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ALARM SYSTEM OR MECHANISM FOR SAFETY BOXES OR THE LIKE

2,758,296

Filed Jan. 19, 1953

2 Sheets-Sheet 1

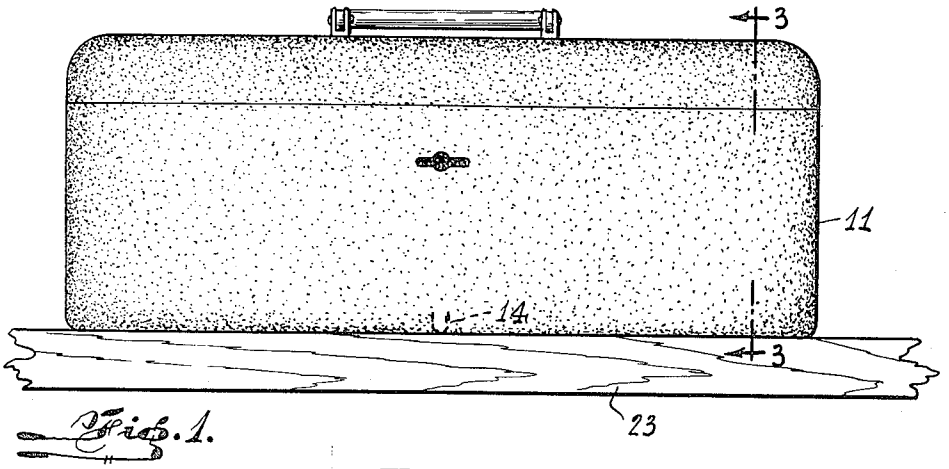
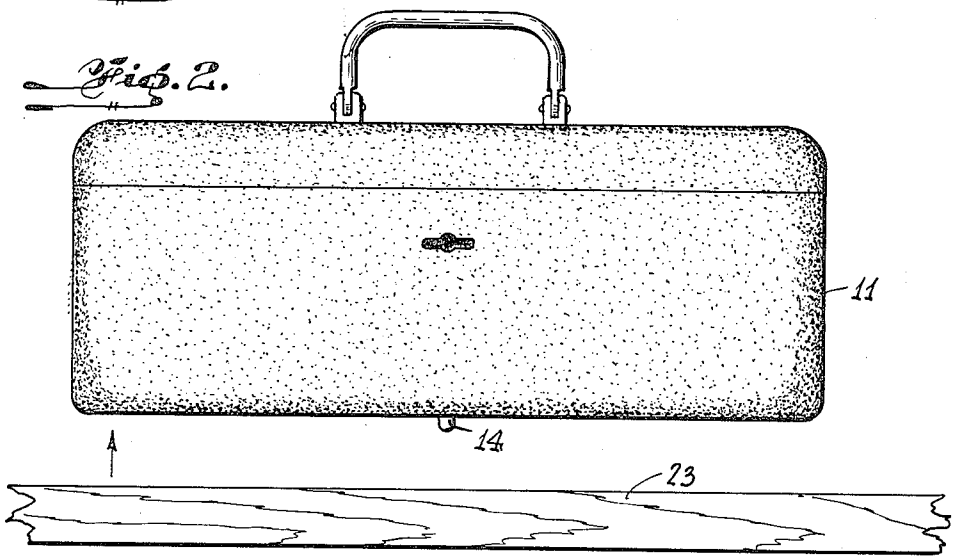


Fig. 1.

Fig. 2.



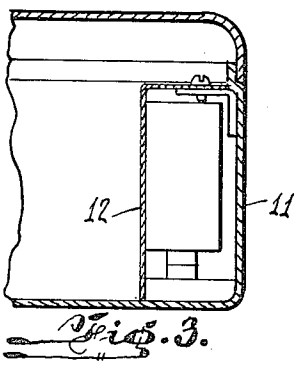


Fig. 3.

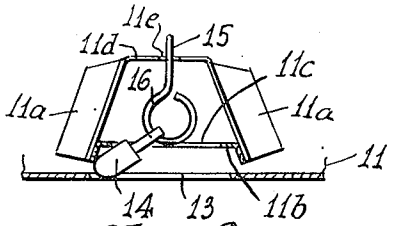


Fig. 2a.

