

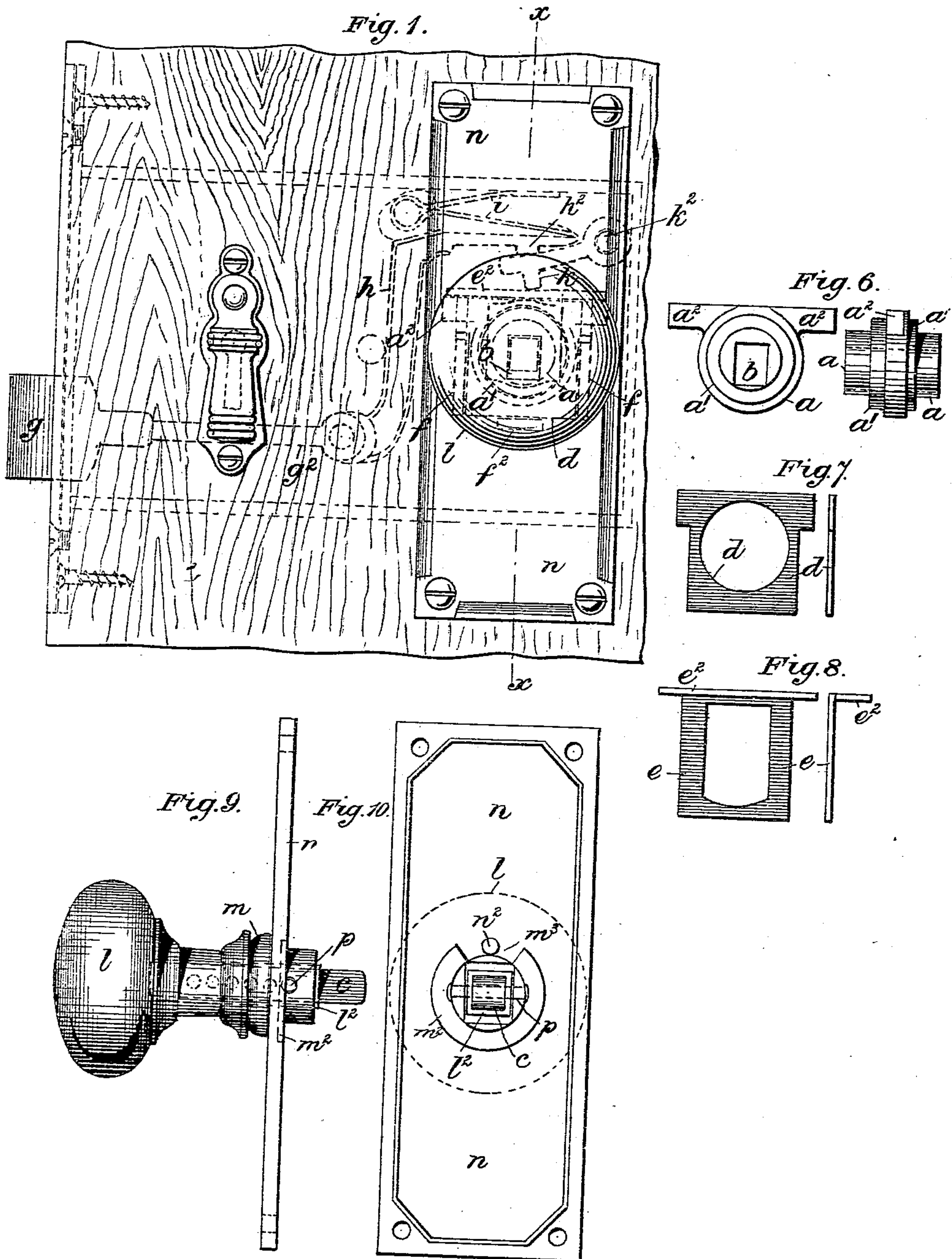
(No Model.)

H. B. WORSEY.
LATCH.

4 Sheets—Sheet 1.

No. 555,354.

Patented Feb. 25, 1896.



