

(No Model.)

3 Sheets—Sheet 1.

J. BARDSLEY.
DOOR CHECK.

No. 441,274.

Patented Nov. 25, 1890.

Fig. 1.

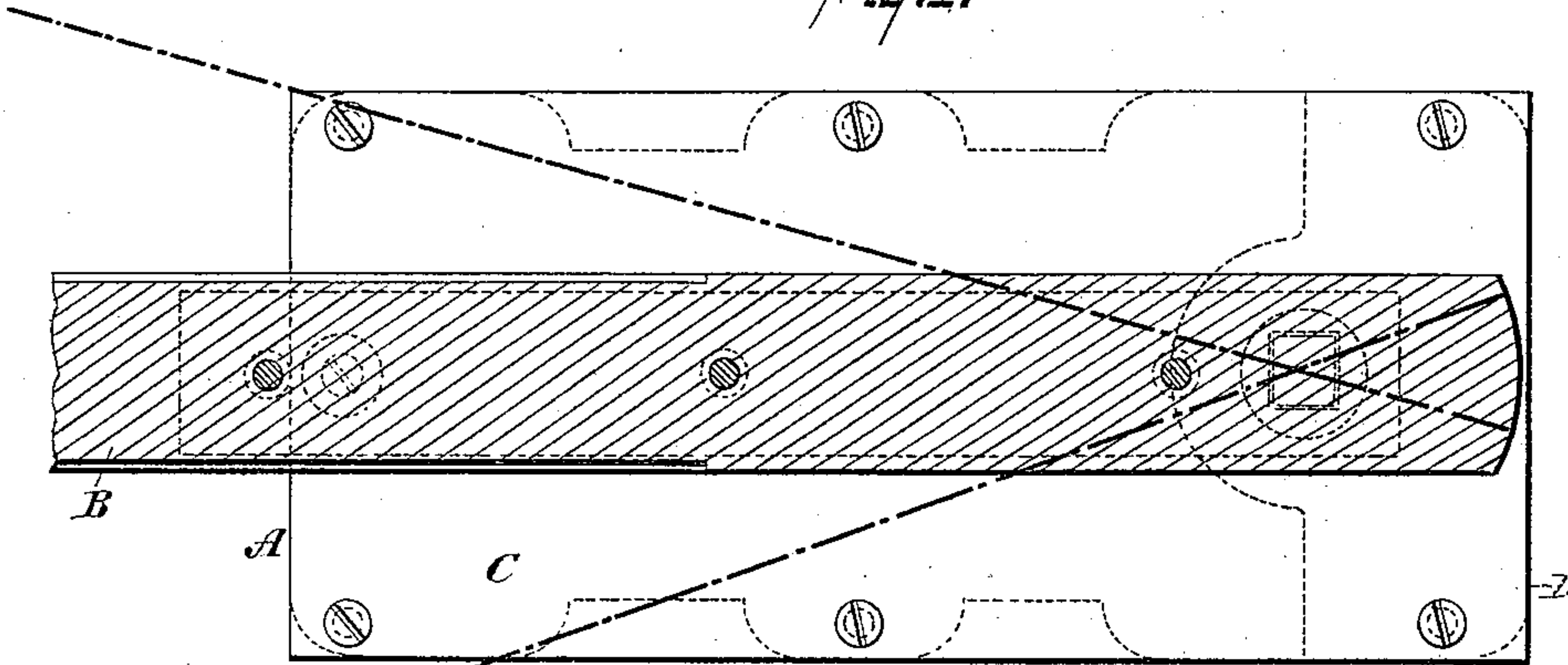


Fig. 2.

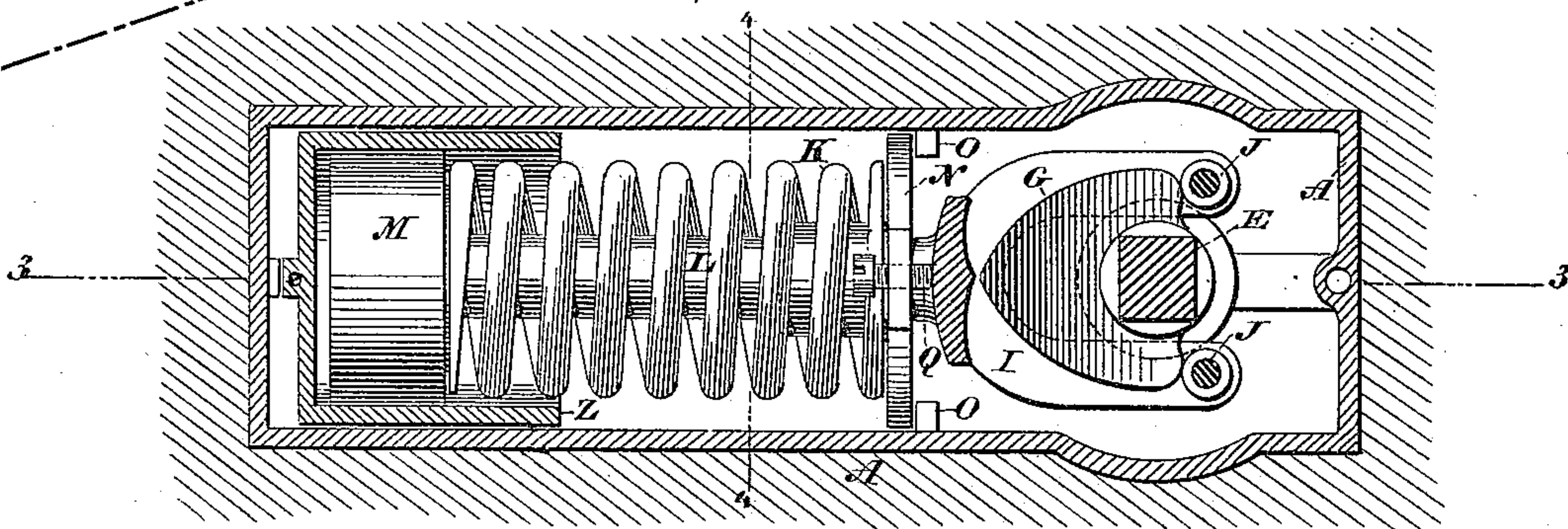


Fig. 3.

