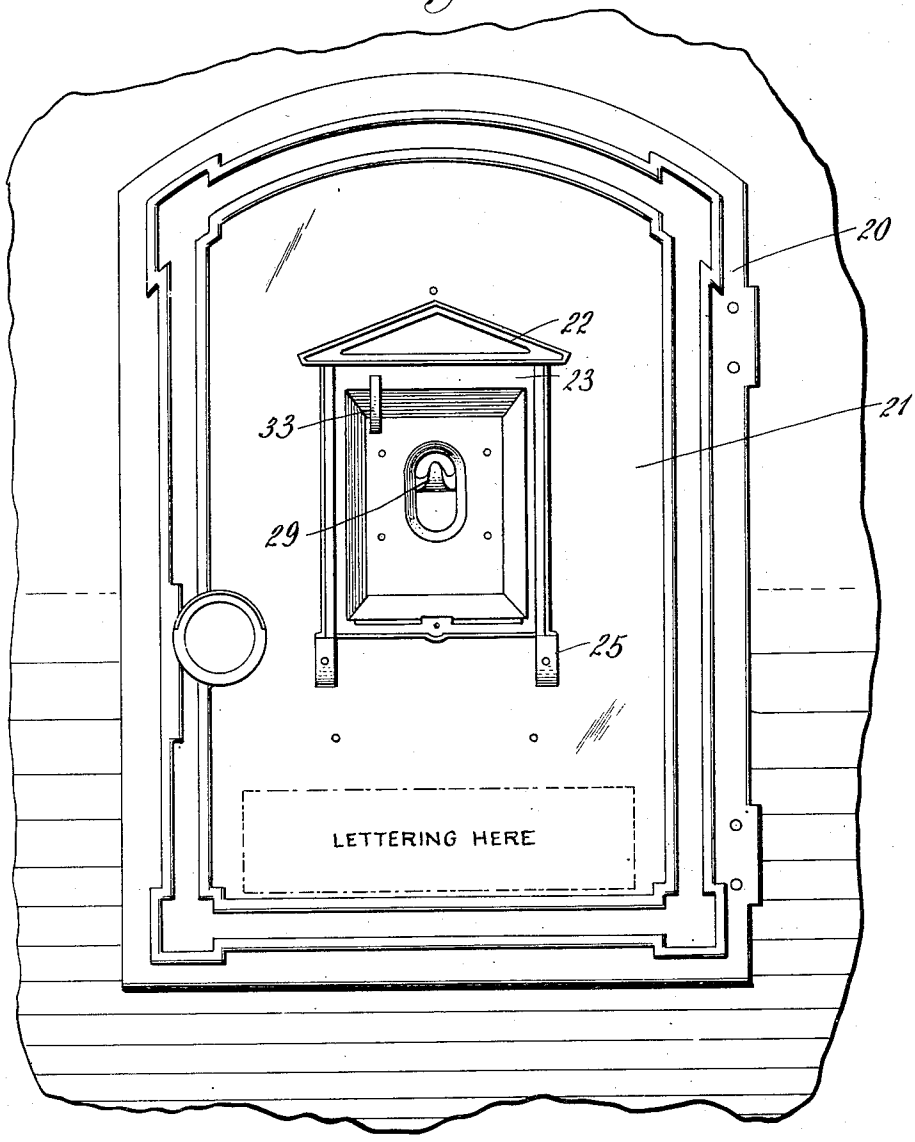
May 7, 1935. P. P. HORNI 2,000,517

DOOR FOR FIRE ALARM BOXES AND THE LIKE

Filed Oct. 18, 1930 6 Sheets-Sheet 1

Fig. 1



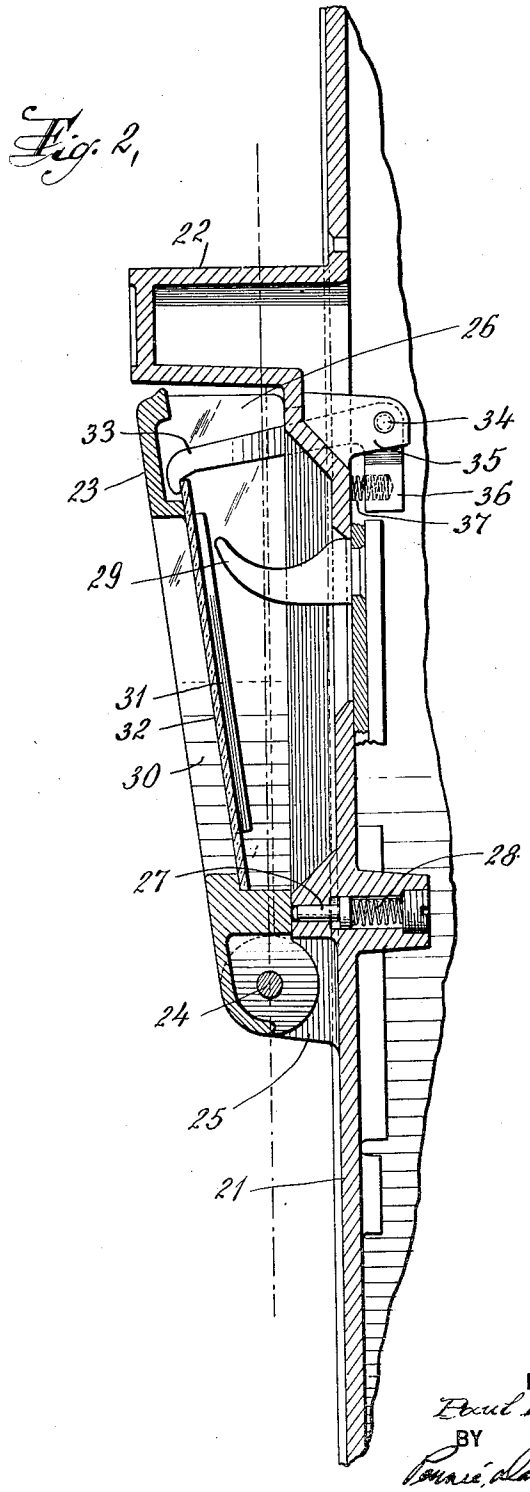
INVENTOR
Paul P. Horni
BY
Pennie, Davis, Marvin & Edmonds
ATTORNEYS

