March 15, 1955 F. M. NEWELL 2,703,907

DOOR CLOSER

Filed July 19, 1954

Fig: 1

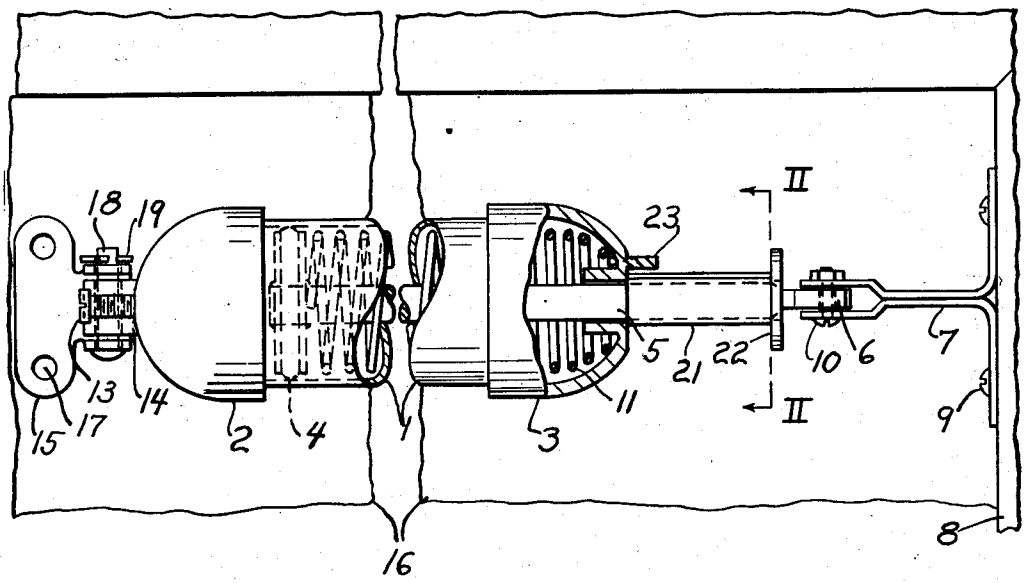
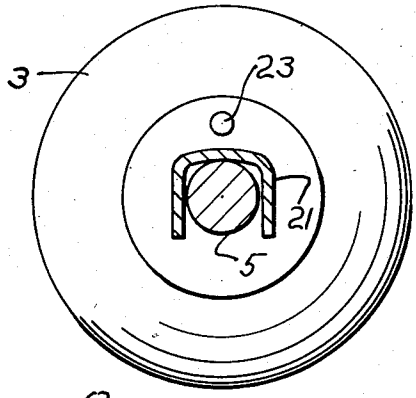


Fig: 2



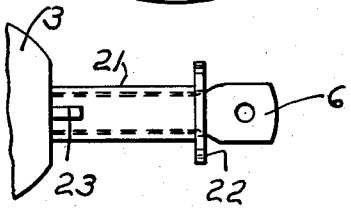


Fig: 3

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DOOR CLOSER

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2 Claims. (Cl. 16—66)

This invention relates to door closers, and more particularly to those of the spring and pneumatic check type.

A well-known type of door closer, usually used for screen doors, includes a barrel in which there is a plunger and a coil spring. The spring causes the door to close, but slamming is prevented by an adjustable valve for the opening through which air escapes from the barrel as the plunger moves towards the valve. For satisfactory checking of such a closer, the spring should be under a predetermined amount of compression at all times. This means that when the closer is installed the spring should be under the desired compression with the door closed. To acquaint the installer with the amount of compression that should be on the spring when he mounts the door closer in position, at least one manufacturer places a mark on the plunger rod just inside the barrel. The instruction sheet that accompanies the closer tells the installer to pull out the plunger rod until the mark on it is just visible at the end of the barrel, and to then install the closer with the rod in that position. In spite of such simple instructions, it has been found that they often are not followed. Either the instructions are ignored, or the plunger rod is pulled out too far. In either case the door closer does not check properly.

It is among the objects of this invention to provide a door closer of the type just described, in which the coil spring is placed under the desired compression by the manufacturer so that the installer is not required to do anything about the spring when he attaches the closer to a door.

In accordance with this invention, the door closer has a barrel with a plunger in it near its front end. A plunger rod is slidably mounted in the rear end of the barrel and is secured to the plunger. The outer end of the plunger rod extends away from the barrel and is provided with a stop. A coil spring encircles the rod inside the barrel between the plunger and the rear end of the barrel. There is a laterally removable spacing member on the rod between the stop and the barrel. The ends of this member engage the stop and barrel to hold the spring under a predetermined amount of compression until the door closer has been installed. The spacing member then is discarded.

The preferred embodiment of the invention is illustrated in the accompanying drawings, in which:

Fig. 1 is a fragmentary view of my door closer attached to a door frame and ready to be attached to the door;

Fig. 2 is an enlarged vertical section taken on the line II—II of Fig. 1; and

Fig. 3 is a fragmentary plan view showing the spacing member and outer end of the plunger rod as seen from above.

