



# UNITED STATES PATENT OFFICE.

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## DOOR CHECK AND CLOSER.

SPECIFICATION forming part of Letters Patent No. 750,802, dated February 2, 1904.

Application filed May 29, 1902. Serial No. 109,459. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM J. BRYON, JR., a citizen of the United States, and a resident of the borough of Manhattan, in the city, county, and State of New York, have invented certain new and useful Improvements in Door Checks and Closers, of which the following is a specification.

My invention relates to improvements in door checks and closers, and has more particular reference to that class of door checks and closers in which a liquid is employed as the checking medium.

In automatically closing a door it is desirable that the door should have a relatively rapid and uniform movement until almost to the end of its closing movement, when it should be so checked as to permit of its easy and gradual closing to the latching-point without undue jar or noise. To secure this result in a simple, efficient, and positive manner has been the object of my invention, which object I obtain by means of the novel features of construction and combinations of parts, as hereinafter set forth in detail, and pointed out in the claims.

Referring to the accompanying drawings, Figure 1 is a vertical section through a door check and closer embodying my invention. Fig. 2 is a horizontal section through the same on line 2 2 of Fig. 1. Fig. 3 is a sectional detail illustrating a modified form of my invention. Fig. 4 is an enlarged view, partly in section, of a valve shown in Figs. 1 and 2.

Similar characters designate like parts in all the figures of the drawings.

In said drawings the main casing 1, comprising the upper or vertical portion 2, having the spring-chamber 3 therein, and the lower or horizontal portion 4, having the liquid-chamber 5 therein, the spring 6, located in the chamber 3, the piston 7, located in the chamber 5, the shaft or spindle 8, extending from the upper side of the vertical portion 2 of the casing down into the liquid-chamber 5 and having at its lower end the crank-arm 9, connecting with the piston 7 through the medium of the link 10, the packing-sleeve 11, surrounding the spindle 8, between the spring and liquid chambers, the sleeve 12, surrounding the spindle 50 within the chamber 3 and having one end of

the spring 6 connected therewith, and the arm 13, operatively connecting at one end with the spindle 8 and sleeve 12, are all, so far as described, of usual construction, arrangement, and operation, it being understood that the casing 1 is adapted to be suitably attached to a door and the arm 13 suitably connected to the door-casing, whereby when the door is opened the spring will be put under tension and when the door is released the said spring by its reaction will operate to close the door, this closing action being controlled by the co-operation of the liquid and piston in the chamber 5.

In accordance with my invention I provide the piston 7 with an aperture or passage-way 14, through which the liquid may pass from one end of the chamber 5 to the other, and I control the flow or passage of the liquid through this aperture by means of a suitable valve, such as the valve 15, which is operated upon the opening of the door to open the said aperture and permit the free flow of the liquid therethrough in the usual manner and during the closing of the door to continue to remain fully open, or substantially so, until the door has almost reached the limit of its closing movement—say to a position within about two inches from the latching-point—at which time it will practically close the said aperture and so restrict the escape of the liquid therethrough that the remaining liquid in the cushion end of the chamber will afford the proper checking resistance to insure the door moving to its latching-point readily, but without undue noise or jar. Controlling the valve so that it will thus remain fully open, or substantially so, and permit the free flow or passage of the liquid through the aperture 14 during the major portion of the closing movement of the door, and then closing the valve to substantially cut off the flow of liquid through said aperture just before the latching of the door gives the most desirable movement for the closing of a door—that is, a rapid movement during practically all of the closing of the door and then the proper checking or cushioning of the same during its final movement to latching position.

As a simple and desirable means for con-

trolling the movement of the valve in the manner described during the closing of the door, I provide the valve 15 (shown in Figs. 1, 2, and 4) with a stem 16 of sufficient length to extend through the aperture 14 in the piston beyond the rear end thereof and provide the adjacent oscillatory end of the link or pitman 10 with a cam-surface 17 for engaging with the said rear projecting end of the valve-stem 16. By this means when the door is closed the cam 17 will be moved to a position to permit the valve to be seated in its seat at the front end of the aperture 14, as indicated by dotted lines in Fig. 2. When the door is now opened and the piston is moved from the position shown in dotted lines to that indicated by full lines, the link 10 is operated by the crank 9 to move its cam 17 into engagement with the valve-stem and force the valve from its seat, as shown, although any action of the cam on the valve during such movement of the piston is not necessary, for the reason that the pressure of the liquid is such as to force the valve from its seat and open the aperture. After the door is released, however, and begins to close and during the corresponding return movement of the piston to its starting position the cam 17, engaging with the valve-stem 16, prevents the valve being closed by the pressure of the liquid thereagainst in the forward end of the chamber 5 and continues to hold the same wide open until the door has almost reached the limit of its closing movement, at which time the cam permits the valve to be quickly seated, for the purpose as hereinbefore set forth.

