

Aug. 29, 1944.

C. A. GETZ ET AL

2,356,989

CONTROL BOX FOR FIRE EXTINGUISHER SYSTEMS

Filed Aug. 30, 1941

3 Sheets-Sheet 1

Fig. 1.

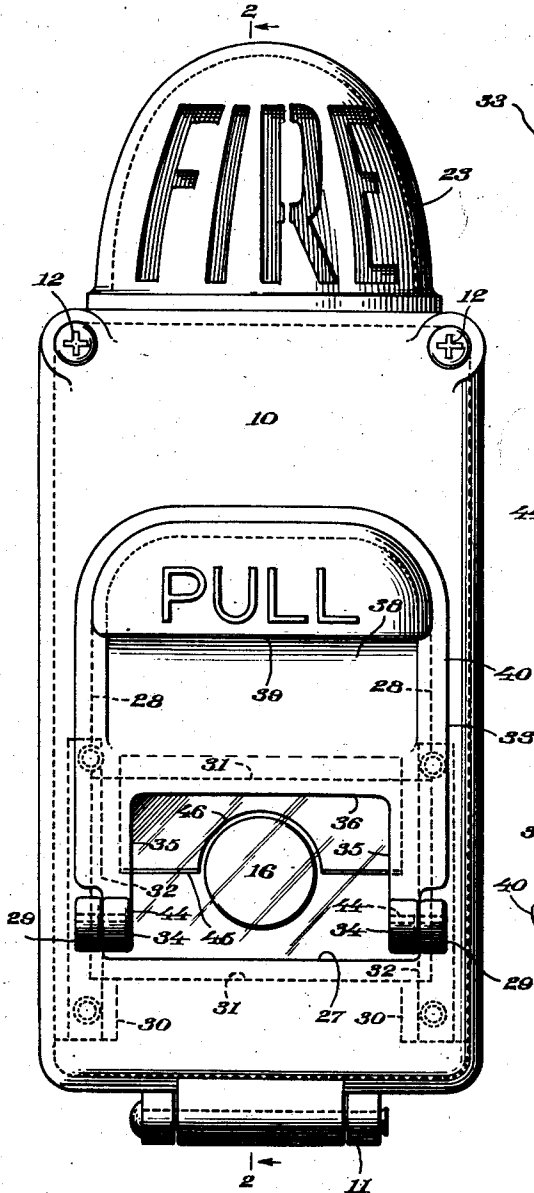


Fig. 4.

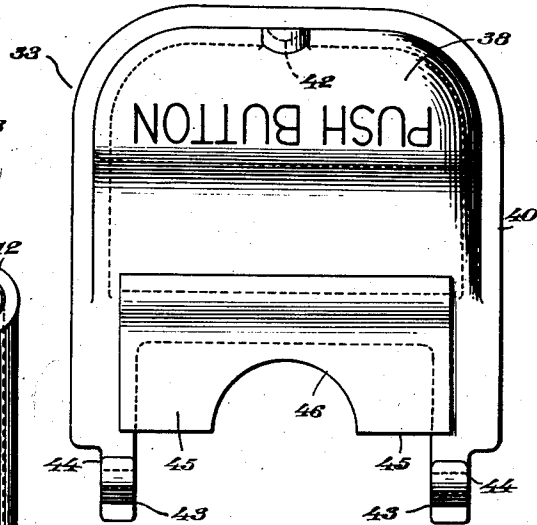
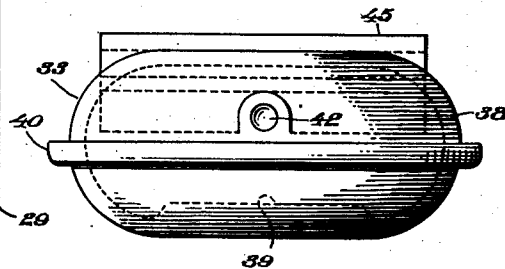


Fig. 5.



