

(No Model.)

4 Sheets—Sheet 1.

J. BARDSLEY.

COMBINED DOOR SPRING AND CHECK.

No. 464,951.

Patented Dec. 15, 1891.

Fig. 1.

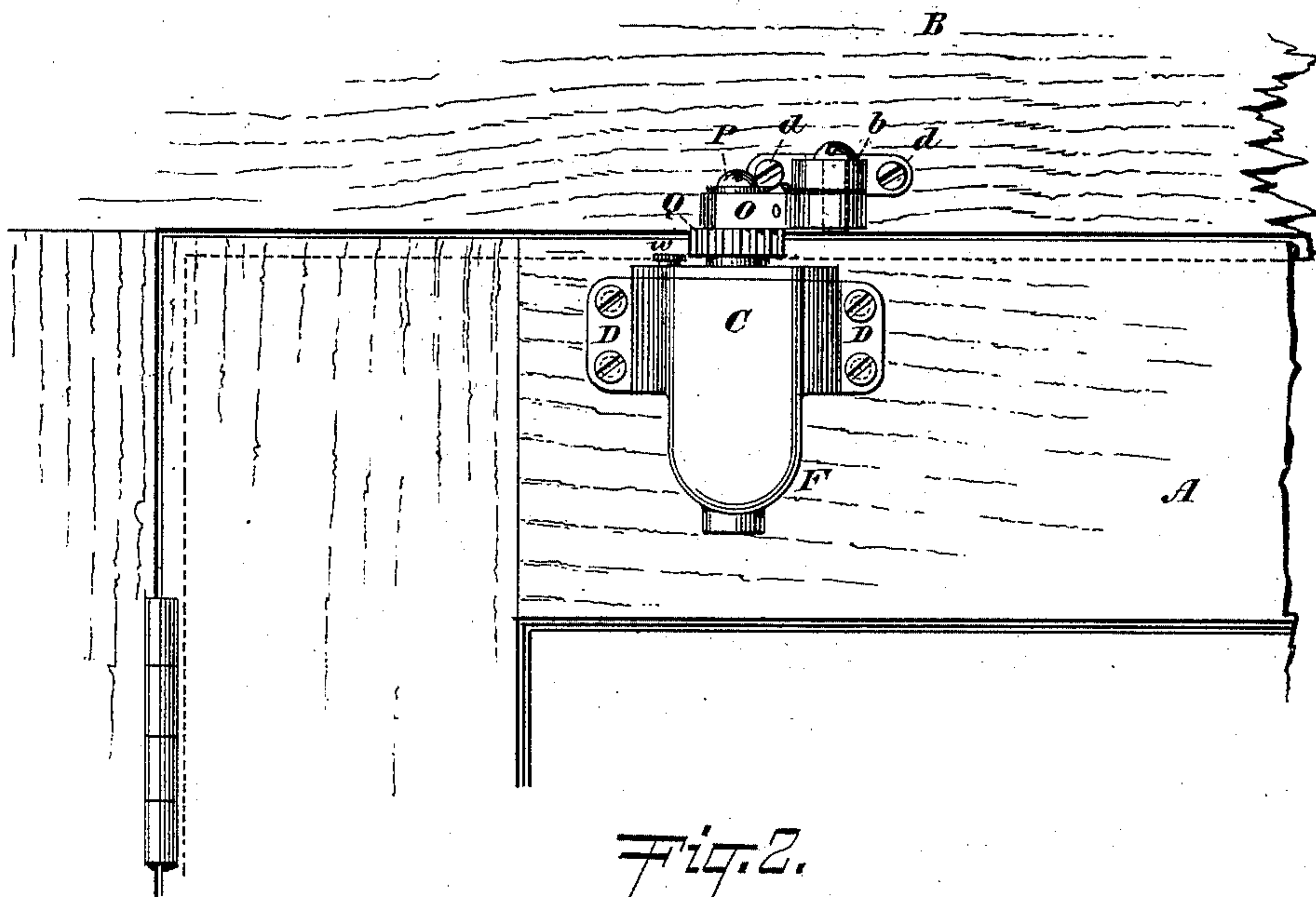
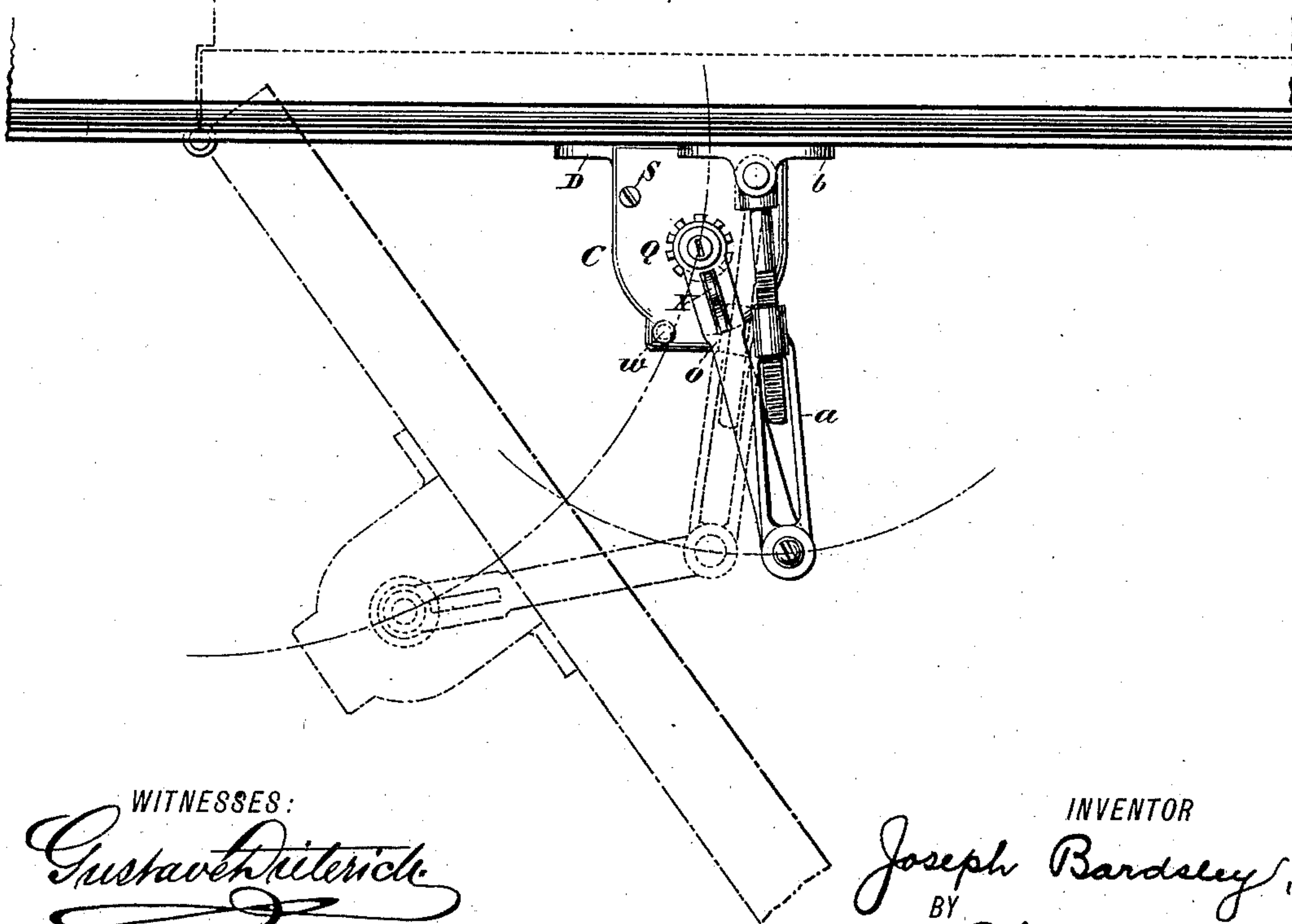


