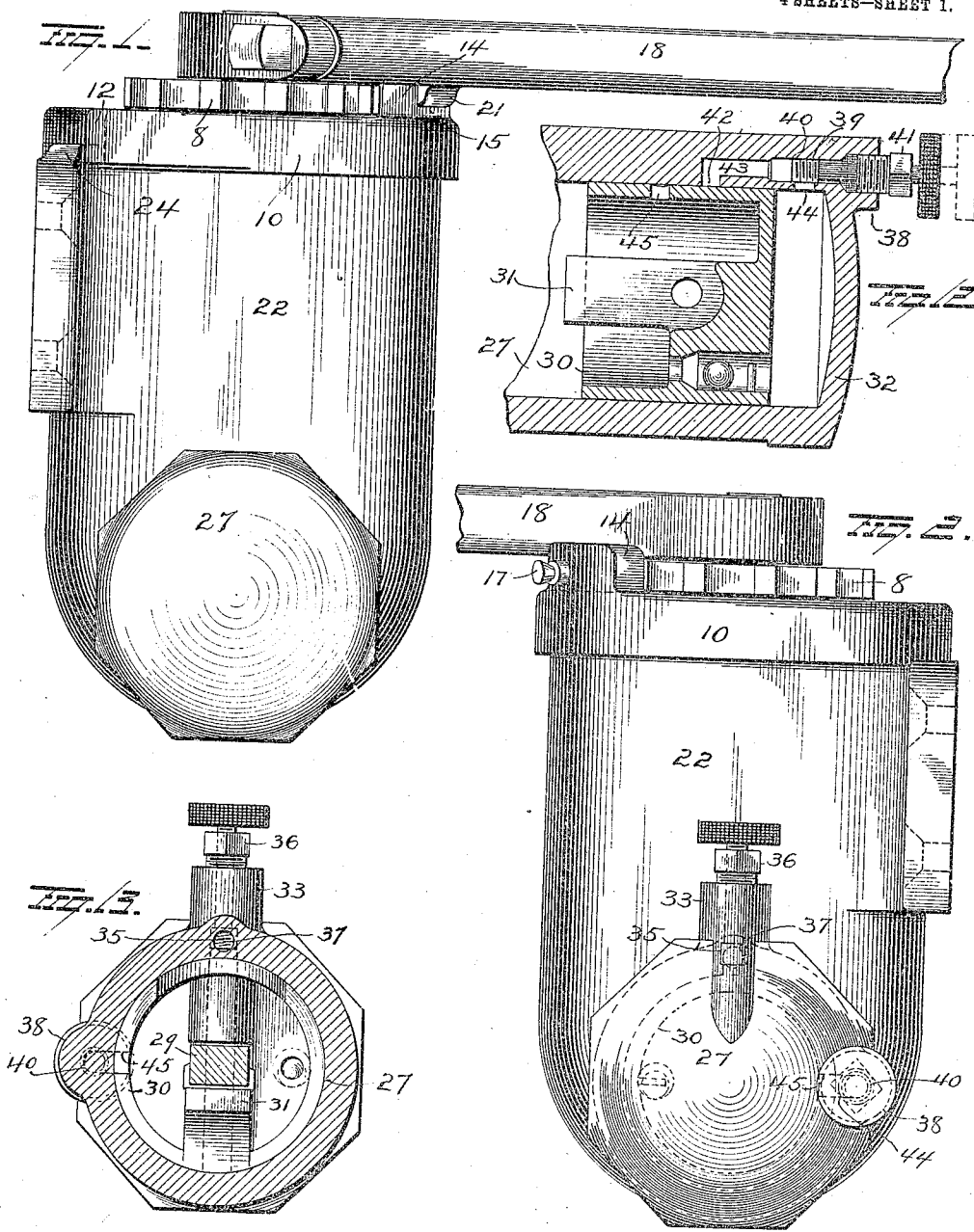


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956,275.

Patented Apr. 26, 1910.
 4 SHEETS—SHEET 1.



