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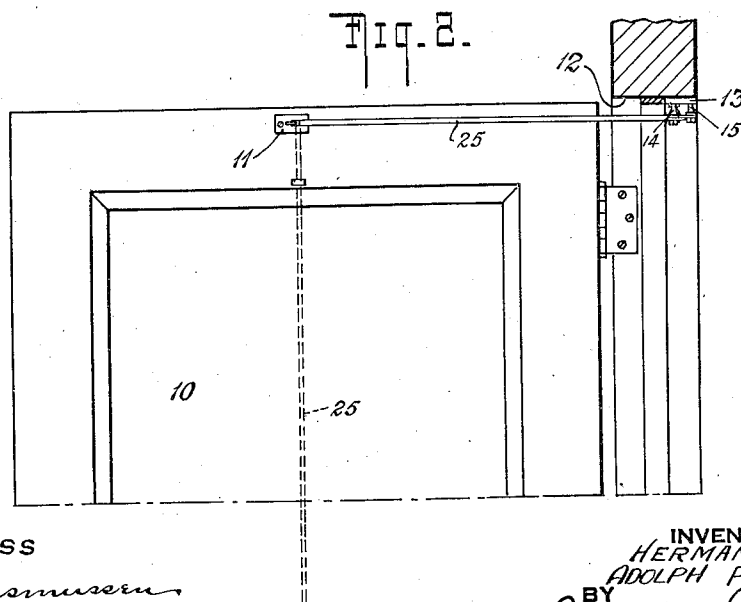
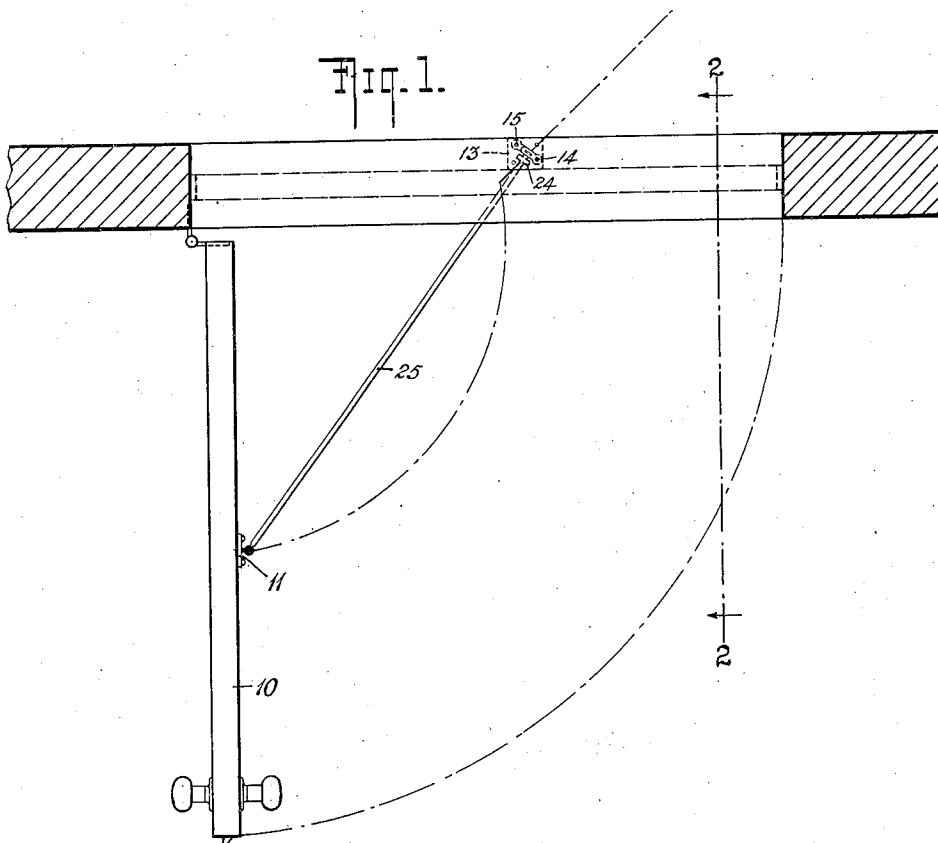
H. WEISS ET AL

