No. 767,295. PATENTED AUG. 9, 1904.

J. J. LARIMER.

COMBINED DOOR SPRING AND CHECK.

APPLICATION FILED SEPT. 21, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. IV.

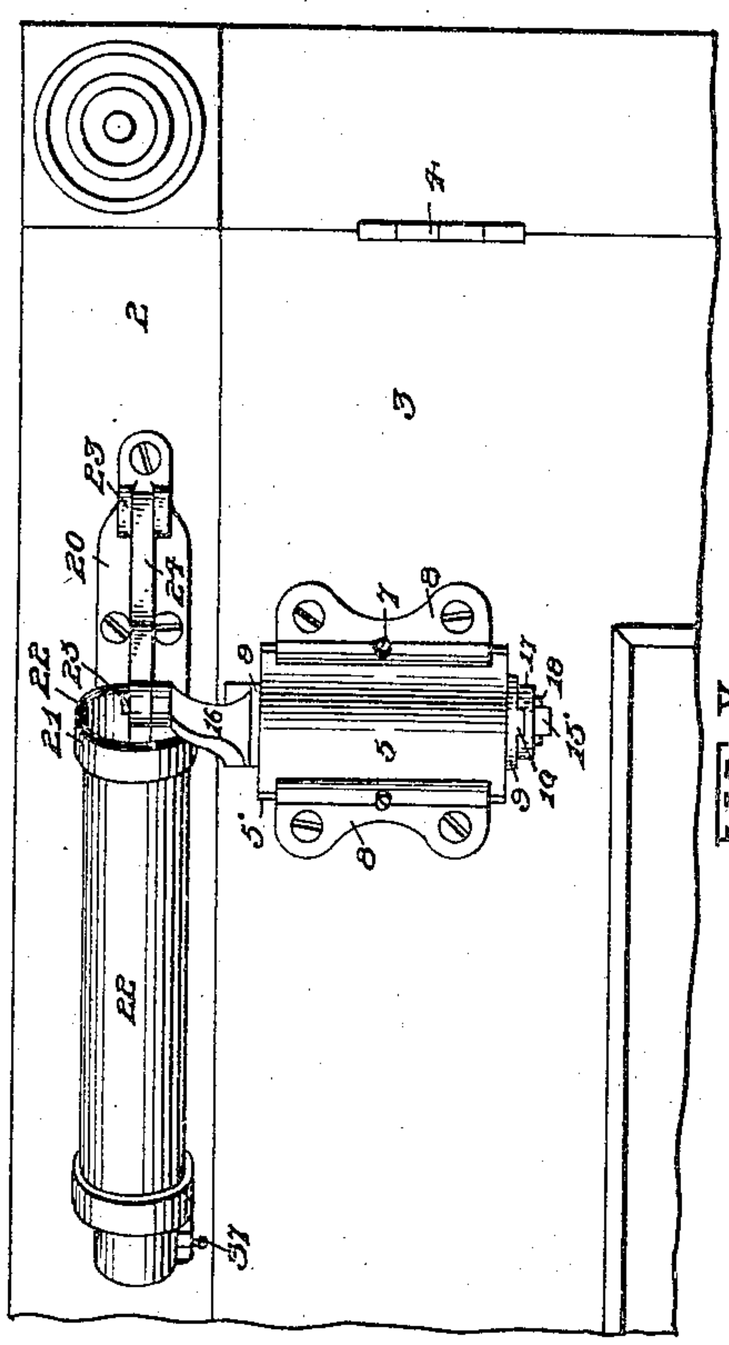


Fig. III.

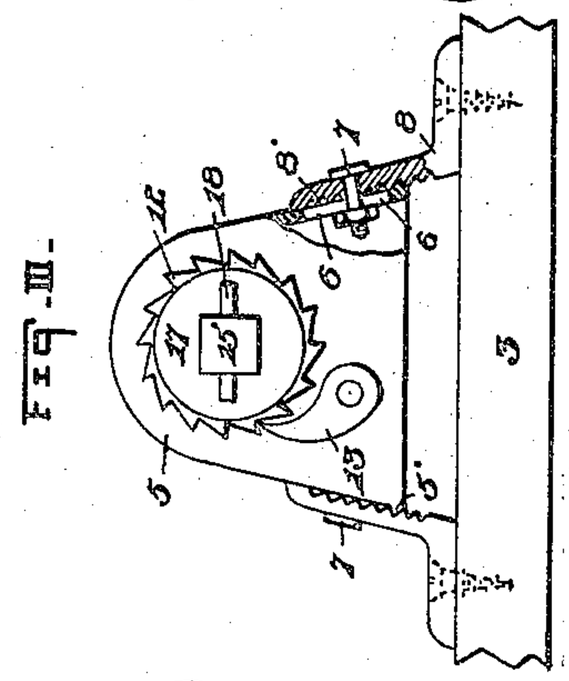


Fig. VII.