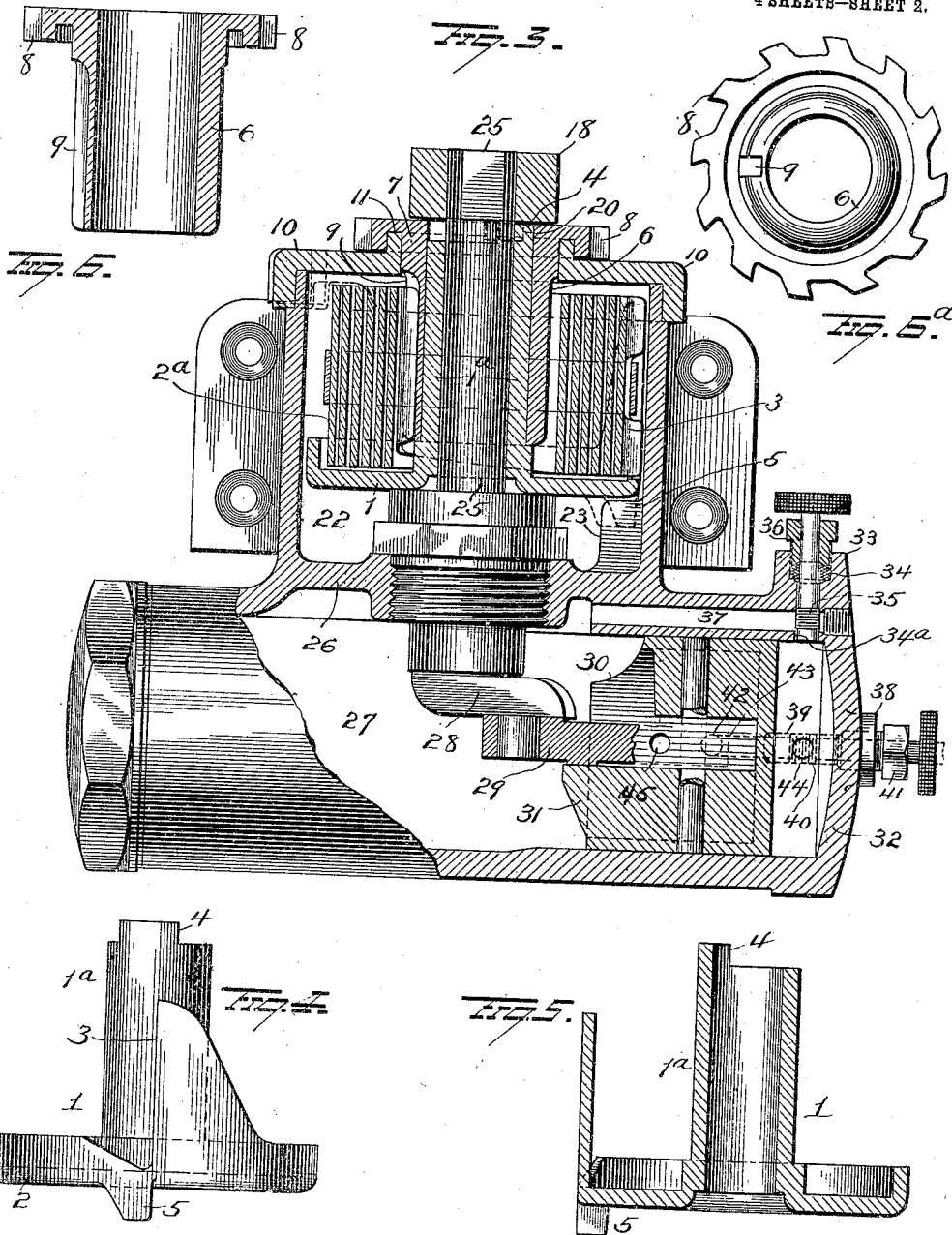
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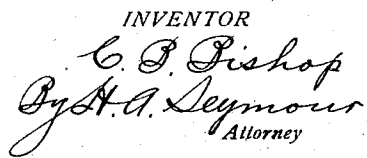


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4 SHEETS—SHEET 3.

