

O. C. RIXSON.
CLOSER AND CHECK FOR SINGLE ACTING DOORS.
APPLICATION FILED APR. 6, 1912.

1,064,255.

Patented June 10, 1913.

2 SHEETS—SHEET 1.

Fig. 1

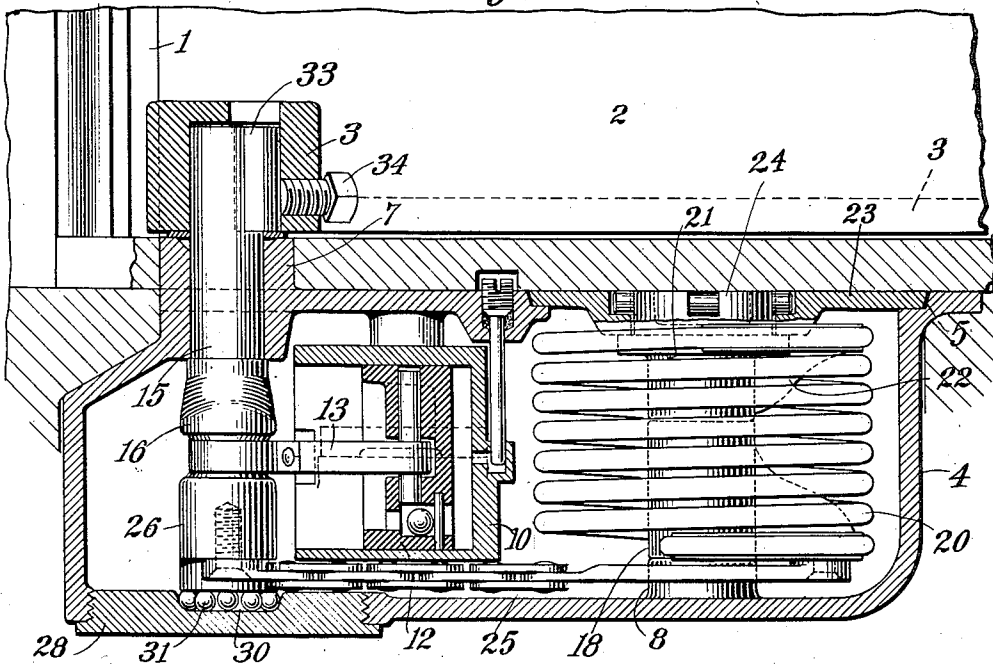
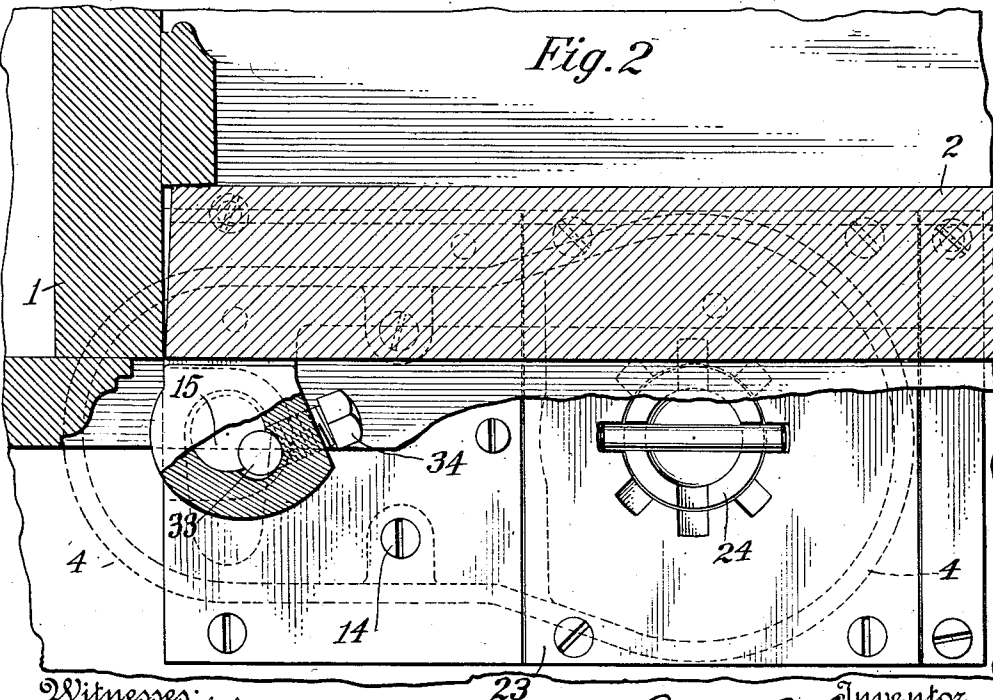


