No. 627,717. Patented June 27, 1899.

C. O. CASE.

DOOR CHECK.

(Application filed Apr. 23, 1898.)

(No Model.) 2 Sheets—Sheet 1.

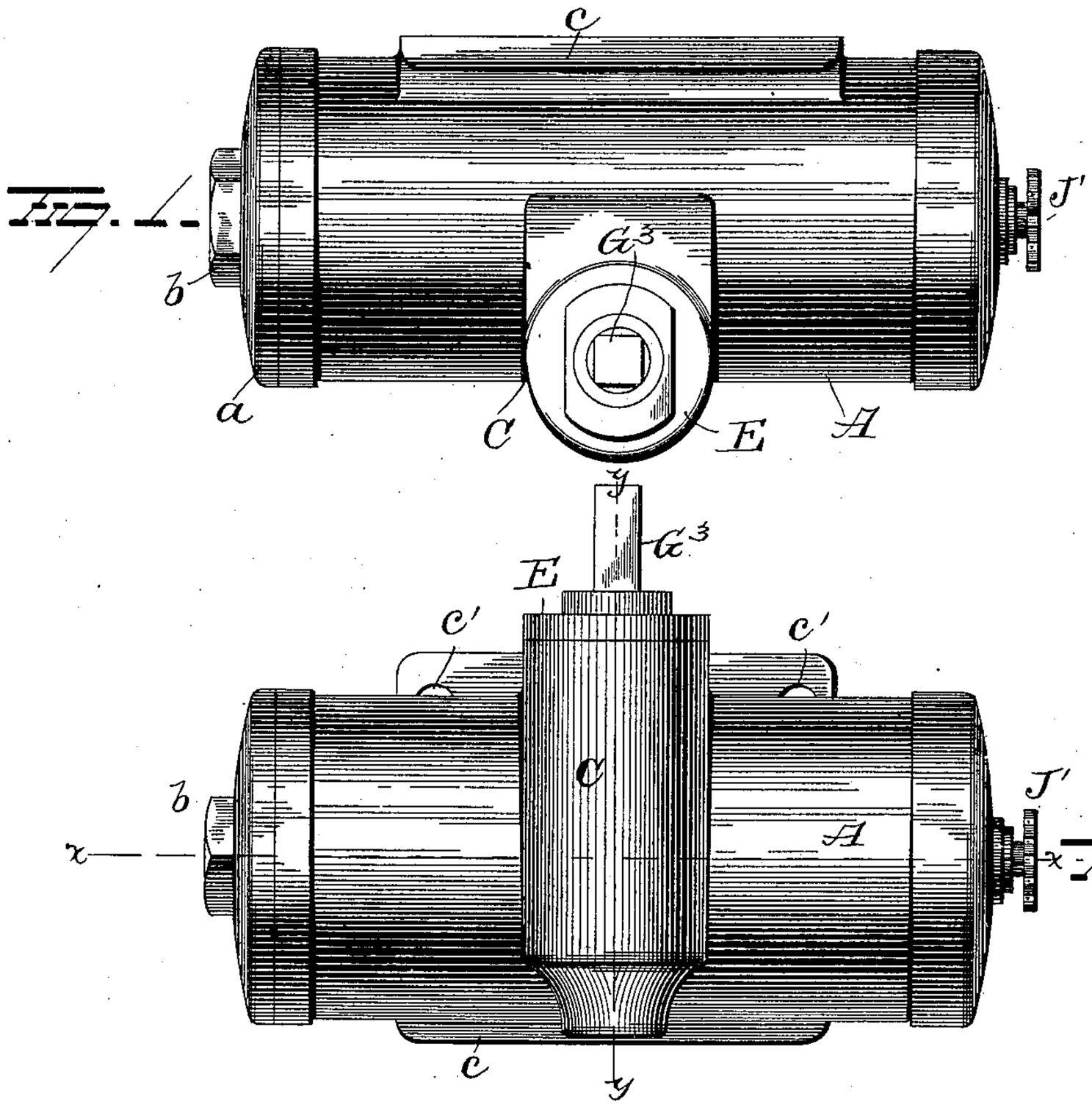


FIG. 1.

FIG. 2.