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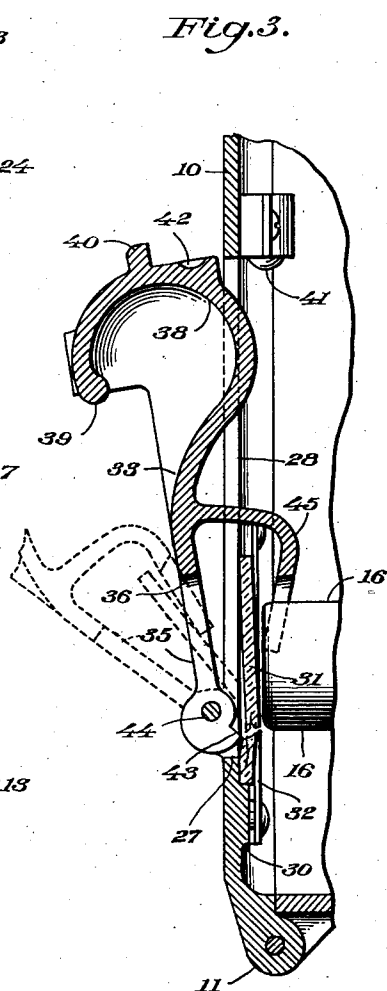
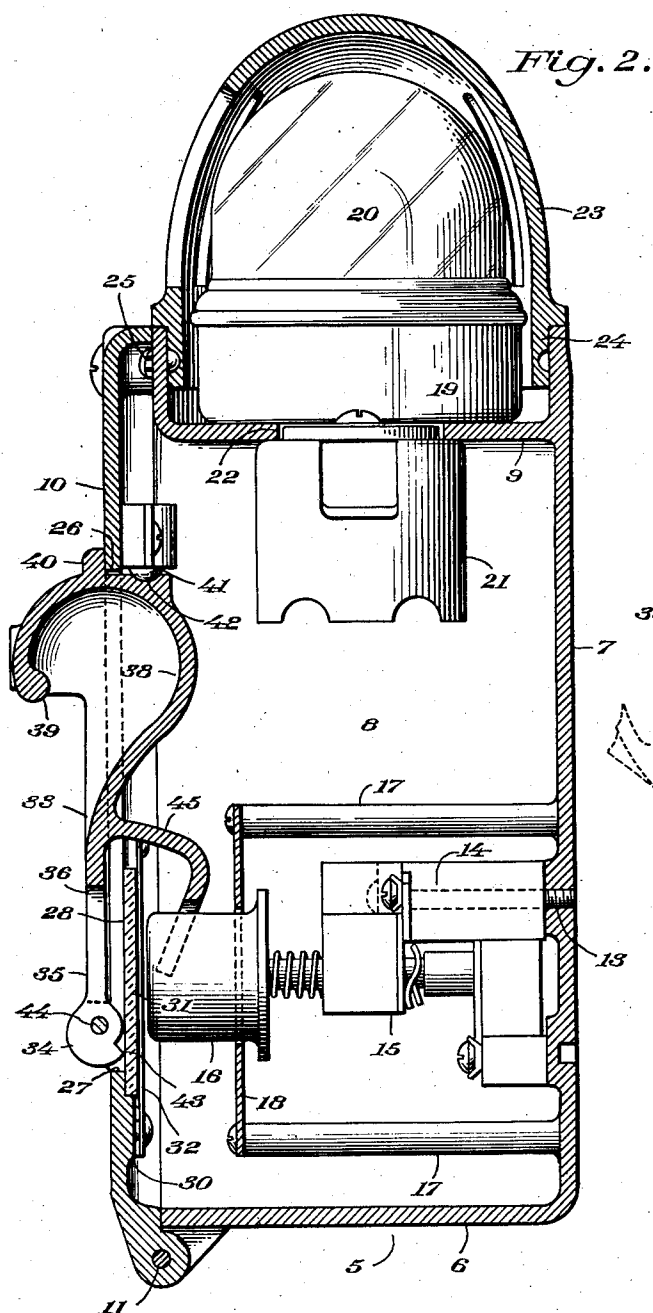
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CONTROL BOX FOR FIRE EXTINGUISHER SYSTEMS

