No. 859,521. PATENTED JULY 9, 1907.

W. W. ROBERTSON.

DOOR SPRING.

APPLICATION FILED JUNE 11, 1906.

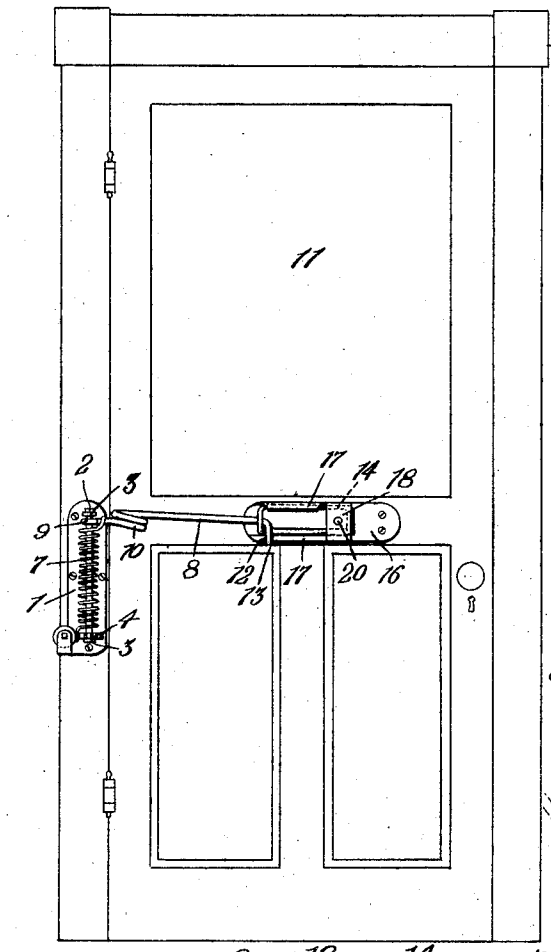

Fig. 1.

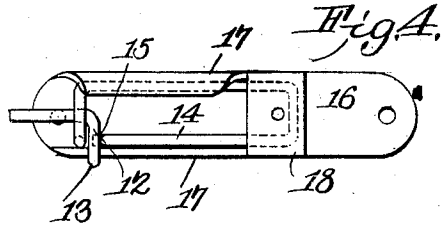

Fig. 4.

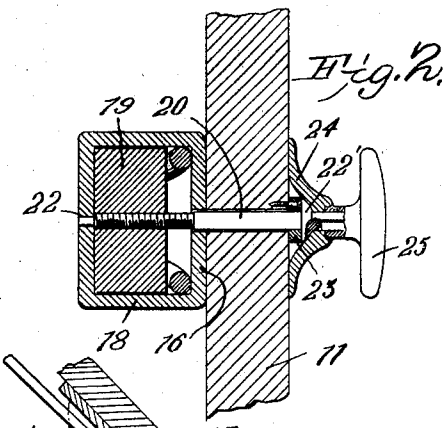

Fig. 2.

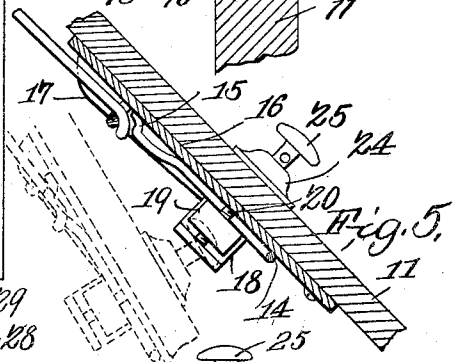

Fig. 5.

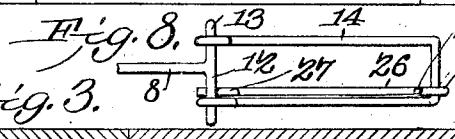

Fig. 8.

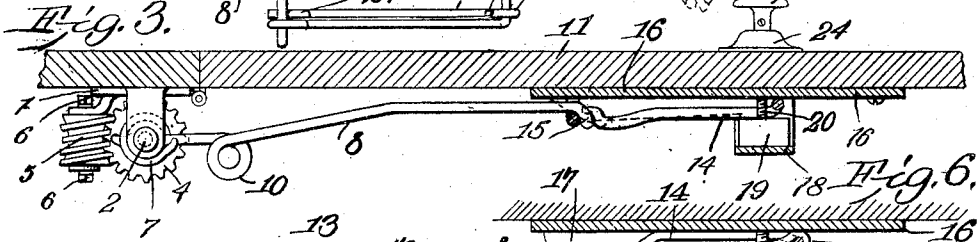

Fig. 3.

