July 3, 1934. W. F. MOORE 1,965,108

DOOR CLOSER AND CHECK

Filed Oct. 19, 1929 2 Sheets-Sheet 1

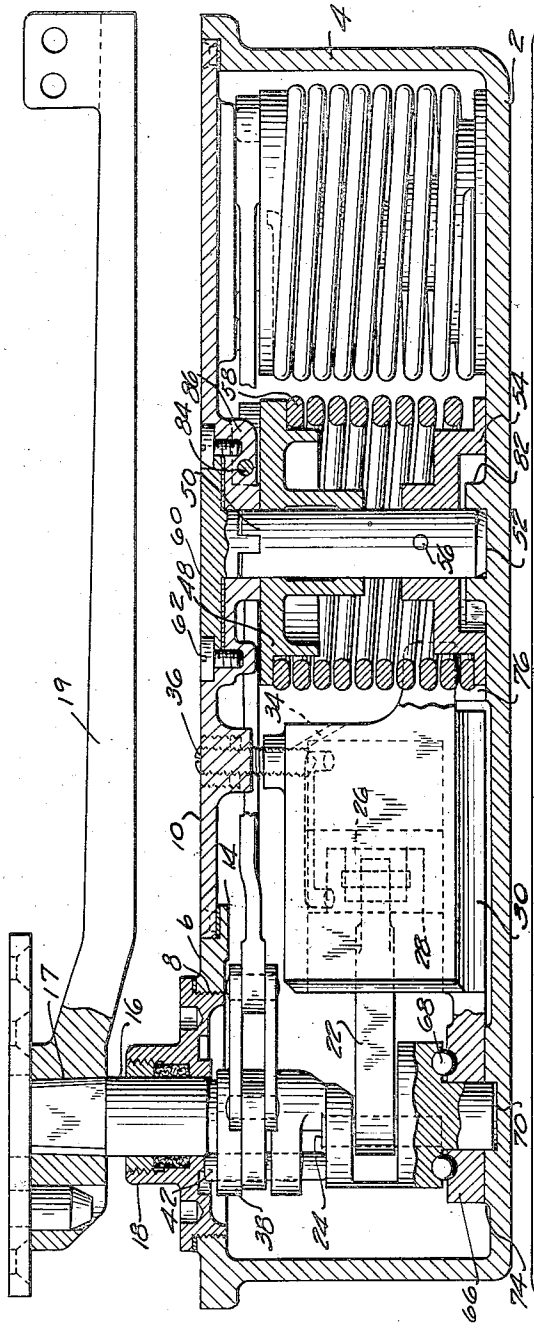


Fig. 1.

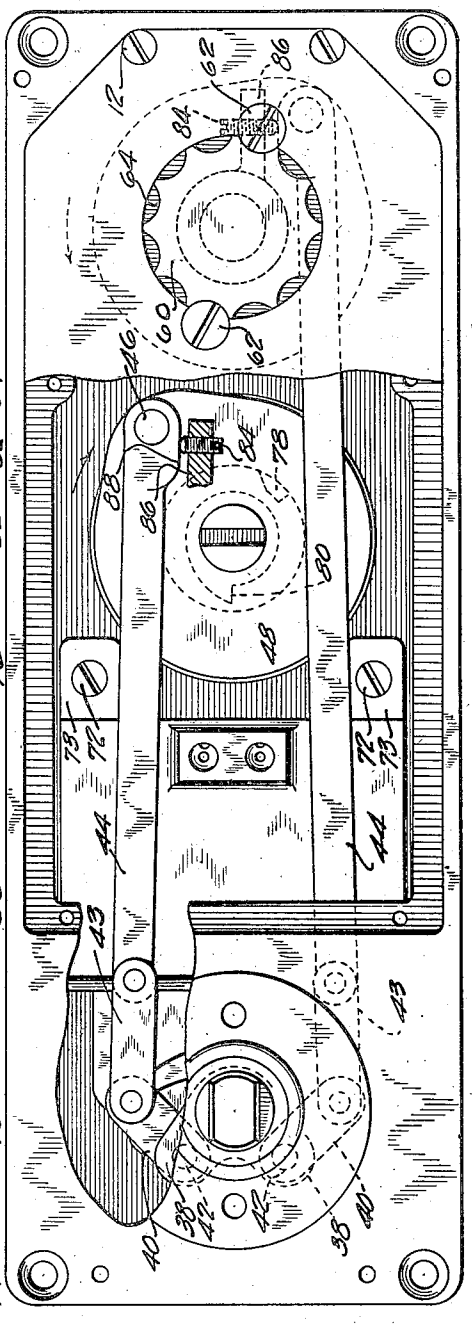


Fig. 2.

