No. 810,411.

PATENTED JAN. 23, 1906.

W. K. HENRY.

DOOR CHECK AND CLOSER.

APPLICATION FILED MAY 6, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

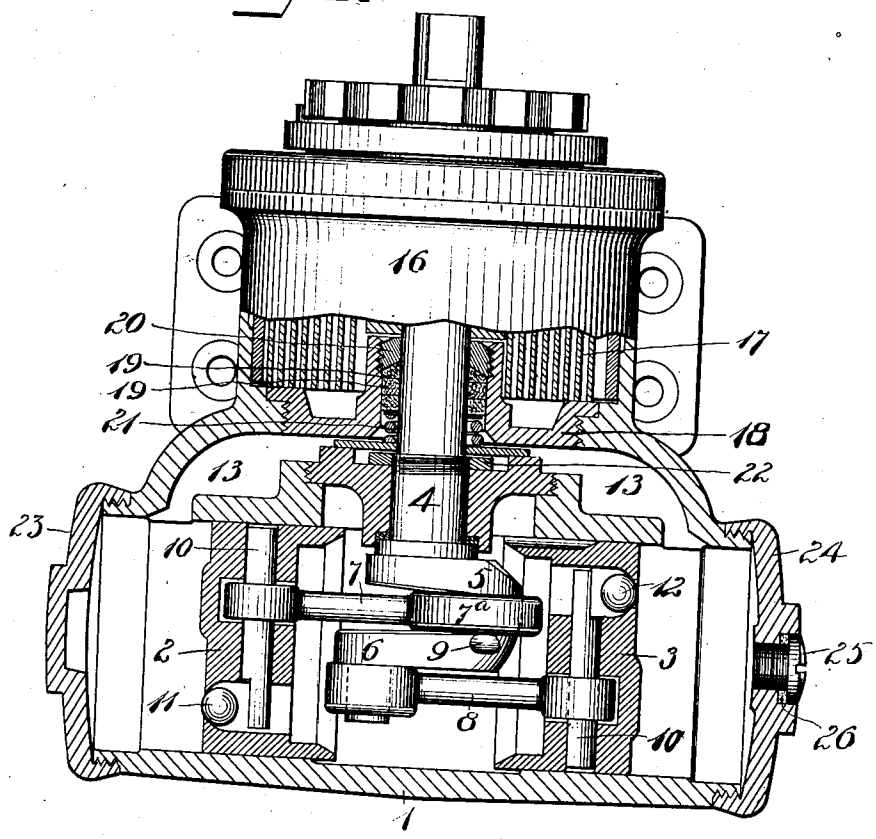


Fig. 3.

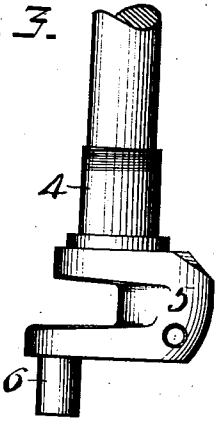


Fig. 6.

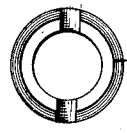


Fig. 7.

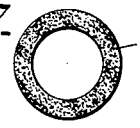
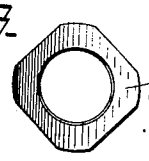


Fig. 8.



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2 SHEETS—SHEET 2.

Fig. 2.

