

T. CURLEY.
DOOR CHECK.

Patented May 29, 1894.

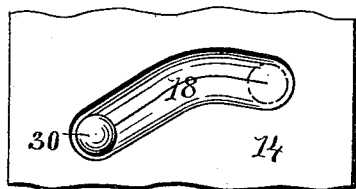


FIG. 3.

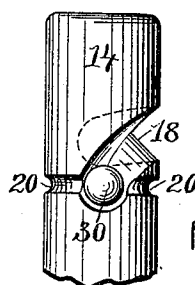


FIG. 4.

INVENTOR,

Henry J. Miller
Chas. H. Luther Jr

Thomas Curley
 4 Joseph A. Miller & Co.
 Attys

UNITED STATES PATENT OFFICE.

THOMAS CURLEY, OF WALTHAM, MASSACHUSETTS.

DOOR-CHECK.

SPECIFICATION forming part of Letters Patent No. 520,637, dated May 29, 1894.

Application filed July 23, 1891. Serial No. 400,467. (No model)

To all whom it may concern:

Be it known that I, THOMAS CURLEY, of Waltham, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Door-Checks; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

This invention has reference to improvements in mechanism by which doors may be closed by spring-pressure which is automatically checked at the proper time to allow the door to close without noise from slamming.

The objects of this invention are to produce a combined door spring and checking device which will be compact in size and shape and which can be readily regulated.

The invention consists in certain peculiar features of construction and combination of novel parts which will hereinafter be more fully described and pointed out in the claims.

Figure 1 represents a front elevation of the improved door-check with a portion of the operating-arm. Fig. 2 is a vertical sectional view of the same showing the inner construction thereof. Fig. 3 is a projected plan view showing the direction of the cam-groove when represented on a plane surface. Fig. 4 is a view of a portion of the plunger showing the cam and the ball working therein.

Similar numbers of reference designate corresponding parts throughout.

In the drawings 5 indicates the plunger-base which is secured in place by the fastening-bracket 6 and on which is supported the mechanism of the door-check. In the lower portion of this base 5 a chamber 7 is formed the bottom of which is closed by a screw-cap 8 carrying the set-screw 9 in a central threaded perforation,—the conical end of this set-screw engages with a perforation 10 in the cap-valve 11 which is thus supported on the upper end of the set-screw. The upper portion of the base 5 is fashioned into a step 12 which is slightly concaved to catch any liquid escaping down the surface of the plunger, this liquid being returned to the chamber 7 through the passage 13.

The plunger 14, formed integrally with the

base 5, has a central vertical passage 15 which is continued through the valve-stem 16 which is secured to the lower end of the plunger and extends downward into the chamber 7 the end resting in the cap-valve 11 and being furnished near this end with the branch-outlets 17. The plunger 14 has also a cam-groove 18, of a V-shaped cross-section, extending partially around its circumference, its direction being upward somewhat abruptly and then having a slight backward slant. The upper end of this groove is connected with the top of the plunger by the small vertical passage 19, while the lower end of this groove connects with the circumferential packing-groove 20 formed around said plunger.

The plunger-cylinder 21 fits snugly over the plunger 14, its lower edge being shaped to seat into the step 12 of the plunger-base,—at the upper end this cylinder has a shank 22 to which the operating-arm 23 is secured and into the end of which the regulating-bolt 24 is screwed and is secured by the lock-nut 25, the upper end of this bolt having a central depression to receive the pointed end 26 of the coiled-spring 27, which surrounds the cylinder 21, the lower end being rigidly secured to the plunger-base 5.

In one of the walls of the cylinder 21, opposite the lower end of the cam-groove 18 is secured a seat-piece 28 of hardened metal having a conical seat 29 to receive the bearing-ball 30 which is free to revolve partially in this seat and partially in the cam-groove.

The chamber 7 is partially filled with a non-freezing and easy-flowing liquid, having lubricating qualities, while the operation of the door-check will admit air thereto.

The end of the operating-arm 23 may be provided with a roller bearing against the door, or this arm may be connected with the door by a suitable pivoted link,—the bracket 6 is secured to the side of the door-frame.

In operation this door closing and checking device is extremely simple, the cap-valve 11 is first adjusted by the set-screw 9 to partially close the outlets 17,—if now the arm 23 be brought forward either from the pressure of the opening door, or otherwise, the cylinder 21 will be turned and the bearing-