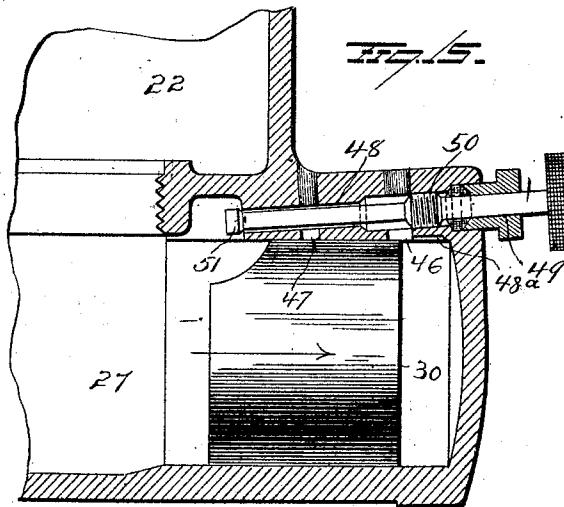
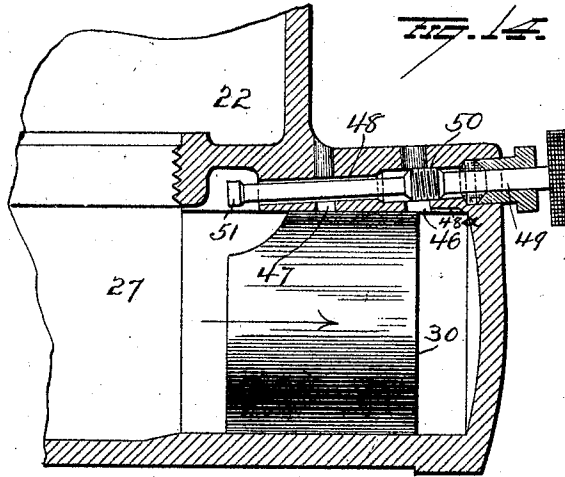


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UNITED STATES PATENT OFFICE.

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DOOR CLOSER AND CHECK.

956,275.

Specification of Letters Patent.

Patented Apr. 26, 1910.

Application filed November 5, 1908. Serial No. 461,219.

To all whom it may concern:

Be it known that I, CHARLES B. BISHOP, of Stamford, in the county of Fairfield and State of Connecticut, have invented certain
5 new and useful Improvements in Door Closers and Checks; and I 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
10 it appertains to make and use the same.

My invention relates to an improvement in door closer and check, the object being to provide means permanently in connection with both ends of the closing spring, where-
15 by the device may be applied to either a right or left hand door without any change or readjustment of any of its parts.

A further object is to provide a door closer with checking means adapted to be
20 adjusted for either quick or quiet closing action at the finish of the closing movement of the door, the construction being such that when once adjusted for either quiet or quick closing action, the check can be applied to
25 either right or left hand doors without any change in such adjustment.

With these ends in view my invention consists in the combination of parts and in details of construction as will be more fully
30 explained and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in end elevation of my improved combined closer and check. Fig. 2 is a view of the opposite end showing the location of
35 the check valves relative to the piston. Fig. 3 is a view in longitudinal vertical section of the device. Fig. 4 is a view of the spring carrier. Fig. 5 is a view in section of same. Fig. 6 is a view in longitudinal section of
40 the ratchet sleeve. Fig. 6^a is a view in plan of same. Fig. 7 is a view in plan of the device. Fig. 8 a view in edge elevation of the cap. Figs. 9, 10 and 11 are views of the lever arm. Fig. 12 is a view in horizontal
45 section through the piston and a portion of the cylinder. Fig. 13 is a view in vertical transverse section through the cylinder and piston, and Figs. 14 and 15 are views in sections through the cylinder, showing a
50 modified form of checking valve.