Fig. 2.



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Fig. 5.

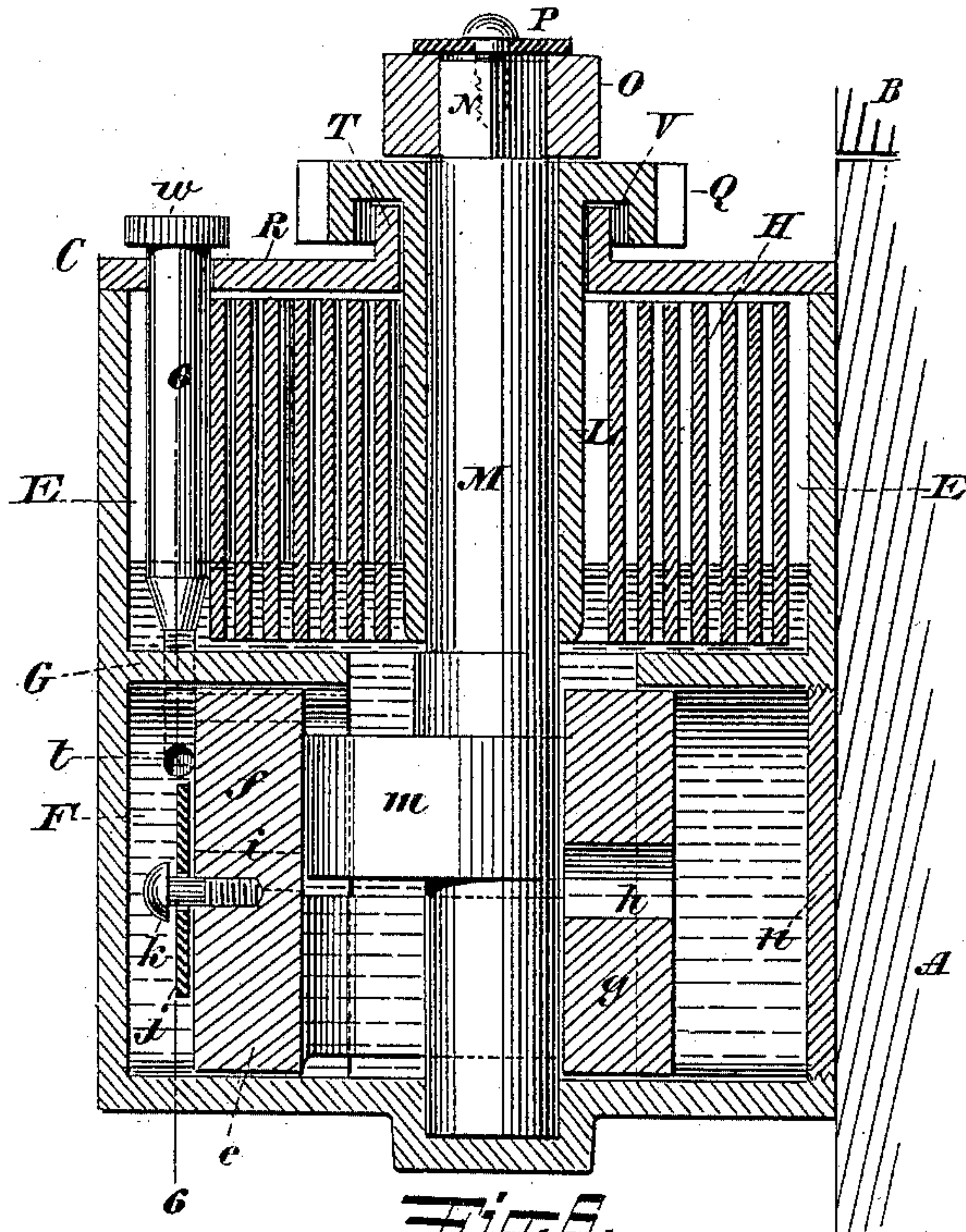


Fig. 7.

