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DOOR CLOSER

Filed July 17, 1928

Fig. 1.

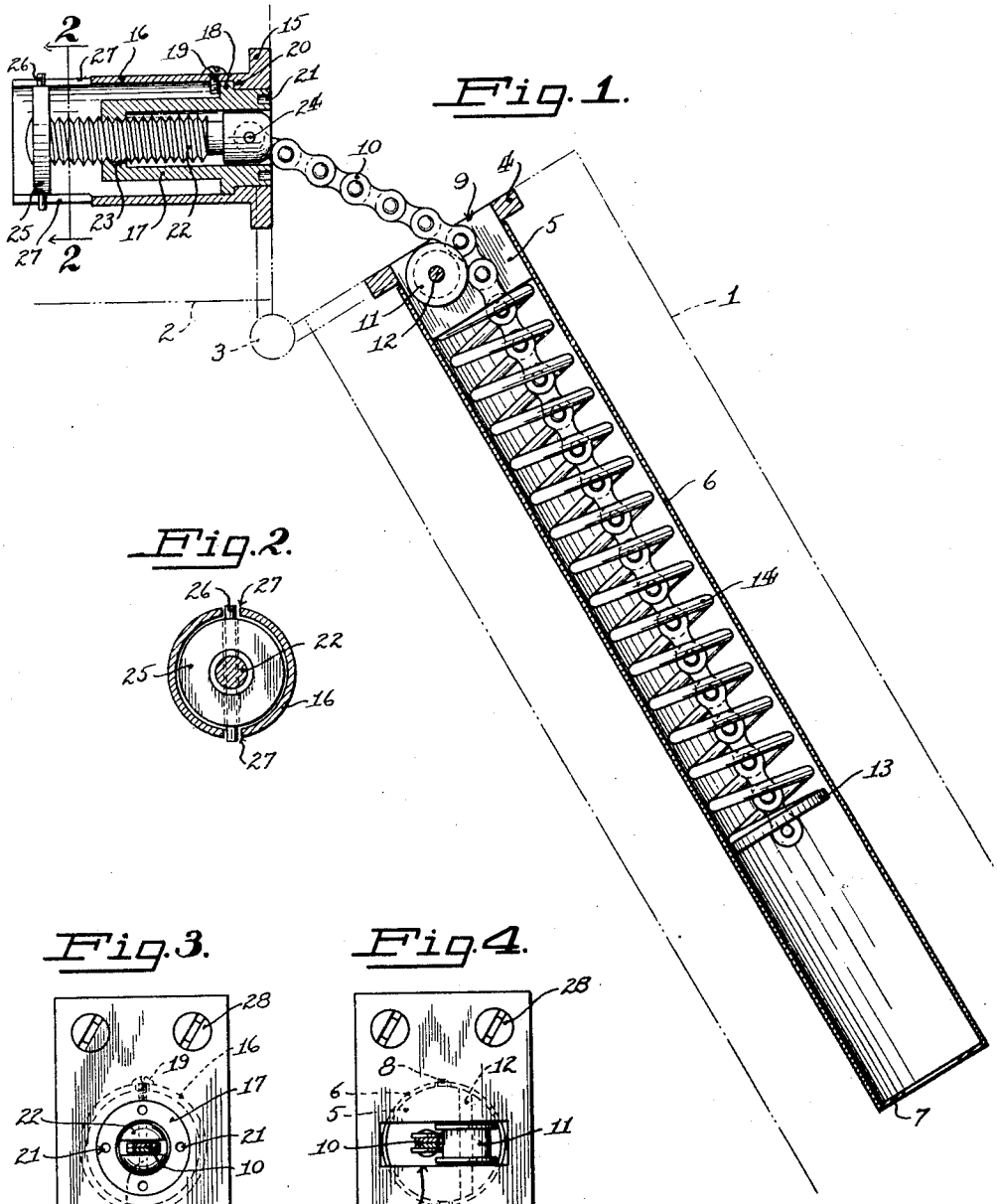


Fig. 2.

Fig. 3.

Fig. 4.

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DOOR CLOSER

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Our invention relates to door closers of the spring actuated type.

The principal object of the invention is to provide a door closer adapted to be concealed by being mortised into the door and its frame. Other objects are to provide a door closer which is capable of adjustment, and which is rugged and simple in construction, resulting in low cost of manufacture and long life.

Still further objects and advantages of the invention will become apparent from the following description of a preferred embodiment thereof, which should be read with the understanding that the form, construction, and arrangement of the several parts may be varied, within the limits of the claims hereto appended, without departing from the spirit of the invention as set forth therein.

Reference should be had to the accompanying drawings, wherein:—

Fig. 1 is a horizontal section of a preferred embodiment of my invention, showing its mounting in a door.

Fig. 2 is a transverse section on the line 2—2 of Fig. 1.

Figs. 3 and 4 are end or face elevations of the adjusting portion and spring portion, respectively.

Referring more particularly to the drawings, the reference numeral 1 designates the door, 2 the door frame, and 3 the hinge upon which the door hangs.