Fig. 2



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Fig. 3

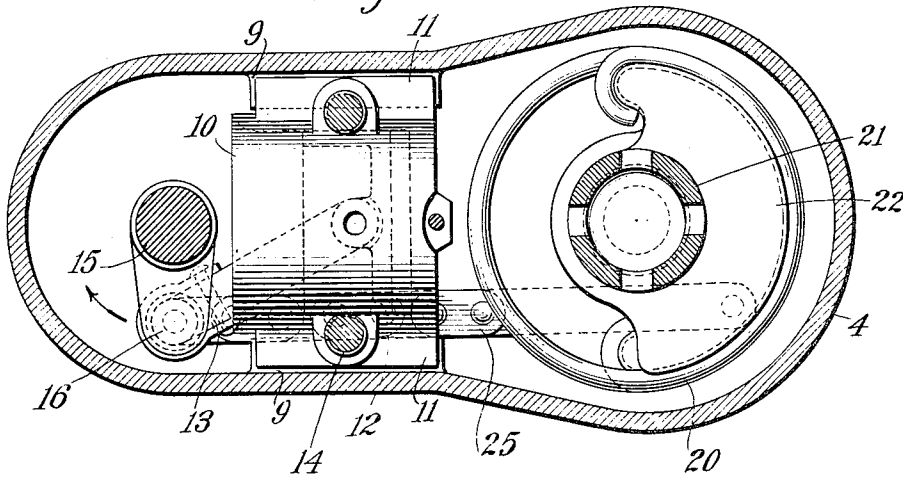


Fig. 4

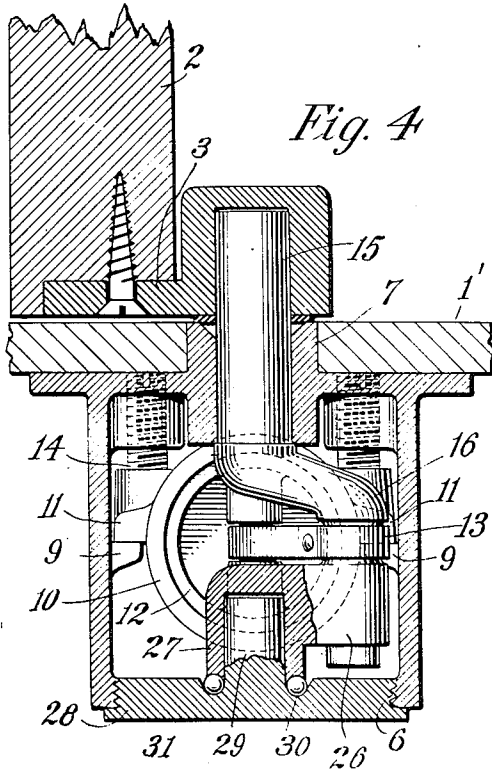
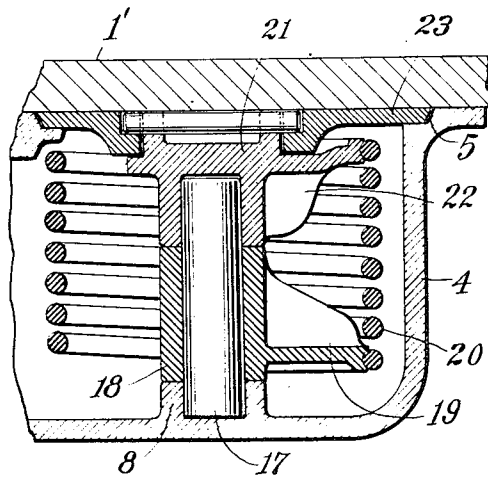


Fig. 5



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CLOSER AND CHECK FOR SINGLE-ACTING DOORS.

1,064,255.

Specification of Letters Patent.

Patented June 10, 1913.

Application filed April 5, 1912. Serial No. 688,763.

To all whom it may concern:

Be it known that I, OSCAR C. RIXSON, a citizen of the United States, and a resident of the city, county, and State of New York, (whose post-office address is No. 7 East Forty-second street, New York city, New York,) have invented a new and useful Improvement in Closers and Checks for Single-Acting Doors, which invention is fully set forth in the following specification.