It will of course be understood that the flow or passage of the liquid from the front to the rear end of the chamber cannot be wholly cut off prior to the door reaching its latching position, as this would of course prevent closing of the door; but I have found in practice that only a very small amount of escape is necessary to insure the door being readily moved to latching position subsequent to the seating of the valve, as described, and that the usual leakage about the piston and through the aperture ordinarily affords sufficient escape for this purpose. In order that this escape may be accurately adjusted, however, I have in the present case located the valve in a longitudinally-adjustable position on its stem 16 by means of a screw-threaded connection between the parts, as shown in Fig. 4, and provided the valve with a set-screw 15' for securing the same in a stationary adjusted position relative to its stem 16. By this means the valve may be so adjusted as to be held by the link 10 during the final closing movement of the door in a position with a slight space or clearance between the same and its seat, as shown in the dotted position of the parts in Fig. 2, so as to provide for the desired escape of liquid.

As an important feature of my invention,

and in order that the door-check may be adapted for use in connection with either a right or left hand door, I have provided the link 10 with two cams at the end thereof and arranged at opposite sides of its center, one being the cam 17, hereinbefore referred to, and the other (indicated at 17') being of corresponding form and arrangement. When the door-check is secured in operative connection with a door, only one of the cams on the link 10 is operative, and the particular one of course depends upon whether the check is attached to a right or left hand door, the crank 9 operating at one side of the center of the chamber 5 in the one case and upon the opposite side in the other.

Referring to Fig. 3, I have shown another embodiment of my invention. In this case the valve (indicated at 20) is shown as a slide-valve, the same being engaged between two lugs 21 21 thereon by the end of the link 10 and operated thereby to slide back and forth to and from a position for closing the apertures 22 22 in the piston. Various other modifications in the means for controlling the passage of the liquid (or air) from one end of the chamber 5 to the other may also be made without departure from the spirit and scope of my invention, for

What I claim, and desire to secure by Letters Patent of the United States, is—

1. A door-check, comprising a liquid-chamber, a piston in said chamber, means for operating the piston, a passage-way communicating with the chamber at opposite sides of the piston, and means, including an oscillating device movable with the piston, for automatically controlling the flow of liquid through the said passage-way.

2. A door-check, comprising a liquid-chamber, a piston in said chamber, means for operating the piston, a passage-way communicating with the chamber at opposite sides of the piston, a valve for controlling the flow of the liquid through said passage-way, and a cam movable with the piston for controlling the valve to automatically regulate the flow of the liquid through the said passage-way during the movement of the piston.

3. A door-check, comprising a liquid-chamber, a piston in said chamber, means for operating the piston, a passage-way communicating with the chamber at opposite sides of the piston, a valve for controlling the flow of the liquid through the said passage-way, and an oscillating cam movable with the piston for controlling the valve to automatically regulate the flow of the liquid through the said passage-way during the movement of the piston.

4. A door-check, comprising a liquid-chamber, a piston in said chamber provided with an aperture or passage-way communicating with the chamber at opposite sides of the piston, a valve for controlling the flow of the liquid through said passage-way, a spring-actuated

spindle having a crank, and a link connecting said crank with the piston, the said link being provided with a cam for engaging with and controlling the action of the valve.

5 5. A door-check, comprising a liquid-chamber, a piston in said chamber provided with an aperture or passage-way communicating with the chamber at opposite sides of the piston, a valve for controlling the flow of the liquid  
10 through said passage-way, a spring-actuated spindle having a crank, and a link connecting said crank with the piston and having means for operative engagement with the valve, for the purpose set forth.

15 6. A door-check, comprising a liquid-chamber, a piston in said chamber provided with an aperture or passage-way communicating with the chamber at opposite sides of the piston, a valve for controlling the flow of the liquid  
20 through said passage-way, a spring-actuated spindle having a crank, and a link connecting said crank with the piston, the said link being

provided with two cams for controlling the action of the valve, one of said cams being operative for a left-hand door and the other for a  
25 right-hand door.

7. A door-check, comprising a liquid-chamber, a piston in said chamber, means for operating the piston, a passage-way communicating with the chamber at opposite sides of the piston, a valve for controlling the flow of the  
30 liquid through said passage-way, two oscillating cams movable with the piston for controlling the action of the valve, one of said cams being operative for a left-hand door and the  
35 other for a right-hand door, and means for operating the said cams.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 28th day of May, 1902. 40

WILLIAM J. BRYON, JR.

Witnesses:

CHAS. F. DANE,  
M. L. TORREST.