

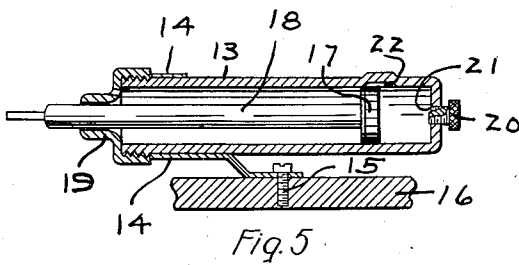
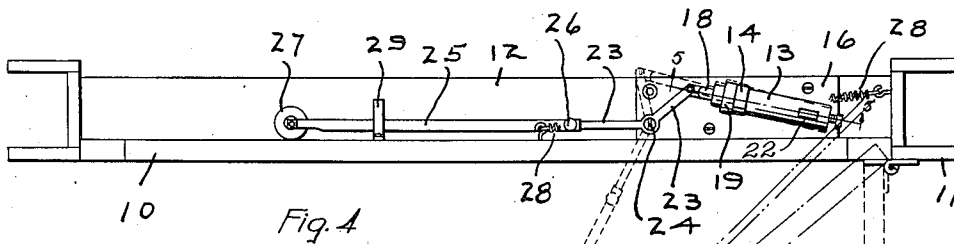
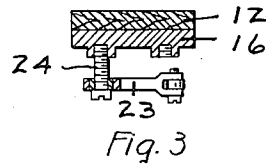
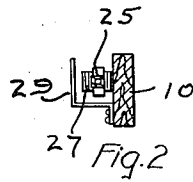
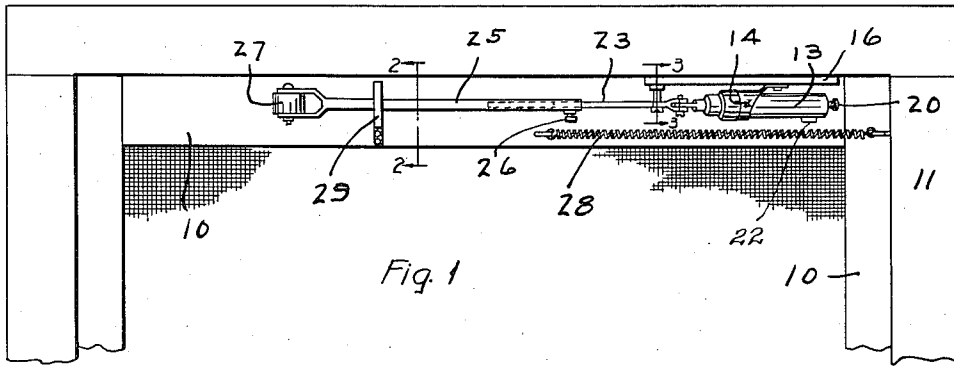
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DOOR CHECK

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DOOR CHECK

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3 Claims. (Cl. 16—84)

This invention relates to a door check device that is simple in construction, easy to install, inexpensive to manufacture, that will operate in an efficient manner and that may be marketed at a relatively low price.

An important object of the invention is to provide along with a conventional air or other fluid cylinder, an adjustable lever arm operatively connected with that cylinder, the length of the arm being variable to meet the individual door requirements without having to increase or decrease the size of the cylinder. A further primary object of the invention is to provide a structure wherein the checking lever which is connected to the cylinder as above indicated is not attached to the door but only comes in contact with the door when the door approaches its closed position. A still further important feature of the invention is the inclusion of means therein to position the end of the lever as the door leaves it to provide suitable striking of the door by that lever when the door returns after being opened.

One particular form of the invention is herein described and shown as being applied to a screen door although the invention is equally adapted for use on any type of door. Reference is made to the accompanying drawing, in which

Fig. 1 is a detail in elevation of the upper portion of the door showing the invention applied thereto;

Fig. 2, a transverse vertical section on the line 2—2 in Fig. 1;

Fig. 3, a transverse vertical section on the line 3—3 in Fig. 1;

Fig. 4, a bottom plan view of the door check mechanism, and

Fig. 5, a central longitudinal section through the check cylinder on the line 5—5 in Fig. 4.

Like characters of reference indicate like parts throughout the several views in the drawing.

A door 10 to be checked in its closing travel is hinged to the frame 11 to swing outwardly as indicated in Fig. 4. To the under side of the door frame head 12, I rockably mount a cylinder 13 to be free to pivot so as to permit horizontal rotation.

This cylinder 13 is herein shown as being mounted by a bracket 14 slipped over the cylinder and having a foot through which a screw 15 passes and enters a plate 16 which is in turn secured to the under side of the head 12. This cylinder carries a piston 17 attached to the inner end of a connecting rod 18 which is slidably guided through a removable head 19. The fit

of the rod 18 through the head 19 is sufficiently loose as to permit escape of air through the head 19 around the rod 18 as the piston 17 may be advanced toward that head. The other end of the cylinder 13 is closed with the exception of a removable plug 20 screwthreadedly carried in that end and having a tapered slot 21 longitudinally across its periphery so that by advancing or retracting the plug 20 in that closed end of the cylinder, a variable size opening or escape may be provided so that as the piston 17 approaches that end of the cylinder, the rate of escape of air or fluid entrapped therebetween may be determined and regulated by the position of the plug 20. Furthermore the cylinder 13 in the form herein shown, but not necessarily so, is provided with a longitudinal passage 22 in its side wall toward the closed end of the cylinder so that as the piston 17 approaches that closed end, the entrapped fluid between the piston and that closed end may escape around the piston 17 through that passageway 22 to the other side of the piston and thereby relieve resistance to travel of the piston toward the plug.