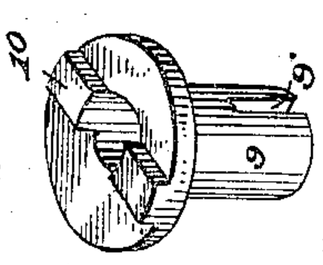


Fig. VIII.

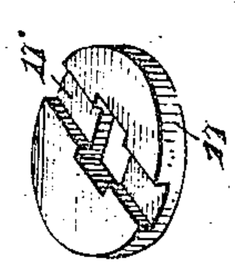


Fig. V.

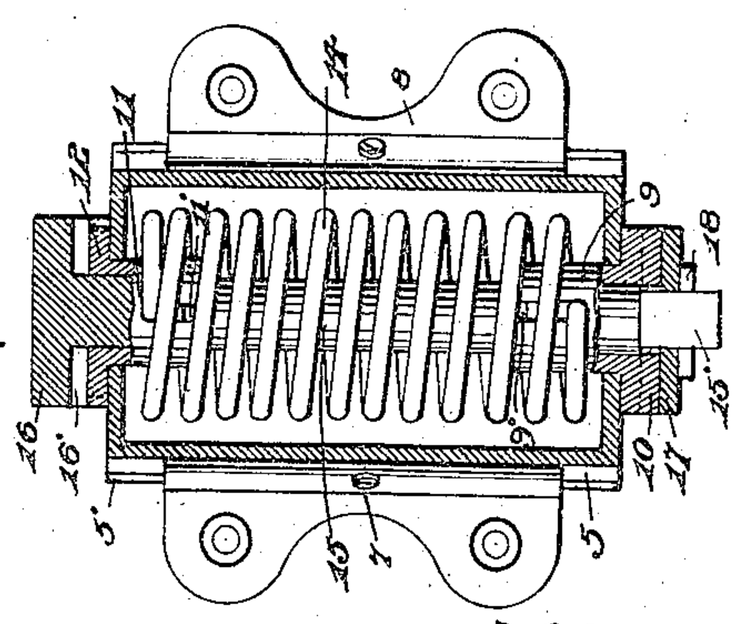


Fig. I.