The spring carrier 1 comprises the sleeve 1^a, and flange 2 at lower end of the sleeve, on which the spring 2^a is supported. This flange is provided with an upturned edge
55 having an integral upwardly projecting ex-

tension, the straight edge 3 of which engages the outer hooked end of the spring 2^a, to wind the latter up from its outer end, and hold it against movement when wound up from its inner end, while the inner hooked
60 end of the spring engages the groove 9 in the ratchet sleeve 6 which loosely embraces the sleeve 1^a of the spring carrier and is free to turn thereon, and is provided at its upper end with a ratchet 8 engaged by the longi-
65 tudinally sliding pin or pawl 17 mounted in lug 14 on cap 10.

The sleeve 1^a of the spring carrier 1, is provided at its upper end with a lug 4 which rests in a plane above the cap 10, and in a
70 position to be engaged by the downwardly projecting lug 20 on the main lever-arm 18, and be turned thereby when the lever arm 18 is turned to the left, and is also provided on its flange 2, at the outer edge of the lat-
75 ter, with the depending lug 5, engaging the lug 23 integral with the spring casing or chamber 22, which lug prevents the carrier 1 from turning when the device is applied
80 to a right hand door.

Sleeve 6 encircles the sleeve 1^a of the carrier, and is provided as previously explained, with a ratchet 8, preferably integral therewith, the teeth of which are engaged by the pin 17, longitudinally movable
85 in the projection 14 on the cap 10. This cap is loosely mounted on the upper open end of the spring casing 22, and is provided centrally with a flanged bearing 11 for the upper end 7 of the sleeve 6, the under side
90 of the ratchet 8 being recessed to receive the flange 11. This cap 10 is provided at its periphery with a laterally projecting lug 12, having a face 13 at right angles to the plane of rotation of the cap, but radially
95 to it, which face 13 is adapted to engage a lug 24 on the spring casing 22 and prevent rotation of the cap 10 in one direction. The lug 14 projecting upwardly from the top of the cap at one edge of the latter, carries
100 the sliding ratchet pin 17, and is provided with an inclined or tangential face 15 adapted to engage a depending lug 21 on the lower face of the main lever arm 18. The pin 17 in the lug 14 engages a tooth 8 of
105 the ratchet sleeve 6, and locks the cap to the sleeve, thus causing them to move in unison when engaged by the lug 21 on the lever arm 18. The spindle 25 passes through the sleeve 1^a, through a stuffing box in the parti- 110

tion 26 between the spring chamber 22 and the piston chamber 27, and is provided at its lower end with a crank 28 to which the piston link 29 is connected. The lever arm 18 is secured to the upper end of the spindle 25, with its lug 20 in a position to engage the lug 4 on the upper end of sleeve 1^a, and its lug 21 in a position to make contact with the inclined or beveled face 15 of the cap 10.

When the check is applied to a left hand door, the opening of the door causes the lug 20 on the lever arm 18, to move into contact with the upwardly projecting lug 4 on the upper end of sleeve 1^a of carrier 1, and as the cap 10 is held from rotating by the engagement of the lug 12 thereon with the lug 24 on the spring casing, and the ratchet 8 and its connected sleeve 6 held against turning by the pin 17, the movement of the lever arm rotates spring carrier sleeve 1^a, and thus winds up the spring from the outer end of the latter. If the device be applied to a right hand door, the movement of the lever arm will be toward the lug 14 on the cap 10, and as the cap and ratchet sleeve 6 are locked together by the pin 17, it follows that the sleeve 6 will be turned, thus winding up the spring from the inner end, the carrier 1, being held against movement, by the engagement of lug 5 on the carrier, with the shoulder 23 in the spring casing 22. It will therefore be seen, that the device may be applied to a right or left hand door and operate without any change whatsoever in the parts or adjustment of the parts, other than the movements of the lever arm and cap necessary to carry them into contact with their abutting lugs or shoulders. It will also be seen that when applied to a left hand door, the spring will be compressed from the end of its outer coil, and when applied to a right hand door will be compressed from the end of its inner coil.

