United States Patent [19]

Berkowitz

[11] **3,895,599**

[45] **July 22, 1975**

[54] **CABINET DOOR ALARM DEVICE**

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[22] Filed: **Aug. 30, 1974**

[21] Appl. No.: **502,030**

[52] **U.S. Cl.** **116/95;** 116/164

[51] **Int. Cl.** **G08b 13/08**

[58] **Field of Search** 116/95, 96, 85, 86, 91, 116/100

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Assistant Examiner—Denis E. Corr

[57] **ABSTRACT**

In a preferred embodiment of the invention, there is provided an alerting anti-theft cabinet alarm device utilizable for a cabinet having either a door pivoted on a hinge for pivoting outwardly or alternately a door sidewardly slidable resulting from a strip which acts to depress the alarm button upon the closing of the door, the main feature of the invention being that a mechanism both cocks and strikes by release of a door which depresses the button, release of door pressure on the trigger button permitting the button to become less depressed irrespective of the degree of slowness with which the pressure is released on the button, the alerting bell ringing always at full intensity.

8 Claims, 8 Drawing Figures

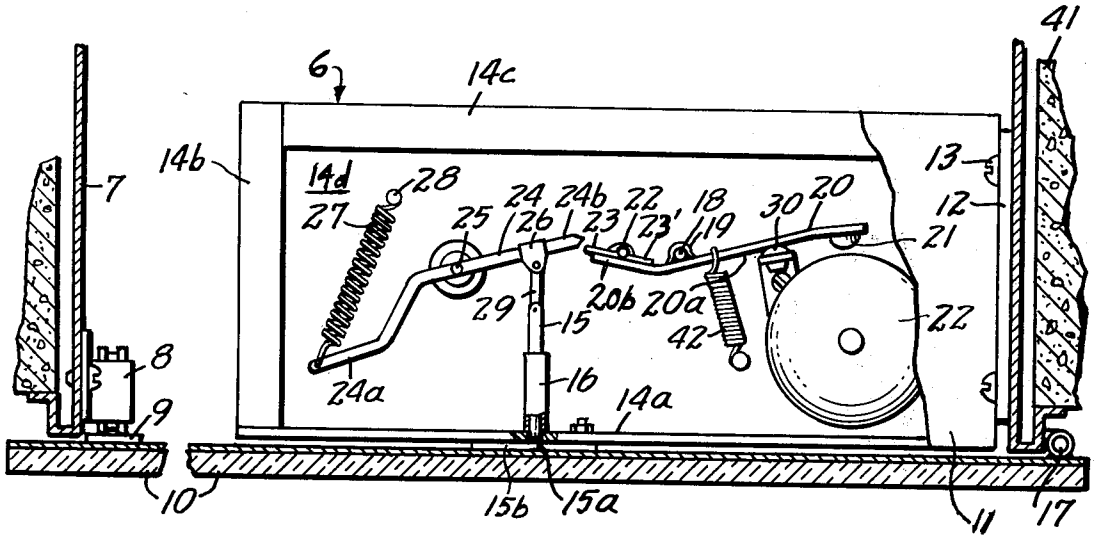


Fig. 2

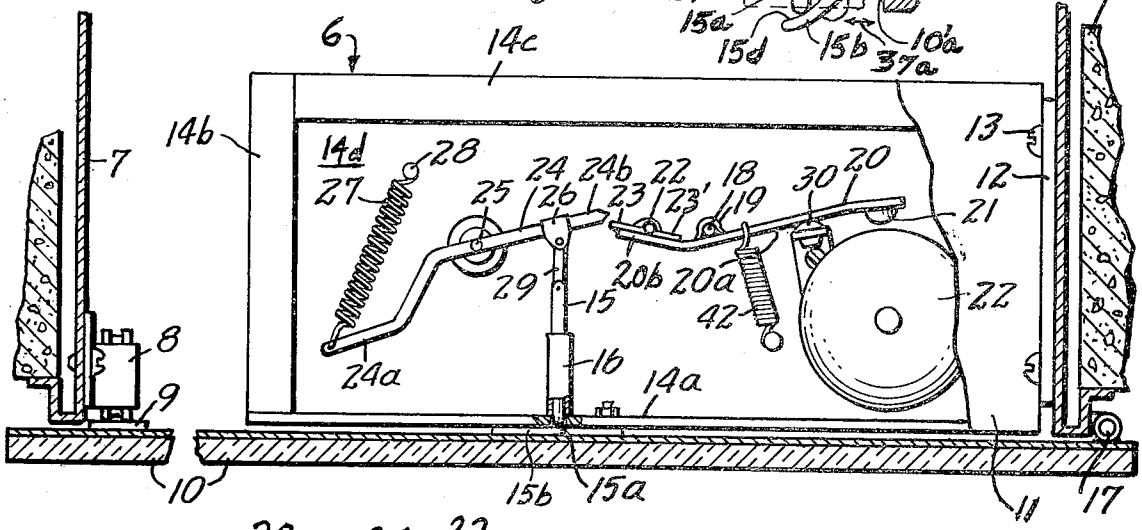


Fig. 2d

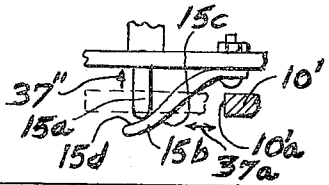


Fig. 2a

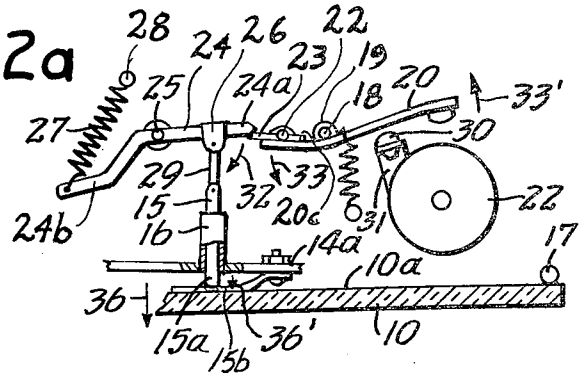


Fig. 1

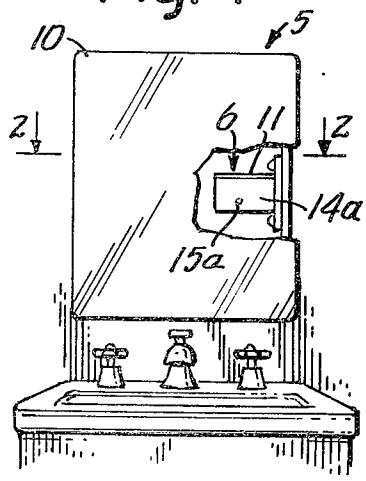


Fig. 2b

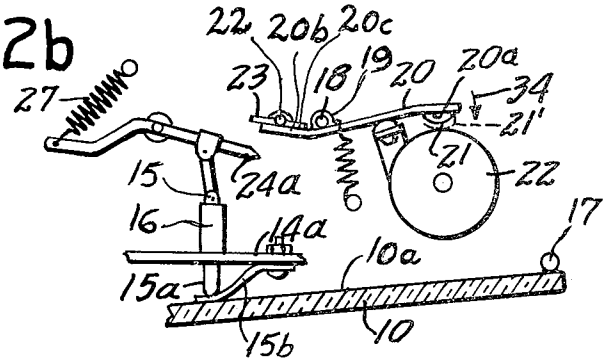


Fig. 3

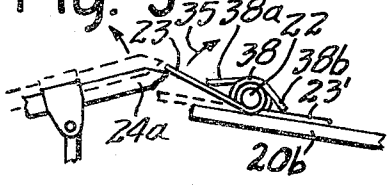


Fig. 2c

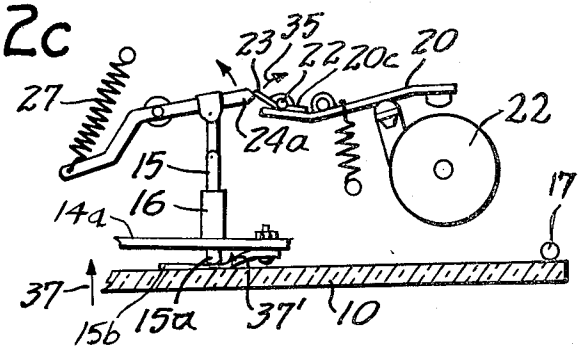
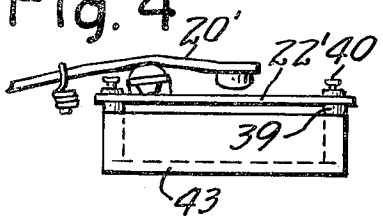


Fig. 4



CABINET DOOR ALARM DEVICE

The present invention relates to alerting door-alarms for drug, jewelry, or money-containing cabinet, etc.