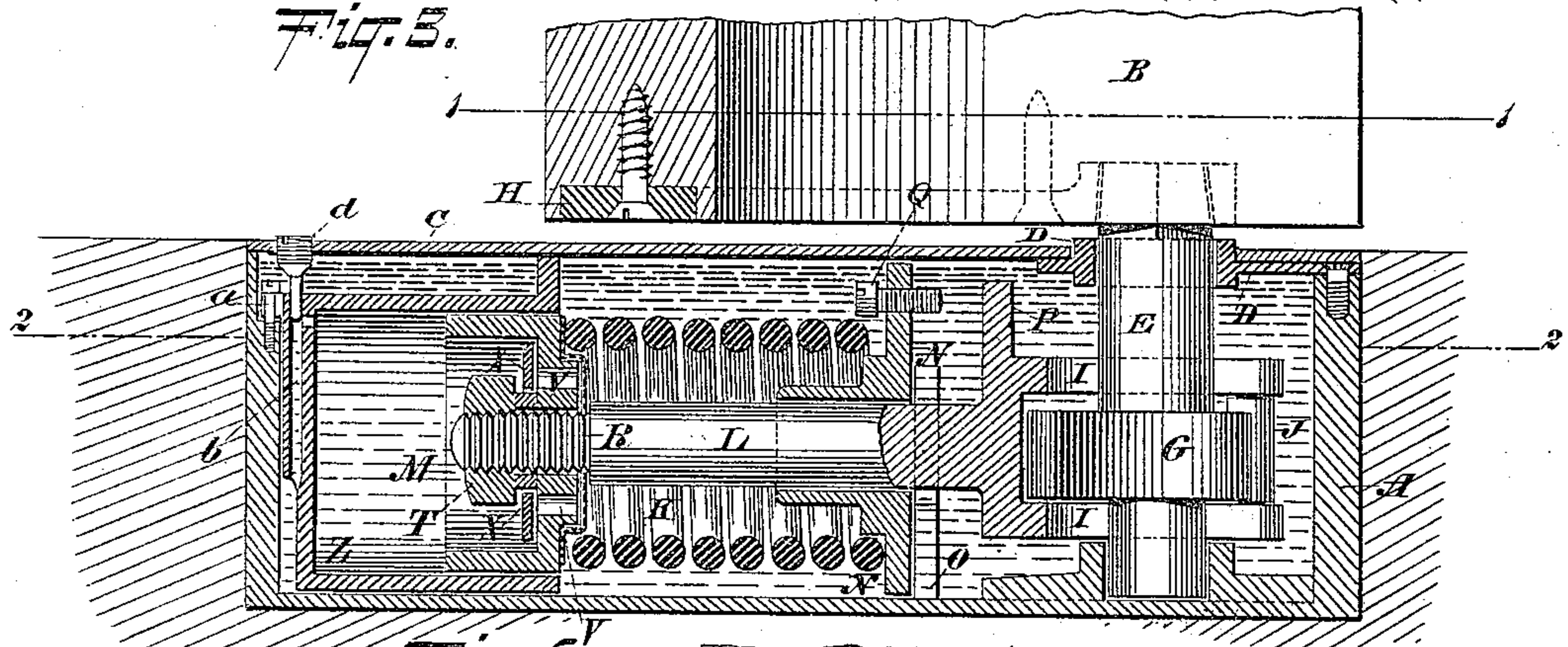
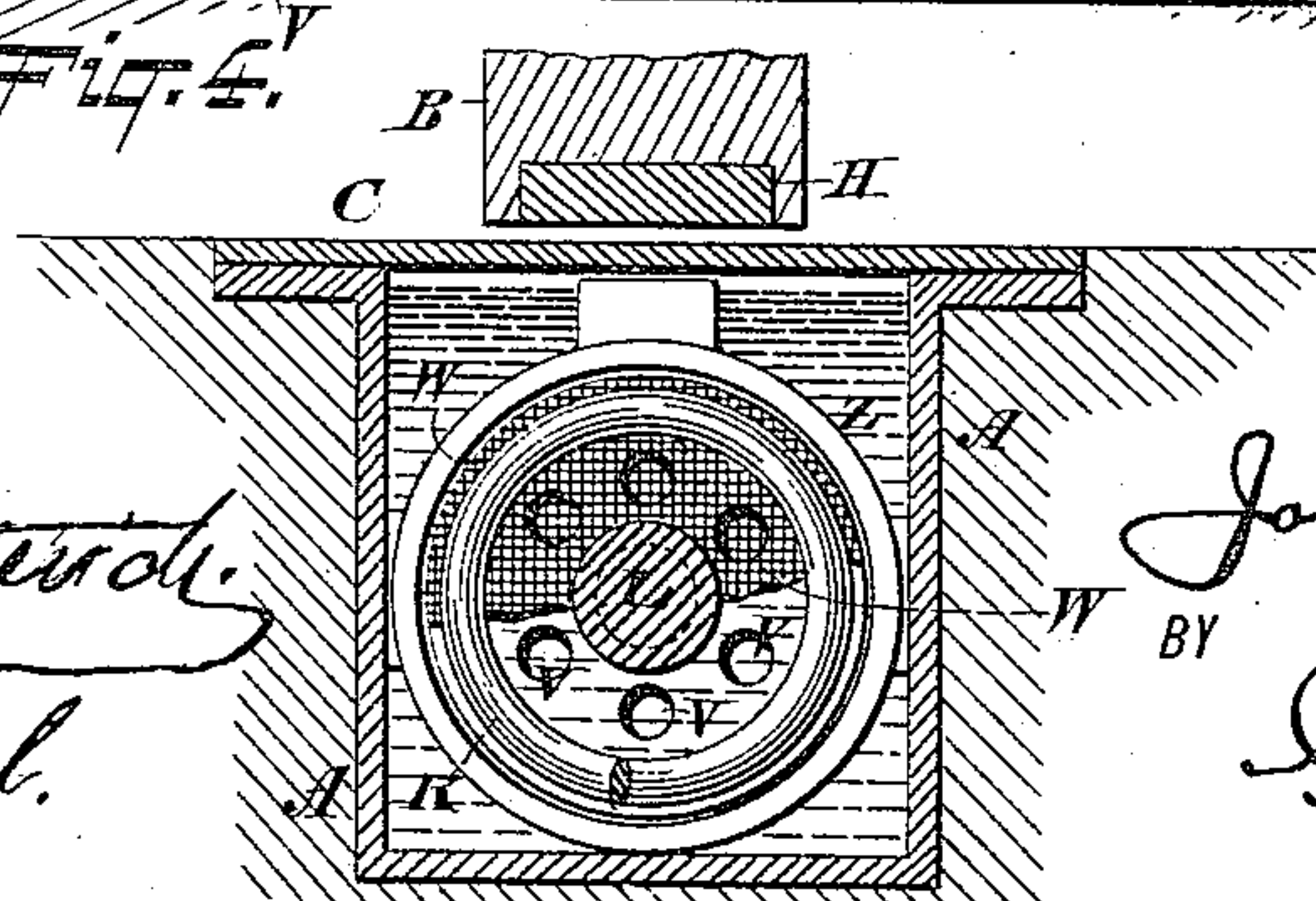


Fig. 4.



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Fig. 5.

