shearing operation to impart the taper to the nails, constitutes the beveled portion w' at the end of the latter; Fig. 12.

By the above operations the partly-formed blank is condensed, reduced in size transversely, planished, and the proper form imparted thereto with great rapidity and certainty, the condensation of the metal imparting greater strength to the nail, especially at the beveled point, where the metal is condensed to the greatest extent, and where the greater density is requisite.

To operate upon twin blanks of the form shown in Fig. 8, recesses in the edges of the dies must be shaped as shown at x'' in Figs. 3 and 4, and when a single blank, Fig. 9, is to be operated on, the dies are of the forms shown at y' , the operations being the same in all cases. When the blanks are to be completed in a separate machine the dies may be formed to impart to the blanks the shape required at

any one of the series of operations to which the blanks are subjected.

In order to secure the proper adjustment of the dies the boxes *a'' a''* of the shafts are attached adjustably to the frame, screws 8 bearing against the boxes and imparting the requisite adjustment.

It will be apparent that several dies, suitable to operate upon blanks of different forms, may be secured to each carrier, as shown, and that reciprocating segmental die-carriers may be substituted for rotating carriers. The dies consist of plates or blocks of steel or other material, *k'*, fitted into recesses in the carriers, Fig. 4, in which they are secured by plates or rings *h' h'* clamped to the carriers by screws at opposite sides, and bearing against the dies, which are slightly thicker than the carriers, to insure their contact with the clamping-plates.

Although we have shown and described certain forms of blanks which may be finished by our improved process, it will be apparent that blanks of other forms may be operated upon to produce a partially-completed or finished blank or nail—as, for instance, blanks made of round wire. We do not claim the production of square nails from wire, however, as it will form the subject of a separate application for Letters Patent.

We claim—

1. The mode of reducing horseshoe-nail blanks by rolling the partly-formed blanks while cold, jointly with the mode described of executing said rolling operation—that is to say, by means of four converging die-rolls acting simultaneously upon the four sides of the blank, substantially as set forth.

2. The mode described of forming the beveled face upon a partly-formed horseshoe-nail blank—that is, by subjecting the blank to the action of converging rolls acting simultaneously on all the faces of the blank, and confining it at all sides, while a projection on one of the dies imparts the beveled face without spreading or forcing the metal into a permanent recess, as set forth.

3. In finishing nails for horseshoes, the process of beveling the points by indenting and condensing the metal without spreading in dies that close upon the metal on all sides, and then removing the superfluous parts, thereby forming a nail with a solid, dense, beveled point, as set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

JOB WHYSALL, JR.
C. M. MERRICK.

Witnessed:

CHARLES E. FOSTER,
COURTNEY A. COOPER.