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DeJong

[11] **3,893,095**

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[54] **ALARM DEVICE FOR INDICATING THE REMOVAL OF A FIRE EXTINGUISHER**

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[52] **U.S. Cl.** **340/272;** 169/23; 340/280; 340/289

[51] **Int. Cl.** **G08b 13/14**

[58] **Field of Search** 340/272, 280, 289; 169/23, 169/51

[56] **References Cited**

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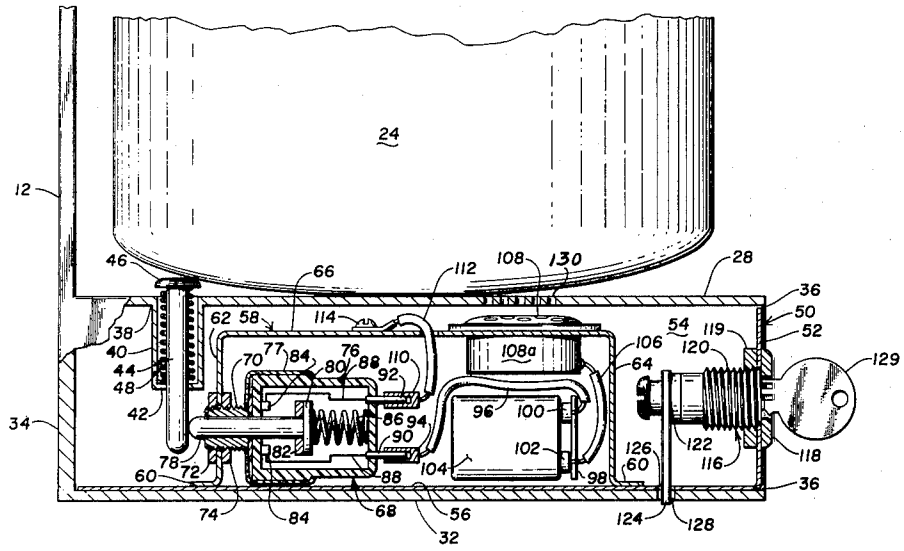
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[57] **ABSTRACT**

The weight of a fire extinguisher depresses a first plunger which in turn maintains a second plunger retracted so as to hold open or deenergize an alarm. When the fire extinguisher is removed, the first plunger moves upwardly out of its obstructive or interfering relation with the second plunger so that the second plunger advances from its retracted position to energize or activate the alarm. Once the alarm is triggered into operation, a slidable drawer must be unlocked and pulled open to reset the alarm.