Filed Aug. 30, 1941

3 Sheets-Sheet 2



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CONTROL BOX FOR FIRE EXTINGUISHER SYSTEMS

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3 Sheets-Sheet 3

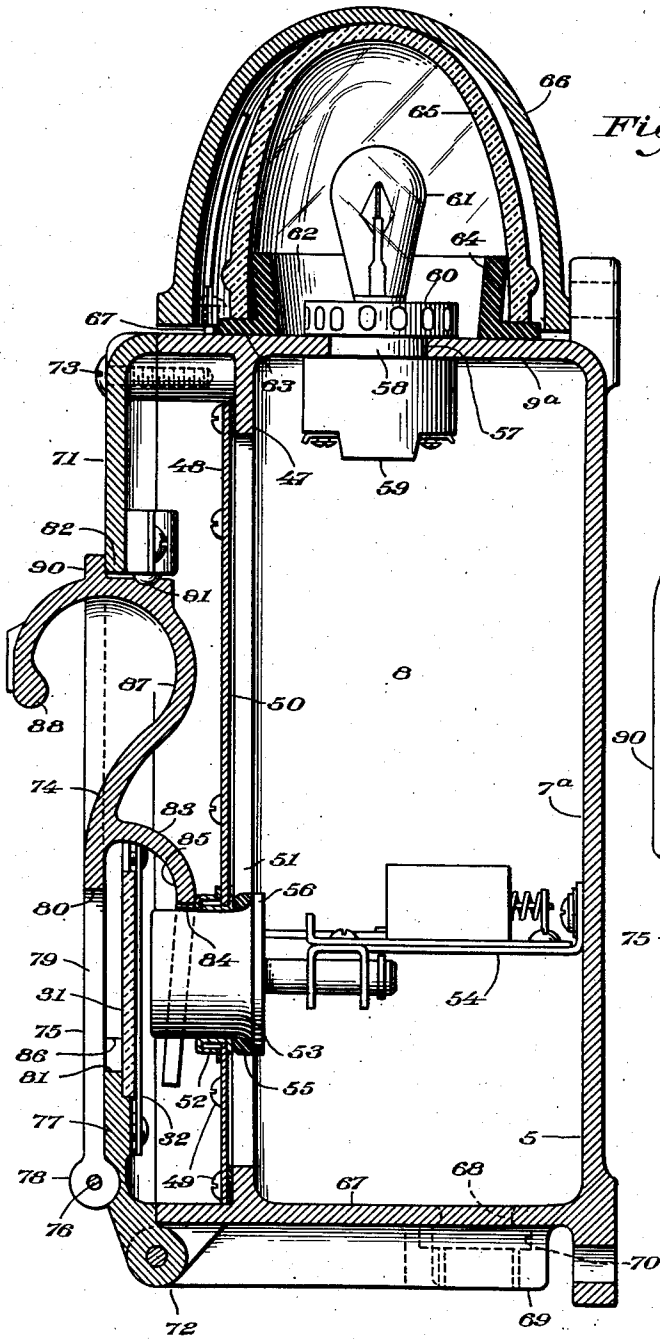


Fig. 6.

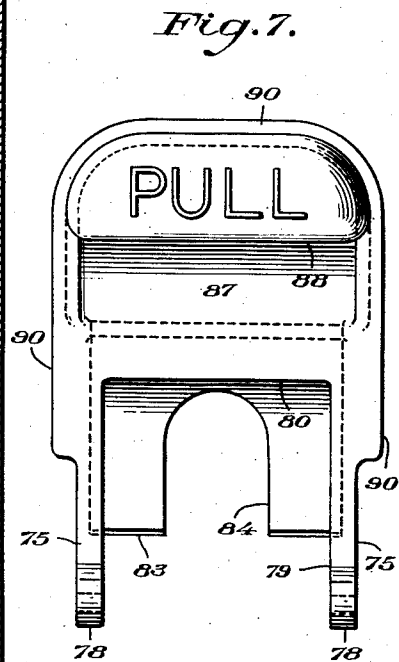


Fig. 7.

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## UNITED STATES PATENT OFFICE

2,356,989

## CONTROL BOX FOR FIRE EXTINGUISHER SYSTEMS

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Application August 30, 1941, Serial No. 409,086

4 Claims. (Cl. 177—372)

This invention relates to new and useful improvements in control boxes employed as a part of fire extinguishing systems.

Control boxes are used as a part of certain fixed fire extinguishing systems, installed in buildings or on other types of properties, to house control devices, such as electric switches, etc. These devices must be placed at strategic locations relative to the hazard or hazards to be protected and usually are employed as remote, manual controls for initiating the operation of the extinguishing system. Although fire protection systems of this type are most frequently installed on private properties where they will not be exposed to the general public, and are only supposed to be placed in operation by persons charged with that responsibility, it is deemed to be advisable to provide some means to prevent these vitally important control devices from being tampered with by any meddlesome person without detection. For that reason, this type of control box must be constructed so that access to the device housed therein may be obtained quickly and easily when the system must be placed in operation, but so that access cannot be obtained without destroying some part of the box which must be replaced by a person having the proper authority.

