Feb. 23, 1960 W. C. HEISLER 2,925,895

FIRE LATCH FOR ELEVATOR DOORS

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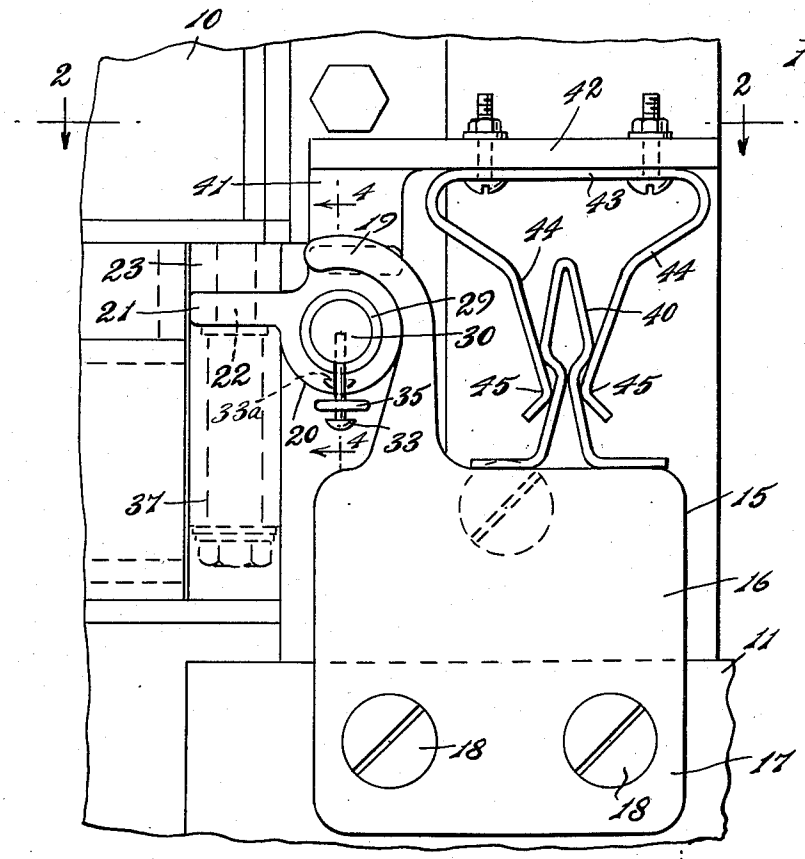


Fig. 1.

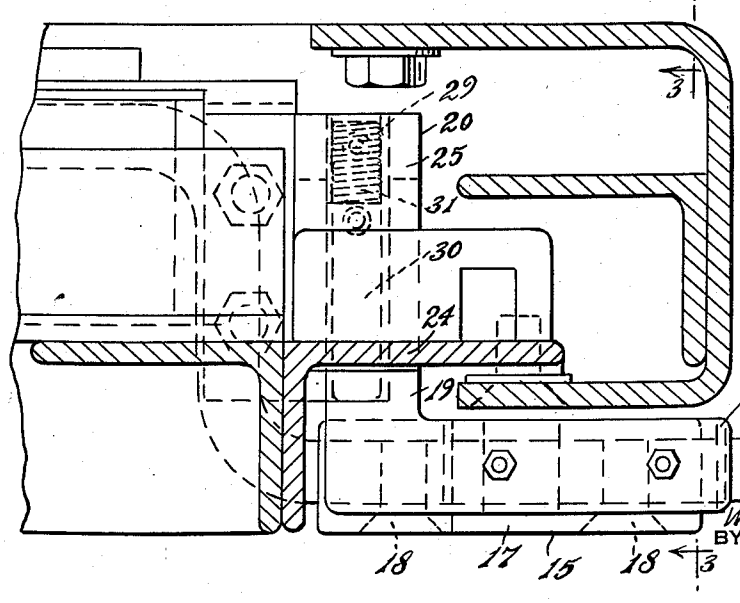


Fig. 2.

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Fig. 3.

