

March 9, 1937.

A. E. BURCH, JR., ET AL

2,072,941

THEFT PREVENTION SYSTEM

Original Filed May 23, 1931 2 Sheets-Sheet 1

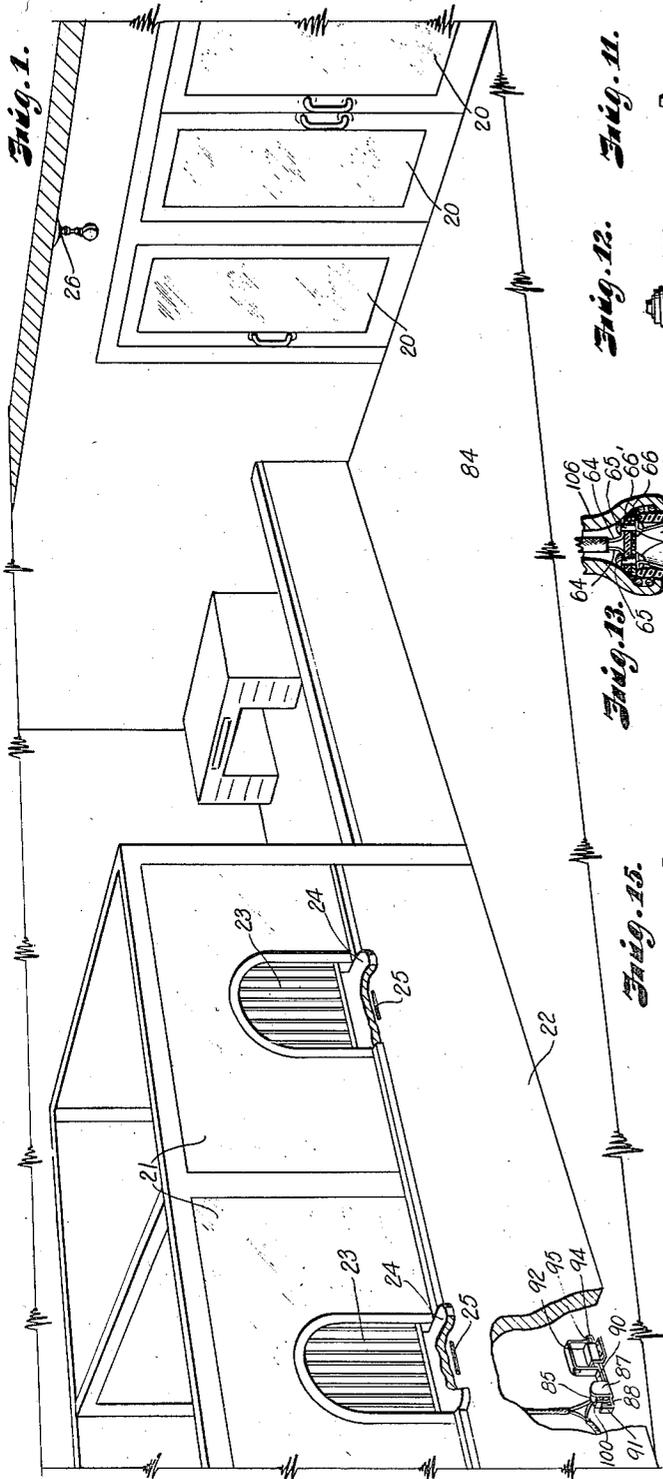


Fig. 11.

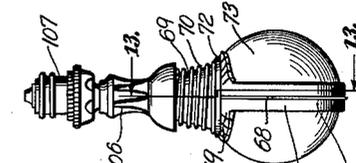


Fig. 12.

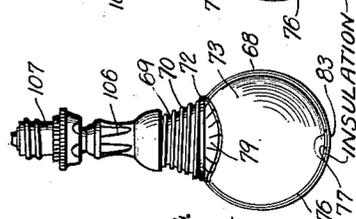


Fig. 13.