10 Claims, 5 Drawing Figures



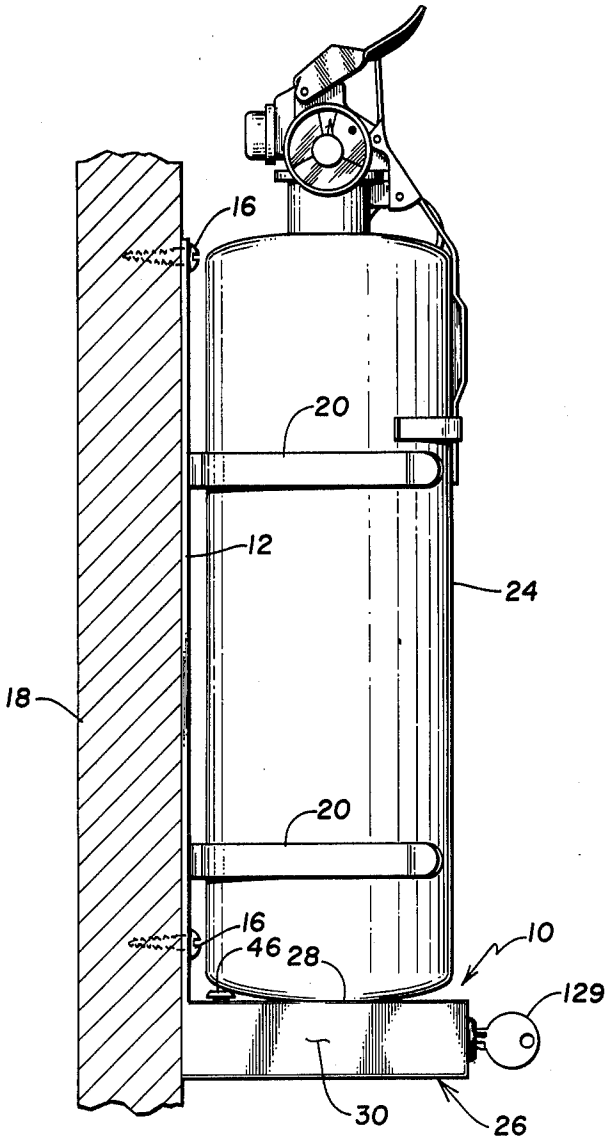


Fig. 1

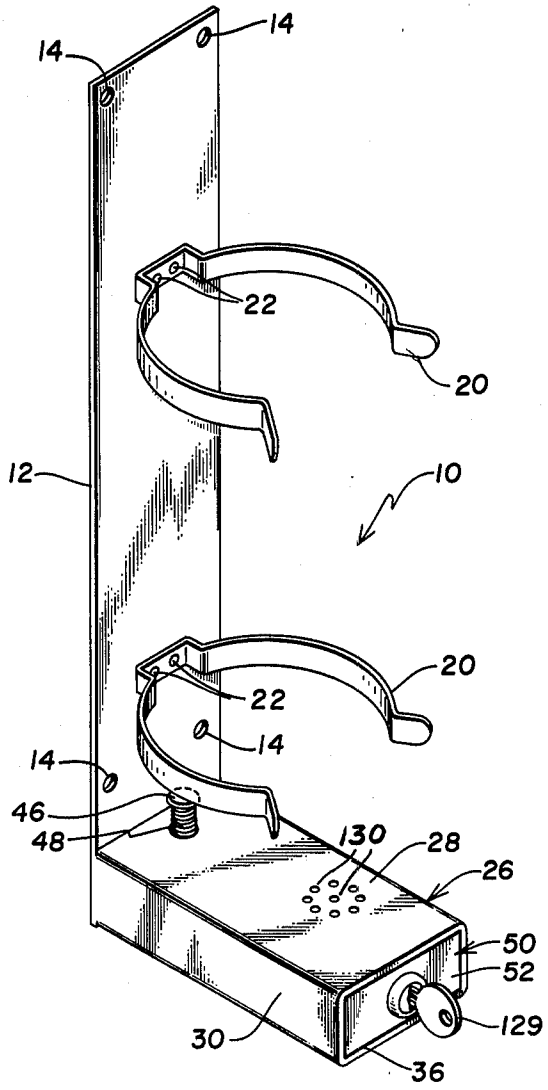


Fig. 2

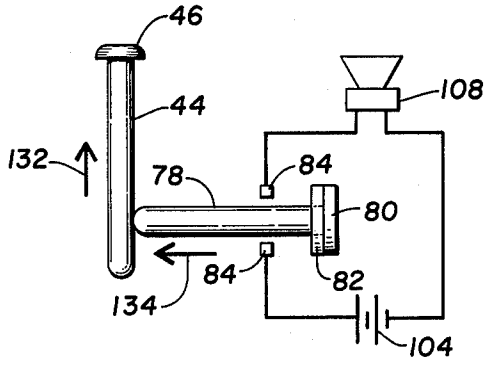


Fig. 4

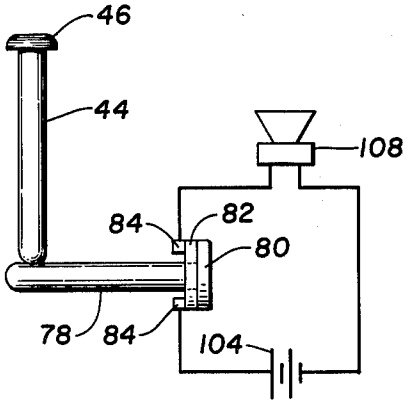


Fig. 5

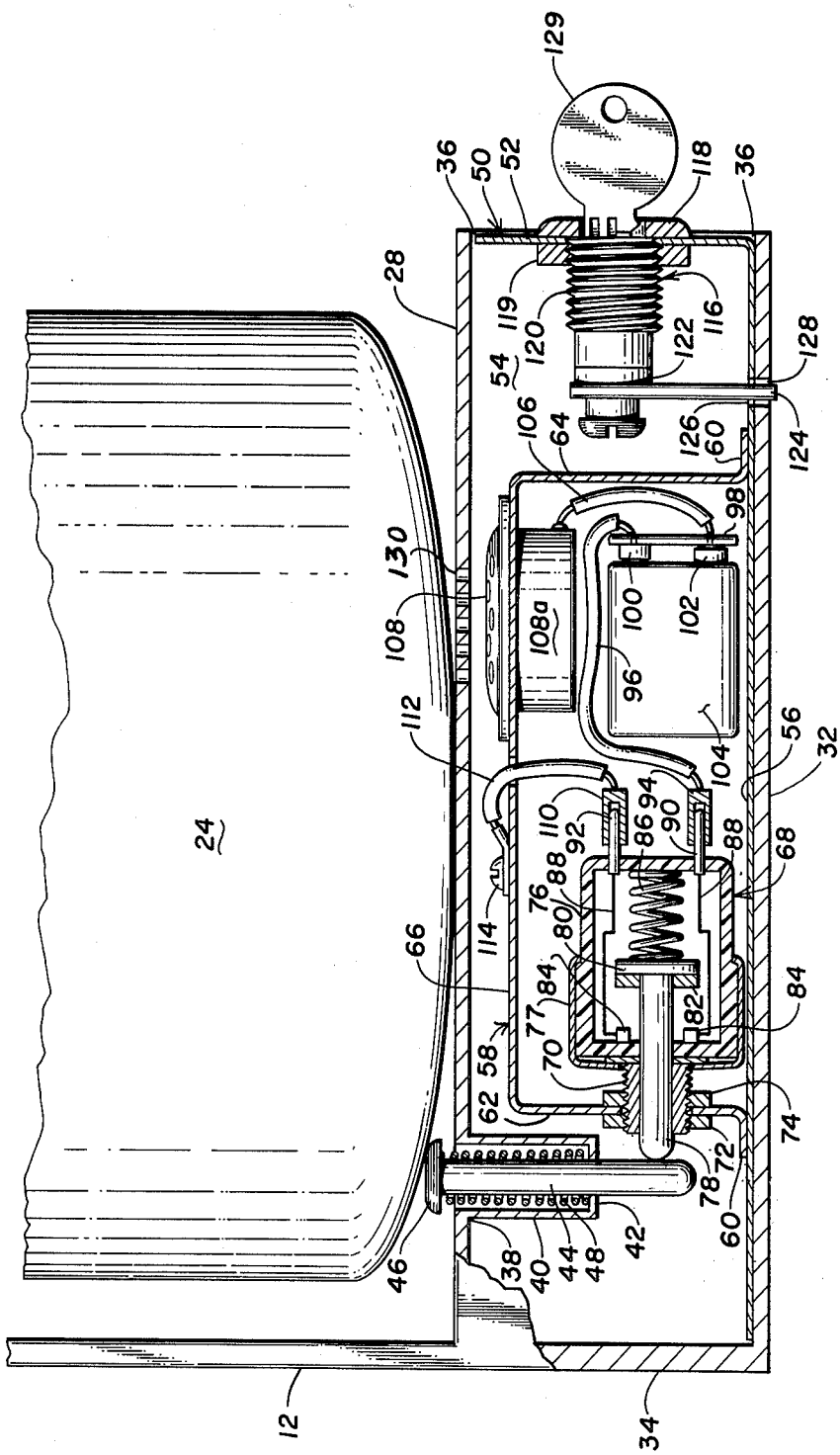

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Fig. 3

ALARM DEVICE FOR INDICATING THE REMOVAL OF A FIRE EXTINGUISHER

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates generally to fire extinguishers, and pertains more particularly to an alarm device that is automatically sounded when the fire extinguisher is removed from the device.

2. Description of the Prior Art

Various alarm devices have been used in the past in conjunction with glass paneled doors containing the fire extinguisher. When the door is opened, the alarm is sounded. The weight of the extinguisher plays no role in this type of protective arrangement.

SUMMARY OF THE INVENTION

A primary object of the invention is to effectively thwart the unauthorized removal of fire extinguishers. In this regard, an aim of the invention is to provide an alarm that is triggered into operation when the fire extinguisher is taken but which alarm cannot be inactivated or reset by the person removing the fire extinguisher.

Another object of the invention is to provide an alarm device that can be reset only by an authorized person, the resetting operation first requiring the unlocking of a slidable drawer.

Still another object is to provide an alarm device that is completely self-contained, there being no external wiring or any parts that can be manipulated or detached by unauthorized persons.