Witnesses:-

George Shaw
Richard Bennett

Inventor:-

Henry Bates Worsley

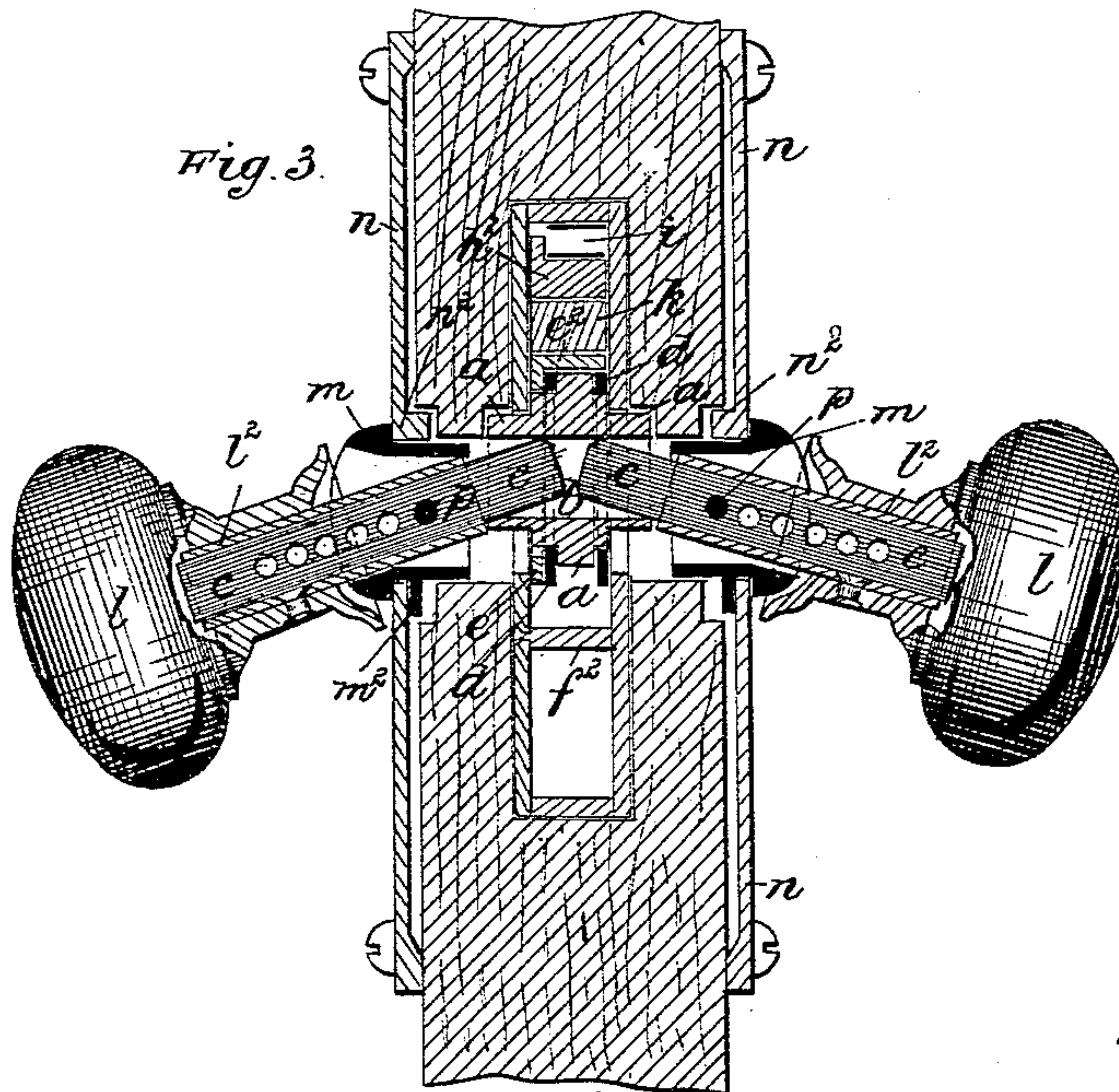
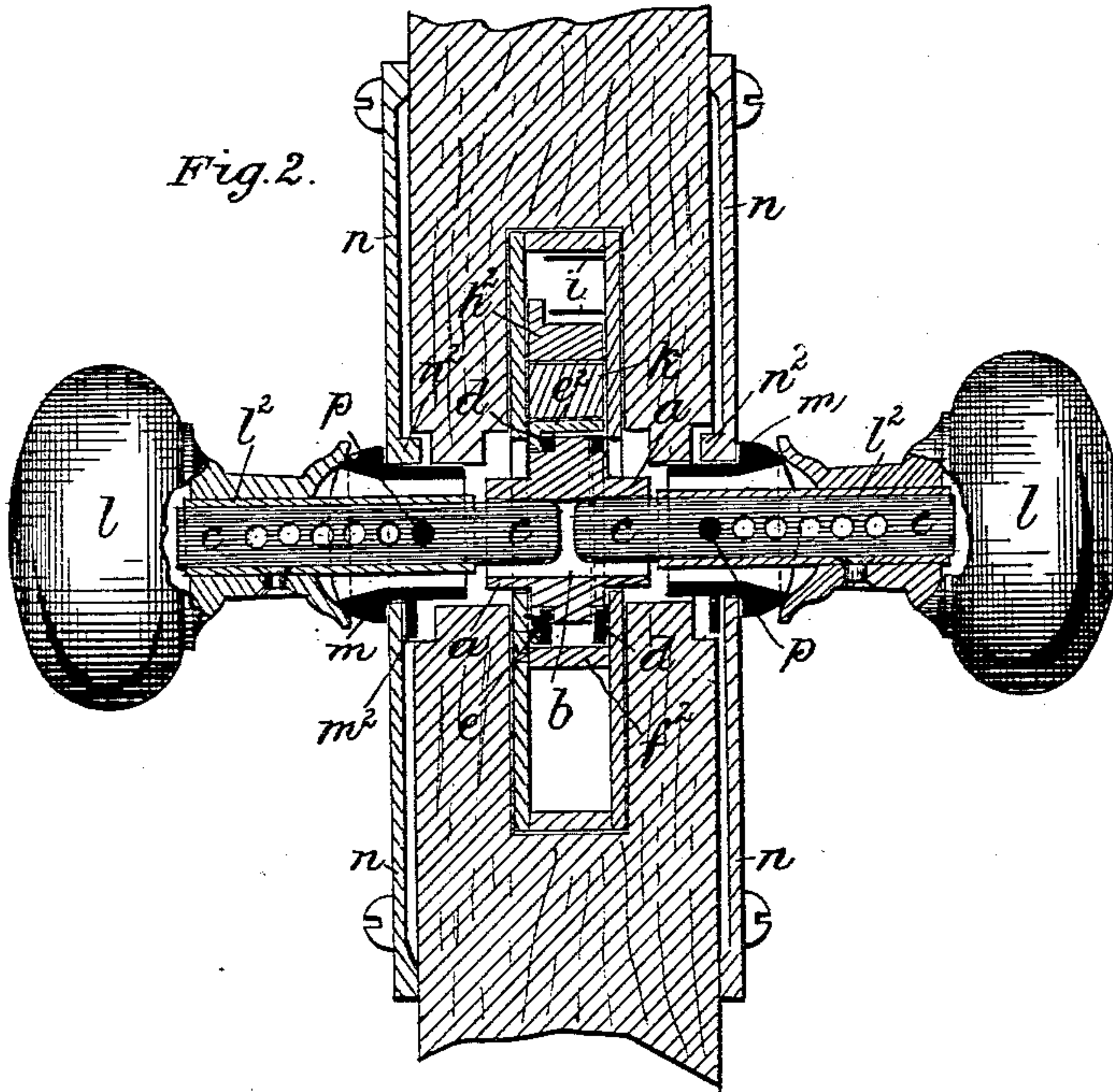
(No Model.)

4 Sheets—Sheet 2.

H. B. WORSEY.
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No. 555,354.

Patented Feb. 25, 1896.



Witnesses;—

George Shaw
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Henry Baxter Worsey

(No Model.)

4 Sheets—Sheet 3.

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Fig. 4.

