Sept. 12, 1933. R. S. POTTER 1,926,558

DOOR CLOSER

Filed Oct. 31, 1930 2 Sheets-Sheet 1

Fig. 1

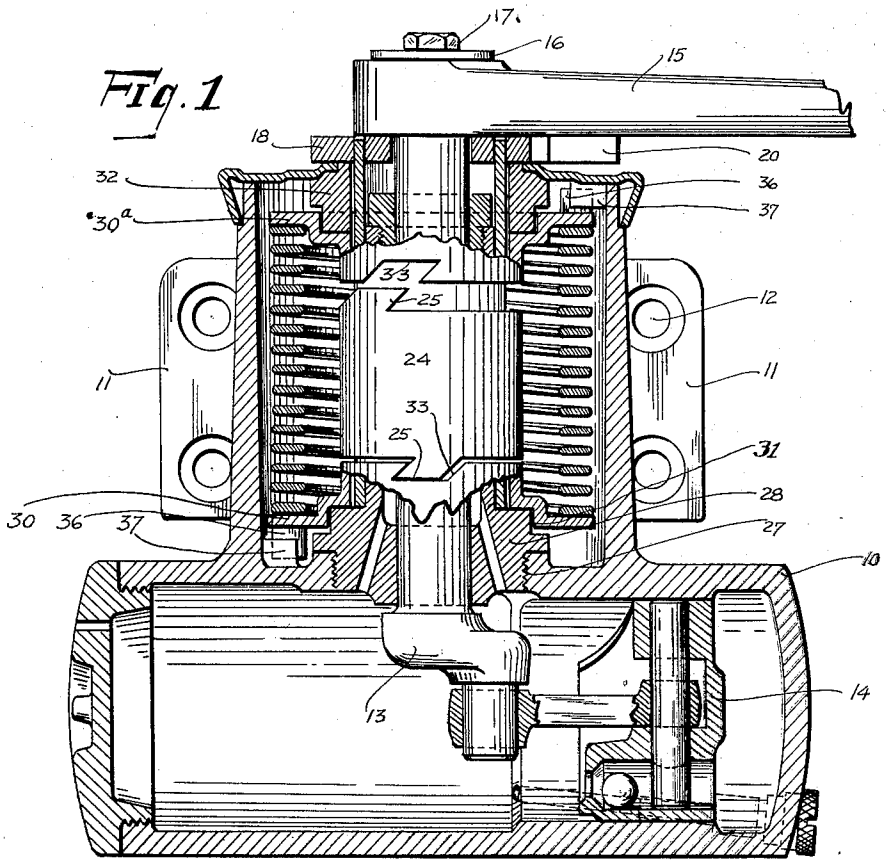
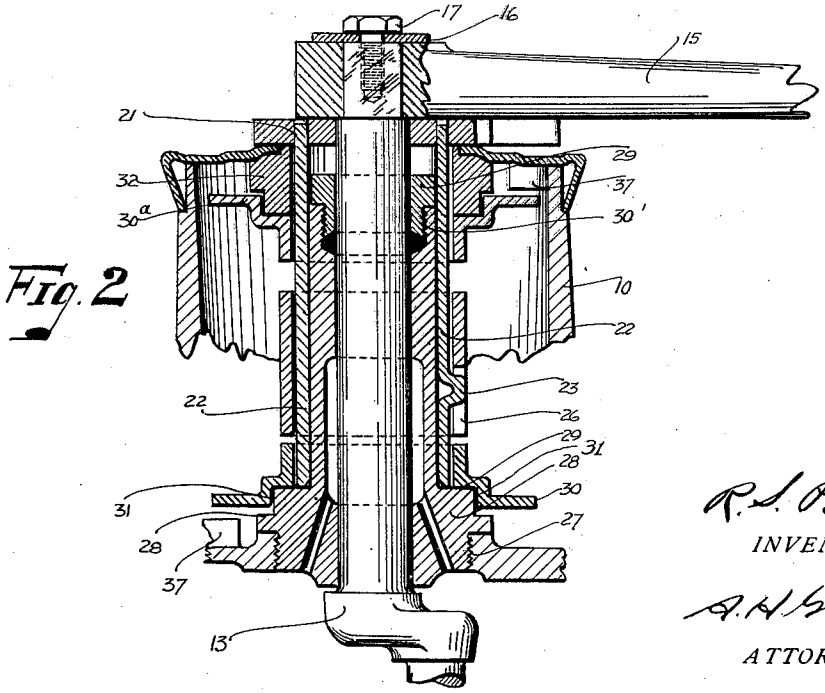


