

No. 639,816.

Patented Dec. 26, 1899.

J. J. LARIMER.  
COMBINED DOOR CHECK AND SPRING.

(Application filed Mar. 30, 1899.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 3

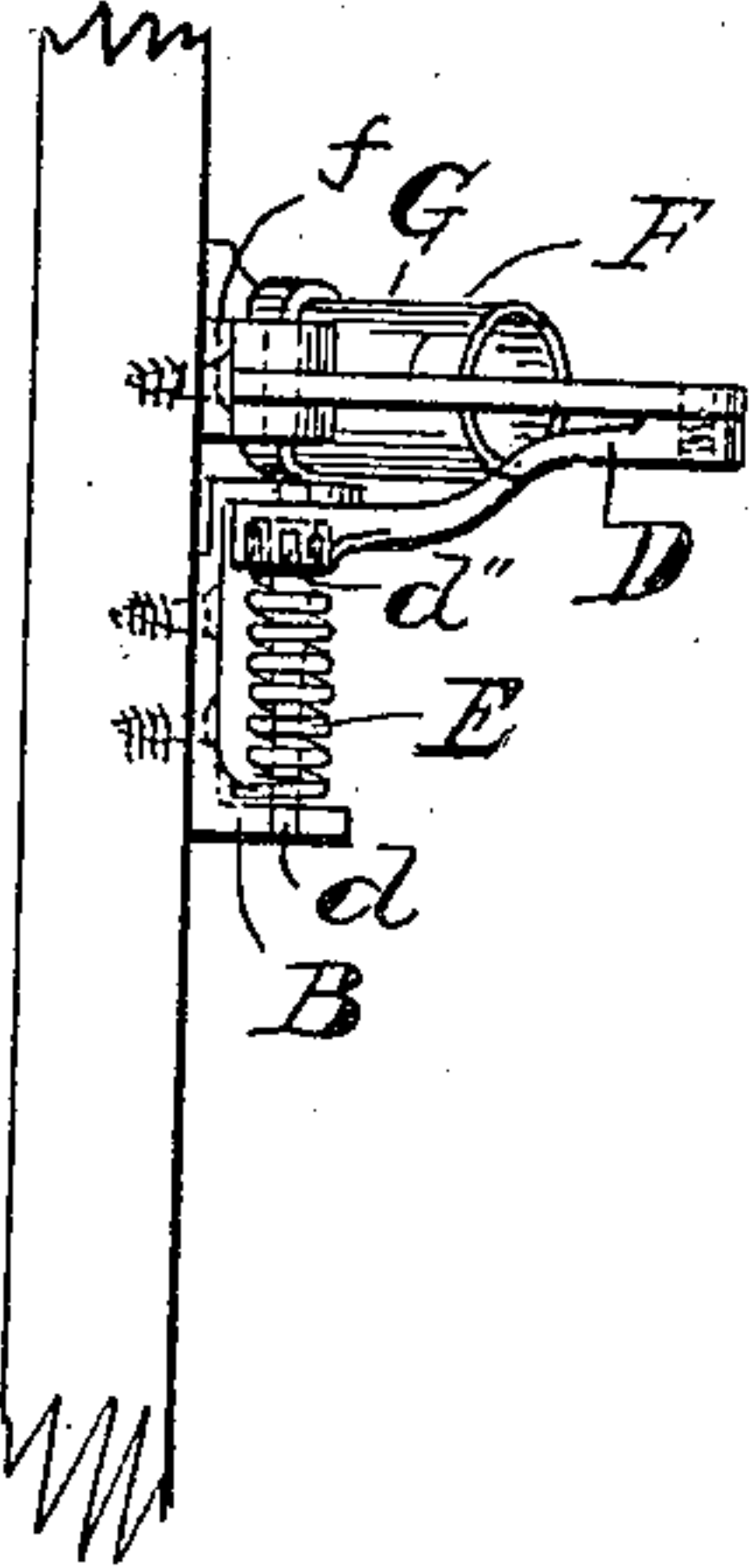


Fig. 1

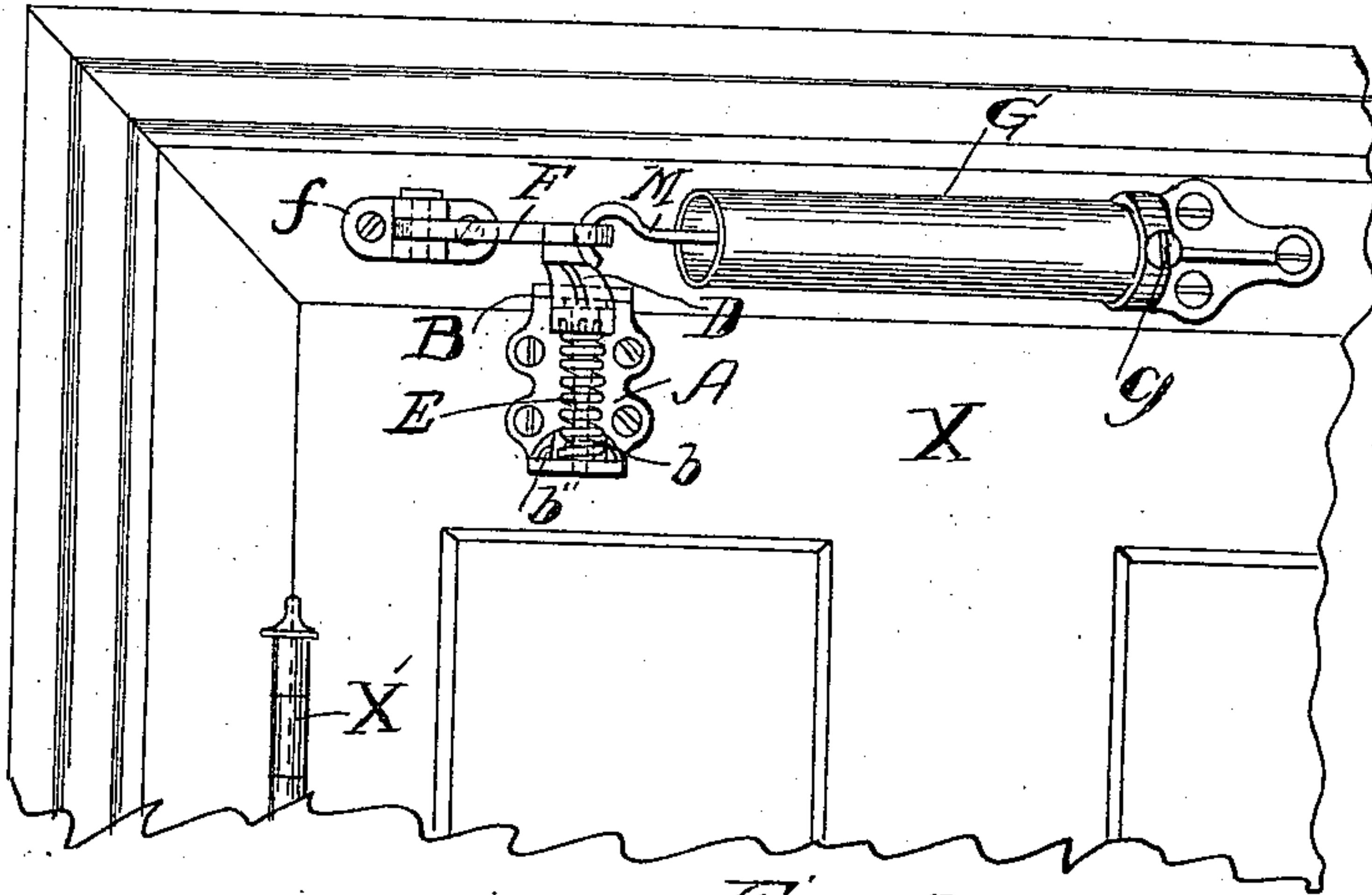