Another object is to discourage the taking of a fire extinguisher by reason of it being apparent that an alarm is associated with the casing supporting the fire extinguisher, this being due to the visibility of the face of the lock and the keyhole therein.

Another object is to provide an alarm device that will not interfere with the removal of the fire extinguisher when actually needed to extinguish a fire.

Yet another object of the invention is to provide an alarm device that will accommodate various sizes of fire extinguishers.

Another object is to audibly signal the unauthorized taking of the fire extinguisher without having to modify in any way the fire extinguisher being protected.

Still another object of the invention is to provide an alarm device that is versatile as to its manner of mounting in that it can be mounted directly on a building wall or located within a cabinet that is mounted on the wall.

A further object of the invention is to provide an alarm device that will be relatively inexpensive to manufacture, thereby encouraging its widespread use.

Briefly, my invention comprises a casing having top, sides, rear and bottom walls but open at the front. Toward the rear of the top wall is located a vertically reciprocal plunger, the plunger being biased upwardly by a coil spring. When the fire extinguisher is placed on the casing, then the plunger is depressed. A slidable drawer is insertable through the front opening, the drawer having a front wall that then blocks the casing opening. A second plunger is mounted in the drawer for horizontal reciprocation, being spring biased toward the first plunger. When the first plunger is depressed by a fire extinguisher, then the second plunger is held in a retracted or cocked position to keep a switch open, thereby deenergizing or inactivating the alarm. When the first plunger is permitted to move upwardly, which it does when the fire extinguisher is removed, then the second plunger advances so as to close the switch and thus trigger or energize the alarm.

A cylinder lock is mounted on the front wall of the drawer. The lock has a latch member thereon which is key-rotated into a downwardly extending position, the latch member then passing through aligned holes, one being in the bottom of the drawer and the other in the bottom wall of the casing. Thus, in order to reset the alarm, it is necessary to first unlock the drawer, pull the drawer out, depress the first plunger (by placing a fire extinguisher thereon), and then sliding the drawer back into the casing to produce the retracted or cocked condition of the second plunger.

BRIEF DESCRIPTION OF THE DRAWING

FIG. **1** is a side elevational view of my alarm device with a conventional fire extinguisher supported thereon;

FIG. **2** is a perspective view of the device itself, the fire extinguisher having been removed;

FIG. **3** is a vertical sectional view taken generally in the plane of the plunger and key of FIG. **2** but with the fire extinguisher of FIG. **1** thereon, only the lower portion thereof, however, being illustrated;

FIG. **4** is a schematic view showing the manner in which the alarm is maintained in an inactive or cocked state, and

FIG. **5** is a schematic diagram showing the alarm after it has been activated or triggered into operation.

DESCRIPTION OF THE PREFERRED EMBODIMENT

My alarm device has been designated generally by the reference numeral **10.** The exemplary device **10** includes an upstanding mounting panel **12** at the rear thereof having four holes **14** therein. As can be understood from FIG. **1,** the holes **14** accommodate screws **16** which extend into the wall labeled **18.** Various ways of attaching the panel **12** can be employed, the screws **16** being a simple expedient that permits a facile illustration thereof.

The mounting panel **12** has a pair of vertically spaced spring clips **20,** the clips **20** being anchored to the mounting panel **12** by rivets **22.** The function of the clips **20,** as is believed evident, is to releasably hold in place a conventional fire extinguisher **24.**

At the lower end of the mounting panel **12** is a retangular casing **26** composed of a top wall **28,** spaced side walls **30** and a bottom wall **32.** The rear wall **34** is merely a downward extension of the mounting panel **12.** The casing **26** has an opening **36** at its front end.

A hole **38** is provided in the top wall **28** at a location near the rear of the casing **26.** Having its upper end secured to the top wall **28,** such as by brazing, is a downwardly depending sleeve **40** having an inturned flange **42** at its lower end. Vertically reciprocal in the sleeve **40** is a plunger **44** having an enlarged head **46** at its upper end, the plunger **44** being of sufficient length so as to project beyond the lower end of the sleeve **40** when depressed, as can be discerned from FIG. **3.** Contained in the sleeve **40** is a coil spring **48,** the lower end of the coil spring **48** bearing against the inturned flange **42** and the upper end of the coil spring **48** bearing against the underside of the enlarged head **46.** In this way, the plunger **44** is biased upwardly, the weight of

the fire extinguisher **24** overcoming the biasing action of the spring **48** to cause the plunger **44** to assume the raised position appearing in FIG. **2.**

