

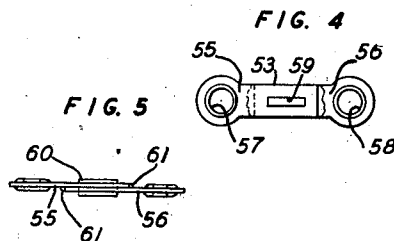
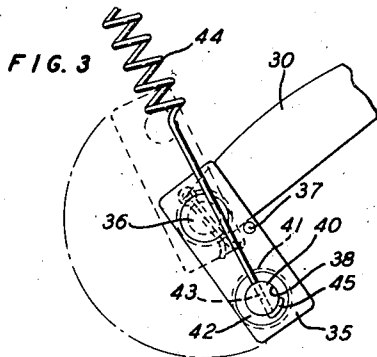
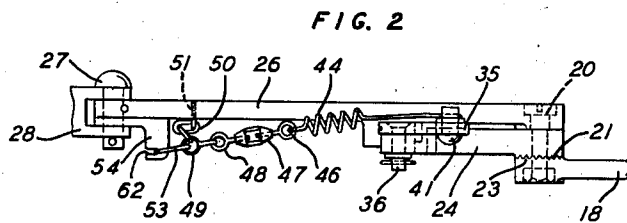
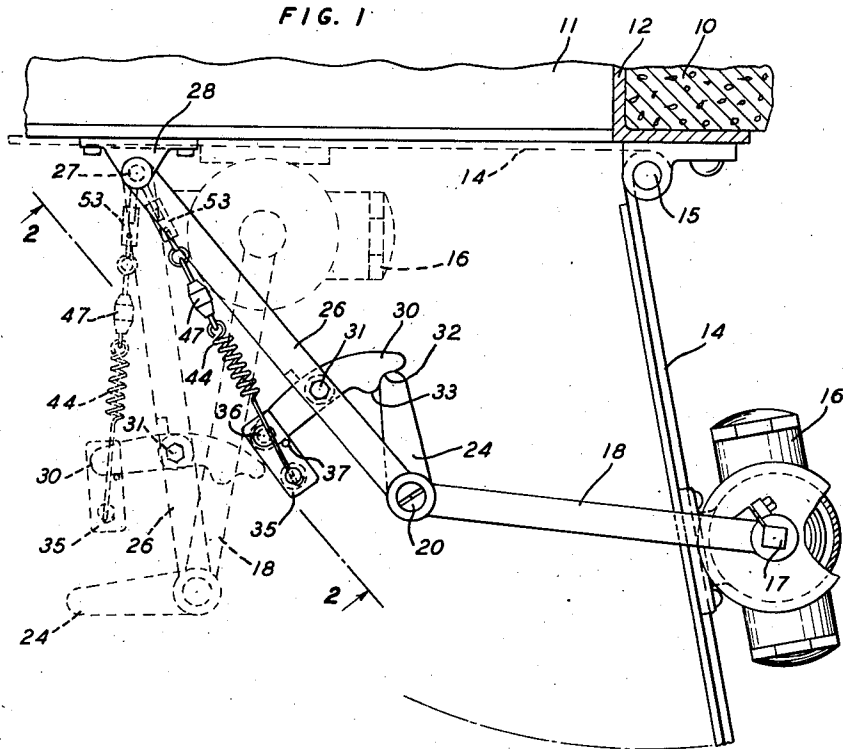
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DOOR CONTROL

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DOOR CONTROL

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6 Claims. (Cl. 16-49)

This invention relates to door controls, and more particularly to closer devices for fire doors.

Fire doors employed to close and seal entrances and exits to rooms are in many instances equipped with door closing devices, for example as shown in the Patent 1,170,384 of April 18, 1916 to Anderson, to hold doors in open positions by a holding means including a fusible link. The said holding means, as in the patent, may include a latch held in a position by a resilient arm including the fusible link to engage an abutment of the closer device to hold the door associated therewith in open position, but upon melting the fusible link, as in the case of fire, the force in the resilient arm to control the latch is removed and the door is allowed to close. It is frequently desirable to check such control means to determine whether or not it would be effective in closing the door in case of fire. With a closer device of the type shown in the aforementioned patent, such testing has been accomplished by melting the fusible link but this not only requires supplying new fusible links after each test but entails considerable labor.

An object of the invention is to provide a door control particularly for fire doors and including a simple, efficient and practical mechanism for checking the efficiency of the control.

With this and other objects in view, the invention comprises a door control including an arm normally urged in a direction, and through the aid of a link, to move a door to close a passageway, an abutment being carried by the arm for engagement with a latch urged by a holding means including a fusible link to render the door control inoperative and including an element actuable to remove the holding force on the latch to test the operativeness of the door control.