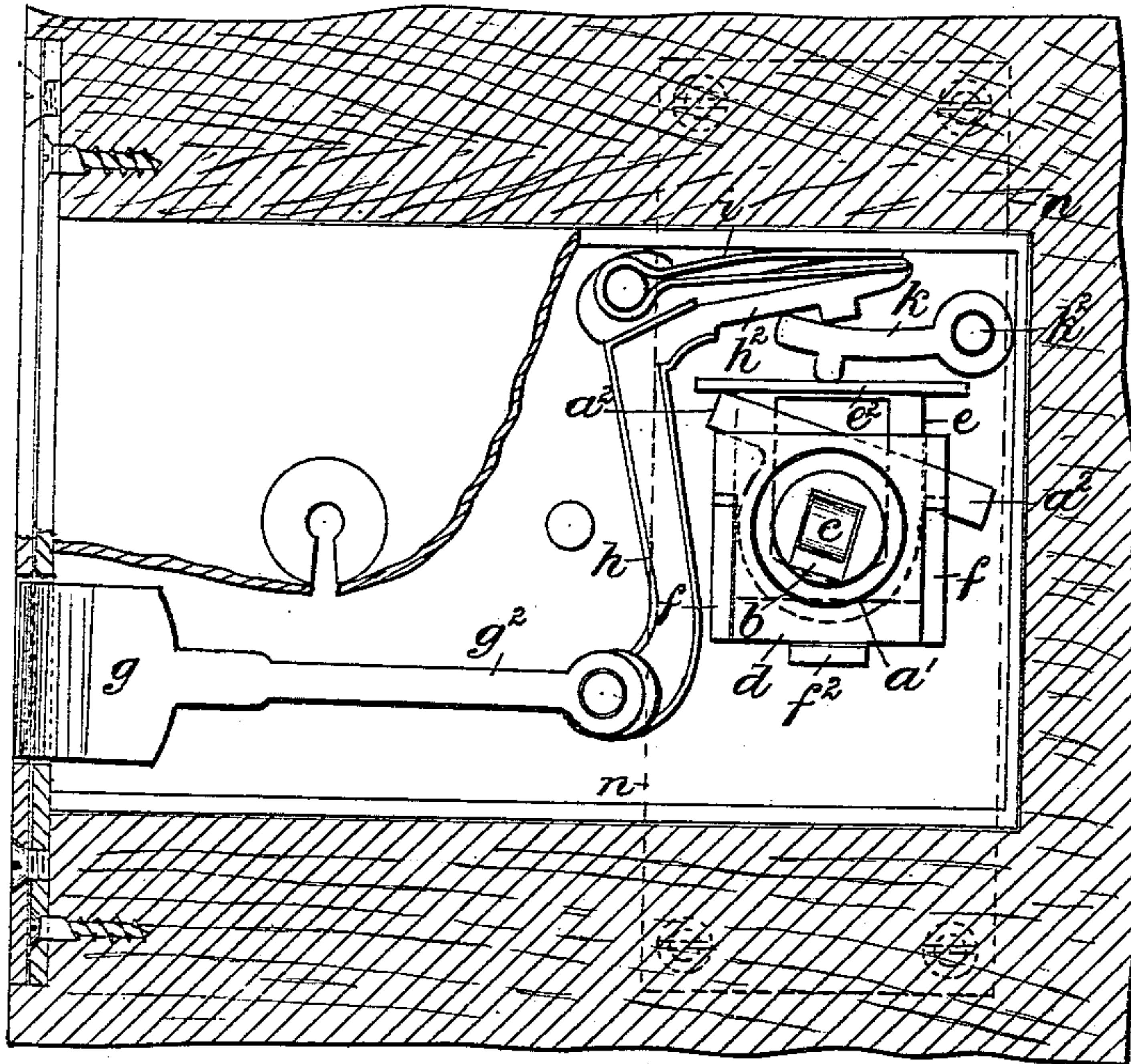
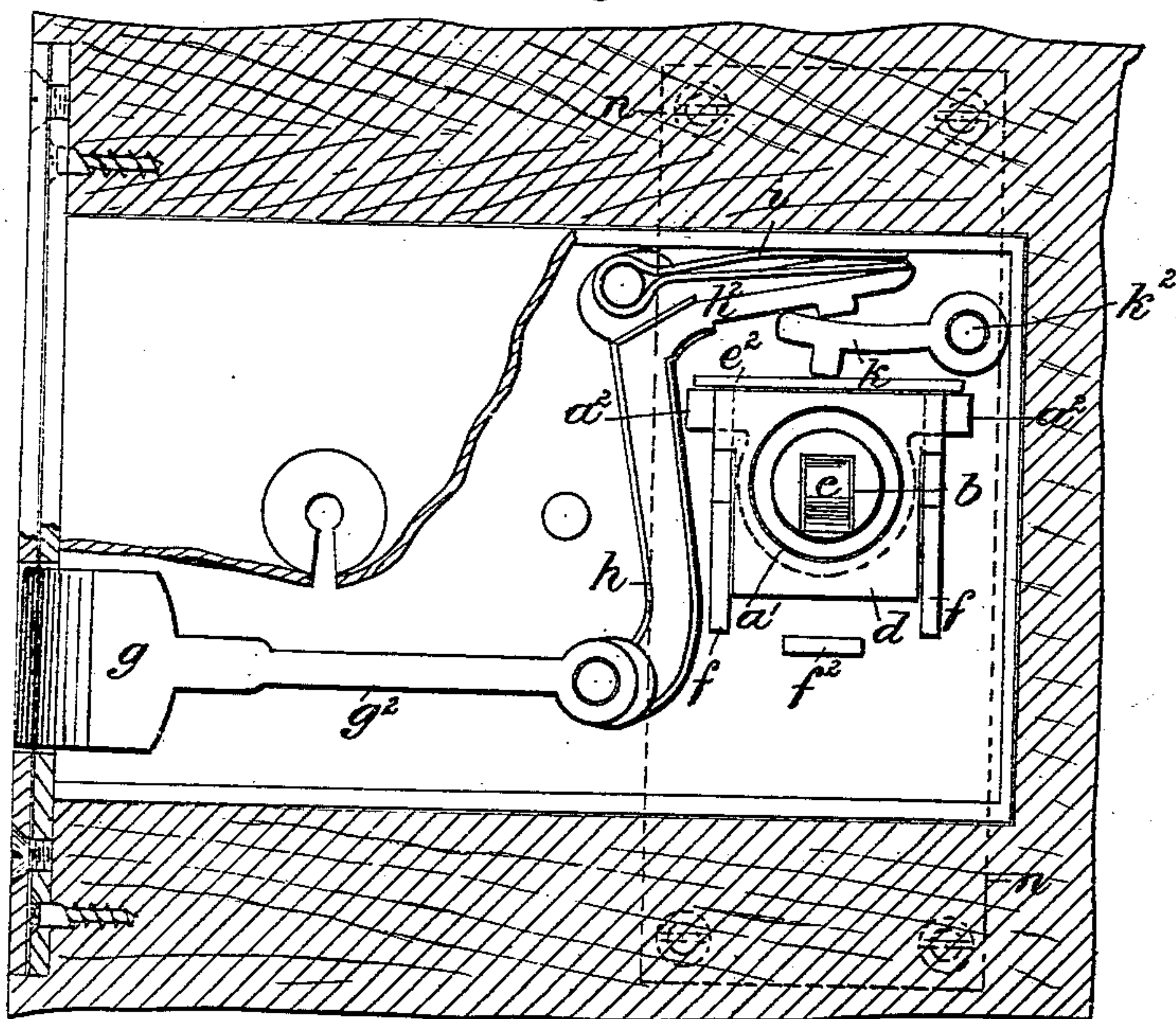


Fig. 5.