BACKGROUND TO THE INVENTION

Prior to the invention there have been diverse door alarms; few if any have been adaptable to a simple percussion mechanism ringing a bell or gong within a cabinet or other enclosure having either pivoted or sliding doors. A common difficulty and disadvantage of prior cabinet alarms has been the susceptability of frustration of the alarm mechanism by effort of a thief to slowly deliberately open the door to the cabinet enclosure in order to ease the percussion striker downwardly slowly against the surface intended to be rung. Also, an alarm mechanism suitable for activation by the opening and closing of the pivoted door has not heretofore been utilizable in the cabinets in the same relative position for the sliding door.

THE SUMMARY OF THE INVENTION

Objects of the present invention include the overcoming and avoiding of one or more difficulties and problems of the types discussed above. Another object of the invention is to obtain an alarm mechanism adapted for cocking an actuation spring mechanism upon the opening of a door and for simultaneous release of the cock spring mechanism upon the occurence of release of restraint of biased trigger structure such that upon the opening of the door sufficiently to gain access thereinto, at any rate of opening the trigger is caused to release the cocked machanism to thereby set-off the alarm such as releasing a striking hammer from its cocked position to strike the bell. Another object is to provide against a muffling of the bell's sound by continuous contact of a striker with the surface of the bell after the initial striking of the bell with the upon setting of the alarm. Another object is to provide a cabinet-mountable alarm of a compact miniature size of a nature that is fool-proof against sneak-thief efforts to ease-open the door in a effort to avoid ringing the alarm. Another object is to provide a cabinet-mountable alarm of a type mountable within a cabinet which in a single predetermined position it is responsive to the opening and closing of either of a pivoted door or a slide door for the pressing downwardly of and release of an alarm-initiating contact structure for contact with the door of the cabinet.

Another object is to obtain a bell as an alert device preferably, as rather than opposed to merely a conventional burglar alarm, preferably used to alert a superior or person in charge, to the fact of an opening of a door in a cabinet or safe in a "densitive" or "classified" area. For example, jewelry manufacturing firms have personnel who have daily access to vaults; the present inventive alert device alerts the supervisor(s) or employer(s) anytime the particular section of of vault or safe is entered. In hospital(s) a head nurse or doctor in charge can similarly note every time the narcotic cabinet in their section is entered. The alert device is well suited for night shifts when most patients are asleep, as the device normally only strikes one stroke, which is to call attention to the entering of the narcotic cabinet. Narcotic thefts can thereby be deceased consideraly. Another object is a door-alert to alert a mother when a child exits through an outside door.

The invention includes a cocking and triggering mechanism, the cocking mechanism and the triggering mechanism positioned one relative to the other such that release of pressure on a trigger causes a cocking mechanism to become cocked by biasing action of a spring biasing and continued progressive release of pressure on the trigger trips a release of the cocked mechanism to set-off an alert such as a bell by a striker. In a preferred embodiment utilizing a striker, a pressing of the trigger button by a closing of the door causes the catch mechanism on the trigger button lever structure to flip non-engagable past a lever-actuation end of the striker lever and the striker lever having a flip-structure preventing such non-engagement but providing for cocking engagement upon release of the trigger structure in its biased direction such that the striker arm is first thereby caused to be raised to a cocked position and upon continued movement of the lever structure the flip-structure at a predetermined point is caused to release the raised spring-biased striker-arm striker thereof which thereupon is spring-biased downwardly to ring the bell; release of pressure on the button retained in a face of a closed door, serves to permit movement of a trigger arm controlled by the button to move forwardly and in the range and process of moving forwardly during the release of total pressure on the button, the first portion of movement of the trigger arm during the release serves to cock the striker arm whereas when the button continues to release the arm at a predetermined point in the same release direction permits the engaged end of the trigger arm to slip from contact with the engaged end of the striker arm whereby the spring biased striker arm thereby immediately is spring biased returnably moving the striker thereof toward the bell such that the striker forceably hits the bell surface. In a further preferred embodiment, the striker arm is composed of a flexible material and there is provided mounted on support structure a stop abuttment structure positioned for normally spacing the striker arm and the striker thereof away from contact with the bell such that only during the forceful spring biased snap-back return of the striker towards the bell does the momentum of movement of the striker cause the striker arm to flex such that the striker thereof continues to move forward to intermittently strike the bell ringing surface before the striker arm straightens-out in a return to its non-flexed state spaced-from the striking purpose of the bell. Such an arrangement avoids continuous contact of the striker with the bell surface after the initial striking thereof. And still a further preferred embodiment, for the button attached to the trigger arm pivotably, there is provided a channel structure and mounted on the support channel structure there is provided preferably a flat-faced strip having opposite upper and lower flat faces with one end of the strip being anchored and the strip being sufficiently flexible that pressure on the strip from either outward directions such as from closing of a pivoted door or from a lateral direction such as from the force of the leading side edge of the door moving slidable side ways in order to press forwardly eventually above (post) the flexible strip and the button thereby to be pressed downwardly by the lower flat face of the flexible strip during the depressing thereof upon a closing of the slidable door. Other features are described in greater details in a following detail disclosed.