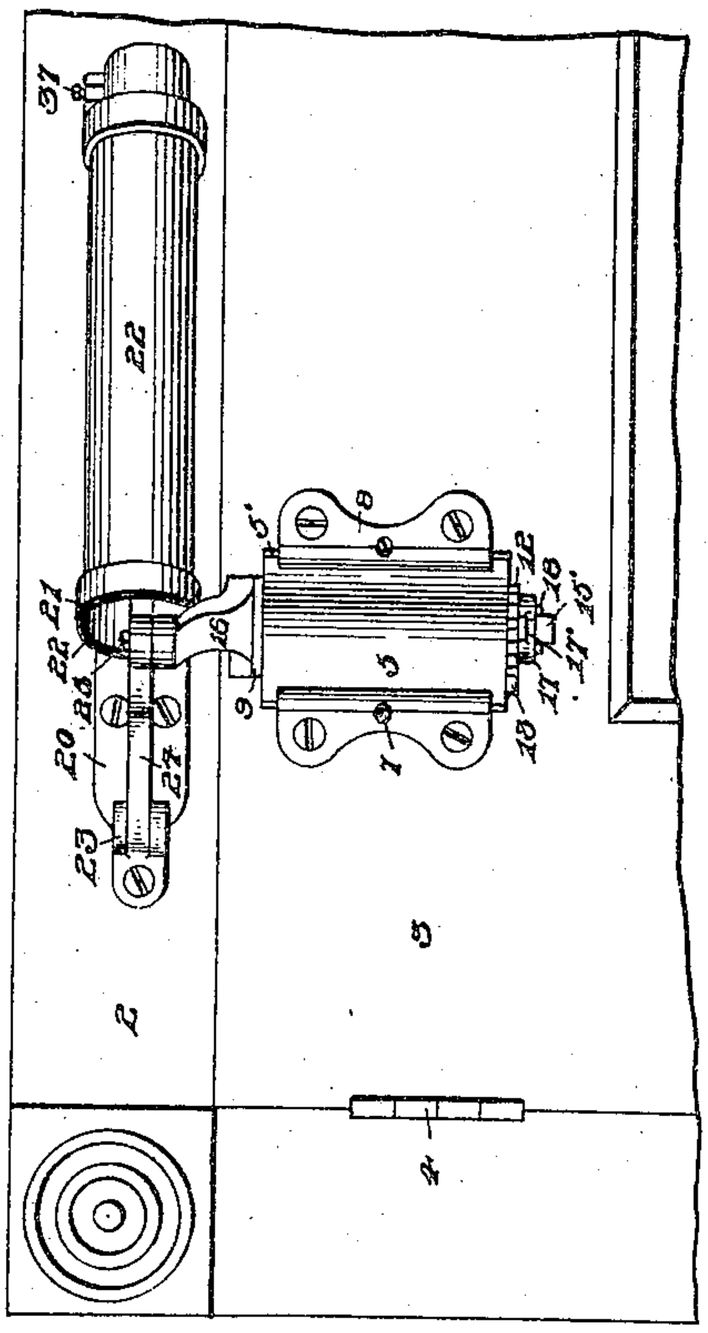
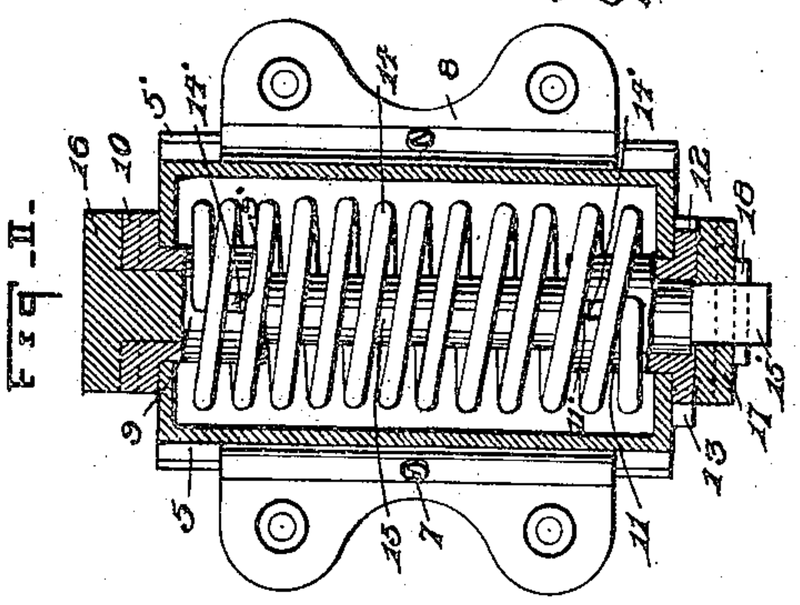


Fig. II.



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No. 767,295. PATENTED AUG. 9, 1904.

J. J. LARIMER.

COMBINED DOOR SPRING AND CHECK.

APPLICATION FILED SEPT. 21, 1903.

NO MODEL. 2 SHEETS—SHEET 2.

Fig. IX.