Fig. 2

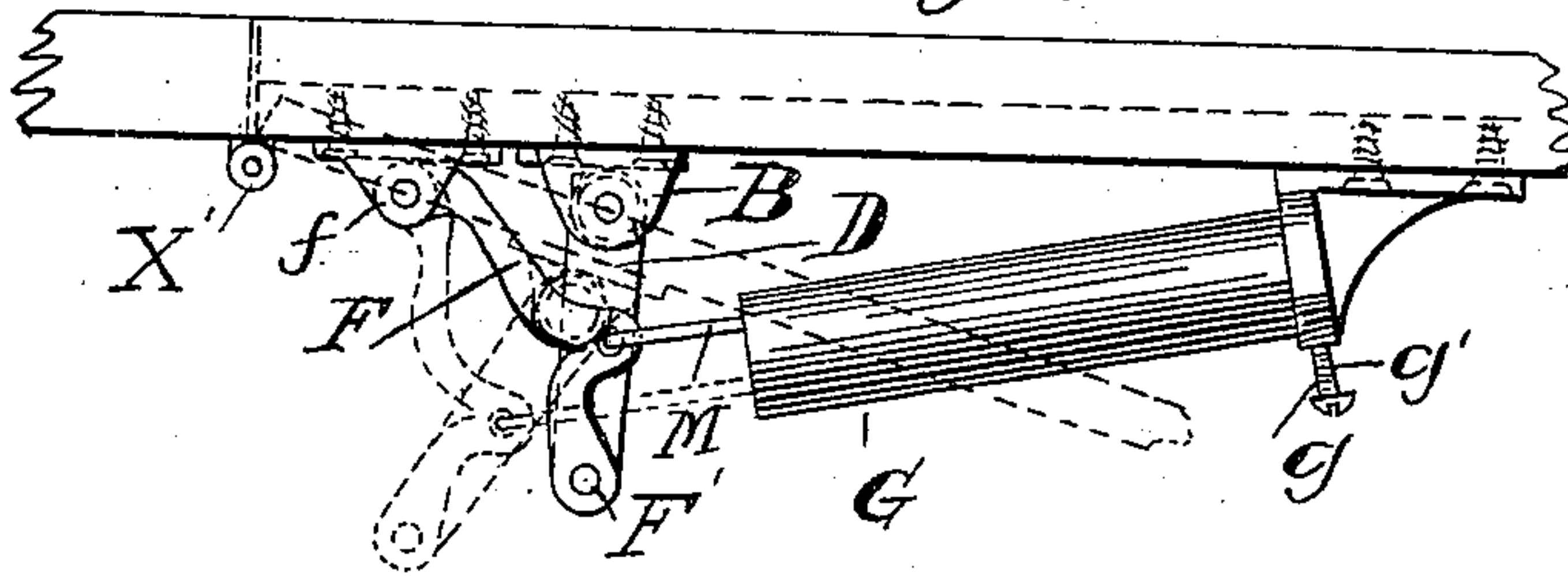


Fig. 4

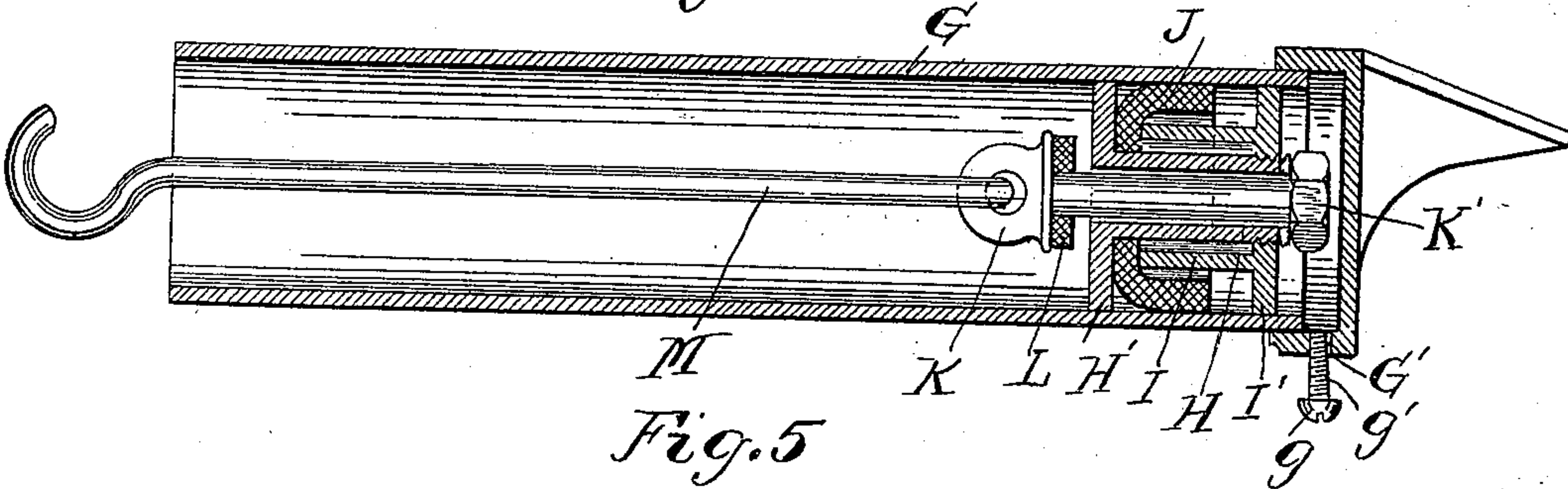
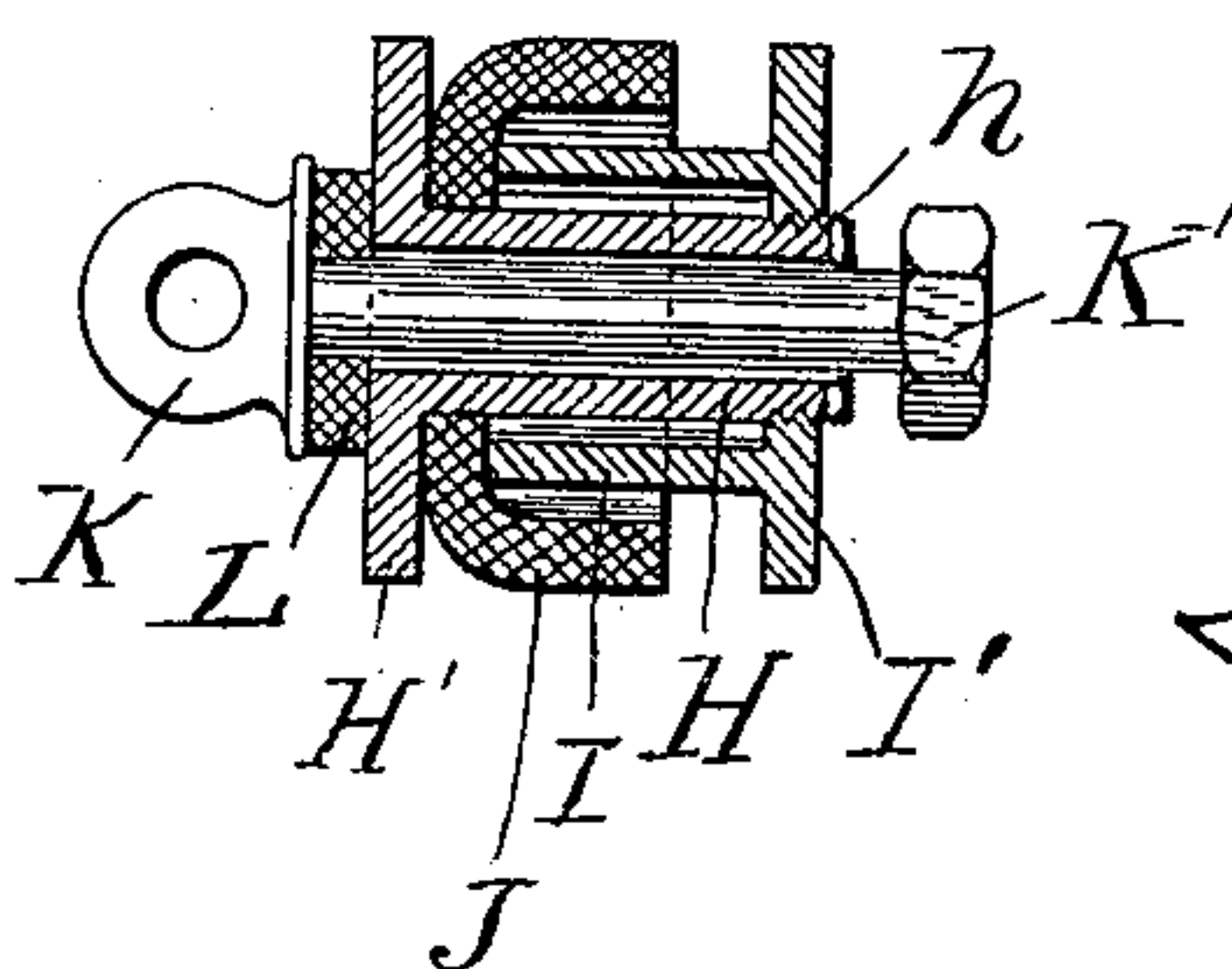