Another essential feature of this type of unit is that the control device protected by the box must be visible at all times although it is inaccessible, so to speak. This ability to see the enclosed control device is important because the most practical units of this type require two manual operations to accomplish the desired result; first, gaining access to the interior of the box and, second, actuating the control device. If the enclosed device is not visible, the person having the occasion to initiate the operation of the fire extinguishing system may perform the first step and then rush away to take care of some other matter, not remembering, in his excitement, that there was a concealed control device that must be actuated.

The barring of meddlers by a destructible box part and the desired visibility of the enclosed instrument may be obtained by placing a transparent, fractureable plate in a window opening formed in the cover of the control box. This plate should be arranged in front of the enclosed control device and destruction of the same should be necessary before the device can be reached for actuation.

It is the usual practice to provide control boxes with hammers, of one design or another, to be

used in destroying the customary transparent plates which bar access to the control devices. These hammers originally are attached to the boxes by light chains. In the course of the months or years that most systems of this type remain idle before they are called upon to extinguish a fire, it is not difficult for the hammers to become detached and lost. Such a loss makes it necessary for the person who is desirous of starting the operation of the system to locate some other object which is suitable for delivering a destructive blow to the fractureable plate. Regardless of what instrument is actually used to destroy the plate, fragments of the same invariably are left in the window opening, and it is almost impossible to reach through the opening to actuate the control device without being injured by the jagged edges of said fragments.

In certain types of properties it is necessary to employ control boxes in locations where a considerable amount of moisture is present, either intermittently or continuously. In such cases it is necessary to provide control boxes which will house the electric control devices in moisture proof chambers or compartments so that all danger of short-circuiting will be avoided.

It is the primary object of this invention to provide a control box for fixed fire extinguishing systems which houses a control device in such a manner that access may be obtained quickly and easily when necessary; which employs a single transparent, fractureable plate for exposing the enclosed control device to view and for preventing access without detection; and which includes means for fracturing the said plate and removing all broken fragments from the opening normally closed by the plate so that a person may reach the control device without danger of being injured.

A more specific object of the invention is to provide control devices of the above mentioned type which include a single, manually operable element which, in being moved from its normal position into a fully operated position, will fracture the transparent plate and will sweep all of the broken fragments of the plate from the opening normally closed by said plate.

A still further specific object of the invention is to provide a box construction which is adapted for housing the manually operable electric control devices of fixed fire extinguishing systems in sealed chambers or compartments so that short-circuiting, due to an accumulation of moisture, will not take place to cause a false operation of the system.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings forming a part of this specification and in which like numerals are employed to designate like parts throughout the same,

Figure 1 is a front elevational view of the fire extinguisher system control box embodying this invention,

Figure 2 is a vertical sectional view taken on line 2—2 of Fig. 1,

Figure 3 is a fragmentary vertical sectional view, taken on the same section line as Fig. 2, but illustrating different stages of the operation of a transparent plate fracturing and removing element,

Figure 4 is a detail, rear elevational view of the transparent plate fracturing and removing element illustrated in Fig. 3,

Figure 5 is a top plan view of this element.

Figure 6 is a similar view to Fig. 2 but illustrates a modified form of control box construction, and

Figure 7 is a detail, front elevational view of the transparent plate fracturing and removing element in Fig. 6.

In the drawings, wherein for the purpose of illustration are shown the preferred embodiments of this invention, and first specifically referring to Figs. 1 to 5, inclusive, the reference character 5 designates in its entirety the main body portion of the control box. This box includes a bottom wall 6, a rear wall 7, side walls 8, and a depressed top wall 9. The front wall of the box is formed by a cover 10 which is hinged at 11 to the bottom wall 6 and is normally retained in its closed position by screws 12 located at its two upper corners.

The lower portion of the back wall 7 has a suitable number of threaded apertures 13 formed therein to receive the mounting screws 14 for a suitable push button type of electric switch 15 which includes the operating button 16. It will be noted by inspecting Figs. 2 and 3 that the outer face of this actuating button 16 is located just inside the box cover 10.

