May 25, 1965 R. K. CHEDISTER 3,185,127

ALARM SYSTEM

Filed Dec. 11, 1962

FIG. 1

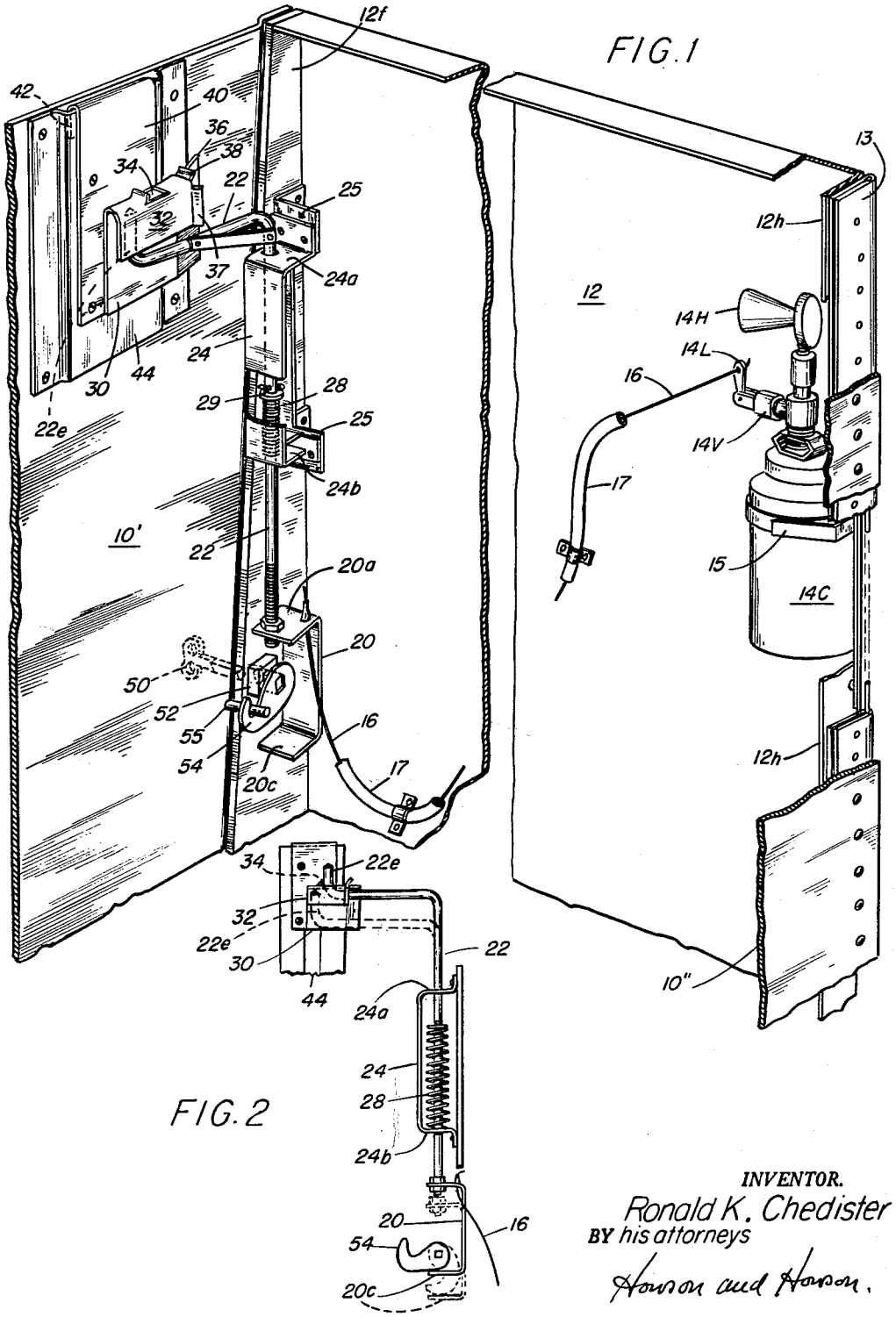


FIG. 2

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ALARM SYSTEM

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10 Claims. (Cl. 116—86)

This invention relates to an alarm system and, more particularly, to an audible alarm for the purpose of combatting thievery by giving notice of attempts to open a locked receptacle or cabinet or machine housing by force or unauthorized methods.

The invention is particularly useful with vending machines and the like which have a door that is normally locked closed, but can be opened with a key to give access to the interior. However, the invention is not limited to such use, but may be employed with many other machines and openable housings.

