Sept. 16, 1958 B. S. BERNHARD 2,851,719

DOOR CLOSER

Filed Feb. 11, 1955

Fig. 1.

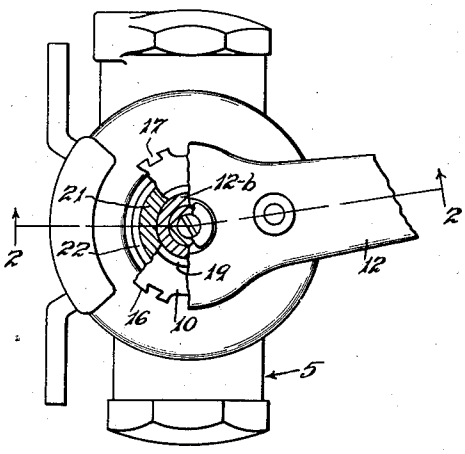


Fig. 3.

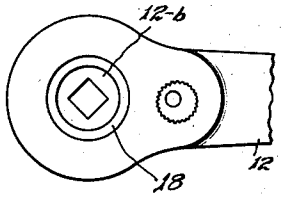


Fig. 4.

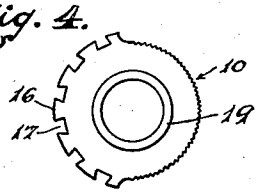


Fig. 5.

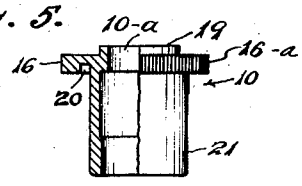


Fig. 2.

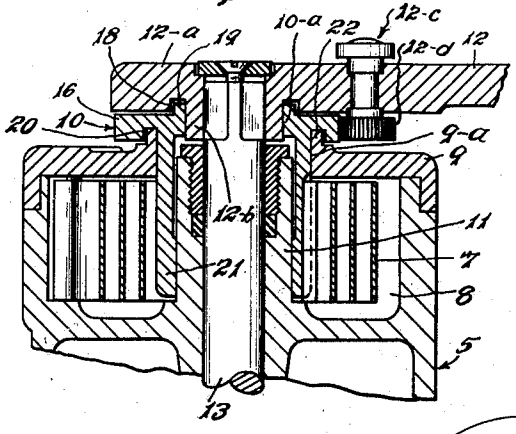


Fig. 6.

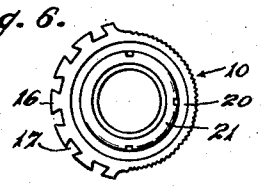
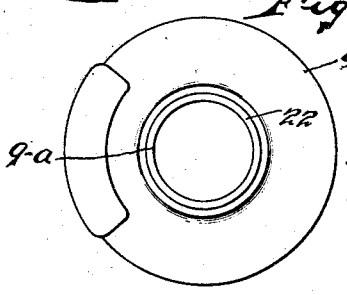


Fig. 7.



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DOOR CLOSER

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Application February 11, 1955, Serial No. 487,675

5 Claims. (Cl. 16—49)

This application relates to a door closer and is a continuation-in-part of my copending application Serial No. 466,019, filed November 1, 1954, and now Patent No. 2,806,244, dated September 17, 1957.

An object of the invention covered in this application is to provide a door closer which is so constructed that foreign matter, such as rain and dirt, is prevented from entering the interior of the case thereof.

Further objects of this invention are to provide a bearing for the ratchet of such a door closer which also functions as a seal against dirt and water, and to provide a baffle structure between said ratchet and the operating arm of the door closer which prevents the entry of foreign matter into the case at this point.

Further objects and advantages of the present invention will be more clearly understood from the following description and from the accompanying drawing in which:

Fig. 1 is a plan view of a door closer embodying the invention with parts thereof being broken away to illustrate its construction.

Fig. 2 is an enlarged sectional side view of the upper portion of said door closer taken on line 2—2 of Fig. 1.

Fig. 3 is a bottom view of the inner end of the operating arm employed in the door closer.

Fig. 4 is a plan view of the ratchet member therein.

Fig. 5 is a side view, partly in central vertical section, of said ratchet member.

Fig. 6 is a bottom view thereof.

Fig. 7 is a plan view of the cover member.

The door closer embodying the instant invention includes a case, generally indicated by the numeral **5**, having a suitable damping mechanism therein (not shown) and a spiral return spring **7** which is contained within a spring chamber **8** in said case. Said case also includes a cover **9** which is disposed over and closes said chamber. The inner end of the spring **7** is anchored to a tubular ratchet **10** that extends through an axial opening **9**–*a* in the cover **9** and is rotatably mounted on said cover and on a hub **11** in said case; the outer end of said spring being anchored to the wall of the chamber **8**.