2,039,468

CHECK DEVICE FOR FIRE DOORS

Filed April 3, 1935

3 Sheets-Sheet 1



WITNESS

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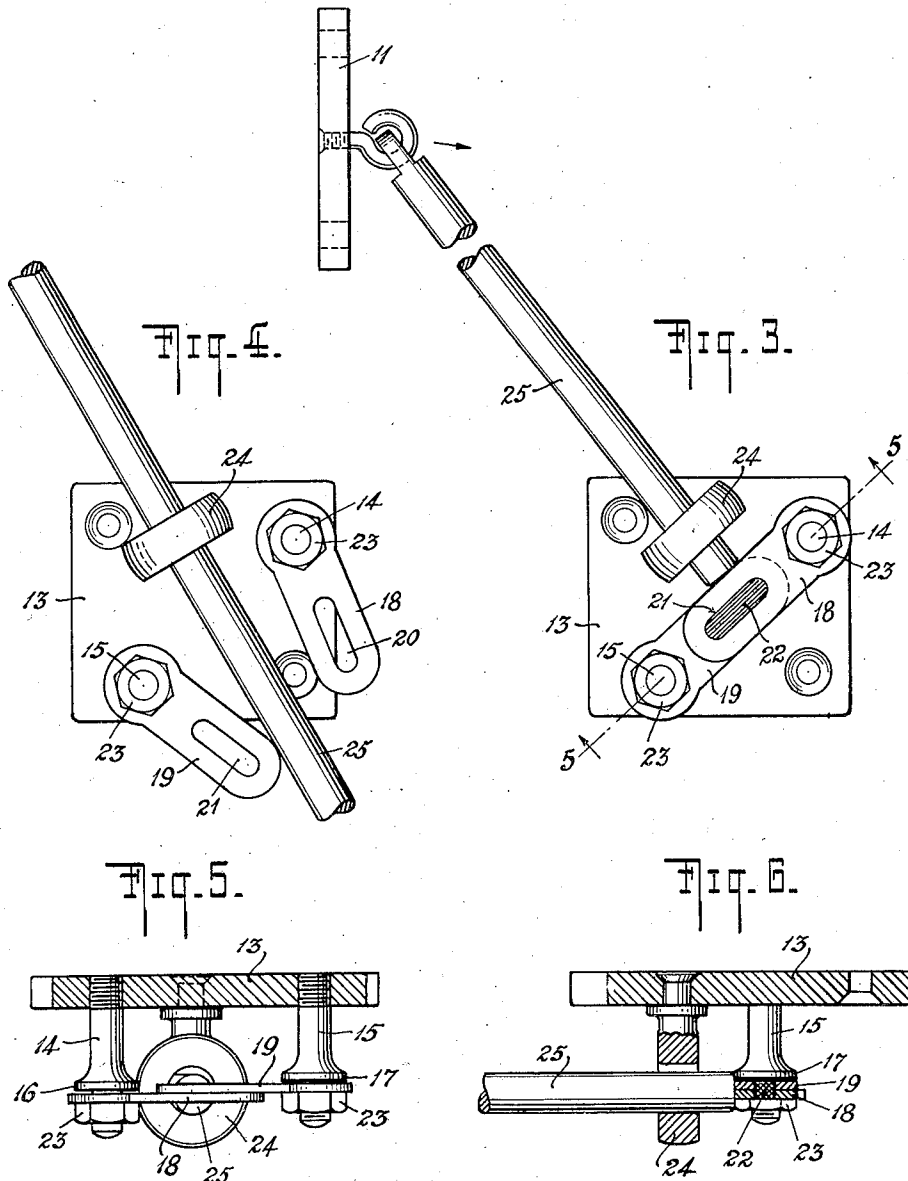
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CHECK DEVICE FOR FIRE DOORS