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2 Sheets-Sheet 2

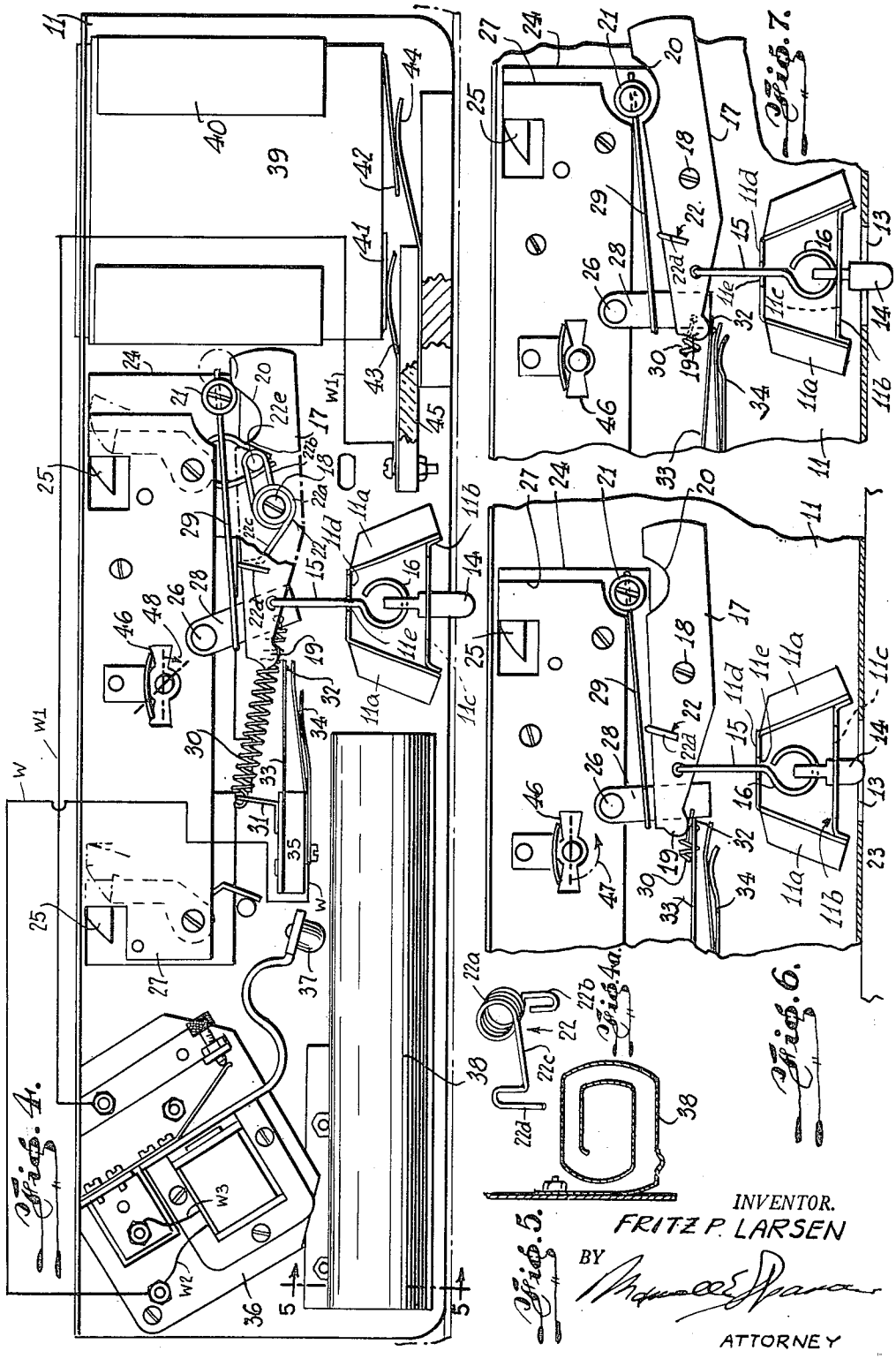


Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

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ALARM SYSTEM OR MECHANISM FOR SAFETY BOXES OR THE LIKE

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2 Claims. (Cl. 340—280)

The present invention relates to a new and improved alarm mechanism or system by means of which all kind of articles, whether included in a safety box or being positioned underneath said alarm mechanism may be protected. The alarm mechanism may also be used to the same protecting effect against undesired or unauthorized opening of windows, doors or the like by simply locating it against same.

The primary object of this invention is to produce an alarm mechanism adapted to provide protection against sneak thieves, burglars and the like by producing a persistent audible signal, as soon as the least tampering or shifting occurs. Said mechanism is contained in a box that may serve directly as a means to hold valuables or as a locker adapted to receive the objects to be protected, or an alarm system that may be simply located at any suitable point such as the door or window of the premises to be protected or over a stack of dockets, securities, bank notes or the like, in a manner such that any tentative removal even of a single article produces of necessity a shifting of the box that releases the alarm signal.

A further object of this invention is to provide for an alarm mechanism, the action of which cannot be stopped wilfully from the outside of its containing box, once said action has been released by any undesired or unauthorized movement of said safety box, except by an authorized person carrying and using a movable locking member to silence the action of said alarm mechanism.