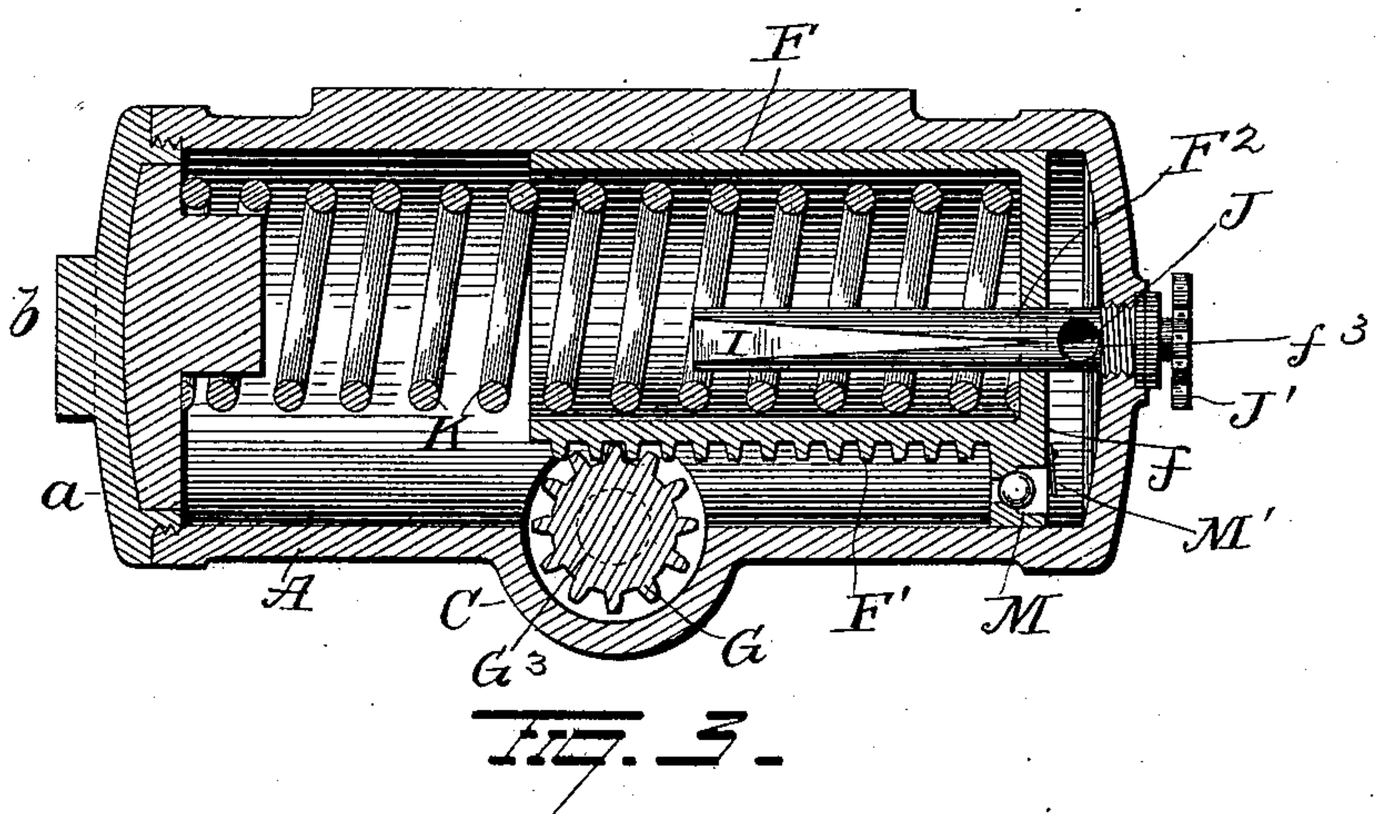


FIG. 3.

WITNESSES
E. J. Nottingham
G. F. Downing.

INVENTOR
C. O. Case
By H. A. Seymour
Attorney

No. 627,717. Patented June 27, 1899.

C. O. CASE.

DOOR CHECK.

(Application filed Apr. 23, 1898.)

(No Model.) 2 Sheets—Sheet 2.

FIG. 4.