Referring to the drawings, the barrel of the door closer is formed from a cylinder **1** having substantially hemispherical caps **2** and **3** screwed onto its opposite ends. Inside of the cylinder there is a plunger **4** which is mounted on the front or inner end of a rod **5** that extends back through the barrel and out through a central opening in its rear cap **3**. The rod extends some distance back beyond the barrel and has its outer end flattened at **6** in order to extend into the fork of a bracket **7** that is connected to the side of the door frame **8** by screws **9**. The bracket fork and flat end of the plunger rod are provided with aligned holes, through which a bolt **10** extends that serves as a pivot. Inside of the barrel a long

coil spring **11** encircles the plunger rod and extends from the plunger to the rear cap **3**, against which it bears.

The front cap **2** is provided with the usual adjustable valve screw **13** that controls the escape of air from the barrel in front of the plunger as the front cap and plunger move toward each other. Also projecting from the front cap is an integral lug **14** that extends into the fork of a small bracket **15** that is adapted to be connected to the door **16** by screws (not shown) extending through holes **17** in the bracket. The lug and bracket are pivotally connected together by a pin **18** extending vertically through them and held in place by a cotter key **19**.

When such a door closer is in use, the coil spring will be compressed when the door is swung open because the barrel will be moved forward on the plunger rod. When the door is released, the expanding spring will swing the door closed, but the closing speed is determined by the rate at which air can escape from the front end of the barrel through the valve. To have the closer operate properly, the spring should be under compression even when the door is closed. This means that the spring must be under a predetermined amount of compression during installation of the door closer.

It is a feature of this invention that the person who installs this door closer does not need to be concerned with holding the spring compressed while he is fastening the closer into place, because the manufacturer has placed the spring under precompression. This is done by means of a spacing member **21** on the outer end portion of the plunger rod behind the barrel. This member engages the rear end of the barrel and a suitable stop on the outer end of the rod. Preferably, the stop is the usual hold-open washer **22** that is loosely mounted on the rod and that normally engages its flat perforated end **6**, as shown in Fig. 3. When a flat washer is used, as shown in the drawings, it is canted on the rod when in hold-open position by means of a projection **23** on the rear cap.

The spacing member most suitably is a U-shaped or channel-like clip which straddles the plunger rod. The clip loosely engages the rod so that the coil spring can cause washer **22** to press the opposite end of the clip against the rear cap **3**. The length of the clip therefore determines the extent of compression of the spring, and the pressure of the hold-open washer and the rear end of the barrel against the opposite ends of the spacer holds it in place during shipment, handling and installation of the door closer. The length of the spacer is chosen for holding the coil spring under the desired predetermined compression.

Bracket **7** is mounted on the door frame first, and then the outer end of the plunger rod, with spacer **21** in place, is pivotally connected to that bracket by bolt **10**. When bracket **15** supported by the front end of the barrel is swung back against the door, holes **17** in the bracket will be in the correct position for attachment of the bracket to the door. The barrel does not have to be pulled forward on the plunger rod to compress the spring, because spacer **21** is compressing the spring the correct amount. After the door closer has been installed in this manner, the door is swung open a little and the spacer will fall away from the plunger rod or can be removed laterally from it. Since there is no further use for the spacer, it can be discarded.

This invention insures that the door closer will be installed with the correct amount of spring pre-compression for proper checking.

According to the provisions of the patent statutes, I have explained the principle of my invention and have illustrated and described what I now consider to represent its best embodiment. However, I desire to have it understood that, within the scope of the appended claims, the invention may be practiced otherwise than as specifically illustrated and described.

I claim:

1. The combination with a door closer having a barrel, a plunger therein near the front end of the barrel, a plunger rod slidably mounted in the rear end of the barrel and secured to the plunger, the rod extending rearwardly away from the barrel and having a stop near its outer end, and a coil spring encircling the rod inside

the barrel between the plunger and the rear end of the barrel, of a laterally removable U-shape spacing member straddling the rod between the stop and barrel and in frictional engagement therewith to hold said spring under a predetermined amount of compression until the door closer has been installed.

2. The combination with a door closer having a barrel, a plunger therein near the front end of the barrel, a plunger rod slidably mounted in the rear end of the barrel and secured to the plunger, the rod extending rearwardly away from the barrel, a hold-open washer loosely mounted on the rod near its outer end, said outer end being provided with an enlargement limiting outward movement of the washer, and a coil spring encircling the rod inside the barrel between the plunger and the rear end of the barrel, of a laterally removable spacing member on the rod between the washer and barrel and in engagement therewith, the length of the spacing member being such as to hold the washer away from the barrel far enough to place the coil spring under a predetermined amount of compression until the door closer has been installed.

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