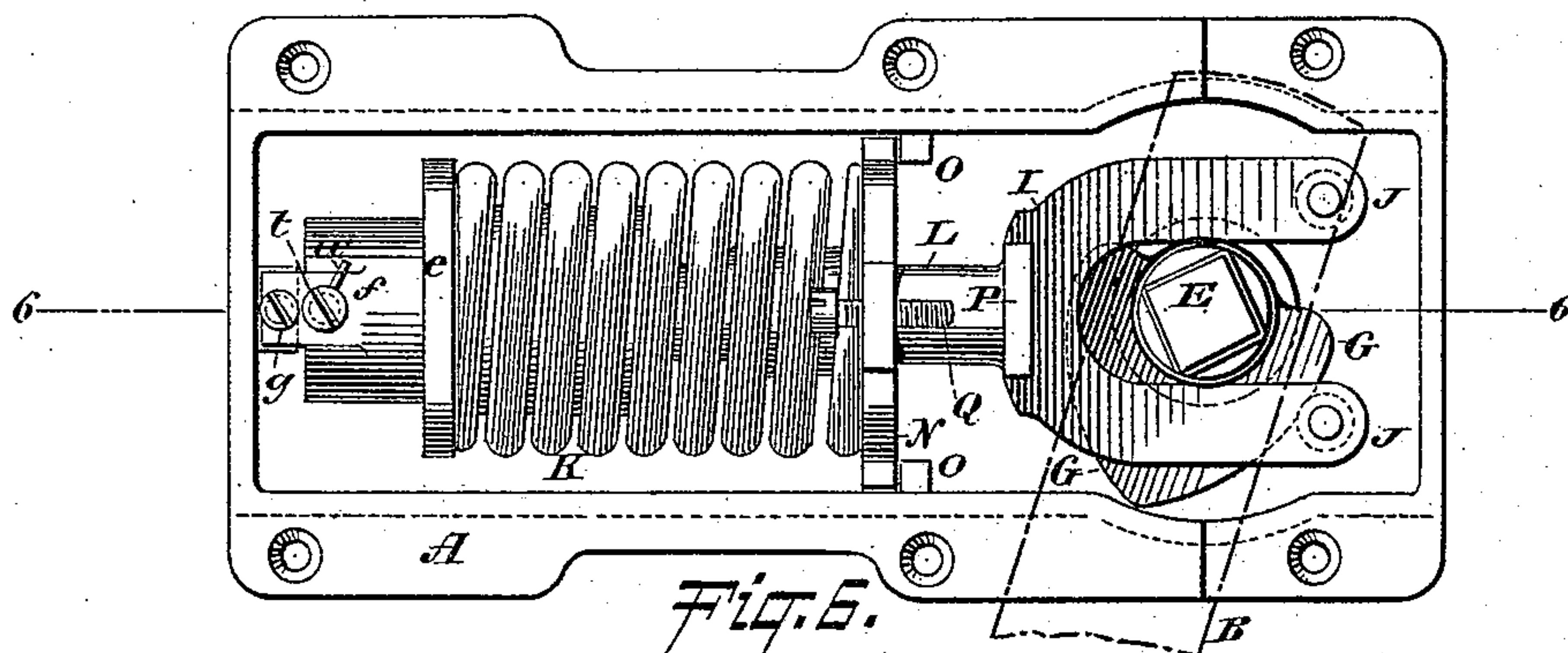


Fig. 6.

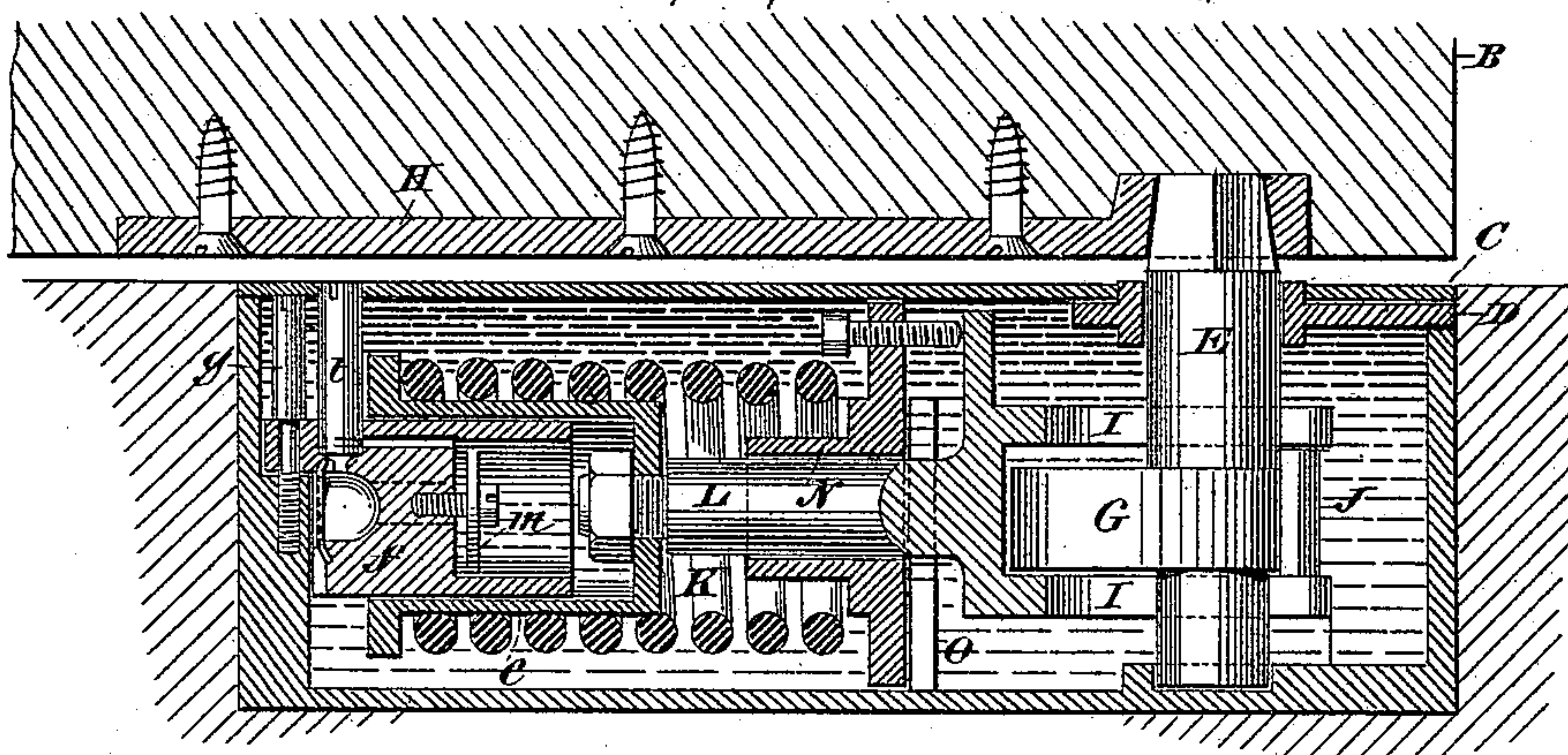


Fig. 8.

