Jan. 7, 1941. W. H. LINDSAY 2,227,656

DOOR CHECK

Filed Aug. 7, 1939

FIG. 1.

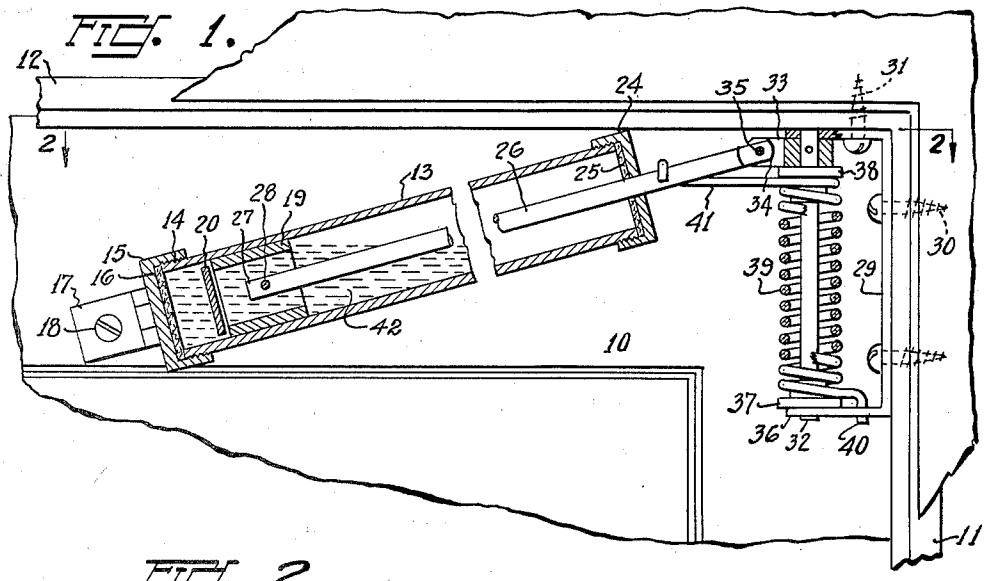


FIG. 2.

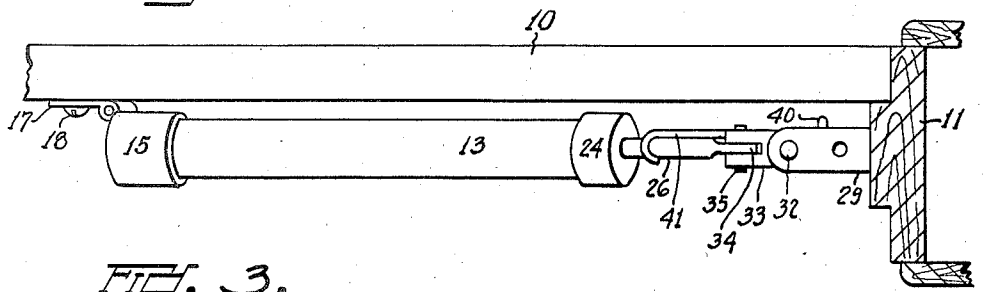


FIG. 3.

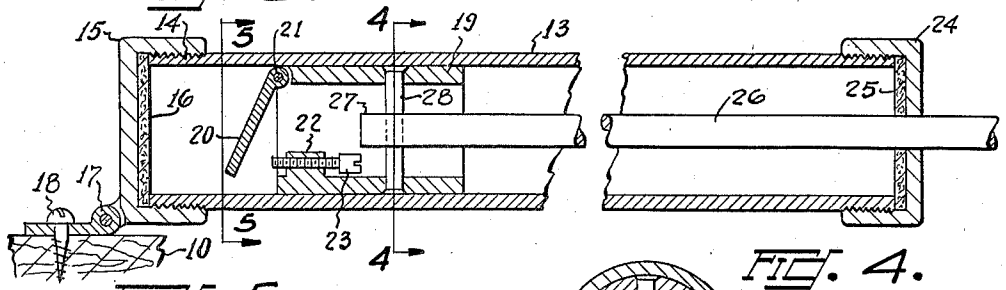


FIG. 4.

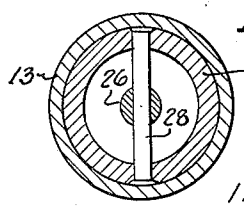
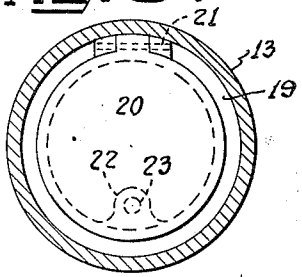


FIG. 5.



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DOOR CHECK

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2 Claims. (Cl. 16—51)

This invention relates generally to devices for controlling the movements of the door and particularly to a hydraulic means for checking the closing operation of a door.

The main object of this invention is to construct a door check which will operate satisfactorily over a long period of time without attention or adjustment regardless of atmospheric conditions.

The second object is the construction of a door check which will be inexpensive to manufacture and adjust for a given condition and easily installed under limited space conditions.