May 7, 1935. P. P. HORNI 2,000,517

DOOR FOR FIRE ALARM BOXES AND THE LIKE

Filed Oct. 18, 1930 6 Sheets-Sheet 2

Fig. 2,



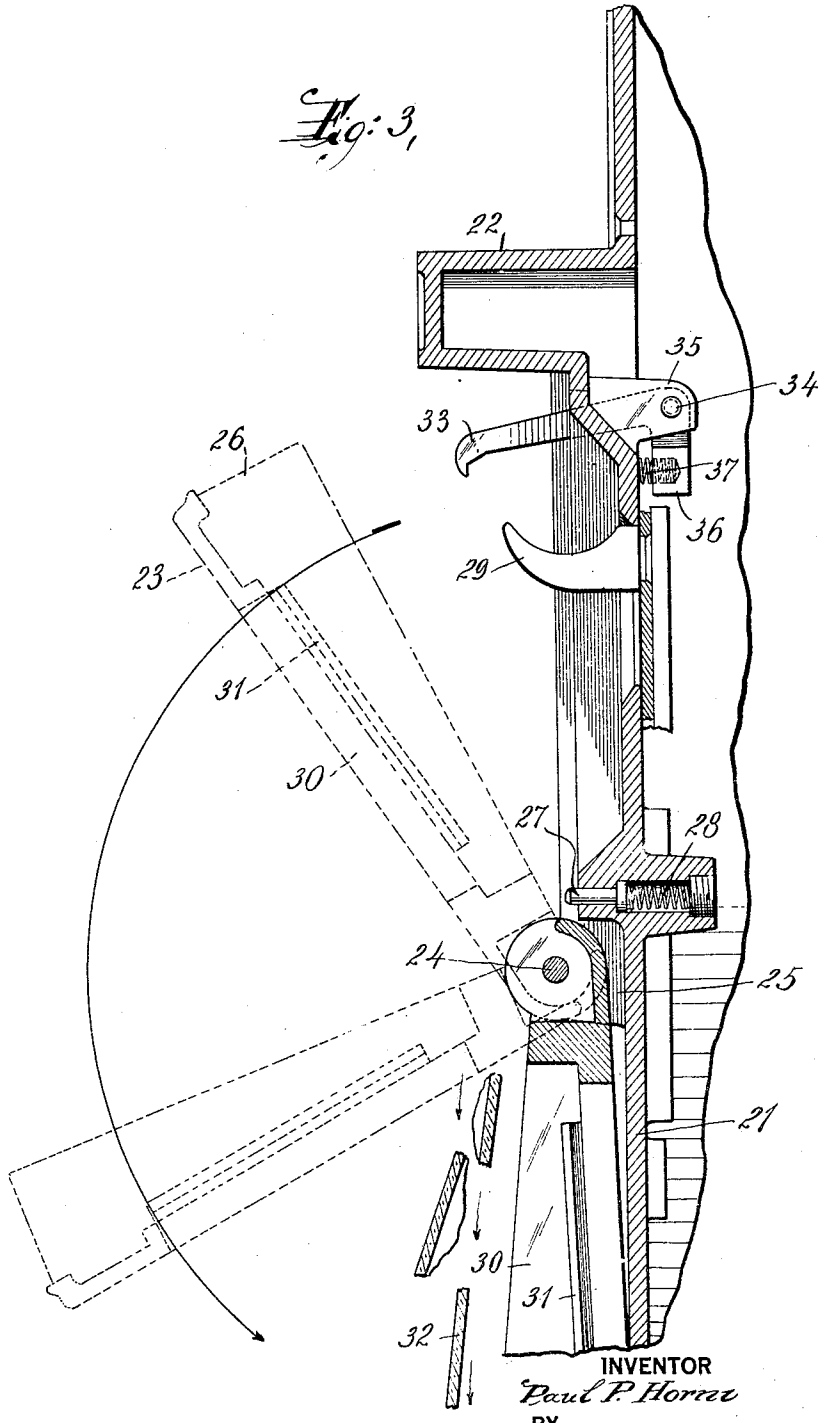
INVENTOR
Paul P. Horni
BY
Pennie, Davis, Marvin & Edmonds
ATTORNEYS