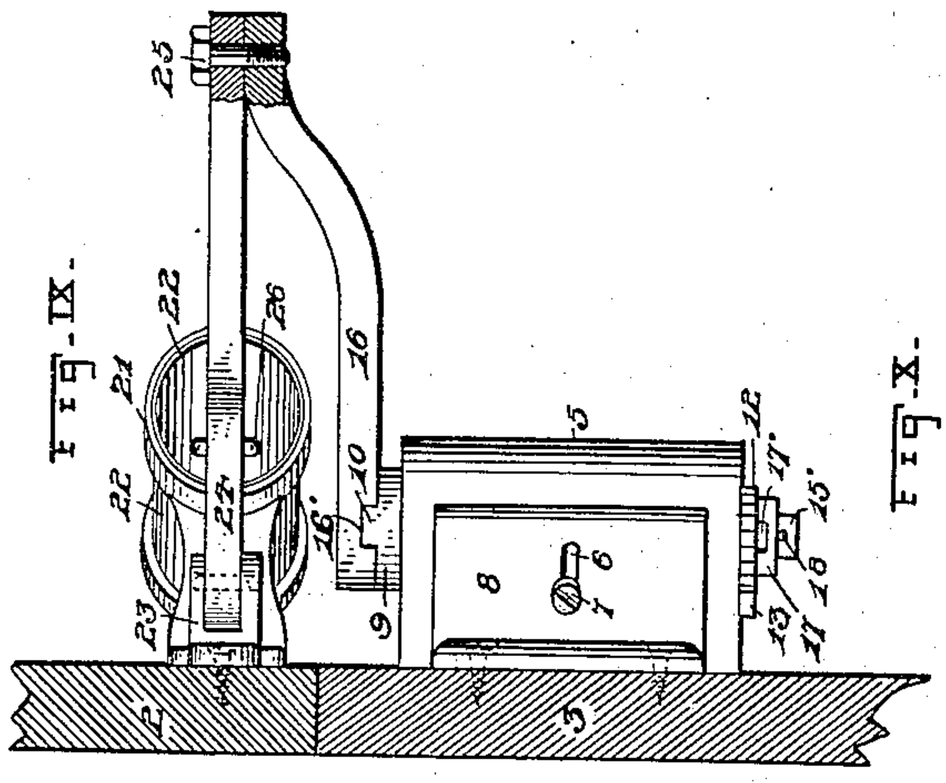


Fig. X.

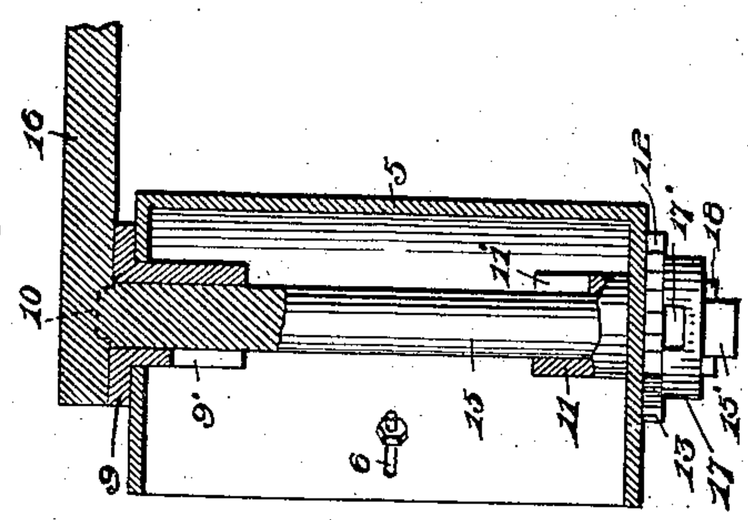


Fig. VIII.