Fig. 2



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Filed Oct. 31, 1930 2 Sheets-Sheet 2

Fig. 3

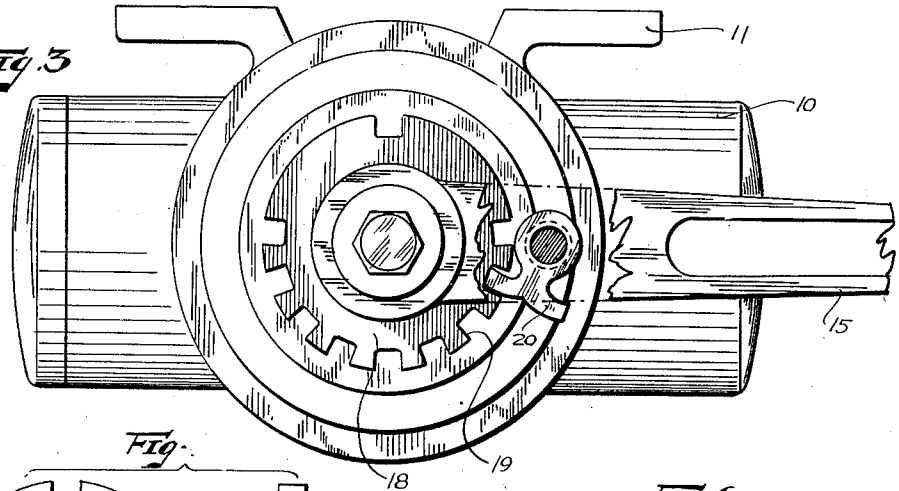


Fig. 4

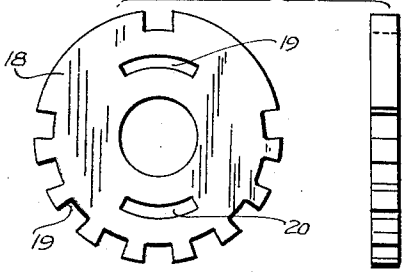


Fig. 6

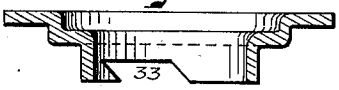


Fig. 5

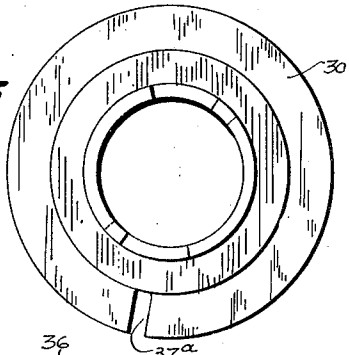


Fig. 8

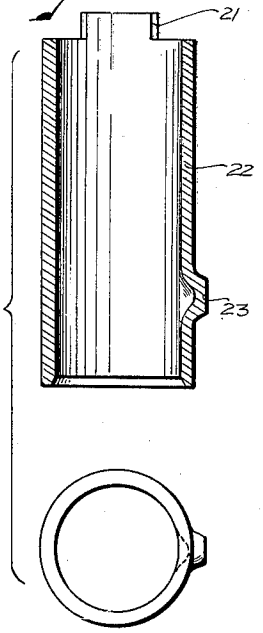
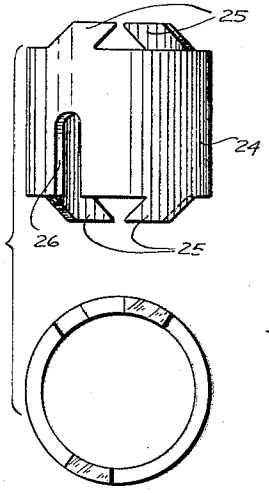


Fig. 9



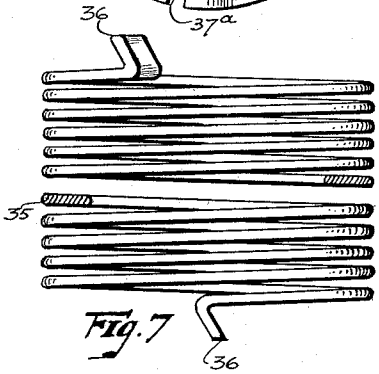


Fig. 7

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UNITED STATES PATENT OFFICE

1,926,558

DOOR CLOSER

Robert S. Potter, Old Greenwich, Conn., assignor to The Yale & Towne Manufacturing Company, Stamford, Conn.