INVENTOR.
Wallace F. Moore
BY
Bartlett Eyre Scott & Heal,
ATTORNEYS.

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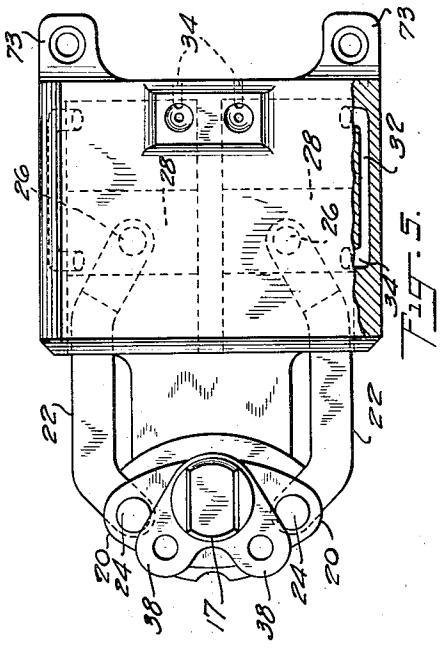


Fig. 5.

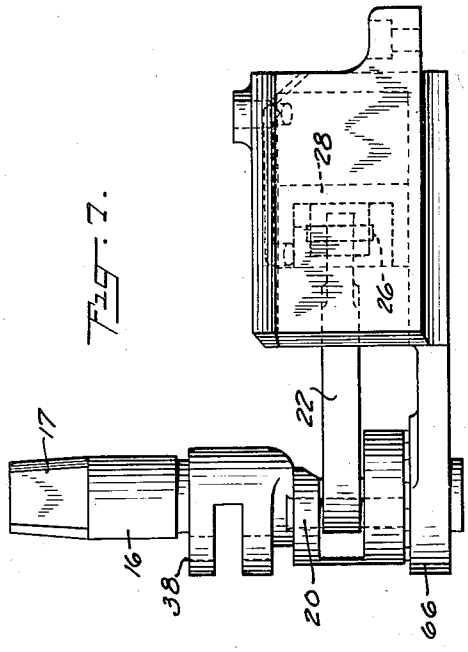


Fig. 7.

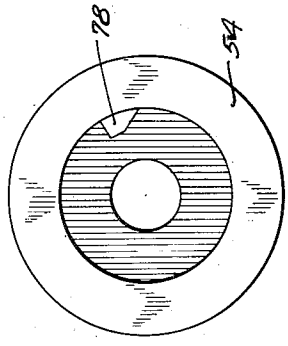


Fig. 4.

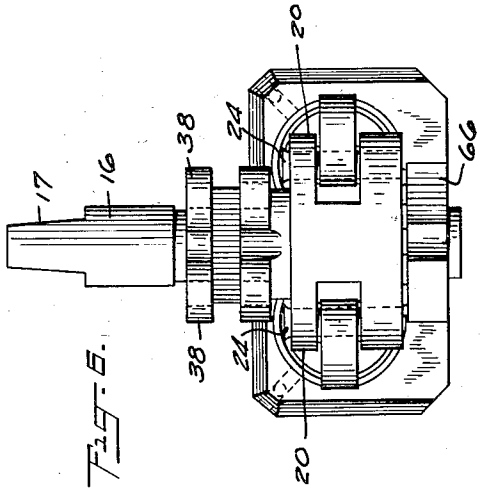


Fig. 6.

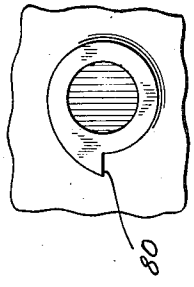


Fig. 3.

INVENTOR.
Wallace F. Moore
BY
Bartlett Eyre Scott & Keel,
ATTORNEYS.

Patented July 3, 1934 1,965,108

UNITED STATES PATENT OFFICE

1,965,108

DOOR CLOSER AND CHECK

Wallace F. Moore, New Britain, Conn., assignor to The American Hardware Corporation, New Britain, Conn., a corporation of Connecticut

Application October 19, 1929, Serial No. 400,785

2 Claims. (Cl. 16—55)

My invention has special reference to door checks that are especially adapted for use on doors of the type that are adapted to be swung open in either direction from the normal closed position.

One of the objects of my invention is to provide a novel and improved door check of this character.

Another object of my invention is to provide a door check of this character which may be easily assembled and taken apart, and which is simple in construction and reliable in operation.