Still another object of this invention is to provide for control means which are coupled with the alarm only when they are to release same.

Yet another object of this invention is to provide for control means which may execute, as a consequence of a deformation of the deformable system, a movement, the nature and/or direction and/or amplitude of which may differ from those of the member of the deformable system actuating them.

A further object of this invention consists in using as a movable locking member the bolt of a lock in which case the removable member is constituted by a key.

Various further and more specific purposes, features and advantages will clearly appear from the detailed description given below taken in connection with the accompanying drawings which form a part of this specification and illustrate merely by way of example one embodiment of the device of the invention.

The invention consists in such novel features, arrangements and combinations of parts as may be shown and described in connection with the apparatus herein disclosed by way of exemplification only and as illustrative of a perferred embodiment.

In the following description and in the claims, parts will be identified by specific names for convenience, but such names are intended to be as generic in their application to similar parts as the art will permit. Like reference characters denote like parts in the several figures of the drawings, wherein:

Figure 1 shows the front view of a safety box with the alarm mechanism according to the invention shown in unreleased position;

Figure 2 illustrates the safety box in lifted position with the alarm mechanism released for giving alarm;

Figure 2*a* shows how the released alarm mechanism is operated by merely moving or shifting the alarm box;

Figure 3 is a sectional view on the line 3—3 of Figure 1;

Figure 4 shows an inside view of the alarm mechanism according to the invention; the electric wiring being shown diagrammatically; Figure 4*a* is a perspective detail view of one of the operating springs;

Figure 5 is a sectional view on the line 5—5 of Figure 4;

Figure 6 is a view of a part of the alarm mechanism in cocked or set position; and

Figure 7 is a view illustrating the part of the alarm mechanism shown in Figure 6 after the alarm has been released by the closing of the electric circuit.

Referring now in more detail to the drawings illustrating a preferred embodiment by which the invention may be realized, the safety box **11** comprises a frame **12** bolted to the inside thereof. The safety box **11** has an opening **13** in its bottom through which a small weight **14** protrudes. This small weight **14** is suspended on a rod **15** forming a loop **16** on its lower end to allow the small weight to be shifted with reference to the rod **15** in all directions, said weight and rod forming the deformable arrangement referred to hereinabove. The rod **14** is rotatably connected to a double-arm lever **17** pivotally mounted on a stud **18**. The front arm **19** of said lever **17** is shaped as a small contact hammer while the rear arm **20** thereof is cut out to avoid a protruding stud **21** and is cam-shaped to be operated in connection with said stud **21**. A spring **22** is constructed to form loops **22***a* which coil around stud **18**. One end of spring **22** terminates in a loop **22***b* which is held securely by pin **22***e*. The other end of spring **22** forms an arm **22***c* terminating in a hook-like end **22***d* looped over lever **17**. Spring **22** keeps lever **17** under tension in such manner that the front arm **19** is kept in a downwardly direction, thus forcing rod **15** and small weight **14** also downwardly against the support **23** upon which the safety box is resting. At the same time the spring **22** forces the cam-shaped part of the rear arm **20** of the lever **17** to cooperate with the stud **21**. This stud **21** forms part of the movable back-plate **24** of the combination-lock mechanism of the safety box the locking lugs **25** of which only are visible in the drawings. Pivotally mounted on a stud **26** which is fixed to the inner cover plate of the combination-lock mechanism of the safety box is a blocking lever **28** which can be moved by the action of the back-plate **24** of the combination-lock mechanism because it is connected to the stud **21**, which is fixed to said back-plate, by means of a connecting link **29**. A spring **30**, one end of which is kept firmly by a lug or bracket **31** and the other end of which is connected to said lever **28**, tends to pull said blocking lever **28** against the free end **32** of a resilient contact spring blade **33** and keeps said blocking lever **28** under constant pressure against said end **32** of said contact spring blade **33**. Underneath the contact spring blade **33** is located another resilient contact spring blade **34**, the support of which is separated from the support of said upper contact spring blade **33** by an insulating means **35**. An electrically operated bell **36** the hammer **37** of which is adapted to strike a loud-sounding alarm bell **38** is arranged within and bolted to the frame **12**. As a power source for the alarm bell **36** a flash-light battery **39** kept in a holder **40** is also arranged within the frame **12** in such manner that the contact fingers **41** and **42** engage with contact fingers **43** and **44** separated be insulating means **45** from one another

which are correspondingly connected to the contact of the bell **36** and to the body of the safety box which forms the ground connection or second conduit. The mechanism is operated by the turn of a safety lock combination key which fits through the keyhole **46**.