Fig. 5



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2 Sheets—Sheet 2.

Fig. 6

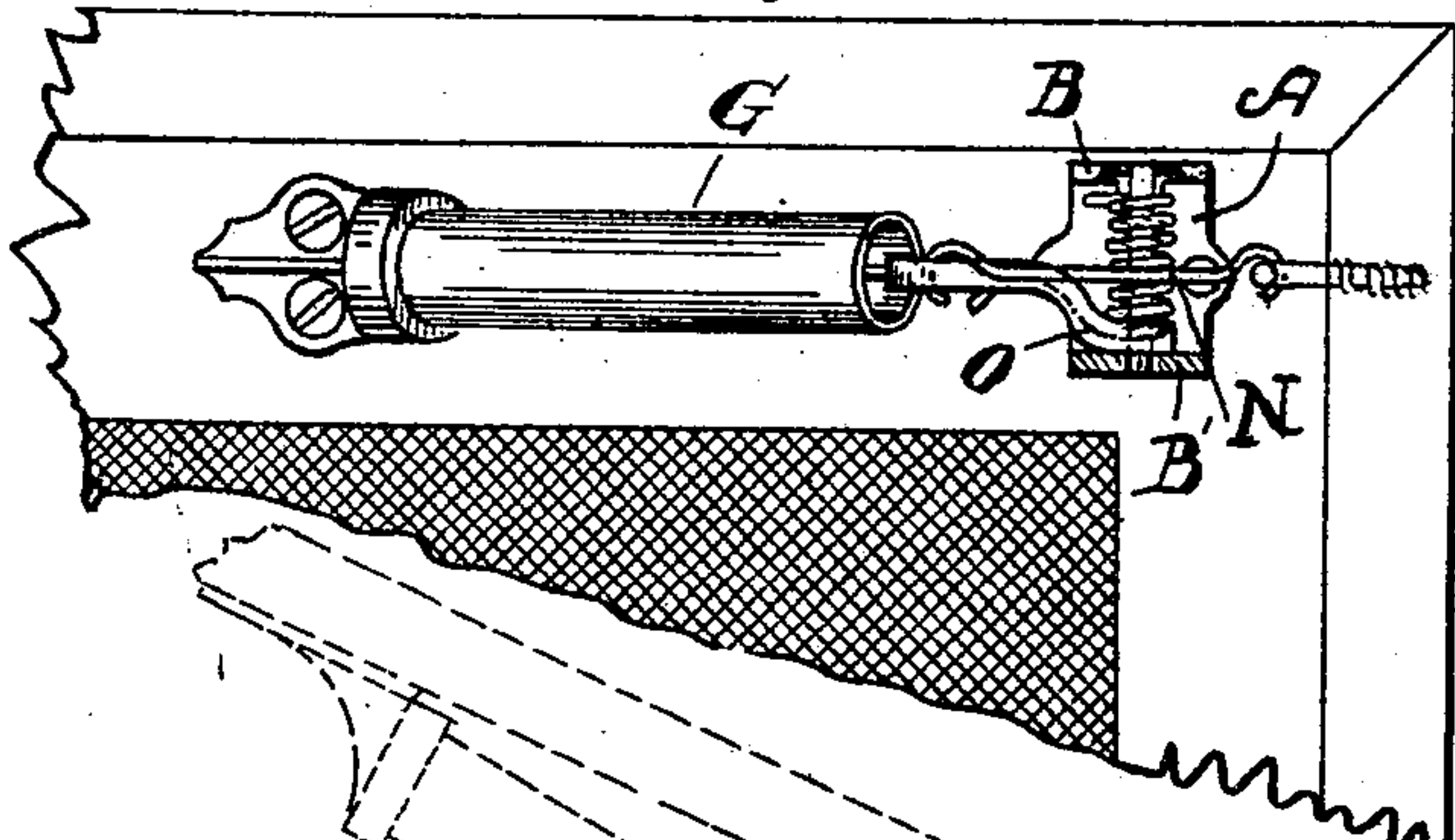


Fig. 7

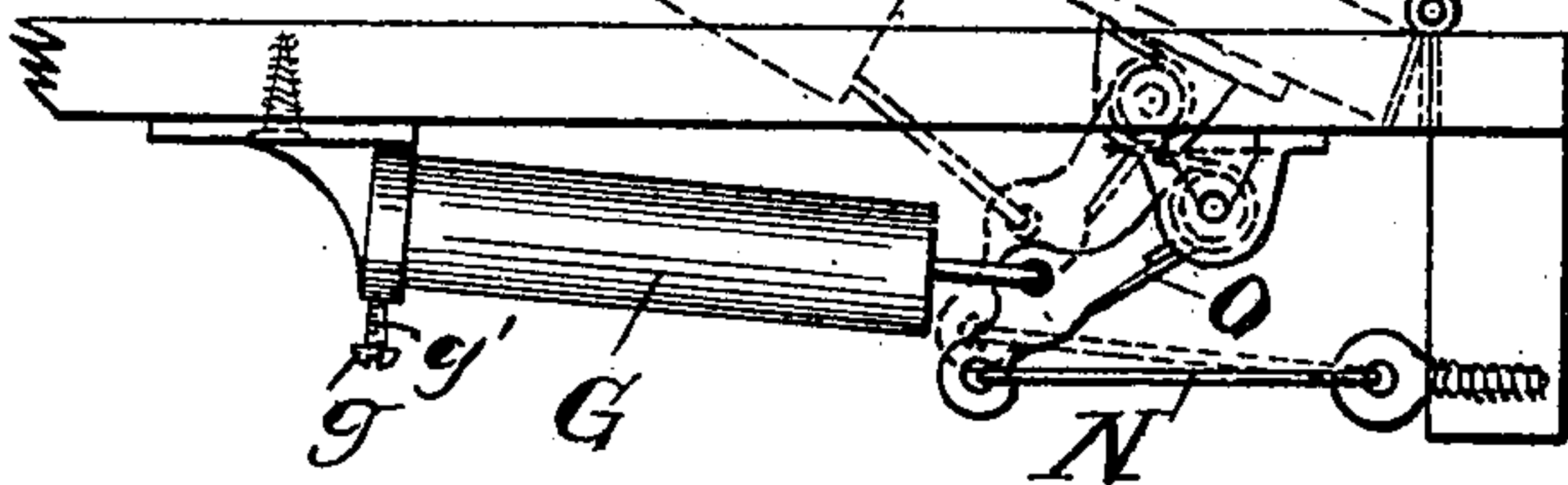