Other objects and advantages will be apparent from the following detailed description when taken in conjunction with the accompanying drawing, wherein

Fig. 1 is a top plan view of the door control shown in solid lines holding a door in open position and in dotted lines with the door in closed position;

Fig. 2 is a fragmentary side elevational view taken along the line 2-2 of Fig. 1;

Fig. 3 is a fragmentary detailed view illustrating the holding and releasing positions of the element for controlling the latch;

Fig. 4 is a side elevational view of a fusible link, and

Fig. 5 is a top plan view of the fusible link.

Referring now to the drawing, numeral 10 des-

ignates a wall, for example of a room, in which 11 is an opening providing an entrance or an exit thereto. The opening 11 is surrounded by a metallic frame 12 upon which a fire door 14 is hinged at one side as at 15.

The door 14 is equipped with a door check or closer device 16 which includes a spring actuated spindle 17 to which one end of an arm 18 is fixed. The other end of the arm is apertured to receive a bolt 20 and the upper face thereadjacent has radial serrations 21 to interengage similar serrations 23 of an abutment 24 to allow for relative adjustment of the abutment with respect to the arm and for the positive holding of the abutment and the arm in desired adjusted positions. One end of a link 26 is also connected to the outer end of the arm 18 through the aid of the bolt 20, this connection being free for relative movement of the link and arm during opening and closing of the door. The other end of the link 26 is mounted on a pivot pin 27 supported by a bracket 28, the latter being mounted upon the upper portion of the frame 12.

A latch 30 is pivotally supported at 31 near its center by the link 26 and has a contour, as illustrated in Fig. 1, with a recess 32 formed to receive the rounded outer end of the abutment 24 and a convex projection 33 over which the end of the abutment must ride before entering the recess. The opposite end of the latch 30 has a testing element 35 pivoted at its inner end, as at 36, to the end of the latch, and carrying a pin 37 to engage the latch and limit the movement of the element counterclockwise about its pivot. An aperture 38 formed in the element 35 near the outer end thereof receives a rotatable member 40 having an enlarged head portion 41 at the lower end thereof in a washer 42 disposed concentric with the upper portion thereof and resting upon the element. The rotatable member 40 is apertured at 43 to receive one end of a spring 44 which extends through the aperture 43 and is bent as at 45 to form positive connection with the rotatable member. The opposite end of the spring 44 is connected to an eyelet 46 of a turnbuckle 47, the other eyelet 48 of the turnbuckle being connected to a link 49 of a chain 50, the opposite end of the chain being fixed at 51 to the link 26.

A fusible link 53 has one end connected to the link 49 of the chain 50 and the other end connected to a bracket 54 mounted upon the link 26. The fusible link is of standard structure but in order to more clearly understand the invention the link is shown in detail in Figs. 4 and 5.

Here it will be noted that the link is formed of two identical parts 55 and 56 of metal, such as brass, having their outer ends rounded and provided with openings 57 and 58 for respective connection with the bracket 54 and the link 49. The portions 55 and 56 overlap as illustrated in Fig. 5 and are provided with elongate apertures 59 which register with each other when in this position to receive a quantity of fusible material 60 and to be otherwise secured together as at 61 by such material to form a solid unit in the form of a link except when heat is applied to melt the fusible material. The fusible link 53 may be removably secured to the link 49 and will remain connected thereto during the manual opening and closing of the door 14. The bracket 54 has a lip 62 of sufficient length and contour to permit free disposal and removal of a fusible link in connection therewith but which will hold the link against displacement therewith when the resilient arm in which it is disposed is slackened during the closing of the door.

With the door control mechanism the door may be manually moved into open position as illustrated in solid lines in Fig. 1 and while being moved into this position from the dotted line position the abutment 24 will swing arcuately with the arm 18 about the pivot or bolt 20, the outer end of the abutment eventually riding over the projection 33 and into the recess 32, where it will be held by the latch 30 through the force of the spring 44. When in this position it will be observed that the connection of the spring 44 with the element 35, that is, the rotatable member 40, is positioned beyond dead center, that is, beyond the center of the pivot 33. The door when once moved into open position will be held in this position by the latch until it is manually started toward its closed position or until heat causes destruction to the fusible link 53. This mechanism is capable of indefinite use but in order to determine the efficiency of the mechanism in closing the door should there be a fire thereadjacent it is desirable to frequently test the mechanism. Heretofore in order to test the efficiency of the mechanism the fusible link has been destroyed by applying heat thereto, thus removing the force of the spring from the latch, and freeing the closer device to move the arm 18 counterclockwise with the spindle 17, and through the connection of the link 26, move the door 14 about its hinges to close the opening 11. By doing this, that is, by melting the fusible link, it is necessary to remove the remaining parts of the link from the bracket 54 and the link 49, inserting a new fusible link and determining whether or not with the new fusible link the resilient arm including the spring 44 will apply sufficient force for the latch 30 to hold the mechanism in open position. This is necessary due to the possible variations in the lengths of the fusible links, such variations requiring adjustment of the turnbuckle 47 to again arrive at the desired force to be applied through the spring 44 to the latch.

