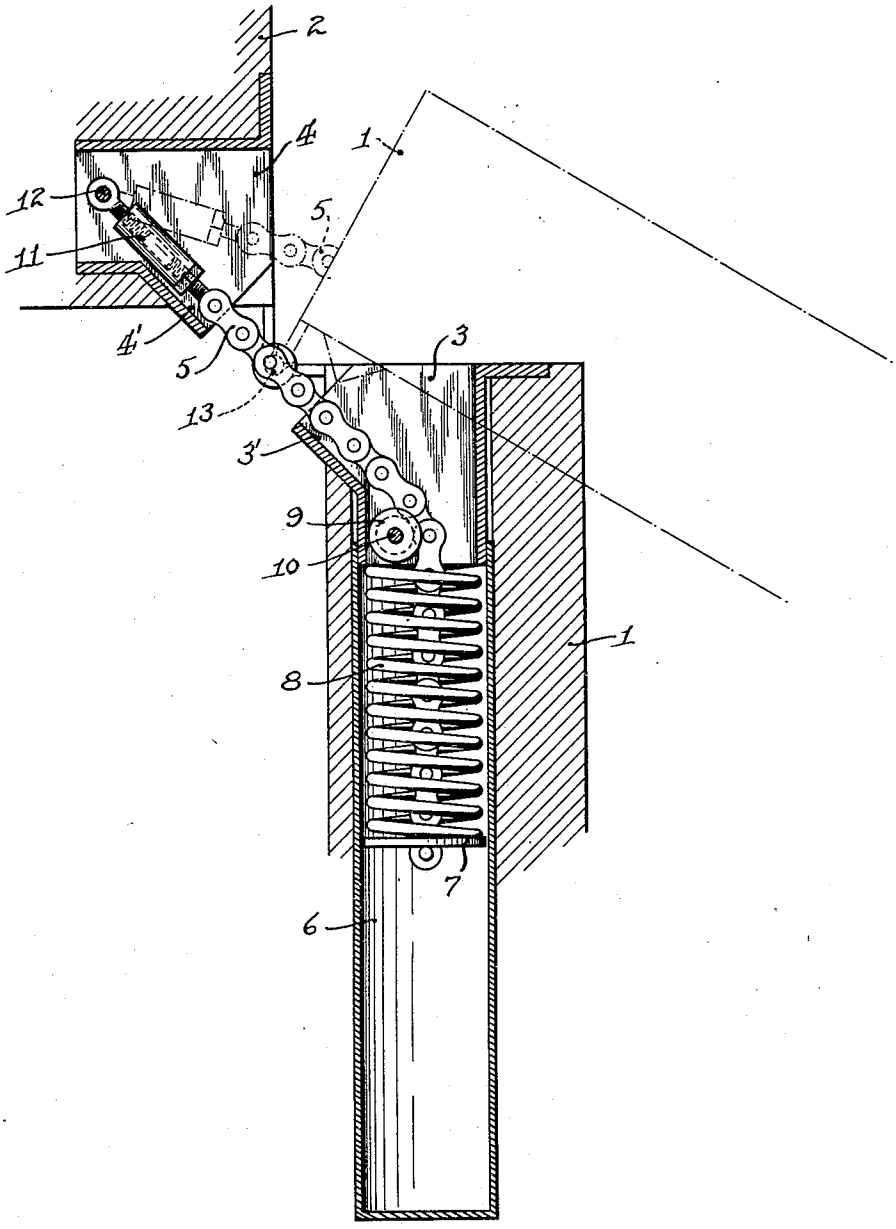
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DOOR CLOSER

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INVENTOR,
Silas W. C. Fitts,
BY Booth & Booth
ATTORNEYS.

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SILAS W. C. FITTS, OF ALAMEDA, CALIFORNIA, ASSIGNOR TO THE CONDOR COMPANY, OF SAN FRANCISCO, CALIFORNIA, A CORPORATION OF NEVADA

## DOOR CLOSER

Application filed March 17, 1931. Serial No. 523,269.

The present invention relates to door closers of the concealed spring actuated type, and constitutes an improvement upon the door closer disclosed in United States Letters Patent No. 1,730,948.

The principal object of the invention is to provide a door closer which will operate to close the door from any predetermined open position, but which will become inoperative when said position is reached in the opening of the door, so that the door will stand open at such position. A further object is to provide a device which will also operate to further open the door from said predetermined position to the full extent of its opening; that is to say, when the door is opened to any point less than the predetermined holding position, which may be 90 degrees, for example, it will be automatically closed, but when opened to said 90 degree position it will remain there, and when opened beyond said position it will be automatically opened the rest of the way to its limit of travel. Still further objects of the invention are to provide means for conveniently adjusting the length of the flexible tension member, thereby adjusting the tension of the closing spring, and to provide means for relieving the tension of said spring when the door is in its fully opened position. These and other objects and advantages of the invention will become apparent from the following specification, which should be read with the understanding that the form, construction and arrangement of the several parts may be varied, within the scope of the claims hereto appended, without departing from the spirit of the invention.

Reference should be had to the accompanying drawing in which the figure is a horizontal section of my improved door closer.

The door closer to which my present invention is applied is similar in general form and operation to that disclosed in said Patent 1,730,948.

