L. C. NORTON.

DOOR CLOSER.

APPLICATION FILED APR. 16, 1919.

1,319,173. Patented Oct. 21, 1919.

Fig. 1

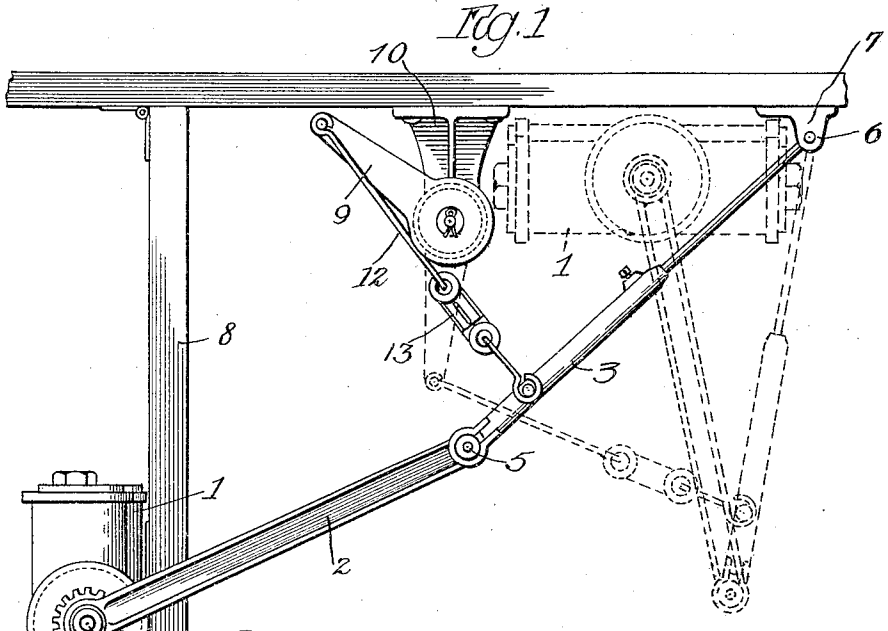


Fig. 2.

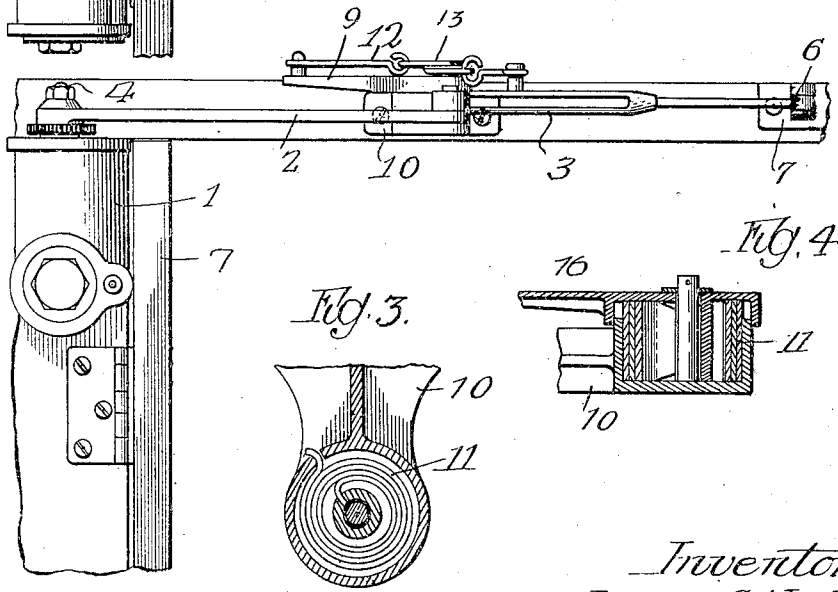


Fig. 3.

Fig. 4.

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DOOR-CLOSER.

1,319,173. Specification of Letters Patent. Patented Oct. 21, 1919.

Original application filed March 18, 1918, Serial No. 223,148. Divided and this application filed April 16, 1919. Serial No. 290,534.

To all whom it may concern:

Be it known that I, LEWIS C. NORTON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Door-Closers, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

My invention relates to improvements in door closers and checks, and particularly to door closers of this type which are used for closing hinged fire doors, and the like.

One of the objects of my invention is to provide a door closer and check which, while exerting a tendency to close the door and checking the too rapid closure of the same to prevent banging of the door, also permits the door to be held completely open, means being provided whereby, in event of a fire, the door-closing means will act instantly to close the door.

For the purpose of disclosing my invention I have illustrated certain embodiments thereof in the accompanying drawings, in which—

Figure 1 is a plan view of a structure embodying my invention;

Fig. 2 is a side elevation thereof; and

Figs. 3 and 4 are detail sections showing the form of spring used in connection with the check and supplementary arm.