Witnesses;—

George Shaw
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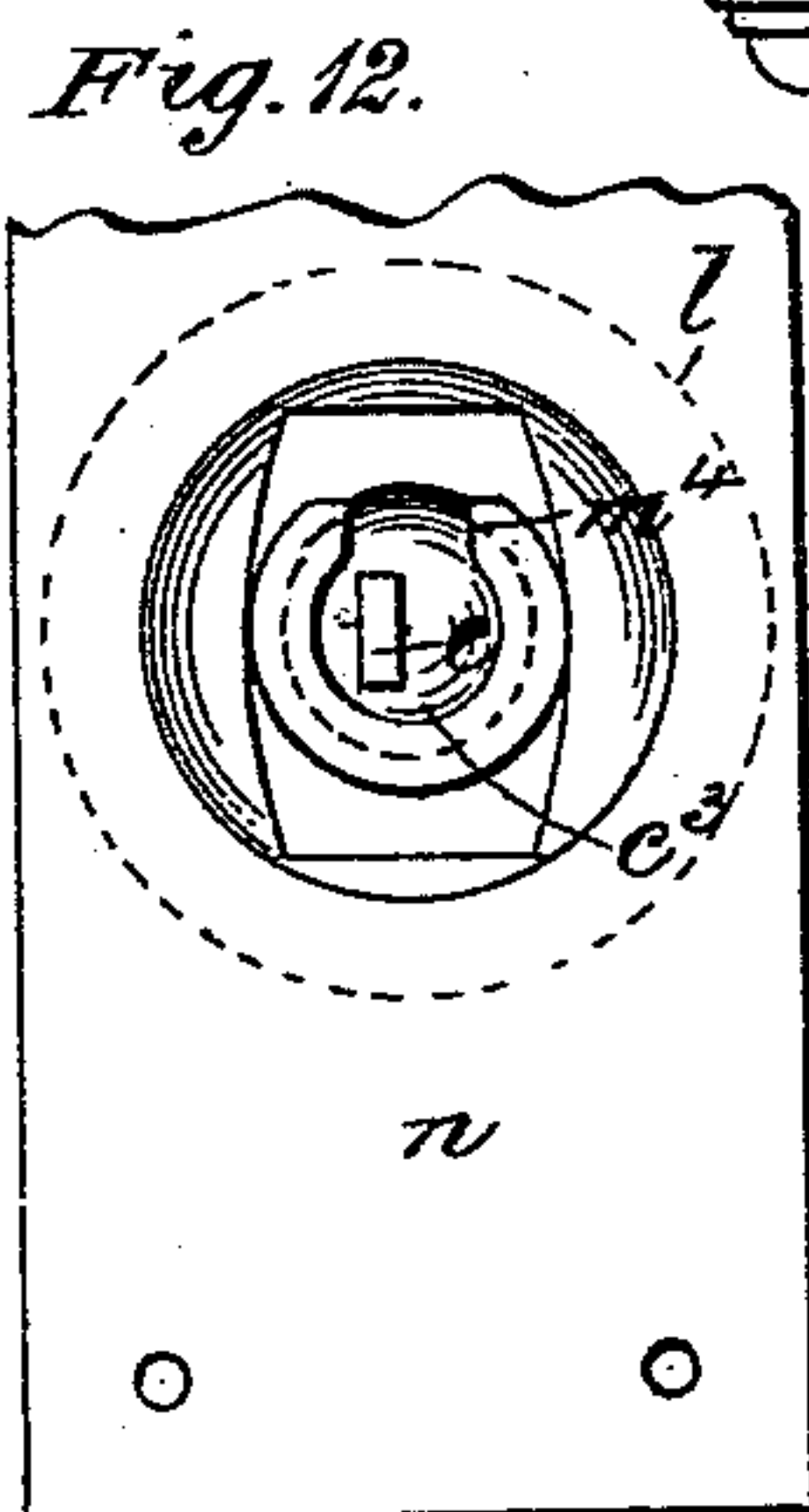
