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J. J. DREXLER ET AL

DETENT MECHANISM FOR DOOR CLOSERS AND THE LIKE

Filed Nov. 4, 1925

Fig. 1.

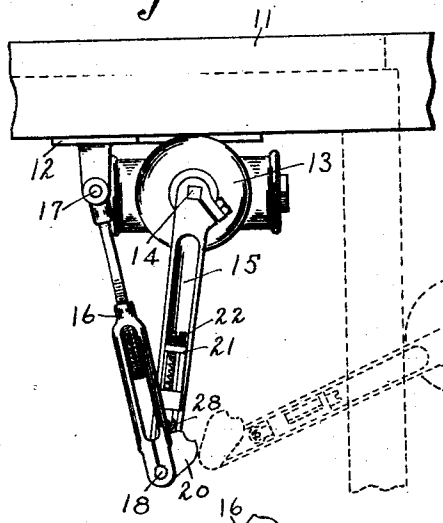


Fig. 2.

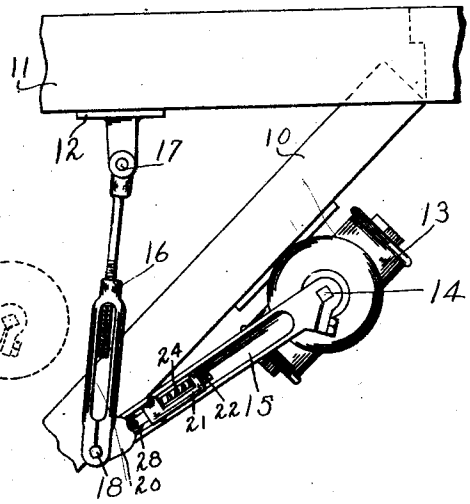


Fig. 3.

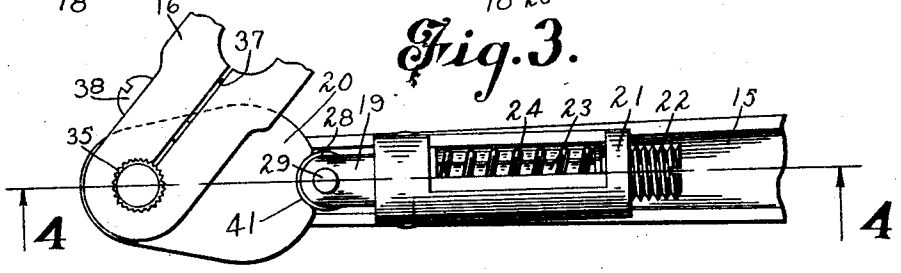


Fig. 4.

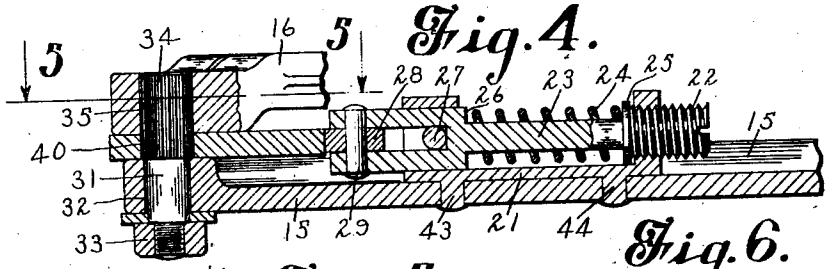


Fig. 5.

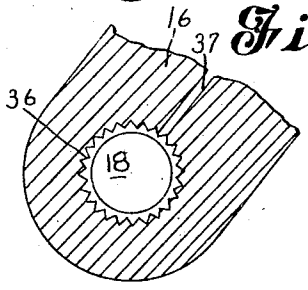
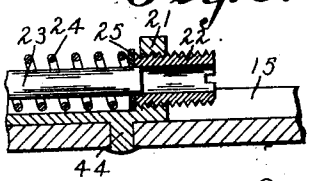


Fig. 6.



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UNITED STATES PATENT OFFICE.

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DETENT MECHANISM FOR DOOR CLOSERS AND THE LIKE.

Application filed November 4, 1925. Serial No. 66,754.

This invention relates to door closers and more particularly to a detent mechanism applicable to door checks and closers, and operating to retain the door in open position.

Such closers are usually provided with springs or some other means to effect the closing of the door, and also are quite commonly provided with a check of some character so that the latter part of the closing motion will be retarded. When such devices are used, it is ordinarily impossible, however, to maintain the door in open position, and in order to overcome this disadvantage, we contemplate providing the closer with a detent mechanism such that the door may be held in the desired open position. Further, our detent mechanism is adjustable so that the open position of the door may be varied as desired. At the same time, the normal operation of the door closer will not be interfered with, for if the door is opened beyond the position at which the detent is set, it will be swung shut in the usual manner.