May 7, 1935. P. P. HORNI 2,000,517

DOOR FOR FIRE ALARM BOXI AND THE LIKE

Filed Oct. 18, 1930 6 Sheets-Sheet 3

Fig. 3,



INVENTOR
Paul P. Horne
BY
Pennie, Davis, Marvin & Edmonds
ATTORNEYS

May 7, 1935. P. P. HORNI 2,000,517

DOOR FOR FIRE ALARM BOXES AND THE LIKF

Filed Oct. 18, 1930 6 Sheets-Sheet 4

Fig. 8,

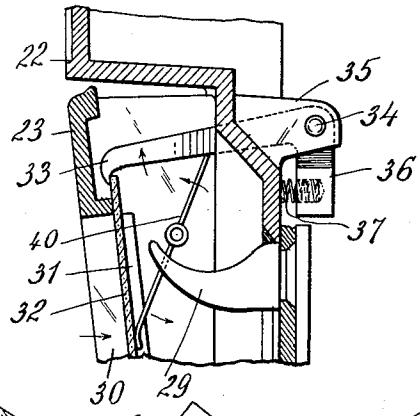


Fig. 4,

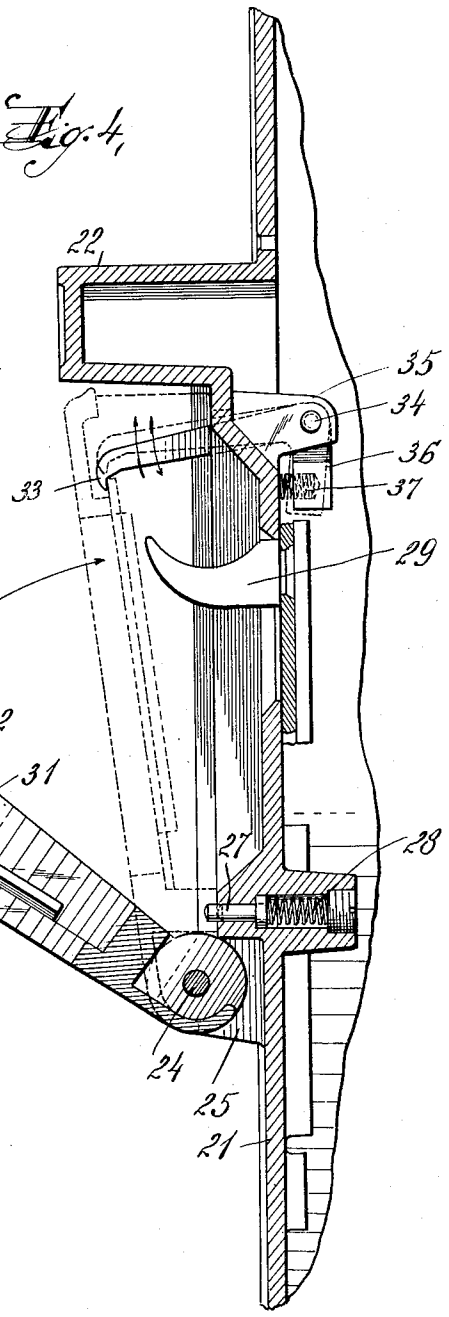
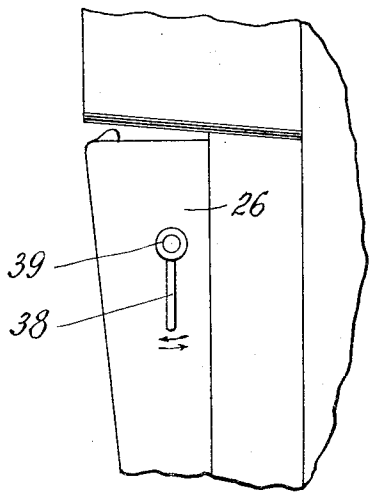