Application October 31, 1930. Serial No. 492,413

4 Claims. (Cl. 16—59)

This invention relates to a door closer, and more especially to a door closer of the inherently reversible type.

More particularly my invention is an improvement over door closers of the type disclosed by Henry in his Patents Nos. 962,143 and 962,144 dated June 21, 1910. Referring to those patents, it will be noted that Henry utlizes a vertically moving clutch sleeve which is engageable with either one of a pair of winding members, to wind up a door closer spring so that the door closer may operate in the usual manner well known in the art.

My invention is an improvement over the patents of Henry in that it eliminates the possibility of friction by a very simple and ingenious arrangement of elements.

It discloses a further improvement over Henry and the prior art in the arrangement for the mounting of the spring and the limiting of the movement of the winding discs and the spring, this arrangement being of a very simple and effective type. Other improvements will be apparent after a review of the specification and drawings wherein a preferred modification of my invention is shown and described. In the drawings, Fig. 1 is a sectional view of my door closer showing the invention in one of its operating positions. Fig. 2 is a view similar to Fig. 1 with certain additional parts in sections. Fig. 3 is a plan view of my door closer showing the relation of the closing arm thereto. Fig. 4 is a plan and side view of an actuating disc. Fig. 5 is a plan view of the one of the winding discs, while Fig. 6 is a sectional view thereof. Fig. 7 is a view of the spring I use in my door closer. Fig. 8 is a sectional and top view of the driving sleeve and Fig. 9 is an elevation and top view of the clutch device carried thereby.

Referring now more particularly to the drawings, reference numeral 10 indicates a door closer casing of the usual type, which is secured to the door by a pair of bracket members 11 held by a series of screws for which the holes 12 are designed. The closer utilizes a regulation type of operating shaft 13 and checking mechanism 14 of the liquid type well known in the art and which need not be described here.

A door closer arm 15 is secured to the door closer shaft 13 by a washer 16 and a nut 17 and is adapted to rotate therewith. An actuating disc 18 (see Fig. 4) is mounted upon the door closer shaft and is equipped with a series of teeth 19 with which cooperates a pawl 20 carried by the door closer arm 15. The disc 18 is cut out at points 19 and 20 for the accommodation of the lug portions 21 of an actuating sleeve 22 which is thereby secured thereto. It will be readily understood that by this arrangement, the sleeve 22, the shaft 13 and the arm 15, will rotate simultaneously upon movement of the arm 15 when the door closer is operated in either the closing or opening direction.

The sleeve 22 is preferably constructed of sheet metal and has a lug portion 23 formed thereon. Of course, it will be readily understood that this lug may be formed in any manner and may be cast onto the sleeve or secured by a screw to the sleeve for the particular purpose described hereinafter. Mounted upon this sleeve is a clutch member 24 having a pair of clutch arms 25 located at either end of the same. This clutch 24 is also equipped with a slot 26 which cooperates with the lug portion 23 of the sleeve 22 for a purpose described hereinafter.

The door closer is formed with a screw threaded portion 27 into which is fitted a bearing portion 28, which is in screw threaded relationship to the portion 27 and is secured thereto. The upward end of the bearing portion 28 is also screw threaded at 30′ for the accommodation of a washer holding member 29′ which prevents the flow or splash of the liquid in an upward direction as will be readily understood by those skilled in the art. The part 28 forms a thrust bearing 29 upon which a winding disc 30 is adapted to rotate. This disc 30 has a downwardly extending flange forming a clearance 31 between the winding disc 30 and the bearing member 28, this clearance being so designed that the flange of disc 30 will rub against the bearing member 28 upon any lateral shifting of the disc 30, in order to prevent contact of the disc with the sleeve member 22 about which it is centered, and about which it is adapted to be rotated as will be described presently.

The upper portion of the door closer is equipped with a bearing portion 32 with which an upper winding disc 30*a* cooperates in the same manner as the lower disc 30 cooperates with the bearing member 28.