Removably received in the casing **26** is a slidable drawer denoted generally by the reference numeral **50.** The drawer **50** has a front wall **52** which blocks the opening **36,** spaced side walls **54,** a bottom wall **56,** but no top or rear wall. Secured to the bottom wall **56** of the drawer **50** is a U-shaped metal bracket **58** comprised of horizontal flanges **60** at each end, upwardly extending end walls **62, 64** and a horizontal top panel **66.** The flanges **60** are welded or otherwise secured to the bottom wall **56** of the drawer **50.**

A switch unit **68** is mounted to the wall **62** of the U-shaped bracket **58.** To effect the mounting, the switch unit **68** has a threaded bushing **70,** there being a nut **72** and a nut **74** to either side of the wall **62** which is apertured so that the bushing **70** is fastened in place. The switch unit **68** also includes a plastic housing **76,** the bushing being anchored thereto by a retainer **77.** Mounted for horizontal reciprocal movement through the bushing **70** is a plunger **78** having an enlarged head **80.** To simplify the drafting, the plunger **78** has been shown with a metal washer **82** adjacent its head **80,** the washer being movable with the plunger **78** to bridge a pair of fixed contacts **84.** There is a coil spring **86** contained within the housing **76** that normally biases the plunger **78** to the left as viewed in FIG. **3,** one end of the spring **86** bearing against the head **80** and the other end against the housing **76.**

It should be evident from FIG. **3** that when the plunger **44** is depressed, then the plunger **78** is held in a retracted position and the switch unit **68** is open because the contacts **84** are not at this time bridged by the metallic washer **82.** However, when the plunger **44** rises, then the plunger **78** is advanced under the influence of the spring **86** to bridge the contacts **84.** The contacts **84** have conductors **88,** extending to a pair of bayonet type terminals **90** and **92** which project from the housing **76.**

The terminal **90** is mated with a slip-on terminal **94** having a conductor **96** extending to a small contact battery terminal board **98.** The battery terminal board **98** has a pair of snap-on terminals **100, 102,** one being a male terminal and the other a female terminal so as to accommodate the terminals on a conventional 9 volt battery **104,** such as is customarily used to power transistor radios.

Whereas the conductor **96** is connected to the terminal **100** of the small board, the other terminal **102** has a conductor **106** extending to one side of a high pitched electromagnetic alarm **108,** comprising a speaker, speaker supported on the top panel **66** of the bracket **58,** a portion **108***a* of the speaker extending downwardly through a circular opening in the panel **66.** The other terminal **92** on the switch unit **68** is mated with a slip-on terminal **110** having a conductor **112** extending to a screw **114** that is attached to the top panel **66** of the U-shaped bracket **58.** The panel **66** itself is connected to the other side of the alarm **108.** Consequently, when the contacts **84** are bridged by the washer **82,** a circuit is completed from the battery **104** through the contacts **84** and the coil of the speaker **108.**

In order to prevent the unauthorized removal of the drawer **50,** the front wall **52** thereof has a cylinder lock **116** mounted therein. The lock **116** has an escutcheon plate or flange **118** that confronts the forward side of the front wall **52.** Confronting the back side of the front wall **52** is a nut **119,** the exterior of the lock's barrel **120** being threaded for the accommodation of the nut **119.** The rear end of the plug **122** rotatable in the barrel **120** has mounted thereon a latch member **124** that can be rotated between a horizontal position in which it is completely within the confines of the drawer **50** to a vertical position (FIG. **3**) where it extends downwardly through a transverse slot **126** in the bottom wall **56** of the drawer **50** and an aligned slot **128** in the bottom wall of the casing **26.** When extending vertically down through the two slots **126, 128,** the drawer **50** is locked within the casing **26** and cannot be removed until the latch member **124** is rotated upwardly into a horizontal position so as to permit the drawer **50** to be pulled outwardly. A key **129** is shown which locks and unlocks the cylindrical lock **116.** When the drawer **50** is fully inserted, as indicated in FIG. **3,** the speaker **108** assumes a position directly beneath a cluster of holes **130** (FIG. **2**) formed in the top wall **28** of the casing **26** so that the sound from the speaker **108** can pass upwardly and outwardly into the surrounding area.