A large amount of goods and money are stolen annually from vending machines of all kinds by forcing the door of the machine open to gain access to the goods and the money within. Not only is there a monetary loss resulting from taking the money and goods, but in addition there is damage to the machine and loss of profits which would otherwise be made while the machine is absent for repairs.

Many thieves and malicious persons are frightened off and take flight at the first sound of an alarm or as soon as attention is centered upon the machine by the sound of a loud noise or alarm. But some will persist long enough to open the cabinet and take the contents if they feel they have a moment to spare before taking flight or being apprehended.

To provide an additional obstacle in the way of quick access to the interior of the machine or cabinet once the key-operated lock is disabled, it is desirable to provide a secondary lock to prevent quick access and require additional time and trouble before it, too, is broken and disabled. In that way not only are the contents of the machine doubly guarded, but the chance of catching the thief is increased.

Alarm systems which are electrically actuated by making and breaking a circuit require services by expert technicians and are initially expensive to make and to install.

Thus, it is an object of this invention to provide a mechanical alarm system for cabinets, vending machines and the like which will sound an audible alarm when the door is opened otherwise than by the usual key.

Another object is to provide an alarm system as aforesaid which will activate a self-powered horn unit contained in the machine or cabinet whenever unauthorized access is attempted by forcing the door open.

Another object is to provide an alarm system as aforesaid which contemporaneously with the activation of an alarm will activate a second lock and stop further opening of the door or closure.

Another object is to provide an alarm system as aforesaid in which the audible sound is given by a self-powered horn unit which once it has been activated, will continue to sound so long as any power fluid remains.

Another object is to provide an alarm system as aforesaid which is inexpensive to manufacture, reliable in use and positive in operation and may be quickly and easily installed in existing machines and cabinets.

Other objects and advantages of the invention will become apparent as the invention is described in connection with the accompanying drawing.

In the drawing:

FIG. 1 is a perspective view of the invention installed in a vending machine cabinet or housing.

FIG. 2 is a side elevation view of a part of the locking mechanism.

Referring to the drawing, the housing or cabinet such as of the vending machine for cigarettes, candy or other articles, is shown as having a back portion with side walls 10' and 1'' made of sheet metal or other suitable material and a cover 12 also of sheet metal or other suitable material hinged at one side edge to the side wall 10'', as at 13. The door may have flanges 12*h* and 12*f* which may overlie inwardly offset marginal edges on the back portion when the door is shut.

Attached to the door 12, preferably adjacent its side flange 12*h*, in any suitable manner as by a bracket and clamp 15 secured to the door flange or hinge, is a horn of the type disclosed in the Reissue Patent 24,730 of C. E. Graham Reeves. This horn comprises a container 14C of liquified gas (such as Freon) to the top of which is attached a control valve 14V operated by a pivoted lever 14L to allow emission of gas to the horn diaphragm and bell 14H. Preferably the lever 14L when moved into horn-blowing position will remain there, due to a flat face thereon, and will be a manual puncture type of valve which punctures a thin membrane in the passage from the container 14C to the bell 14H. Thus, the horn will be caused to blow continuously.

To lever 14L is attached a flexible wire or cable 16 passing through a guide tube 17 attached to the inside of the door 12.

The opposite end of the cable 16 is affixed to a U-shaped slidable metal stamping 20, the upper leg 20*a* of which is affixed in turn by bolts to the threaded lower end of an actuating rod 22 which extends parallel to the side wall 10' and usually vertically. The intermediate portion of the actuating rod 22 is slidably mounted within a U-shaped guide bracket 24 by passage through apertures in the parallel upper and lower legs 24*a* and 24*b* of the guide-bracket. The legs have out-turned feet by which this bracket is secured to right-angle supports 25 which are mounted upon the flange 12*f* of the cover or door 12.

The upper end of the actuating rod 22 is bent at right angles to the intermedate and lower ends of that rod and the extremity is again bent, upwardly, at right angles parallel to the main portion of the rod.

The tip of the upper end 22*e* of the actuating rod 22 is adapted to engage a latch plate and to hold the rod in its lower or inoperative position when the door is shut. But on opening the door even a crack (other than when the door is released by the usual key), provision is made to relock the door in that cracked-open position. To this end, a latch plate 30 is located on the side wall 10' adjacent the top thereof. This latch plate has its upper edge folded over inwardly of the cabinet to form an inverted channel into which the upper end 22*e* of the actuating rod 22 may slide.