A suitable number of mounting posts 17 are grouped around the electric switch 15 and function to support a centrally apertured plate 18 which surrounds the operating button 16 for the switch. This plate acts as a shield to prevent the person who depresses the operating button 16 from contacting any electrically energized parts of the switch 15.

The top wall 9 of the box is depressed to form a pocket for receiving the holder or mount 19 for the red, glass globe 20. An electric light is mounted within the holder 19 and the globe 20 and is electrically connected to a porcelain socket or receptacle 21 which is located inwardly of the depressed top wall 9. This wall is centrally apertured at 22 for accommodating the portion of the electric light bulb which passes from the globe 20 into the socket or receptacle 21.

A suitable lamp guard 23 has its base 24 socketed in the pocket formed by the depressed top wall 9. This guard is suitably secured in place by the fastener 25. Fig. 1 discloses this guard 23 as having the word "Fire" formed therein by cutting away appropriate parts of the front wall of the guard.

Suitable electric wire admitting openings, not shown, may be formed in any of the bottom, rear, or side walls of the main box part 5. The wires

will be used to complete electric control circuits with the switch 15. The electric lamp, not shown, housed within the globe 20, will be suitably connected to such wires, and this bulb either may be constantly energized to assist one in locating the control box in the dark or, if preferred, it may be energized only as a result of actuation of the switch 15 to initiate the operation of the fixed fire extinguisher system which is controlled by the switch 15.

The cover 10 is provided with an opening which is defined at its top by the edge 26, see Fig. 2, and at its bottom by the edge 27, see Figs. 1 and 2. The side edges are designated by the reference character 28 in Figs. 1, 2, and 3. Hinge ears 29 are located at the two lower corners of this cover opening. The central vertical planes of these hinge ears are located approximately in line with the side edges 28 of the opening and, because of that fact, the said hinge ears project slightly laterally inwardly of these said side edges. Located on the rear face of this cover 10, and below the hinge ears 29, are two shoulders 30. The upper edges of these shoulders are located below the bottom edge 27 of the said cover opening.

A transparent, fracturable plate, which may be formed of glass, is located in the lower portion of the cover opening and is designated by the reference character 31. The fracturable plate is adapted to rest on the top edges of the shoulders 30. This places the bottom edge of the fracturable plate below the bottom edge 27 of the cover opening. The horizontal dimension of this fracturable plate approximately corresponds with the distance between the two side edges 28 of the cover opening and this plate width will cause the lower edge portions to lie in back of the portions of the two hinge ears 29 which extend laterally inwardly of the side edges 28 of the opening. By inspecting Fig. 1, it will be seen, therefore, that the fracturable plate is supported against movement frontwardly out of the opening by the lower margin of the cover opening and by the portions of the hinge ears 29 which project inwardly of the side edges 28 of the cover opening. To prevent the fracturable plate 31 from moving inwardly, two side straps 32 are secured to the back of the cover, the lower ends being attached to the shoulders 30, to overlie the side edge portions of the fracturable plate and engage the rear face of said plate.

A pull lever 33 is adapted to be pivotally attached to the hinge ears 29, carried by the cover 10. To accomplish this pivotal mounting, hinge ears 34 are formed on depending branches 35 of this lever. Figs. 1 and 2 clearly disclose these branches as being arranged at the side portions of the lever and spaced from each other to expose a part of the fracturable plate 31 and to fully disclose the front face of the operating button 16 for the switch 15. Above the edge 36, the lever 33 is solid throughout its width.

This solid upper portion of the lever is depressed or off-set inwardly at 38, see Figs. 2 and 3, to provide a depression to receive the finger tips of the person operating the lever. A gripping edge 39 is formed as a part of the top portion of the lever, and this edge projects forwardly of the front face of the cover 10. A marginal flange 40 is formed along both sides of and the top of the lever to overlap the marginal portion of the cover opening to limit inward pivotal movement of the lever relative to the cover. A spring pressed detent 41 is suitably mounted on the inner

face of the cover 10 and is adapted to engage in a depression 42 formed in the upper end portion of the lever 33 to retain the lever in its normal position.