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3 Sheets-Sheet 2



WITNESS

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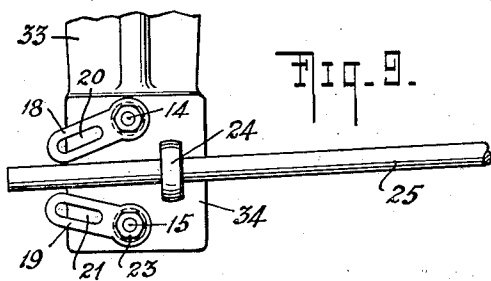
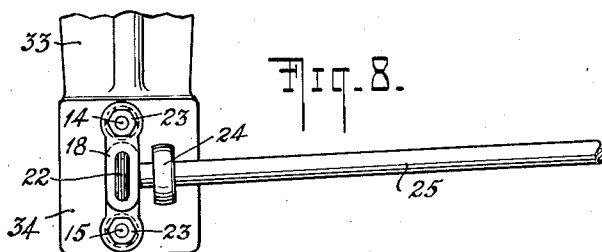
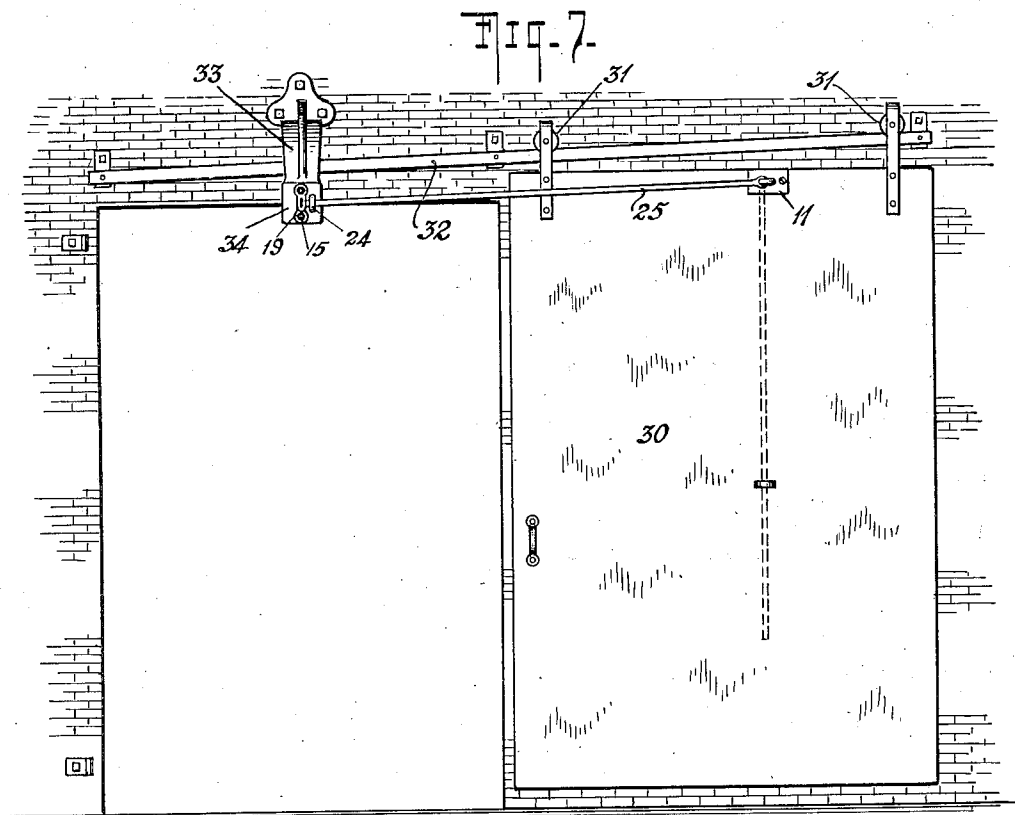
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CHECK DEVICE FOR FIRE DOORS

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3 Sheets-Sheet 3



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CHECK DEVICE FOR FIRE DOORS

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Application April 3, 1935, Serial No. 14,394

6 Claims. (Cl. 189—49)

This invention relates to a check device for fire doors and has for its object to provide a simple, inexpensive and reliable check device which will hold a fire door in opened position under normal conditions but which will permit the door to close automatically when the temperature of the surrounding atmosphere rises above a predetermined level because of fire.

A particular embodiment of the invention is illustrated in the accompanying drawings in which similar reference characters refer to similar parts throughout the several views and in which Fig. 1 is a top view of a fire door of the swinging type illustrating the manner in which the device may be attached thereto; Fig. 2 is an elevation of the top portion of the door shown in Fig. 1 showing the device in operative and non-operative positions; Fig. 3 is an enlarged detailed view of the device showing the position of the parts under normal conditions; Fig. 4 is an enlarged detailed view of a portion of the device showing the position of the parts after the fusible element has been rendered inoperative by heat; Fig. 5 is a section taken along 5—5 of Fig. 3; Fig. 6 is a sectional view taken at right angles to the line 5—5 of Fig. 3; Fig. 7 is an elevation of a fire door of the sliding type illustrating the manner in which the device may be attached thereto; Fig. 8 is an enlarged view of a portion of the device shown in Fig. 7 under normal conditions and Fig. 9 is a view of the parts shown in Fig. 8 after the fusible element has been rendered inoperative.

