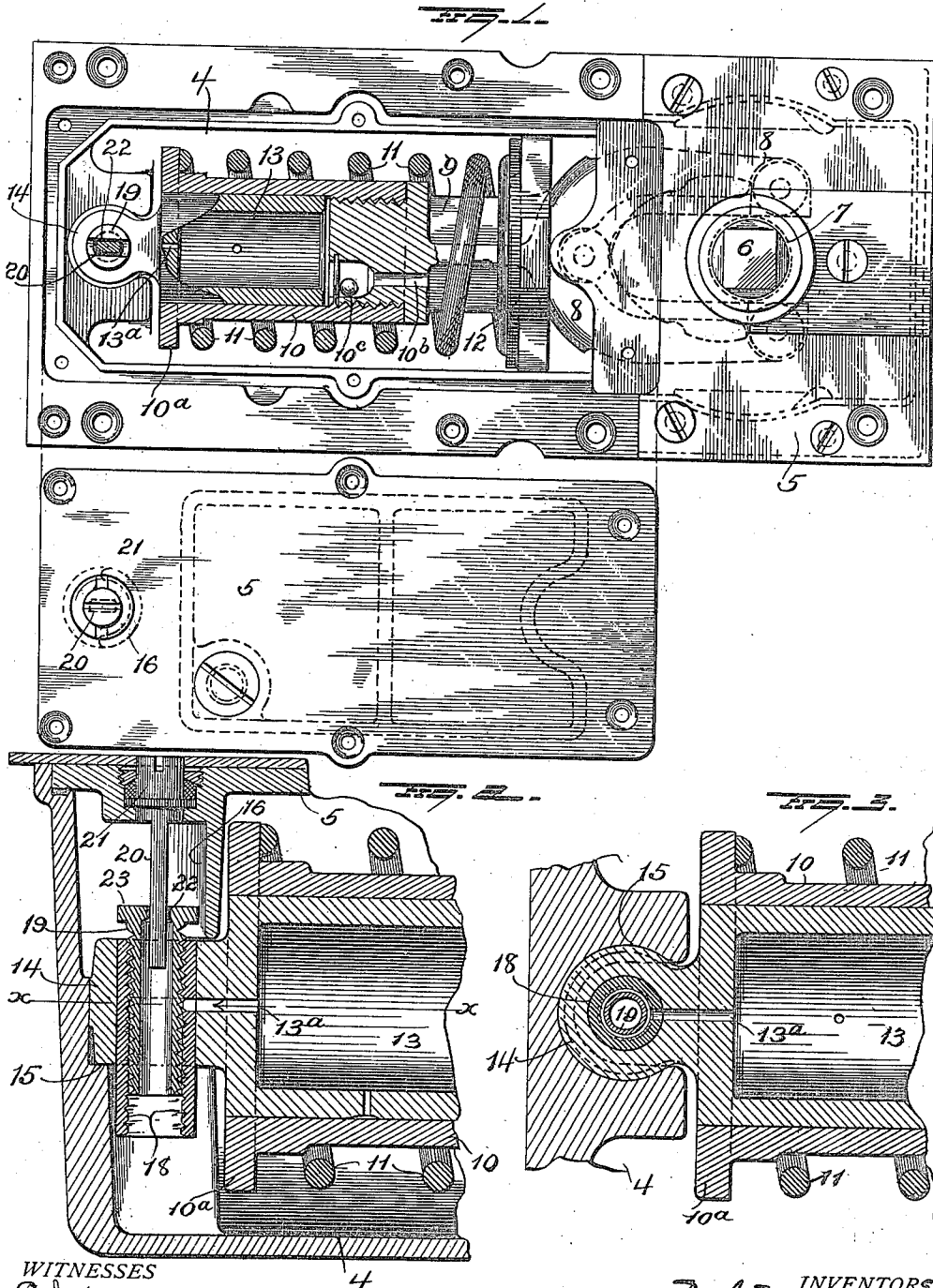


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DOOR CHECK AND CLOSER.
APPLICATION FILED JULY 11, 1916.