To guide the movement of the rod into the channel, the vertical entrance edges 36 and 37 are flared divergently, as is also the top or transverse edge 38 of the channel. In this top or transverse portion, midway along its length is an aperture 34 for the purpose of allowing the end 22*e* of the actuating rod to be projected up into it as the end 22*e* slides along the channel whenever the door is opened other than by manipulation of the usual key. The projection of the end 22*e* relocks the door stopping further opening movement. See FIGURE 2.

In order that the relocking will occur when the door is opened merely a crack, for example about 1/16 of an inch, after the flange 12*f* separates from the vertical edge of the back portion of the cabinet, the latch plate is so positioned relative to the end 22*e* of the actuating

rod that the end 22*e* will be in position to enter aperture 34 when that condition occurs.

In order to cause such relocking automatically by projection of the end 22*e* into the aperture 34 as the unauthorized opening of the door starts, a coiled compression spring 28 is wound around the actuating rod 22 midway along its length. The lower end of the spring presses upon the upper surface of the leg 24*b* of the guide member 24 which is affixed to the door while the upper end of the spring presses against a washer or collar 29 affixed on the actuating rod 22.

Not only will the spring cause the projection of the end 22*e* into the aperture 34 of the locking plate to cause automatic relocking of the door in partially open position, but at the same time, the action of the spring by virtue of the connection of the bottom member 20 to the lower end of the rod causes a pull on cable 16 which, it will be recalled, is connected to this bottom member 20. Hence, as the cable is pulled, the lever 14L of the valve on the horn is actuated which causes the horn to sound. Because the lever 14L is of the type which will remain in actuated position when once it has been pulled into that position, the horn continues to sound, drawing attention of any persons nearby or even in remote places, to the breaking into the machine.

To facilitate mounting of the latch plate 30 on existing cabinets, a mounting plate 40 is provided with an outwardly reversely bent end or top edge 42 which may be hooked over the top or end of an existing conventional vertical stiffening brace 44 on the cabinet, such brace being of channel shape with out-turned edges or flanges lying flat against the side wall 10′ and secured thereto. The locking plate 30 may be welded or attached by screws, or otherwise, to the mounting plate 40 which, in turn, is suitably secured in any desired fashion to the brace or side wall.

The cabinet is provided with a conventional lock, key hole and key 50. The lock is mounted on the door. Inside the cabinet is a turnable stud 52 extending from the lock and having on its end a transverse flat locking cam 54.

In the position shown in FIG. 1, the hook of the cam engages a keeper or lock pin 55 on the cabinet back part to hold the door closed. But when the key turns the cam down, to unlock the door (dotted position of FIG. 2) the cam engages the upper surface of the lower leg 20*c* of the U-member 20. This holds the member 20 and actuating rod 22 in lowermost position so that when the door opens, the spring 28 is rendered ineffective to and is prevented from projecting the actuating rod 22 upwardly. Hence, the relocking or secondary locking functions are not performed and the horn is not actuated.

From the foregoing, it will be observed that the invention provides for simultaneously actuating the horn and for relocking the door of the cabinet by a secondary locking mechanism whenever the door is forced partially open or is opened by unauthorized methods without the use of the usual key by authorized personnel.

While dimensions may be varied, the objective of giving an alarm and relocking the door to prevent access to the interior of the housing will be achieved if mechanism operates when only a slit or crack appears between the swinging edge of the door and the front vertical edge of the back portion of the enclosure. Desirably the mechanism must act before the hand of a thief can be inserted through the opening he has forced.

It will be noted that the latch plate 30, because of its folded-over portion 32, holds the upper end or extremity of the actuating rod 22*e* in such a position that it cannot be removed without passing beneath the hole 34. As a practical matter, it is impossible to force the door inwardly of the cabinet, yet any outward movement of the cabinet door except by first operating the key-controlled cam 54, will inevitably cause the actuating rod to be projected upwardly and to sound the alarm and relock the cabinet.

It will be noted that all parts, except the latch plate and its mounting plate, are mounted on the door. But it is within the scope of the invention to mount the latch plate on the door and other parts on the back section of the housing, as may be desirable in some instances. In such cases, the key-operated lock would also be mounted on the back section.

Many modifications within the scope of the invention will occur to those skilled in the art. Therefore, the invention is not limited to the precise form and detail of the preferred embodiment in connection with which the invention has been described.