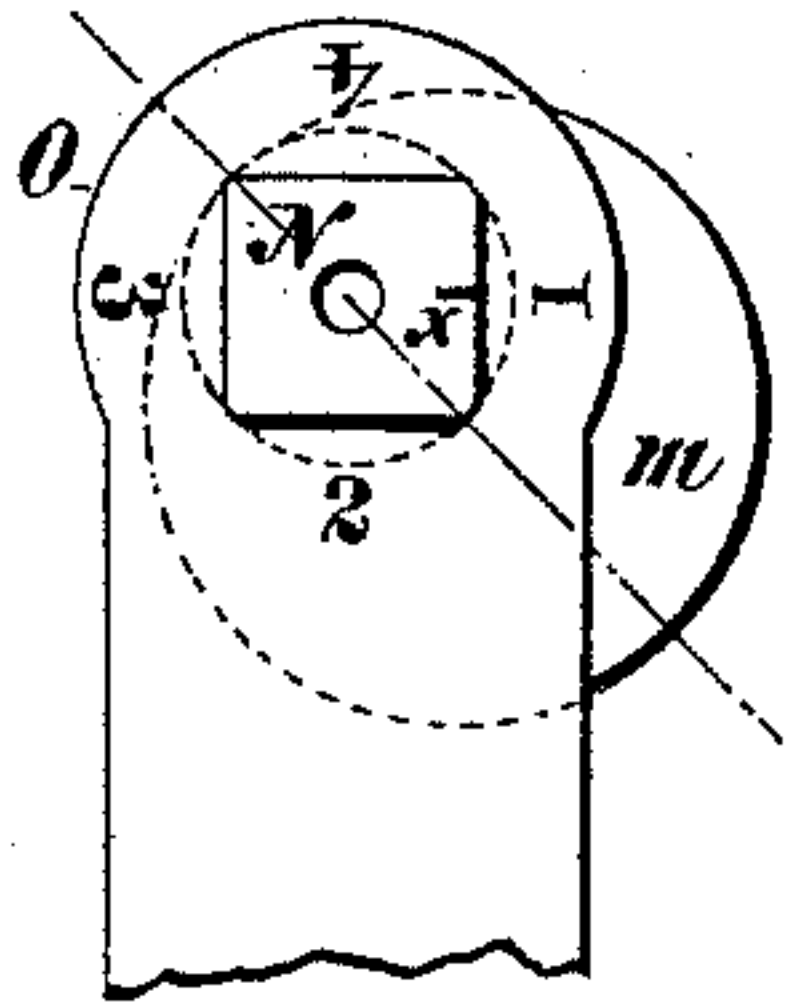
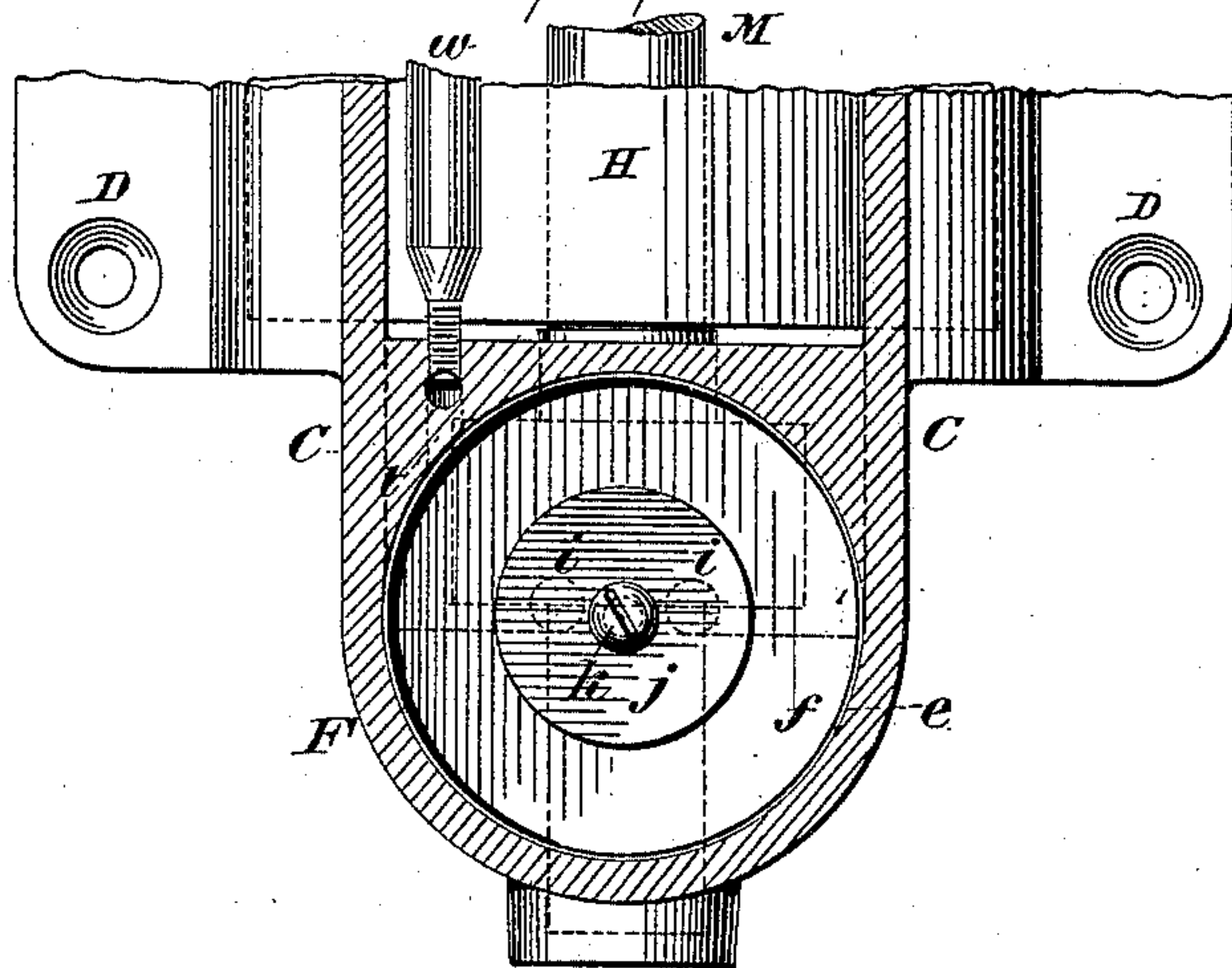


Fig. 6.



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Fig. 8.