The third object is to construct a door check which will be extremely rigid at its position of fastening to the door frame and at the same time be easily interchangeable from a check for the door itself to the screen door thereof.

The fourth object is to construct a hydraulic door check from which it will be impossible for the fluid to leak out at any time.

The fifth object is to construct a special form of valve mechanism for a hydraulic door check in which the resistance can be entirely removed or selectively applied to the operating mechanism thereof.

These and other objects are accomplished in the manner set forth in the following specification as illustrated in the accompanying drawing, in which:

Fig. 1 is a fragmentary elevation of the corner of the door and door frame showing the door check broken away in vertical sections, and showing the door in a closed position.

Fig. 2 is a horizontal section taken along line 2—2 in Fig. 1.

Fig. 3 is an enlarged longitudinal section of the operating cylinder, showing the valve in an open position.

Fig. 4 is a section taken along the line 4—4 in Fig. 3.

Fig. 5 is a transverse section taken along the line 5—5 in Fig. 3 showing the position of the valve.

Similar numerals refer to similar parts throughout the several views.

Before entering into the description of this invention, it is understood that numerous forms of door checks of this general type have been constructed in the past, most of which employ air as the operating fluid. Such devices are not only difficult to adjust for a given condition but are also seemingly difficult to maintain in adjustment owing to the variable conditions under which the devices operate. The purpose of using a hydraulically operated check is to facilitate the operation thereof and insure a continued uniform operation which is unaffected by changes in temperature, or moisture, or the dust laden content of the surrounding air.

Referring in detail to the drawing, there is shown a door 10 which is mounted within the frame 11 by means of a hinge not shown. The position of the frame head 12 is also indicated referring in particular to the invention the same will be seen to consist of a hydraulic cylinder 13 whose lower end 14 is threaded and closed by means of a cap 15, the union being sealed by the gasket 16. The cap 15 has attached thereto a hinge 17 which is fastened to the door 10 by means of the screw 18.

Within the cylinder 13 is mounted a tubular piston 19, to one end of which is hinged the circular valve 20 by the pin 21. Within the member 19 is formed the lug 22 through which is threaded the adjustment screw 23 which limits the movements of the valve 20 in the closing direction. The cylinder 13 has threaded on its upper end a cap 24 which preferably contains a gasket 25. Extending axially through the cylinder 13 is a piston rod 26. Through the lowermost end 27 extends the piston pin 28 which also extends through the piston 19.

The U shaped bracket is secured to the door frame parts 11 and 12 by means of the screws 30 and 31. Mounted on the bracket 29 is a vertical pin 32 on whose upper end is secured an arm 33 to which is hingedly connected the upper end 34 of piston rod 26 by means of the rivet 35. Between the arm 33 and the opposite end 36 of the bracket 29 are placed the collars 37 and 38 between which is disposed the torsion spring 39 whose end 40 bears against the bracket portion 36, also end 41 bears against the piston rod 26.

The operation of the device is as follows:

With the parts in the position shown in Fig. 1 and a quantity of liquid placed within the cylinder 13 and the door 10 in a closed position it will be seen that when the door 10 is opened the piston 19 will be drawn away from the lower end of the cylinder 13 without any resistance being offered to such movements due to the fact that the valve 20 opens freely in that direction but when an attempt is made to close the door or it is closed under the action of the spring 39, there is a movement in the opposite direction the first portion of which causes the valve 20 to close as tightly as permitted by the screw 23 to provide the desired resistance to the closing action of

the door. This can be increased and decreased by varying the setting of the screw 23.

If the check is to be used on a screen door for a portion of the time it is only necessary to remove the screw 18 and turn the cylinder 13 180 degrees and insert the screw 18 into the opposite door where it will function as before.

It will be observed that by placing the screw 31 on the end of the bracket 29 and the screw 30 on the base thereof that the utmost rigidity is provided for the bracket. The outstanding advantage of this device resides in its continued uniformity of operation, and once adjusted, its action remains the same under all conditions until that adjustment is changed. It will also be observed that due to the angle of inclination it is not possible for any of the liquid 42 to leak out or escape from the cylinder even though the cylinder be maintained in an almost completely filled condition.

I claim:

1. A door check having in combination an inclined hydraulic cylinder, a cap on the lower end of said cylinder hingeable to a door, a tubular piston within said cylinder having a valve across its lower end adapted to close upon a downward movement of said piston, means for limiting the degree of closing, a piston rod having its lower end connected to said piston and having its upper end projecting from said cylinder, and a spring urged arm hingedly attachable to a door frame having its swinging end hinged to the upper end of the piston rod.

2. A door check consisting of an inclined hydraulic cylinder closed at its lower end and having a piston rod therein projecting from its upper end, a tubular piston within said cylinder connected to the lower end of said piston rod, a circular gate hinged to one end of said tubular piston having means for limiting the closing action thereof, a bracket attachable to a door frame and having an arm pivotally mounted thereon, said arm being hinged to the uppermost end of said piston rod and a torsion spring on said bracket adapted to urge said rod in a door closing direction.

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