In the drawing, the reference numeral 1 designates the door and 2 the door frame, although these parts may be reversed without affecting the construction or operation of the device in any way. 3 and 4 are similarly formed castings, one of which is inserted in the rear edge of the door and the other in the adjacent face of the door frame. The casting 4 forms an anchor member for a flexible tension member 5, preferably a chain as shown. The other end of said chain extends through the casting 3 and into a tubular housing 6 which is secured to said casting 3 and extended into the door 1, the casting 3 and housing 6 constituting what may be termed the body member of the assembly. The end of the chain within the body member is connected by a suitable thrust washer or disk 7 with a compression spring 8 mounted in the housing 6 between the disk 7 and the inner end of the casting 3. The spring 8, therefore, keeps the chain 5 under tension. A roller 9 is mounted upon a pin 10 in the casting 3, and serves as a guide for the chain 5.

The outer or fixed end of the chain 5 is connected with an adjusting turn-buckle 11, which is pivotally connected with a pin 12 in the anchor casting 4. The turn-buckle 11, which may be reached by a suitable small wrench inserted through the open mouth of the casting 4, serves to adjust the tension upon the chain 5, by varying its length.

The castings 3 and 4 have aligned lateral slotted offsets 3′ and 4′, which project through the inner faces of the door and door frame, and in which the chain 5 lies when the door is opened more than a small amount. This position of the chain, that is, its ability to pass into the lateral extensions 3′ and 4′, is permitted by placing the guide roller 9 and the anchor pin 12 some distance back from the edges of the door and frame.

The door hinge is shown in the drawing at 13. It may or may not be positioned in the same horizontal plane as the closer, but if it is so positioned it must be slotted to permit the chain 5 to pass through it.

The essential feature of the invention is that the lateral guide extensions 3′ and 4′ and the pins 10 and 12 are so positioned that the chain 5 will lie in the axis of the door hinge 13, when the door is opened to a predetermined position, as, for example, 90 degrees, as shown in full lines in the drawing. In this positional relation between the chain and the door

hinge, there is no force acting upon the door to either close or open it, and it therefore stands without moving. If the door be moved toward its closed position, the chain will pass inside the line of the hinge pin 13, as illustrated in broken lines, and the spring 8 will thereupon exert a closing force upon the door. When the door is opened from the position shown in full lines, the chain passes outside of the line of the hinge pin 13, and the spring 8 thereupon acts upon it to move the door further open to the limit of its travel. In this opening movement, the spring extends slightly, thereby relieving, to some extent at least, the strain upon it.

It should be noted that the threefold function of the device, that is to say, its ability to hold the door in a predetermined intermediate position, and to close or open it from either side of that position, is caused by positioning the guide roller 9 and the anchor-pin 12 back of the faces of the door and frame, and providing the lateral guide extensions 3′ and 4′ in which the chain passes as the door is opened. The position at which the chain is in line with the axis of the hinge 13, that is, the position at which the door remains stationary, is determined by the positions of the roller 9 and anchor-pin 12, and the extent of the lateral guides 3′ and 4′.

It should be noted that the operation of the device is entirely automatic, and the only adjustment required is that of the turn-buckle 11 to place the desired tension upon the chain 5. Moreover, the device is almost wholly concealed, the only exposed parts being the lateral guide extensions 3′ and 4′, and the chain when the door is open. Finally, by making the castings 3 and 4 identical, except for the positions of the pins 10 and 12, which can be inserted in drilled holes, manufacturing costs are reduced to a minimum.

I claim:—

1. A closer for hinged doors comprising an anchor member and a body member, one mounted in the door and the other in the door frame, and both having aligned lateral guide extensions on one side, a spring in said body member, and a flexible tension member having one end connected with said anchor member and the other end resiliently connected with said body member through said spring, said tension member being adapted to lie within said guide extensions when the door is opened.

2. A closer for hinged doors comprising an anchor member and a body member, one mounted in the door and the other in the door frame and both having aligned lateral guide extensions on one side, and a flexible tension member extending between and resiliently connecting said anchor and body members, said flexible member lying within said guide extensions when the door is opened and being positioned in line with the axis of the door hinge when the door is at a predetermined position and passing to one side of said hinge axis when the door is moved away from said position.

3. A closer for hinged doors comprising an anchor member and a body member, one mounted in the door and the other in the door frame and both having aligned lateral guide extensions on one side, a flexible tension member extending between and resiliently connecting said anchor and body members, said flexible member lying within said guide extensions when the door is opened and being positioned in line with the axis of the door hinge when the door is at a predetermined position and passing to one side of said hinge axis when the door is moved away from said position, and a turn-buckle included in said tension member for adjusting its length.

4. A closer for hinged doors comprising an anchor member and a body member, one mounted in the door and the other in the door frame, and both being laterally slotted, a guide in said body member positioned at the base of the slot and remote from the face thereof, and a flexible tension member having one end connected with said anchor member at a point inside the base of its slot and remote from its face and the other end passing over said guide and being resiliently connected with said body member, said tension member being arranged to pass laterally into the slots of said anchor and body members when the door is opened.

In testimony whereof I have signed my name to this specification.

SILAS W. C. FITTS.