

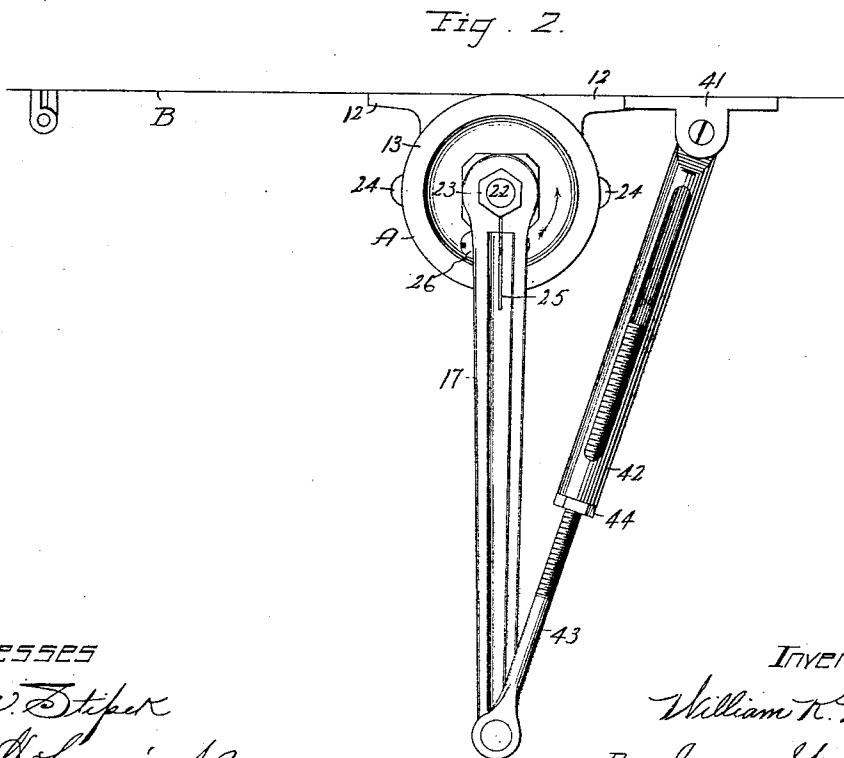
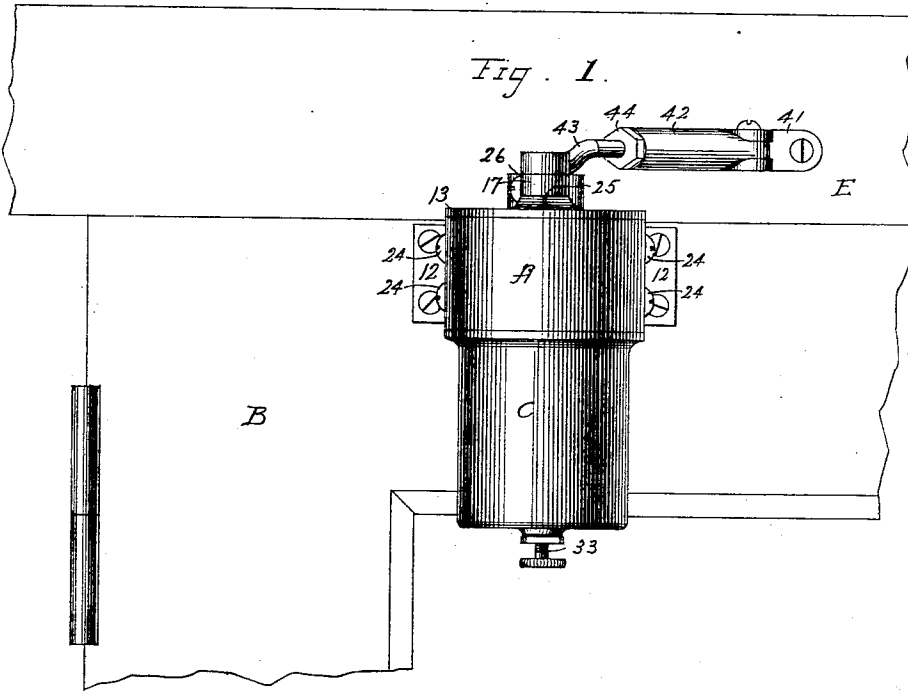
(No Model.)