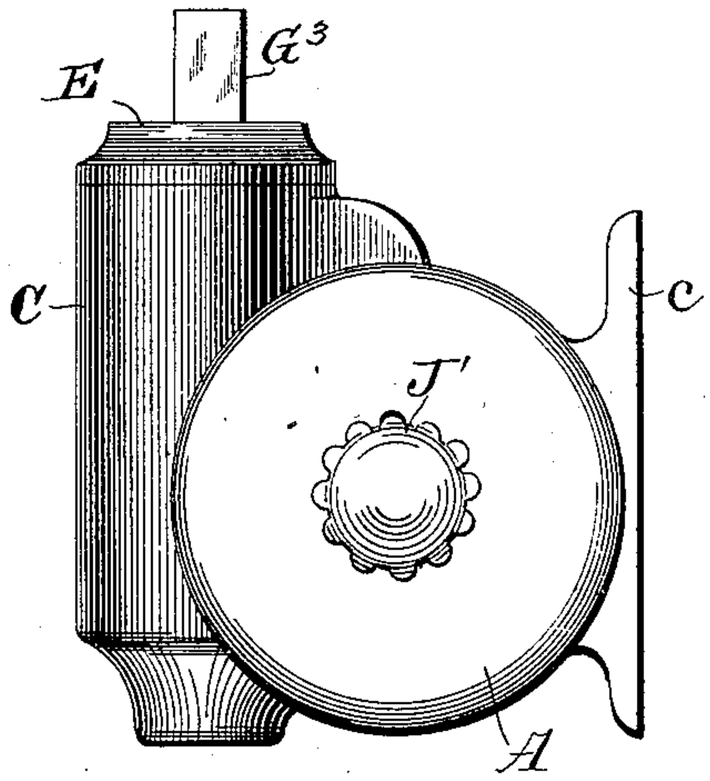
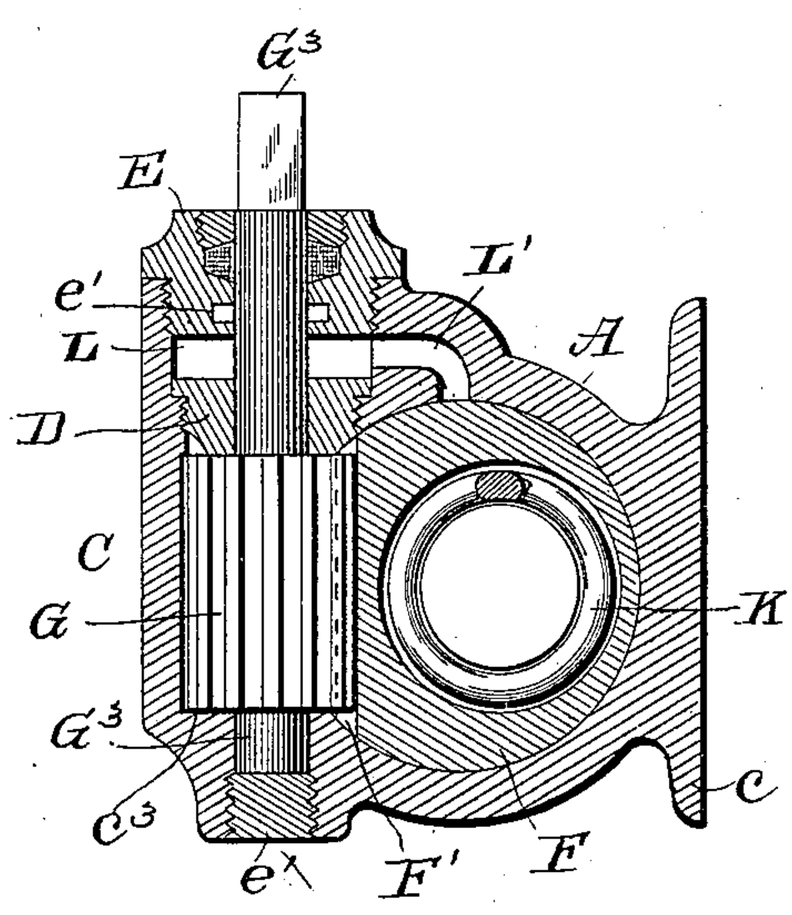


FIG. 5.



WITNESSES
E. J. Nottingham
G. F. Dorning.