The several features of my invention, whereby the above mentioned and other objects may be attained, will be readily understood from the following description and accompanying drawings, in which:

Figure 1 is a longitudinal sectional view, partly in elevation, of a door check embodying the features of my invention in their preferred form;

Fig. 2 is a plan view of my improved check with certain parts removed and parts broken away;

Fig. 3 is a detail plan view of a portion of the bottom wall of the casing of the check showing a stop for limiting the action of one of the door closing springs;

Fig. 4 is a detail bottom plan view of one of the spring anchoring collars of the check;

Fig. 5 is a detail plan view, partly in section, of a portion of the checking mechanism of the door check when removed as a unit from the casing of the device; and

Figs. 6 and 7 are respectively front and side views of the same.

The door check illustrated in the drawings is of the type of the one illustrated and described in Letters Patent to Oscar C. Rixson "Door closing mechanism", No. 1,025,309 dated May 7, 1912. As shown, my improved door check is provided with a casing having a bottom wall 2, a vertical side wall 4 and a top wall 6. The top wall is provided with a screw-threaded cylindrical opening 8 near its forward end, and with an opening extending from a point spaced a distance back of said opening 8 to the rear end thereof, the latter opening being closed by a cover 10 which is detachably secured in place by screws 12. This cover 10 has its top surface flush with the top surface of the top wall and is set on an inwardly projecting flange 14 on the top wall.

The operating parts of the door check comprise a shaft 16 which extends through and is journaled in a bearing collar 18 screw-threaded into the cylindrical opening 8. The upper end of the shaft 16 has flattened sides and extends into a correspondingly shaped slot 17 in an arm 19 which is adapted to be secured to the lower edge of a door, thus securing the shaft and door so as to cause them to turn together. The shaft 16 is provided with oppositely directed arms 20 which are bifurcated at their ends to receive the forward ends of links 22 that are pivoted on pins 24 secured in the bifurcated ends of the arms. The rear ends of the links are pivoted on wrist pins 26 carried by pistons 28 that are mounted in a fluid cylinder block 30 secured on the bottom wall of the casing. The cylinder block is provided with bypasses 32 and ports or vents 34 controlled by valve screws 36, and the pistons are provided with ball-valve-controlled ports (not shown), all suitably arranged to effect the desired checking of the turning movements of the shaft 16.

The shaft 16 is also provided with arms 38 that are bifurcated to receive the forward ends of links 40 which are pivoted to the arms by means of pins 42 which extend through apertures in the bifurcated ends of said arms and said end of the links. The other ends of the links 40 are connected by links 43 with the forward ends of links or rods 44, the rear ends of which are pivotally connected by means of pins 46 with collars 48 loosely mounted on vertical shafts 50. The shafts 50 have their lower ends suitably supported for turning movement in sockets 52 in the bottom wall of the check casing, and their upper ends mounted for turning movement in apertures in the cover 10. On the lower end portions of the shafts 50 are secured collars 54 by means of pins 56. A door closing spring 58 is coiled about the axis of each of the shafts 50 and has its upper and lower ends respectively secured to the collars 48 and 54. Each shaft 50 is adapted to be turned to adjust the tension of the associated spring by means of a disk 60 detachably secured to the upper end of the shaft and set into an aperture in the cover 10, the disk being held in adjusted position by means of cap screws 62 screw-threaded into apertures in the cover 10, the heads of the screws extending over and received in notches 64 in the disk.

Except as hereinafter described, the parts above referred to may be and preferably are the same as the corresponding parts of the door check of said Rixson Patent No. 1,025,309 to which reference may be had for a more full and complete description of both the construction and mode of operation of said parts.

In assembling the parts of the check of said Rixson patent, it is necessary to place the pivot shaft in the check casing separately from the pistons and cylinders and in taking the check apart for the purpose of replacement or repair it is necessary to remove these parts separately, which operations owing to the limited space, are difficult and take considerable time to perform. In accordance with the present invention, however, the construction is such that the pivot shaft, piston and cylinder block, and the connections between the shaft and the pistons, may be assembled previ-