2 Sheets—Sheet 1.

W. K. HENRY.
DOOR CHECK.

No. 580,085.

Patented Apr. 6, 1897.



Witnesses

W. E. Steyer
C. D. Loomis Jr.

Inventor

William R. Henry,
By James Shepard,
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(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

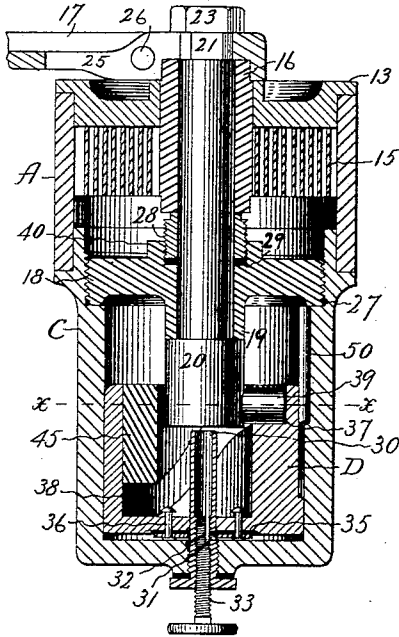


Fig. 4.

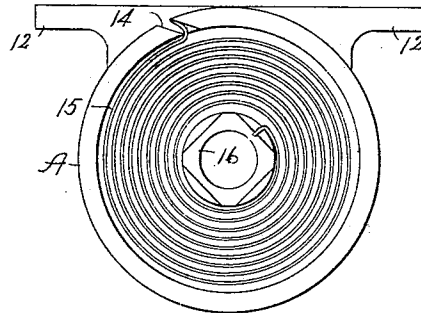


Fig. 5.

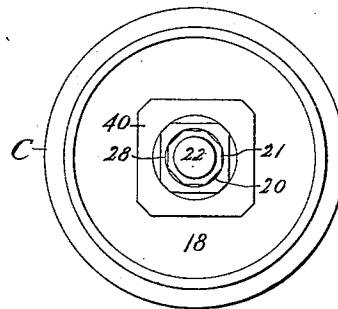


Fig. 6.

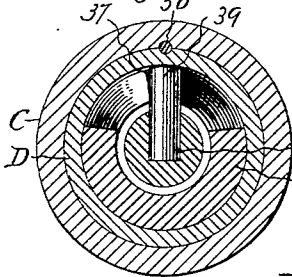


Fig. 7.

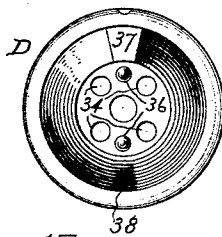


Fig. 8.

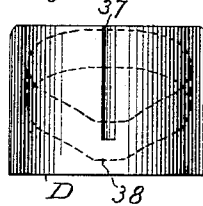


Fig. 9.

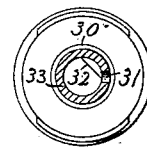


Fig. 10.

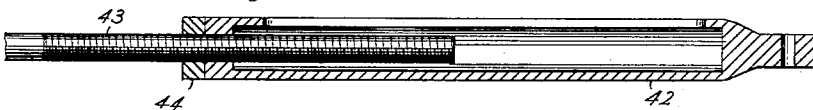
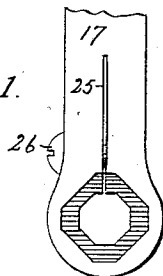


Fig. 11.



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UNITED STATES PATENT OFFICE.

WILLIAM K. HENRY, OF NEW BRITAIN, CONNECTICUT, ASSIGNOR TO THE
RUSSELL & ERWIN MANUFACTURING COMPANY, OF SAME PLACE.

DOOR-CHECK.

SPECIFICATION forming part of Letters Patent No. 580,085, dated April 6, 1897.