In the embodiment of the invention illustrated, I provide a door closer which provides, in general, a cylinder 1, a spring-operated arm 2 and a lever 3. The spring-operated arm 2 is mounted upon a spring-rotated shaft 4, which shaft is connected by suitable mechanism with a piston operating in the cylinder 1, the piston being so arranged that while it will permit the arm 2 to be rotated freely in a clockwise direction for a predetermined length of time, it will check the continued movement of the arm to slow the same down, so that the door will not shut with a bang. The check, comprising the cylinder and the spring-rotated arm 2, is preferably mounted on the door. At the outer end of the arm 2 an arm 3 is pivotally connected thereto, as at 5, and the opposite end of the arm 3 is pivotally connected, as at 6, to a plate 7 secured to the door frame. The arm 3 is preferably made adjustable to provide for different positions on the door frame. The device thus far described is of such construction that when the door 8 is opened the tendency of the spring surrounding the shaft 4 is to rotate the arm 2 in a clockwise direction, thereby closing the door.

In order that the door when open all the way may be allowed to remain open, and at the same time in event of fire the apparatus for closing the door operate, I provide a spring-rotated lever arm 9 mounted on a suitable base 10 secured to the door frame. This lever arm 9 tends to rotate in a clockwise direction under the influence of a suitable coiled spring 11 mounted on the base 10 and within a suitable inclosing casing, and having one end connected to the shaft on which the arm 9 is rigidly mounted, and the other end secured to the base 10. The end of the arm 9 is connected by a rod 12 to the arm 3 at a point near the pivotal connection 5. Interposed in the rod 12 is a fusible link 13 consisting of two link sections suitably held together by a solder which is adapted to melt at a predetermined temperature. The strength of the spring 11 is such that when the arms 2 and 3 are in substantial alinement, that is, when the door is open 90 degrees, as shown in the drawings, the spring 11, due to the fact that the arms 2 and 3 are nearly on a dead center and the arms 9 and 12 are nearly on a dead center, has a greater pull than the spring in the door check, thereby holding the arms 2 and 3 in their alined position and preventing the door from closing. In event, however, it is desired to close the door, a slight pull on the part of the operator will reverse this unbalanced condition and the door check will tend to close the door. As the door moves closed and the arm 2 moves past the point where it is extending at right angles to the door, the pull of the spring 11 will coincide with the pull of the spring of the door closer to assist in the closing of the door. This assisting of the spring of the door check is decidedly advantageous in certain positions where there is a strong draft passing through the door way, as the resistance to be overcome by the spring of the door check increases as the door closes, and the additional pull of the spring 18 aids the spring of the door check in overcoming this resistance.

With the door open, in event of a fire, the

heat of the fire will melt the solder connection of the two sections of the link 13, thereby disconnecting the arm 21, and the arm 3 and the door will move closed under the influence of the door closer. It will be noted that by this construction the fusible link is positioned near the center of the doorway, where it will be in the path of the heat of the fire and will readily fuse.

This application is a division of my application Serial No. 223,148, filed March 18, 1918.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. The combination with a pair of arms pivotally connected, one of which is pivoted to the door frame and the other to the door and having a tendency to move from a substantially right-line position to a substantially parallel position to close the door, of a stationarily mounted spring-rotated arm and a fusible link connection between said arm and said pair of arms.

2. The combination with a pair of arms pivotally connected, one of which is pivoted to the door frame and the other to the door and having a tendency to move from a substantially right-line position to a substantially parallel position to close the door, of a spring-operated arm having a tendency to hold said pivoted arms in a substantially right-line position, and a fusible link connecting the end of said arm to said pivoted arms.

3. The combination with a pair of arms pivotally connected, one of which is pivoted to the door frame and the other to the door and having a tendency to move from a substantially right-line position to a parallel position to close the door, of a third arm mounted intermediate the ends of the two pivoted arms, a spring tending to rotate said arm, a fusible link connection between the end of said arm and said pivoted arms, said spring exerting a tendency to hold said arms in a right-line position when the door is open and exerting a tendency to draw said arms to a parallel position when the arms have been moved past a right-angled position.

4. The combination with a pair of arms pivotally connected, one of which is pivoted to the door frame and the other to the door and having a tendency to move from a substantially right-line position to a parallel position to close the door, of a spring-operated rotatable arm, a link connection between the end of said arm and one of said arms near the pivotal connection between the two, said arm opposing the movement away from a right-line position when the pivoted arms form more than an angle of 180 degrees and aiding the movement of the arms toward the parallel when the arms form less than an angle of 180 degrees.

5. The combination with a pair of arms pivotally connected, one of which is pivoted to the door frame and the other to the door and having a tendency to move from a substantially right-line position to a substantially parallel position to close the door, of a spring-actuated member exerting a tendency to prevent the arms from closing the door when the arms form an angle with respect to one another greater than 180 degrees and exerting a tendency to assist in closing the door when the arms form an angle less than 180 degrees, and a fusible link connection between said spring-actuated member and the arms.

6. The combination with a pair of arms pivotally connected, one of which is pivoted to the door frame and the other to the door and having a tendency to move from a substantially right-line position to a parallel position to close the door, of a fusible link connected to said arms near their joint, and means connected with said fusible link exerting a pressure against the closing tendency of said arms when the arms lie at an angle greater than 180 degrees and with the closing action of the arms when the arms lie at an angle less than 180 degrees.

In witness whereof I have hereunto subscribed my name.

LEWIS C. NORTON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."