Sept 17, 1957 B. S. BERNHARD 2,806,244

DOOR CHECK AND CLOSER

Filed Nov. 1, 1954

Fig. 1.

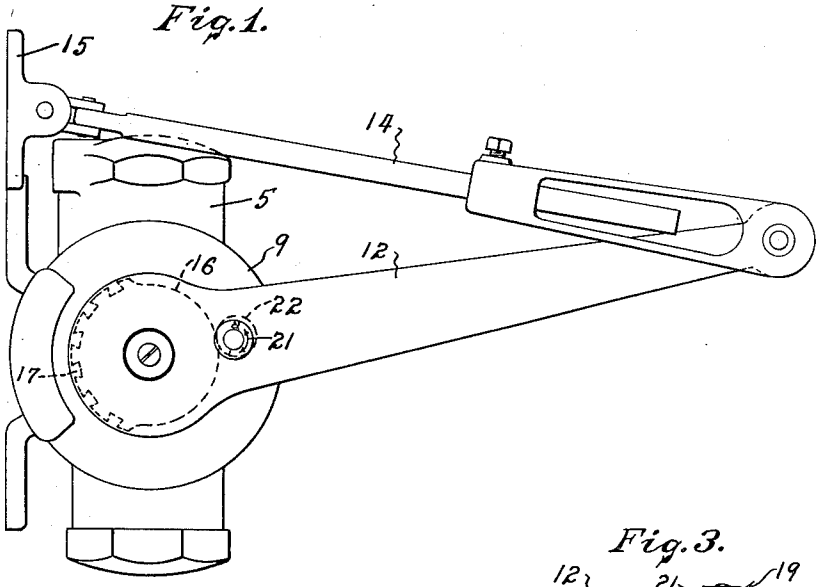


Fig. 3.

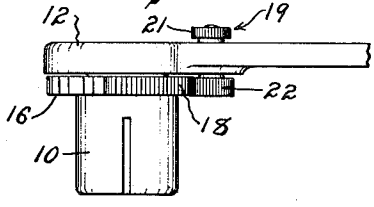


Fig. 2.

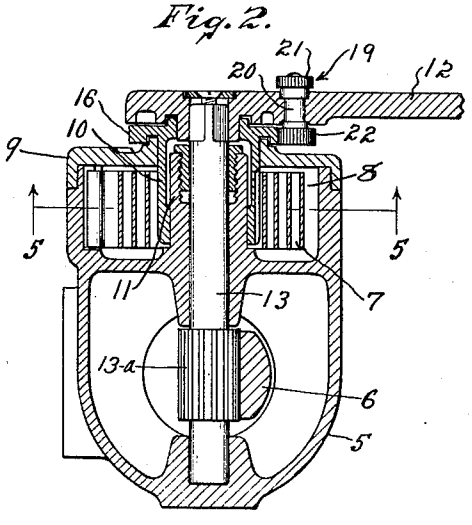


Fig. 4.

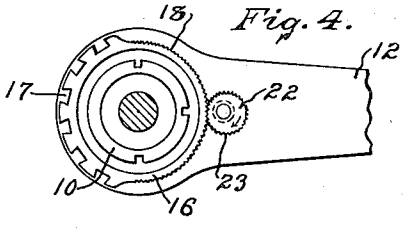
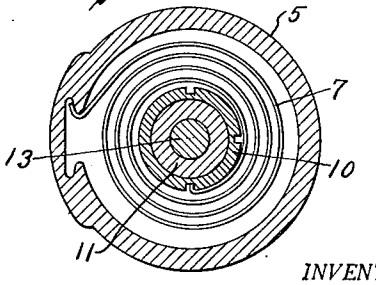


Fig. 5.



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DOOR CHECK AND CLOSER

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6 Claims. (Cl. 16—65)

This invention relates to a door check and closer and more particularly in the construction of the ratchet and pawl normally incorporated in such devices to permit adjustment of the return spring thereof.

An object of the present invention is to provide a ratchet and pawl mechanism which is much easier to manipulate than conventional mechanisms when it is desired to adjust the tension of said return spring.