THE FIGURES

FIG. 1 illustrates an elevation front view in an in-part view of typically a bathroom lavatory and cabinet thereover with a mirrored door, illustrating in partial cut-away the cabinet door in order to illustrate behind the door a typically appearing alarm unit of the present invention in a mounted state on a side face of the cabinet within the cabinet.

FIG. 2 illustrates a view as taken along lines 2—2, together with a partial cut-away of the enclosing casing of the alarm unit to thereby illustrate an elevation top view of a preferred embodiment of the present invention.

FIGS. 2*a*, 2*b* and 2*c* are illustrates in-part view in flow-diagrams in sequence one with the other of various stages of operation during the initial closed state and the opening of a pivoted door and of the closing thereafter of the pivoted door, to result in a ringing of the bell and in a resetting of the mechanism for subsequent repeated functioning.

FIG. 2*d* illustrates a still further embodiment in which the button-depressing flexible strip is illustrated in phantom in the depressed state as for example is shown in the FIG. 2*a*, and illustrated in the button-extended state for a situation and embodiment utilizing a lateral slidable door illustrated in the sidewardly slid-open state.

FIG. 3 illustrates an enlarged view in an in-part view more completely illustrating the re-setting position being accomplished by the FIG. 2*c* state of movement.

FIG. 4 illustrates an alternate embodiment shown also in elevation stop view similar to that of FIG. 2, 2*a* through 2*d* and 3, the FIG. 4 embodiment differing in the employment of gong or chime-type alarm bell.

