P. E. NORDQVIST.

DOOR CHECK.

APPLICATION FILED MAY 3, 1910.

1,041,853.

Patented Oct. 22, 1912.

2 SHEETS—SHEET 1.

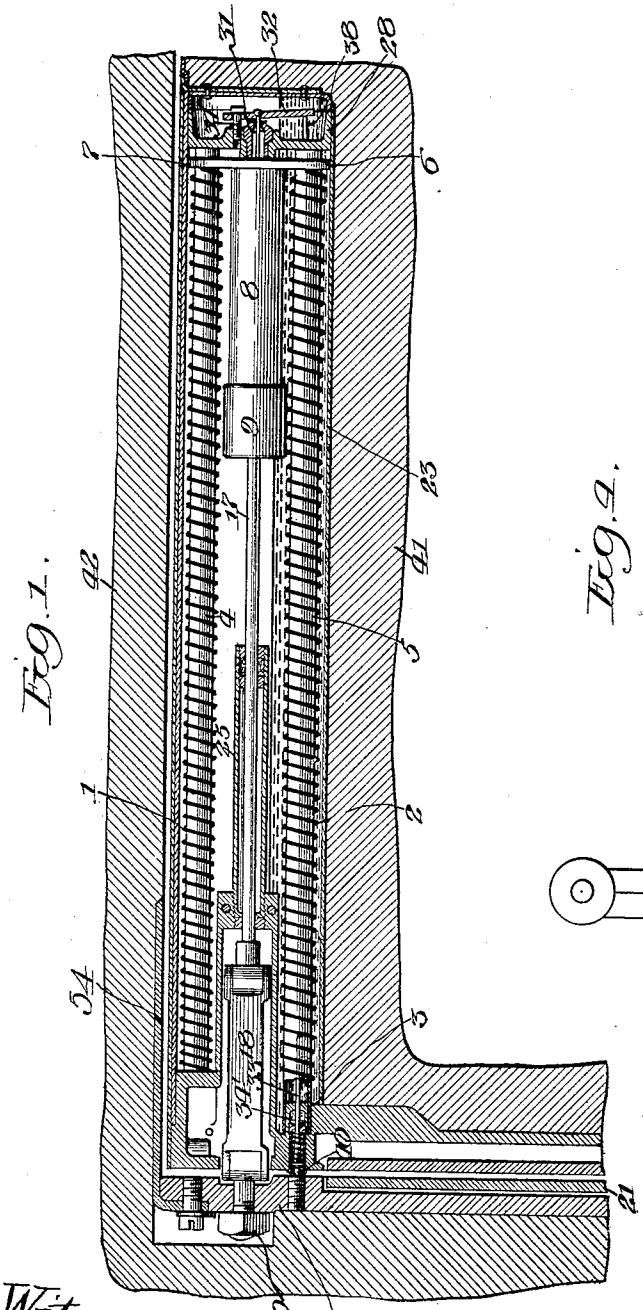

Fig. 1.

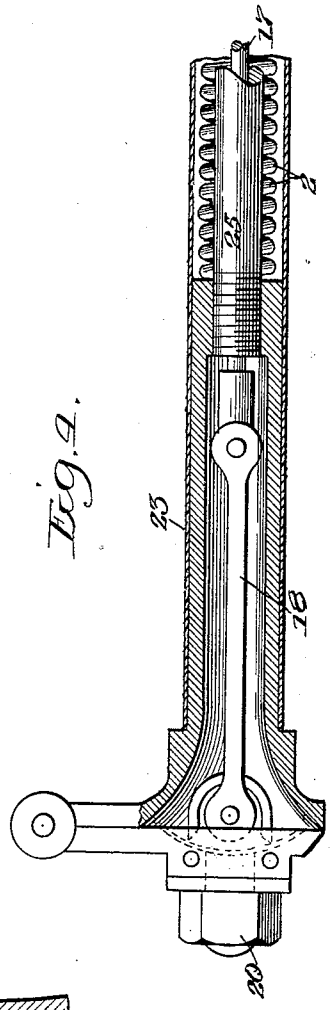

Fig. 4.

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2 SHEETS—SHEET 2.

Fig. 2.