Figs. 2 and 3 disclose the spaced hinge ears 34 of the lever as being formed with relatively short projections 43 which are arranged below the pivot pins 44 that pivotally connect the two sets of hinge ears 29 and 34. These two laterally spaced projections 43 normally are out of engagement with the fracturable plate 31 but are adapted to engage this plate after but slight movement of the lever 33 about the pivot pins 44. This engagement of the projections 43 with the fracturable plate causes the plate to be broken, as is illustrated in Fig. 3.

Figs. 2 to 5, inclusive, clearly illustrate a plate or arm 45 as extending inwardly and downwardly of the rear of the lever 33. This arm or plate has its depending portion lying in back of the fracturable plate 31 and is cut away at 46 to straddle the switch operating button 16. As the lever 33 is swung outwardly beyond the point where the projections 43 fracture the plate 31, the depending part of the arm or plate 45 engages the fracturable plate 31 and sweeps the broken portions of this plate outwardly through the opening formed in the cover 10. As the lever 33 swings downwardly into its lowermost position, the opening formed in the bottom portion of the lever between the branches 35 and the edge 36 will be bridged by the lower part of the cover. The angular plate or arm 45 will then project forwardly and upwardly relative to the front face of the cover and will cooperate with this front face to form a pocket to collect and hold at least the larger pieces of the fracturable plate 31 which have been swept from the cover opening by the lever.

As was previously pointed out, the shoulders 29 form rests for the two lower corners of the fracturable plate 31. This retains the lower edge of the plate below the lower edge of the cover opening, represented by the character 27. These two lower corners of the fracturable plate 31 are clamped between the rear straps 32 and the backs of the hinge ears 29. Above these hinge ears, the side edges of the fracturable plate 31 are only backed up by the straps 32. No support is provided in front of these side edges in this upper region of the plate.

As the lever 33 is swung outwardly about its pivot pins 44, the projections 43 very promptly engage the two lower corner portions of the fracturable plate, in the regions where the plate is clamped both at its front and at its rear. These projections 43 break the plate. Because of the difference in length of the lever arms provided by the projections 43, on one side of the pivot pins 44, and the major portion of the length of the lever 33, arranged on the opposite side of the pivot pins, the person operating the lever will experience no difficulty in breaking the glass. As the lever is swung outwardly to a greater extent, the angular plate or arm 45 will engage the pieces of the fractured glass, or transparent plate, 31 and will sweep these broken pieces entirely outwardly of the opening formed in the cover 10. As the upper, side edge portions of this plate 31 are not supported against outward movement, no difficulty will be experienced in sweeping the fragments out of the cover opening.

By inspecting Fig. 2, it will be seen that the marginal flange 40 extends almost entirely around the two sides and top of the lever 33. This mar-

gin, when placed in engagement with the front face of the cover 10, will hold the lever in its normal position and will prevent too great an extent of movement of the lever inwardly relative to the plane of the cover. When in this normal position, the rear part of the depressed upper portion 38 of the lever will be arranged within the control box or inwardly of the plane of the cover. The forwardly projecting gripping edge portion 39 will be arranged forwardly of the plane of the cover.

When the lever is swung outwardly and downwardly until its lower portion engages the front face of the lower part of the cover, the entire opening formed in the cover will be made available for actuating the push button 16 of the switch 15 and for making repairs to this switch and the electrical connections for the electric light bulb connected to the fixture 21 and positioned within the globe 20.

The shield 18 may have to be removed in case it is necessary to service the switch 15. However, this shield will prevent the fingers of the person actuating the control from making contact with any energized portion of the switch.

The modified form of the invention shown in Figs. 6 and 7 embodies two features of construction which are different from those disclosed in Figs. 1 to 5 inclusive. The first difference deals with the sealed chamber or compartment in which the electric control device or mechanism is housed so that moisture cannot reach the same and cause a short circuit which might cause a false operation of the device. The second feature deals with the means employed for fracturing the transparent plate and sweeping all of the broken fragments of the plate from the opening normally closed by the same. The detail description covering the structure of Figs. 6 and 7 will only be applied to the two modified features. All of the remaining structural elements or formations will have applied thereto the same reference characters as have been applied in connection with Figs. 1 to 5 inclusive so that the detail description of these elements or structural formations given in connection with Figs. 1 to 5 inclusive will apply to Figs. 6 and 7.