This invention relates to door-closers and checks.

One object of the invention is to apply to a single-acting door (that is, a door which opens in one direction only) certain features set forth and claimed in my pending U. S. application Serial No. 475,885, filed February 3, 1909, (Patent No. 1,025,309, granted May 7, 1912.) Among these features of my prior invention are the connecting of the checking-mechanism to the door in such manner that at the instant the door is attaining its closed position the check will be affording substantial opposition, so as to prevent slamming at the last moment; and, further, the connecting of the spring-mechanism to the door in such a manner that after the door has attained its closed position the spring will be exerting substantial opposition to the opening of the door, which will prevent the swinging of the door to-and-fro, as by a sudden gust of wind or the like. These two advantages are obtained in my previous application by so arranging the parts that when the door is in its closed position the line of action from the checking-mechanism, and also the line of action from the spring-mechanism, shall pass to one side of the axis on which the door swings.

With double-acting doors, the two rear edges of the door are cut away or rounded off, so as to permit the door to turn freely without binding against the door-jamb; whereas this feature is undesirable in single-acting doors. Also, with single-acting doors it is customary to have a beading or stop down the face of the door-jamb, against which stop the rear edge of the door abuts when closed; whereas, there can be no such stop with double-acting doors. Moreover, to apply to a single-acting door the construction of my prior application, in the manner there indicated, would require the shaft to be located at some considerable dis-

tance out from the rear of the door, and also that the rear edges of the door be rounded off,—which are undesirable features with a single-acting door. So that an important feature of my invention is to so construct and arrange the mechanical parts and the casing therefor that the complete device can be properly installed with a single-acting door.

Another feature of my invention is to permit convenient assemblage of the parts that constitute the door-closer; and still another feature is to provide means for conveniently connecting the door to the door-closer. For the first-named purpose, I provide a casing of peculiar shape, adapted to receive the operating mechanism and to be located beneath the door-sill so as to extend partly beneath the door-jamb at the rear of the door,—whereby the operating-shaft or spindle is presented in substantially the plane of said door-jamb.

As to the second-named feature, with ordinary single-acting door-closers adapted to be embedded beneath the door, the utmost care and precision is necessary in properly seating the door-check upon the protruding shaft; and as such devices come from the factory, the tension of the spring or springs causes the free end thereof to abut against certain stops in the casing, so that, unless the spring is retracted somewhat at the time the door-plate is fitted upon it in its normal closed position, the piston of the checking-mechanism would hammer upon the cylinder-head. Therefore it has been customary in doing such work to first retract the spring slightly and then attempt to place the door-plate upon it. By my present invention the door and door-plate are first engaged with the spindle, and thereafter the spring is retracted into proper adjustment and held there.

More specifically, my invention consists of the construction and arrangement of parts as hereinbelow set forth and claimed, and particularly in the conformation of the casing for the mechanism, in the construction of the shaft, and in the manner of connecting the spring-mechanism and the checking-mechanism thereto.

My invention consists also of the various details hereinafter pointed out and claimed.

My invention will be best understood by describing a preferred embodiment thereof,

in connection with the annexed drawings in which—

Figure 1 is a vertical section, taken longitudinally through one of my new door-closers, showing a portion of the door and door-jamb; Fig. 2 is a horizontal section through the door and door-jamb, showing a plan of my door-closer; Fig. 3 is a horizontal section through the casing of my door-closer, showing a plan of the operative mechanism; Fig. 4 is a vertical section, taken transversely through the casing, in the line of the operating-shaft that connects with the door; and Fig. 5 is a vertical section taken longitudinally through the spring-mechanism and one end of the casing.

1 represents the door-jamb, and 2 the door; while 3 is the door-plate, a flat plate secured flush in the bottom edge of the door and offset to one side as seen in Fig. 4. A strip 1' may be placed over the threshold, if desired. The remaining parts consist broadly of the casing, the shaft, the checking-mechanism (a cylinder and piston), and the spring-mechanism, with means for securing the two latter parts within the casing, and further means for connecting the spring and the check to the shaft.

The casing 4 is shaped substantially as shown in Figs. 1 and 3, and has the opening 5 at one end of the top, and an opening 6 at the other end of the bottom, with a journal-bearing 7 above the latter. Beneath the opening 5 is a seat 8; and intermediate the openings are two oppositely-located horizontal shelves 9.