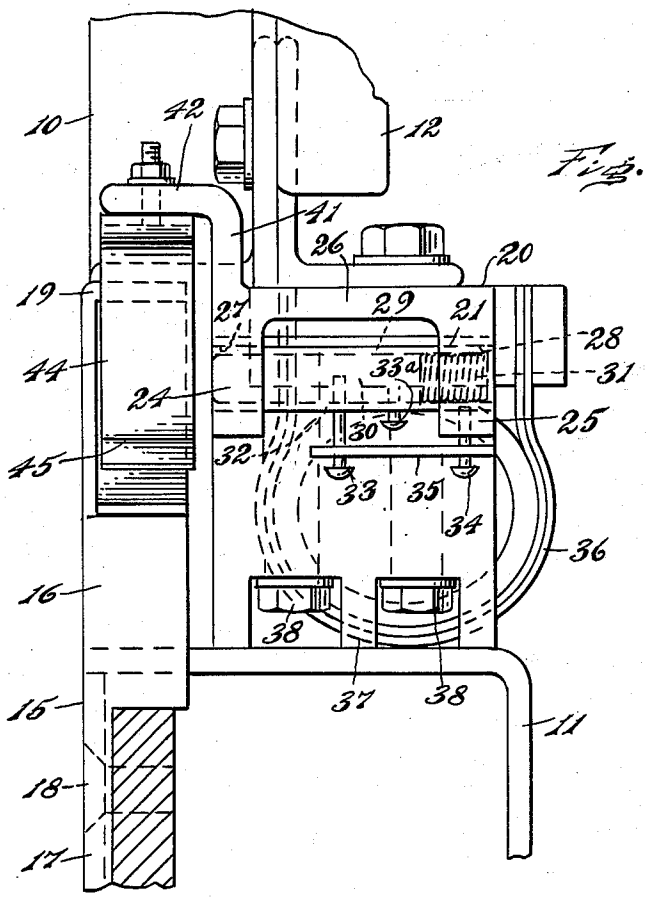
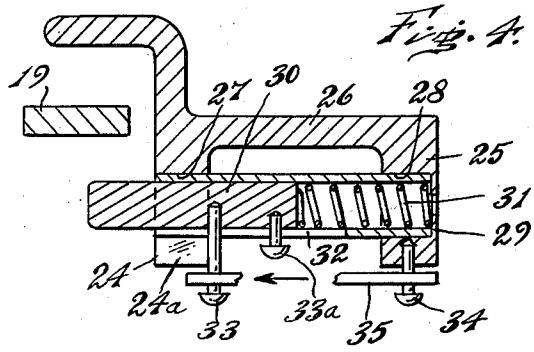


Fig. 4.



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FIRE LATCH FOR ELEVATOR DOORS

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5 Claims. (Cl. 189—48)

This invention relates to fire latches for elevator doors, and more particularly to automatic latching mechanism effective for retaining elevator doors and the like in locked condition upon the occurrence of an excessive temperature in the vicinity thereof.

Single doors and separable doors of the bi-parting counterbalanced type or of the counterweighted slide-down type have heretofore been employed on elevators and the like. Such doors are customarily provided with safety interlocks so that the door is maintained in closed and locked condition before the elevator can be moved with respect thereto and so that the door is retained in closed and locked condition until the elevator has stopped at the landing where the doors are located.

In separable doors, also, it has heretofore been proposed to employ safety astragals and to compress such astragals to some extent.

In the event of a fire it is desirable to maintain the door in locked condition so that the door will not be open and provide an undesired air vent.

It is the principal object of the present invention to provide an improved character of fire latch suitable for use on single doors as well as doors of the bi-parting counterbalanced type or of the counterweighted slide down type for locking the door or doors in a closed position in case of the occurrence of a fire.

It is a further object of the present invention to provide latching mechanism of the character aforesaid which can be quickly and easily installed on various types of doors now in use, and without interference with the safety interlocks now employed.

It is a further object of the present invention to provide an improved character of fire latch for bi-parting doors and with which positioning means is provided for compressing a safety astragal when necessary.

It is a further object of the present invention to provide a device of the character aforesaid in which the parts are relatively simple in construction and reliable and positive in operation when required.

Other objects and advantageous features of the invention will be apparent from the description and claims.