DETAILED DESCRIPTION OF THE INVENTION

In greater detail, FIGS. 1, 2, 2*a*, 2*b*, 2*c* and 3 illustrates a preferred embodiment of the invention, FIG. 2*d* illustrating the same embodiment except with a slide-opening door rather than the pivotably swing-closing door of the FIGS. 1, 2, 2*a* through 2*c*. The FIG. 4 embodiment would differ from the earlier above-noted embodiments only in the utilization of a different type of alarm bell. FIG. 1 illustrates a bathroom cabinet 5 having mirror door 10 mounted on the face on the cabinet enclosure as illustrated in FIG. 2 by the pivot hinge 17. Mounted on the cabinet inside side-face alarm unit 6 mounted by its flange 12 being secured by grooves 13. The outwardly directed face 14*a* have extending through apertures therein the actuation button 15*a* with the strip 15*b* mounted on the face 14*a* at one end of the strip 15*b* mounted on the face 14*a* at one end of the strip with the surface extending concealably over the button 15*a* as illustrated in each of FIGS. 1 and 2 and subsequent Figures. The upper face 11 is illustrated in FIG. 2 in cut-away in order to illustrate the interior mechanism. The FIG. 2 in greater detail discloses the forward wall portion 14*a* also illustrated in FIG. 1, and the end wall 14*b* and the back wall 14*c* enclosing the alarm unit. Also in elevation plan view in FIG. 2 there is illustrated base wall 14*d* of the alarm unit container. The pivoted axes 18 and 25 each would be, for example, mounted uprightly typically, on the base wall 14*d*. Also, the anchoring post 28 and spring 27 as well as the anchoring post for spring 42 would be mounted within the upper face of the base wall 14*b*. Also, the striker-arm abuttment 30 and the bell 22 would be mounted on the upper face of the wall 14*b*. The button 15*a* is channeled for axial movement of its shaft 15 in axial to and fro directions by the channeling structure 16 sunk within the forward wall 14*a*, this relation being more fully illustrated in the diagrammatic cut-away view of the FIG. 2*a*. The arm 15 is connected by a pivotably mounted link there to illustrated as link 29 connected at its opposite end pivotably to the pivot structure 26 mounted on the trigger arm 24. The trigger arm 24 is pivotably mounted on the pivot axis 25 and at its end 24*a* have attached spring biasingly thereto the biasing spring 27 anchored on to spring achoring post 28, such that the button 15*a* is always biased towards its ejected state in order to always to press outwardly toward the face 10*a* (see FIG. 2*a*) of the door 10. Accordingly, as illustrated in FIG. 2*b* as the door 10. Accordingly, whenever the door 10 opens against the pull of the magnet 8 against a metallic strip 9 attached to the door face 10*a*, such that the door moves in direction 36, as illustrated in FIG. 2*a*, the button 15*a* moves in direction 36′ while thereby the contact end 24*a* is permitted to move in direction 32 in engagement with the key 23 to cause it to move in direction 33 around its pivot point 18 by virtue of its pivot mounting structure 19 of arm 20. The spring 42 anchoring on the base side 14*d* is spring biased against the striker arm 20 portion 20*a* in a manner which always spring biases the arm 20*a* (of the striker 21 thereof) against the abuttment structure 30. The key 23 is mounted pivotably on a pivot 22 onto the arm 20 by virtue of a leaf 20*c* which is fixedly mounted on the face of the striker arm 20 portion 20*b*. The key 23 is spring-biased in the direction 33 by virtue of the biasing arm 38*a* of spring 38 illustrated in FIG. 3, the opposite end of the arm (for the spring 38) being identified as arm 38*b* biased against the mounted leaf 23′. By virtue of the flexible nature of the arm 20, when the arm is released from the position illustrated in FIG. 2*a*, the striker 21 moves in direction 34 as illustrated in FIG. 2*b* to thereby strike the bell 22 by virtue of the striker position illustrated in phantom in FIG. 2*b* as striker position 21′ resulting from the fact of the biasing spring 27 forcing the button 15*a* continuously outwardly as the door 10 is withdrawn such that the contact end portion 24*a* moves into a non-engaging with the key 23 permitting the arm portion 20*b* to move upwardly while concurrently the striker 21 and arm portion 20*a* move downwardly in direction 34 illustrated in FIG. 2*b*. The spaced-away relationship of the arm 20 by virtue spacing abuttment structure 30 prevents the striker 21 from remaining in contact with the bell 21 after it strikes the bell whereby the ringing sound of the bell is not muted. FIG. 2*c* illustrates the intermediate position of the contact end portion 24*a* during its upward movement while the button 15*a* is being forced in direction 37′ by virtue of pressure there-against by the closing door 10 moving in direction 37. FIG. 3 is enlarged in-part view of the FIG. 2*c* stage of operation, also the FIG. 3 illustrating the biasing spring shown only symbolically in the preceding Figures, the spring 38 serving to hold the key 23 in the extending state as shown in phantom in FIG. 3 and as shown in the extended state in FIG. 2. The FIG. 3 illustration, it is illustrated that the end contact portion 24a is continuing to move upwardly to press the key 35 continuingly in direction 35 until such time as the contact end portion moves into the phantom position shown

therefore, at which time the key **23** moves or slips downwardly to its phantom-illustrated position shown in FIG. **3** as well as in FIG. **2.**

FIG. **2***d* differs from the preceding Figures only with regards to the illustration of a differently mounted door **10'** which is mounted for sliding opening and closing in directions **37***a*, the door **10'** being shown in the open state but also being shown in phantom in its position in the closed state, whereby in movement from the illustrated position to the phantom-closed position the key **15***a* would thereby be caused to move in direction **37''** by virtue of pressure of the lower face **15***d* of the strip **15***b* as the sliding door leading edge face **10'***a* presses against the strip face **15***c*. The FIG. **4** differs from the prior embodiment only in the substitution of a different type of alarm bell which includes the sounding box **43** together with a time bar **22'** mounted on insulating cushion **39** by clamps **40.** The striker arm **20'** and all other structures corresponding to that of prior illustrated embodiments. The FIG. **2** illustration discloses some of the details of the cabinet such as the side walls of the cabinet referred to as **7,** and the wall structure **41** into which the cabinet walls **7** are mounted.

Accordingly, by virtue of the invention irrespective of the slowness or speed with which a pivoted door or sliding door is opened, the release of pressure on the button **15***a* causes the striking arm to come cocked and instantly thereafter released with a constant striking pressure by virtue of a constant tension of the spring **42** as shown in the illustration of FIG. **2***a* such that the striking force of the striker **21** on the bell as always the same and can not be frustrated by a sneak theft who might vary the speed of opening the door in his effort to prevent a ringing of a bell or other alarm.