ball 30, riding in the seat 29 and partially in the cam-groove 18, will rise in the groove, thus lifting the cylinder and elongating the coiled-spring 27. At the first upward movement of the cylinder, caused as described, a vacuum will be created in the chamber 7 which will tend to draw the cap-valve 11 in place over the valve-stem 16, closing the outlets 17 and allowing the liquid to pass through the perforation 10 in the cap-valve and thence along the vertical passage 15 to the upper end of the plunger. The forward pressure on the arm 23 being continued, the cylinder 21, still riding on the bearing-ball 30 working in the cam-groove, will rise until the highest portion of this groove is reached and will descend slightly as the ball moves along the short descending-arm of the groove, this descent being only sufficient to hold the cylinder in place against the contraction of the elongated spring. When it is desired to close the door, a slight push is sufficient to drive the ball 30 over the highest point of the cam-groove, the spring 27 being allowed to contract will act to quickly close the door, but will be retarded by the compression of the air and liquid contained in the cylinder 21, the liquid will be forced back through the passage 15 driving the cap-valve 11 downward, the end of the set-screw 9 will enter and close the perforation 10 and the liquid will be forced through the outlets 17, which, being partially closed by the cap-valve, will allow the liquid to pass very slowly and the door will close gradually and without noise. When the liquid is drawn to the top of the plunger by the upward movement of the cylinder a portion will work down, through the passage 19 and the cam-groove, into the packing-groove 20 and form a packing,—should any portion of this liquid be forced down to the end of the cylinder it will be caught by the concaved step 12, acting as a drip-cup, and this liquid will be returned through the passage 13 to the chamber 7.

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

1. In a door-check, of the nature described, a plunger, having a central vertical passage, supported on a base, a chamber containing liquid within said base, a vertically-perforated valve-stem having transverse outlets extending downward from said plunger and valves for closing said outlets, as described.

2. In a door-check, a spring-operated cylinder, a fixed plunger, on which the cylinder is movable, a seat-piece secured in the wall of said cylinder and having a seat, and a bearing-ball movable in said seat and engaging with a cam-groove formed in said plunger, as described.

3. A spring-operated cylinder, a fixed plunger, on which the cylinder is movable, a bearing-ball held in a seat in the wall of said cylinder and engaging with a V-shaped cam-groove provided in the periphery of said plun-

ger, a passage connecting the upper end of said groove with the top of the plunger, and a packing-groove surrounding said plunger and connected with the cam-groove, as described.

4. In a door-check having a movable cylinder, the combination therewith, of a centrally vertically perforated plunger, supported on a base, having a concaved step surrounding said plunger, a passage connecting said step with a chamber formed in said base, a vertically-perforated valve-stem extending from the center of the plunger into said chamber and having transverse outlets at the lower end thereof, a perforated cap-valve fitting over the end of said valve-stem, and a set-screw working through the bottom of the chamber and adapted to raise the cap-valve to wholly, or partially, close the outlets in the valve-stem, as described.

5. A cylinder, a fixed plunger on which the cylinder is vertically movable, a coiled-spring, surrounding said cylinder, one end journaled in the top thereof the other end rigidly secured to the base of the plunger, adapted to return the cylinder to place by the contraction of the elongated spring, and means carried by the cylinder adapted to engage the plunger to vertically move the cylinder, as described.

6. In a door-check and spring, the combination with the cylinder 21 operated by the arm 23 against the contraction of the spring 27 and provided with the seat-piece 28 having the conical seat 29, and the bearing-ball 30, of the plunger 14, having the cam-groove 18 in which said ball engages, supported on the base 5, a chamber 7 within said base, and one or more passages connecting the upper end of the plunger with said chamber, as described.

7. In a door-check and spring, the combination with the plunger 14 supported on the hollow base 5 and having the cam-groove 18, passage 19 and circumferential packing-groove 20, a central passage 15 extending vertically through said plunger and the valve-stem 16 secured thereto and provided with outlets, the centrally-perforated cap 11 movable over the end of said valve-stem, the set-screw 9 by which the cap 11 is adjusted, and the screw-cap 8, in a perforation in which the set-screw works, of the cylinder 21 vertically movable on said plunger against the contraction of the spring 27 journaled in the top thereof and provided with the seat-piece 28 having the seat 29 and the bearing-ball 30 in said seat, adapted to engage the cam-groove 18, as described.

8. In a door spring or check, the combination with a cylinder, a plunger on which the cylinder is movable, an arm secured to the cylinder for operating the same, of a coiled-spring, surrounding said cylinder, one end being rigidly secured to the plunger or base thereof, the other end being conical in shape and journaled in an adjustable bearing

formed in part with or secured to said cylinder.

9. The combination with the cylinder 21, the plunger 14, having the hollow base 5, the step 5 12 and a passage connecting said step with the hollow portion of the base, of the arm 23, the spring 27, surrounding the cylinder 21, rigidly secured at the lower end and having the upper conical end bent over to engage a bearing 10 in the upper end of the adjustable-bolt 24 having the lock-nut 25, as and for the purpose described.

10. In a door-check, in combination, a plunger furnished with a chamber and having a 15 passage located adjacent to the wall of the

chamber and a second passage centrally located with reference to the chamber, both connecting the chamber with outer portions of the plunger, a screw-cap for closing the end chamber, an adjustable device carried by the 20 cap for regulating the flow of fluid through the central passage, and a cylinder surrounding the plunger.

In witness whereof I have hereunto set my hand.

THOMAS CURLEY.

Witnesses:

HENRY J. MILLER,

JOSEPH A. MILLER, Jr.