The nature and characteristic features of the invention will be more readily understood from the following description, taken in connection with the accompanying drawings forming part thereof, in which:

Figure 1 is a fragmentary view in elevation showing a pair of elevator doors with the fire latch of the present invention applied thereto;

Fig. 2 is a horizontal sectional view taken approximately on the line 2—2 of Fig. 1;

Fig. 3 is a vertical sectional view taken approximately on the line 3—3 of Fig. 2, and with the guide removed; and

Fig. 4 is a vertical sectional view taken approximately on the line 4—4 of Fig. 1, and showing the locking bolt in released position.

It should, of course, be understood that the description and drawings herein are illustrative merely, and that

various modifications and changes can be made in the structure disclosed without departing from the spirit of the invention.

Like numerals refer to like parts throughout the several views.

The fire latch in accordance with the present invention includes as components an abutment such as a rigid hook which is mounted at any preferred location, for example, at a fixed top framing member at a location such as opening in the hatchway, on a single door, or on one of the doors of bi-parting doors, and a bolt movable into engagement with the hook, and mounted on a single door, at a fixed location such as the top framing member of an opening in the hatchway, or on the other of the doors of bi-parting doors. The bolt is normally spring pressed towards a position for locking engagement with the abutment but is restrained from movement by a fusible link.

Where bi-parting doors are employed with an astragal of compressible type an additional resilient positioning means for the doors is also advantageously employed.

Referring now more particularly to the drawings and merely for purposes of illustration, the fire latch is shown in a particular application to upper and lower vertically separable bi-parting doors **10** and **11**.

The upper door **10** can be provided at each side with the customary chain hitch **12** for raising and lowering the door **10** by a chain or the like (not shown).

At each end of the door **11**, a bracket **15** is provided and while the bracket **15** at one end is illustrated, the bracket **15** at the other end is of similar construction but of opposite hand.

The bracket **15** is preferably made as a malleable iron casting, and includes a body portion **16** from which a downwardly extending integral plate **17** extends. The plate **17** is secured to the side of the door **11** facing into the hatchway by bolts **18**.

The body portion **16** of the bracket **15** has, extending upwardly therefrom, an arm **19**, preferably of hook shape.

At each end of the door **10**, a bracket **20** is provided and while the bracket **20** at one end is illustrated, the bracket **20** at the other end is of similar construction but of opposite hand.

The bracket **20** is preferably made as a malleable iron casting and is provided with an integral horizontal plate **21** which is secured to the under side edge of the door **10** by bolts **22** extending through an interposed spacer block **23**.

The bracket **20** is preferably provided with integral spaced horizontal sockets **24** and **25** with a vertical integral connecting portion **26** therebetween. The sockets **24** and **25** have alined horizontally disposed openings **27** and **28** with a liner **29** extending therebetween and terminating inwardly of the outer end of the socket **25**. Within the liner **29** a bolt **30** is provided for horizontal slidable movement.

Within the portion of the liner **29** in the socket **25** a coil spring **31** is provided and is normally maintained in compressed condition. For this purpose, the bolt **30** has extending therefrom, and through a slot **32** in the liner **29**, a retaining arm **33**. The socket **24** has a slot **24***a* therein for the passage of the arm **33** when released. The socket **25** has extending from the outer face thereof, and parallel to the arm **33**, a retaining arm **34**. The arms **33** and **34** have extending therebetween and in engagement therewith a fusible link **35** of any desired material, capable of melting at a predetermined temperature. The bolt **30** can also have extending therefrom and through the slot **32** in the liner **29** a positioning arm **33***a* for limiting the extended position of the bolt **30** upon rupture of the fusible link **35**.

As illustrated in Fig. 3, a compressible astragal 36 may be provided, carried by one of the doors, such as the upper door 10, and engaging the upper marginal edge of the lower door 11. If such an astragal 36 is employed it may also be desirable, in order to limit the degree of compression thereof to provide at each end of the astragal 36, a bumper 37 of any suitable material, such as rubber, to limit the closing movement of the doors 10 and 11. The bumper 37 is secured to the lower edge face of the door 10 by bolts 38.

Where a compressible astragal 36 is employed, as well as in certain other types of installations, it is desirable to provide door positioning and retaining structure to properly position the doors 10 and 11 for positive engagement of the bolt 30 with the hooked arm 17.