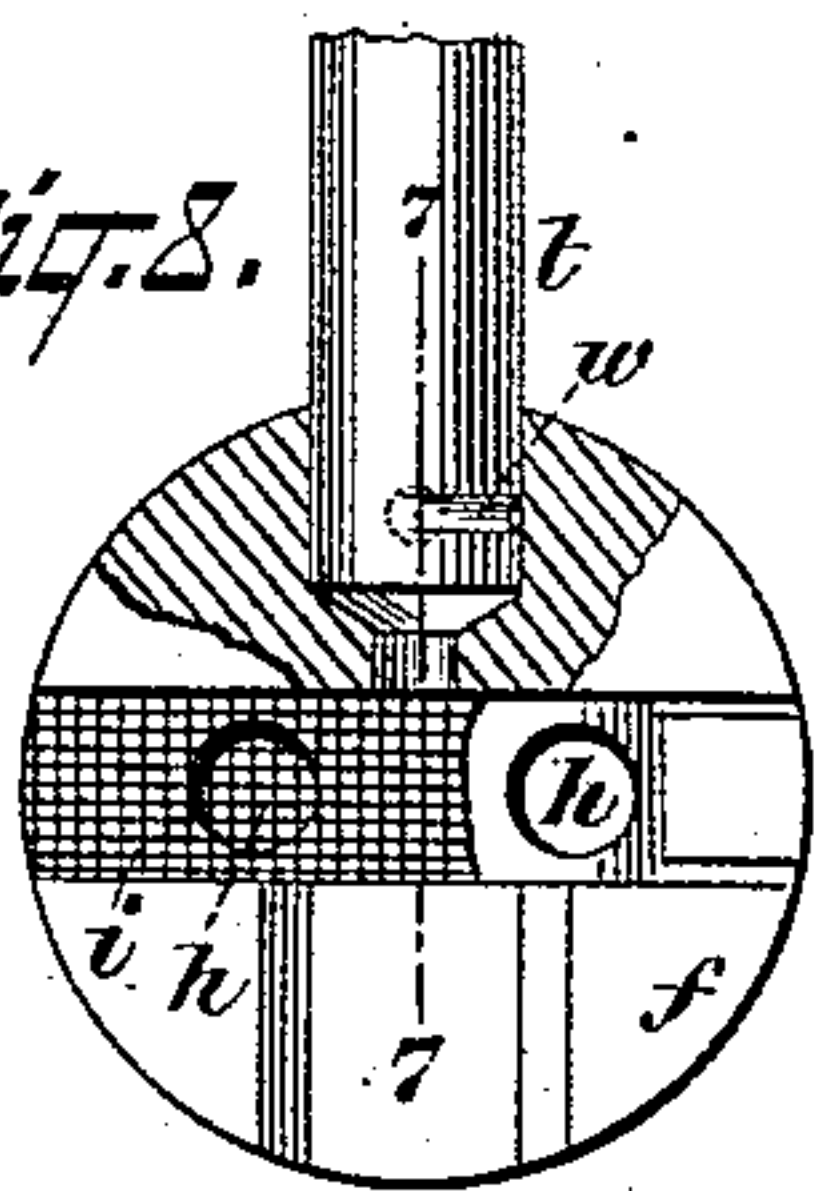


Fig. 7.

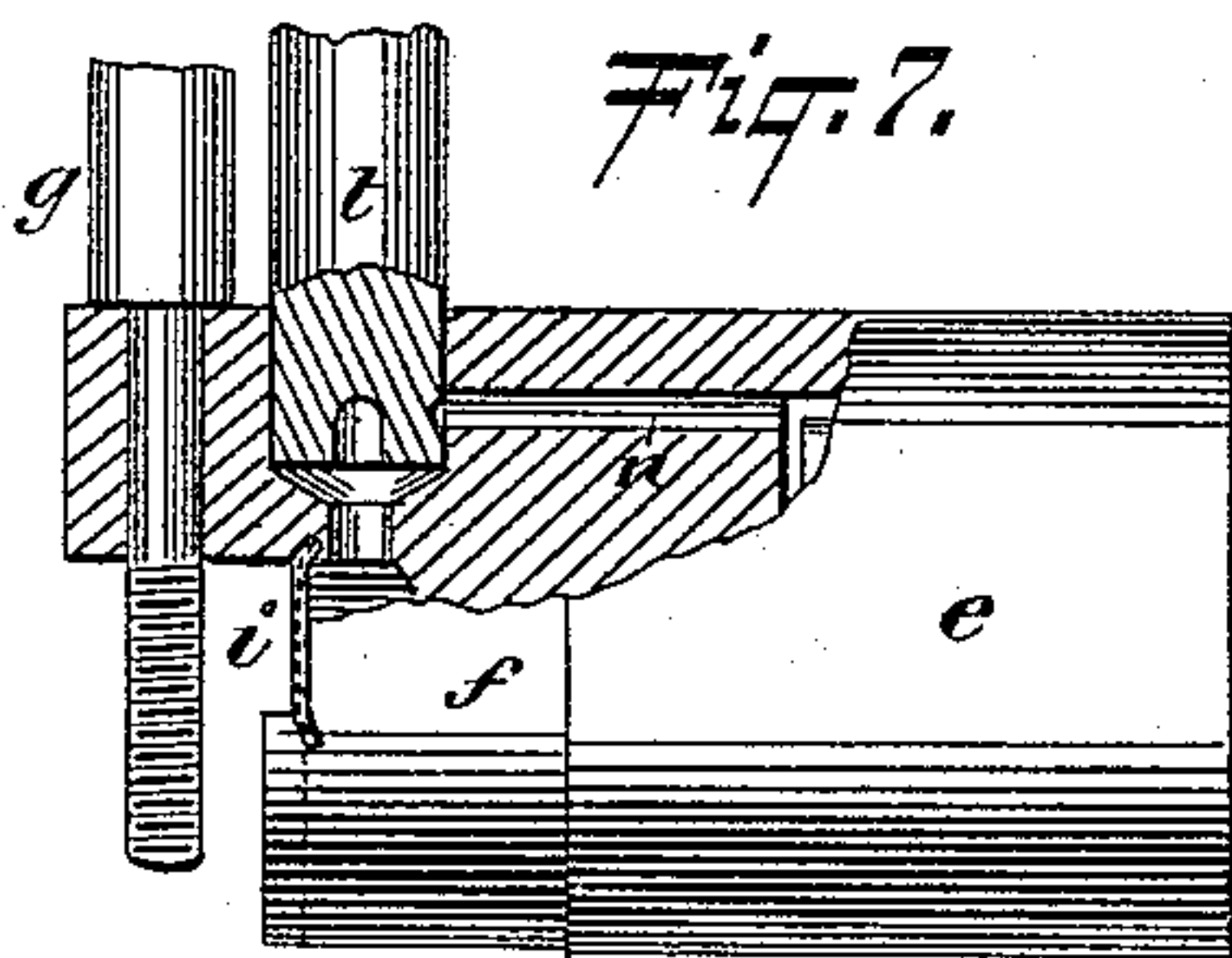


Fig. 9.