During the normal operation of the mechanism or door control the element 35 is in the position shown in Fig. 1, to cause the spring 44 to act upon the latch 30 to hold the mechanism including the door closer device 16, the arm 18 and the link 26 inoperable to move the door to closed position once the door is opened to the solid line position indicated in this figure. If sufficient heat were applied to the fusible link 53, such as in the case of fire, the fusible material 60 and 61 holding the portions 55 and 56 to-

gether would be melted, causing a removal of the force of the spring 44 and thus rendering the latch 30 ineffective to hold the abutment 24 against movement and permitting the door closer mechanism to move the door into closed position.

It is frequently desirable to check the mechanism to determine its efficiency in moving the door into closed position and this may be readily done by moving the element 35 clockwise beyond dead center to free the force of the spring from the latch and to render the mechanism free for operation. After the mechanism has been tested the element 35 may be moved counterclockwise until the stop pin 37 locates the element in a position so that the spring 44 may again apply a holding force to the latch 30. With the aid of the element 35, the testing operation is simplified, requiring only the aid of an elongate instrument to aid in reaching the element to move it from its normal position to its releasing position and back into its normal position. This eliminates the necessity of the person making such test the need of a step ladder, a torch to fuse the fusible link, tools to remove the portions of the fused link and a supply of new fusible links in addition to all of the labor coupled with the testing of the mechanism through the destruction of the fusible link. The use of the element 35 eliminates the necessity of all this labor and expense, which are greatly multiplied when many mechanisms require testing.

The embodiment of the invention herein disclosed is merely illustrative and may be modified and departed from in many ways without departing from the spirit and scope of the invention as pointed out in and limited solely by the appended claims.

What is claimed is:

1. A door control comprising mechanism operable to normally urge a door from an open position to a closed position and including an abutment, a latch actuable to hold the abutment against movement and the mechanism against operation, an element pivotally supported by the latch, spring means connected to the element to apply a force to the latch to actuate it when the element is moved into one position, the force being removed from the latch to render the mechanism operable when moved out of the said position, and means to locate the element in the said position.

2. A door control comprising mechanism operable to normally urge a door from an open position to a closed position and including an abutment, a latch actuable to hold the abutment against movement and the mechanism against operation, an element pivotally supported by the latch, a spring, and a rotatable member connecting the spring to the element for movement of the element into a position to cause the spring to apply a force to the latch to actuate it and for movement out of the position to remove the force from the latch to render the mechanism operative.

3. A door control comprising mechanism operable to normally urge a door from an opening position to a closed position and including an abutment, a latch actuable to hold the abutment against movement and the mechanism against operation, an element pivotally supported by the latch, a spring, a rotatable member connecting the spring to the element for movement of the element into a position to cause the spring to apply a force to the latch to actuate it and for movement out of the position to remove the force from the latch to render the mechanism opera-

tive, and means to locate the element in the said position.

4. A door control comprising a mechanism constructed for operation to normally urge a door from an open position to a closed position and including an abutment, a latch actuable to hold the abutment against movement and the mechanism against operation, a resilient arm including a fusible link adapted to render the arm ineffective when fused and a spring to apply a force to the latch to actuate it to hold the mechanism against operation, and means in connection with the resilient arm to cause removal of the force of the arm from the latch to free the mechanism for operation to test the spring in the efficiency of the mechanism in closing the door.

5. A door control comprising a mechanism constructed for operation to normally urge a door from an open position to a closed position and including an abutment, a latch actuable to hold the abutment against movement and the mechanism against operation, a resilient arm including a fusible link adapted to render the arm ineffective when fused and a spring to apply a force to the latch to actuate it to hold the mechanism

5 against operation, and a link connecting the resilient arm with the latch and actuable to cause removal of the force of the spring in the arm from the latch, to free the mechanism for operation to test the efficiency of the mechanism in closing the door, and to return the force to the latch to render the mechanism inoperable when the door is moved into open position.

10 6. A door control comprising a mechanism constructed for operation to normally urge a door from an open position to a closed position and including an abutment, a latch actuable to hold the abutment against movement and the mechanism against operation, a resilient arm to apply a force to the latch to actuate it to hold the mechanism against operation, and a testing element pivotally connected at spaced positions to the latch and the arm and movable into one position to cause creation of the force in the arm to actuate the latch and movable into another position to cause removal of the force from the latch to free the mechanism for operation to test the efficiency of the mechanism in closing the door.

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