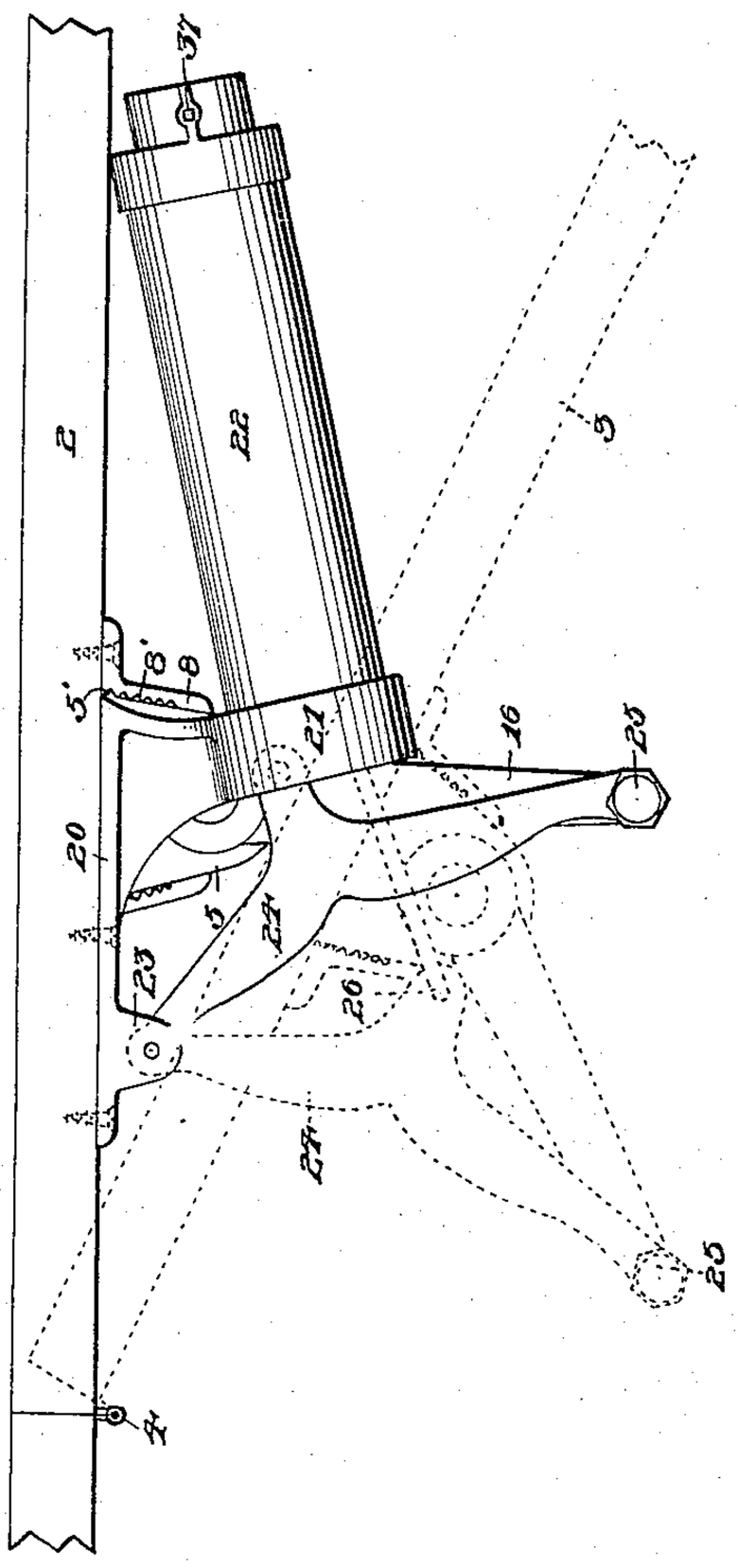
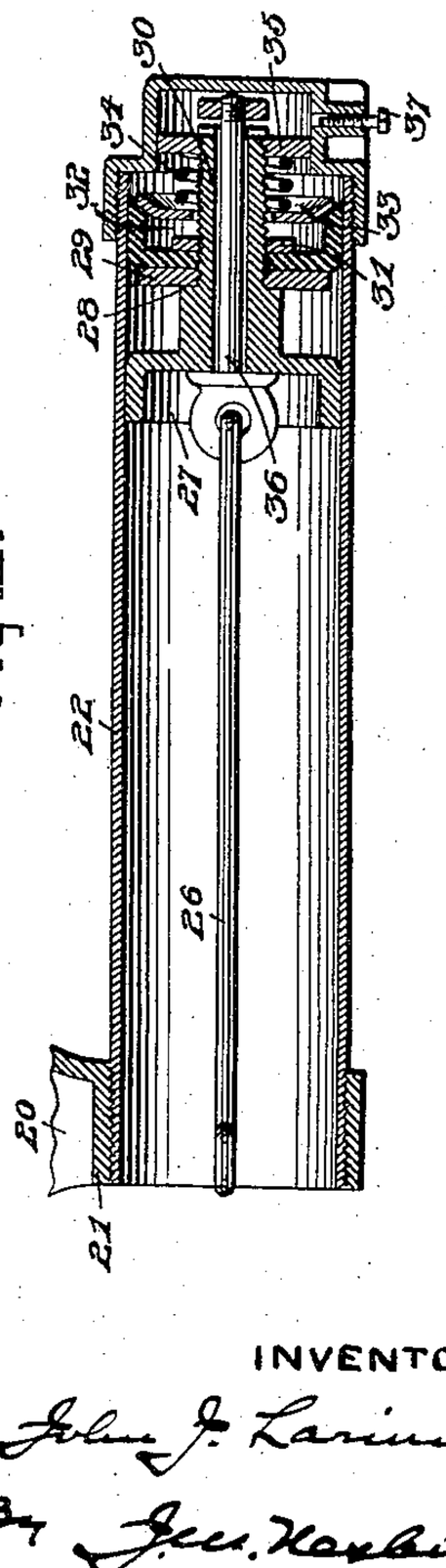


Fig. XI.