Fig. 8

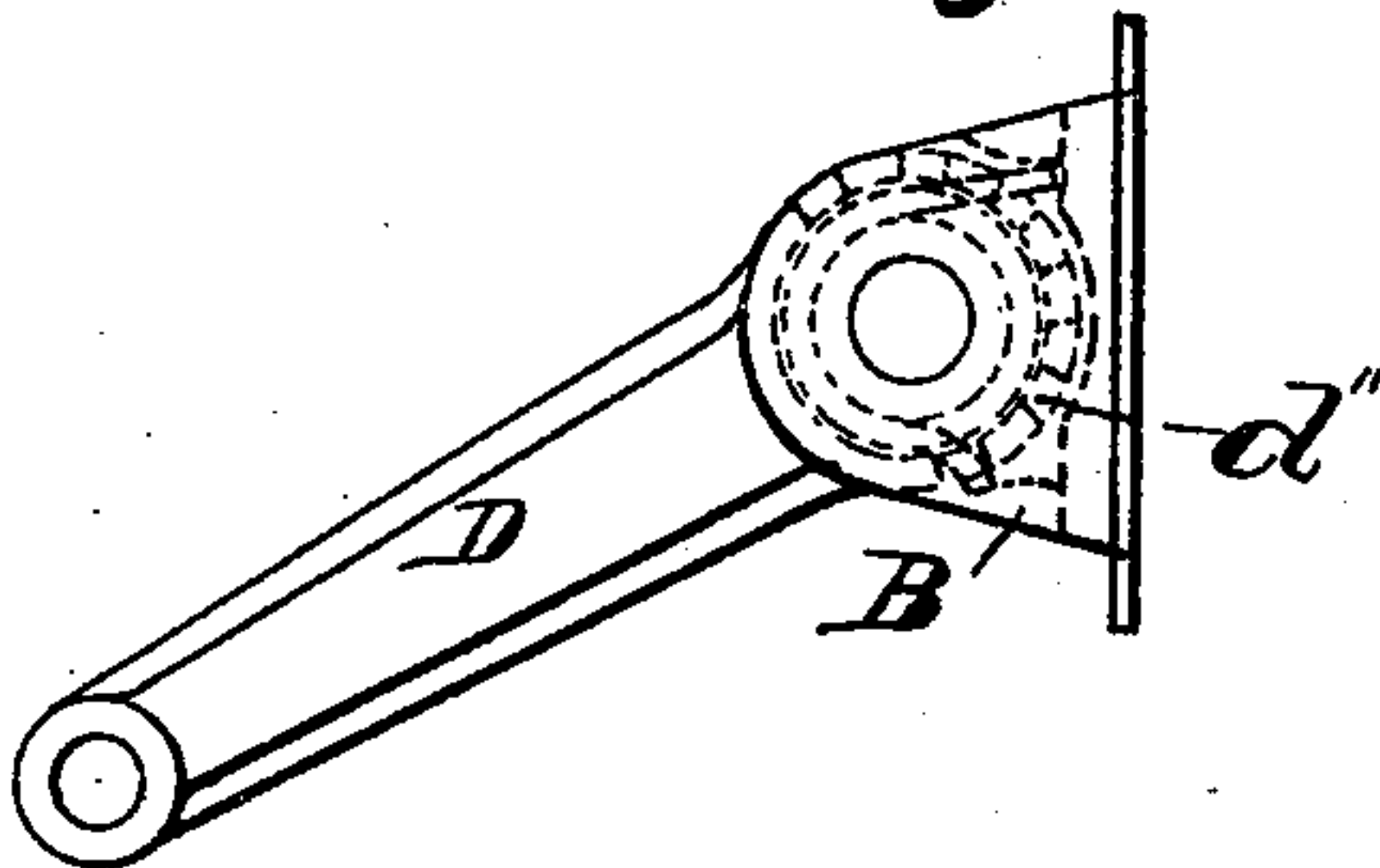
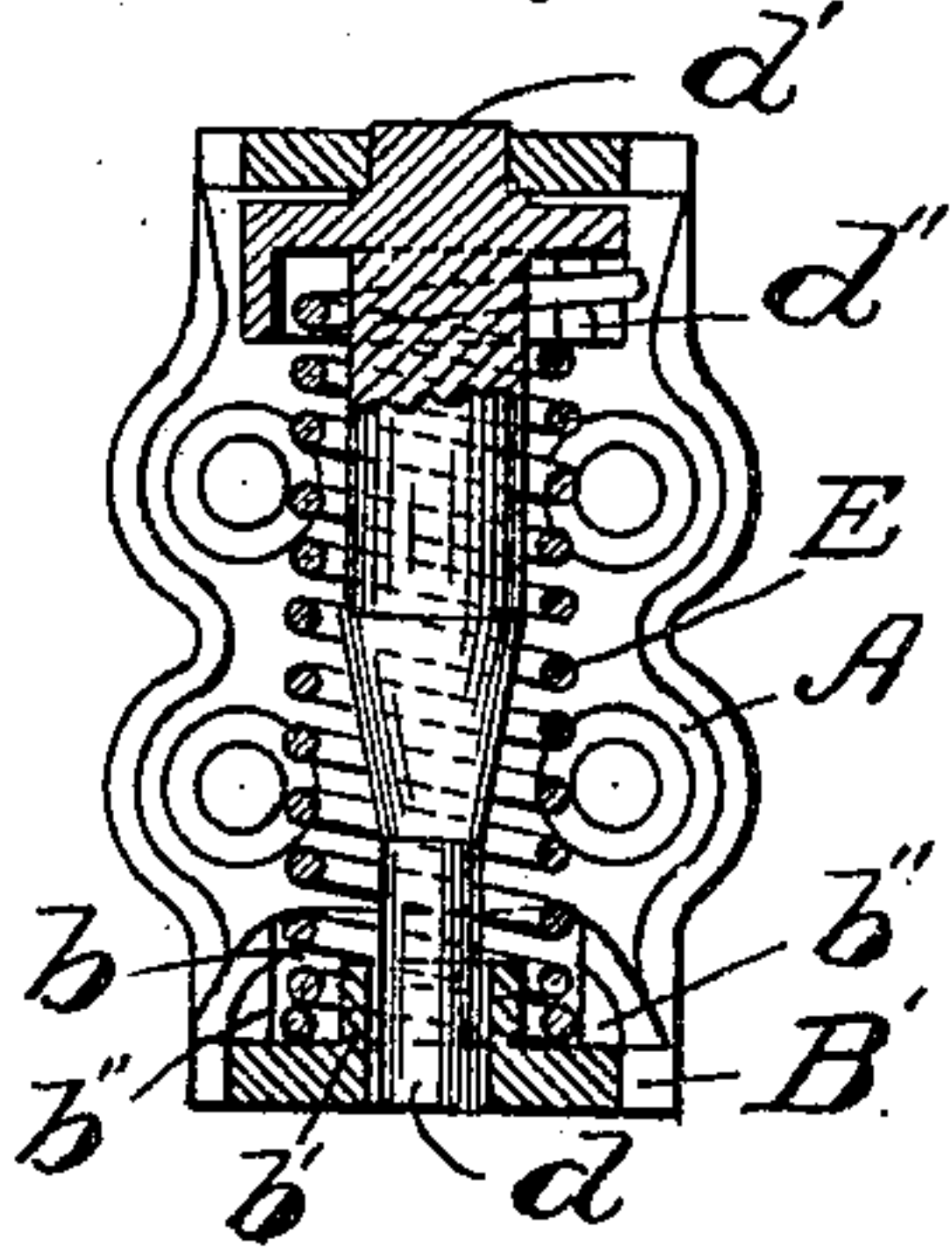


