

J. H. Vickers,

Latch.

No. 103819.

Patented May 31, 1870.

Figure 1.

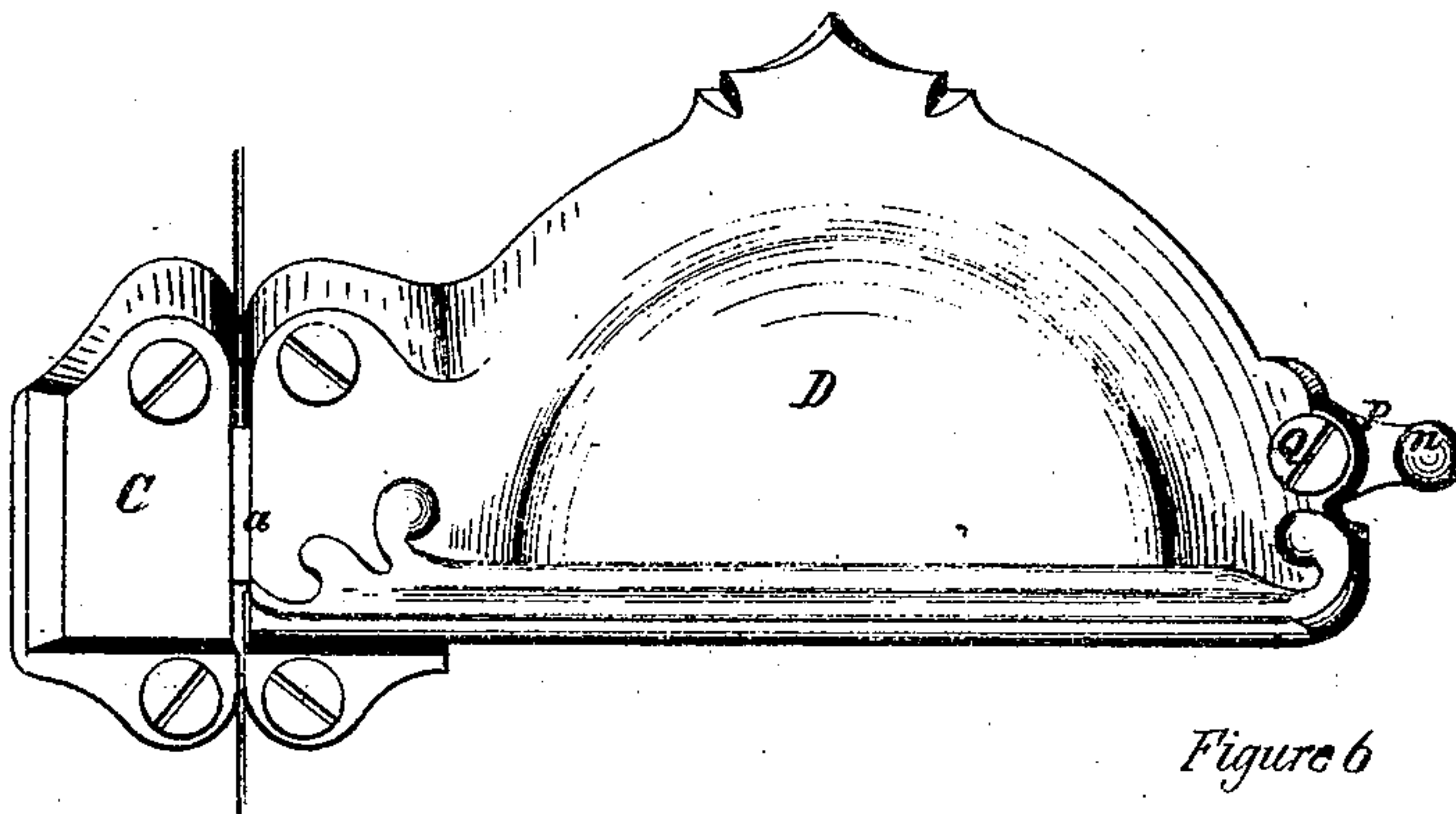