One suitable form of retainer or latching device is illustrated as including a spear shaped tongue 40 secured to an upper edge of the body portion 16 of the bracket 15.

The bracket 20 has an integral upward extension 41 from which a horizontal plate 42 extends. The plate 42 has secured thereto a retainer 43 with a pair of resilient spring arms 44. The spring arms 44 include end portions 45 for engagement in recessed portions of the tongue 40 so that within a limited range of movement the retainer will tend to position the doors 10 and 11 with respect to each other so that as the astragal 36 is partially compressed and, at the same time, the hooked arm 19 for engagement by the bolt 30 upon release of the bolt 30 will retain the doors in closed position.

The mode of operation will now be pointed out.

The doors 10 and 11, in normal operation, will be opened and closed in the usual manner. Upon closing of the doors 10 and 11, the spring arms 44 by their engagement with the recessed portions of the tongue 40 will retain the doors 10 and 11 at the desired position with respect to each other.

If now, an excessive temperature is attained so that the fusible link 35 is ruptured or melted, the bolt 30 will be released and urged by the spring 31 horizontally inwardly to a position so that it extends below the hooked arm 19. Any tendency of the doors 10 and 11 to separate or open will be resisted by the engagement of the bolt 30 with the hooked arm 19. The astragal 36, if employed, by reason of its compressibility will aid in sealing the opening between the doors 10 and 11.

I claim:

1. A fire latch for elevator doors comprising two members one of which is movable with respect to the other and at least one of which is a door, at least one bracket secured to one of said members at a side margin thereof and having a receptacle portion, at least one second bracket secured to the other of said members at a corresponding side margin thereof, interengaging devices carried by said brackets positioning the contiguous edges of said members in predetermined meeting relation, said second bracket having mounted therein a bolt horizontally slidably movable into locking engagement with said receptacle portion for preventing relative movement of said members, a resilient device engaging said bolt and normally urging said bolt into locking engagement with said receptacle portion, an elongated fusible link connected respectively at spaced locations along said link to said second bracket and said bolt and holding said bolt against movement by said resilient device, and stop means for limiting the advance of said bolt by said resilient device.

2. A fire latch for biparting upper and lower vertically movable elevator doors comprising at least one bracket secured to the upper margin of the lower door at one side thereof and having a hooked arm, at least one second bracket secured to the lower margin of the upper door at a corresponding side thereof, interengaging devices carried by said brackets positioning the contiguous edges of said doors in predetermined meeting relation, said second bracket having mounted therein a bolt horizontally slidably movable into locking engagement with said hooked arm for preventing separation of said doors, a resilient device engaging said bolt and normally urging said bolt into locking engagement with said hooked arm, an elongated fusible link connected respectively at spaced locations along said link to said second bracket and said bolt and holding said bolt against movement by said resilient device, and stop means on one of said brackets for limiting the advance of said bolt by said resilient device.

3. A fire latch as defined in claim 2 in which said second bracket has a sleeve mounted therein in which said bolt is slidably mounted and within which said resilient member is disposed, and said stop means also includes a stop pin carried by said bolt, and said second bracket has a portion for engagement by said pin to limit movement of said bolt to locking position.

4. A fire latch as defined in claim 2 in which said second bracket has a sleeve mounted therein, said bolt is slidably mounted in said sleeve and said resilient device is disposed in said sleeve, said sleeve has a longitudinal slot, a connector is provided connected to said bolt and extending through said slot to which said fusible link is connected, said bolt as a part of said stop means has a stop pin connected thereto and extending through said slot, and said second bracket has a portion for engagement by said stop pin to limit movement of said bolt to locking position.

5. Latching apparatus for elevator doors comprising two members one of which is vertically movable with respect to the other to a closed position and at least one of which is a door, interengaging latching devices on said members at at least one side margin thereof holding said members in closed relation, and interengageable members carried respectively by said first members at a corresponding side margin thereof, a resilient device for urging one of said last members to engagement with the other, said last members having an elongated fusible link for controlling the engagement thereof, and stop means for limiting the movement of said one of said last members by said resilient device.

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