The box body 5 is provided with a perfectly plain rear wall 7a and the top wall 9a is flat instead of being depressed. The bottom wall 6, side walls 8 and top wall 9a have formed integrally therewith a flange 47 which projects inwardly from all of these walls to provide a seat for the plate 48 that is secured thereto by the screws, or the like, 49. A sealing gasket 50 is interposed between the marginal portions of the plate 48 and the flange 47 to seal between these two members to prevent moisture, or the like, from passing between the same. The plate 48 is formed with an opening 51 in which is mounted a collar 52 that slidably receives the operating button 53 for the push button switch mechanism 54. A packing gasket 55 encircles the push button 53 and bears against the rear flange 56 which forms a part of the button. As the switch mechanism 54 is spring loaded, the operating button 53 will normally be forced in an outward direction which will cause the packing gasket 55 to be clamped between the flange 56 of the operating button and the rear face of the collar 52 and plate 48. This packing gasket, therefore, will provide a sealed joint between the operating button and the plate 48.

The top wall 9a of the box body is provided with an opening 57 through which passes the

portion 58 of a porcelain socket or receptacle 59. A clamping ring 60 is threaded on the portion 58 of the said socket or receptacle and functions in the usual manner to clamp this common type of socket construction to the top wall. An electric light bulb 61 is threaded into the socket or receptacle 59.

A rubber packing ring 62 is formed with a base flange 63 that flatly engages the top face of the top wall 9a. An upstanding flange 64 of this packing ring is adapted to be fitted in the glass globe 65. The bottom edge of this red globe engages the base flange 63 of the rubber ring. A suitable guard 66 is fitted over the globe 65 and engages the top or upper portion of the latter. A suitable number of securing screws 67 pass through outwardly projecting ears formed on the bottom portion of the guard 66. Due to the engagement between the top portion of the guard and the top of the globe 66 and 65 respectively, the securing screws 67 for the guard may be employed for tightening down on the latter to cause the bottom edge of the globe 65 to be forced tightly against the base flange 63 of the rubber packing ring 62. The globe 65 and rubber packing ring 62, therefore, form a water-tight seal for the electric bulb 61, its porcelain socket or receptacle 59, and the opening 57 formed in the top wall 9a of the box body.

The bottom wall 6 of the box is formed with an opening 68 through which the electric wires are passed. An internally threaded nipple 69 depends from the bottom wall 6 in register with the opening 68. A seat 70 for a packing gasket washer is provided in the bore of the nipple 69 so that an electric wire conduit end may be threaded into the nipple and seated against the gasket to seal the wire admitting opening 68.

The cover 71 for the front of the control box is hinged to the bottom wall 6 of the box body at 72 and is secured in place at its upper end by means of the two corner screws 73. An opening is formed in this cover 71 to accommodate the pull lever 74. This pull lever is provided with two relatively long, depending branches 75 which are pivotally connected to ears, or the like, by pins 76. These ears are not shown in Fig. 6 but project forwardly from the front wall portion 77 of the cover 71. The pins 76 pass through the ears 78 which are formed on the extremities of the long branches 75. Fig. 7 discloses these branches as being transversely spaced to provide an opening 79 which is defined at its two sides by the inner edges of the branches 75 and at its top by the edge 80.

It will be noted from the above description that this pull lever 74 differs from the pull lever 33 of the previously described mechanism by being mounted on the front of the cover 71 at points which are located below the bottom edge 81 of the opening formed in the cover. The top edge of this opening is designated by the reference character 82. In other words, the pull lever 74 is not pivotally connected to the cover 71 at the two lower corners of the opening formed in the cover.

The pull lever 74 is formed with an angular plate or arm 83 that projects inwardly and downwardly. The downwardly projecting portion of this plate or arm is bifurcated at 84 so that it can straddle the operating button 53.

This angular plate or arm 83 is so shaped that the curved portion 85 of the same will first engage the upper edge portion of the fracturable transparent plate 31 as the pull lever is swung

outwardly about the pivot pins 76. This initial engagement of the angular plate or arm with the fracturable, transparent plate will apply the force required to break the plate. The remainder of the angular plate or arm will engage and sweep from the opening in the cover 71 any broken fragments of the transparent plate so that no fragmentary portion will remain to interfere with the operation of the push button 53. This angular plate or arm 83, therefore, performs the dual function of breaking the transparent plate and sweeping all broken fragments from the cover opening.