Fig. 9,



INVENTOR
Paul P. Horni
BY
Penne, Davis, Marvin & Edmonds
ATTORNEYS

May 7, 1935. P. P. HORNI 2,000,517

DOOR FOR FIRE ALARM BOXES AND THE LIKE

Filed Oct. 18, 1930 6 Sheets-Sheet 5

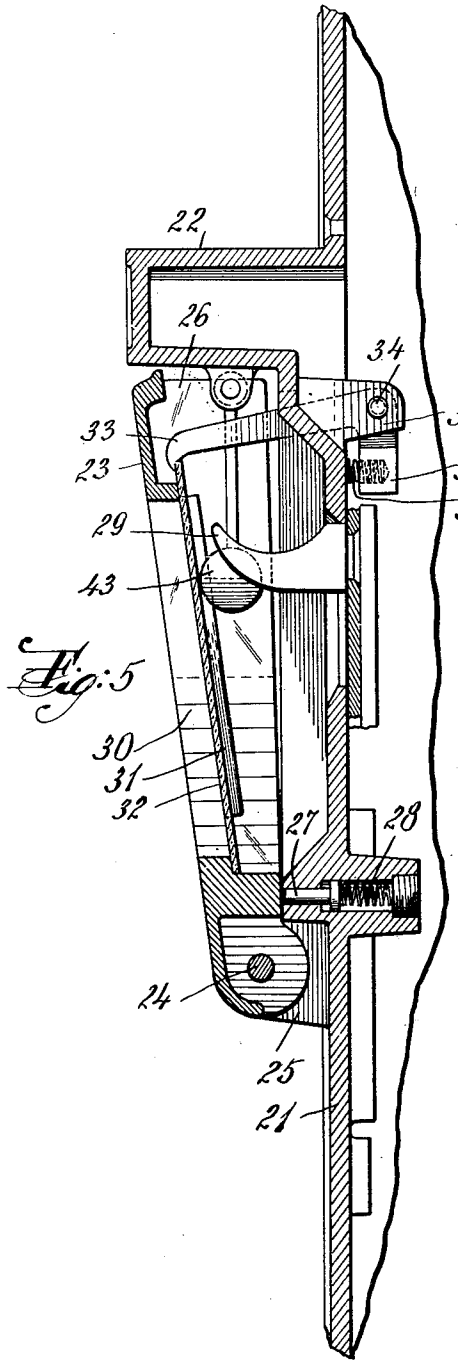


Fig. 5

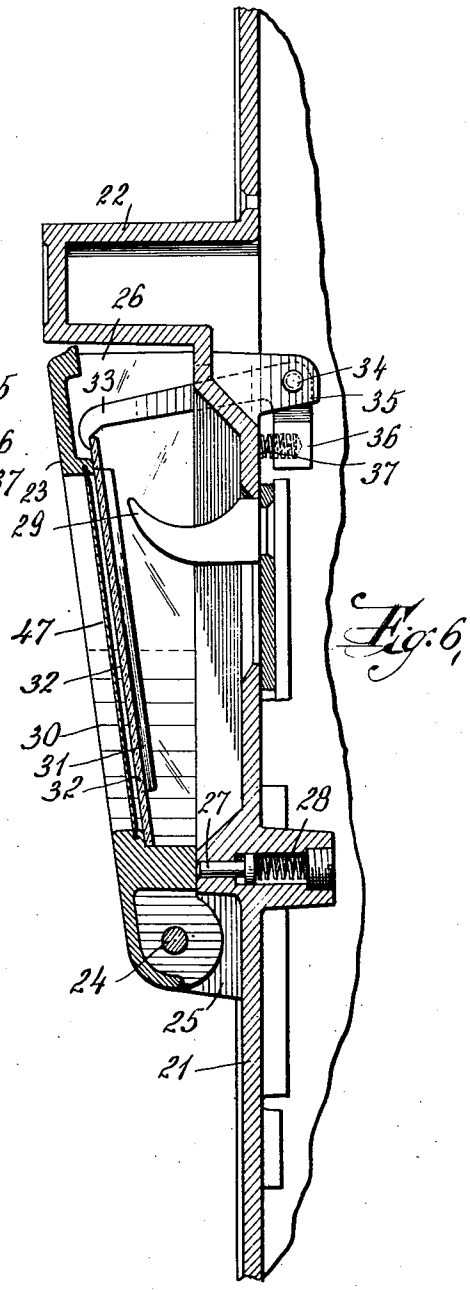


Fig. 6

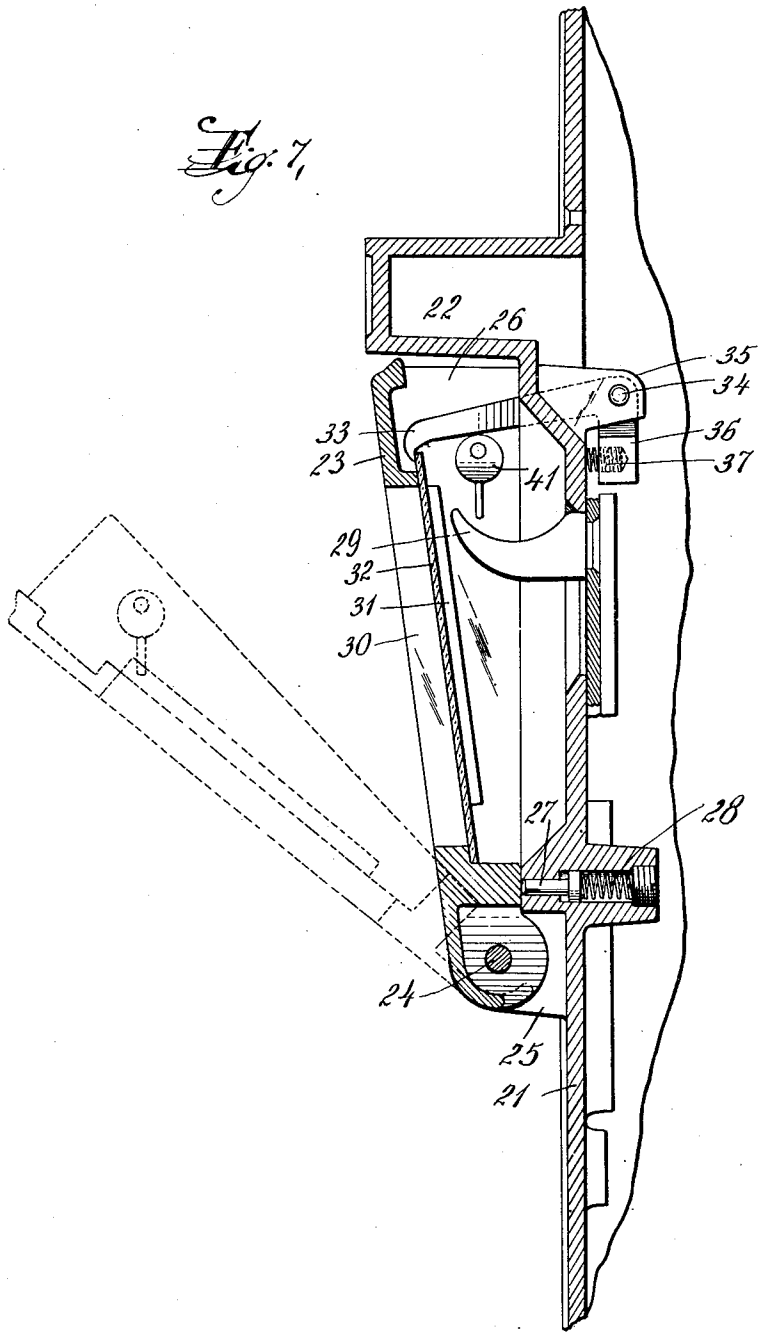
INVENTOR
Paul P. Horni
BY
Pennie, Davis, Marvin & Edmonds
ATTORNEYS