Application filed July 8, 1895. Serial No. 555,242. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM K. HENRY, a citizen of the United States, residing at New Britain, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Door-Checks, of which the following is a specification.

My invention relates to improvements in door-checks; and the objects of my improvement are simplicity and economy in construction and general efficiency and convenience of the article.

In the accompanying drawings, Figure 1 is a front elevation of my door-check, together with a portion of a door and its casing. Fig. 2 is a plan view of the same. Fig. 3 is a central vertical section of the same on a larger scale, the plane of section extending from front to rear, some of the parts being shown in elevation. Fig. 4 is a plan view of the spring-chamber with its cap and the crank-arm removed. Fig. 5 is a detached plan view of the cylinder. Fig. 6 is a horizontal section through the cylinder and piston on the line xx of Fig. 3. Fig. 7 is a detached plan view of the main portion of the piston, the part bearing the upper cam-surface being removed. Fig. 8 is a side elevation of the piston with its internal cam-groove indicated in broken lines. Fig. 9 is a horizontal section of the vent-tube and its regulating-screw, the same being on a still larger scale than the preceding figures. Fig. 10 is a central longitudinal section, partly in elevation, of the link that connects the crank-arm with the casing or door, the scale being the same as for Fig. 8; and Fig. 11 is a reverse plan view of the inner end of the crank-arm.

A designates a spring-chamber provided with bracket-like wings 12 for securing the spring-chamber and connected parts in their place upon a door or its casing. I have shown the machine with the spring-chamber A attached to the door B. The sides of this spring-chamber are formed by a short cylinder or tube with both ends alike. Its upper end is closed by the cap 13, and its lower end is closed by the upper end of the liquid-cylinder C. The spring-chamber is also slotted longitudinally, as at 14, Fig. 4, to receive the hooked outer end of the spring 15, the inner

end of said spring being hooked into a slot or otherwise suitably secured to the sleeve or tube 16, whose end projects through the center of the cap 13 and is fitted for the attachment thereto of the crank arm or lever 17 in any ordinary manner, as, for example, by having a squared or angular portion, as shown in Fig. 4. The cap and the cylinder may be secured to the respective ends of the spring-chamber by radial screws 24.

The lower end of the liquid-cylinder C is cast solid and the upper end is closed by a screw cap or end 18, said cap being provided with a central hub 19, within which the crank-shaft 20 takes one of its bearings, the upper part of said shaft taking its bearing within the sleeve or tube 16 of the spring-chamber. The upper or outer side of this cap 18 may have a squared or slabbed off hub 40 for the application of a wrench in screwing it in. A short projecting portion of said shaft is squared or made angular, as at 21, and above said portion is a central threaded stem 22, Fig. 5, for receiving the securing-nut 23.

The hub or inner end of the crank arm or lever 17 has two different recesses or sockets, as best shown in the reverse plan view, Fig. 11, the lower one of said sockets fitting the upper end of the sleeve 16, while the upper socket fits the angular portion 21 of the crank-shaft 20, whereby said crank-shaft and sleeve must of necessity move together to the extent that they may rotate. The crank-arm 17 is slit from the sockets in its head toward its opposite end for some distance, as at 25, to permit its sides to spring or yield a little, and a transverse screw 26 extends across said slit 25 to more firmly bind the head of the crank-arm on the sleeve 16 and shaft 20. A bracket 41, secured to the casing E, (or sometimes to the door,) has one end of a link pivoted to it, the other end of said link being pivoted to the outer end of the crank-arm 17. I prefer to form this link of a tubular part 42 and threaded rod 43, screwed into said tubular part and provided with a set-nut 44, whereby said link is extensible and may be locked at whatever length it may be adjusted to.

The screw-cap or cylinder end 18 may be made liquid-tight by any suitable packing, as at 27, Fig. 3, and made tight around the

crank-shaft by a stuffing-box 28 and packing 29 or any ordinary construction.

