June 14, 1955 J. F. REYNOLDS 2,710,957

ALARM DEVICE

Filed June 19, 1953 2 Sheets-Sheet 1

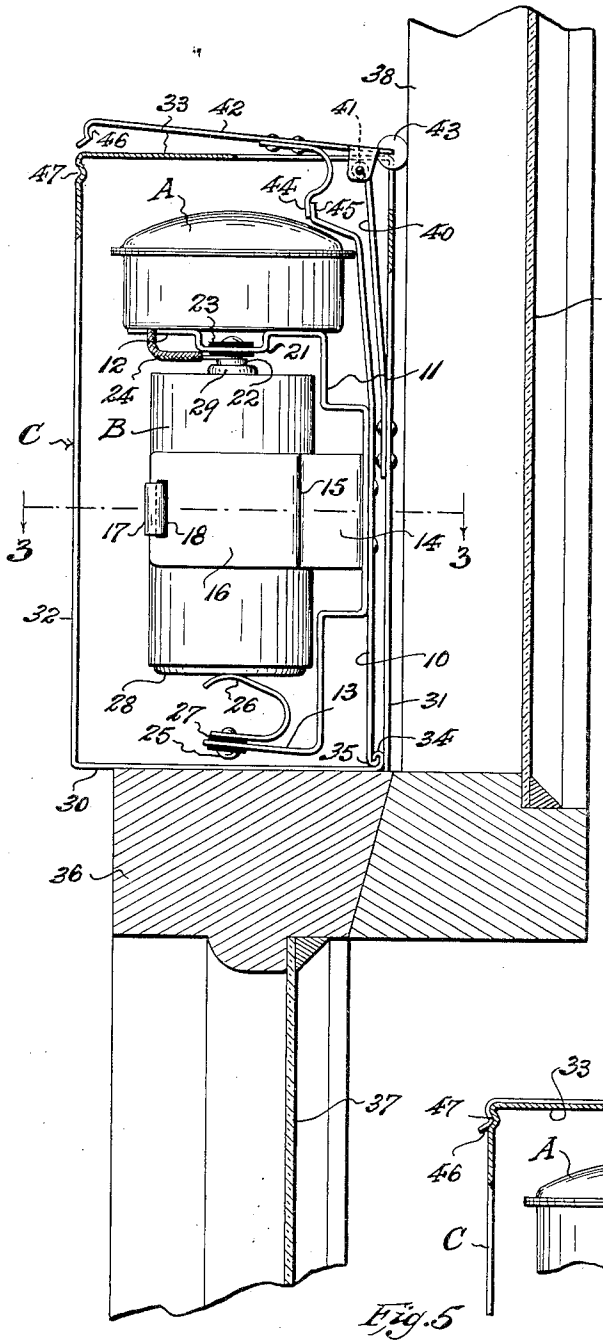


Fig. 1

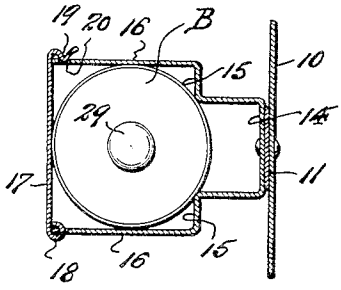


Fig. 3

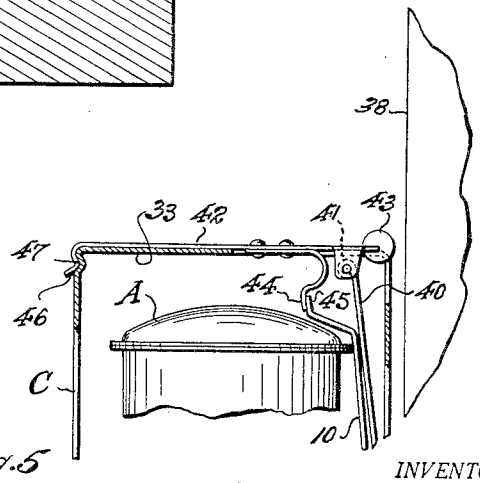


Fig. 5

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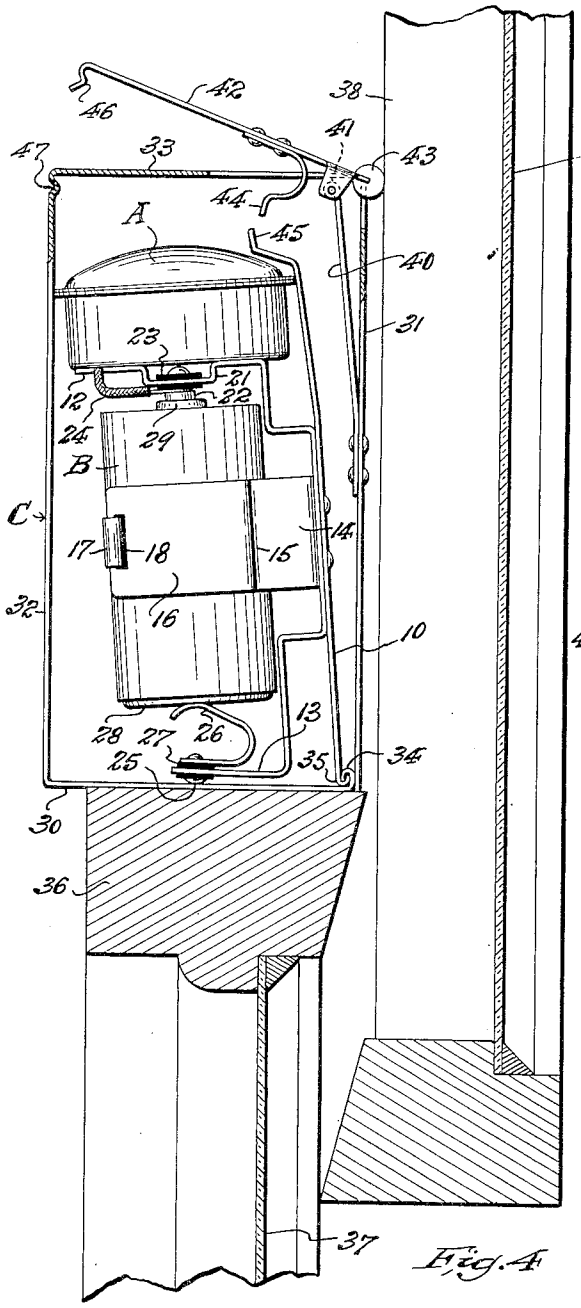


Fig. 4

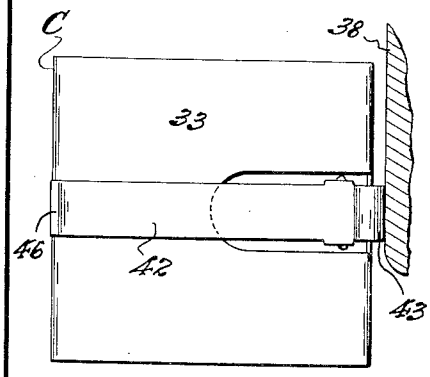


Fig. 2

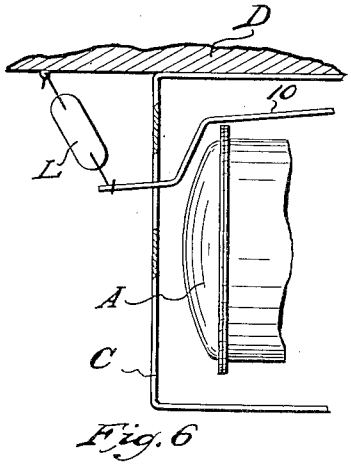


Fig. 6

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ALARM DEVICE

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Application June 19, 1953, Serial No. 362,834

8 Claims. (Cl. 340—274)

This invention relates to an improved alarm device operable to sound an audible alarm or to operate other signal means and adapted for use as a burglar alarm, fire alarm and for other uses.

