No. 831,051. PATENTED SEPT. 18, 1906.

M. J. FLYNN.

DOOR CHECK.

APPLICATION FILED APR. 13, 1905.

Fig. 1.

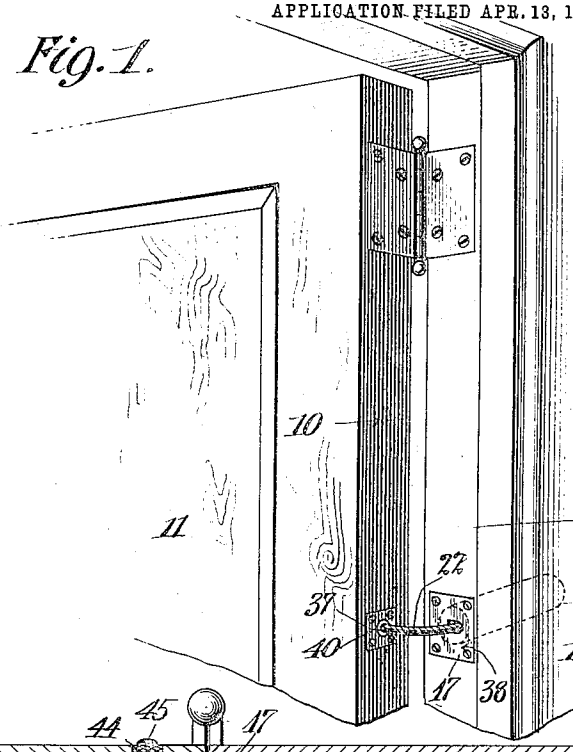


Fig. 4.

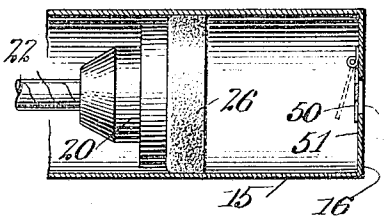


Fig. 2.

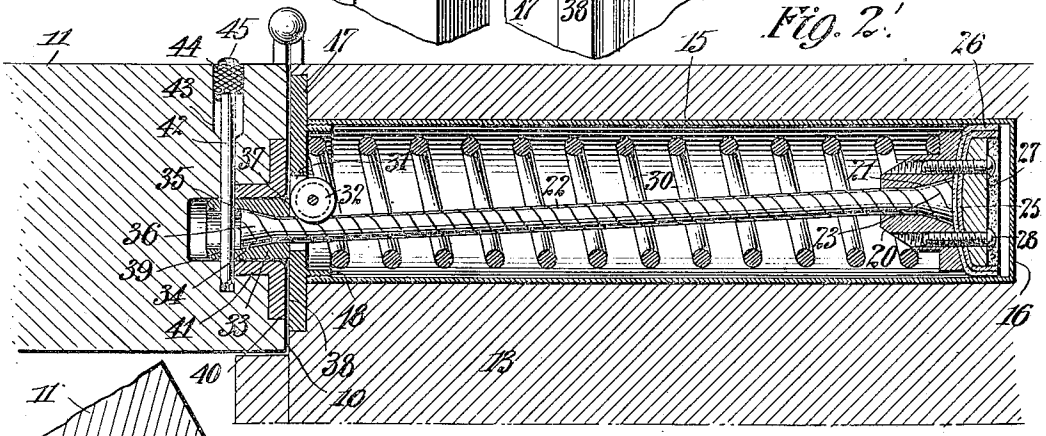
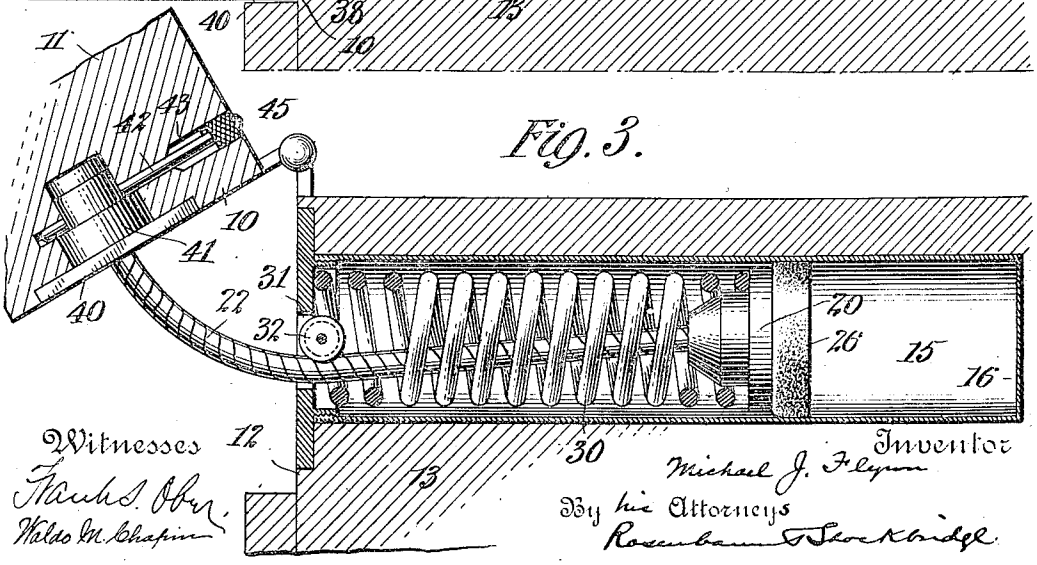