The alarm mechanism is operated in the following manner: If the safety box is closed and locked in its normal position, the lugs of the combination lock engage with corresponding recesses in the body of the safe box. As shown in Figure 4, the back-plate **24** of the combination-lock is moved in this position so far back, that the stud **21** connected to it keeps the rear arm **20** of the lever **17** down, whereby the front arm **19** of said lever **17** stays clear of the upper contact spring blade **33**. The electric circuit is thus interrupted and the mechanism is in its "ineffective" position. The key can be removed in this position and the box can be carried or moved without giving alarm. Now, if the box is brought into its right position and the key is turned in the lock in the direction **47** as shown in Figure 6 by one half turn, the back-plate **24** of the combination safety lock is moved in such manner, that the stud **21** thereof slides down the cam-shaped cut-out on the rear arm **20** of the lever **17** thus making free the action of said lever **17** which is now only supported by rod **15**, small weight **16** and supporting means **23** for the safety box. The lever **28** moves also under the influence of the spring **30** against the front edge **32** of the upper contact spring blade **33** and is kept there under the tension of said spring **30**. The key can be removed from the box in this position, too, but the alarm mechanism is now cocked. The slightest movement of the box in any direction causes the small weight **14** to tilt under the pressure of spring **22** which is free to move the front arm **19** of lever **17** downwardly pressing upper contact spring blade **33** likewise downwardly to make contact with lower contact spring blade **34**. The circuit is thus closed and the alarm released (see Figure 7). The alarm cannot be stopped from outside the box unless the mechanism is turned back by the key into its locked normal position, because lever **28** became also free and had been pulled over upper contact spring blade by its spring **30** when said upper contact spring blade **33** was pressed downwardly by the front arm **19**, shaped like a hammer, of lever **17**, thus blocking the electric contact in its closed position. To open the safety box **11** it is only necessary to turn the key in the lock in the direction **48** shown in Figure 4, whereby the backplate **24** is moved further backwardly moving simultaneously the locking lugs **25** to disengage from their corresponding recesses in the body of the safety box but not releasing the alarm mechanism.

The looped portion **16** of the rod **15** is located in housing **11***a* connected to frame **11**, having the bottom wall **11***b* provided with opening **11***c* accommodating the weight **14**, and the top wall **11***d* provided with slot **11***e* for the projection of rod **15**.

While the invention has been described and illustrated with respect to a certain particular preferred example which gives satisfactory results, it will be understood by those skilled in the art after understanding the principle of the invention, that various changes and modifications may be made without departing from the spirit and scope of the invention and it is intended, therefore, in the appended claims to cover all such changes and modifications.

What I claim is:

1. An alarm mechanism comprising a box with an opening, a control element inside said box and displaceable between a normal and an off-normal position and comprising a stationary front plate and a responsive movable back plate with protruding bolt means mounted thereon, said control element being inaccessible from outside said box, removable key means fitting said opening and adapted to displace said control element from without, alarm means within said box including circuit contacts, operating means within said box for rendering said alarm means effective, said operating means comprising a pivotally operated lever having a front contact arm and rear cam shaped arm, and wherein said rear cam shaped arm in cooperation with said protruding bolt of said control means is adapted to be inoperative when properly aligned with said protruding bolt and operative when disaligned therewith in response to movement of said box, resilient means urging said lever into an operative position, link means operatively connected with said protruding bolt for actuation of said alarm means upon movement of said back plate and bolt into said operative position, a pivotally operated blocking lever mounted on said front plate and having a moving free end and interfering in said normal position of said control element with any displacement of said link means tending to actuate said alarm means, thereby preventing operation of said alarm means in said normal position of said control element while permitting such operation in said off-normal position thereof, and resilient actuated locking means in said box so engaging said alarm means including said circuit contacts in said off normal position of said control element, as to maintain said alarm means actuated independently of said locking member until said control element is returned to normal position.

2. In an alarm mechanism a control element displaceable between a normal and off-normal position and comprising a stationary front plate and a responsive movable back plate with protruding bolt means mounted thereon, means to displace said control element, alarm means, operating means for rendering said alarm means effective, said operating means comprising a pivotally operated lever and so aligned with said protruding bolt means as normally to be in an operative position and adapted to be in an inoperative position when not so aligned, resilient means urging said lever into an operative position and link means operatively connected with said protruding bolt means for actuation of said alarm means upon movement of said back plate and protruding bolt means into an operative position, blocking means on said front plate interfering, in said normal position of said control element, with any displacement of said link means tending to actuate said alarm means, thereby preventing operation of said alarm means in said normal position of said control element while permitting such operation in said off-normal position thereof, and resilient actuated locking means so engaging said alarm means in said off-normal position of said control element, as to maintain said alarm means actuated independently of said locking member until said control element is returned to said normal position.

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