Looking now at Figs. 1, 5, and 6, it will be observed that each of the discs 30, 30*a*, is equipped with a cutout portion 33 adapted to cooperate with the extended elements 25 on the clutch 24 in a manner similar to that ofthe Henry Patent 962,143. Rotation of the sleeve 22 in either direction, will operate through the lug 23 to move the clutch member 24 either upwardly into co-action

with the upper disc 30a or downwardly into co-action with the disc 30.

The usual type of door closer spring and mounting is varied in accordance with the teachings of my invention to obtain a more efficient operating unit, and at the same time, obtain a unit which may be economically constructed and economically assembled while maintaining the efficiency and operating power which is required in an efficient door closer.

The spring utilized in my invention is shown in Fig. 6 and consists of a helically wound spring 35 which has two ends 36, shaped as shown. Each of these ends is adapted to enter a cut-out portion 37a in its particular winding disc 30 or 30a. As will be noted in Fig. 1, each end 36 will extend beyond the portion 37a and into co-operation with lugs 37 which are secured to the closer casing in any desirable manner. It will be readily understood that if the upper winding disc 30a is actuated by rotation of the sleeve 22, it will rotate the spring end 36 away from the upper lug 37. At the same time the winding of the spring will force its other end 36 into cooperation with the lower lug 37 so as to limit the movement of this lower end and cause continued winding tension of the spring, this tension being utilized in a manner well known in the art.

While my invention is not basic in character, it has made practical the type of reversible door closer disclosed by Henry. This type of door closer has now become commercially successful because it is operable with a minimum of friction and with a minimum number of operating parts arranged in an efficient manner. My invention has considerable merit, therefore, and while I have disclosed a specific embodiment of the same, it should be understood that variations within the scope of the appended claims will readily occur to one skilled in the art.

I claim:

1. In a door closer, an operating shaft, a sleeve adapted to rotate with said shaft, a pair of spring winding discs mounted coaxially with said sleeve and extending about the same, a pair of bearings for said discs adapted to maintain the same against outward thrust while permitting rotation about said sleeve, said bearings being arranged to prevent contact between said sleeve and either of said discs.

2. In a door closer, an operating shaft, a sleeve adapted to rotate with said shaft, a pair of spring winding discs mounted coaxially with said sleeve and extending about the same, a spring surrounding said sleeve and bearing at each end on said discs, said spring being secured for winding movement by either one of said discs relatively to the other disc, means carried by said sleeve for rotating one or the other of said discs depending upon the direction of rotation of said shaft, a pair of bearings for said discs adapted to maintain the same against outward thrust and for rotation about said sleeve, said bearings being arranged to prevent contact between said sleeve and either of said discs, whereby rotation of the sleeve and one of said discs will be free of frictional resistance by the stationary one of said sleeves.

3. In a door closer, an operating shaft, a sleeve adapted to rotate with said shaft, a pair of spring winding discs mounted coaxially with said sleeve and extending about the same and having vertical flanges spaced parallel to the cylindrical face of said sleeve, a spring surrounding said sleeve and bearing at each end on said discs, said spring being secured for winding movement by either of said discs relatively to the other disc, a clutch member mounted about said sleeve and adapted to be actuated thereby for rotating one or the other of said discs depending upon the direction of rotation of said shaft, a pair of bearings for said discs adapted to maintain the same against outward thrust and for rotation about said sleeve so as to be available for actuation by said clutch member, said bearings being arranged however to prevent contact between said sleeve and either of said discs while so maintaining them, whereby rotation of the sleeve and one of said discs will be free of frictional resistance by the stationary one of said sleeves.

4. In a door closer, an operating shaft, a sleeve adapted to rotate with said shaft, a pair of spring winding discs mounted coaxially with said sleeve and extending about the same, a spring surrounding said sleeve and bearing at each end on said discs, said spring being secured for winding movement by either of said discs relatively to the other disc, a clutch member mounted about said sleeve and adapted to be actuated thereby for rotating one or the other of said discs depending upon the direction of rotation of said shaft, a pair of bearings for said discs adapted to maintain the same against outward thrust and for rotation about said sleeve so as to be available for actuation by said clutch member, said bearings being arranged however to prevent contact between said sleeve and either of said discs while so maintaining them, whereby rotation of the sleeve and one of said discs will be free of frictional resistance by the stationary one of said sleeves.

ROBERT S. POTTER.