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No. 767,295. Patented August 9, 1904.

UNITED STATES PATENT OFFICE.

JOHN J. LARIMER, OF CHICAGO, ILLINOIS.

COMBINED DOOR SPRING AND CHECK.

SPECIFICATION forming part of Letters Patent No. 767,295, dated August 9, 1904.

Application filed September 21, 1903. Serial No. 173,999. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. LARIMER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in a Combined Door Spring and Check, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention has particular reference to certain improvements in the door check and spring patented to me December 26, 1899, No. 639,816; and one object is to so construct the door-closing mechanism that it may be used interchangeably on either right or left hand doors, the arrangement being such that one spring serves for either use.

A further object is to improve the spring-case and to provide novel means for mounting the same.

Another object of the invention is to provide a single mounting for the cylinder and the lever which connects the closing and cushioning mechanisms, whereby the device may be more conveniently and accurately mounted by inexperienced persons than heretofore.

Still a further object is to provide effective piston mechanism of improved construction.

In the accompanying drawings, Figure 1 is a front elevation of my improved device applied to a door swinging to the left hand, and Fig. 2 is a vertical sectional view of the spring mechanism shown in Fig. 1. Fig. 3 is a bottom plan view of the spring-case and mounting shown in Fig. 1, the spring-case being shown extended from the door to illustrate the improved mounting. Fig. 4 is a view similar to Fig. 1, illustrating the device applied to a door swinging to the right hand; and Fig. 5 is a sectional view of the spring arrangement of Fig. 4. Fig. 6 is a detail view of the sleeve for connecting the shaft and spring, and Fig. 7 is a detail view of a washer adapted to interlock with the sleeve. Fig. 8 is a top plan view of the device illustrated in Fig. 1, the position of the parts being indicated in dotted lines with the door partially open. Fig. 9 is an end elevation. Fig. 10 is a vertical sectional view of the spring-case, taken at right angles to Figs. 2 and 5. Fig. 11 is a sectional view of the cylinder and piston.

Referring to the drawings, 2 indicates the door-frame or casing, 3 the door, and 4 the door-hinge.

5 designates a case open at the back and slotted at the sides at 6 to receive bolts 7 for adjustably securing the same between brackets 8. The brackets are preferably serrated at 8′, and the rear edges of case 5 are formed with ribs 5′ to provide a rigid hold. The extensible mounting for the spring-case afforded by brackets 8 provides for properly mounting the device where the door-casing projects beyond the plane of the door.

Fitting and rotatable in an opening formed in one end of case 5 is headed sleeve 9, having lugs 10 at its outer end, while fitting a similar opening in the opposite end of the case is sleeve 11, formed with ratchet-head 12, which is held from rotating by dog 13, pivoted to the end of the case. Insertible through the open back of the case is a coiled spring 14, having its extremities bent at 14′ to form holds, one extremity being secured in slot 9′ of sleeve 9 and the other end similarly secured in slot 11′ of sleeve 11. Extending through case 5, said sleeves, and the spring is shaft 15, having fixed to its upper end the door-closing arm 16.

In the arrangement shown in Figs. 1 and 2, wherein the door is hinged at the left-hand edge, case 5 is mounted on the door with sleeve 9 uppermost and with lugs 10 fitting corresponding depressions 16′ in the under side of arm 16, so that when said arm turns toward hinge 4 when the door opens by means of the connections presently to be described sleeve 9 turns with it and has the effect of winding up or increasing the tension of the spring, the lower end of the latter being held fixed by sleeve 11, which is locked by dog 13. The lower extremity of the shaft is squared at 15′, and fitting the same is head or washer 17, confined by pin 18, thereby preventing sleeve 11 from dropping.

For a door hinged at the right-hand edge, as in Figs. 4 and 5, spring 14 and shaft 15 re-

tain the same relative position, but case 5 is inverted from the position shown in Figs. 1 and 2, bringing the dog-held sleeve 11 to the top of the case or immediately beneath arm 16 and with spring-winding sleeve 9 at the bottom. In this position shaft 15 simply turns in sleeve 11, as before, but is made rigid with sleeve 9 by means of depressions 17′ in head 17 embracing lugs 10. Thus the spring is held fixed at the upper end and wound at the lower end, the operation being just the reverse of the arrangement shown in Fig. 2. The construction whereby this reversal of operation is effected is extremely simple and the necessity for distinct right and left hand springs is avoided. No part of the spring is exposed, and the inclosing case may be kept clean or polished without difficulty.