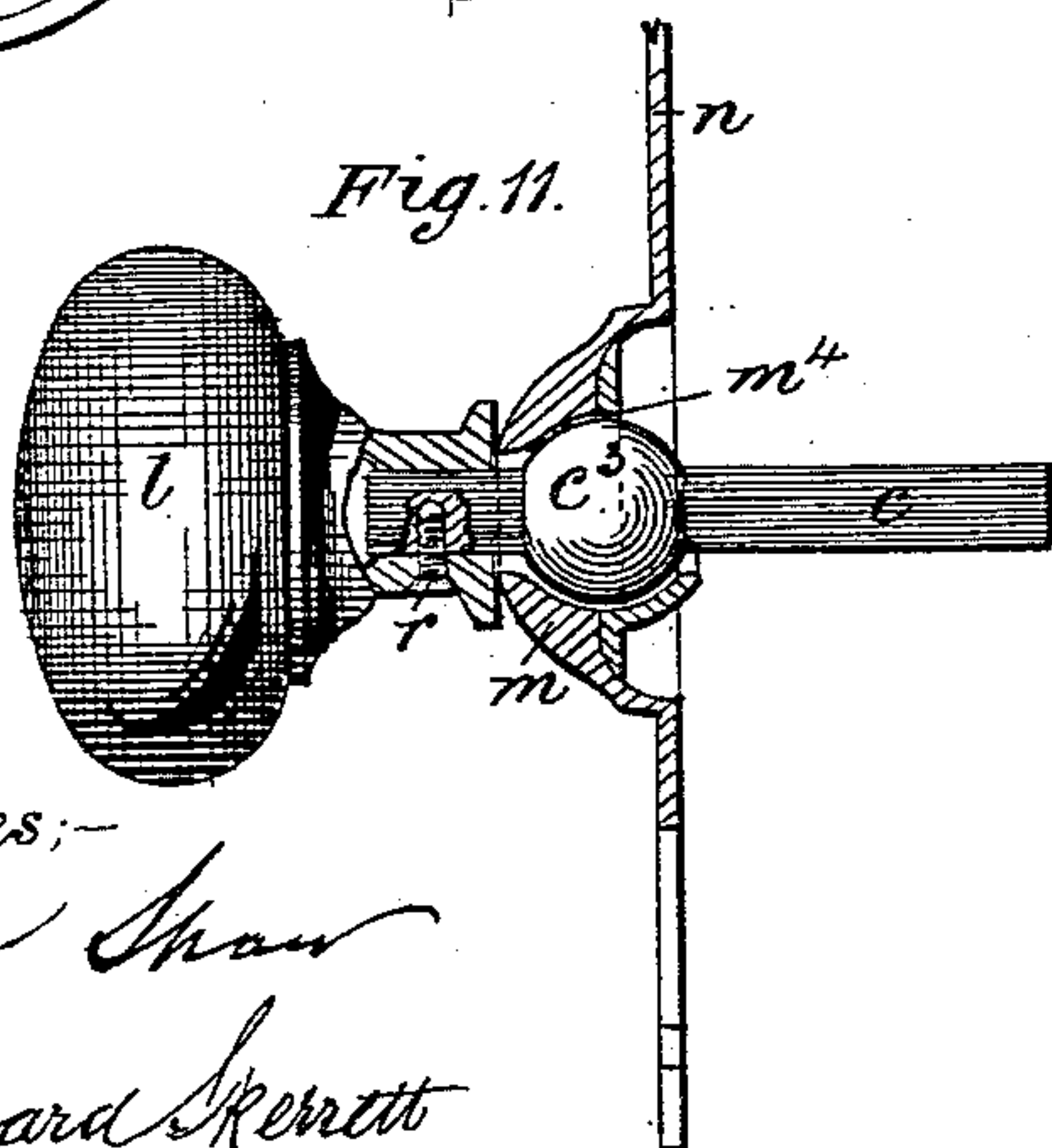
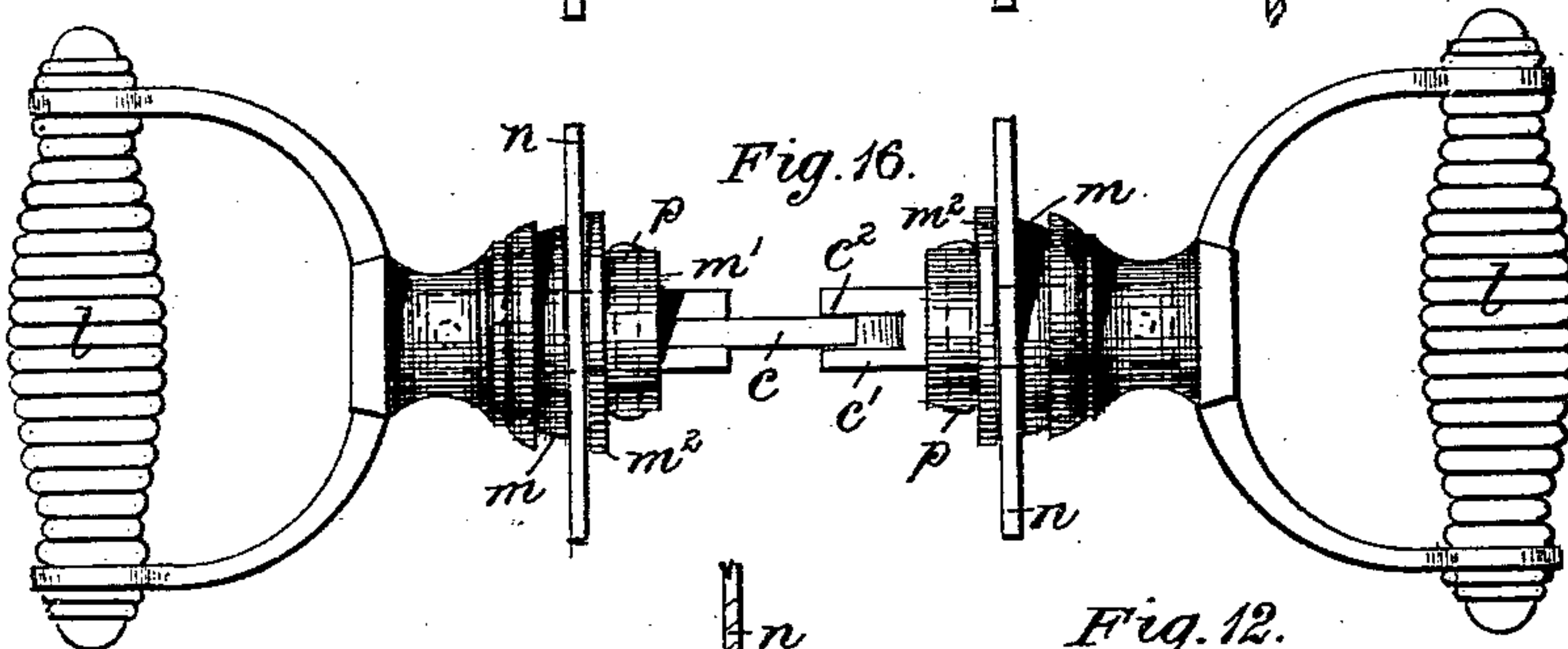
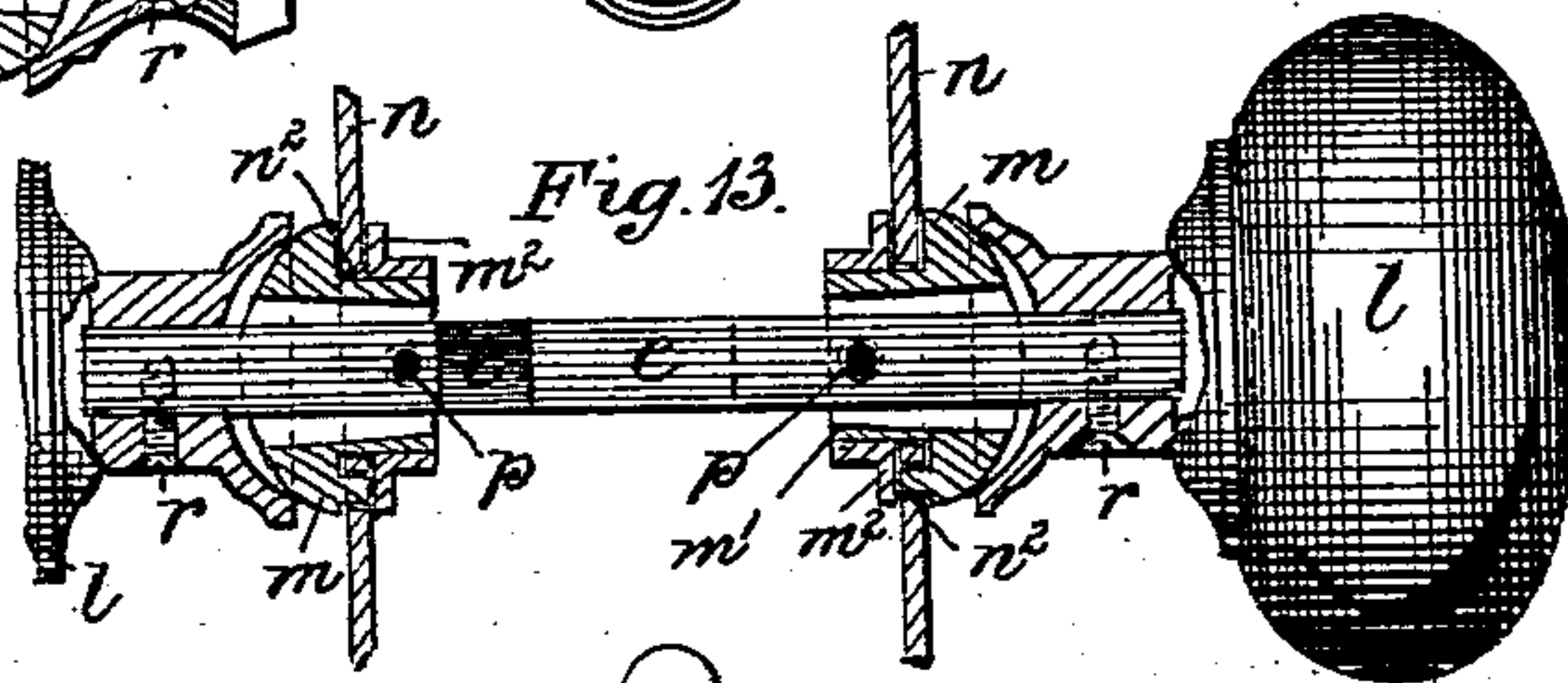