The invention has for an object to provide an alarm unit which can be held against gravity in a normal initial alarm silencing or signal cut out position, but which, when released, will move under gravity to an alarm sounding or signal activating position.

The invention has for a further object to provide an alarm unit comprising an electrically operable audible alarm sounding means or other signal means and a source of electrical energy in circuit therewith, together with means to support the unit thus constituted against gravity in a circuit interrupting position, but subject, when the support is released, to move under gravity to a circuit closing position for alarm sounding or signal activating operation.

The invention has for another object to provide releasable detent means for holding the alarm unit and its support against gravity in its alarm silencing position.

The invention has for another and more specific object to provide an alarm device characterized as above stated which is well adapted for application as a burglar alarm to windows of the double hung sash type, and including detent means adapted to be tripped and released by surreptitious movement of either the upper or lower window sash.

The above and other objects will be understood from a reading of the following detailed description of this invention in connection with the accompanying drawings, in which:

Fig. 1 is a side elevational view, in part section, of an alarm device according to this invention as mounted in operative relation to a window of the double hung sash type, the window sashes being shown in vertical section; Fig. 2 is a top end plan view of the alarm device; and Fig. 3 is a fragmentary horizontal cross sectional view, taken on line 3—3 in Fig. 1.

Fig. 4 is a view similar to that of Fig. 1, but showing the window opened and the alarm device released for operation in response to opening movement of the window.

Fig. 5 is a fragmentary side elevational view, in part section, showing the tripable detent means for the alarm unit withdrawn from operative relation to the window, whereby to permit opening and closing of the latter without actuating the alarm.

Fig. 6 is a fragmentary side elevational view, in part section, showing the alarm device as arranged for use as a fire alarm, wherein the alarm unit is detained in normal initial alarm silenced position by a fusible detent link.

Similar characters of reference are employed in the above described views, to indicate corresponding parts.

The alarm unit according to this invention comprises an upstanding carrier plate 10 which is hinged at its lower end to a suitable stationary support. Affixed to the outer face of the carrier plate 10 is a suitably shaped frame member 11 which is provided with a top arm 12 to project outwardly from its upper end, and a bottom arm 13 to project outwardly from its lower end. Affixed to the frame member 11, intermediate its top and bottom arms 12 and 13, is means to detachably support a dry cell electric battery B, so as to dispose the same longitudinally between said frame member arms. In an illustrative form thereof as shown, said latter means comprises an outwardly projecting and outwardly open yoke member 14, respective sides of which are provided with externally offset shoulders 15 from which extend side arms 16, between and within the embrace of said side arms the battery B can be engaged, so as to abut said shoulders 15, whereby to determine its operative seated position within the yoke member. To detachably retain and secure the battery B clamped within the embrace of the yoke member, a retainer bar 17 is suitably pivotally connected at 18 to the outer end portion of one side arm 16 of the yoke member, so as to close across the outer open end of the yoke member; said retainer bar having an inwardly offset latch nosing 19 at its free end to releasably engage in a latch receiving opening 20 with which the outer end portion of the opposite side arm 16 of the yoke member is provided, whereby to latch the retainer bar in its closed battery holding position.

Affixed upon the top arm 12 of the frame member 11 is an electrically actuatable sound producing alarm member A. This alarm member may comprise any well known sound emission device capable of excitation by an electric current, such as an electric bell or an electric buzzer, the latter being shown. Although in most cases an audible alarm may well be preferred, it will nevertheless be understood that a visible signal or alarm, such as an electric light, can be substituted for the audible alarm. It is therefore intended that the scope of this invention shall comprehend both audible alarm means or visible signal or alarm means as equivalent.

Beneath the alarm member A, the top arm 12 of the frame member is provided with a downwardly offset section 21 which supports a contact piece 22. Said contact piece, although supported by said offset section 21, is electrically insulated therefrom by interposed insulation 23. One pole of the alarm member A is connected by a conductor 24 to the contact piece 22. The other pole of the alarm member A is grounded to the frame member 11, carrier plate 10 and the support in connection with which said carrier plate is pivotally mounted.