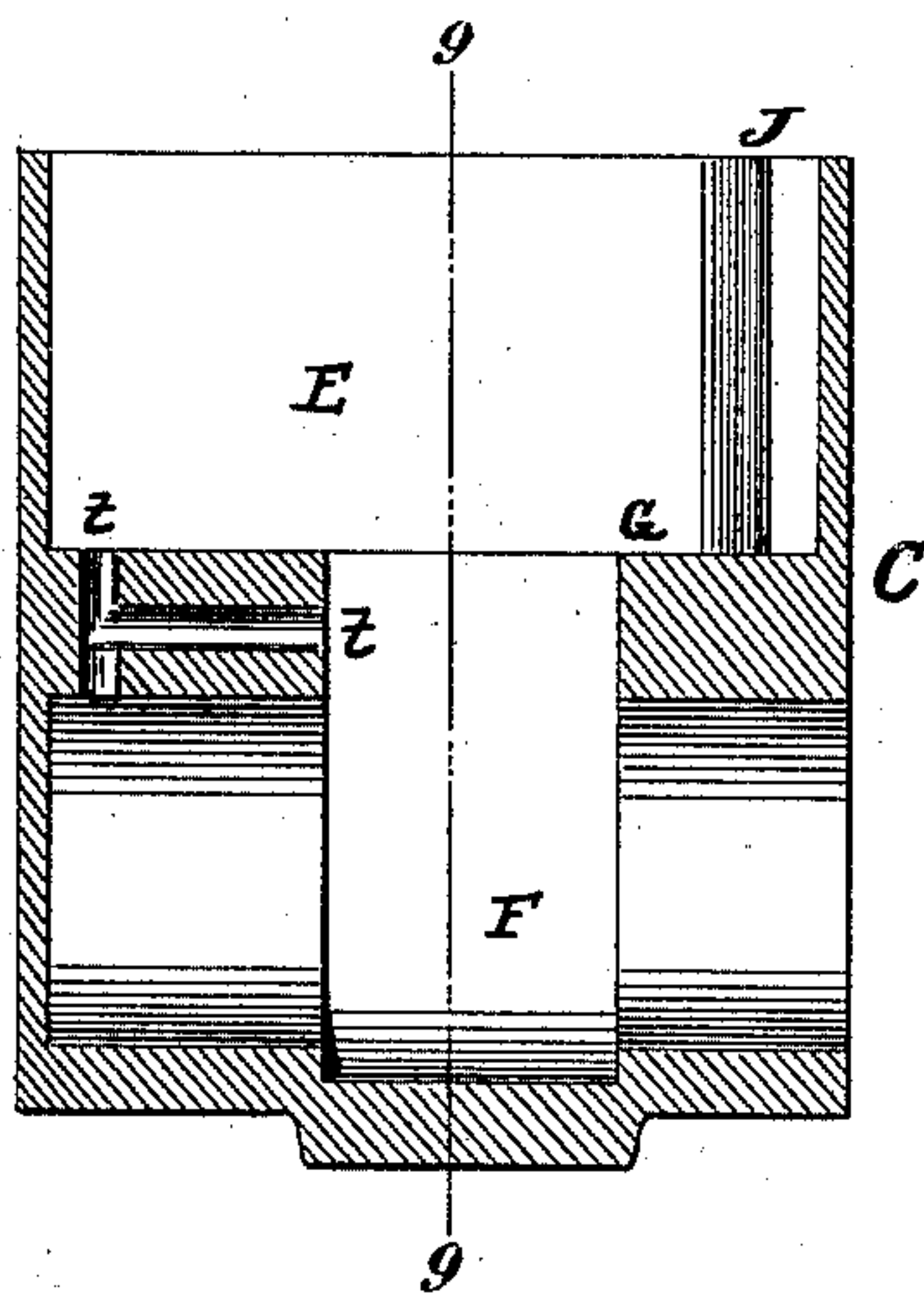
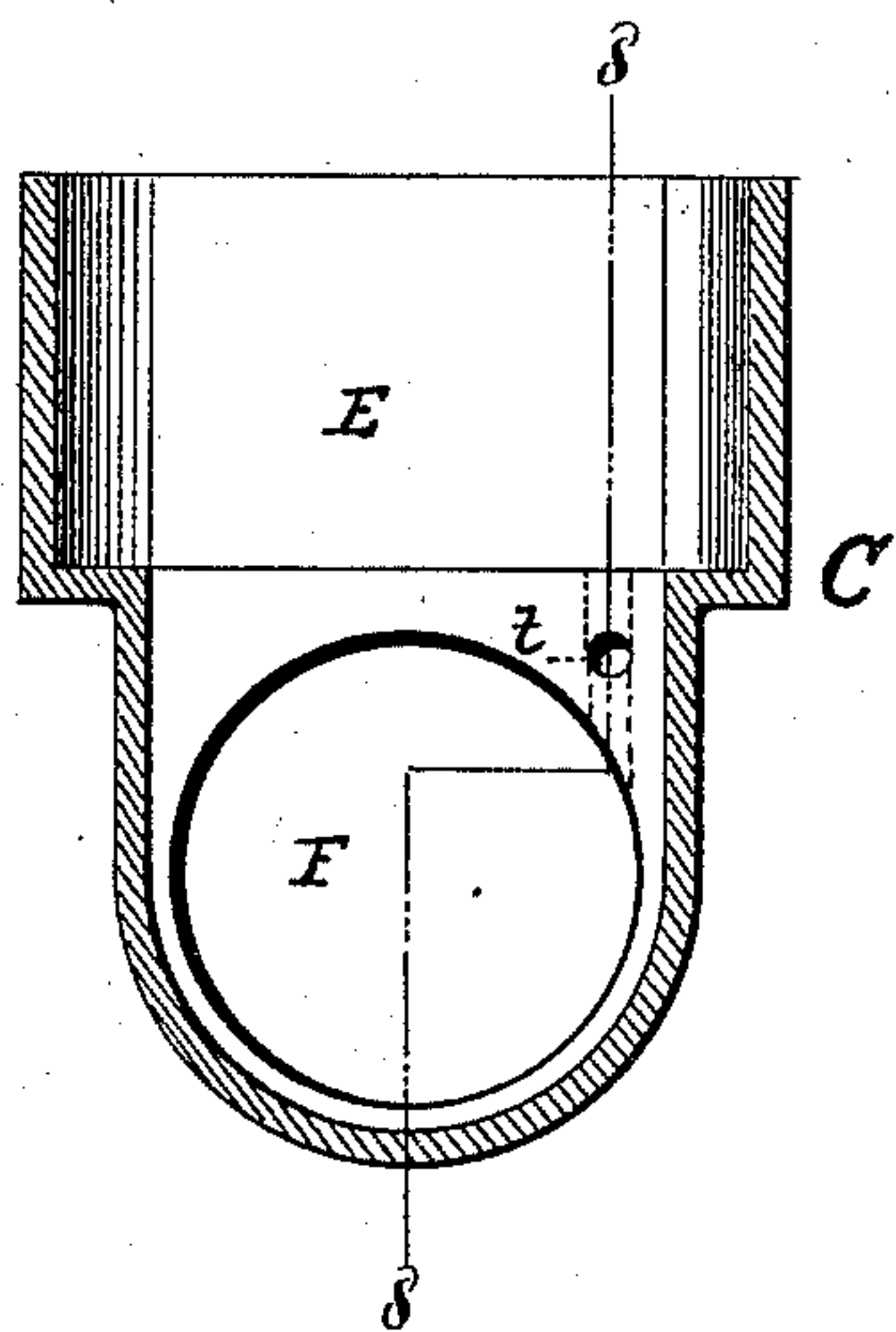