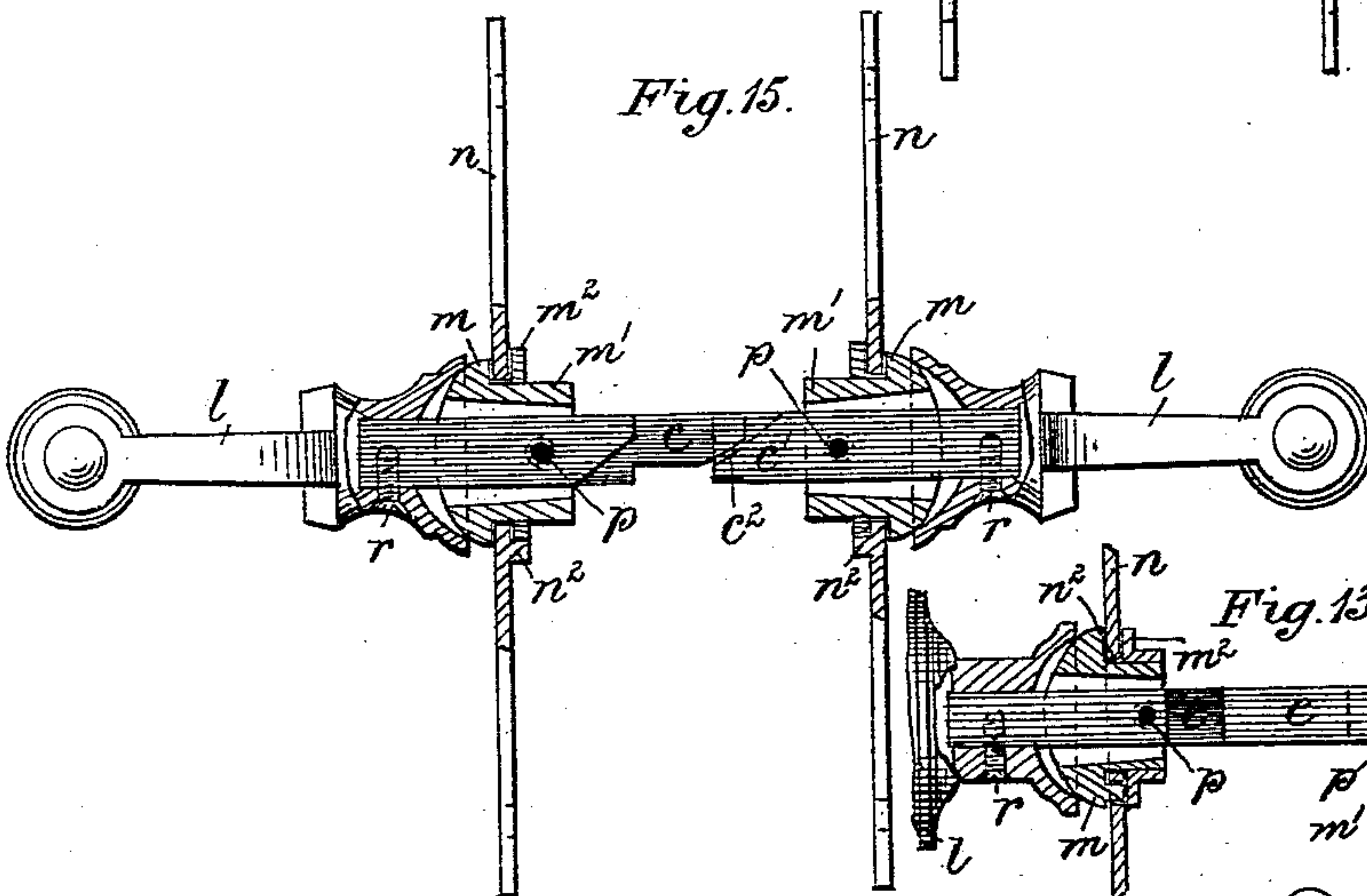
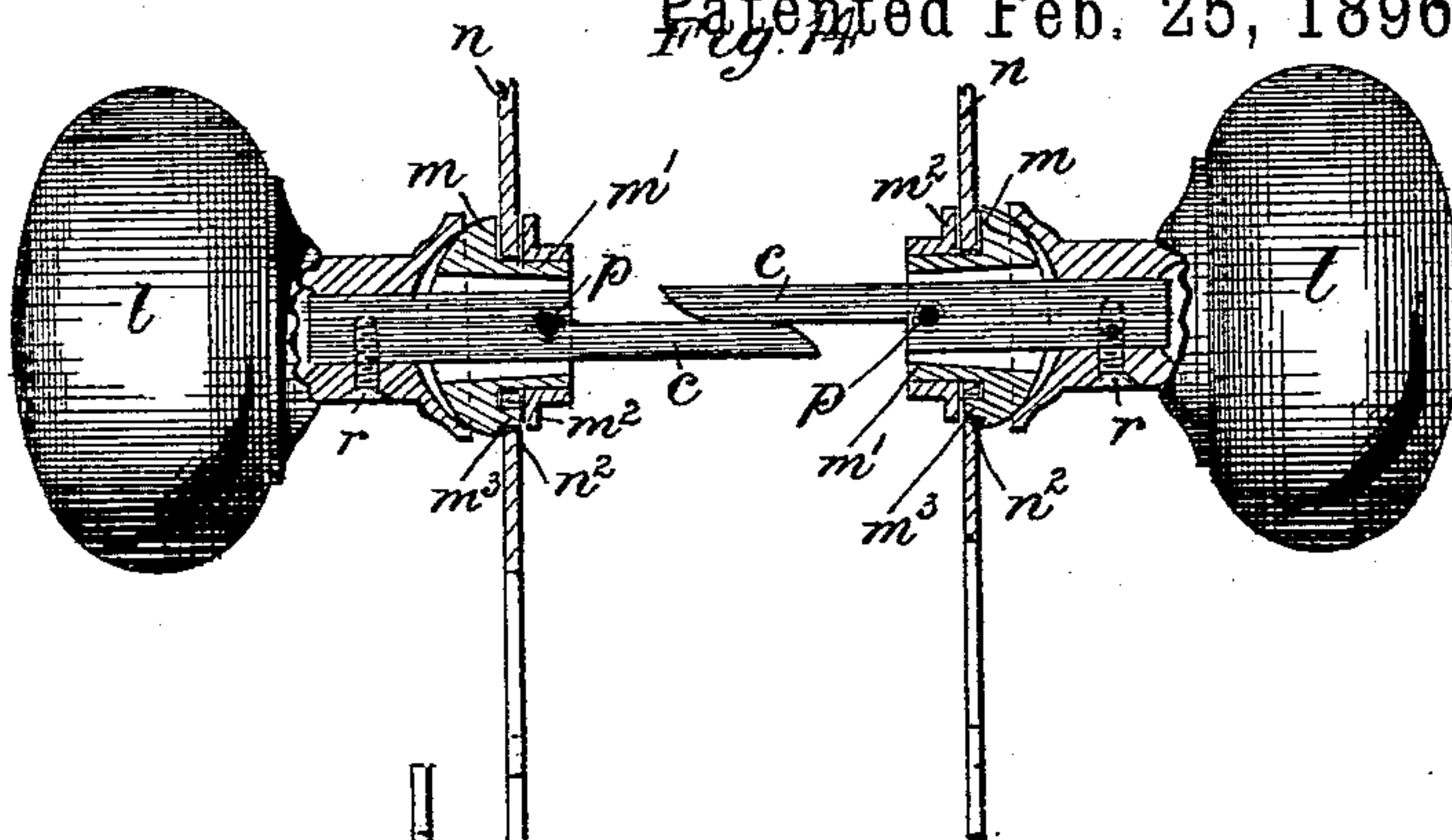
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No. 555,354.