May 7, 1935. P. P. HORNI 2,000,517

DOOR FOR FIRE ALARM BOXES AND THE LIKE

Filed Oct. 18, 1930 6 Sheets-Sheet 6

Fig. 7,



INVENTOR
Paul P. Horni
BY
Pennie, Davis, Marvin & Edmonds
ATTORNEYS

Patented May 7, 1935 2,000,517

UNITED STATES PATENT OFFICE

2,000,517

DOOR FOR FIRE ALARM BOXES AND THE LIKE

Paul P. Horni, Newark, N. J.

Application October 18, 1930, Serial No. 489,687

4 Claims. (Cl. 177—372)

This invention relates to boxes for enclosing mechanism for energizing fire alarms and the like, and has particular reference to a novel door, whereby access to the fire alarm mechanism may be readily had in case of fire.

Heretofore, two distinct types of fire alarm boxes were employed, one in which a door had to be opened in order to reach the lever, button or key for initiating the alarm, and in the other type a frangible element such as a plate of glass had to be broken in order to gain access to the alarm mechanism. Each of these former types of fire alarm boxes had certain objections as well as advantages, and it is the principal object of this invention to provide a fire alarm box which employs both arrangements in a novel way in order to secure the advantages of each arrangement and obviate the objections thereof.

Accordingly, the present invention comprehends a fire alarm box having a door pivoted thereto, which is adapted to be opened to obtain access to the alarm-giving lever, button or key normally enclosed by the door. The door is equipped with a frangible element, such as a sheet of glass, and is normally biased to open position either by overbalancing it so that it will swing open by gravity when released, or by providing a spring or the like for forcing the door open when it is released. A latch suitably pivoted or otherwise mounted on the frame of the box engages one edge of the glass sheet in the door and serves as the sole means for holding the door in closed position. Accordingly, disengagement of this latch from the glass sheet causes the door to swing automatically, so that the alarm-giving lever, button or key is immediately rendered accessible. This disengagement of the latch from the glass sheet is most readily obtained by breaking the glass, so that it falls away and is released from the latch, and the door is no longer held against opening and automatically swings open.

In an alternative arrangement, the alarm box is equipped with positive means for breaking the glass, which operates without any specific act on the part of the user in striking the glass or requiring the user to search for an object with which to strike the glass. This means preferably consists of a pendulous weight, projection, or other object or striker so placed behind the door adjacent the glass that movement of the door, which is preferably slightly ajar for the purpose, causes the striker to break the glass, whereby the latch which normally engages it to hold the door in closed position is rendered ineffective and the door flies open. In order to prevent injury to the user by flying fragments of glass as he breaks the glass sheet, the latter is preferably overlaid with a sheet of flexible material which may be struck to break the glass behind it, and encloses the broken pieces of glass so that they do not injure the user. If the glass is broken in a way other than by striking the flexible sheet, the latter acts in the same way to prevent the broken pieces of glass from injuring the user.