ously to positioning them in the check casing and may be placed in operative position in the casing as a unit, thus doing away with the difficult work of connecting up these parts after they are positioned in the casing. To provide for this, the cylinder block 32 has a forward extension 66 which has an aperture for receiving the lower reduced end of the pivot shaft 16, and the extension and body of the shaft are provided with bearing grooves for ball-bearings 68, the extreme lower end of the shaft extending slightly into a socket 70 in the bottom wall of the casing. With this construction, the cylinder block and shaft may be passed through the opening closed by the removable cover 10 and by tipping the parts, the upper end of the shaft may be brought up through the screw-threaded cylindrical opening 8, and the cylinder block set upon the bottom wall of the casing with the lower end of the shaft extending into the socket 70. When this has been done, the bearing collar 18 may be slipped over the upper end of the pivot shaft and screwed down into the screw-threaded opening 8. The cylinder block may be secured rigidly in position by means of screws 72 which are passed through rearwardly extending ears 73 in the block and screw-threaded into the bottom wall. The block, when thus positioned rests upon a boss or raised portion 74 on the bottom wall and upon bosses, one of which is shown at 76, that support the ears 73, the portion of the cylinder block between the boss 74 and the ears 73 being spaced a slight distance above the bottom wall.

After the cylinder block, pistons and shaft 16 have been thus positioned in the casing but before the bearing collar 18 has been applied, the spring mechanisms may be placed in the casing. In connecting the links 40 with the bifurcated ends of the shaft arms 38, the links are applied to the arms and the pivot pins 42 passed through the opening 8 and inserted through the apertures in the links and said arms, the lower ends of the pivot pins 42 resting upon the piston link arms 20 so as to prevent the pins dropping out.

After the spring mechanisms have been placed in the casing, the bearing collar 18 may be screwed into place and the cover 10 applied, the casing previously being filled with oil or other checking fluid. The valve screws 36 may then be applied and the springs adjusted by means of the disks 60.

In the illustrated construction, opposed stops 78 and 80 are respectively provided on the associated anchor collar 54 and the bottom wall of the casing, the under side of the collar having a downwardly opening recess on the wall of which the stop 78 is formed and the bottom wall being provided with a boss 82 projecting into said recess on which the stop 80 is formed. These stops 78 and 80 associated with each spring prevent overwinding of the spring and assist the operator to determine the proper tension to be placed on the spring.

In order to limit the unwinding of the springs and to ensure accurate stopping of the door in closed position, adjustable stop screws 84 are mounted in lugs 86 on the under side of the cover 10, with the inner end of each screw in position to be engaged by an inwardly projecting portion 88 on the inner edge of the end of each link 44, when the door reaches closed position. By arranging the screws on the inside of the cover, instead of having them extend through the cover, the necessity of sealing the screw holes against leakage is eliminated.

As will be evident to those skilled in the art, my invention permits various modifications without departing from the spirit thereof or the scope of the appended claims.

What I claim is:

1. In a floor door check of the type having a casing adapted to be set into a floor having a bottom wall and a top wall, said top wall having an opening and a cover closing said opening, a vertical pivot shaft mounted for turning movement in the casing for attachment to the door, spring mechanisms located within said casing, connections between said spring mechanisms and said shaft whereby said spring mechanisms oppose the opening of the door in opposite directions, respectively, said spring mechanisms each comprising a vertical shaft mounted for turning movement in opposite directions, a disk loosely mounted on the upper portion of the shaft, a spring coiled about the shaft and having its upper end secured to said disk and its lower end connected with said shaft, connection between each of said disks and said pivot shaft comprising a link having one end pivotally connected with the disk, said springs when under tension acting through said link connections to tend to hold the door closed, and means for turning each of said spring shafts to tighten the spring associated therewith, the improvement which consists in means comprising adjustable stop screws mounted on the inner side of said cover and adapted to be engaged by the pivoted end portions of said links when the door reaches closed position to limit the unwinding of the springs and to insure accurate stopping of the door in closed position.

2. In a floor door check of the type having a casing adapted to be set into a floor having a bottom wall, side walls and a top wall, the forward portion of said top wall being provided with an opening, a bearing collar removably secured in said opening, said top wall also being provided with another opening spaced back of said first-mentioned opening, a removable cover for closing said second-mentioned opening, a cylinder block mounted on said bottom wall of the casing, a pivot shaft for connection with the door extending through said bearing collar, a piston in said cylinder block, connections between said piston and shaft for reciprocating the piston upon turning the shaft in opposite directions, a door closing spring mounted within the casing back of said cylinder block, and a detachable connection between said spring and said shaft, said spring and said detachable connection being removable from the casing through said second-mentioned opening upon removing the cover thereof, the improvement which comprises a forward extension on said cylinder block having a bearing therein for supporting the lower end of said shaft, and said cylinder block, piston, shaft and connection between the piston and shaft being adapted to be removed from said casing as a unit through said second-mentioned opening upon removing said spring and detachable connection.

WALLACE F. MOORE.