1,240,778.

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UNITED STATES PATENT OFFICE.

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Specification of Letters Patent. Patented Sept. 18, 1917.

Application filed July 11, 1916. Serial No. 108,700.

To all whom it may concern:

Be it known that we, ROBERT S. POTTER, of Greenwich, Fairfield county, Connecticut, and PEDER MIKKELSEN, of Stamford, in the county of Fairfield and State of Connecticut, and citizens of the United States, have invented certain new and useful Improvements in Door Checks and Closers; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to improvements in door checks and closers which are set into the floor and constitute a hinge for the lower end of the door, and particularly to that type of check and closer wherein the piston is secured at one end to the casing, and the cylinder, through the action of a lever and its shaft, is pulled away from the piston in the act of opening the door and is pushed up against it by the action of a spring during the closing movement of the door, this latter movement being resisted by a liquid which is forced through a valved opening, as is customary in liquid checks.

The object of this invention is to provide an improved valve for the escape of the liquid from the cylinder during the closing movement of the door, and it consists of the parts and combination of parts as will be more fully explained and pointed out in the claims.

In the accompanying drawings, Figure 1 is a top view partly in section and partly broken away of a combined check and closer embodying our invention the cover plate being removed and shown below said figure; Fig. 2 is an enlarged view in vertical section of the valve mechanism, and Fig. 3 is a view on line $x-x$ of Fig. 2.

4 represents a casing to be embedded in the floor below the door, and closed at its upper side by cover plate 5 secured by screws to laterally projecting flanges at the upper open edge of the casing.

Mounted in the casing 4 and cover 5 adjacent one end of the casing, is the vertical

spindle or shaft 6, the lower end of which is seated in a socket 7 in the bottom of the casing, and is supported near its upper end by a suitable bearing formed in or carried by the cover. The upper end of the spindle 6, which projects above the cover is made angular in cross section and is adapted to enter a correspondingly formed recess in a lever or shoe to be carried by the lower edge of the door.

The spindle or shaft 6 is provided with a cam, preferably of heart shape as shown, and adapted to engage rollers carried by the yoke 8, which is connected with the rod 9 carrying the cylinder 10.

The cylinder is provided at its outer open end with a peripheral flange 10^a which is engaged by one end of the spring 11, the opposite end of said spring bearing against the stop plate 12 through which the rod 9 passes, the said stop plate being restrained by its contact with the casing and cover, against movement toward the shaft 6, hence when the shaft is turned as in opening the door, the spring 11 will be compressed or put under tension and operate to close the door when the latter is released.

The cylinder 10 is mounted and reciprocates on the hollow piston 13, and is provided at its closed end with an inlet port 10^b for the passage of the checking liquid to the interior of the cylinder and piston, this port being closed during the closing movement of the door, by a ball valve 10^c, so that the liquid must, at such time escape through the port 13^a at the rear end of the piston as shown in Fig. 2.

The hollow piston 13 is provided at its rear closed end with a rearwardly extending lug 14, the latter being preferably integral with the piston. The axis of this lug is vertical and the lug has a curved periphery which conforms to the curved recessed seat formed integral with the casing 4 at the rear end of the latter. This recessed seat is open at the top and has a restricted opening at the front for the narrowed neck of the lug 14, the parts being so shaped and of such size as to permit the lug to turn in its bear-

ing, and in this way provide for proper coordination of the piston 13 with its cylinder 10 during the movements of the latter while opening and closing the door.

5 To prevent the lug from rising out of its seat, a projection 16 is formed integral with the cover plate 5, which projection, when the parts are assembled, comes within such distance of the top of the lug as shown, as
10 to prevent any undue vertical movement.

The lug 14 is provided with a centrally located vertical bore, which in the present instance is lined with the bushing 18. The port 13^a in the end of the piston, passes
15 through this bushing and opens into the bore of the latter.