Fig. 9.



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UNITED STATES PATENT OFFICE.

JOSEPH BARDSLEY, OF BROOKLYN, NEW YORK.

COMBINED DOOR SPRING AND CHECK.

SPECIFICATION forming part of Letters Patent No. 464,951, dated December 15, 1891.

Application filed January 31, 1891. Serial No. 379,800. (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 Combined Door Springs and Checks, of which the following is a specification.

The invention relates to improvements in combined doorsprings and checks; and it consists in the devices hereinafter described, and particularly pointed out in the claims.

Referring to the accompanying drawings, Figure 1 is a detached front elevation of a combined door check and spring constructed in accordance with the invention, shown applied to a door, the latter being partly broken away; Fig. 2, a top view of same, the position of the parts of the device being shown by full lines and by dotted lines, the latter illustrating the position when the door is partly open. Fig. 3 is a central vertical section, on an enlarged scale, of same, the section being on the dotted line 3 3 of Fig. 4. Fig. 4 is a transverse section of same on the dotted line 4 4 of Fig. 3. Fig. 5 is a vertical section of same on the dotted line 5 5 of Fig. 4. Fig. 6 is a vertical section of same on the dotted line 6 6 of Fig. 5; and Fig. 7 is a detached view illustrating the upper end of the actuating-spindle with the cam carried thereby, and indicating by the figures 1, 2, 3, and 4, respectively, the different positions at which said cam may be set for the purpose of adapting the door spring and check for either a right or left hand door or for the inner or outer side of said door. Fig. 8 is a sectional view on the dotted line 8 8 of Fig. 9 of the casing, which when in use incloses the spring and other features of the invention; and Fig. 9 is a sectional view of same on the dotted line 9 9 of Fig. 8.

In the drawings, A designates the door, B the lintel above the same, and C the casing containing the spring and other parts hereinafter specifically referred to. The casing C is secured to the upper portion of the door by means of the screws D, as illustrated more particularly in Fig. 1, and contains two cham-

bers (lettered E F, respectively) separated by a shelf or partition G. Within the chamber E and resting upon the shelf G is the helical spring H, one end I of which is hooked upon a lug J, formed within the casing C, while the other end thereof snugly enters a vertical slot K, formed in the sleeve L, which encompasses the upper portion of the actuating-spindle M. The spindle M is seated in the lower portion of the casing C and extends upwardly through the same, being provided upon its upper portion with the said sleeve L and being squared on its upper extremity N to receive the end of the lever O, the latter being held in place by means of a washer and screw P. The sleeve L is formed with the toothed wheel Q, the latter being at the upper end of said sleeve and immediately below the lever O. The chamber E of the casing C is provided with the cap R, held in place by screws S, (see Fig. 2,) and being provided with an opening at about its center, said opening being surrounded by the vertical flange T, which extends upward within the annular groove V, formed in the lower side of the toothed wheel Q, as illustrated in Figs. 3 and 5. It is to be noted that the toothed wheel Q, with its sleeve L, while surrounding the actuating-spindle M, is independent of the same, and that its function is, during the opening of the door, to wind the spring H around itself, the inner end of said spring being, as above described, held in the slot K of said sleeve. The lever O, however, being on the squared end of the actuating-spindle M, will, during the opening of the door, serve to rotate said spindle. Within a slot W of the lever O is pivoted the pawl X, having the lug or extension Y and engaging point Z, the latter being adapted, as illustrated in Fig. 3, to engage the teeth of the wheel Q at such times as it may be desired to cause the movement of the lever O to rotate said wheel and thus wind the spring H. It will be understood that when the door is open the tension of the spring will operate to reverse the movement of the sleeve L and wheel Q, and thus through the lever O and its connections to close the door.