It will be seen that the arrangement of this invention provides a very effective and efficient arrangement for immediately rendering accessible the lever, button, or key for sounding the alarm, and for a better understanding of the invention, preferred embodiments of this arrangement are illustrated in the accompanying drawings, in which

Figure 1 is a face view of a new fire alarm box of this invention with the door removed to show the release lever or latch;

Fig. 2 is a vertical section through the novel door;

Fig. 3 illustrates graphically the manner in which the door automatically swings open when the glass is broken;

Fig. 4 illustrates the method of inserting a new sheet of glass and the manner in which the door is latched;

Fig. 5 illustrates a modification including a striker whereby the glass is broken;

Fig. 6 illustrates an arrangement whereby a sheet of flexible material encloses the glass and protects the user from flying particles; and

Figs. 7, 8, and 9 illustrate alternative arrangements, whereby the box may be opened either by breaking the glass or by releasing the latch.

In these drawings, numeral **20** designates the frame of the fire alarm box having the usual front panel **21**, upon the front of which is mounted the housing **22**. Referring to Fig. 2, a door **23** is pivoted at its lower edge on a hinge pin **24** extending between the lugs **25** of the housing **22**. The door is provided with downwardly tapering side flanges **26** but no top flange, so that the top of the door is open and its center of gravity is to the left of the hinge pin **24** as seen in Fig. 2, whereby the door **23** is overbalanced and tends to swing open by gravity when it is released. In case the door **23** should stick for any reason such as dirt lodged between its side flanges **26** and the housing **22** or around the hinge pin **24**, or by ice and the like, a plunger **27** is provided which is forced by spring **28** against the door **23** to urge it to open position when it is released.

Behind this door **23** and within housing **22** is

the usual alarm-giving lever 29 or the equivalent key, button, or the like, for operating the alarm mechanism contained within the frame 20, but not shown in the drawings because it is not part of the present invention.

The door 23 is provided with a center opening 30 opposite the alarm lever 29 and with overhanging flanges 31 along its vertical edges of this opening 30. These flanges 31 are adapted to embrace the side edges of a sheet of glass 32 which normally closes opening 30 in the front of the door 23, and which is either transparent, translucent, opaque, or partly opaque or masked to display the alarm lever 29 behind it. The sheet of glass 32 is inserted through the open top of the door and slid in position between the overhanging flanges 31 in the manner shown in Fig. 4.

The top edge of the glass sheet 32 projects slightly and, engaging this top edge, is a latch 33 pivoted on a pin 34 mounted on the bracket 35 located on the back of the frame front panel 21. The inner end of the latch 33 is provided with an extension 36, between which and the back of the frame 22 is placed a spring 37 which normally urges the latch 33 in engagement with the top edge of the glass sheet 32. Accordingly, after the glass sheet 32 has been inserted in the door 23 in the manner shown in Fig. 4, it is only necessary to move the door to closed position, as shown in phantom in Fig. 4, whereupon the latch 33 snaps over the top edge of the glass sheet 32 to latch the door in closed position. It will be noted that the latch 33 is the only element which holds the door 23 shut, and that this latch engages only the glass sheet 32 to perform this function. Thus the door 23 is normally biased to open position by gravity or the plunger 27 or both, but is held closed by the latch 33.

When the glass sheet 32 is broken by a user in order to gain access to the alarm-giving lever 29, the latch 33 automatically releases the door 23, inasmuch as the glass sheet falls away in pieces as shown in Fig. 3. The door then swings downwardly as shown in phantom in Fig. 3, either by gravity or because of the pressure of plunger 27, and the user then pulls down on the alarm lever 29 to sound the alarm. Thereafter the glass sheet 32 is replaced as shown in Fig. 4, the door 23 closed, and the apparatus is again ready for operation.

In some instances, the user may hesitate to break the glass sheet 32, or not have means for doing so, so that an auxiliary arrangement may be provided for disconnecting the latch 33 from the glass sheet 32. Several forms of this auxiliary arrangement are illustrated in Figs. 7, 8, and 9. As shown in Fig. 9, the handle 38 is placed on the outside of the door and is connected to the end of a shaft 39 journalled through one of the side flanges 26 for example, and carrying on its inner end the cross bar 40, one end of which engages the glass sheet 32, and the other end of which engages the latch 33. Accordingly, movement of the lever 38 causes the cross bar 40 to disengage latch 33 from glass sheet 32, so that the door 23 flies open.