4 is a face plate set into the rear edge of the door, and may or may not be incorporated as a part of the hinge, as desired. The face plate 4 has an inward boss 5, to which is removably secured a barrel 6 extending into a suitably positioned bore or recess in the door. A flange 7 is preferably formed upon the inner end of the barrel 6. Any suitable connection may be used between the boss 5 and the barrel 6, which for purposes of illustration I have indicated at 8 in Fig. 4 as a bayonet lock joint.

The face plate 4 and its boss 5 are provided with a horizontally disposed slot 9, through which a flexible tension member 10 freely passes, running over a sheave 11 journaled upon a pin 12 which is located in the end of said slot nearest the hinge 3. The flexible tension member 10 may be of any suitable construction such as a cable, or, as shown, a chain. Its inner end is secured to a head 13, freely slidable in the barrel 6. A compression spring 14 is interposed between the slidable head 13 and the inner end of the boss 5.

The other end of the flexible tension member 10 is secured to the door casing 2 as follows: A face plate 15 is set in the door jamb, and carries a fixed sleeve 16, which extends into a suitable recess in said jamb. Within the sleeve 16 is a rotatable bushing 17, prevented from moving endwise by a flange 18 which lies between a removable lug or screw 19 and an interior shoulder 20 in said sleeve. The rotatable bushing 17 is provided with an interiorly threaded rear end, and with suitable grasping means upon its outer end, as for example holes 21 adapted to receive a spanner wrench, by which it may be turned. The outer end of said sleeve is preferably flush with the face of the plate 15.

A threaded stem 22 lies within the sleeve 17, and is screwed through its rear end, as shown at 23. The flexible tension member 10 is secured to the forward end of said stem, preferably by means of a removable pin 24. The rear end of said stem carries a guide or centering disk 25, freely slidable within the sleeve 16, and a pin 26 extends transversely through said disk and said stem, the ends of said pin projecting into and sliding within longitudinal slots 27 in the sleeve 16.

The operation of the device will be apparent from the drawing and the foregoing description. One end of the flexible tension member 10 being fixed by being secured to the stem 22, the spring 14 is compressed when the door is opened, and said spring is sufficiently strong to close the door by its expansion. The strength, or more properly the degree of compression of the spring can be adjusted by turning the bushing 17, thereby moving the stem 22 in or out. The stem is prevented from turning, during such adjustment, by the pin 26 working in the slots 27.

In installing the device, the flexible tension member 10 is disconnected from the stem 22 by removing the pin 24, said stem being moved outwardly by turning the bushing 17, to permit said pin to be removed. The barrel

6 and the sleeve 16 are then put in their respective sockets in the door and jamb, and secured in such positions by any convenient means, as for example screws 28 through the face plates 4 and 15. The head 13 now rests against the end flange 7 of the barrel 6. The stem 22 is moved outwardly to its limit, and the end of the flexible tension member 10 is connected therewith by insertion of the pin 24, the door being open just enough to allow access to said pin. Finally the stem 22 is moved inwardly to carry the pin 24 inside the bushing 17, thereby locking said pin in position, and also tightening the spring. Sufficient compression can then be put upon said spring, by moving the stem 22 farther in, to cause it to completely close the door under whatever specific conditions may exist.

It will be obvious that, if desired, the barrel 6 may be located in the door frame and the sleeve 16 in the door, without affecting the construction or operation of the device in any way. When a rectangular chain is used for the flexible tension member, as shown, the pin 26 and slots 27 may be dispensed with, since the stem 22 will be kept from rotating with the bushing 17 by the chain which passes through the rectangular slot 9.

When the door is closed, our device is entirely concealed, and when it is open, only the face plates and the flexible connecting member are in sight, and these are in a very inconspicuous position. The device is simple, its moving parts are few and of such a nature that they can be made of ample size to resist wear, and the strength of the spring can be readily adjusted, all of which will be apparent from the drawing and the foregoing description.

We claim:—

1. A door closer comprising an anchor member mounted upon one member of a hinge-connected door and door frame assembly; a rotatable bushing carried by said anchor member; a stem positioned within said bushing and having threaded connection therewith; a flexible tension member having one end connected with said stem; and a spring connecting the other end of said tension member with the other member of said assembly.

2. A door closer comprising an anchor member mounted upon one member of a hinge-connected door and door frame assembly; a rotatable bushing carried by said anchor member; a stem positioned within said bushing and having threaded connection therewith; means for preventing rotation of said stem; a flexible tension member having one end connected with said stem; and a spring connecting the other end of said tension member with the other member of said assembly.

3. A door closer comprising an anchor member adapted for insertion in one member of a hinge-connected door and door frame assembly; a rotatable bushing housed within said anchor member; a stem positioned within said bushing and having threaded connection therewith; a flexible tension member having one end connected with said stem; a spring housing adapted for insertion in the other member of said assembly; and a spring within said housing, said spring being connected with the other end of said tension member for resisting the opening of the door.

In testimony whereof we have signed our names to this specification.

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