Figure 6

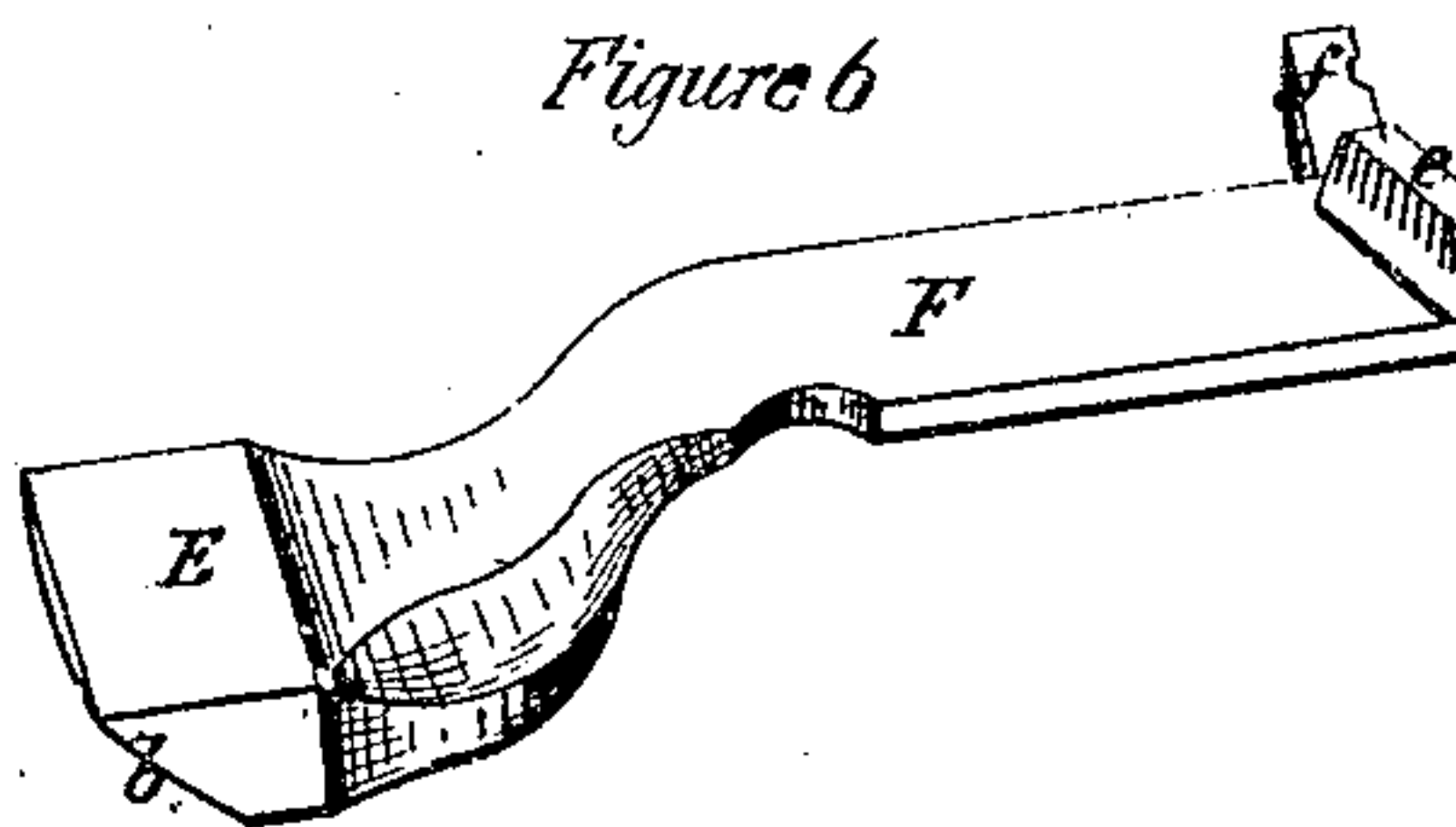


Figure 2

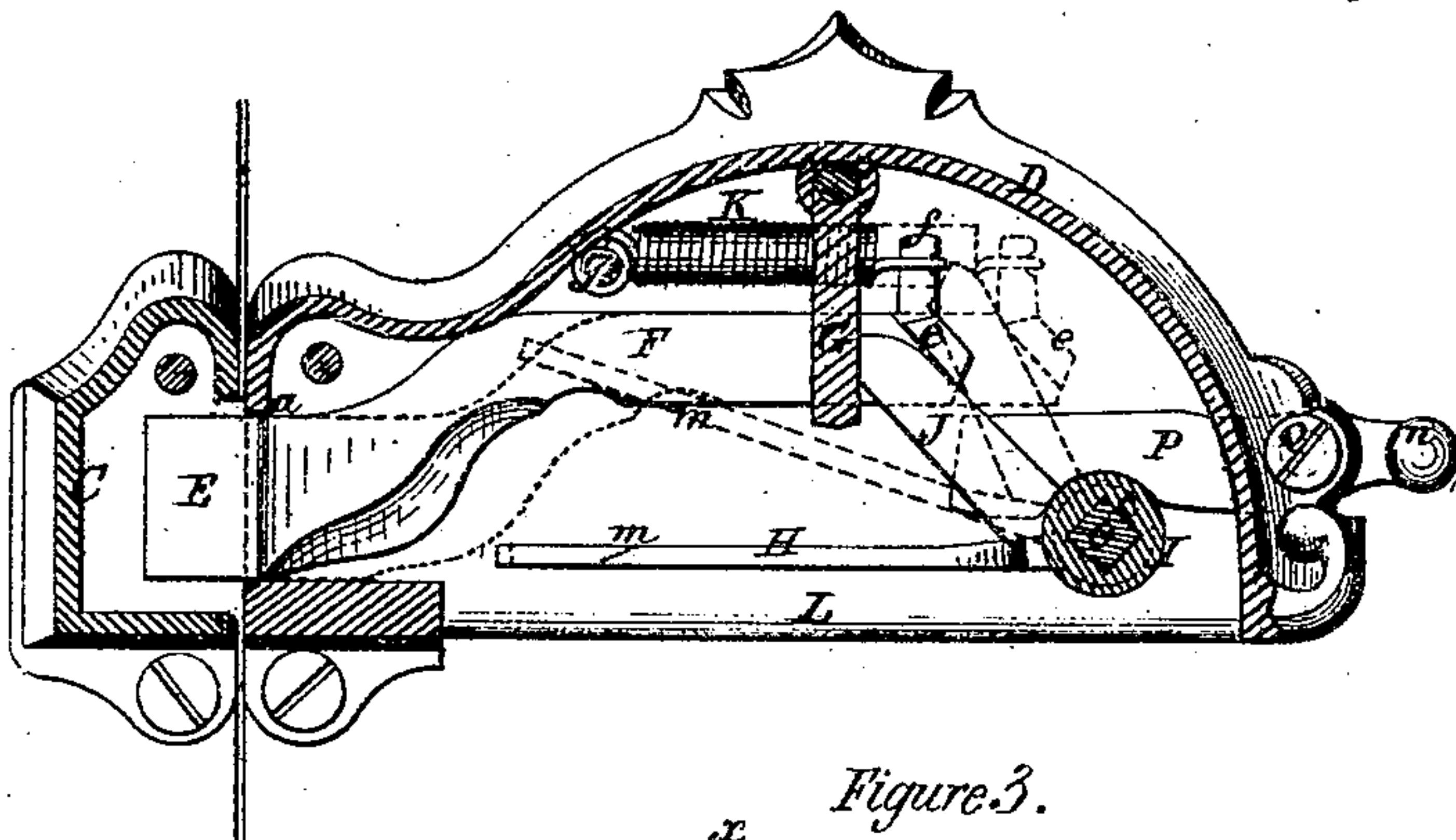


Figure 5.