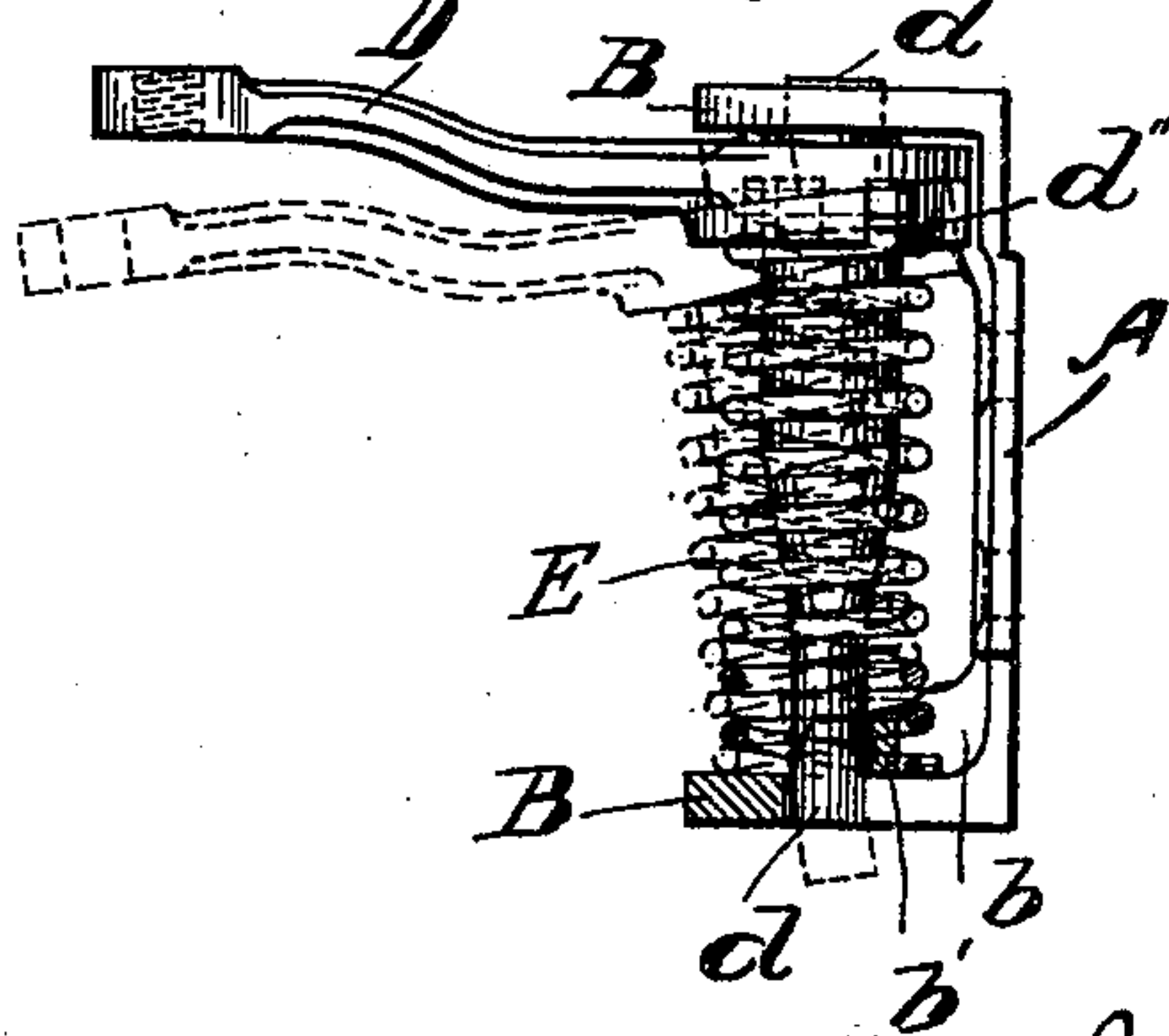
Fig. 9



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Fig. 10



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# UNITED STATES PATENT OFFICE.

JOHN J. LARIMER, OF CRABTREE, PENNSYLVANIA.

## COMBINED DOOR CHECK AND SPRING.

SPECIFICATION forming part of Letters Patent No. 639,816, dated December 26, 1899.

Application filed March 30, 1899. Serial No. 711,094. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN J. LARIMER, a citizen of the United States, residing at Crabtree, in the county of Westmoreland and State of Pennsylvania, have invented new and useful Improvements in a Combined Door Check and Spring, of which the following is a specification.

This invention relates to an automatic door check and spring; and the object thereof is to provide a simple and improved device of the type embodying a spring for resisting opening of the door and a pneumatic check for preventing closing thereof with a slam.

The invention resides in the novel features of construction and in the combination and arrangement of parts hereinafter fully described and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is an elevation, Fig. 2 a plan, and Fig. 3 a rear edge view, showing the method of applying my improvement to the inner side of a door. Fig. 4 is a section of the check. Fig. 5 is a similar view of the plunger, showing position of its parts during the closing of the door. Fig. 6 is an elevation, and Fig. 7 a plan, showing the method of applying my improvement to the inner side of an outwardly-swinging door. Figs. 8, 9, and 10 are detail views of the spring-actuated arm.

Referring to the drawings, A is a bracket secured to the inner side of door X, said bracket being formed with top ear or projection B, apertured to receive short pintle  $d'$  at the inner end of projecting arm D, while the bottom and longer pintle  $d$  bears in bottom bracket-ear B', backwardly slotted at  $b$  and formed on top with curved boss  $b'$ . Arm D is held with its pintles in the position indicated by coiled spring E, which resists rotation of the arm by having its lower extremity in engagement with one of shoulders  $b''$ , while its upper extremity is confined in one of undercut slots  $d''$  in the circular inner end of arm D. Boss  $b'$  forms the rear side of the lower pintle-bearing, and also holds the spring from contact with the pintle. To remove the arm from the bracket, as when dismantling the check or for changing the engagement of the spring to vary its tension, it is only necessary to depress the arm against the resistance of the spring, so as to free top pintle  $d'$ ,

and then turn it to one side in direction indicated by dotted lines, Fig. 10.