INVENTOR
C. O. Case
By H. G. Seymour
Attorney

UNITED STATES PATENT OFFICE.

CROMWELL O. CASE, OF NEW BRITAIN, CONNECTICUT, ASSIGNOR TO THE P. & F. CORBIN, OF SAME PLACE.

DOOR-CHECK.

SPECIFICATION forming part of Letters Patent No. 627,717, dated June 27, 1899.

Application filed April 23, 1898. Serial No. 678,585. (No model.)

To all whom it may concern:

Be it known that I, CROMWELL O. CASE, a resident of New Britain, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Door-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 it appertains to make and use the same.

My invention relates to an improvement in liquid door-checks, the object of the same being to provide simple and durable means for confining the liquid within the casing and in so providing for the passage of the liquid from one end of the piston to the other that the spindle-bearings, which are generally the points of leakage, are not subjected to the pressure of liquid racing from one end of the cylinder to the other.

A further object is to provide a door-check of compact form, of simple construction, and of few parts and one that can be manufactured and sold for less than those now on the market.

With these ends in view my invention consists in the parts and combinations of parts, as will be more fully described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in plan of my improved door-check. Fig. 2 is a side view of same. Fig. 3 is a longitudinal sectional view on the line *x x* of Fig. 2. Fig. 4 is an end view, and Fig. 5 is a transverse sectional view on the line *y y* of Fig. 2.

A represents a cylindrical casing having one end integral and closed at its other end by a tightly-fitting screw-threaded cap *a*, having an angular boss *b* cast thereon for engagement of a wrench used in securing the cap in place. This cylindrical casing A is provided with the integral brackets *c*, having screw-holes *c'* therein for the insertion of screws, by which the device may be held in place, and with a smaller integral cylinder C at right angles to the main cylinder A, the two cylinders being partly merged together, with their chambers in open and direct communication with each other, as clearly shown in Fig. 3. The smaller cylinder C is closed at its bottom by a closely-fitting or permanently-secured screw-plug *e'* and at its top by the threaded sleeve D and gland E, which will be more fully referred to later on.

Located within the cylinder A is the plunger or piston F. This plunger or piston is provided with a bore or chamber located eccentrically therein and is provided on the side which is thickened by locating the chamber or bore eccentrically with teeth cut therein, forming a rack-bar F', extending from a point just in rear of the head *f* of the piston or plunger back to its rear end. The rack-bar F' engages the pinion G, located in the smaller cylinder C, and hence the longitudinal movement of the piston or plunger and the rotary movement of the pinion G are simultaneous, the pinion operating to move the plunger in opening the door and the plunger operating to rotate the pinion in closing the door. All that portion of the piston except the portion cut away to form the rack closely fits within the cylinder A. Hence the liquid in passing from one side of the piston or plunger to the other must pass around and in contact with the rack-bar and through the smaller cylinder C.

The head of the piston or plunger F snugly fits within the bore of the cylinder A and is provided centrally with an aperture F^2 for the passage of the tube I. This tube is secured in the closed end of cylinder A, and it may be made tapering, or, if cylindrical, it may be provided with one or more beveled surfaces. The rear end of the tube, or the part thereof adjacent to the head of the cylinder A, snugly fits and practically closes the aperture F^2 in the head of the piston; but as the piston moves away from the fixed end of the tube and toward the end of the tube reduced in diameter by tapering or beveling the outer surface thereof a space gradually increasing in size is formed between the tube and wall of the aperture for the passage of the liquid, and when the piston is moving in the opposite direction this space or opening is gradually reduced in size and finally closed. This tube is also provided, near its fixed end and at a point in front of the head of the piston or plunger, with an opening f^3, which latter can be wholly or partly closed by the plug-valve

J, mounted in the tube and provided at its outer end with a thumb-wheel J′, by which it is turned.

Formed in that portion of the piston or plunger which projects beyond the rack-bar F is a recessed aperture forming a seat for a ball-valve M, the latter being retained in place by the cap M′. This valve is closed by the pressure of the liquid against it as the piston is moving toward its normal position, as shown in Fig. 3, and is opened to permit of the passage of the liquid through the opening when the piston is moving in a direction to compress the spring.