In order to simplify the operation of applying the combined check and spring and at the same time reduce the number of parts, I have arranged to make the connection with the door-casing 2 by means of a single part or casting 20, the same being provided at one end with socket 21, in which the inner end of cylinder 22 is secured, preferably by threading, the socket being arranged at such an angle as to support the cylinder in proper position. At the opposite end of casting 20 is bearing 23 for the inner end of lever 24, the outer end of the lever being pivotally connected to the extremity of arm 16 at 25, and the lever between its ends connecting with piston-rod 26. With this arrangement only a single mounting on the door-casing is necessary, and with this mounting immediately above case 5 it is only necessary in positioning the device to observe care in placing the parts at such distance from the hinged edge of the door as will produce the best results. In changing from left to right the cylinder and lever 24 are of course reversed; but this is immaterial, as their operation is the same in either position.

The piston operative in cylinder 22 is formed with the cup-shaped end portion 27 and behind the latter with shoulder 28, which forms an abutment for washer 29, mounted on threaded piston-stem 30, and clamped against said washer by means of nut 31 is the leather cup 32, having its edge backwardly disposed and beveled, as shown.

33 is a beveled or dished washer freely movable on stem 30 and held pressed against the beveled end of the leather cup by coiled spring 34, confined on the stem by nut 35. The beveled washer operates as a wedging cone to keep the cup edge distended and in tight contact with the cylinder, thus forming a most durable and efficient piston-packing. The piston and stem are tubular, and the headed valve 36 therein, with which rod 26 connects, serves to actuate the piston and to admit air when the piston is being withdrawn in the manner fully described in my patent above referred to. The vent controlled by flattened screw 37 for gradually releasing the confined air and permitting the door to close is also the same as in my former patent.

I claim as my invention—

1. The combination of a casing, a sleeve rotatable therein and having lugs projecting therefrom, a door-closing shaft extending through the sleeve, means constructed and arranged to rigidly unite the sleeve and shaft through the medium of said lugs, and a spring for resisting rotation of the sleeve.

2. The combination of a casing, a sleeve rotatable therein and having lugs projecting therefrom, a door-closing shaft extending through the sleeve, an arm rigid with the shaft and having depressions to receive said sleeve-lugs, and a spring for resisting rotation of the sleeve.

3. The combination of a vertically-reversible casing, a sleeve rotatable in one end thereof, a door-closing shaft adapted to extend through the sleeve and casing interchangeably in reverse directions, an arm rigid with the upper end of the shaft, a washer removably fitting and rotatable with the lower end of the shaft, means whereby said sleeve is adapted to interlock with said arm and washer interchangeably, and a spring for resisting rotation of said sleeve.

4. The combination of a door-spring casing, and an extensible mounting therefor.

5. The combination of a door-spring casing, and sustaining-brackets therefor adapted to adjustably unite with opposite sides thereof.

6. In a door-check, a cylinder, a piston, radially-expansible packing carried by the piston, and means for radially expanding the packing.

7. In a door-check, a cylinder, a piston, an expansible cup-shaped packing carried by the piston, and a spring-actuated device adapted to exert constant pressure on the open end of the packing for expanding the same.

8. In a door-check, a cylinder, a piston, an expansible cup-shaped packing carried by the piston, and a beveled or cone-shaped head adapted to enter the open end of the packing and expand the same.

9. In a door-check, a cylinder, a piston, an expansible cup-shaped packing carried by the piston and having the edge of its open end beveled, and a beveled or cone-shaped head adapted to enter the open end of the packing and impinge the beveled edge thereof.

10. In a door-check, a cylinder, a piston, an expansible cup-shaped packing carried by the piston and having the edge of its open end beveled, a beveled or cone-shaped head adapted to enter the open end of the packing and impinge the beveled edge thereof, and a spring for forcing said head toward the packing.

11. In a door-check, a cylinder, a piston

therein provided with a head and a threaded stem, a flexible cup-shaped packing confined on the stem, a head movable on the stem and adapted to enter the open end of the packing for expanding the same, a spring embracing the stem and bearing against the head, and a nut on the stem for confining the spring.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN J. LARIMER.

Witnesses:
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T. A. NYE.