Mounted through the bottom arm 13 of the frame member 11 is a contact piece 25 which projects from the underside thereof. Electrically connected with the contact piece 25, for extension from the upper side of said bottom arm 13 of the frame member 11, is a resilient contact member 26. Said contact piece 25 and contact member 26, although supported by the bottom arm 13 of the frame member 11, are electrically insulated therefrom by interposed insulation 27.

When the battery B is inserted within the yoke member 14 so as to be operatively supported thereby, the bottom end of battery cup electrode, which constitutes one pole 28 of the battery, is electrically contacted by the resilient contact member 26, and through the latter is electrically connected with the contact piece 25, while the other pole 29 of the battery, constituted by its central carbon or like electrode, is electrically contacted by the contact piece 22 which is connected to one pole of the alarm member A.

The alarm unit, characterized as above described, is mounted in a suitable stationary supporting casing C, which is preferably formed by a bottom wall 30, back wall 31, front wall 32 and top wall 33, the sides being preferably, but not necessarily, left open. A convenient

hinge structure for pivotally connecting the carrier plate 10 to the casing C, to upstand from the bottom wall 30 of the latter, comprises a downwardly open stationary hook flange 34 which is connected with the bottom wall 30 of the casing adjacent the juncture thereof with the back wall 31, with which is engaged an upwardly open movable hook flange 35 formed in connection with the bottom end of the carrier plate 10. By such form of hinging connection, the alarm unit can be easily and quickly entered in or removed from the casing interior by endwise sliding or the hook flange 35 relative to the hook flange 34.

When the alarm unit is entered in the casing C in operative hinged relation thereto, and then swung back about its hinge connection to a normal initial upstanding position, the bottom arm 13 of the frame member 11 will be upswung away from the bottom wall 30 of the casing, thus spacing away the contact piece 25 from the latter, and thereby interrupting the circuit by which the battery B is electrically connected to the alarm member A (see Fig. 1). A suitable releasable detent means (examples of which will be subsequently herein described) is provided for holding the alarm unit against gravity in such normal initial alarm silencing or off position. When the detent means is released to free the alarm unit for operation, since the center of gravity of the alarm unit is outwardly offset from its point of pivotal support, the alarm unit will fall forward or outwardly, thus carrying the contact piece 25 into engagement with the bottom wall 30 of the casing, and thus into contact with the electrical ground provided by the casing C, the carrier plate 10, and frame member 11, all of which comprise electrically conductive material, thus closing the circuit by which the battery B is electrically connected to the alarm member A, so that the latter is actuated with alarm sounding or signal actuating effect (see Fig. 4).

As shown in Figs. 1 to 5 inclusive, the alarm device can be furnished in a form well adapted for use in connection with a window of the double hung sash type to serve as a burglar alarm which will be actuated to sound an alarm if the window protected thereby be surreptitiously opened. For such use, the casing C and its contained alarm unit is mounted to stand upright upon the top rail 36 of a lower window sash 37, and the device is provided with a detent means to hold the alarm unit in normal initial alarm silenced position. Said detent means is arranged to engage a stile 38 of the upper window sash 39, and is so cooperative therewith as to be tripped by movement of either sash relative to the other. One illustrative form of detent means adapted for such operation comprises a yieldable leaf spring 40 which is affixed to the back wall 31 of the casing, within the latter, to extend toward the casing top or end wall 33. The upper free end of said leaf spring 40 terminates in a hinge knuckle 41 to which is pivotally connected a detent lever 42. Said detent lever extends externally across the top wall 33 of the casing. Affixed to the rearward end of said detent lever 42 is a friction piece 43, preferably comprising soft rubber or other similar frictional material. Mounted on the underside of the detent lever 42, to depend therefrom within the interior of the casing C, is a detent dog 44. The upper end of the carrier plate 10 is provided with an offset lip 45 adapted to be normally engaged by the detent dog 44, whereby to releaseably hold the alarm unit, against gravity, in its normal initial alarm silenced position. When arranged for operation, the supporting leaf spring 40 exerts rearward longitudinally directed thrust upon the detent lever 42, whereby to urge the friction piece 43 into strong frictional engagement with the face of the upper sash stile 38 to which it is opposed (see Fig. 1). Under these conditions, if the lower sash 37 is raised, or the upper sash is lowered, a downward movement is imparted to the friction piece 43, whereby the detent lever 42 is upswung about its pivotal connection with the hinge knuckle 41 of leaf spring 40. This upswinging movement of the detent lever 42 withdraws the detent dog 44 from the lip 45 of carrier plate 10, thus freeing the latter from the restraint of the detent means (see Fig. 4). When the carrier plate 10 is thus released, the alarm unit falls forward, under gravity, to engage the contact piece 25 with ground, thus closing the circuit by which the battery B is electrically connected to the alarm member A, so that the latter is actuated with alarm sounding effect.