Referring to Figs. 1 and 2 of the drawings, the reference character 10 designates a fire door upon the upper portion of one side of which is mounted a supporting base 11 of one part of the device of the present invention and the reference character 12 designates the soffit of the door lintel to which is secured the supporting base 13 of another part of the device. The door 10 is provided with means (not shown) so that it automatically moves back into closed position after it has been opened. The means for accomplishing this result with a fire door of the swinging type such as is illustrated, are well known and may comprise weights or the usual door check.

Referring now more particularly to the construction of the device of the present invention, the supporting base 13 is provided with a pair of spaced standards or posts 14 and 15 which are fixedly secured at one end to such base in any suitable manner and are disposed vertically with relation to said base. The outer ends of the posts 14 and 15 are reduced in cross section so that

shoulders 16 and 17 are formed on such posts intermediate their outer ends and the base 13. As is shown in the accompanying drawings, the posts are preferably enlarged at this point so that the outer surfaces of the shoulders 16 and 17 have an area substantially greater than the cross sectional area of the reduced outer ends of the posts.

Bridging the posts 14 and 15 is a fusible link which comprises two horizontally disposed arms 18 and 19, the outer end portion of each of said arms being provided with a perforation which is larger in diameter than the diameter of the reduced outer end portion of the post which extends therethrough so that said arms may readily rotate about their respective posts when released under abnormal temperature conditions as will be hereinafter more fully explained. The inner end portions of the arms 18 and 19 are in overlapping relation, the overlapping portions of the arms 18 and 19 being provided with slots 20 and 21, respectively, which are positioned on the arms so that they are in alignment. The space defined by the aligned slots is filled with a fusible element 22 which joins the overlapping portions of the arms together in a strong union. The fusible element 22 is constituted of metallic material which fuses at a temperature suitable for the purposes of the device. The arms 18 and 19 of the fusible link are maintained in position on the reduced outer end portions of the posts 14 and 15 respectively by the nuts 23 which are in threaded engagement with such end portions of the posts. The distance between the shoulder of each post and the nut 23 mounted thereon is greater than the thickness of that portion of the fusible link which is supported therebetween so that free rotation of the arms of such link is assured when the fusible element 22 has been rendered inoperative by heat.

A swivel member 24 is rotatably mounted on the base 13, such member comprising an annularly shaped upper portion adapted to receive loosely the free end of a rod 25 which is pivotally supported in any suitable manner at its other end on the base 11. The vertically disposed annularly shaped portion of the swivel member 24 is so positioned with relation to the fusible link that the free end of the rod 25 is maintained in engagement with the overlapping portions of the arms of such link under the pressure exerted by the door. The external radius of the annularly shaped portion of the swivel member is slightly greater than the distance between the axial center of such member and the nearest edge portion

of the fusible link so that the rotative movement of the swivel member is limited to less than 180°.

It will thus be seen from the above description of the device, that when the parts are in operative position as shown in Figs. 1 to 3, the free end of the rod is held in tight engagement against the overlapping portions of the arms 18 and 19 of the fusible link by means of the swivel member 24 and the door, thereby keeping the latter open against the influence of the means tending to close it (not shown) and placing a strain upon the fusible element 22. When the temperature of the surrounding atmosphere, however, has increased to such an extent as to fuse the metallic material of which the fusible element 22 is constituted, the pressure of the rod 25 on the overlapped portions of the arms 18 and 19 of the fusible link will rupture the joint thereby releasing the rod 25 which under the guidance of the swivel member 24 passes between the posts 14 and 15, causing the arms to rotate outwardly about such posts and permitting the door to close. As the swivel member 24 maintains the rod 25 in a substantially horizontal position throughout its range of movement there is no possibility of the rod becoming a source of danger to anyone after it is released. When normal conditions have been restored the arms 18 and 19 may be removed readily from the base 13 by unscrewing the nuts 23 and again united by aligning the slots 20 and 21 and pouring solder in the space formed by such slots. The joint formed by this construction is strong and durable under ordinary conditions yet readily becomes inoperative by heat. In case it is desired to keep the door normally closed, the rod 25 can be readily disassembled from the swivel member 24 and may be placed in a spring catch mounted on the door, as shown in Fig. 2, to keep it from swinging or becoming a source of danger.