A further object of this invention is to provide a ratchet and pawl which will permit finer adjustment of the return spring than is now possible in conventional devices of this type.

Further objects and advantages of the 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 check and closer embodying my present invention.

Fig. 2 is a side view thereof in central vertical section.

Fig. 3 is a side view of the operating arm of the door check and closer and my improved ratchet and pawl mechanism.

Fig. 4 is a bottom view thereof.

Fig. 5 is a sectional bottom view taken on line 5—5 of Fig. 2.

The present invention is embodied in a conventional door check and closer which, as illustrated in the drawing, commonly includes a case **5** which is secured to the door and has a check mechanism **6** therein and a spiral return spring **7** which is contained within a spring chamber **8** in said case that is closed by a suitable cover **9**. The inner end of the spring is anchored to a tubular ratchet **10** that extends through an opening 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 is anchored to the wall of the chamber **8**, as clearly shown in Fig. 5.

The operating arm **12** of the door check and closer is non-rotatably secured to a shaft **13** which is rotatably mounted in the case **5** and operates the check mechanism through a pinion **13**–*a* thereon. An adjustable frame arm **14** is pivotally attached at one end to the outer end of said operating arm, and the opposite end of said frame arm is pivotally attached to a bracket **15** which is normally secured to the door frame.

The ratchet **10** has an annular flange **16** thereon disposed between the cover **9** and the arm **12**, and a portion of said flange is provided with a series of dove-tailed notches **17** to receive a suitable spanner wrench for rotating the said ratchet when it is desired to adjust the tension of the spring **7**.

The present invention is particularly directed to the provision of improved means for adjustably connecting the ratchet **10** to the operating arm **12** so as to permit adjustment of the spring tension thereon and adaptation of the door check and closer to right or left hand doors.

It will be seen from the drawing that substantially half of the circumferential surface of the flange **16** on the ratchet **10** is serrated to provide a plurality of vertically disposed fine teeth **18** thereon, and that the operating

arm **12** carries a pawl **19**. Said pawl includes a shaft **20** that is rotatable in and extends through the arm **12** and has at its upper end a knurled knob **21** and at its lower end an eccentric circular foot **22** which is serrated to provide a plurality of fine teeth **23** therearound which are adapted to mesh with the teeth **18** on the flange **16**. The knob **21** is provided with suitable indicia denoting the direction in which the pawl should be rotated to adapt the door check and closer for use on right or left hand doors.

In the drawing, I have illustrated the door check and closer as applied to a right hand door, and it will be understood that in such an installation the return spring **7** tends to rotate the ratchet **10** in a clockwise direction as viewed in Fig. 1, and, due to the engagement of the teeth on the flange **16** with the teeth **23** on the foot **22** of the pawl **19**, said pawl is urged in a counter-clockwise direction. Since the foot **22** is disposed eccentrically with respect to the shaft **20** of the pawl, it will jam against the flange and prevent rotation of the ratchet relatively to the arm **12**. When the door is opened, the arm **12** and the ratchet **10**, which is secured thereto by the pawl **19**, move in a counter-clockwise direction and wind the spring **7** so that upon release of the door, said spring will rotate the ratchet and the arm in a clockwise direction to close the door.

When it is desired to adjust the tension of the spring, a suitable wrench is inserted into one of the notches **17** in the flange **16** on the ratchet and said ratchet is rotated in a counterclockwise direction to just release the tension on the pawl **19**. Said pawl is then rotated in a clockwise direction to disengage the foot **22** thereon from the flange on said ratchet and the ratchet is then rotated to either wind or unwind the spring, depending upon whether it is desired to increase or decrease the tension thereof.

When the desired tension has been obtained, the pawl is rotated in a counterclockwise direction until the teeth **23** on the foot **22** thereof are in engagement with the teeth **18** on the flange **16** of the ratchet. The ratchet may then be released and the pawl **19** will hold it in adjusted position.