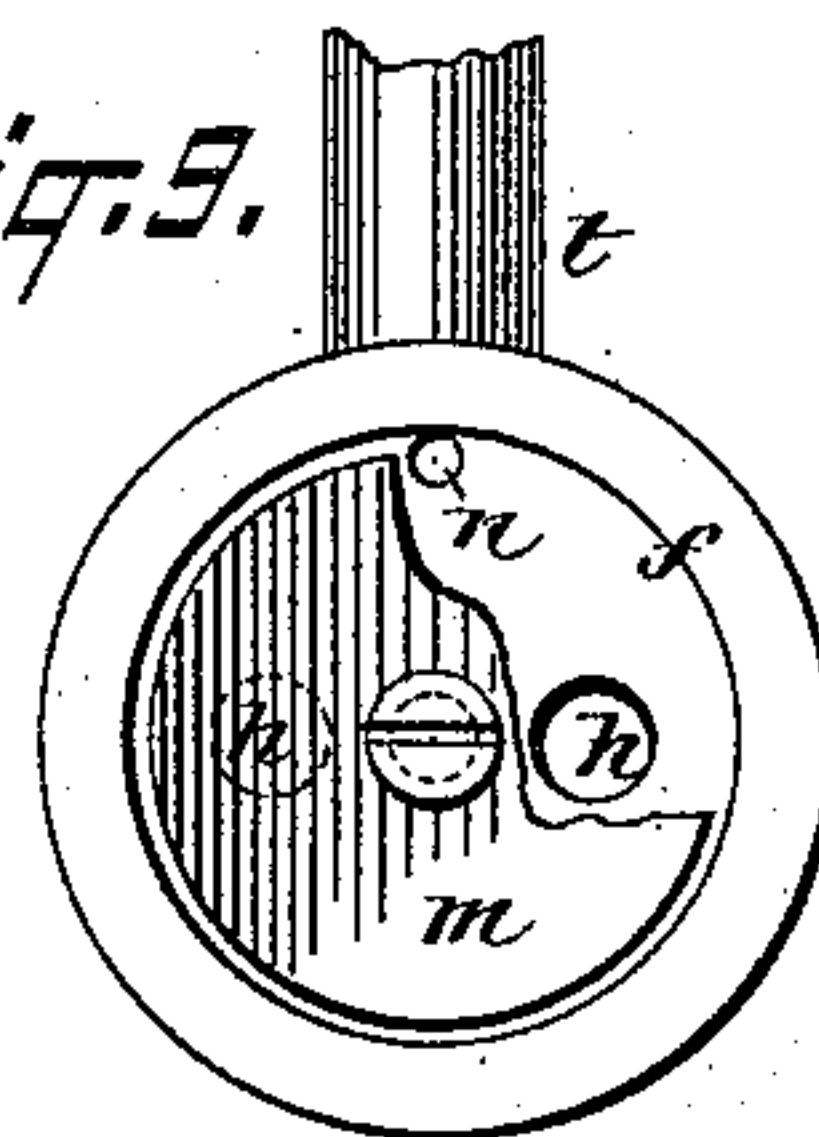
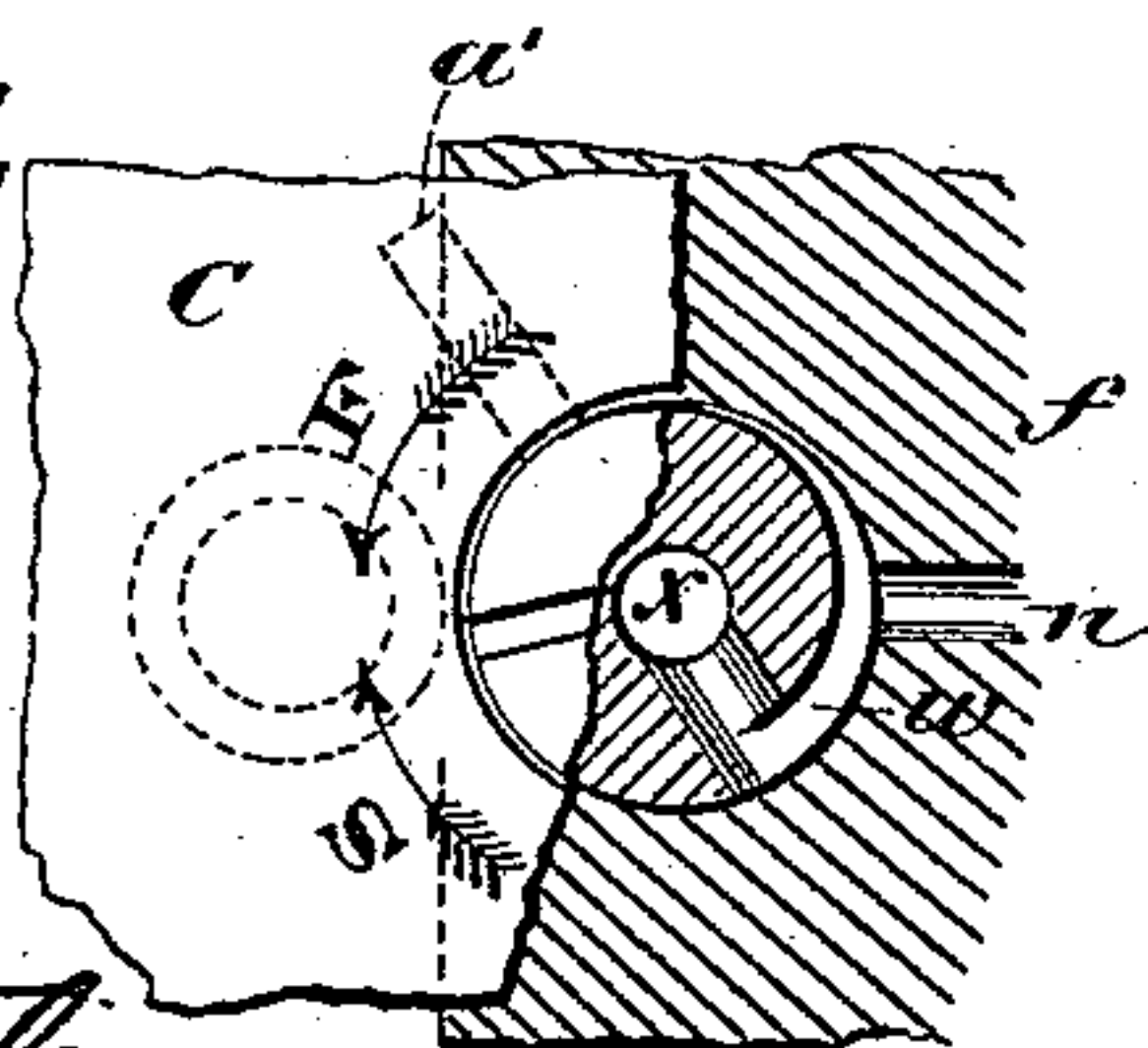


Fig. 10.