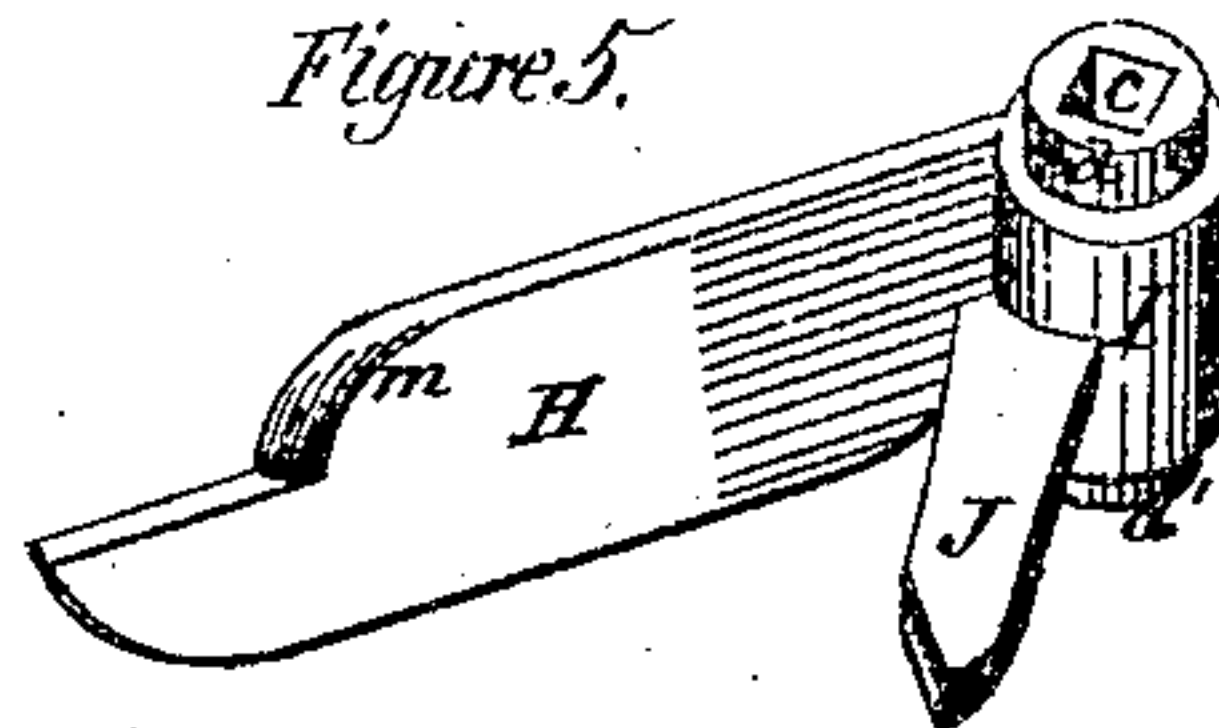


Figure 4.