The mechanism for checking the liquid, to provide for quick or silent closing is shown in Figs. 3—12—13—14— and 15. The piston 30 is mounted to be reciprocated in the chamber 27, and is connected to the crank 28 by the link 29. The piston is hollow and open at its end adjacent the crank, and is provided internally with the integral shelf or support 31, on which the link 29 rests, and which prevents any tendency of the link to sag due to wear on the parts. The piston is provided in its head or closed end, with an opening and a ball valve therein, which latter operates to permit the liquid in chamber 27 to pass freely into the space between the head of the piston and the adjacent end of the piston chamber or cylinder during the opening movement of the door, but which closes and prevents the passage of the liquid through the piston during the closing movement of the door. The cyl-

inder or chamber 27 is provided centrally adjacent to the head 32 with the upwardly projecting lug 33, having an internally threaded hole 34 adapted to receive the valve 35. This hole 34 is enlarged at its upper end to receive the packing nut 36, and communicates near its lower end with the conduit 37 which extends rearwardly through the wall of cylinder 27 and communicates with the interior thereof behind the piston 30.

Projecting from the head 32 of cylinder 27 at one side thereof, as shown in Figs. 2, 12 and 13, is a lug 38 having an internally threaded hole 39 for the valve 40. This hole 39 is enlarged and threaded at its outer end for the reception of the packing nut 41, and communicates with the conduit 43. This conduit communicates with the valve port 44 in the piston and port 42 leading into the cylinder 27. When it is desired to adjust the check for silent closing, the valve 40 is moved to its position to close port 44 as shown in full lines in Fig. 12, and valve 35 is adjusted to open the port 34^a so as to permit the liquid to pass into the conduit 37 and escape into the cylinder 27 in rear of the piston. By regulating the size of the opening between port 34^a and conduit 37, the movement of the piston can be regulated to a nicety. The movement, is, however, after adjustment of the valve always uniform and the door moves to its closing position without noise or any acceleration of speed at the final closing. When it is desired to have a quick closing action, valve 35 should be partly closed, and valve 40 opened. This permits the liquid in front of piston to pass into port 44, through conduit 43 to port 42. When the piston has moved to a position where the port 45 therein registers with the port 42, the liquid in front of the piston will be suddenly released thus permitting the spring to close the door with a quick movement.

In the construction shown in Figs. 14 and 15 I have provided a single valve for effecting the silent or sudden closing movement. In this form the cylinder 27 is provided with two ports 46 and 47 communicating with the conduit 48 terminating in rear of the piston. The port 47 is so located as to be closed by the piston, except when the latter is approaching the end of its closing movement, while the port 46 is always in communication with the cylinder either directly or through the groove 48^a. The valve stem 49 is mounted to move in the conduit 48 and is provided with the valves 50 and 51, the former of which is externally threaded to engage threads in the walls of the conduit, while the latter rests just outside the inner end of the conduit. When it is desired to have the door close silently and with a regular and uniform movement, the

valve stem and its valves are adjusted to the position shown in Fig. 14. In this adjustment port 46 is nearly closed thus restricting the passage of the liquid into the conduit, while the valve 51 is removed from the inner orifice of the conduit so as to permit of the ready and unobstructed egress of all liquid passing through the conduit. When a quick closing action is desired, the valve stem should be moved outwardly to the position shown in Fig. 15. When in this position, valve 50 is removed from port 46 thus permitting free ingress of the liquid into conduit 48, while valve 51 partly obstructs the flow of the liquid through the inner end of conduit, thus permitting of the gradual movement of the piston and the door, until the cut away portion of the piston uncovers port 47. This releases the liquid in the conduit and also that confined between the head of the piston and end of the cylinder, thus permitting the spring to close the door with a quick action. These valve mechanisms can be adjusted for either quick or silent action and when once adjusted are ready for use with the closer when applied to either a right or left hand door.

With this improved closer and check, after the parts have been once assembled, the device can be applied to any door without any change or adjustments whatsoever, and after its application, the closing action can be changed from quick to silent or vice versa by a simple adjustment of the valves as explained.