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Fig. 11

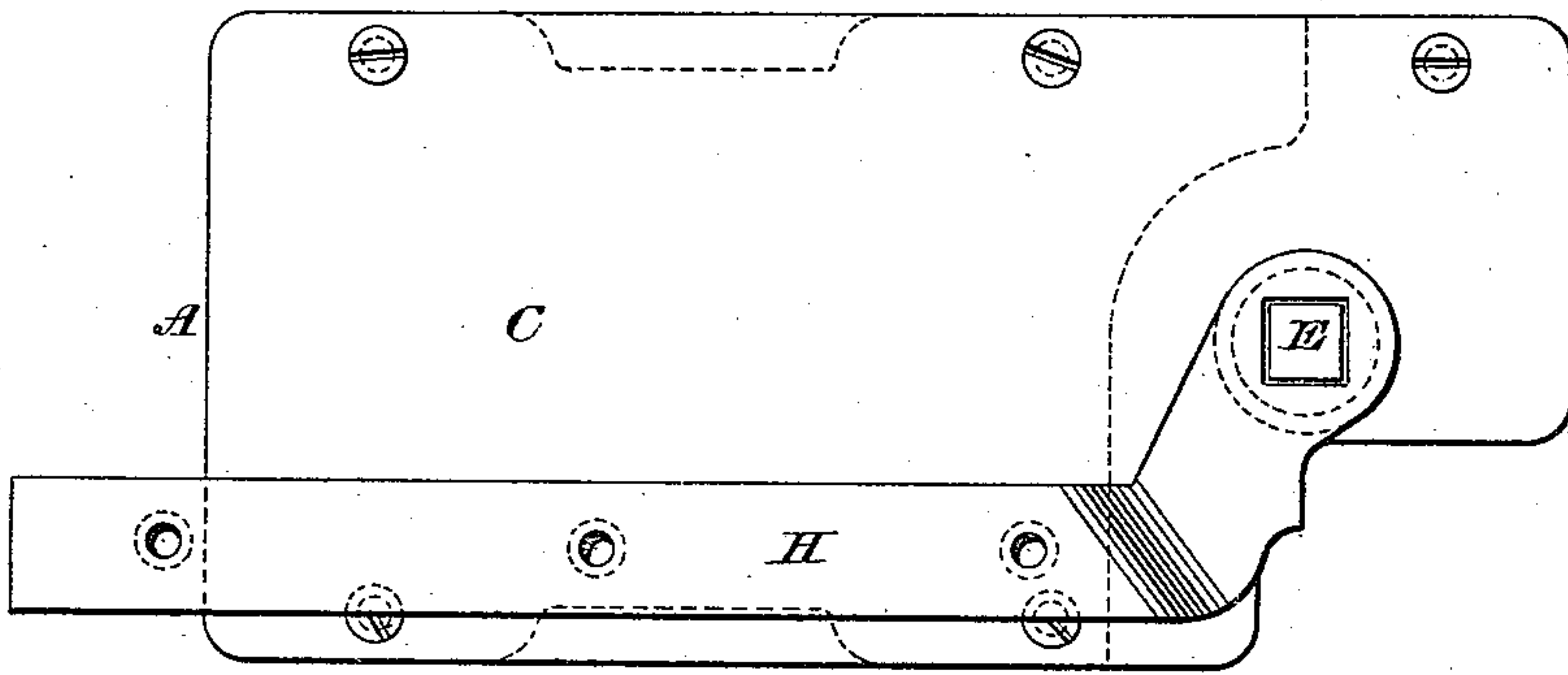


Fig. 12.

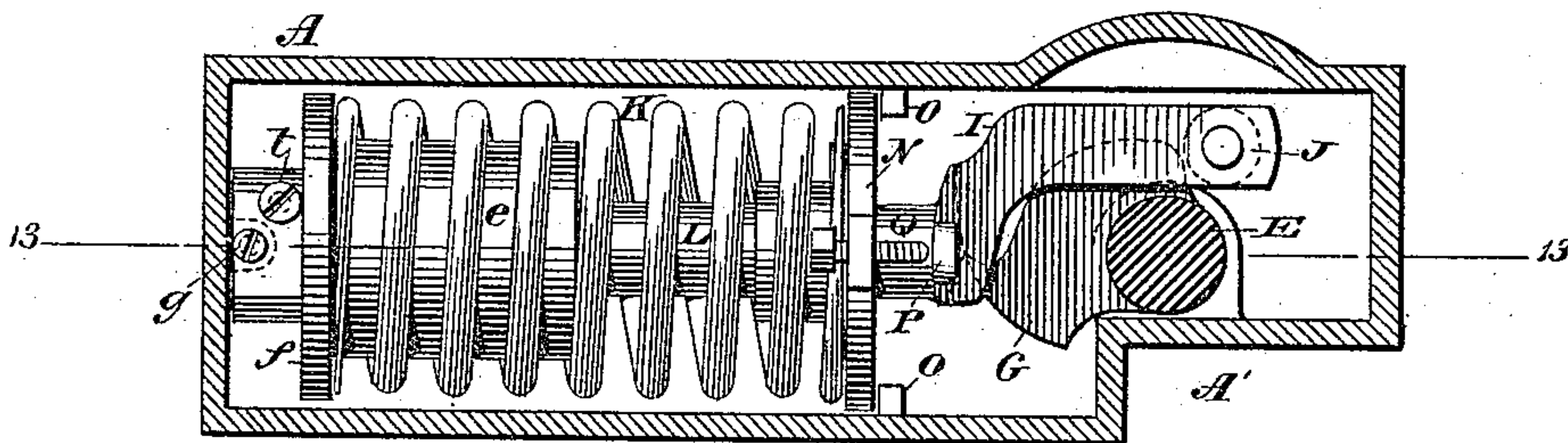
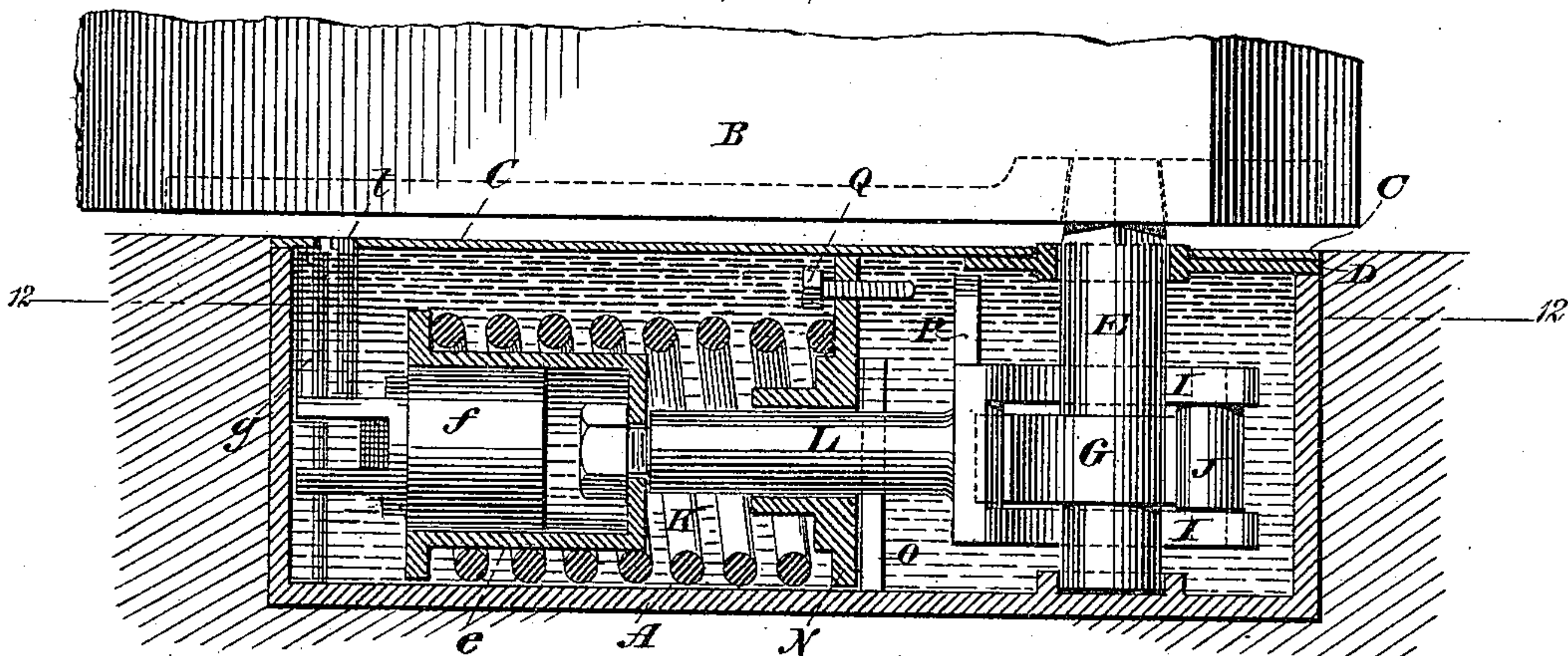