When the alarm device is used, as above described, as a window guarding burglar alarm, means is provided to permit withdrawing the same from service, so that the window sashes can be raised and lowered without actuating the alarm. To this end, means is provided for longitudinally shifting the detent lever 42 so as to retract the friction piece 43 from engagement with the stile 38 of the upper sash 39, and thereupon latching down said detent lever 42 in such shifted position. Such means comprises the provision in connection with the outer end of the detent lever 42 of a dependent latch nosing 46, which is adapted to be releasably latched into a latch receiving socket 47 with which the front wall 32 of the casing C is provided (see Fig. 5).

The alarm device having the novel alarm unit can be readily modified to serve as a fire alarm. For such use, the casing C can be horizontally disposed in affixed relation to a ceiling D of a room or other space to be served by the alarm, so that the alarm unit, when released, can, under gravity, drop to alarm circuit closing position. In such case, the free end of the carrier plate 10 of the alarm unit is extended to project exteriorly from an end of the casing C, and connected between the same and the ceiling D is a detent in the form of a fusible link L (see Fig. 6). It will be obvious that, if the link L is melted and parts under abnormal temperature induced by fire, the alarm unit will be released to drop, under gravity, to its alarm circuit closing condition, with alarm sounding effect.

It will be understood that by modifying the detent means to suit conditions involved, the alarm unit can be readily adapted to serve many purposes in addition to those above specified. For example, it can be used in connection with exterior and interior house doors, closet doors, casement windows, furniture and like drawers, and in various other locations.

Having now described my invention, I claim:

1. In an alarm device, an alarm unit comprising a carrier means including longitudinally aligned and spaced apart frame arms outwardly projecting therefrom, a stationary support to which said carrier means is pivotally connected subject to movement under gravity relative thereto, an electrically operable alarm member fixedly mounted on one frame arm of said carrier means, said carrier means and stationary support to which it is pivotally connected constituting an electrical ground to which one pole of the alarm member is connected, a contact element carried by the frame arm of said carrier means on which the alarm member is mounted but electrically insulated from said frame arm, means to connect the other pole of said alarm member with said contact element, a dry cell electric battery also mounted on said carrier means intermediate its frame arms with one electrode thereof contacting said contact element, a second contact element mounted on the other frame arm of said carrier means but electrically insulated therefrom, and means to connect the other electrode of said battery with said second contact element, whereby to provide a battery-alarm member circuit, said second contact element being normally held out of contact with said stationary support and thus out of contact with electrical ground when said carrier means is restrained in a normal initial position against gravitational movement, but adapted to be moved into contact with said stationary support and thus with said ground by gravitation of said carrier means, where-

by to close the battery-alarm member circuit with alarm activating effect.