It is evident that many slight changes might be made in the relative arrangement of the parts shown and described without departing from the spirit and scope of my invention hence I would have it understood that I do not wish to confine myself to the exact construction and arrangement of parts shown and described, but

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

1. In a door closer, the combination with a spring chamber having an internal shoulder and an external shoulder and a cap mounted to rotate and having a shoulder to engage the external shoulder on the casing, of a spring carrier located within the casing and provided with a shoulder to engage the internal shoulder in the spring chamber and also provided with means for engagement with the lever arm, a sleeve concentric with the axis of the spring carrier, a spring connected at its outer end to the carrier and at its inner end to said sleeve, means connecting the sleeve and cap whereby they rotate in unison and a lever arm having means for engaging the carrier, when turned in one direction and having means engaging the cap when turned in the opposite direction.

2. In a door closer, the combination with

a spring chamber, a spring therein of a spring carrier having means at its outer edge for engaging the outer end of the spring, and a centrally located sleeve, a ratchet sleeve embracing the sleeve on the carrier and connected to the inner end of the spring, means including stops on the carrier and casing for preventing the rotation of the carrier in one direction, means including lugs on the cap and casing for preventing the rotation of the ratchet sleeve in one direction and a lever arm having detachable engagement with the sleeve on the carrier and also with the ratchet sleeve whereby when the lever arm is turned in one direction the spring will wind up from its outer end through the carrier and when turned in the opposite direction the spring will be wound up from its inner end through the ratchet sleeve.

3. In a door closer, the combination with a spring casing having a stop therein, of a spring carrier within the casing and provided with a stop to engage the stop on the casing for preventing movement of the carrier in one direction and a sleeve integral therewith, a spring the outer end of which is secured to the carrier, a ratchet sleeve embracing the sleeve on the carrier, and engaged by the inner end of the spring, means including lugs on the casing and cap for preventing rotation of the ratchet sleeve in one direction and a lever arm having means for detachable engagement with both sleeves, substantially as and for the purpose specified.

4. In a door closer the combination with a spring chamber, of a carrier therein, means including stops on the carrier and casing for preventing rotary movement of the carrier in one direction, a cap mounted to rotate on the spring casing, lugs on the cap and casing for preventing rotation of the cap in one direction, a ratchet sleeve projecting through the cap into the spring chamber, adjustable means of connection between the cap and the ratchet sleeve, a spring connected at its outer end to the carrier and at its inner end to the ratchet sleeve, and a lever arm having means for detachable connection with the carrier and also with the cap whereby when turned in one direction it rotates the spring carrier, and when rotated in the opposite direction rotates the cap and its connected ratchet sleeve.

5. The combination with a spring chamber and a rotary cap thereon, of a carrier mounted to turn in the spring chamber and provided with a centrally located sleeve having an upwardly projecting lug, stops on the carrier and casing for preventing the carrier from turning in one direction, a ratchet sleeve embracing the sleeve on the carrier and provided at its upper end with ratchet teeth, a coiled spring connected at its outer

end to the carrier and at its inner end to the ratchet sleeve, a movable pin carried by the cap and engaging the toothed wheel on the sleeve and a lever arm having detachable
5 connection with the lug on the sleeve of the carrier and also with the cap.

6. In a door check and closer the combination with a piston chamber and a spring chamber the latter having a movable cap, a
10 carrier having a sleeve projecting up through said cap, a ratchet sleeve embracing the sleeve of the carrier, a spring connected at one end to the carrier and at its other end to ratchet sleeve a spindle passing
15 through the spring chamber into the piston chamber and a piston connected to the spindle, of a lever arm secured to the spindle and having a shoulder to engage a shoulder on the sleeve of the spring carrier whereby

the latter will be moved with the lever arm 20 in one direction, means including the movable cap connecting the lever arm and ratchet sleeve whereby the latter will be moved with the lever arm in the opposite direction, and a liquid check the valves of 25 which may be adjusted for silent or quick closing action of the piston and which when set for either action may be used on either a right or left hand door without change of adjustment. 30

In testimony whereof, I have signed this specification in the presence of two subscribing witnesses.

CHARLES B. BISHOP.

Witnesses:

W. H. TAYLOR,
WARREN S. ABEL.