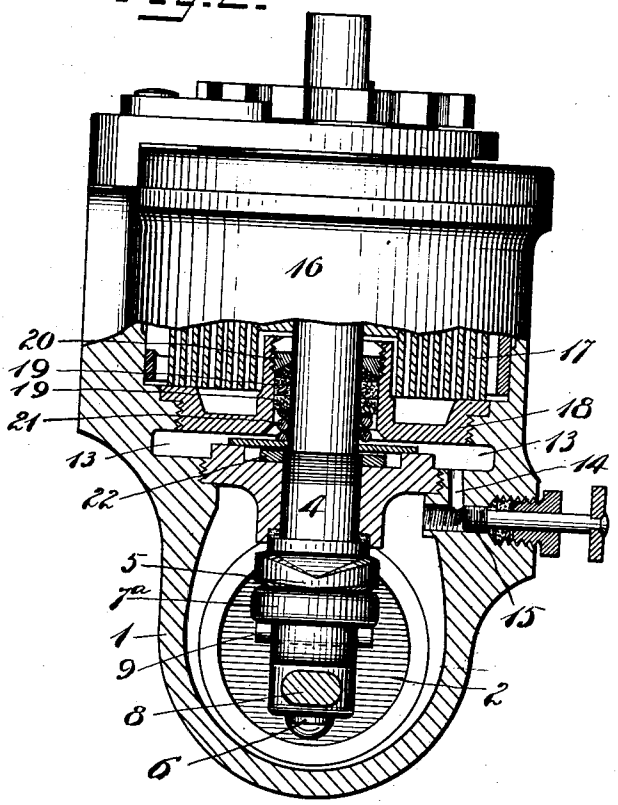


Fig. 4.

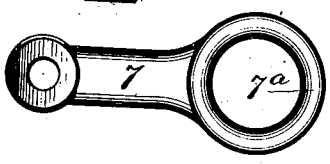


Fig. 5.



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DOOR CHECK AND CLOSER.

No. 810,411. Specification of Letters Patent. Patented Jan. 23, 1906.

Application filed May 6, 1905. Serial No. 259,081.

To all whom it may concern:

Be it known that I, WILLIAM K. HENRY, a citizen of the United States, residing at New Britain, Hartford county, Connecticut, have invented certain new and useful Improvements in Door Checks and Closers, of which the following is a full, clear, and exact description.

My invention relates to improvements in door-checks, and the same is of particular advantage when employed in connection with a door-closer, for example, such as set forth in my application, Serial No. 259,082, filed May 6, 1905.

The main object of my invention is to provide an effective liquid door-check which may be easily assembled and which is of such construction that it may be used without changing the internal mechanism upon either a right or a left hand door.

In the accompanying drawings, Figure 1 is a longitudinal section of the door-check and a part of the closer, the balance of the latter being shown in elevation. Fig. 2 is a cross-section of the check-casing with one of the pistons removed. In this view a cross-section of the closer mechanism is partly shown, while the balance is shown in elevation. Fig. 3 is a view of the lower part of the spindle with the crank thereon. Fig. 4 is a plan view of one of the connecting-rods. Fig. 5 is a plan view of another connecting-rod. Fig. 6 is a plan view of the packing-gland. Fig. 7 is a plan view of the packing. Fig. 8 is a plan view of the crank-supporting nut.

1 designates a cylinder constituting the liquid-chamber. 2 3 designate pistons arranged therein.

4 designates the spindle having suitable bearings. The lower part of the spindle is furnished with a crank portion furnishing the two opposite cranks 5 and 6, arranged one above the other so as to receive the connecting-rods 7 8, respectively. Both cranks 5 6 are made integral, and the construction is such that both connecting-rods may be applied thereto quickly and easily. This is accomplished by constructing the crank-pin of crank 5 of considerably greater diameter than the crank 6 and its crank-pin, so that the enlarged strap portion 7^a of the connecting-rod 7 may be easily passed over the crank 6 and the adjacent support and then slipped into place on the pin of crank 5. The diameter of the strap 7^a is large enough to slip freely over any portion of the lower crank and crank-pin, and the assembling of the cranks and the strap ends of the connecting-rods is effected before the spindle-bearings are attached to the case, at which time if the heads of the cylinder 1 are assembled the various parts may be turned freely so as to effect said connection.

9 designates a cotter-pin or other suitable device which may be secured to the crank 5 after the connecting-rod 7 is in place to prevent it from dropping down or tilting out of alinement.

10 10 designate the wrist-pins.

11 12 designate check-valves for the pistons 2 3, respectively.