Operation

The manner in which my alarm device **10** functions is extremely simple. It will perhaps be the easiest to refer to FIGS. **4** and **5** for the operational sequence. In FIG. **4,** the vertically reciprocal plunger **44** is held depressed by reason of the weight of the fire extinguisher **24.** Thus, the positional relationship appearing in FIG. **4** corresponds to that of FIG. **3.** The arrow **132** in FIG. **4** indicates the direction of the biasing action supplied by the coil spring **48** shown in FIG. **3.** The other arrow **134** signifies the biasing action supplied by the coil spring **86** of FIG. **3.** It will be obvious that the depressed plunger **44** is in an obstructive or interfering relation with the plunger **78,** thereby holding the plunger **78** in a retracted or cocked position so that the plunger **78** cannot move in the direction of the arrow **134.** Stated somewhat differently, the two plungers **44,** 78 are mounted for axial movement along two mutually intersecting paths.

However, when the plunger **44** moves upwardly in the direction of the arrow **132** shown in FIG. **4,** it reaches the upper position illustrated in FIG. **5,** which position also appears pictorially in FIG. **2.** This condition happens when the fire extinguisher **24** is removed from the top wall **28** which functions as a supporting platform for the extinguisher **24.** As soon as the plunger **44** moves upwardly, then the plunger **78** can advance rearwardly in the direction of the arrow **134** appearing in FIG. **4.** The two plungers **44, 78** thus assume the relative positions illustrated in FIG. **5.** It is important to note that the contacts **84** at this time are bridged by the metal washer **82,** thereby closing the circuit to the alarm **108,** power flowing from the battery **104** through the alarm **108** so that a high pitch sound is produced.

The sound emitted by the alarm **108** emanates upwardly through the cluster of holes **130** in the top wall **28** of the casing **26.** There is no top wall to the drawer **50** so there is a clear avenue of escape as far as the sound is concerned. The audible alarm thus serves as a warning to anyone in the vicinity that the fire extinguisher **24** has been removed.

While the proper removal of the fire extinguisher **24** also sets off the alarm, if a fire has indeed occurred,

then the highly audible signal additionally performs the important function of warning people in the vicinity that a fire has occurred. If the removal is unauthorized, such as by a vandal or thief, then the sounding of the alarm calls attention to this act. Consequently, my invention will find especial utility in various public buildings, particularly schools, where passers-by are apt to be present and would automatically take note of the unauthorized removal. On the other hand, if my device is installed in an apartment house or office building, even though someone is not present at that time when the fire extinguisher **24** is being removed, nonetheless the sounding of the alarm arouses the tenants or occupants in the area, resulting in an immediate investigation.

Although it is believed evident from FIG. **3**, FIG. **5** indicates that once the vertical plunger **44** has moved upwardly and the horizontal plunger **78** has advanced horizontally therebeneath, the vertical plunger **44** cannot thereafter be depressed. More specifically, the plunger **78** has moved beneath the plunger **44** so that any attempt to depress the plunger **44**, such as to turn off the alarm, will not be successful because the lower end of the plunger **44** will simply strike the now released plunger **78**.

Therefore, my device **10** will remain in a cocked position as shown in FIGS. **3** and **4** until the fire extinguisher **24** has been removed. This causes a triggering of the alarm by reason of the closing of the switch unit **68** in that the contacts **84** are now bridged by the washer **82**. The switch unit **68** is literally latched closed by reason of the inability to redepress the vertical plunger **44** to the obstructive relation between it and the plunger **78** so that the alarm continues to sound until someone having the key **129** arrives so as to reset the alarm. In the meantime, any act of vandalism or thievery with respect to the fire extinguisher **24** is brought to the attention of others who are present in the vicinity.

It should be apparent that the unlocking of the drawer **50** through the agency of the key **129** causes the latch member **124** to be moved out of the position depicted in FIG. **3**. When in the position of FIG. **3**, the latch member **124** extends downwardly through the two slots **126, 128** so that the drawer **50** cannot be removed because the latch member **124** engages the bottom wall **32** of the casing **26** at the right side of the slot **128**. When rotated upwardly, though, the latching member **124** no longer extends downwardly into the slot **128** and the drawer can be pulled forwardly or to the right as viewed in FIG. **3**, the key **129** serving as a pulling expedient when partially turned.