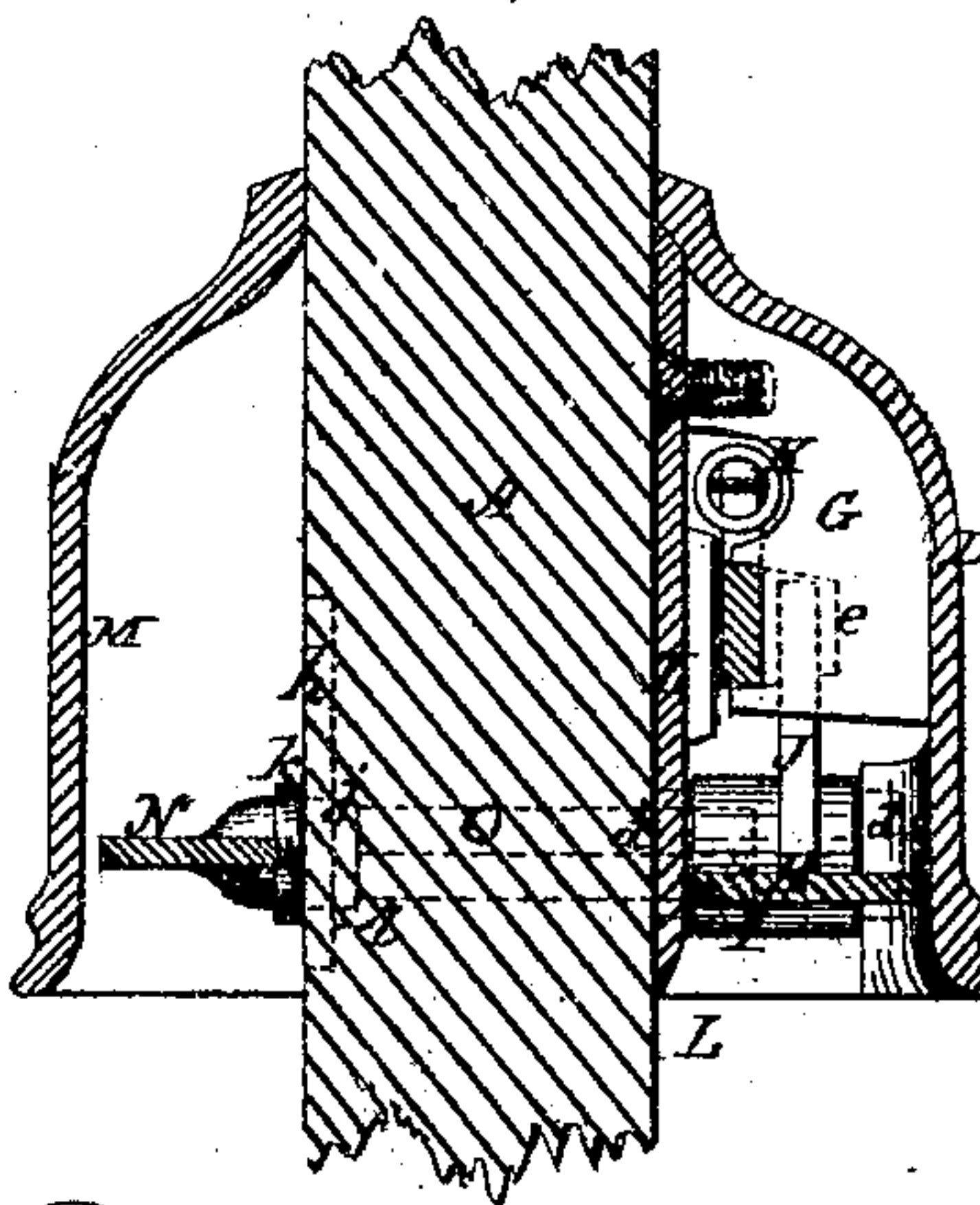
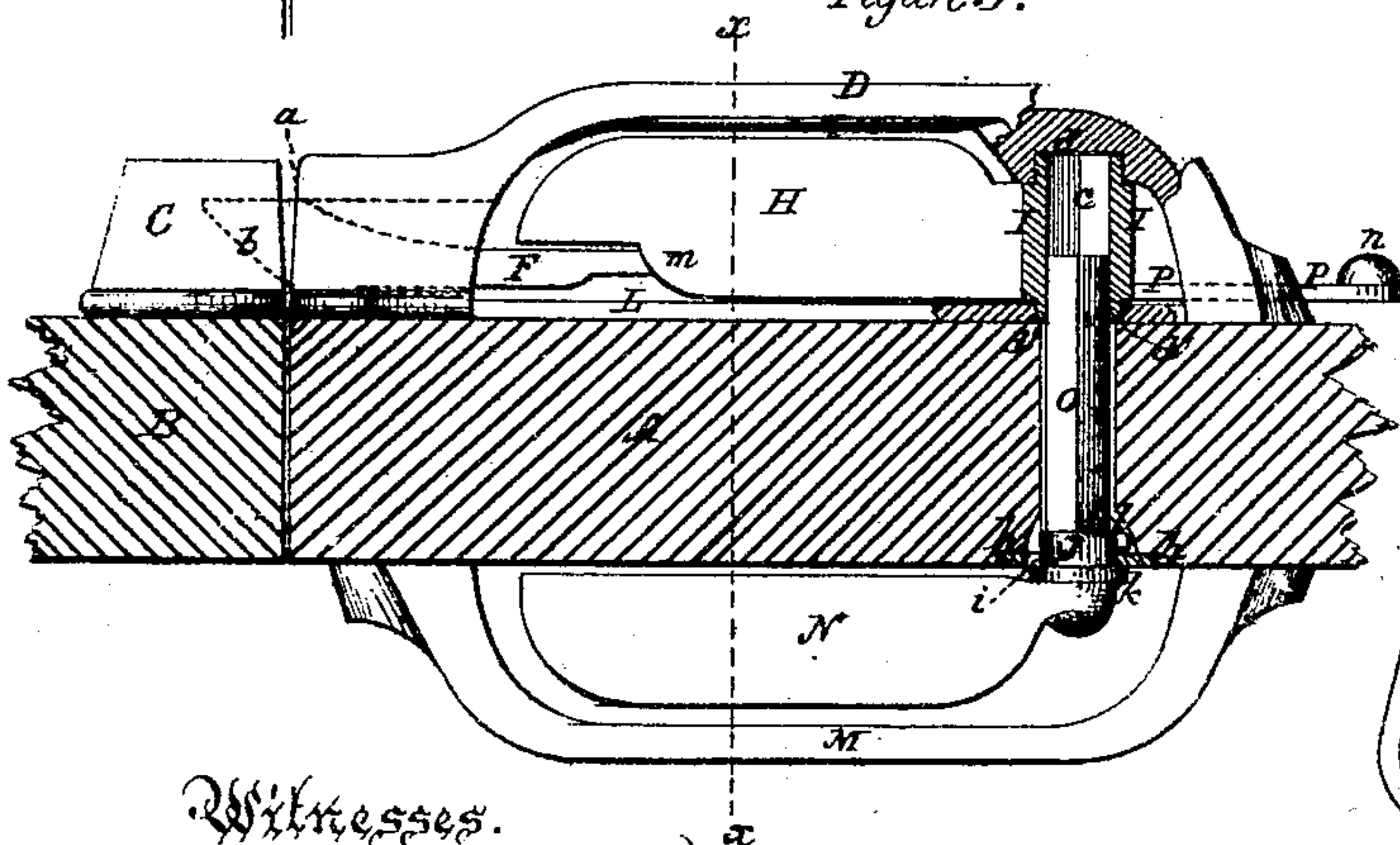
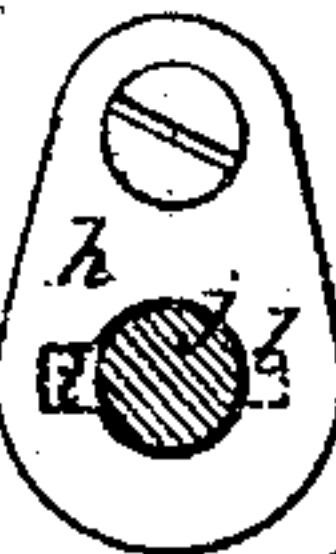


