

G. W. YEAGER & C. J. LAMM.
LIQUID DOOR CHECK.
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1,057,200.

Patented Mar. 25, 1913.

Fig. 2.

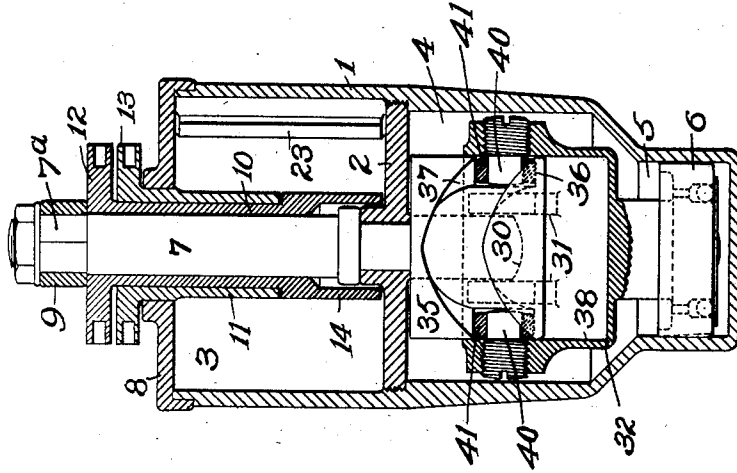
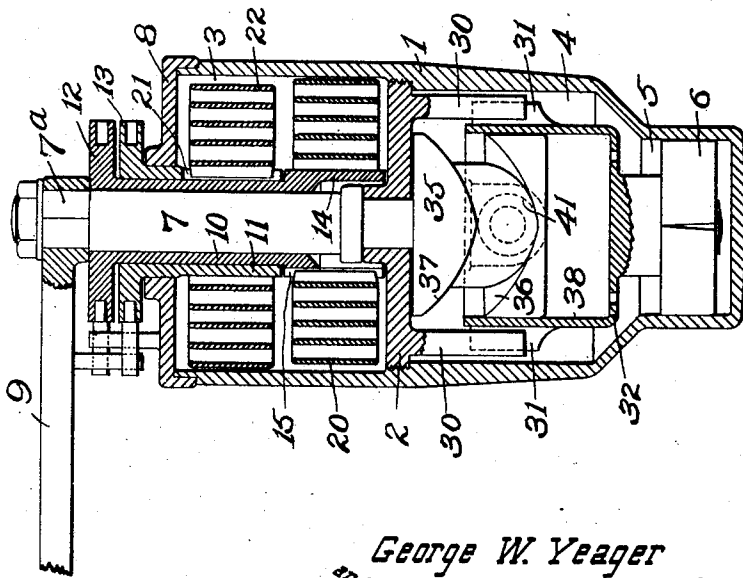


Fig. 1.



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LIQUID DOOR-CHECK.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, GEORGE W. YEAGER and CALVIN J. LAMM, both citizens of the United States, and residents of the city of Reading, in the county of Berks and State of Pennsylvania, have invented certain new and useful Improvements in Liquid Door-Checks, of which the following is a specification.

Our invention relates to liquid door checks, and the main object is to provide simple and satisfactory means for so guiding the liquid-controlled piston and for operating the same by the spring-controlled spindle, as to avoid objectionable wear upon the piston, and also to permit of readily using the same on either a right or left hand door or on a double-acting door.

The invention is fully described in connection with the accompanying drawings and the novel features thereof are particularly pointed out in the claims.

Figure 1 is a longitudinal section of a check embodying the invention. Fig. 2 is a similar view taken at right angles to Fig. 1.

The cylindrical casing 1, is divided by a partition 2, into an upper spring chamber 3, and a liquid chamber 4; the lower portion 5 of the latter having the reciprocating piston 6 fitted thereto.

The operating spindle 7, which passes through the spring chamber 3 and its cap 8, is journaled in the partition 2, and has secured to its angular upper end 7^a a link connection 9 as usual. Mounted upon the spindle, as shown, are inner and outer sleeves 10 and 11, each provided with exterior toothed heads, 12 and 13 respectively. The enlarged lower portion 14 of the inner sleeve 10, which extends below the outer sleeve 11, is provided with a vertical slot 15, in which is engaged the inner end of a flat spiral spring 20; and the outer sleeve 11 is also provided with a slot 21, in which is engaged the inner end of a similar spring 22. The outer ends of said springs are in contact with opposite sides of a casing rib 23, the springs being arranged reversely so as to operate one as a right hand spring and the other as a left hand spring, with the spindle 7 controlled by one or the other according as the swing of the link 9 operates upon the toothed head 12 of the inner sleeve 10, or the toothed head 13 of the outer sleeve 11 to wind up the respective springs.