10 is the cylinder provided with two oppositely-disposed horizontal flanges 11, each of which may be provided in its upper surface with a concave seat. The cylinder, with its piston 12 and pitman 13, is inserted into the casing through the upper opening 5, and moved along until its flanges 11 rest upon the shelves 9; after which a screw 14 is passed down from the outside of the casing into the seat in each flange of the cylinder, thereby locking the latter firmly and immovably in position. Then the shaft 15 is introduced through the bottom opening 6, its upper end protruding through the bearing 7; and a strap upon the outer end of pitman 13 is passed around the eccentric 16 of the shaft, and secured in place as by riveting. Next the spring-mechanism is inserted through said upper opening 5, and properly connected to the shaft. This spring-mechanism comprises the stud 17 set in the seat 8, a sleeve 18 journaled upon stud 17 and carrying an offset arm 19 (for securing the lower end of the spring), a capped sleeve 21 also mounted on said stud and carrying a similar offset arm 22 (for securing the upper end of the spring), and the coiled-spring 20, which surrounds the sleeves and has its ends

secured to arms 19 and 22 respectively. A cover-plate 23 is fastened over the casing to cover the opening 5, but in the center of this plate is a circular opening to give access to the capstan 24, for adjusting the tension of the spring in the well-known manner. When the spring-mechanism has been thus inserted, the inner end of the jointed links 25 is hooked around the end of the arm 19, and the outer end of said jointed links is connected to the shaft 15, as by a screw passing into the eccentric portion 26 (preferably in vertical alinement with eccentric 16). The shaft 15 is shown as U-shaped, having a markedly-eccentric crank 16 for the check-connection, with the alined eccentric-bearing 26 for the spring-connection; and preferably as having its lower end tubular, as indicated at 27 (see Fig. 4). After the parts are thus assembled, the screw-plate 28 is secured in the lower opening 6. This plate carries the stud or arbor 29 and the annular race-way 30, both of them concentric with the axis of the shaft 15. The arbor 29 seats itself within the hollow bearing at the bottom of the shaft 15; and ball-bearings 31, located in the race-way, support the shaft.

The upper end of the shaft 15 is made cylindrical, instead of angular as heretofore; and the offset of the door-plate 3 has a circular opening adapted to receive the same. Along one side of this circular opening is a substantially semi-circular groove; and in the upper end of the shaft 15 is a corresponding groove of somewhat smaller diameter. 33 is a cylindrical pin, of hardened steel, adapted to enter the cavity formed by these two grooves; and 34 is a set-screw for adjusting the parts and holding them in adjustment.

When the parts have been assembled as already explained, the construction and relative proportions, and the arrangements, are such that the groove in shaft 15 will lie somewhat nearer to the door than does the corresponding groove in the offset of the plate 3; then the hardened pin 33 is introduced, being driven down by force if necessary; and finally the set-screw 34 is turned down against pin 33 thereby axially turning shaft 15 (to the left in Fig. 3), thus retracting the spring-mechanism from contact with the stop referred to in the early part of this specification. A great advantage attending this manner of connecting the door-plate to the spindle lies in the fact that the door is capable of being adjusted vertically with respect to the closing-and-checking mechanism. The threshold at the bottom of the doorway varies in thickness in different buildings, or there may be no strip at all, so that the upper end of the spindle protrudes a greater or less distance; and, also, it may be desired to vary the clearance of the door

above the threshold or the floor. The fact that the upper end of the spindle is of (substantially) uniform cross-section, permits the door-plate 3 to be lowered a greater or less distance thereon and thereafter to be locked firmly in any adjustment by means of the wedging action of the pin 33 and the set-screw 34.

It will be observed that the upper left hand portion of the casing (as seen in Fig. 1) is deflected or lowered, so as to permit inserting it beneath the door-jamb, so as to bring the shaft 15 into the plane of the door-jamb, while providing room for the play of eccentrics 16 and 26. It will be noted also that, in the arrangement shown, the pivoted links 25 do not have to slide over a stationary surface, but travel along with the rotating surface 27 of the lower portion of the shaft 15; and, in similar manner, that the position of the crank-bearings 16 and 26 (at substantially a right-angle to the line of operation for the spring-mechanism and the checking-mechanism respectively) permits the door to swing open as much as 180° if the door-casing does not interfere. This arrangement thus utilizes the efficiency of my previous invention.