Figure 3.



Witnesses.
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Cha. C. Upperman



Inventor.
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By his Attorneys,
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United States Patent Office.

JOHN H. VICKERS, OF NORWICH, CONNECTICUT, ASSIGNOR TO WILLIAM A. AIKEN, OF SAME PLACE.

Letters Patent No. 103,819, dated May 31, 1870.

IMPROVEMENT IN DOOR-LATCHES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, JOHN H. VICKERS, of Norwich, in the county of New London and State of Connecticut, have invented certain new and useful Improvements in Door-Latches, which I denominate the Drawer-Pull Latch; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing of the same, which makes part of this specification, and in which—

Figure 1 represents an elevation of a drawer-pull latch, embracing my improvements, as applied to the inside of the door;

Figure 2 represents a similar view, the front plate of the pull being shown in section, to expose the arrangement of the latch and its operating mechanism;

Figure 3 represents a horizontal section through a portion of the door and its frame, showing the drawer-pulls and the levers for operating the latch, as applied to the inner and outer sides of the door, these parts being shown in inverted positions;

Figure 4 represents a vertical section of the parts shown in fig. 3, at the line *x x* of said figure;

Figure 5 represents a view, in perspective, of the operating-lever, with its inclined arm; and

Figure 6, a view, in perspective, of the latch showing the projection against which the inclined arm of the operating lever acts.