In an alternative arrangement, a cam 41 is mounted on the inner end of shaft 39, so that manipulation of lever 38 causes latch 33 to disengage glass sheet 32. This arrangement is shown in Fig. 7. Rod 40, shown in Fig. 8, has an additional purpose and that is to hold the glass 32 in place instead of the overhang on flanges 31 as shown in Fig. 4. Accordingly, it is only necessary for the user to push inwardly on glass sheet 32 to open the door, inasmuch as this action causes the lower end of rod 40 to pivot about the shaft 39 as indicated by the arrows in Fig. 8, so that its upper end disengages latch 33 from glass sheet 32 and the door flies open. It will be seen that, with this arrangement, it is not necessary to break the glass to open the door, nor is it necessary to manipulate lever 38 to release the latch 33, although the lever is ready for use in this way if the user should adopt this method for opening the door.

Frequently, it is not possible for the user to find an object with which to break the glass, and so, in an alternative arrangement, a striker is provided for breaking the glass without requiring a positive striking act on the part of the user to do so. In Fig. 5 is illustrated an arrangement whereby the door 23 is held slightly ajar by latch 33, and a pendulous weight 43 is suspended from the top of housing 22 immediately behind the glass sheet 32. With this arrangement, it is only necessary for the user to jar the door 23, which causes the weight 43 to swing rearwardly, so that its rebound breaks the glass sheet 32 from the rear to release latch 33, and the door 23 flies open. While a pendulous weight 43 is preferred, any other striker or projection engaging the rear of the glass so that the glass is broken when the door is pushed toward fully closed position, is an equivalent arrangement within the scope of this idea.

In any of these arrangements where it is necessary to break the glass in order to open the door, it is preferred that the user be protected from the flying pieces of glass. Accordingly, as shown in Fig. 6, a sheet 47 of flexible material overlies the glass sheet 32, and is so arranged that if the glass 32 is broken for any reason, the pieces of glass are prevented from flying and causing injury to the user. The flexible sheet 47 may be of thin sheet metal, but it preferably consists of a transparent sheet of celluloid or the like. As this flexible protector sheet 47 immediately overlies the glass sheet 32, it may be struck and the impact of the blow is transmitted to the glass to break it in the usual way. Of course, other means of breaking the glass described herein may be used with equal facility, the object of this arrangement being to prevent the fragments of glass from injuring the user, however, the sheet of glass may have been broken.

It will be seen that the new fire alarm box arrangement of this invention and the various modifications thereof which lie within its scope provide a very simple and effective means for gaining access to the alarm-giving lever, button or key without requiring the user, who is usually excited and in haste, to read a set of instructions which would appear complicated under the circumstances, or require him to perform a number of operations to obtain the simple result of gaining access to the alarm-giving mechanism. At the same time, the operating mechanism of the alarm box is protected against the weather and inadvertent or unintended operation by an enclosure which though readily opened is secure and effective for the purpose. While the arrangements and modifications thereof described herein are preferred embodiments of the invention, it is to be understood that the invention is not limited thereby, but is susceptible of various changes in form and detail within its scope.

I claim:

1. In a fire alarm box, the combination of a frame, a movable door thereon, a frangible element mounted in the door, a latch engaging said element for holding said door in partially closed position, and means inside of said door rendered effective by movement of said door toward fully closed position for breaking said element to release said latch.

2. In a fire alarm box, a frame, a door pivoted thereon, a frangible element on said door, means engaging said element for holding said door partly closed, and means rendered effective by movement of said door toward fully closed position for breaking said element to release said door.

3. In a fire alarm box, a frame, a door pivoted thereon, a frangible element on said door, means engaging said element for holding said door partly closed, and a member arranged adjacent said element for breaking the same when said door is moved toward fully closed position.

4. In a fire alarm box, the combination of a frame, a door pivoted thereon, a frangible element on said door, a latch pivoted on the frame for engaging said element for normally holding said door in partially closed position, and a separate striker suspended adjacent said element and adapted to be swung away from the element by movement of the door toward fully closed position so as to break said element on the return swing.

PAUL P. HORNI.