Link F is pivoted to the extremity of arm D, as indicated at F', and extends backward to the door-frame, to which it is hinged in bracket  $f$ , and this bracket is arranged at such a point with relation to door-hinge X' and pintles  $d$   $d'$  that the door may open wide before arm D and link F aline. Otherwise full opening of the door would be prevented.

Secured to the frame above the door is cylinder G, its open end being toward arm D and formed at its closed end with threaded vent G' to receive screw  $g$ , and the latter is formed with a tapering flat  $g'$  to vary the ingress and egress of air to and from the cylinder. Within the cylinder is an elongated piston, which is made up of the telescoping neck parts H and I, threaded together at  $h$  and formed with disks H' and I', respectively, which form the piston-heads. Cup-leather J is confined on neck part H and against disk H' by neck part I. The diameter of the latter is much less than that of the disks, so that there is ample room between the cylinder and neck I for the free portion of the leather to play. The tendency of leathers when confined as here shown is to spread, and much better results are had when the working edges are not confined, but have sufficient room for play, as herein provided for. Eyebolt K extends centrally through the piston and is secured by nut K', the bolt having slight longitudinal play. The extremity of neck part H is notched, so that nut K' does not seal thereagainst upon the outward stroke of the piston, as when opening the door, so that air may pass the bolt to the rear of the piston and prevent the formation of a partial vacuum; but when the movement is reversed, as when closing the door, the bolt moves back, bringing leather washer L, carried by the bolt, against disk H', thus sealing the bolt-passage against egress of air and forming the latter into a cushion, which can escape only gradually through contracted vent G'.

It is essential that a long-length plunger be provided in order to prevent cramping in the cylinder resulting from lateral strain on the piston-rod. It is also necessary that the leather shall have the freest possible action, and to this end it must not be subjected to



any twisting or other motion save its longitudinal reciprocation. My improved plunger is designed with special view to meeting these requirements, which it does most effectually.

5 The piston-heads are wide apart and yet so nearly fit the cylinder without frictionally binding it that cramping is impossible. Between the heads is ample room for the leather to work, the heads holding it against any dis-  
10 torting tendency or from becoming a factor in causing the plunger to bind or stick.

Link M, extending from bolt K, connects the piston with link F, as shown. The parts have such relative position that the line of  
15 pull on link M when opening the door is, as nearly as possible, central with the piston, thus avoiding unnecessary friction. Slight vibration of link M is, however, unavoidable; but the elongated form of the piston prevents  
20 that tendency to wedge or cramp that would be encountered were it disk-like or short.

The tension adjustment of the spring makes it possible to adapt the device to both light and heavy doors and to effect a quick or slow  
25 closing thereof, and this may also be regulated to a nicety by the cylinder vent-screw.

Screen-doors are usually hung so as to swing outward from the door-frames, with no por-  
30 tion of the frame immediately above the door to support the check-cylinder, and in order to adapt my check and spring to doors so mounted I arrange the parts as shown in Figs. 6 and 7, wherein both the spring and check-  
35 cylinder are secured to the door. This arrangement necessitates connecting piston-link M directly to spring-arm D, the outer end of the latter being anchored by link N to the door-jamb. In this style of mounting  
40 arm D is preferably inverted, with its longer pintle *d* uppermost, and in springs of small size the notched enlargement of arm D for confining the spring extremity may be dispensed with by forming the arm with flange  
45 O for holding the spring end.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a door-check, the combination of a cylinder, a long-length piston therein, the piston comprising separated heads H' and I', elongated telescoping necks H and I carried by the heads, neck H interlocking with head I' and neck I stopping short of head H', the heads and necks forming an elongated peripheral space, and leather J confined between  
55 head H' and neck I, with its outer periphery disposed toward head I', the leather freely

working in the said peripheral space and maintained in proper position by the heads without binding or sticking tendency, substantially as shown and described. 60

2. An improved resistance device for door-checks comprising bearings, an arm, pintles on the arm extending into the bearings, and a spring for holding the pintles in the bear-  
65 ings and also for resisting rotation of the arm, substantially as shown and described.

3. An improved resistance device for door-checks, consisting of a bracket having projecting bearings, an outwardly-extending arm  
70 having a long and a short pintle adapted to turn in the bracket-bearings, the pintles projecting in opposite direction and entering the bearings on the inner or adjacent sides of the latter, and a spring for holding the pintles  
75 from longitudinal displacement, substantially as shown and described.

4. An improved resistance device for door-checks, consisting of a bracket having projecting bearings, an outwardly-extending arm  
80 adapted to be positioned between the bearings and having oppositely-projecting pintles which enter the bearings, and an expansion-spring coiled about one of the pintles and positioned between one of the bearings and the  
85 arm, with the spring ends secured to said parts, whereby the pintles are held in position in the bearings and turning of the arm is resisted, substantially as shown and de-  
90 scribed.

5. An improved resistance device for door-checks, consisting of a bracket having top and bottom projecting bearings, one of the bearings being centrally apertured and the  
95 other bearing formed with a closed slot, the slotted bearing being formed on its inner side with a boss, an outwardly-projecting arm having its inner end positioned between the bearings, a short pintle projecting from the  
100 arm into the centrally-apertured bearing, a long pintle extending into the other bearing between the forward end of the slot and the boss, and an expansion-spring coiled around the long pintle, one end of the spring embracing the bearing-boss and secured to the  
105 bearing, and its opposite end secured to the arm, substantially as shown and described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOHN J. LARIMER.

Witnesses:

J. M. NESBIT,  
F. E. GAITHER.