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UNITED STATES PATENT OFFICE.

HENRY BAXTER WORSEY, OF BIRMINGHAM, ENGLAND.

LATCH.

SPECIFICATION forming part of Letters Patent No. 555,354, dated February 25, 1896.

Application filed November 4, 1895. Serial No. 567,922. (No model.)

To all whom it may concern:

Be it known that I, HENRY BAXTER WORSEY, a subject of the Queen of Great Britain, residing at Birmingham, England, have invented certain new and useful Improvements in Door-Latches and Latches for Door-Locks; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its object to effect the withdrawal of the latch-bolts of door locks and latches either by the turning of one or other of the knobs in the ordinary way or by the depression of either by the knobs; and my said invention consists of the construction and arrangements or combinations of the parts hereinafter described of the latch mechanism for effecting that object.

I will describe my invention in connection with a combined door lock and latch.

I construct the follower of the latch and the parts immediately connected therewith in the following manner: I form the follower from a circular or nearly circular disk of metal having at its middle an oblong hole for the knob-spindle to pass through. The said follower has at top a cross-head which, when in position in the lock, is situated under the turned-out or flanged upper edge of a rectangular metal plate situated in a vertical race or guide in the lock-case. The said rectangular metal plate I will hereinafter refer to as the "lifting-plate" of the follower mechanism. Between the lifting-plate and the follower is a sheet-metal washer, in a circular hole in which the bush of the follower takes and rotates when the knob is turned in the ordinary way.

The stem of the latch-bolt is pivoted to the vertical arm of a cranked lever, the free end of the horizontal arm of which is pressed down by a spring or weight and bears through an intermediate lever on the lifting-plate hereinbefore referred to.

Each of the knobs carries a short spindle the inner ends of which are flattened and overlap one another. The overlapping parts are of a size and shape suitable to fit in the hole in the follower; or the ends of each of the short spindles may be square, in which case the

two inner ends occupying the hole in the follower abut against each other instead of overlapping. The inner end of the neck of each of the knobs is concave and bears against a bulbous or nearly hemispherical head of a collar attached to the knob-spindle by a horizontal pin or pivot, the said pin or pivot also serving to secure the knob and spindle to the door rose or plate, the cylindrical stem or neck of the said collar passing through the said rose or plate. The hole in the said collar through which the knob-spindle passes is wedge-shaped, the said hole being larger at its outer end than at its inner end, at or near which the horizontal pin or pivot passes through the said collar and spindle. By this means the knob and short spindle are capable, in addition to a rotary or turning motion, of an angular motion in a vertical plane.

The action of the parts is as follows: When one or other of the knobs is depressed, the free end of its spindle is raised and the follower and lifting-plate are lifted in the vertical guide of the lock-case, and the said lifting-plate, acting through the intermediate and cranked levers, effects the withdrawal of the latch-bolt. On the release of the knob the spring or weight effects the return of the parts to their normal positions. Instead of depressing the knob it may be turned in the ordinary way, when one or other of the arms of the cross-head of the follower acting under the lifting-plate operates the levers and effects the withdrawal of the latch-bolt.

Instead of permitting the vertical angular motion of the knobs in the way hereinbefore described the part of each of the spindles adjoining the knob may be formed into a ball and a spherical socket may be formed in the rose or plate of the door-handle for the ball of the spindle to work in, or other equivalent arrangements of parts may be employed.

Figure 1 of the accompanying drawings represents in front elevation a portion of a door provided with a spring-pressed latch-bolt containing mechanism constructed according to my invention. Figs. 2 and 3 represent cross-sections of the same, taken on the line *x x*, Fig. 1. Fig. 4 represents the said door in section and a portion of the lock-case removed, the latch being represented in its withdrawn position, having been operated by

the turning of the knob. Fig. 5 represents a similar view to that represented in Fig. 4, the latch-bolt having been withdrawn by downward pressure on one or other of the knobs. Figs. 6, 7, and 8 represent parts of the follower mechanism detached, as hereinafter described. Fig. 9 represents in side elevation, and Fig. 10 in back elevation, one of the knobs and its spindle together with the knob-fixing plate detached from the door. Fig. 11 represents in section, and Fig. 12 in elevation, a modification to be used in place of the cupped or hemispherical parts of the knob and rose represented in Figs. 2, 3, and 9; and Figs. 13, 14, 15, and 16 represent modifications of the short spindles of the knobs.

The same letters of reference indicate the same parts in the several figures of the drawings.

a a' a^2 is the follower of the latch mechanism, (shown separately in front and end elevation in Fig. 6,) in which follower is the oblong hole b for the square knob-spindle c to pass through. The said follower consists essentially of a nearly circular disk a , having on either side circular bushes a' a' and at top a cross-head a^2 . On each side of the follower a is placed the nearly rectangular pierced sheet-metal washer d , (one of which is shown detached in Fig. 7,) the circular holes in which washers take on and constitute the bearings for the circular bushes a' a' of the follower. The cross-head a^2 of the follower a and the upper edges of its washers d d when in position take under the flanged edge e^2 of the rectangular pierced plate e , hereinafter called the "lifting-plate." The said lifting-plate e is shown separately in front elevation and edge view in Fig. 8. The said lifting-plate is situated between the two vertical guiding-strips f f on the lock-case, and in the normal position of the parts the said lifting-plate e and washers d d rest upon and are supported by the horizontal strip or stop f^2 , also on the lock-case. The edges of the washers d d fit within and work against the vertical guiding-strips f f in the manner hereinafter described.

The stem g^2 of the latch-bolt g is pivoted to the vertical arm h of the cranked lever h h^2 , the horizontal arm h^2 being pressed by the spring i on the upper side of the small intermediate lever, k , turning on the center k^2 , the lower acting part of which lever k bears on the horizontal flange e^2 of the lifting-plate e .