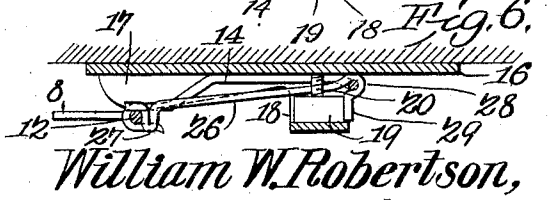

Fig. 6.

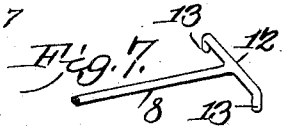

Fig. 7.

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UNITED STATES PATENT OFFICE.

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DOOR-SPRING.

No. 859,521. Specification of Letters Patent. Patented July 9, 1907.

Application filed June 11, 1906. Serial No. 321,214.

To all whom it may concern:

Be it known that I, WILLIAM W. ROBERTSON, a citizen of the United States, residing at Benton, in the county of Scott and State of Missouri, have invented a new and useful Door-Spring, of which the following is a specification.

This invention has relation to door springs and it consists in the novel construction and arrangement of its parts as hereinafter shown and described.

More particularly this invention relates to a door closer and check purposed to be attached to a door to facilitate in the automatic closing or the checking of the same to hold it open or closed; also, it relates merely to a door check without the closing feature.

The invention consists especially of a rod suitably supported for turning upon a pivot. Said rod is provided at an intermediate point with a coil which is adapted to be located opposite the edge of the door, one end of said rod being adapted to engage the side of the door while the other end is pivotally attached to suitable spring actuating mechanism located upon the door jamb. A means is provided whereby the end of said rod that engages the door may be temporarily secured in fixed position with relation to the same and as the said rod is pivoted on a center different from that of the door, the difference in the length of the two radii will hold the door in the position at which the fixing of the end of the said rod to the door occurs. By releasing the end of the rod from its fixed relation with the door, the spring mechanism operating through the said rod automatically closes the door. The door spring is so constructed that it may be applied to doors that are hinged at either longitudinal edge.

In the accompanying drawing: Figure 1 is a side elevation of the door spring applied to a door, Fig. 2 is a vertical sectional view through the door showing the means for fixing the rod with relation to the door, Fig. 3 is a detail sectional view of a means for adjusting the tension of the spring, Fig. 4 is a side elevation of a plate and link used upon the door, Fig. 5 is a sectional view through the door at right angles to Fig. 2, Fig. 6 is a sectional view of a portion of the door using a modified form of plate and link, Fig. 7 is a perspective view of the link engaging end of rod as shown in Fig. 6, and Fig. 8 is a side elevation of the modified form of link.

The door spring consists of the plate or housing 1 which is attached to the door jamb. The pin 2 is secured at its ends in the lugs 3, 3 and the spur wheel 4 is journaled upon said pin. The worm gear disk 5 is suitably mounted upon the plate 1 and engages the spurs of the wheel 4. The said worm gear disk 5 is concaved along its periphery as shown in Fig. 3 and is provided at each end with the squared ends 6, 6 which are adapted to enter the receiving opening of a suitable winding key (not shown). The said squared ends 6, 6 are provided at each end of the shaft in order that the said worm gear disk 5 may be reversed. That is to say that by extending one or the other of the said squared ends 6, the worm of the disk 5 is reversed in position and consequently when operated, will reverse the rotation of the spur wheel 4. Such construction is desirable in order that the door spring may be used at either side of the door irrespective of the hinging of the door.

The coiled spring 7 surrounds the bolt 2 and is fixed at one end to the spur wheel 4. The upper end of said coil spring 7 bears laterally against the inner end of the rod 8. Said rod 8 is provided with an eye 9 which receives the bolt 2. At an intermediate point, the said rod 8 is provided with a suitable number of coils 10, the vertical axis of the coils being located directly opposite an edge of the door 11. The opposite end of the said rod 8 is provided with the cross-piece 12 to each end of which is formed a downturned end 13. The link 14 is provided at its end with the bends 15 which lies under the said cross-piece 12.