The partition 2, which is tightly secured in the casing as usual, carries rigidly depending guide-bars 30, arranged on opposite sides of the spindle 7; and these guides are loosely fitted to ways 31 formed therefor on the exterior wall of a top extension 32 of the piston, so as to guide the latter in its reciprocating movement and prevent turning movement thereof.

The reciprocating piston movement is directly effected by rotation of the spring-controlled spindle 7; this being accomplished, as shown, by providing the lower end of the spindle with a cylindrical head 35 which is exteriorly formed a double-cam-groove having reversely inclined faces 36 and 37 on each side of the spindle axis. This cam-grooved spindle head 35, is loosely fitted in a circular recess or cupping 38 of the top extension 32 of the piston; and the cam groove is engaged by the inner ends of oppositely arranged wall screws 40, 40 adjustably secured in the wall of said cupped extension, said inner ends carrying anti-friction rollers 41, 41, as indicated, to insure free movement in the cam groove.

The vertical movement of the piston is positively guided by the depending guide bars 30 of the partition 2, which also prevent any turning action of the piston. The action of the rotating spindle upon the piston is so balanced upon opposite sides of the axis as to avoid any tilting tendency, and thus prevent side strains and resulting unequal wear which would soon cause leakage and unsatisfactory operation. Owing to the double-cam arrangement described the piston is similarly reciprocated by a to-and-fro movement of the door either to the right or left.

Each upward movement of the piston takes place during the opening of the door and the winding-up of one or other of the springs 20 or 22; and the liquid in the chamber 4, during this movement, is freely passed through the usual valves in the piston head 6 to the lower portion 5. And each lowering movement of the piston takes place during the closing of the door by the unwinding of the spring, such closing action being checked by the usual restricted flow of liquid from the chamber 5 to chamber 4.

It will thus be seen that our improved check may be used for either a right or left hand door, or for a double-swinging door, in the latter case the piston 6 making an up-

and-down movement for the swing of the door on each side of the central position, and the liquid acting as a check each time the door approaches this central position.

5 By the arrangement of parts herein described a double cushioning effect is had—*i. e.*, that when the piston and cup-shaped extension move vertically in either direction the liquid contained within the casing is operated upon at two distinct points, viz: be-
10 tween the piston and the lower end of the casing and between the bottom of the cup-shaped extension and the lower side of the head carried by the spindle. For this reason the check is especially adapted to be used on
15 very heavy doors and at the same time the parts are so compactly assembled as not to interfere with the movement of the door or present an unsightly appearance or occupy
20 excessive space.

The preferred construction shown may be modified without departing from the invention as specifically pointed out in the claims.

What we claim is:—

25 1. A door check comprising a casing, a piston fitting snugly in the lower portion of the casing and adapted to slide therein and having an opening passing through the same, a cup shaped extension carried by the
30 piston, means for restraining the piston and extension against rotation, members carried by the extension and projecting into the interior thereof, a spring controlled spindle journaled in the casing and having at its
35 lower end a head which is slidably received within the cup shaped extension and along which the said extension is adapted to move, said head having a cam groove, which is en-

tered by the inwardly disposed members carried by the cup extension.

2. A door check comprising a casing, a partition detachably mounted therein and having depending guides, a piston fitting snugly in the lower portion of the casing and adapted to slide therein, said piston hav-
45 ing openings passing through the same, a cup shaped extension carried by the piston and having lugs received by the guides, a spring controlled spindle journaled in the casing and partition and carrying at its
50 lower end a head located below the partition, said head having a cam groove, and inwardly disposed projections carried by the cup shaped extension received within the
55 said cam groove.

3. A door check comprising a casing, having a reduced lower end portion, a piston snugly fitting in the reduced end portion of the casing and adapted to slide therein, said
60 piston having an opening passing through the same, a cup shaped extension carried by the piston and spaced from the inner walls of the casing, means for restraining the piston and extension against rotation, a spindle
65 journaled in the casing and carrying at its lower end a head provided with a cam groove and inwardly disposed projections carried by the cup shaped extension and received within the groove.

In testimony whereof, we affix our signatures, in the presence of two witnesses.

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CALVIN J. LAMM.

Witnesses:

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