While we have shown and described our invention as particularly applicable to door closers, it will be understood that the same may be applied to any hinge members so that these members will be yieldingly held in a given position.

One object of our invention is to provide a pair of hinged members with a detent mechanism such that when these members have been moved to a certain position they will be releasably held in such position.

Another object of the invention is the provision of a detent mechanism for door closers or the like, such that when the door to which the closer is applied has been opened to a pre-determined position, it will be releasably held in such position.

A still further object of the invention is the provision of a door closer or the like, with an adjustable detent mechanism, such that the position in which the door will be held open may be varied within wide limits.

A still further object of the invention is the provision of a detent mechanism for door closers, such that the normal operation of the closer will not be interfered with, but on the contrary the closer will act in the usual manner to close the door when it has been moved to open position, or when it is desired to retain the door in a pre-determined open position this may be done, and moreover, this pre-determined position may be varied as desired.

To these and other ends the invention consists in the novel features and combination of parts to be hereinafter described and claimed.

In the accompanying drawings:

Fig. 1 is a top elevational view of a door check and closer, provided with our improved detent mechanism;

Fig. 2 is a view similar to Fig. 1, showing the door held in open position;

Fig. 3 is an enlarged top plan view of the detent mechanism;

Fig. 4 is a sectional view on line 4—4 of Fig. 3;

Fig. 5 is a sectional view on line 5—5 of Fig. 4;

Fig. 6 is a sectional view through the hollow spring adjusting nut.

The preferred embodiment of our invention which we have selected to illustrate and describe, is shown as applied to a door check and closer of more or less usual form, secured to a door 10 and a door frame or jamb 11. Upon the door frame is a bracket 12, the casing 13 containing the closing and checking mechanism (not shown) being secured to the door 10. The closing mechanism includes a spindle 14 to which is rigidly secured an arm 15, designed to rotate with the spindle 14. An arm or link 16 is pivoted to the bracket 12 at 17, and to the arm 15 at 18 in the usual manner, the arm 16 being adjustable in length.

According to the well known operation of the above described elements, the closing and checking mechanism within the casing 13 serves to effect the closing of the door after it has been moved to open position, and also retards the latter part of this closing movement so that the door shuts softly.

Our improved detent mechanism consists of a movable detent 19 and a relatively fixed but adjustable detent 20. The detent 19 is in the form of a plunger mounted within a cylindrical guide casing 21, closed at the rear end by a hollow screw 22. The plunger projects from the front end of the cylinder and is provided with a stem 23 extending rearwardly within the screw 22. A spring 24 reacts between a washer 25, resting against the inner end of the screw and a shoulder 26 at the rear of the plunger. The latter mem-

ber is bifurcated and the parts thereof embrace a pin 27 which serves as a stop to limit the forward movement of the plunger under the impelling force of the spring. A roller 28 may be provided at the forward end of the plunger to reduce friction between the parts so that an easy and smooth operation of the mechanism will result. This roller is pivoted upon a pin 29 passing through the two forks at the head of the plunger.

The detent member 20 is rigidly secured upon a pin 31, which serves as a pivot pin between the arms 15 and 16. This pin passes loosely through an eye 32 in the arm 15, and is provided at its lower end with a nut 33 to hold it in place. The pin 31 is preferably rigidly attached to the arm 16 so that the pin and detent member 20 move with this arm. This rigid attachment is effected in the form shown by means of a series of serrations or teeth 34, formed longitudinally of the pin on the upper part thereof. The eye 35 in the arm 16 is similarly serrated, as shown at 36, so that the serrations of the pin and those of the eye 35 must be matched before the parts can be assembled. When once assembled they are rigidly attached together, however, so that the pin can rotate only with the arm, and the member 20 being rigid with the pin will stand at a fixed angle to the arm. This angle can be adjusted, however, by lifting the arm 16 off the pin and turning it to the desired angle before the serrations are again matched and the arm replaced.

In order to secure the detent in adjusted position, this member is slotted as at 37, the slot communicating with the eye 35, and a screw 38 passing across the slotted portion may be tightened to bind the two parts of the arm upon the pin 31.

We have found that the detent member 20 may be conveniently secured to the pin 31 by drilling a round opening 40 therein and forcing the serrated portion of the pin 31 through this opening, the serrations cutting their way into the periphery of the eye so that the detent will be firmly fixed upon the pin. This member is provided at the end thereof adjacent the plunger 19 with a recess 41 of a proper size and shape to receive the roller 28 upon the plunger. Upon each side of this recess the detent is of rounded form so that the roller will ride easily and smoothly over the edge of the detent member into the recess. This recess is of the proper depth and the spring 24 is given the required tension so that while the door may be opened and closed freely up to or beyond the point at which the detent is set, if opened just to the point at which the plunger 19 is received in the recess 41, it will be retained in this position. The tension of the spring 24 may be conveniently regulated by means of the screw 22, which is threaded into the rear end of the cylindrical guide 21 and bears against the spring washer 25, which is slidably mounted upon the stem 23. The cylindrical guide or spring housing 21 may be secured to the arm 15 in any desired manner. As shown, it is secured thereto by the rivets 43 and 44.