The device of the invention is also readily adapted for use in connection with a fire door of the sliding type which is constructed or provided with suitable means so that it automatically moves to closed position after being released from opened position. In Fig. 7 there is illustrated a sliding fire door 30 which is provided with overhead pulleys 31 adapted to ride on a rail 32 which is inclined towards the closed position of the door so that the latter may readily slide shut when released from its opened position. Positioned intermediate the sides of the door opening is a bracket 33 which is permanently secured at its upper end to the wall above the door opening by bolts. The bracket 33 extends downwardly and outwardly from the wall so as not to interfere with the opening or closing of the door and so that the lower portion 34 is supported substantially parallel with the door adjacently to the latter's outer upper edge portion when the door is in closed position. Fixedly secured one above each other to the lower portion 34 of the bracket 33 are the spaced standards or posts 14 and 15 upon which is supported the fusible link comprising the arms 18 and 19 and the fusible element 22. The free end of the rod 25 which is pivotally supported in any suitable manner at its other end on the base 11 which is suitably affixed to the sliding door, is slidably supported by the swivel member 24 so that it is maintained in engagement with the overlapping portions of the arms of the fusible link under the pressure exerted by the door. The several parts of the device will operate in the same manner hereinabove described with respect to the swinging door when the tempera-

ture in the room becomes abnormal because of fire.

While we have illustrated and described the rod and the check mechanism as being mounted on the door and the door lintel respectively, it will be understood that they can be interchanged or mounted in other positions and that various changes in the form, construction and arrangement of the several parts may be resorted to without departing from the spirit and scope of our invention, hence we do not wish to limit ourselves strictly to the arrangement herein set forth.

We claim:

1. In combination with a door which automatically closes upon being released from opened position, a check device adapted to release said door when the temperature of the surrounding atmosphere rises above a predetermined level comprising a freely pivoted rod, a fusible element, guide means for detachably maintaining the free end of said rod in engagement with said fusible element whereby the door is checked in opened position under normal conditions, said guide means being adapted to control the path of movement of said rod during the closing of said door when the fusible element has been rendered inoperative by heat.

2. In combination with a door which automatically closes upon being released from opened position, a check device adapted to release said door when the temperature of the surrounding atmosphere rises above a predetermined level comprising a pair of arms, means for rotatably supporting each of said arms, a fusible element uniting said arms, a pivoted rod, guide means for maintaining the free end of said rod in engagement with said arms at their point of juncture whereby the door is checked in opened position under normal conditions and a strain is exerted on the fusible element uniting said arms, said guide means being adapted to control the path of movement of said rod during the closing of said door when the fusible element uniting said arms has been rendered inoperative by heat.

3. A combination such as set forth in claim 2 in which the means for guiding the pivotal rod is mounted for rotational movement.

4. In combination with a door which automatically closes upon being released from opened position, a check device adapted to release said door when the temperature of the surrounding atmosphere rises above a predetermined level comprising a pair of standards mounted on said base, a fusible element supported by said standards, a pivoted rod, guide means rotatably mounted on said base and adapted to maintain the free end of said rod in engagement with said fusible element whereby the door is checked in opened position under normal conditions, said guide means being adapted to control the path of movement of said rod during the closing of said door when the fusible element has been rendered inoperative by heat.

5. In combination with a door which automatically closes upon being released from opened position, a check device adapted to release said door when the temperature of the surrounding atmosphere rises above a predetermined level comprising a base, a pair of standards mounted on said base, a pair of arms mounted for rotational movement on said standards, a fusible element uniting said arms, a pivoted rod, a guide element rotatably mounted on said base and adapted to maintain the free end of said rod in engagement with said arms at their point of

junction whereby the door is checked in opened position under normal conditions and a strain is exerted on the fusible element uniting said arms, said guide means being adapted to control the path of movement of said rod during the closing of said door when the fusible element uniting said rotatable arms has been rendered inoperative by heat.

6. In combination with a door which automatically closes upon being released from opened position, a check device adapted to release said door when the temperature of the surrounding atmosphere rises above a predetermined level comprising a base, means fixedly securing said base to the soffit of the door lintel, a pair of standards mounted on said base, a pair of arms mounted for rotational movement on said stand-

ards, a fusible element uniting said arms, a rod, means pivotally supporting said rod on the upper end portion of said door, a guide element rotatably mounted on said base and adapted to hold the free end of said rod in engagement with said arms at their point of juncture whereby the door is checked in opened position under normal conditions and a strain is produced on the fusible element uniting said arms, said guide means being adapted to maintain said rod in a substantially horizontal position throughout its range of movement during the closing of said door when the fusible element uniting said rotatable arms has been rendered inoperative by heat.

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