When the door check and closer is to be installed on a left hand door, the position of the spring **7** in the spring chamber **8** is reversed from that shown in Fig. 5 and said spring then tends to rotate the ratchet **10** in a counterclockwise direction as viewed in Fig. 1. Under such conditions, the arm **12** is secured against rotation relatively to the ratchet by rotating the pawl **19** in a clockwise direction, as viewed in Fig. 1, until the teeth on the eccentric foot **22** thereof engage the teeth on the flange **16** of the ratchet. The said foot **22** will then be jammed against the ratchet by the force exerted by the return spring **7** to thereby prevent relative rotation of the ratchet and the arm **12**.

It will be understood from the above description that by the provision of the fine teeth and the eccentric pawl, it is possible to obtain a very fine adjustment of the spring **7** and to securely lock the ratchet **10** to the operating arm **12** in the adjusted position and against accidental disengagement of the pawl from the ratchet.

I claim:

1. In a door check and closer including a check mechanism, an operating arm connected to said mechanism, a return spring for driving said arm, and means for anchoring one end of said spring; means for adjustably connecting said spring to said arm including a rotatable ratchet member having the opposite end of said spring anchored thereto, a pawl rotatably mounted on said operating arm and having an eccentric foot portion adapted to jam against the adjacent face of said ratchet whereby said arm

is adjustably secured to the ratchet for movement therewith in one direction.

2. In a door check and closer including a check mechanism, an operating arm connected to said mechanism, a return spring for driving said arm, and means for anchoring one end of said spring; means for adjustably connecting said spring to said arm including a rotatable ratchet member having the opposite end of said spring anchored thereto, a series of teeth on said ratchet member, and a pawl rotatably mounted on said operating arm and having an eccentric portion with a surrounding series of teeth thereon engageable with the teeth on the ratchet member.

3. The subject matter set forth in claim 2 including manually operable means on said pawl for rotating the eccentric portion out of engagement with said ratchet.

4. In a door check and closer including a case having a check mechanism therein, an operating arm connected to said mechanism, a return spring for driving said arm, and means for anchoring one end of said spring to said case; means for adjustably securing said spring to the operating arm including a tubular ratchet rotatably mounted in said case and having the opposite end of said spring anchored thereto, an annular flange on said ratchet having a series of teeth extending around a portion thereof, a pawl including a shaft rotatably mounted in said arm and having an eccentric foot thereon disposed adjacent to said flange, a series of teeth on said eccentric foot engageable with the teeth on said flange, and means on said flange adapted to receive a tool for rotating said ratchet.

5. In a door check and closer including a case having a check mechanism therein, an operating arm connected to said mechanism, a return spring for driving said arm, and means for anchoring one end of said spring to said case; means adjustably connecting said spring to said operating arm including a ratchet rotatably mounted in said case and having the opposite end of said spring anchored thereto, an annular flange on said ratchet disposed exteriorly of the case, a plurality of notches in said flange for receiving a tool; a portion of the circumferential edge of said flange being serrated to provide a plurality of fine teeth therearound, a pawl including a shaft rotatably mounted in said arm and having a circular foot portion eccentrically mounted on one end thereof adjacent said flange; at least a portion of the circumference of said circular foot being serrated to provide a series of teeth thereon engageable with the teeth on said flange, and a knob at the opposite end of said shaft for rotating said pawl to move said foot into and out of engagement with said flange.

6. In a door check and closer including a case, a check mechanism in said case, a rotatable operating arm connected to said mechanism, a return spring for rotating said arm, and means for anchoring one end of said spring to said case; means for adjustably connecting said spring to said arm including a ratchet rotatably mounted in said case and having a cylindrical peripheral face, the opposite end of said spring being anchored to said ratchet whereby said ratchet is normally urged to rotate in one direction, a pawl movably mounted on said arm and normally freely movable thereon toward and away from said cylindrical peripheral face and into frictional engagement therewith upon movement of the pawl toward said cylindrical peripheral face, whereby the force of said spring will rotate said ratchet and displace said pawl into jamming relationship with the peripheral face of the ratchet and thereby prevent rotation of said ratchet relatively to said arm.

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