2. In an alarm device, an alarm unit comprising a carrier means including longitudinally aligned and spaced apart frame arms outwardly projecting therefrom, a stationary support to which said carrier means is pivotally connected subject to movement under gravity relative thereto, an electrically operable alarm member fixedly mounted on one frame arm of said carrier means, said carrier means and stationary support constituting an electrical ground to which one pole of the alarm member is connected, a contact element carried by the frame arm of said carrier means on which the alarm member is mounted but electrically insulated from said frame arm, means to connect the other pole of said alarm member with said contact element, dry cell electric battery also mounted on said carrier means intermediate its frame arm with one electrode thereof contacting said contact element, a second contact element mounted on the other frame arm of said carrier means but electrically insulated therefrom, means to connect the other electrode of said battery with said second contact element, whereby to provide a battery-alarm member circuit, said second contact element being normally held out of contact with said stationary support and thus out of contact with electrical ground when said carrier means is restrained in a normal initial position against gravitational movement, but adapted to be moved into contact with said stationary support and thus with said ground by gravitation of said carrier means, whereby to close the battery-alarm member circuit with alarm activating effect, and releaseable detent means engageable with the carrier means to hold the same against gravity in battery-alarm member circuit interrupting position.

3. An alarm device comprising a carrier means including longitudinally aligned and spaced apart frame arms outwardly projecting therefrom, a stationary support to which said carrier means is pivotally connected subject to movement under gravity relative thereto, an electrically operable alarm member fixedly mounted on one frame arm of said carrier means, said carrier means and stationary support constituting an electrical ground to which one pole of the alarm member is connected, a contact element carried by the frame arm of said carrier means on which the alarm member is mounted but electrically insulated from said frame arm, means to connect the other pole of said alarm member with said contact element, a dry cell electrical battery, means to detachably mount said battery upon said carrier means intermediate its frame arms with one electrode of said battery contacting said contact element, a second contact element mounted on the other frame arm of said carrier means but electrically insulated therefrom, means to connect said second contact element with the other electrode of said battery, whereby to provide a battery-alarm member circuit, said second contact element being normally held out of contact with said stationary support and thus out of contact with electrical ground when said carrier means is restrained in a normal initial position against gravitational movement, but adapted to be moved into contact with said stationary support and thus with said ground by gravitation of the carrier means, whereby to close the battery-alarm member circuit with alarm activating effect, and a releaseable detent means cooperative with said carrier means for holding the latter against gravity in battery-alarm circuit with interrupting position.

4. An alarm device according to claim 3 wherein the detent means includes a fusible link anchored by one end to stationary means and connected by its other end to the free end portion of said carrier means.

5. An alarm device for use as a burglar alarm in connection with a window of the double hung sash type, said alarm device comprising a support adapted to be affixed upon the top rail of the lower window sash in upstanding position thereon, a carrier means having its lower end pivotally connected to said support subject to movement under gravity relative thereto, an electrically operable alarm member mounted on said carrier means, said carrier means and support constituting an electrical ground to which one pole of said alarm member is connected, a contact element mounted on said carrier means but electrically insulated therefrom, means to connect the other pole of said alarm member with said contact element, a dry cell electric battery also carried by said carrier means with one electrode thereof contacting said contact element, a second contact element mounted on said carrier means but electrically insulated therefrom, means to connect the other electrode of said battery with said second contact element, whereby to provide a battery-alarm member circuit, said second contact element being normally held out of contact with said support and thus with said electrical ground when said carrier means is restrained in normal initial position against gravitational movement, but adapted to be moved into contact with said support and thus with said ground by gravitation of said carrier means, whereby to close the battery-alarm member circuit with alarm activating effect, a releasable detent means comprising a detent lever, means to pivotally connect said detent leven with the support, a friction piece carried by said detent lever to oppose and engage a stile of the upper window sash, and said detent lever having a detent dog to engage said carrier means to releaseably hold the same against gravity in a normal initial position, relative movement of said friction piece and the stile of the upper window sash being operative to turn said detent lever about its pivotal connection with said support whereby to disengage said detent dog from the carrier means and thus release the latter for gravitation to battery-alarm member circuit closing position.

6. An alarm device according to claim 5, including means to detachably mount said battery on the carrier means.

7. An alarm device according to claim 5, wherein the means for means for pivotally connecting said detent lever to the support includes a leaf spring affixed to said support and adapted to yieldably thrust the detent lever and its friction piece toward the stile of the upper window sash.

8. An alarm device according to claim 7, wherein the detent lever and support are provided with cooperative latch means for releaseably securing said detent lever in a retracted position to withdraw its friction piece from operative contact with the stile of said upper window sash.

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