Fig. 3.



Witnesses

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DOOR-CHECK.

No. 831,051. Specification of Letters Patent. Patented Sept. 18, 1906.

Application filed April 13, 1905. Serial No. 255,268.

To all whom it may concern:

Be it known that I, MICHAEL J. FLYNN, a citizen of the United States, residing at the city of New York, in the borough of Brooklyn and State of New York, have invented certain new and useful Improvements in Door-Checks, of which the following is a full, clear, and exact description.

This invention relates to door-checks; and the primary object thereof is to provide means for closing a door which is so organized that the parts thereof may be secured to the abutting edges of the door and its jamb in such manner that when the door is closed said parts will be entirely concealed from view. The device may for this reason be characterized as an "invisible" door-check.

The details of the invention will hereinafter appear, and the novel features thereof will be set forth in the claims.

In the drawings forming part of this specification, Figure 1 is a perspective view of a portion of the rear or back edge of a door and its jamb, showing my invention applied thereto. Fig. 2 is a longitudinal section of one form of the invention, the door being shown in its closed position. Fig. 3 is a similar section taken at right angles to Fig. 1 and showing the door in a partly open position, and Fig. 4 is a detail sectional view showing a modification.

The device is intended to be mounted between the back edge 10 of a door 11 and the face 12 of a door-jamb 13. Although either part may be mounted upon the door, yet in the present illustration the larger portion of the device is mounted upon the jamb. This portion comprises a cylinder 15, having a closed end 16 and having at its opposite end a closure in the form of a plate 17 projecting beyond the outlines of the cylinder, through which securing devices may be passed. The plate is shown as having a screw-threaded flange 18 for entering the cylinder and engaging screw-threads upon the interior thereof. A piston is shown within the cylinder 15, the same comprising a body portion 20, having an opening through the center thereof which is counterbored, as at 21, for receiving the piston-rod 22, having its end at 23 spread to fill the counterbore. The piston-rod is flexible and in the present illustration is represented as being made of resilient cable. Suitable steel-wire cable of sufficient diameter and strength to meet the requirements of the various employments will be used. The piston-packing comprises a disk 25, having rearwardly-turned edges or flange portions 26 for engaging the inner walls of the cylinder. This disk may be secured to the body portion 20 by means of a plate 27 and screws 28. The piston-packing 25 may be made of some suitable material—as, for instance, leather sufficiently lubricated to render it pliable. A coiled compression-spring 30 is interposed between the body of the piston and the plate 17 and tends to force the piston rearwardly toward the end 16 of the cylinder. The plate 17 is provided with an opening 31, through which the piston-rod 22 will pass out of the cylinder, a suitable sheave 32 being mounted adjacent to said opening and over which the flexible piston-rod will pass. The end of the piston-rod is shown as entering a coupling member 33, having a counterbore 34 undercut at 35 to receive the enlarged end 36 of the cable piston-rod. It will be seen that the length of the piston-rod is such that the shoulder, as 37, on the coupling member will abut the face 38 of the plate 17 and hold the piston from being forced by the spring to the end 16 of the cylinder, whereby the spring will always be held under tension and the coupling member always drawn securely against the plate. This will insure the door being closed even should it be temporarily interrupted at some point before it reaches its closed position. The rear of the door is shown as carrying a plate 40, provided with a rearwardly-extending tubular portion 41, constituting a socket, which socket is adapted to receive the coupling member 33. This coupling member has an opening 39, adapted to register with the rear of the socket 41, so that when the coupling member is in the socket a pin 42, passing behind such socket, may enter the recess or opening 39 and secure the parts together. An opening 43 for the accommodation of such pin may be made in the door, and a metallic bushing 44 may be put around such opening for the purpose of preventing wear. The pin may be provided with a head 45 to permit its ready removal when it is desired to uncouple the check and release the door from the control of the check or if for any reason it is desired to unhinge the door.