The knob-spindle c c is divided at its middle—that is to say, each knob l has a short horizontal spindle c , the inner ends of the two short spindles nearly abutting in the oblong hole b of the follower a . The inner face of each of the necks of the knobs l is of a hollow spherical figure and bears against the bulbous or spherical outer part, m , of the rose m m^2 attached to the knob-fixing plate n , the inner flange m^2 of the said rose bearing against the inner face of the said knob-fixing plate n . Each of the short spindles c is adjusted in the tube l^2 of its knob and at the same time piv-

oted to the rose, so as to be capable of a vertical angular motion by a horizontal pin p , the said pin passing through one or other of the row of holes in each short spindle. The inner flange, m^2 , of the rose m m^2 has a quadrant-shaped cut-away part m^3 , (see Fig. 10,) in which the stop-pin n^2 on the inner side of the knob-carrying plate n is situated for limiting the turning motion of the knob in one or other direction.

The action of the parts is as follows: When the latch-bolt g is withdrawn by the turning of one or other of the knobs l , the follower a is turned by the knob-spindle c ; and one or other of the arms of the cross-head a^2 of the follower acting under the flange e^2 of the lifting-plate e effects the raising of the said lifting-plate e and through the levers k and h h^2 the withdrawal of the latch-bolt, as seen in Fig. 4. On the release of the knob l the parts resume their normal positions by the action of the spring i . It will be understood that on the motion of one of the knobs and its spindle a corresponding motion is given to the opposite knob and its spindle.

When the latch-bolt is withdrawn by the depression or vertical angular motion of one or other of the knobs l , the inner end of the spindle c attached to the depressed knob, acting on the follower a , lifts the said follower together with its washers d d and lifting-plate e , as represented in Figs. 3 and 5, the lifting motion being transmitted through the levers k and h h^2 to the latch-bolt, as described, when the knob is turned. On the release of the knob l the parts resume their normal positions by the action of the spring i . On the last-described method of operating the latch-bolt the inner end of the knob works on the bulbous part m of the rose m^2 , the short spindle of the knob turning on the horizontal pin p , as seen in Fig. 3.

It is desirable to impart the necessary stroke to the latch g by a comparatively slight vertical movement of the lifting-plate e . This lifting-plate, guided by the vertical guide-strips f , moves in a perpendicular plane and acts on the short lever k , so that a slight motion of the lifting-plate imparts the necessary motion to the lever h h^2 to completely retract the latch g . The washers d afford proper bearings, near the center of the lock-case, for the circular bushes or hubs a' of the oscillatory disk a , while rendering it possible for this disk to rise and fall, since the washers are susceptible of vertical movements between the guide-strips f . The lever k is provided, as before stated, in order that the flanged edge e^2 of the lifting-plate e can, by a slight upward movement, properly actuate the lever h h^2 to retract the latch.

I wish it to be understood that the return of the parts of the latch mechanism to their normal positions may be effected by the action of a weighted lever instead of by a spring-pressed lever, as represented.

Instead of pivoting the short or divided

spindles to the roses of the door-knobs in the way already described the said spindles may have formed on them spherical enlargements c^3 for engaging hollow spherical sockets m in the door-fixing plate n , as represented in Figs. 11 and 12, the inner part of the spherical socket having a cut-away part m^4 to permit the spindle taking the required angular motion in a vertical plane when the latch is withdrawn by the depression of the knob.

I will now describe the modified spindles.

In place of making the inner ends of the short spindles nearly abut against each other, as in Figs. 2 and 3, they may be arranged side by side and overlap, as represented in Fig. 13, or they may be arranged to overlap one on the other, as represented in Fig. 14; or the spindle c of one knob may be of a length sufficient to pass through the follower and engage in a slot c^2 in the short spindle c' of the other knob, as represented in side elevation in Fig. 15 and plan in Fig. 16.

The arrangements hereinbefore described and represented enable a person whose hands are not at liberty to operate the knob by a turning or rotary motion—as, for example, a servant carrying a tray into or out of a room—to effect the withdrawal of the latch-bolt and the unfastening of the door by simply applying a downward pressure to the knob.

Having now particularly described and ascertained the nature of my invention and in what manner the same is to be performed, I declare that I claim as my invention—

1. The combination with a door-latch, door knobs or handles, and a knob-spindle, of parallel guides arranged in the lock-case, an oscillatory disk or follower having a cross-head and bushes or hubs and into which the knob-spindle extends, vertically-movable washers guided by the guide-strips and forming bearings for the bushes or hubs of the disk, and a vertically-movable lifting-plate guided by the guide-strips and raised by the cross-head of the disk when the latter is actuated by the knob-spindle, and devices operated on by the lifting-plate for retracting the latch, substantially as described.

2. The combination with a latch, knobs or handles, and a knob-spindle, of parallel guide-strips arranged in the lock-case, an oscillatory disk or follower having a cross-head and lateral bushes or hubs, vertically-movable washers guided by the guide-strips and constituting bearings for the bushes or hubs of the disk or follower, a lifting-plate guided by the guide-strips and raised either by the oscilla-

tory motion of the disk or follower, or by the bodily vertical motion thereof, a pivoted lever connected with the latch, and a lever acted upon by the lifting-plate for operating said pivoted lever to retract the latch when the lifting-plate is raised, substantially as described.

3. The combination with a latch-case, and a latch, of rotatable roses each constructed with a spherical portion, a divided knob-spindle, the sections of which are pivoted in the rotatable roses and are provided with spherical portions fitting the spherical portions of the roses, said sections of the knob-spindle being susceptible of axial rotation with the roses and also of angular motion within the roses, and devices actuated either by the rotation or the angular motion of the sections of the knob-spindle for retracting the latch, substantially as described.

4. The combination with a latch-case, a latch, a pivoted latch-operating lever, and a divided knob-spindle having the sections provided with knobs or handles, of rotatable roses journaled in the sides of the latch-case, constructed with convex surfaces and within which the said sections of the knob-spindle are pivoted, so that they can rotate with the roses and also move angularly therein, an oscillatory and vertically-movable disk or follower having a cross-head and into which the sections of the knob-spindle extend, vertically-movable washers constituting bearings for the disk or follower, a vertically-movable lifting-plate which is raised either by the turning motion of the disk or the follower, or by the bodily vertical movement thereof, and a device acted upon by the lifting-plate for operating the latch-actuating lever, substantially as described.

5. The combination with a latch-case, a latch, a pivoted latch-operating lever, and a divided knob-spindle having the sections provided with knobs or handles, of rotatable roses journaled in the sides of the latch-case, constructed with convex outer surfaces and within which the said sections of the knob-spindle are pivoted, so that they can rotate with the roses and also move angularly therein when the knobs or handles are rotated or depressed, and devices actuated by the sections of the knob-spindle for retracting the latch, substantially as described.

HENRY BAXTER WORSEY. [L. S.]

Witnesses:

GEORGE SHAW,
RICHARD SKERRETT.