This plate 31 is mounted in the cover opening 15 in substantially the same manner as is shown in the form of the invention illustrated in Figs. 1 to 5 inclusive. The only difference resides in the provision of corner projections 86 which take the place of the inwardly projecting portions of the hinge ears 29 shown in Fig. 1. It will be recalled that portions of these hinge ears were arranged in front of the transparent plate 31 so as to cooperate with the two side straps 32 to support the plate. The corner projections 86 of Fig. 6, also, cooperate with the side straps 32 to mount the transparent plate.

The remainder of the pull lever 74 is depressed or offset at 87 to provide a depression to receive the finger tips of the person operating the lever. A gripping edge 88 is formed as a top portion of the lever. A marginal flange 90 is formed along both sides and the top of the lever to overlap the marginal portion of the opening formed in the cover 71. This marginal flange 90 and the lower portions of the branches 75 will engage the front face of the cover to limit inward pivotal movement of the lever relative to the cover. A spring pressed detent 91 functions to hold the lever in its normal position, as shown in Fig. 6.

It will be appreciated that the covers 10 and 71, with their respective transparent plate fracturing and sweeping members, may be interchangeably associated with the two different types of box bodies. That is to say, the cover 10 with its pull lever 33 may be mounted on the box body of Fig. 6 while the cover 71 and its pull lever 74 may be mounted on the control box body of Figs. 1 and 2. Additionally, many different types of control devices may be mounted in the two boxes just so the different control devices are each provided with an operating button which may pass through the opening of the shield plate 18 of Fig. 2 and the sealing plate 48 of Fig. 6.

It is to be understood that the form of this invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size, and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Having thus described the invention, we claim:

1. A control box, comprising a body portion, a control device mounted in the body portion and including an operating member, a front cover for said body portion having an opening positioned to expose the operating member through a part thereof, a fracturable transparent plate closing the part of the cover opening exposing said operating member, a lever having a body portion shaped to provide an opening and a finger gripping portion above the opening, means for pivotally connecting the lower portion of the lever to the lower portion of said front cover so that its finger gripping portion will occupy a part of the cover opening above said transparent plate

and its opening will expose the transparent plate when the lever is in its normal position, and means rigidly carried by the lever for breaking the transparent plate and sweeping the broken fragments from the cover opening to uncover the said operating member as a result of swinging of the lever outwardly from its normal position.

2. A control box, comprising a body portion, a control device mounted in the body portion and including an operating member, a front cover for said body portion having an opening positioned to expose the operating member through a part thereof, a fracturable transparent plate closing the part of the cover opening exposing said operating member, a lever having a body portion shaped to provide an opening and a finger gripping portion above the opening, means for pivotally connecting the lower portion of the lever to the lower portion of said front cover so that its finger gripping portion will occupy a part of the cover opening above said transparent plate and its opening will expose the transparent plate when the lever is in its normal position, and a bent arm rigidly carried by the lever and arranged to extend in back of the transparent plate for breaking the transparent plate and sweeping the broken fragments from the cover opening to uncover the said operating member as a result of swinging of the lever outwardly from its normal position.

3. A control box, comprising a body portion, a control device mounted in the body portion and including an operating member, a front cover for said body portion having an opening positioned to expose the operating member through a part thereof, a fracturable transparent plate closing the part of the cover opening exposing said op-

erating member, a lever having a body portion shaped to provide an opening and a finger gripping portion above the opening, means for pivotally connecting the lower portion of the lever to the lower portion of said front cover so that its finger gripping portion will occupy a part of the cover opening above said transparent plate and its opening will expose the transparent plate when the lever is in its normal position, a bent arm rigidly carried by the lever and arranged to extend in back of the transparent plate for breaking the transparent plate and sweeping the broken fragments from the cover opening to uncover the said operating member as a result of swinging of the lever outwardly from its normal position, and means associated with the lever and the front cover for determining the normal position of the lever and releasably holding the lever in such position.

4. In a control box, a cover having an opening, a fracturable transparent plate closing a part of the cover opening, a lever having a body portion shaped to provide an opening and a finger gripping portion above the opening, means for pivotally connecting the lower portion of the lever to the lower portion of said cover so that its finger gripping portion will occupy a part of the cover opening above said transparent plate and its opening will expose the transparent plate when the lever is in its normal position with respect to the cover, and means rigidly carried by the lever for breaking the transparent plate and sweeping the broken fragments from the cover opening as a result of swinging of the lever outwardly from its normal position.

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