A lever 23 is rockably mounted on the plate 16 by any suitable means, here shown as by the screw 24. In the particular form of the lever herein shown, one end is turned inwardly away from the door 10 and is pivotally attached to that part of the rod 18 which projects or extends from the head 19. The other arm of the lever 23 extends along the inside of the door 10 in spaced relation therefrom and carries an adjustable extension 25 secured at any adjusted length by means of a screw 26. The outer end of the extension 25 is provided with any suitable means for contacting the inside of the door 10 without causing damage or marring of its finish, the means herein shown being a rubber roller 27.

The door 10 is normally pulled to a closed position by a spring 28 attached to the inner side of the door by one end and by its other end to any suitable part of the door frame. The door 10 may be pushed or carried to its open position as indicated by the dash lines in Fig. 4 against the yielding pull of the spring 28, all as in the usual and well known manner.

A member 29, herein shown as in the form of a hook, is attached to the inner side of the door 10 to extend over the extension 25 with sufficient clearance thereover so as to permit the roller 27 to pass out thereunder as the door 10 is swung to its open position. However as the door thus swings, the hook 29 will come into contact first with the extension 25 so as to rock the lever 23

and cause the piston 17 to be pulled along in the cylinder 13 toward the head 19. By the time the roller 27 passes out from under the hook 29 as indicated by the dash-dot lines of the door in Fig. 4, the piston 17 has been brought into close proximity with the head 19 and since the extension 25 is then freed from engagement with the hook 29, all of the various members, including the extension 25, lever 23, piston 17 and its cylinder 13 are left in the positions thus created while the door continues to swing through the remainder of its travel.

Now upon release of the door to return it to the influence of the spring 28, the spring 28 will cause the door to rapidly travel toward its closed position. However this rapid travel is checked and the door is gently closed in a manner now to be described. As above indicated, the extension 25 is left in that position as indicated by the dash lines in Fig. 4 so that the roller 27 is struck by the door 10 in its returning travel. The inertia of the door and the continued pull of the spring 28 will cause the extension 25 to be pushed inwardly with the roller 27 again passing under the hook 29 as it rolls along the inner side of the door. Now as the lever 23 is rocked by this travel of the extension 25, the piston 17 is pushed backwardly in the cylinder 13 causing the fluid therein to be quickly compressed as in the case of air or in any event causing the fluid trapped between the piston and the closed end of the cylinder to set up a resistance to that travel of the piston. This resistance, of course, will be imparted directly to the door 10 through the lever 23 and its extension 25 with the contacting roller 27, thus quickly slowing down the travel of the door 10 in opposition to the pull of the spring 28. The parts are so proportioned as to size and fit that the quick build up of pressure prevents the spring from slamming the door shut but still permits the spring to pull the door closed against that pressure or resistance. The final degree of resistance is controlled by adjusting the plug 20 to permit escape of the fluid trapped by the piston in the end of the cylinder. By the time the piston 17 has approached the closed end of the cylinder as indicated in Fig. 5, the door 10 will have reached a position within several inches of its closed position, the rate of deceleration of movement of the door being greatest at this immediate position. Then when the by-pass is employed, instead of continuing that same rate of deceleration, the piston 17 uncovers the by-pass 22, so that the entrapped fluid between the piston 17 and the closed end of the cylinder 13 is quickly released

through that by-pass so that the spring 28 may then pull the door 10 on to its closed position with a decrease in that resistance theretofore offered. The parts in any event are so proportioned that this final closing of the door within the last few inches of travel is accomplished gently but positively without any slam or resulting noise.

For a given spring, weight or size of door, and fixed setting of the plug 20, the length of the lever is decreased by moving in the extension 25 to overcome slamming. Thus I have achieved a very simple, effective door check that is extremely low in cost comprising essentially a cheaply constructed cylinder and an adjustable lever connected to a piston therein.

While I have herein shown and described my invention in the best form as now known to me, structural variations may be employed without departing from the spirit of the invention and I, therefore, do not intend to be limited to that precise form beyond the limitations as may be imposed by the following claims.

I claim:

1. For checking the closing of a door normally closed by a spring, a rockable lever in the path of the door, means yieldingly resisting rocking of the lever in a closing door direction, and means carrying the lever through an initial predetermined length only of the door opening travel, said resisting means comprising a cylinder and a piston in the cylinder connecting with said lever, said lever being adjustable as to length whereby the effective lever length may be varied to meet varying door conditions.

2. For checking the closing of a door normally closed by mechanical means, a rockable lever in the path of the door, means yieldingly resisting rocking of the lever in a closing door direction, and means carrying the lever through an initial predetermined length only of the door opening travel, said lever being adjustable as to length whereby the effective lever length may be varied to meet varying door conditions.

3. For checking the closing of a door normally closed by mechanical means, a rockable lever in the path of the door, means yieldably resisting rocking of the lever in a closing door direction, and means carrying the lever through an initial predetermined length only of the door opening travel, said lever being in two tubular pieces, one telescoping in the other held at adjustment by a set screw whereby the effective lever length may be varied to meet varying door conditions.

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