Fig. 13.



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UNITED STATES PATENT OFFICE.

JOSEPH BARDSLEY, OF BROOKLYN, NEW YORK.

DOOR-CHECK.

SPECIFICATION forming part of Letters Patent No. 441,274, dated November 25, 1890.

Application filed April 19, 1890. Serial No. 348,671. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH BARDSLEY, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Door-Checks, of which the following is a specification.

The invention relates to improvements in spring-checks for doors; and it consists in certain elements hereinafter described and claimed, constituting further developments of the door-checks shown and described in Letters Patent of the United States granted to me October 27, 1885, and July 19, 1887, and numbered, respectively, 329,000 and 366,711.

The present invention embraces a pivot seated in a casing beneath the heel of the door and connected at its upper end with the door, a piston, piston-rod, cylinder, spring, and stop, all inclosed in said casing and adapted to be used in connection with a fluid whose passage through channels from one end to the other of the piston regulates the action of the door. The spring is compressed during the opening of the door, and its force upon the door being released operates to close the same, the flow of the fluid preventing any sudden or violent action of either the spring or door.

The check which is made the subject of this application may be applied to either single or double acting doors with equal efficiency, and its particular nature, objects, and construction will appear in full from the detailed description hereinafter presented.

Referring to the accompanying drawings, Figure 1 is a top plan view of a check embracing the invention, the door being shown in section on the dotted line 1 1 of Fig. 3, and heavy diverging dotted lines being presented to indicate that the door is double-acting, or may be moved in either direction; Fig. 2, a longitudinal transverse section of same, the section being on the dotted line 2 2 of Fig. 3, and the parts of the check being shown in their normal position with the door closed; Fig. 3, a vertical longitudinal section of the check, being on the dotted line 3 3 of Fig. 2, and showing the door partly open and the spring compressed; Fig. 4, a vertical transverse section of the check on the dotted line 4 4 of Fig. 2; Fig. 5, a slightly-modified form

of check constructed in accordance with the invention, the door being shown open and the spring compressed; Fig. 6, a central vertical longitudinal section of same on the dotted line 6 6 of Fig. 5, and representing the position of the spring and other movable elements in their normal position with the door closed; Fig. 7, an enlarged side elevation, partly in section, on the dotted line 7 7 of Fig. 8 of the piston, cylinder, and fluid-regulator, shown on a smaller scale in Fig. 6; Fig. 8 an end view, partly broken away, of same; Fig. 9, an elevation, partly broken away, of the inner end of the piston; Fig. 10, a horizontal section through the upper outer end of said piston and fluid-regulator on the line of the passage for the flow of fluid through the piston, and showing a detached portion of the covering-plate of the casing for the operative parts of the check, the arrows denoting the two motions of the fluid-regulator to expedite or retard the flow of the fluid and the two extreme positions of the regulator being indicated by the letters F S, respectively; Fig. 11, a top plan view of the invention embodied in a single-acting spring-check; Fig. 12, a longitudinal transverse section of same on the dotted line 12 12 of Fig. 13, the parts being in their normal position, as when the door is closed; and Fig. 13, a central vertical longitudinal section of same on the dotted line 13 13 of Fig. 12, the spring being shown partly compressed by the partial opening of the door.

In the drawings, referring to Figs. 1 to 4, inclusive, A denotes an inclosing-casing seated in the floor beneath the door B and provided with a covering-plate C, which is removably secured by screws, as indicated in Fig. 1, and at its rear end rests upon the supplemental plate D, the form of which is shown by dotted lines in Fig. 1. Within the rear end of the casing A is seated the vertical pivot E, which carries the heart-shaped cam G, and at its upper end is angular in cross-section and projects upward through an aperture in the plate D into the correspondingly-formed seat in the rear end of the bar H, fastened to the lower edge of the door. The purpose of thus connecting the pivot E with the door is to cause the rotation of the pivot and cam G in one direction during the open-

ing of the door, and thereby to compress the spring hereinafter referred to, and to effect the closing of the door by the reverse rotation of said pivot and cam under the action of said spring.

The cam G, carried by the pivot E, moves between the upper and lower arms of the yoke I and is held in firm contact with the rollers J of said yoke by the spring K, which encompasses the piston-rod L, connected at its rear end with the yoke and at its front end with the piston M. The spring K is held between the piston M and the stop N, which encircles the rod L, and has a bearing against the lugs O, located a sufficient distance from the pivot E to permit the movement of the cam G and yoke I without coming into contact with them. On the yoke I is provided the lug P, projecting upward in position to act as a bearing for the point of the screw Q when it is desired to relieve the stop N from contact with the lugs O, as hereinafter described. The screw Q is within an internally-threaded aperture in the stop N, and may be worked toward or from the lug P at will.

The front end of the piston-rod L is reduced in diameter, forming a shoulder R, and is threaded and passes through an aperture in the piston M, being there secured by a nut T. The piston M is cup-shaped, and through it passes the series of apertures V (see Figs. 3 and 4) for the fluid contained in the casing A, said apertures being protected at the outer end of the piston by the screen W and adapted to be closed during the closing of the door by the valve-plate X, loosely mounted on a collar between the projecting edges of the nut T and the inner end of said apertures.

The piston M is fitted to and adapted to have a sliding movement in the cylinder Z, which is stationary, being held by the screw *a*, and is provided with the port or channel *b* for the passage of the fluid from the cylinder Z. The port *b* is furnished with the regulating-screw *d*, whose purpose is to more or less close the port for the purpose of controlling the flow of the fluid through it, according to the consistency of the fluid, the strength of the spring, and other circumstances.