The pinion rests on the seat c^3, and the lower end of the pinion shaft or stem G^3, to which the pinion is integral or rigidly secured, rests on the plug *e*, thus affording ample bearing for the pinion and preventing the possibility of any lateral movement of same. The upper end of this stem is secured to a jointed arm, which latter is secured to a door, casing, or jamb in the usual manner and is supported at a point just above the pinion by sleeve D and above the sleeve D by the gland E. The sleeve D is screwed into place within the smaller cylinder and rests with one end in contact with the pinion and operates to a large extent to prevent any liquid from passing upward either by pressure or capillary attraction. The gland E is screwed into the upper end of the small cylinder C and, besides carrying a packing, is provided near its lower end with an annular groove *e*′, which latter forms an air-check around the shaft or stem, which absolutely prevents the liquid from crawling up the spindle by capillary attraction. A space L is left between the sleeve and gland, and any liquid that may be forced around or through sleeve D gravitates back through the port L′ into cylinder A. Hence it will be seen there is no pressure at all against the gland E, and I have found in actual practice that the air chamber or check *e*′ forms an absolute barrier against the crawling of any liquid up around the spindle.

Located within the casing and bearing at one end against the inner face of the head of the piston and at its other end against the cap E or plate carried by said cap is the spring K, which latter tends to hold the piston in the position shown in Fig. 3.

The cylinder A is filled or partly filled with a liquid, and Fig. 3 represents the positions of the parts when the door is closed. By now opening the door the plunger is moved rearwardly, thus compressing the spring, and the liquid behind the piston passes around the piston and past the ball-valve, some of the liquid also passing through tube I and through aperture F^2 around the tube. As soon as the door is released the spring tends to force the piston back; but the movement of the latter is obstructed and retarded by the liquid in front of the piston. The ball-valve is held closed by the pressure of the liquid thereagainst. Hence the liquid must pass to the rear of the piston through or around the tube. At the beginning of the closing movement of the door the small or reduced end of the tapered or beveled tube and the opening through the tube allows of the comparatively free passage of the liquid; but as the door nears its closed position the size of the opening is gradually reduced, thus reducing the speed of the door and bringing the latter to its closed position without any shock.

With this construction it will be seen that the spindle, which is the part subjected to wear and is the point where leakage occurs, is protected from the liquid as the latter races from one end of the cylinder to the other, and hence the outer bearing sustaining same is not subjected to the action of the liquid under pressure.

It is evident that numerous slight changes might be resorted to in the general form and arrangement of the several parts herein set forth without departing from the spirit and scope of my invention, and hence I would have it understood that I do not wish to limit myself to the precise details shown and described, but consider myself at liberty to make such slight changes and alterations as fairly fall within the spirit and scope of my invention.

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

1. A door-check comprising a main cylinder, a smaller cylinder partly merged into the side of the main cylinder at right angles thereto, a spring-actuated piston having a rack formed on the body thereof, and an opening in its head for the passage of liquid, a portion of the piston-head overhanging the rack and provided with a valved opening, and a pinion in the smaller cylinder engaging the rack on the piston, the pinion being located in a line with and in rear of the overhanging edge of the piston-head.

2. A door-check comprising a main cylinder, a smaller cylinder at right angles thereto and partly merged in the side of the main cylinder a piston or plunger having an eccentric body and provided with external teeth the latter being in a line with the overhanging edge of the piston-head and with an opening for the passage of the liquid to the rear of the head, a spring for moving said piston in one direction, a pinion mounted in the smaller cylinder and projecting into the main cylinder and engaging the teeth on the piston, a packing-sleeve for the pinion-shaft, a gland secured in the smaller cylinder above the sleeve and a port leading from the space between the gland and sleeve to the main cylinder.

3. In a door-check, the combination with a casing, a valved plunger and a spring for moving the plunger in one direction, of a pinion engaging teeth on the plunger and a gland embracing the pinion-shaft and having an annular recess forming an air-check.

4. In a door-check, the combination with a

casing, a valved plunger and a spring for moving the plunger in one direction, of a pinion engaging teeth on the plunger, a sleeve for packing the pinion-shaft and a gland above the sleeve, the gland having an annular recess.

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

CROMWELL O. CASE.

Witnesses:
ALBERT N. ABBE,
G. ERNEST ROOT.