As may be observed by reference to Figs.

1 and 2, one end of the lever O is secured upon the upper end of the actuating-spindle M, while the other end thereof is pivotally secured to the extensible rod *a*, which is pivotally secured to a lug *b*, fastened to the lintel B by means of screws *d*.

The lower chamber F of the casing C constitutes a cylinder to receive the reciprocating piston *e*, having the heads *f* *g*, the latter being provided with the opening *h*, and the former with the openings *i* and valve *j*, the latter being loosely held upon the screw *k*, and being adapted to regulate the flow of liquid through said openings *i*, as hereinafter more fully explained. The middle portion of the piston *e* is cut away to receive the cam *m* and to permit the passage through it of the lower portion of the actuating-spindle M, as illustrated more fully in Figs. 3 and 5. The end of the cylinder formed in the chamber F is provided with the threaded cap *n*, which is adapted to firmly close the end of said cylinder after the piston *e* has been introduced therein.

Within the walls of the cylinder F is formed the port *t*, consisting of a horizontal portion and a vertical portion, as shown by dotted lines in Fig. 5, the vertical portion of the port *t* having an opening adjacent to the left-hand end of the cylinder F, and the horizontal portion of said port having an opening in the walls of the cylinder F adjacent to the actuating-spindle M, as illustrated by dotted lines in Fig. 5.

The shelf or partition G between the chambers E F of the casing C is cut away at its central portions, as illustrated in Fig. 5, to permit the passage through it of the actuating-spindle M with its cam *m*, and it is at this middle portion of the said shelf or partition G that the horizontal end of the port *t* has an opening. The purpose of the port *t* is to permit the passage of the oil or other liquid within the casing C from one side to the other of the head *f* of the piston *e*.

In order to regulate the flow of oil or other liquid through the port *t*, I have provided the adjusting-screw *w*, as illustrated in Fig. 5, which passes downward through the cap R and shelf or partition G, the point of the screw entering the port *t* at the junction of its vertical and horizontal portions, and thereby being adapted upon the rotation of the screw to restrict the size of the port *t* and regulate the flow of the oil or other liquid through the same. The screw *w* is provided with a suitable milled head in order to facilitate its adjustment.

After the piston *e* has been inserted into the cylinder formed by the chamber F and the cap *n* secured in place the spindle M is inserted downward through the piston *e* and the spring H, with the gear-wheel Q and sleeve L, introduced into the chamber E of the casing. The oil or other liquid (indicated in the drawings by dotted lines) having been poured

into the casing, the cap R is secured by the screws S, whereupon the jointed arms or levers O *a* and casing C may be secured to the door in position to effectuate the objects for which it was constructed.

The position of the actuating-spindle M with its cam *m* (illustrated in the drawings) is such as to adapt the device for a right-hand door, and in this position it is illustrated in Fig. 1. Upon the door being opened the spring H will, through the medium of the lever O, pawl X, toothed wheel Q, and sleeve L, be caused to wind upon itself, thus creating a tension opposing the opening of the door, and which will, upon the door being released, close the same. During this operation the actuating-spindle M will also, owing to the lever O being secured upon its squared upper end, have a rotary movement imparted to it, thereby bringing the cam *m* against the head *g* of the piston *e*, forcing said piston toward the right-hand end (looking at Fig. 5) of the cylinder F and driving the oil or other liquid through the port *h* into the middle portion of the casing. The movement of the piston *e* toward the cap *n* is without much opposition, since the opening *h* is of sufficient diameter to permit the oil or other liquid to freely pass through the same into the middle portion of the cylinder F. After the door has been opened and then released the spring H will, by reversing the movement of the sleeve L and toothed wheel Q, act through the lever O and arm *a* to close the door, and at this time the cam *m* will come into contact with the head *f* of the piston *e* and thereby reverse the movement of the latter, causing it to leave the right-hand end of the cylinder F and approach the left-hand end thereof. During this movement of the piston *e* toward the left-hand end of the cylinder F the oil between the head *f* and the end of the cylinder will be forced through the port *t*, and this, being of restricted diameter, will retard the flow of the oil and the movement of the piston *e* to such extent that the door may close gently. While the piston *e* is moving toward the left-hand end of the cylinder F the pressure of the oil will close the valve-plate *j* against the openings *i* and thus prevent the escape of the oil except through the port *t*. Upon opening the door, however, the piston *e* moves toward the right-hand end of the cylinder F, and at this time the oil passes into the inner ends of the openings *i* and operates to free the valve-plate *j* from contact with the end of the piston *e*, and thus a free passage is formed for the oil from the middle portion of the cylinder F to the left-hand end thereof. It will thus be observed that while the spring H operates to close the door its force is controlled by the action of the piston *e* in the cylinder F.

The pawl X, being pivotally secured in the lever O and having the extension Y, may be readily lifted from contact with the toothed wheel Q whenever desired. By reason of the

pawl X the movement of the lever O may be communicated to the sleeve L, while at the same time said lever is engaged in rotating the actuating-spindle M. The extension Y has been applied to the pawl X as a matter of convenience merely, and hence does not form an essential feature of the invention.