What is claimed is:

1. An enclosure having a back section, a door section hinged thereon, and a key-operated lock including a member on one section operable by a key to engage or disengage a member on the other section for holding said door section closed or to release it, in combination with an alarm system comprising an audible sound-producing device and mechanical means inaccessible from outside said enclosure to actuate said audible device, said audible device and said means both being mounted on the same enclosure section as said key-operated lock, means on the other enclosure section rendered effective by relative movement between itself and said actuating means on forced opening of said door a crack to cause operation of said actuating means in one direction and actuation of said sound-producing device, said means on said other enclosure section including secondary locking means causing relocking of said door section upon movement of said actuating means in said one direction and means operated by unlocking of said key-operated lock to prevent movement of said actuating means in said one direction.

2. The combination as claimed in claim 2 wherein the relocking of the door section occurs simultaneously with the operation of said actuating means and with actuation of said audible signal.

3. An enclosure having a back section, a door section hinged thereon, and a key-operated lock for holding said door section closed, in combination with an alarm system comprising an audible sound-producing device, mechanical means inaccessible from outside said enclosure to actuate said audible device, spring-biased means including a rod on one of said sections operable when released to activate said mechanical means, a holding plate on said other enclosure section slidably engaged by said rod and holding said rod from release when said door section is closed, said rod being released upon slidable movement of said rod with respect to said holding plate as said door section is forced open a crack, and means operated by unlocking of said key-operated lock to prevent operation of said actuating means.

4. The combination as claimed in claim 3 wherein said audible sound device comprises a self-powered horn having a gaseous power supply and valve means between said supply and horn to control the flow of gas to the horn.

5. The combination as claimed in claim 4 wherein said valve has an actuating lever which when operated causes a continuous flow of gas to be maintained to the horn.

6. An enclosure having a back section, a door section hinged thereon, and a key-operated lock for holding said door section closed, in combination with an alarm system comprising an audible sound-producing device, and secondary locking means, means effective on opening said door section a crack to operate said sound-producing device and said secondary locking means to give an alarm and to lock the door against further opening movement, and means operated by unlocking said key-operated lock to hold said operating means inactive.

7. An enclosure having a back section, a door section hinged thereon, and a key-operated lock for holding said door section closed, in combination with an alarm system comprising an audible sound-producing device, and sec-

ondary locking means, spring-biased means moving automatically on opening said door section a crack to operate said sound-producing device and said secondary locking means to give an alarm and to lock the door against further opening movement, and means operated by unlocking said key-operated lock to hold said operating means inactive.

8. An enclosure having a back section, a door section hinged thereon, and a key-operated lock for holding said door section closed, in combination with an alarm system comprising an audible sound-producing device having an operating member constructed and arranged to maintain continuous alarm when movable into position therefor,

secondary locking means,

spring-biased means connected to said member and releasable to move said member into said alarm position and also to lock said secondary locking means,

and means effective on opening said door section a crack other than when released by unlocking said key-operated lock to release said spring-biased means,

and means operated by unlocking of said key-operated lock to prevent operation of said actuating means.

9. An enclosure having a back section, a door section hinged thereon and a key-operated lock including a member on one section operable by a key to engage or disengage a member on the other section for holding said door section closed or to release it, in combination with an alarm system comprising a self-powered horn having a gaseous power supply and valve means between said supply and horn to control the flow of gas to the horn, mechanical actuating means inaccessible from outside said enclosure to actuate said self-powered horn, means rendered effective by forced opening of said door section a

crack to cause operation of said actuating means in one direction and actuation of said horn, secondary locking means rendered effective by operation of said actuating means to cause relocking of said door section sumultaneously with operation of said actuating means, and means operated by unlocking of said key-operated lock to prevent movement of said actuating means in said one direction.

10. An enclosure having a back section, a door section hinged thereon, and a key-operated lock for holding said door section closed, in combination with an alarm system comprising an audible sound-producing device, mechanical means inaccessible from outside said enclosure to actuate said device, spring-biased means on one of said sections operable when released to activate said mechanical means, means on the other of said sections holding said spring-biased means inoperative while the door section is closed but releasing said spring-biased means upon forced opening of said door section a crack, secondary locking means operated by said spring-biased means when said audible sound means is actuated to relock said door section when it is opened a crack, and means operated by unlocking of said key-operated lock to prevent operation of said actuating means.

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LOUIS J. CAPOZI, *Primary Examiner.*

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,185,127 May 25, 1965

Ronald K. Chedister

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 2, line 6, for "1″" read -- 10″ --; line 30, after "slidable" insert -- sheet --; same column 2, line 42, for "intermedate" read -- intermediate --; column 4, line 36, for the claim reference numeral "2" read -- 1 --.

Signed and sealed this 28th day of September 1965.

(SEAL)
Attest:

ERNEST W. SWIDER
Attesting Officer

EDWARD J. BRENNER
Commissioner of Patents