Around the cylinder from end to end is a by-pass 13. 14 designates a communicating passage from the space between the pistons to said by-pass 13. (See Fig. 2.) 15 designates a valve whereby the size of this communicating passage 14 may be varied at will. The pistons 2 3 are shown in their normal inactive position. When the door is opened, the spindle 4 is turned, and the pistons 2 3 are moved away from each other and toward the opposite ends of the cylinder 1. During this movement the liquid freely passes the check-valves 11 12. When, however, the door starts to close, the liquid between the pistons is prevented from flowing through the passages in the pistons, since the check-valves 11 12 automatically close said passages. It is then necessary for the liquid to flow through the communicating passage 14 into the by-pass 13 and thence to the cylinder ends. By this means the door may be opened freely, but is checked as it closes.

I need not describe the closing mechanism in detail, since that is set forth in my above-referred-to application. Suffice it to say that 16 is a casing affording a spring-chamber within the same.

17 designates the spring, the same being suitably connected to the spindle 4. The spring-chamber is closed off from the liquid-chamber by a partition 18, through which the spindle 4 passes. Between the walls of the partition 18 and the spindle are packing-washers 19 19, of suitable material, held in place by a gland 20, screw-threaded into a sleeve-like extension on said partition 18. Under-

neath the packing-washers 19 may be a spring 21. The packing-washers 19 are caused to snugly fit against the side walls by the pressure of the spring 21 and the restraining influence of the gland 20, and thus prevent the leakage of oil.

22 designates a nut screw-threaded on the spindle 4 and arranged to draw it up into proper position preparatory to assembling the parts located above the check.

From the foregoing it will be seen that the cranks 5 6 being out of line will receive the connecting-rods in such manner that they will not interfere in crossing the center, no matter which way the spindle 4 is turned. The connecting-rods may be made integrally, it being unnecessary to open the ring 7^a at the end of the upper rod 7 when the parts are assembled. It is also possible to assemble these parts without dismembering the crank. With a construction other than that set forth herein it would be impossible to connect the upper rod 7 with the crank 5 unless either the ring 7^a were split or the crank dismemberable.

23 24 designate removable caps for the ends of the cylinder 1. One of these caps—for example, 24—may have an opening therein which may be closed by a screw-plug 25. 26 is a packing-washer for the screw-plug 25. From the foregoing it will be apparent that the check may be quickly assembled before liquid is admitted. By removing the plug 25 the liquid may be readily introduced or removed at any time. This, of course, is of particular advantage when the check is originally assembled. The advantage of employing a relatively small opening for the admission or removal of the liquid is that the danger of leakage is substantially reduced. Furthermore, it permits the caps 23 24 to be secured to the cylinder ends with a suitable cement or other packing material, which renders the same absolutely liquid-tight, and it is necessary in introducing or removing the liquid from the cylinder to break these joints. The admission-port closed by the plug 25 is so small relatively to the size of the cap that it is a very easy matter to effectively pack the same and render it liquid-tight by the use of a small packing-washer.

What I claim is—

1. In a door-check, a cylinder, a spindle having two cranks at its lower end, said cranks being arranged oppositely and in different planes, the lowermost crank being free-ended, the diameter of the crank-pin nearest the spindle being substantially greater than the diameter of the other crank-pin and crank, pistons, connecting-rods between said pistons and said crank-pins, the strap end of one of said connecting-rods being of sufficient diameter to freely pass over one of said crank-pins and crank-arms to engage the other crank-pin.

2. In combination, a cylinder, two pistons therein, a spindle having two cranks, said cranks being arranged oppositely and in different planes, connecting-rods having strap ends, said rods adapted to said cranks and arranged between said cranks and said pistons, the strap-bearings of the crank-pins of said cranks corresponding respectively to said straps, one of said connecting-rod straps being of greater diameter than the other to slip over one of said crank-pins and cranks and properly engage the other crank, the closer mechanism including spring-chamber and spring and a liquid-tight partition between said cylinder and said spring-chamber.

3. In a door-check, a cylinder, two pistons, a spindle having two cranks and crank-pin, oppositely arranged and in different planes, the diameter of the upper crank-pin being greater than the diameter of the other pin and crank, and connecting-rods having strap ends between said crank-pins and said pistons, the strap end of one of said rods being sufficiently large to slip over one of said cranks and crank-pin and fit the other pin.

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Witnesses:
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