To all whom it may concern:  

Be it known that I, JOHN CRAWFORD Moore, a subject of the King of Great Britain, residing at Nightingale Hall, Lower Edmonton, London, England, have invented and useful Improvements in Door-Closers or Door-Checks, of which the following is a Specification.

This invention relates to improvements in or relating to door closers or door checks the object thereof being to effect improvements in or relating to single or double acting door closers or door closers and door checks which will operate equally well on right and left hand doors without any change in the mechanism whatsoever without a ratchet.

The improved device is easy to assemble and easy to take part, simple of construction, most efficient in action and one which it is impossible for the liquid to leak from as the case is not perforated in any part where the liquid is contained.

In order that this invention may be fully understood it will now be described with reference to the accompanying drawings in which:—

Fig. 1 is a plan of the device. Fig. 2 is a front elevation with the arms removed. Fig. 3 is a side view of the casing. Fig. 4 is a plan with the cover and horizontal bevel wheels removed for the purpose of more clearly showing some of the parts. Fig. 5 is an irregular longitudinal vertical section partly in elevation and viewed from the back of the casing. Fig. 6 is a detailed section on line X, X, of Fig. 5. Fig. 7 is a detailed view of the spring tensioning adjuster. Fig. 8 is a side elevation of the tube valve. Fig. 9 is a view at right angles to Fig. 8. Fig. 10 is a partially sectional side elevation of the same.

As shown in the drawings, the device comprises the casing a, cylinder b and cover or lid c, all secured on the top of the door.

Arranged within the casing a is a removable block d supporting a vertical bevel wheel e directly connected by a rod f with the piston head g while in the block d the lower extremity of the rotary spindle h is journaled.

The upper extremity of this spindle passes through and is supported by the lid c while it carries near its lower extremity a horizontal bevel wheel e’ meshing with the afore-said bevel wheel e.

Upon vertical posts i the springs j which are made right and left handed are arranged and supported around collars k, the latter being maintained apart by sleeves k’. The upper extremities k of these springs are secured to a tensioning yoke l through the medium of links l’ and adjusted by the screw v (Fig. 2 and Fig. 7) while their lower extremities k’ are connected by chains m with the perforated and elongated lugs n (Fig. 6) carried by the vertical spindle h of the said lugs being elongated or of elliptical form as shown.

Referring now more particularly to Figs. 1 to 3 of the drawings, on the upper outside extremity h’ of the spindle h is pivoted on the transverse pin o by means of a screw as shown in Fig. 1 the split portion o’ of the spindle arm the said arm being completed by the rod p screwing therein, the bracket arm comprises the curved rod q pivoted to the arm p and the rod q’ linked to r as at r’. The rods q q’ are provided with a right and left handed screw thread respectively and connected together by the link q” as shown for the purpose of adjustment.

Upon the lid a, the eccentrical placed cam s is formed while the split portion o’ of the spindle arm is constructed with a heel or extension o” both of the latter bearing thereon when the door is closed to keep it steady in this position.

The bracket r is provided with a spring t (Figs. 1 and 2) for giving the door an initial start when the door is fully opened away from the side the casing is on and the springs j lose their power by reason of the joint connecting the arms being more or less in line with the dead center r’, this start being effected by the said spring coming into contact with the rod q’ of the bracket arm.

The valve and by-pass mechanism intended for use in connection with this combined door closer and check and which is more clearly shown in Figs. 5, 8, 9 and 10 of the drawings comprises a tube v having a screw threaded enlarged solid shoulder v’ designed to screw into the cover or lid c and a milled head v” for convenience in manipulating the same. This tube v which passes closely through a hole g’ in the piston g has a lower bore w of a larger diameter than the upper bore w’ the two being connected by a portion forming a seating for the ball w” the latter being prevented from leaving the tube by the cross pin w’d. The tube v is furnished with fluid inlets y at a point above the travel of the piston, and
near the bottom with fluid passages $y'$ or the open end while it is likewise formed with a flat or reduced circumference $z$ which serves as a by-pass.

5. In operation, when the piston is raised by the swinging open of the door, the fluid is sucked through the openings $y$ and passes the ball $w^2$ and out through the exits $y'$ or the open end to supply fluid to the undersurface of the piston while upon the door being released and the piston $y'$ forced down under the action of the springs $j$ which have previously been tensioned, the ball $w^2$ assumes the position shown in dotted lines (Fig. 10) and closes the tube $e$, when the fluid can only return to the space above the piston through the bypass formed by the flat $z$, or reduced circumference the extent of the latter being varied according to requirements. It will be seen that the action of this valve is extremely simple and effective while it can be readily removed for inspection or repair or for permitting fluid to be readily supplied to the cylinder and casing.

In practice, the casing of the device is intended to be secured to the door and the bracket $x$ to the lintel while it is equally suitable for single acting right or left handed doors or for double acting doors. Upon the rotary spindle $h$ being turned in either direction by the opening swing of a door, it will be seen that the springs $j$ are tensioned through the medium of the connecting chains $m$ rolling the required distance around said spindle connected by the lugs $n$, while the piston is raised by the bevel wheels $e, e'$ and connecting rod $f$. Upon the door being released, the latter is closed by the reaction of the springs, through the reverse turning of the rotary spindle $h$, the closing force being transmitted through the spindle and bracket arms, $o', p$ and $q, q', q''$ while the slow descent of the piston, by reason of the closing of a valve, in the tube passing therethrough and the provision of a by-pass in connection with the same serves to control the speed of the door.

I am aware that a yoking plate connecting the extremities of two longitudinally stretched spiral springs with an adjusting screw passing through the spring casing and the plate for adjusting the tension of the springs has been employed in connection with door closers and also in connection with door checks a tube passing through the check piston has been provided for permitting the flow of the fluid from one side to the other of the said piston and I make no claim broadly for these features.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:

1. In a door closer, the combination with 65 a vertical rotary spindle carrying a cross-piece outside the casing a forked lever arm pivotally connected to said cross-piece an eccentrically disposed cam ring surrounding the upper extremity of said rotary spindle, 70 which ring has an upward graduating surface adapted to bear against said forked lever arm, and designed to move it in a vertical manner, substantially as and for the purpose specified.

2. In a door closer the combination with 80 a vertical rotary spindle carried in a casing on the top of the door, which spindle is operated by the opening of the door against the force of springs of a bracket secured on the lintel of the door which bracket carries a spring, of a lever arm connected to said bracket bent laterally at its outward extremity from said bracket, which bent part is designed to pass underneath the lintel of the door, and the straight part thereof operates against the spring on said bracket when the door is opened to about 95 degrees of a circle away from the side said casing is on.

3. In a door closer with a casing secured on a door carrying a vertical rotary spindle which is adapted to be turned by the opening of the door, of springs located around separately supporting spindles on said casing flexible bands which connect said rotary spindle with these springs in such a manner that whichever way this rotary spindle is turned these springs are tensioned.

Signed at Edmonton, Middlesex, England, this 4th day of April 1913.

JOHN CRAWFORD MOORE.

Witnesses:
M. WATTS,
JAMES M. DEXTER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."