When the parts of the check are in their normal position, being that illustrated in Fig. 2, and the door is pushed open, the rotation of the pivot E will bring the cam G against one of the rollers J and cause it to force the yoke I, rod L, and piston M rearward, (toward the said pivot,) thereby compressing the spring K against the stop N and withdrawing the piston to the outer end of the cylinder Z, as shown in Fig. 3. During this movement of the piston M the oil, water, or other fluid passes freely through the apertures V, opening the valve-plate X therefrom and filling the cylinder Z, in which it will act as a cushion against the inner end of the piston. Upon the door being released, the force of the spring K moves the rod L, piston M, and yoke

I back to their normal position, reversing the rotation of the pivot E and cam G and closing the door. During the return movement of the piston M to its position at the inner end of the cylinder Z the pressure of the fluid closes the valve-plate X against the apertures V, and said piston drives the fluid out from the cylinder through the port *b*, the escape of the fluid being slow and gradual, owing to the smallness of the port, and regulating the movement of the piston into the cylinder, and thereby the closing of the door. The exit-port *b* being contracted, the spring will be unable to suddenly force the parts to their normal position, and hence while the door will with certainty be closed it will not have a violent action.

The spring K presses the stop N very firmly against the lugs O, and this would render it inconvenient to withdraw the parts of the check from the casing A were not some means provided to overcome this pressure of the stop, and hence to facilitate the removal of the parts in their connected condition, after withdrawing the covering-plates and screw *a*, I screw the screw Q against the lug P until the stop N is forced from contact with the lugs O, at which time all the parts within the casing A may be withdrawn and replaced in connected condition at will, the pressure of the spring being confined between the piston M and stop N, and the force previously exerted against the lugs O having been transferred to the screw Q and lug P.

The foregoing description of the check shown in Figs. 1 to 4, inclusive, with the letters of reference, applies also to the check illustrated in Figs. 5 to 10, inclusive, with the exception that in the latter figures a different form of piston, cylinder, and fluid-regulator is shown. The description of the check represented in Figs. 5 to 10, inclusive, will therefore be more particularly confined to the construction and operation of the cylinder, piston, and fluid-regulator, the other elements being lettered the same as the like elements presented in Figs. 1 to 4, inclusive.

Referring to Figs. 5 to 10, inclusive, the cylinder *e* is secured to the end of the rod L and incloses and moves upon the piston *f*, which is held stationary by the screw *g*. The piston *f* is provided with the apertures *h*, extending through it and protected by the screen *i* at one end and adapted to be closed at their opposite end by the loosely-supported valve-plate *m*. The piston *f* is also provided with the escape-port *n*, which is controlled as to its operation by the rotary fluid-regulator *t*, which is seated in the piston in the path of the port *n* and is provided at its upper end with a slot, so as to adapt it to be rotated by an ordinary screw-driver. It is to be noticed that the regulator *t* has a rotary motion but not a vertical motion, such as a threaded screw would have, and that the lower end of the regulator is provided with the gradually-enlarging groove *w*, which at its larger end

turns inward to the vertical opening x , passing downward through the lower end of the regulator in position to discharge the fluid behind the screen i . The purpose of the groove w in the regulator t is to expedite or restrict the flow of the fluid from the cylinder e through the port n , and hence to control the action of the spring K and the closing of the door. When the larger end of the groove w is brought into line with the port n , the fluid will escape more freely and the door will close more quickly; but when the smaller end of the groove w is turned in line with the port n the flow of the liquid from the cylinder e will be retarded and the door will, as a consequence, close more slowly. In Fig. 10 the regulator t is shown in a medium position with respect to the port n , and from this figure it will appear obvious that by turning the regulator toward the letter "F" the flow of the fluid will be expedited or made more free, and by turning it toward the letter "S" the passage of the fluid through the port n will be retarded or made more slow. The regulator t carries a pin a' , (shown by dotted lines in Fig. 10,) which at the extreme positions of the regulator will strike the screw g and act as a stop. The form of regulator t (shown in Figs. 5 to 10, inclusive) is equally applicable to the check presented in the Figs. 1 to 4, inclusive, and is the form of regulator I most prefer.

In the operation of the check shown in Figs. 5 to 10, inclusive, during the opening of the door and the consequent compression of the spring the fluid passes through the apertures h into the cylinder e , and during the closing of the door the expansion of the spring and movement of the cylinder cause the fluid within the latter to close the valve-plate m against the apertures h and to make its escape through the port n .

In the check shown in Figs. 1 to 4, inclusive, are a movable piston and a stationary cylinder, while the check illustrated in Figs. 5 to 10, inclusive, makes use of a movable cylinder and stationary piston.

In Figs. 11 to 13, inclusive, is illustrated the check, constructed for use on a single-acting door, and it is the same in all essential respects as the check shown in Figs. 4 to 10, inclusive, with the exception that in the single-acting check the corner of the casing is provided with the angular recess A' to fit against the corner of the door-frame. One pair of the arms of the yoke I is dispensed with, and the cam G is conformed for a single-acting check, the wall of the angular recess A' serving as a stop for the cam. These elements of the single-acting check are of course applicable to the check shown in Figs. 1 to 4, inclusive. The various figures have, however, been presented with a view of fully explaining the character of the invention and of illustrating the various operative parts in their different positions.

The novelty of the invention as relating to the rear or pivot end of the check is shown in Figs. 11 to 13, inclusive, while the remaining features of novelty are shown at the opposite end of the check presented in Figs. 1 to 10, inclusive.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The door-check consisting of the casing A and the pivot E , seated in said casing, combined with the sliding yoke and rod adapted to be moved by the rotation of said pivot, the spring encompassing said rod, the stop for the spring, the piston, the cylinder, the inlet for the liquid into said cylinder, and the escape-port therefrom, the said cylinder when in position being entirely open at its end which receives and co-operates with said piston, and the whole being inclosed by the casing A , substantially as and for the purposes set forth.

2. The door-check consisting of the casing A and the pivot seated in said casing, combined with the sliding yoke and rod adapted to be moved by the rotation of said pivot, the spring encompassing said rod, the stop for the spring, the cylinder secured to and carried by said rod, and the stationary apertured piston having the valve and the escape-port, the whole being inclosed by the casing A , substantially as and for the purposes set forth.

3. The check consisting of the actuating-pivot, yoke, rod, piston, cylinder, spring, and stop, all arranged within the casing containing the fluid, combined with an inlet for the fluid into the cylinder, an escape-port for the fluid therefrom, and the rotary regulator t , having the gradually-enlarging groove w in the path of said escape-port, and the interior opening x , connecting with said groove, substantially as set forth.

4. The door-check consisting of the pivot connected with the door and seated in the casing beneath the same, combined with the sliding yoke and rod adapted to be moved by the rotation of said pivot, the cylinder, piston, spring, and stop for said spring, the stop carrying the screw Q , and the yoke a bearing for the point of the screw, substantially as set forth.

5. The check consisting of the actuating-pivot carrying the cam and seated in the casing beneath the door, said casing having the angular recess A' to fit against the corner of the door-frame, combined with the sliding yoke and rod, the piston, cylinder, spring, and stop, all arranged within said casing, substantially as set forth.

Signed at New York, in the county of New York and State of New York, this 18th day of April, A. D. 1890.

JOSEPH BARDSLEY.

Witnesses:

CHAS. C. GILL,
E. D. MILLER.