The operating arm **12** of the door closer is non-rotatably secured to a shaft **13** which is journaled in the hub **11** of the case **5** and operates the piston generally included in the damping mechanism. Said securing means is of well known construction and includes a washer clamped against the upper face of the operating arm by a screw, as shown in Figs. 1 and 2. The hub **11** also is provided with a well known structure that includes a packing washer and a threaded thimble which compresses the packing washer, this being clearly shown in Fig. 2. The ratchet **10** has an annular flange **16** thereon disposed between the cover **9** and the hub portion **12**–*a* of the arm **12** and the rear portion of said flange contains a series of dovetailed notches **17** adapted to receive a suitable spanner wrench for rotating the ratchet when it is desired to adjust the tension of the spring **7**. A flange **12**–*b* extends downwardly from said hub portion and into an

axial opening **10**–*a* in the ratchet **10**. The arm **12** and the ratchet **10** are normally secured against relative rotation by a dog **12**–*c* having a serrated eccentric foot **12**–*d* which jams against the serrated edge **16**–*a* of the flange **16** as fully described in my previously mentioned Patent No. 2,806,244.

The invention covered in this application is particularly directed to the provision of improved means for sealing the interior of the door closer against the entry of rain and dirt. As shown in the drawing, an annular recess **18** is provided in the underside of the hub portion **12**–*a* of the arm **12** around the hub flange **12**–*b*, and an upwardly projecting annular flange **19** is provided on the ratchet member around the opening **10**–*a* and extends into the said annular recess **18**. In addition, an annular recess **20** is provided in the underside of the flange **16** on the ratchet around the tubular portion **21** thereof, and an upwardly projecting annular flange **22** is provided on the cover **9** around the opening **9**–*a* therein and extends into said annular recess **20**.

When the parts of my improved door closer are assembled, as clearly illustrated in Fig. 2, the flanges **19** and **22** extend into their respective recesses **18** and **20**. The top surface of the annular recess **20** bears upon the upper surface of the annular flange **22** and this arrangement provides a thrust bearing for rotatably supporting the ratchet against movement axially inwardly with respect to the case. In addition, the mating surfaces provide a seal which prevents the entry of foreign matter into the interior of the case.

The flange **19** on the top of the ratchet fits into the annular recess **18** and thereby provides an effective baffle which prevents the entry of foreign matter into the interior of the case at this point.

I claim:

1. In a door closer including a case having a spring chamber therein and an axial opening providing a bearing for a shaft, a rotatable shaft extending into said axial opening, a cover on said case closing said chamber, a ratchet member having a hub portion extending through an axial opening in said cover, an annular flange extending laterally from said ratchet member, and an operating arm secured to said shaft and having a hub portion extending into an axial opening in said ratchet member, sealing means including an annular recess in the underside of the operating arm surrounding the hub portion thereof, an annular flange on the ratchet member surrounding the axial opening therein and extending upwardly into the annular recess in the operating arm, an annular recess in the underside of the lateral flange on the ratchet member surrounding the hub portion thereof, and an annular flange on said cover surrounding the axial opening therein and extending upwardly into the said annular recess of the ratchet member.

2. In a door closer including a case having an opening therein and a rotatable shaft extending through said opening, a ratchet extending through said opening and rotatably carried by said case, said ratchet having an opening therein through which said shaft extends, an operating arm secured to said shaft and rotatable relatively to said ratchet and said case, and means normally connecting said operating arm to said ratchet, sealing means comprising an annular recess in said operating arm surrounding said shaft, an annular flange on said ratchet surrounding the opening therein and fitting into said recess, a second annular recess in said ratchet surrounding said shaft and an annular flange on said case surrounding the opening therein and fitting into the recess in said ratchet.

3. In a door closer, a case having a circular opening therein, a rotatable shaft extending through said opening, a ratchet extending through said opening and having an

annular recess therein, an annular flange on said case surrounding said opening and projecting into said recess, said flange supporting said ratchet for rotation relatively to said case and providing a seal preventing the passage of foreign matter into the opening therein, said ratchet containing an opening through which said shaft extends, an operating arm secured to said shaft and rotatable relatively to said ratchet and said case, means normally connecting said arm to said ratchet, said arm having an annular recess therein surrounding said shaft, and an annular flange on the top of said ratchet surrounding the opening therein and fitting into the recess in said arm.

4. In a door closer including a case having an opening therein and a rotatable shaft extending through said opening, a ratchet member extending through said opening and rotatably carried by said case, said ratchet member having an opening therein through which said shaft extends, an operating arm member secured to said shaft having a hub fitting into the opening in said ratchet member, said arm member being rotatable relatively to said ratchet member and said case, means normally connecting said operating arm member to said ratchet member, and sealing means including an annular recess in one of said members surrounding said shaft and an annular flange

on the other of said members fitting into said recess thereby preventing the passage of foreign matter between said members.

5. In a door closer including a case having an opening therein and a rotatable shaft extending through said opening, a ratchet extending through said opening and rotatably carried by said case, said ratchet having an opening therein through which said shaft extends, an operating arm secured to said shaft having a hub fitting into the opening in said ratchet, said arm being rotatable relatively to said ratchet and said case, means normally connecting said operating arm to said ratchet, and sealing means including an annular recess in said operating arm surrounding said shaft and an annular flange on said ratchet surrounding said opening therein and fitting into said recess thereby preventing the passage of foreign matter between said arm and ratchet.

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