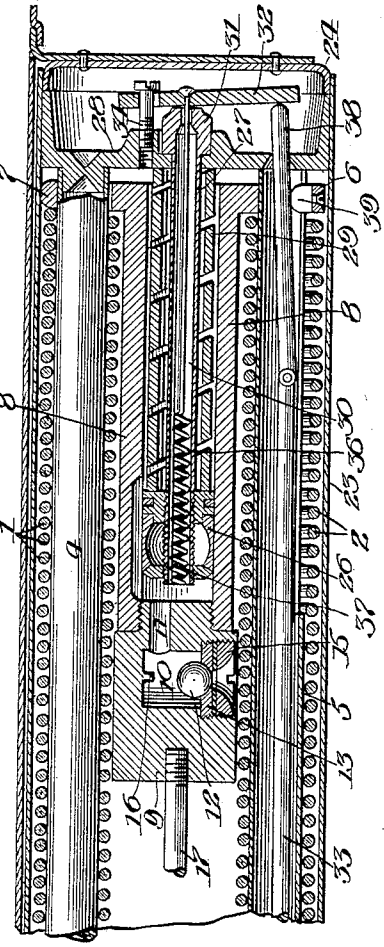
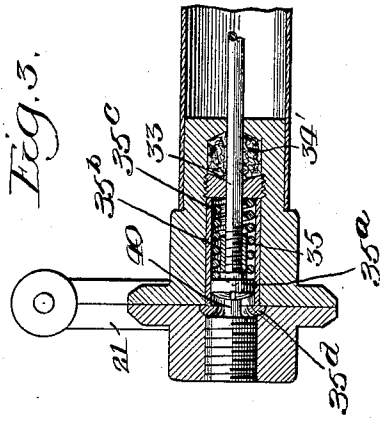


Fig. 3.



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UNITED STATES PATENT OFFICE.

PER ERIK NORDQVIST, OF CHICAGO, ILLINOIS, ASSIGNOR TO CONCEALED DOOR CHECK COMPANY, OF SANTA BARBARA, CALIFORNIA.

DOOR-CHECK.

1,041,853. Specification of Letters Patent. Patented Oct. 22, 1912.

Application filed May 3, 1910. Serial No. 559,209.

To all whom it may concern:

Be it known that I, PER ERIK NORDQVIST, a subject of the King of Sweden, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Door-Checks, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to door checks, and has for its object the provision of improved means whereby the door check is automatically actuated after allowing a door to close slowly up to a position near its closed condition, at which time said means come into operation to permit the said door check to more rapidly close the door, thus to be certain of a complete closure of said door, which might not be the case if the door check tended to close the door more slowly as it approaches its closed position.

In the preferred form of my device I provide a cylinder and a piston, and a valve which permits egress from the cylinder, which valve is controlled by an adjustable bar, which bar acts in connection with means provided upon the door casing, which means engage the bar when the door is almost closed, and thereby actuate the valve mechanism to allow the rapid flow of fluid from the cylinder when the door is nearly closed, thereby to give the door added impetus.

I will explain my invention more in detail by reference to the accompanying drawings illustrating one embodiment thereof, in which—

Figure 1 is a longitudinal sectional view of my improved door check. Fig. 2 is a detailed view of the valve mechanism. Fig. 3 is a detail view of the means provided upon the hinge to actuate the valve-controlling mechanism; and Fig. 4 is a top view of the rear portion of the door check.

My improved door check consists of sets of draw springs 1, 2, which impinge against the abutment 3, and surround two stationary tubes 4 and 5. The opposite ends of the springs press against the ears 6 and 7, provided upon a cylinder 8, which cylinder has a head 9. The head 9 has a chamber 10, which connects by means of a duct 11 with the interior of the cylinder 8. The head 9 is screwed into the cylinder 8 in such manner that when the head is removed the cylinder can be properly bored from its left hand extremity, if so desired. The chamber 10 has a ball valve 12, seated preferably upon a lead seat 13, below which I provide a washer of fiber or similar material, all of which parts forming the valve seat are then held in place by means of the screw-threaded nut 15. From this it will be apparent that the ball valve 12 permits fluid to enter the cylinder at its left hand extremity, but prevents its return through that same opening. A projection 16 prevents the ball from closing the aperture of the duct 11.

The cylinder is connected, by means of the bar 17, with a link 18, which link, by means of a bolt 20, is pivotally fastened to the hinge 21. Suitable packing prevents egress of fluid through the opening, and accommodates the bar 17.