In drawer-pull latches as heretofore constructed, several serious objections and disadvantages have been experienced, which have tended, in a great measure, to prevent their introduction into use. The most serious of these objections is the mounting of the latch upon a pivot, so that it must move into and out of the keeper in the arc of a circle, requiring thereby to have the bolt of the latch beveled in two directions, one being oblique to the other, giving the front end of the latch a triangular form, in order to bring its end in a vertical line in opening the door. This requires the opening in the plate-pull to be large enough to accommodate the sweeping motion of the latch, and the shrinking and expanding of the door and frame renders the oblique beveled side of the latch liable to be thrown out of line, and thus to catch in the keeper, or to withdraw the latter, so that the latch will not reach it. Moreover, the operating levers have been held in place heretofore by very unstable means, so that they would be more or less loose and liable to bind against the inner sides of the pull-plate by which they are held in place.

My improvements are designed to remedy these disadvantages, and consist in constructing the inside hand-lever with an arm maintaining an acute angle therewith, and acting upon the latch so as to move it into and from its keeper in a longitudinal line; in the

arrangement of the lever relatively to the stem of the latch, in such manner that they will act in conjunction to limit the retraction of the latch; in the arrangement of the inclined acting arm in relation to a boss on the interior of the plate-pull, in such manner as to limit the projection of the latch; in the arrangement of the bearings of the hub of the lever directly within and entirely upon the pull-plate; and in locking the square spindle of the outer lever within and to the door, in such manner as to allow it to vibrate and be held in place without being fitted against the inner side of the pull-plate, as heretofore.

In the accompanying drawing—

A represents a portion of the door, to the stile of which the drawer-pull latch is applied; and

B, the frame to which the keeper C is secured.

The plate D, within which the latch is inclosed, in its contour resembles that of a drawer-pull, and may be japanned, bronzed, plated, or enameled with glass or porcelain, or otherwise finished, and properly secured by screws to the inner side of the door. One end of this pull-plate is provided with an opening, *a*, into and through which the beveled end *b* of the latch E is fitted and plays.

The stem F of the latch is not in the same horizontal plane with its beveled end *b*, but is elevated and supported in a guide-boss, G, cast upon the interior of the pull-plate, as shown in figs. 2 and 4. The crook in the stem F of the latch and the boss G serve two important functions in connection with the operating lever, to be presently described.

The lower side of the pull-plate D is open, and the operating lever H is secured therein, so as to maintain a horizontal position when the latch E is projected, and to be pressed upward upon the insertion of the fingers to grasp the pull to open the door, as shown in fig. 2. This lever H has a hub, I, formed on one end thereof, provided with a square opening, *c*, and an annular bearing shoulder, *d d'*, at each end thereof. From this hub I an arm, J, extends upward at an acute angle with the lever H, in such a position that it will bear against the side of the guide-boss G, while the inclined side of a projection, *e*, on the end of the latch-stem F, will fit against the opposite side of the arm J, in such manner that the boss G and arm will form a lock to prevent the lever H from descending below a horizontal position, and at the same time form a stop to limit the projection of the latch, as shown in fig. 2. In this position of the parts it will be seen that the inclined arm J, when actuated by the lever H in the arc of a circle, acts against the inclined side of the projection *e* on the stem F of the latch, and, therefore, moves the latter in a horizontal line into and out of its keeper, by which I am enabled to use a latch having a square,

instead of an oblique locking end, as in latches pivoted so as to swing into and out of its keeper in the arc of a circle.

The retraction of the latch is limited by making the inclination of the acting arm J, relatively to the operating lever H, such that the latter will strike the stem F of the latch exactly at the moment its beveled end *b* is retracted even with the end of the pull-plate, as shown in figs. 2 and 3, and as this result is dependent upon the contact of the lever H and latch, the latter must always be withdrawn with the same degree of accuracy. The latch is projected and held in such position by a spiral spring, K, attached by one end to pin, *f*, on the stem F of the latch, and by its other end to a stud, *g*, on the interior of the plate-pull.