19 is a screw valve, the external threads of which conform as to size and shape with the threads in the bushing above port 13^a,
20 while the threads in the bushing below the port are more or less cut away so as to leave spaces between the threads of the screw and bushing for the escape of the liquid downwardly between the said parts. It is
25 obvious therefore, that when the liquid is forced through port 13^a, as is the case during the closing movement of the door, it will escape downwardly between the threads on the screw and bushing. It is also ob-
30 vious that as the external threaded screw is screwed in to a greater or less depth, the length of the passage through which the liquid must be forced will be longer or shorter, and therefore the time required to
35 force the liquid through will be correspondingly increased or decreased. It will therefore be apparent that by screwing the screw valve 19 more or less, the time required to force the liquid through will be correspond-
40 ingly lengthened or shortened.

An important feature of this construction is that while the time for the closing movement may be regulated, it is not done by varying the size of the escape opening
45 through which the liquid passes, but merely by making such opening longer or shorter and thus increasing or decreasing the friction. The objection to making the liquid escape hole larger or smaller by means of
50 a valve, is that when the hole is small enough to satisfy some conditions, small particles of dirt in the liquid are liable to become clogged therein and thus interfere, if not destroy the operation of the check,
55 whereas with our improvement if the opening be throttled down to its limit, the opening through which the liquid must pass will be as large as ever but considerably longer.

A minor advantage is that when the liquid 60 is forced through a small hole with considerable force, a whistling sound is produced, which in this construction is obviated.

The screw valve 19 is adjusted to lengthen

or shorten the passage through which the 65 escaping liquid must pass, by the stem 20, the head 21 of which is seated, and packed in a recessed seat in the cover plate 5, the said seat being in the vertical plane of the screw valve 19. The shank of this stem 70 20 is preferably rectangular in cross section and passes through an oblong slot 22 in the head 23 of the screw valve 19, the slot 22 being somewhat wider than the thickness of the shank of stem 20, so as to permit the 75 lug 14 and screw 19 to turn with the piston 13 during the opening and closing movements of the door, without turning said stem. The screw valve 19 is preferably made hollow as shown and by turning the 80 stem 20, the screw valve will be moved up or down on the stem, the head 21 of the rod being preferably provided with a slot for a driver by which it may be turned.

We have shown the bore of the lug lined 85 with a bushing, and while this construction is preferable, it is not necessary, as the internal threads for the screw can be cut in the lug 14 or any other part of the check where it could be advantageously employed. 90 Again, while we have shown the valve as applied to a well known type of door check and closer, we do not confine its application to such type, or to any other particular type, but claim it broadly for use on all liquid 95 checks where control of the escaping liquid is necessary.

Having fully described our invention what we claim as new and desire to secure by Letters-Patent, is:—

1. A valve for controlling the escape of liquid consisting of an internally threaded member having a port and an externally threaded member within said other member and passing the port therein, the threads on 105 one of said members being partly cut away in that portion of the valve through which the liquid must pass in escaping, the externally threaded member being adjustable in the other member whereby the length of 110 the threaded section through which the liquid must flow in escaping can be lengthened or shortened.

2. A valve consisting of a member having a bore and a port leading to the bore in- 115 termediate the ends of the latter, the said bore being threaded at both sides of the port, the threads being partly cut away on that portion of the bore through which the liquid must pass in escaping, an externally 120 threaded member adapted to adjust the length of the thread through which the liquid must flow in escaping, and means for actuating the externally threaded member.

3. A valve consisting of a member having 125 a bore, a bushing within said bore, a port in said member and communicating with the bore of the bushing, the said bore of the

bushing being threaded, the threads in that portion through which the liquid must pass in escaping being partly cut away, and an externally threaded member adapted to adjust the length of the thread through which the liquid must flow in escaping.

In testimony whereof, we have signed

this specification in the presence of two subscribing witnesses.

ROBERT S. POTTER.
PEDER MIKKELSEN.

Witnesses:

JOHN W. SCOTFIELD,
WILLIAM S. BALKHAM.