The entire door check is inclosed by a shell 23, which engages a portion of the abutment 3 at one end, and is closed by a cap 24 at the other end, thus to maintain fluid in said door check proper. When the door is opened, the link 18 and arm 17 draw the cylinder 8 to the left, against the action of the draw springs 1 and 2, at the same time permitting liquid or other suitable fluid, which fills the door check up to about the lower edge of the tube 25, to enter the cylinder through the valve 12. The precipitate return of the door, under the actuation of the springs 1 and 2, is then prevented by a piston 26, fastened upon the piston rod 27, which piston rod is loosely mounted in an open head, or bridge, 28. A spring 29 acting against the piston and the head serves to hold the piston in its left-hand position. The piston rod has a longitudinal bore 30, through which the liquid in the cylinder can pass through a nozzle 31, the opening of which nozzle is closed by a valve 32, through the agency of an adjustable valve-actuating rod 33, which holds the valve 32 slightly away from its seat. The action of the draw springs tending to push the cylinder toward the right forces the liquid of the cylinder past the valve 32 in a small quantity, so as to allow the door to close slowly. The valve 32 is held in its place by a screw 34 fastened in the head 28.

The rod 33 extends through a suitable packing 34′ in the abutment 3, and terminates in a threaded end 35 adjustably screwed in a hollow screw 35^a; said screw 35^a being slidably mounted in a sleeve 35^b and normally maintained by a spring 35^c against fixed stops 35^d on said cylinder for firmly supporting the rod 33 in position. A spring 36 holds the valve 32 against its seat, which spring is held in place by a pin 37. The rod 33 has a hinged extremity 38, which serves the purpose of permitting the door to close more slowly as it approaches its closed position. This is due to a projection 39 upon the ear 6, which projection, as the cylinder moves toward the left, elevates the jointed rod 33 and extension 38, so as to press the valve 32 farther away from its seat.

As the door approaches normal position, it will be seen that the projection 39 permits the lowering of the hinge portion of the rod 33, thereby reducing its effective length, and gradually bringing the valve 32 against its seat to make the door close more slowly. The rod 33 and its extremity 38 thus serve a dual purpose, making a permanent adjustment of the action of the valve 32, and at the same time a variable adjustment in the course of each operation.

When the door is nearly closed, it is desirable to provide means for rapid exodus of the liquid, in order to give a sudden jerk to the door to be sure that it closes effectively, and for this purpose, I provide an adjustable projection 40, upon the hinge 21, which adjustable extension engages the bar 33, when the door is normally closed, thereby pushing said bar over in a position to open the valve 32, and thus allowing a largely increased flow of fluid from said cylinder for the purpose described.

It will be understood that the cross-section portion 41 constitutes the door and cross-section 42 constitutes the door casing.

Cross reference is made to co-pending applications Serial Nos. 559207, 559208, 559210, 559211, 559213, and 559214 filed by applicant May 3, 1910, which show general features of construction, shown but not claimed in this application, which is limited to my improved device on the casing for securing an accelerated movement of the door as the latter nears its closed position.

It will of course be understood that all the parts herein described, excepting the hinge, 21, plate 54 and casting 55, are mounted upon the door, the parts which are not mounted upon the door being mounted upon the door casing.

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

1. In a door check and closer, the combination of a cylinder and piston, means for permitting free entrance of a fluid to said cylinder, a shiftable valve for throttling the escape of fluid from said cylinder, an adjustable device for firmly supporting said shiftable valve in any desired position, and means adapted to actuate said adjustable device during closing of the door for shifting said valve to open position.

2. In a door check and closer, the combination of a cylinder and piston, means for permitting free entrance of a fluid to said cylinder, a shiftable valve for throttling the escape of fluid from said cylinder, resilient means tending to maintain said valve in closed position, a fixed stop, an adjustable device confined between said stop and shiftable valve for firmly supporting the latter in any desired position, and means adapted to actuate said adjustable device during closing of the door for shifting said valve to open position.

3. In a door check and closer, the combination of a cylinder and piston, means for permitting free entrance of a fluid to said cylinder, a shiftable valve for throttling the escape of fluid from said cylinder, a fixed stop, an adjustable device engaging said valve, means for yieldingly maintaining said adjustable device against said fixed stop for firmly supporting said shiftable valve, and means adapted to actuate said adjustable device during closing of the door for shifting said valve to open position.

In witness whereof I hereunto subscribe my name this 9th day of March A. D., 1910.

PER ERIK NORDQVIST.

Witnesses:

HAZEL JONES,

A. LYDA JONES.