It is within the scope of the present invention to make such variations and modifications and substitution of equivalents as would be apparent to a person of ordinary skill.

I claim:

1. A door-opening alarm device comprising in combination:

a first lever means for providing contact and pivoted at a point spaced-away from one of upper ends of the lever arm means,

a first end of the first lever arm means having a first contact surface;

and alarm means for initiating a signal and having a signal-initiating second contact surface positioned to be contacted by said first contact surface;

first biasing spring means for biasing said first lever arm in a direction such that said first contact surface is biased toward said second contact surface;

second lever-arm means for intermittent forcing of said first contact surface away from said second contact surface by acting upon said first lever arm means intermittently in one of opposite to and fro alternate direction and having a third contact surface positioned for contact with a face of a closed door such that when in contact with the face of the closed door the first lever arm means is retained in a first direction such that the first contact surface is not forced away from the second contact surface, the second lever arm means being pivotably mounted at a point spaced away from at least one of opposite ends thereof, said one spaced away end of the second lever arm means being positioned for pressing against said first lever arm means in the direction such that force is impartable thereto for moving the first contact surface away from the second contact surface;

second spring means for biasing said second lever arm means toward a second direction such that when a face of a closed door is moved from a retaining contact with said third contact surface said first contact surface is caused to move away from said second contact surface, biasing action of said second spring means being greater than biasing action of said first spring means;

and spring biased-key means for providing force-imparting engagements of said second lever arm means with said first lever arm means when a face of a closed door is removed from retaining contact with said third contact surface and being mounted on one of the first and second lever arm means for engagement with the remaining other of the first and second lever arm means.

2. A door-opening alarm device of claim **1,** in which said spring biased-key means includes a key-biasing spring in a pivoted key biased by the key-biasing spring in a direction toward said third contact surface and in its mounted state the pivoted key being biased against a stop abuttment preventing further pivoting toward said second direction and being pivotable against spring biasing of the key-biasing spring in a direction moving towards said direction from said second direction such that when a face of said door moves to a closed state to press against said third contact surface the third contact surface becomes moved from said second direction toward said first direction against biasing action of said second spring means while concurrently tripping said spring-biased key.

3. A door-opening alarm device of claim **2,** in which said alarm means comprises a bell and said second contact surface comprises a surface of said bell which when struck by said first contact surface causes the bell to give off audible sound.

4. A door-opening alarm device of claim **3,** in which said spring biased-key means is mounted on said first lever arm means.

5. A door-opening alarm device of claim **4,** in which said spring-biased key means is mounted on an end of said first lever arm means opposite from that at which the first contact surface is located, and first pivot structure pivotably mounting the first lever arm means at a point intermediate between the first contact surface and the spring-biased key means in its mounted state, and in which the second lever arm means includes a fourth contact surface spaced-away from a fulcrum point of pivot of the second lever arm means, the fourth contact surface being the positioned for to and fro contact with said spring-biased lever in to and fro movement of the fourth contact surface from said first direction toward said second direction and from said second direction returnably toward said first direction.

6. A door-opening alarm device of claim **4,** including a channel structure of a shape and position such that said third contact surface is movable reciprocatably in to and fro alternate motions, and depressable structure having spaced substantially plainer face with the structure mounted in a position such that the plainer face extends substantially angularly inclined relative to a leading thickness face of a sliding door whereby the depressable structure is depressable of said third contact

surface when a slidable door is slid toward and over said third contact surface.

7. A door-opening alarm device of claim 6, in which said depressable structure is a flexible strip having each of opposite upper and lower face substantially flat, mounted on an outward face of the channeling structure with the distal portion of the strip being positioned over and with lower surface thereof in contact with said third contact surface such that when pressure is exerted on said upper surface thereof, the lower surface thereof is thereby caused to depress the third contact surface such that upon release of pressure on the strip's upper surface when the third contact surface is in a depressed state the third contact surface is permitted to move outwardly in a direction from said first direction towards second direction as a sliding door is slid to an open state to result in a ringing of the bell.

8. A door-opening alarm device of claim 3, and a lever abutting structure mounted for spacing the first lever arm means from the alarm means and its second contact surface, and said first lever arm means including an elongated flexible element such that upon movement of the second lever arm means toward said second direction sufficiently to release the first lever arm means, the distal end portion of the first lever arm means becomes struck against the lever abutting structure causing the elongated flexible element to flex forwardly sufficiently for the first contact surface to strike the second contact surface resulting in initiating the alarm signal.

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