A vent-tube 30, open at its upper end and provided with a side orifice 31, is secured in the lower end of the liquid-cylinder and extends upward to near the middle of the cylinder, as shown. Within this vent-tube is the vent-regulating screw 33, which is screwed into the lower end of said tube and has a flattened portion 32 opposite the orifice 31, so that by turning said screw the quantity of fluid that can pass said tube may be regulated as desired.

Within the liquid-cylinder is a hollow piston D, which is held against rotation by a spline 50. The lower end of the piston D fits over the vent-tube 30, is provided with port-holes 34, and a valve 35, which slides on pins 36 for opening and closing said port-holes in the ordinary manner of similar valves. The inner wall of the hollow piston is provided with a cam-groove that extends spirally downward from both sides of a short horizontal portion or summit 37 toward the upper end of the piston to another short horizontal portion 38 toward the lower end of the piston at about half a revolution from the upper horizontal portion, whereby the groove is a reversible or two-handed groove. The piston may be cast in one piece and the cam-groove milled out, or, if desired, the main part of the piston (shown separately in Fig. 6) may be cast with the lower surface of the cam-groove on it and the upper surface may be cast or made of a separate piece 45, secured within the main part, as shown in Figs. 3 and 6. A wing or projection 39 on the crank-shaft 20 enters this cam-groove, as shown. The liquid-cylinder should be filled with liquid.

When the parts are mounted as shown, opening the door will pull the crank-arm 17 to turn the shaft 20 in the direction indicated by the dart in Fig. 2, thereby winding up the spring 15 and at the same time moving the wing or projection 39 from the position shown in Fig. 3 toward the rear side to the left, thereby forcing the piston upwardly. The valve 35 will fall and let a portion of the liquid flow freely through the port-holes to the lower side of the piston.

If the door is opened far enough, the piston will be raised so far as to bring the wing or projection 39 into the lower horizontal portion of the cam-groove. Upon releasing the door the force of the spring will be exerted to return the door to its former position and thereby revolve the crank-shaft in the opposite direction, causing the piston to return to the bottom of the liquid-cylinder. Upon the return of the piston the valve 35 will close the port-holes through the piston, and no liquid can pass it, except such as may leak and that which passes through the vent-tube, whereby the piston must return slowly and

check the force of the spring substantially as in the ordinary manner of checks of the same class.

In order to change the check for use on a different-handed door, the crank-arm is removed, the liquid-cylinder and spring-chamber cap 13 removed, so that the spring-chamber and its spring may be inverted, and the cap and liquid-cylinder are again secured in place. If both ends of the sleeve 16 are made angular to fit the head of the crank-arm, the sleeve may be inverted with the spring-chamber and spring, but if only one end is made angular then said sleeve should be removed and reinserted with its angular end uppermost. The operation is the same as before, only the wing or projection 39 of the crank-shaft 20 passes through the other portion of the cam-groove, but no matter which way the crank-shaft turns its action is to raise the piston. The short horizontal portion of the cam-groove at the upper end of the piston may be made of such width and height as to let the wing or projection of the crank-shaft reach it just before the door is closed, so that the spring may act with its full force to close the door as the door reaches the jamb.

I claim as my invention—

1. The combination of a cylinder and piston, the spring and spring-chamber, the sleeve inside the spring and having an angular end projecting from said spring-chamber, the piston-operating shaft projecting from said sleeve, and the crank-arm having a double-socketed hub, the interior of which is of an angular form having one portion thereof fitted to receive the angular end of the sleeve and the other portion thereof to receive the angular end of the shaft for rotating them together, substantially as described and for the purpose specified.

2. A door-check having a rotating projecting part, a crank-arm having its head fitted thereto and also slit lengthwise on the body side only of said arm, as at 25, and provided with the screw 26 substantially as described and for the purpose specified.

3. In a door-check, the combination of a cylinder, a piston in the form of a hollow cylinder with a closing or bottom wall at one end and a reversible cam-groove upon the inner face of its cylindrical wall, a shaft supported in bearings at one end of said cylinder with its end projecting into the hollow of said piston and having a projection or wing engaging the cam-groove on the inner face of the cylindrical wall of said piston, substantially as described and for the purpose specified.

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Witnesses:

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M. S. WIARD.