The operation of our device is as follows: When the door is in closed position, as shown in Fig. 1, it will readily be seen that it may be swung to open position upon which movement the roller 28 will move along the surface of the detent 20 toward the recess 41. If the door is released before the roller is received in the recess, it will, of course, be returned to its closed position in the usual manner. If moved beyond the position wherein the roller is received in the recess in the detent, the roller will ride into and out of the recess, as shown in dotted lines in Fig. 1, and if the door is released, the momentum of the closing movement will effect the same action upon the closing of the door, causing the roller to ride into and out of the recess upon the other side, so that the door will be closed in its usual manner and the normal operation of the closer will not be affected. If, however, the door is opened to the position shown in Fig. 2, it will be releasably retained in this position. If it is then desired to close the door, it is only necessary to give it a slight push which will release the roller from the recess and the door closer will then perform its normal function. The open position of the door, as shown in Fig. 2, may be adjusted within any desired limits by removing the arm 16 from the pin 31 and replacing it at the proper angle to the detent member. It will be apparent that with such a connection between the detent member and the arms 16 that these two members may be adjusted through an angle of 360 degrees, and owing to the number of serrations 34 and 36, may be set in a great variety of positions.

While we have shown and described a preferred embodiment of our invention, it is to be understood that it will not be limited to all the details shown, but is capable of modification and variations within the spirit of the invention and the scope of the appended claims.

What we claim is:

1. A door closer, including a pair of pivoted arms, and automatically operating means to releasably hold said arms in predetermined angular relation, comprising a detent member rigidly attached to one of said arms and a cooperating detent member movably attached to the other arm, said last named detent member being spring pressed into engagement with the first, and means for adjusting the tension of said spring.

2. A door closer, including a pair of pivoted arms, and means to releasably hold said arms in predetermined angular relation, comprising a detent member rigidly and adjustably attached to one of said arms and a cooperating detent member movably attached

to the other arm, said last named detent member being spring pressed into engagement with the first, and means for adjusting the tension of said spring.

3. A door holder comprising, a pair of arms pivotally connected together at their outer ends, a pivot bolt therefor, a disk non-rotatably mounted on said bolt between said arms, means for adjustably connecting said bolt and disk with one of said arms at different angular positions relatively to the axis of said bolt, a holding shoulder on said disk, a yielding means carried by the other arm co-acting with said holding shoulder at one predetermined angular position of said arms with relation to each other, to hold said arms in said position.

4. A door closer comprising in combination a pair of pivoted arms, a detent member adjustably secured to one of said arms adjacent the pivot point thereof, means for locking said detent member to said arm upon adjustment thereof, yielding means carried by the other arm to engage said member, and a shoulder on the detent member with which said yielding means is adapted to engage to hold the arms in predetermined angular position.

5. A door closer including in combination a pair of pivoted arms, a disk adjustably secured to one of said arms at the pivot point, means for locking said disk to said arm upon adjustment thereof, said disk having a holding shoulder thereon, and a smooth surface adjacent said shoulder, yielding means mounted on the other of said arms to engage with said shoulder in a predetermined angular position of the arms.

6. A door closer comprising a pair of pivoted arms, a pivot bolt at the hinge between said arms, a detent member secured to said bolt, a spring pressed plunger on one of said arms adapted to engage the detent member to hold the arms in predetermined angular position, and means for securing the pivot bolt to the other arm in various adjusted positions.

7. A door closer including a pair of pivoted arms, means to hold said arms in predetermined angular position comprising a pair of cooperating members, one being adjustably secured to one of said arms for angular adjustment relatively thereto, and the other comprising a spring pressed plunger secured to the other of said arms and adapted to yieldingly engage the first member.

8. A door closer including a pair of pivoted arms, and means to releasably hold said arms in predetermined angular position, comprising a detent member adjustably secured to one of said arms adjacent the pivot point thereof, means for locking said detent member to said arm upon adjustment thereof, and a cooperating detent member movably attached to the other arm, said last named detent member being spring pressed into engagement with the first.

9. In combination with a door and door frame, a door closer for urging the door to closed position, including a pair of pivoted arms, means secured to said arms adjacent the pivot point for releasably holding them in a predetermined angular position to hold the door in a predetermined open position, said holding means being inoperative to prevent the closing of the door when moved beyond the predetermined position, and means to adjust the controlling means to vary said predetermined position.

In witness whereof, we have hereunto set our hands this 27 day of October, 1925.

JOSEPH J. DREXLER.
HENRY H. MUNSON.