The several parts being thus constructed and arranged, are inclosed within the plate-pull D, by means of a back-plate, L, fitted thereto, so as to be flush with the inner edge thereof. The hub I of the operating lever has one of its cylindrical bearings, *d*, fitted in the inner side of the plate-pull D, and the other *d'* extends through and is flush with the face of the back-plate L, and as the latter is countersunk in the pull-plate and secured thereto, the bearings of the hub I are entirely within said pull-plate, and are, therefore, firmer, more durable and convenient in the manufacture and application of the latch, than if the bearings were fitted within the door-frame and held in place by the uncertain contact therewith of the inner side of the pull-plate, as heretofore.

The outer side of the door is provided with a pull-plate, M, having only an operating lever, N, the position of which at all times corresponds with that of the inner pull-plate H, so that the latch E is operated the same from either side of the door. This lever N is provided with a square spindle, O, which passes through the door and extends into the correspondingly-shaped opening *c* in the hub I of the opposite lever H, in such manner as to lock the two together and admit of axial adjustment, to compensate for shrinkage and expansion and of different thicknesses of doors.

In order to lock the square spindle O within the door, and provide a bearing for its outer end, a small plate, *h*, is secured to the side of the door, with a cylindrical opening therein, provided with a notch, *i*, and a cylindrical bearing, *j*, and shoulder *k* are formed on the square spindle O, at its connection with the lever N, so as to fit into the annular opening in the bearing-plate *h*, while a pin, *l*, projecting from the spindle O, allows the latter to be inserted in the opening in said bearing-plate *h*, and thus lock the spindle to its bearing by the outer shoulder *k* and the inner pin *l*, so that the range of motion of the lever N will at no time bring the pin *l* opposite the notch *i*, and, therefore, cannot work out of its bearings, but allows

it, nevertheless, to be easily withdrawn and replaced when the pull-plate is removed, as shown in fig. 3.

The latch is securely held in place by the guide-boss G and the countersunk back-plate L, so that this plate serves not only as a bearing for the latch E, but for the hub I of the operating lever H. This lever conforms to the inner side of the plate-pull D, and, while its end passes beneath the latch-stem F, to obtain the proper range of motion, it must strike against the latch-stem by a stop or shoulder, *m*, as shown in figs. 2, 3, and 5, for the purpose before stated.

The door is opened from either direction by simply inserting the fingers within the plate-pull, and pressing them upward against the lever, the plate grasped, and the door opened.

To convert the latch into a locking-bolt when desired, a catch, P, is pivoted, at Q, to the end of the pull-plate D, so as to be thrown into and out of range with the end of the latch by means of the knob *n*, and for this purpose the inner end of the catch is sufficiently heavy to keep it down out of the way upon the hub I; and in locking the latch it is raised up in line with the stem, and abuts against its end, so that it cannot be retracted until the catch is released therefrom, as shown in fig. 2.

Having described my invention,

I claim—

1. The pivoted hand-lever of a pull-plate latch, provided with an arm, J, on its upper side, arranged so as to act between a projection, *e*, on the latch E, and a fixed guide-boss, G, of the pull-plate, to limit the projection and retract said latch horizontally, as herein shown and described.

2. The hand-lever H of a drawer-pull latch, made with a stop or shoulder, *m*, in such relation to the elevated stem of the latch as that the free end of the lever, in being elevated, will come in contact with said elevated stem, and thus limit the retraction of the latch, as herein shown and described.

3. The hand-lever H, having its hub I mounted with bearings *d d'*, directly within the plate-pull D, instead of within the door, whereby the advantage of a short firm bearing for the lever is obtained, as herein shown and described.

4. The combination with the pull-plates D and M of the operating hand-levers H and N, the inclined acting arm J, the latch E, with its projection *e*, the stop or boss G, spring K, and the short fixed hub I and spindle O, locked in position as described, the several parts being constructed, arranged, and operating as herein specified.

JOHN H. VICKERS.

Witnesses:

FRED. CAMP,
SAMUEL TAYLOR.