The casing C is provided at opposite sides with the lugs J, as illustrated more clearly in Fig. 4, and the purpose of thus arranging said lugs is to permit the reversal of the spring H whenever it may be desired to adapt the device for a left-hand door, or vice versa. The arrangement of the spring H and cam *m* (illustrated in the drawings) is such as said devices should be given when the combined spring and check is to be applied to a right-hand door, and under this condition the indicating-notch *x* on the upper end of the spindle M will be in line with the numeral "1" on the lever O, as shown in Fig. 7. Should it be desired, however, to apply the combined door spring and cheek to a left-hand door, it would be necessary to reverse the spring H, so that its hooked end I (see Fig. 4) would engage the lug J at the right-hand side of the casing C, and also to bring the indicating-notch *x* on the spindle M in line with the numeral "2" on the lever O, thereby adapting the combined spring and check for a left-hand door without altering the initial position of the piston *e* within the cylinder F. The combined door spring and check hereinbefore described is also adapted to be placed upon the outer side of either a right or left hand door, and when so applied the casing C will be secured to the jamb and the lug *b* to the door. When the device is to be adapted for the outer side of a right-hand door, the notch *x* on the spindle M will be brought into line with the numeral "3" on the lever O, and when adapted for the outer side of a left-hand door said notch *x* will be brought into line with the numeral "4" on said lever. The relation of the spindle M and lever O is thus changed as the device is adapted for its different locations in order that the initial position of the piston *e* when the door is closed (being that illustrated in the drawings) may remain unaffected by the reversing of the position of the casing C and lever-arms O *a*. Under all the changed positions of the casing C and arms O *a* the initial position of the piston *e* with relation to the cylinder F and cam *m* when the door is closed remains the same, and it is for convenience in preserving this condition that the numerals 1 2 3 4 are provided. In this manner uniformity of action in the piston *e* is secured under all the positions of the casing C and arms O *a*, while the reversal of the spring H insures the closing of the door under said positions.

In the foregoing specification I have referred to the element *m* as a cam for purposes of description. It is in reality, however, simply an arm or lever extending from the actu-

ating-spindle M for engagement with the piston *e* in order that the latter may receive its movement from said spindle.

In referring to the cam I do not therefore wish to confine the invention to that which might technically be considered a cam. Attention may also be called to the pivoted pawl X, adapted to have a vertical movement, when desired, and capable of engaging the toothed wheel of a door-spring in either direction with but one edge. The operation of this pawl is positive and its use convenient and effectual.

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

1. A combined door spring and check consisting of the casing forming the spring-chamber and the horizontal liquid-holding cylinder, the latter extending beneath said chamber, combined with the actuating-spindle extending through said chamber and into said cylinder, the horizontally-reciprocating piston within said cylinder, the valve-controlled port in said piston, the passage for the liquid around said piston, the cam on said spindle to effect the reciprocation of said piston, the helical spring encompassing said spindle, and means, substantially as described, for winding said spring and rotating said spindle, substantially as set forth.

2. The combined door spring and check consisting of the casing forming the chambers, the helical spring in one of said chambers, and the piston reciprocating horizontally and longitudinally in the other of said chambers, in combination with the actuating-spindle for operating said piston in connection with a checking-liquid, the sleeve and toothed wheel encompassing said spindle and receiving one end of said spring, the lever-arm on the spindle, and the pawl connecting the said arm and toothed wheel, substantially as set forth.

3. The casing having the two chambers, one being in the form of a horizontal cylinder, the cap R, closing one chamber, and the cap *n*, sealing the outer end of said cylinder, combined with the reciprocating piston in said cylinder, the actuating-spindle M, passing through said chambers, the cam *m* on said spindle in position to be carried against the vertical face of said piston, the sleeve L and toothed wheel Q on said spindle, the spring H, held at one end by said casing and at the other by said sleeve, passages for the liquid from one side to the other of said piston, the lever-arm on said spindle, and a pawl connecting said lever-arm with said toothed wheel, substantially as set forth.

4. The jointed lever-arms and the spindle on the end of which the lever-arm *o* is mounted, combined with the spring H, encompassing said spindle and adapted to wind and unwind with the rotation thereof, the toothed wheel on said spindle, and the vertically-acting pawl X, pivoted in the slot W of said lever *o* and having the single point Z adapted to en-

gage the said toothed wheel in either direction without shifting either the wheel or pawl, substantially as set forth.

- 5 The casing containing the spring, the actuating-spindle, the liquid, and cylinder, combined with the piston open at its center and having heads *f g*, with openings *h i*, the valve *j*, the port *t*, and adjusting-regulator *w*, substantially as set forth.

Signed at New York, in the county of New York and State of New York, this 30th day of January, A. D. 1891.

JOSEPH BARDSLEY.

Witnesses:

CHAS. C. GILL,
R. A. PORTEOUS.