The plate 16 is fixed to the door 11 and is provided with the upturned flanges 17 between which the said link 14 is adapted to reciprocate. At all times the said link 14 rests flat against the side of the plate 16. At an intermediate point the said plate is provided with the guide 18 and within the said guide is located a nut 19, said nut being adapted to slide within the said guide 18. The shaft 20 is screw threaded at one end and enters the said nut 19, the extreme end of said shaft being located in a perforation 22 provided in the outer portion of the guide 18. The said shaft 20 passes through the door 11 through a registering perforation in the plate 16 and through the link 14. The shoulder 22′ is fixed to the shaft 20 and bears against a washer 23 attached to the opposite side of the door 11. The plate 24 is centrally perforated and receives the shaft 20 and fits against the outer side of the shoulder 22. Said plate 24 is also fixed to the door 11. The knob 25 is attached to the shaft 20 and its sleeve bears against the plate 24 in a manner usually employed in door knob constructions. It will thus be seen that as the door 11 is swung upon its hinges, the link 14 will slide longitudinally along the plate 16 and that the link at all times lies flat against said plate. When acting as a door spring, the moment that the door is released when in an open position, the tension of the spring 7 operating against the rod 8 will force the door into a closed position, it being understood that the spring 7 is of sufficient length so that the door may be readily swung open without overcoming too great tension and that the coils 10 provided in the rod 8 at the edge of the door in a measure permit the said rod 8 to make a bend at this point and consequently relieves the said

rod of much strain as the varying change in direction of the side of the door, occurs in the rod 8 at a point opposite the edge of the door.

When the door is opened and it is desired that the device be used as a door check, the knob 25 is turned so that the threaded end of the shaft 20 engaging the thread of the nut 19 moves the said nut 19 in the guides 18 toward the link 14 and the face of the said nut impinges the side link 14 against the plate 16.

The end of the link 14 which is provided with the bend 15 passes under the transversely extending portion 12 of the rod 8. The said end of the link is under slight tension to move away from the plate 16 and consequently the transversely extending portion 12 of the rod 8 is lifted as far as possible away from the said plate 16. The other end of the link 14 under which the rod 8 passes limiting the outward movement of the said rod. It is obvious that when the end 19 is moved down against the end of the link 14 provided with the bend 15 that the said end is depressed and the transversely extending portion 12 of the rod 8 may ride over the same.

The flanges 17 of the plate 16 are inclined and the downturned ends 13 of the transversely extending portion 12 of the rod 8 pass along the edges of the said flanges.

In the form of the invention as shown in Figs. 6 and 8, the link 14 is provided with a tongue 26. The end of the said tongue passes under the transversely extending portion 12 of the rod 8. The said tongue is provided with a hump 27 which normally lies against the side of the said portion 12 of rod 8. The said tongue 26 is linked at the point 28 around the link 14 and the extreme end 29 of the tongue 26 bears laterally against the side of the nut 19.

By reference to Fig. 6 of the drawing, it will be observed that the normal position of the hump 27 is against the side of the portion 12 of the rod 8 but when the nut 19 is depressed, said hump 27 is carried down below the said portion 12 of the rod 8 and the end of the said rod is free to pass over the end of the hump 27.

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

1. A door spring consisting of a rod, a spring actuated means attached to the jamb and engaging the said rod, a link engaging the end of said rod, and a means for clamping said link against the door.

2. A door spring consisting of a rod, a spring actuating means attached to the door jamb and engaging the said rod, a plate attached to the door and having a guide, a link pivotally attached to the end of said rod and adapted to reciprocate upon said plate, a shaft journaled in the door and having a screw thread, a nut threaded upon said shaft and adapted to reciprocate within the plate guide, and a suitable means for rotating said shaft.

3. A door spring consisting of a rod, a spring actuating means adapted to be attached to the door jamb and engage said rod, a link having bent ends which engage and receive the end of said rod, a plate attached to the door and supporting said link and clamping means coöperating with said plate and adapted to impinge said link.

4. A door spring consisting of a rod, a spring actuating means adapted to be attached to a door jamb and engaging said rod, said rod having at one end a cross-piece provided with downturned ends, a link attached to said rod, a plate adapted to be attached to the door and supporting said link and clamping means adapted to coöperate with said plate to impinge said link.

5. A device of the character as described consisting of a rod attached at one end to the door jamb, a link attached to the door and having a spring member passing under the end of the rod, said spring member having a hump which passes behind the rod.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

WILLIAM W. ROBERTSON.

Witnesses:
ERNEST L. GRANT,
JOHN MCWILLIAMS.