The parts may be made in stock and are interchangeable one for another. Furthermore, by making right-hand springs and left-hand springs, the apparatus is applicable to either right-hand doors or left-hand doors, at will. All that is necessary to make this change, is to substitute a left-hand spring for a right-hand spring (or vice versa) and then to rotate the shaft 15 through 180° and connect up as before.

I have thus described my invention with some particularity of detail, but only for the sake of clearness; since my invention is not limited to the precise construction and arrangement herein set forth. Considerable variations may be made therein without departing from the spirit of my invention, which comprises so constructing and arranging the parts that the spindle or shaft 15 will be located near the plane of the door-jamb, and the novel means by which the apparatus may be readily assembled and put in place and the door properly secured thereto.

Having thus described my invention, I claim:

1. In a closer-and-check for doors, the combination of a casing adapted to be located in the floor, checking-mechanism in said casing, a spindle journaled in said casing and operatively connected to said checking-mechanism and provided with a hollow cylindrical lower end, a detachable plate covering an opening in the bottom of said casing beneath said spindle and carrying a stud that enters the hollow thereof, spring-mechanism in said casing, and jointed links

operatively connecting said spring with said spindle and bearing against said cylindrical portion thereof.

2. In a closer-and-check for doors, the combination of a casing depressed at one end of its top and having a spindle-bearing adjacent thereto and an opening in its bottom beneath said bearing, a spindle journaled in said bearing and having eccentrics for connection to door-closing mechanism and door-checking mechanism, and a plate secured to said casing to cover said opening and provide a bottom-bearing for said spindle.

3. In a closer-and-check for single-acting doors, the combination of operating-mechanism seated in the floor and comprising a protruding cylindrical spindle having a longitudinal groove therein, a door-plate carried by the bottom edge of the door and having an offset with a cylindrical opening to receive said spindle, said opening having a longitudinal groove adjacent said first-named groove, a pin entering the concavity formed by the two grooves aforesaid, and means for causing said pin to vary the adjustment.

4. In a closer-and-check for single-acting doors, the combination of operating-mechanism seated in the floor and comprising a spindle whose upper end is cylindrical, a door-plate having a cylindrical bore adapted to receive said spindle, and adjustable means for rigidly securing together said spindle and plate.

5. In a closer-and-check for doors, the combination of operating-mechanism seated in the floor and comprising a protruding spindle, a door-plate adapted to rotate said spindle, and means for adjustably connecting said spindle and plate against relative movement both vertically and horizontally.

6. In a closer-and-check for single-acting doors, the combination with operating-mechanism of a casing therefor adapted to be seated in the floor and beneath the door-jamb and having its rear upper portion depressed and provided with an opening at the forward portion of its top and an opening at the rear portion of its bottom, a seat below the first-named opening, a journal-bearing above the second-named opening, a horizontal shelf on either side of the interior of said casing, and means for closing said openings.

7. In a closer-and-check for single-acting doors, the combination of a casing adapted to be seated in the floor and cut-away at its rear upper portion so as to extend beneath the door-jamb, door-closing mechanism and door-checking mechanism in said casing, a spindle operatively connected to each of said mechanisms and located nearly in line with the rear face of the door and to one side thereof; and a door-plate for the bottom

edge of said door and having an offset engaging said spindle.

8. In a closer-and-check for single acting-doors, a door-plate secured in the bottom
5 edge of the door and having an offset for engagement with the operating-spindle, in combination with operating-mechanism located in the floor and comprising a spring and a check and a U-shaped crank-spindle
10 connected thereto, said spindle being connected to said offset and located near the plane of the door-jamb.

9. In a closer-and-check for single-acting doors, the combination with operating-
15 mechanism seated in the floor and comprising a spindle having a protruding upper end, a door-plate vertically adjustable upon said spindle, and means for positively locking said spindle and plate together at any
20 desired vertical adjustment.

10. In a door-closer and check, the com-

bination with operating-mechanism seated in the floor and comprising a spindle with protruding upper end, of a door-plate detachably engaging said spindle, and means
25 for rigidly locking the two together against relative vertical or horizontal movement.

11. In a closer and check for single-acting doors, the combination of the door, with closing means, checking means, a spindle to
30 which said closing and checking means are operatively connected, and means rigidly connecting said door and spindle against relative vertical or horizontal movement.

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

OSCAR C. RIXSON,

Witnesses:

GEORGE PARIOT,
HERMAN HUPFAUF.