When replacing the drawer **50** in the casing **26**, it should be noted that with the fire extinguisher **24** depressing the plunger **44**, the inward movement of the drawer **50** causes the horizontally reciprocal plunger **78** to abut against the depressed plunger **44** so as to cause the spring **86** to be progressively compressed as the drawer **50** is moved inwardly. Of course, the obstruction or interference created by the depressed plunger **44** keeps the plunger **78** from advancing with the drawer **50** once it engages the plunger **44**. Such an occurrence moves the washer **82** away from the contacts **84** as clearly illustrated in FIG. **3** (and also in FIG. **4**). Hence, when the drawer **50** is inserted under these conditions, the alarm is reset or cocked and is in continued readiness should the fire extinguisher **24** again be removed.

I claim:

1. An alarm device for indicating the removal of a fire extinguisher therefrom comprising a casing having an opening at the front, a drawer slidably received in said casing having a front wall for blocking said casing opening, an electric alarm in said drawer, a switch in circuit with said alarm, a horizontally reciprocal plunger for opening said switch in a first position thereof to inactivate said alarm and closing said switch in a second position thereof to activate said alarm, means biasing said plunger into said second position, a vertically reciprocal plunger extending downwardly through the top of said casing to a first position to retain said horizontal plunger in its first position, means biasing said vertical plunger upwardly to a second position to permit said horizontal plunger to assume its second position, and means for locking said drawer in said casing, whereby when a fire extinguisher is supported on said casing said vertical plunger is depressed sufficiently by said fire extinguisher to keep said horizontal plunger in its said first position and when said fire extinguisher is removed said horizontal plunger moves to its said second position.

2. An alarm device in accordance with claim **1** in which said casing includes top, side, rear and bottom walls, and said drawer includes front, side and bottom walls, said drawer being open at the top and rear.

3. An alarm device in accordance with claim **2** in which the rear wall of said casing extends upwardly to provide an upstanding mounting wall, and means on said mounting wall for releasably holding a fire extinguisher in position on said top wall so as to depress said vertical plunger.

4. An alarm device in accordance with claim **3** including a sleeve secured at its upper end to said top wall and extending downwardly into said casing for guiding said vertical plunger, the lower end of said sleeve terminating at an elevation above the reciprocal path traversed by said horizontal plunger.

5. An alarm device in accordance with claim **3** in which the bottom wall of said drawer and the bottom wall of said casing each have slots therein which are in alignment when said drawer is within said casing, and said lock means includes a latch member rotatable downwardly into said openings when aligned to effect the locking of said drawer within the casing.

6. An alarm device in accordance with claim **5** in which said alarm comprises an upwardly facing speaker, said top wall having a plurality of holes therein so that the sound from said speaker can pass through said casing when said alarm is actuated.

7. An alarm in accordance with claim **1** including means in said drawer for connecting a battery in circuit with said alarm and switch.

8. An alarm device for indicating the removal of a fire extinguisher comprising a casing including top, side, rear and bottom walls, said casing having a front opening a vertically reciprocal plunger extending downwardly through said top wall into said casing, said plunger being located near said rear wall, spring means normally biasing said plunger upwardly to raise the lower end of said plunger within said casing, a drawer slidably received in said casing having a front wall for blocking said casing opening, a horizontally reciprocal plunger carried in said drawer, spring means biasing

said horizontally reciprocal plunger toward said vertically reciprocal plunger, said horizontal plunger engaging the lower end of said vertical plunger as said drawer is moved into said casing when said vertically reciprocal plunger is depressed by a fire extinguisher, a switch actuatable into closed position by said second biasing means when the lower end of said vertically reciprocal plunger rises under the influence of said first biasing means, an electric alarm means in circuit with said switch, said electric alarm means being energized when said switch is closed, and lock means for preventing removal of said drawer from said casing, whereby when the fire extinguisher is removed the vertical plunger rises sufficiently to permit said horizontal plunger to advance therebeneath and close said switch, said horizontal plunger then underlying said vertical plunger so that said vertical plunger cannot then be depressed again until said lock means is unlocked and said drawer pulled sufficiently open to permit said vertical plunger to move downwardly without interference from said horizontal plunger.

9. An alarm device in accordance with claim **8** in which said drawer has only bottom and side walls in addition to said front wall, said casing top wall having at least one hole therein, and said electric alarm means including a speaker disposed beneath said one hole when said drawer is received in said casing.

10. An alarm device in accordance with claim **9** in which said bottom walls have aligned slots when said drawer is received in said casing and said lock means includes a latch arm rotatable into said aligned slots to lock said drawer in said casing.

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