Fig. 3 represents the device with the door partly open, with the piston drawn up part way in the cylinder, and the flexible piston-

rod 22 moving upon the sheave and bent over to permit the swinging of the door away from its jamb. As the piston is drawn out air will find access between it and the end 16 of the cylinder. During the outward movement of the piston the spring will be compressed. When the door is released, the piston will be forced inwardly toward the end 16 of the cylinder by the energy stored in the spring through its compression. The air between the piston and the end of the cylinder during such inward movement will act as a cushion, preventing the too rapid yielding of the piston to the influence of the spring.

It will be seen that the flange 26 of the piston-packing is directed toward the end 16 of the cylinder. Consequently air will find ingress to the cylinder on the outward movement more readily than it will find egress on the compression-stroke or inward movement. When the door is opening, the piston will move outwardly and air will be drawn into the space between the piston and the end 16 of the cylinder. Upon the release of the door the spring, which has been compressed, will force the piston toward the end 16 of the cylinder and draw the door toward its closed position. As the piston advances, owing to the above-stated action of the piston-packing, the confined air will be compressed and cushion the spring in its closing of the door. The first part of the travel of the piston is opposed by a more yielding cushion of air than at subsequent stages of such travel, owing to the increased compression, so that the door will at first be drawn rapidly, then its progress will be impeded until sufficient air has escaped to weaken the cushion below the strength of the spring, when the door will be quietly closed, but with sufficient force to bring it up to its proper position even against the resistance of a door-latch or of drafts. The momentum given the door in the first stages of its closing would not be retarded and the door would slam if the piston-rod were made of too flexible cable; but it is proposed to use a cable sufficiently flexible to permit free action of the door and yet sufficiently rigid not to bend when the piston in its return stroke is retarded, but to interpose its rigidity and check the door when the piston is checked or retarded. By means of this device the door will be firmly shut, but in such a manner that it will not slam, and when it is shut the check will be entirely concealed.

In most instances the plates 17 and 40 will be mounted so that their respective faces 38 and 46 will be substantially flush with the surfaces upon which they are mounted, so that when the door is opened all that will be seen will be the faces of such plates and the short length of the piston-rod which has been drawn out through the aperture 31.

In some cases it may be found desirable to admit air to the cylinder behind the piston more rapidly. If so, a check-valve 50 and port 51 may be provided at the end 16 of the cylinder, as illustrated in Fig. 8, whereby air will be readily drawn into the cylinder upon the outward movement of the piston; but upon the return or compression stroke the valve will close in a well-known manner, and the air-cushioning effect produced in the other form of device will also be present here.

What I claim is—

1. The combination with a door-jamb and a door having its edge abutting said jamb, when closed, and moving away from the same in opening, of a spring seated in the jamb, a resilient cable operatively connected to said door edge and to said spring for compressing the spring, and air-cushioning means for retarding the expansion of the spring.

2. In a door-check, the combination with a cylinder, of a piston therein, a spring for forcing the piston to one end of the cylinder, a steel-wire-cable piston-rod, means for attaching the cylinder to a door-jamb, and means for attaching the piston-rod to a door.

3. A door-check comprising a cylinder, a piston therein, a closure for the cylinder, a spring between such closure and the piston, a steel-wire piston-rod connected to such piston and passing out through the closure, and a removable coupling-piece carried by such piston-rod.

4. In a door-check, the combination with a cylinder, of a piston therein, a plate constituting a closure for the end of the cylinder and forming a flange about the end, a spring between such closure and the piston, a flexible steel-wire piston-rod connected to such piston and passing out through the closure, the flange of said closure providing means for the attachment of the cylinder to the face of a door-jamb, a plate for attachment to the edge of a door, and a coupling secured to the end of said piston-rod and to the latter plate.

5. In a door-check, the combination with a cylinder having a closed end, a piston in said cylinder, a closure for the outer end of said cylinder having an opening, a spring between such closure and the piston, a sheave adjacent to said opening, a flexible steel-wire piston-rod connected to said piston and passing out through said opening and over said sheave, and a valve in the closed end of said cylinder adapted to open upon the outward stroke of the piston and to close upon its return or compression stroke.

In witness whereof I subscribe my signature in the presence of two witnesses.

MICHAEL J. FLYNN.

Witnesses:
E. W. McCARTY,
MAY BIRD.