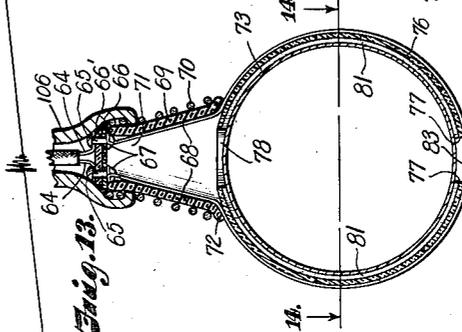
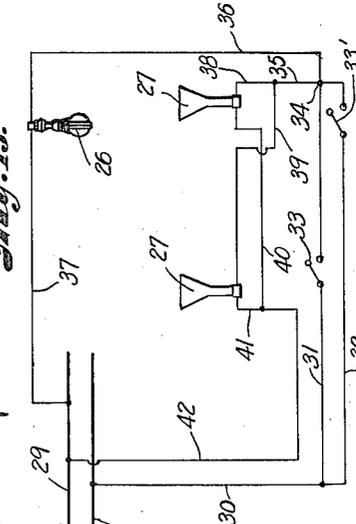


Fig. 15.



INVENTORS
Arthur E. Burch Jr.
and Enos Cornwall

BY *Alfred R. Fuchs*
ATTORNEY.

UNITED STATES PATENT OFFICE

2,072,941

THEFT PREVENTION SYSTEM

Arthur E. Burch, Jr., and Enos Cornwall, Kansas City, Mo.; said Burch assignor, by mesne assignments, to Enos Cornwall, Kansas City, Mo.

Application May 23, 1931, Serial No. 539,500
Renewed July 30, 1936

14 Claims. (Cl. 102-1)

Our invention relates to theft prevention systems, and more particularly to a system utilizing means producing an irritant gas, such as a tear gas or similar incapacitating gas to prevent or interfere with the activities of robbers when the same is released into the air.

Our improved theft preventing system comprises means for releasing the gas producing means, which includes a fusible electrical element, which upon fusion actuates the means whereby the gas generating means is set in action and means for closing the electrical circuit whereby the current is passed through the fusible element to fuse the same, which means is so constructed that the same will not fuse the element by accident, as it is fully as important to avoid accidental operation of the means as it is to provide means which will readily release the gas producing material when this is desired, said circuit closing means preferably comprising a foot operated member which must be moved in a plurality of directions to close the circuit, and which can be moved by means of the foot without any appreciable motion of the foot being noted by anyone in front of the usual cage or counter provided in a bank or similar place, as a relatively small movement of the foot is necessary to actuate the switch in spite of the fact that the movement must be in predetermined directions to avoid accidental movement of the switch actuating means.

It is a further purpose of our invention to provide a system of the above mentioned character, which comprises means for projecting the irritant gas in a predetermined direction and means for producing a general scattering distribution of the gas, said means being either used separately or in conjunction with each other, but being preferably used in conjunction with each other, because, particularly, in bank holdups or similar robberies, usually more than one person participates in the same, and while it is desirable to direct the irritant gas to certain specific points of the room, it is also desirable to provide a general distribution thereof at the same time to incapacitate other members of the band of robbers, if there is more than one.

It is a further purpose of our invention to provide a new and improved switch closing mechanism comprising a foot operated member, which must be moved in a plurality of directions to actuate the same so as to close the electrical circuit in which the fusible elements actuating the gas producing means are located, said switch closing means preferably being a lever that is both

tiltable and slidable, and which must be moved both upwardly and substantially horizontally to move the same to switch closing position.

It is another object of our invention to provide a new and improved irritant gas distributing means comprising a nozzle or projecting device having a flaring portion and a tubular portion, within which a cartridge or shell is located containing gun powder or similar material and the gas producing material, said shell or cartridge including a fusible electrical element extending into the same and insulated from the metallic parts thereof, said fusible element igniting the powder when the element flashes due to the passage of electrical current therethrough to expel the irritant gas producing means from the cartridge into the tubular member and projecting the gas through the flaring portion of the devices in the direction desired.

It is still another purpose of our invention to provide means for producing a scattering or spreading of an irritant gas comprising a bomb, which is suspended, and which is held in suspended condition by a member having a fusible portion, which will be flashed to release the bomb when an electrical current is passed through said fusible portion, causing said bomb to drop to the floor or some other surface beneath the same, whereupon the same will open, causing the release of the gas producing material therein, which will cause the same to spread in all directions from the point of release thereof.

Our invention further contemplates the use of resilient means holding the suspending member under tension, and aiding in the release of the bomb from its suspended position when the suspending member is fused.

An important advantage of using the electrical fuse element over previously used means for actuating tear gas producing devices, which usually included an electrical heating element, is, that when current is caused to pass through the fuse it will immediately flash, igniting the powder or breaking the suspension for the bomb, making our system much more rapid in operation than the devices previously used, as all the time necessary for heating up the heating coil previously used by others is saved.

Other objects and advantages of our invention will appear as the description of the drawings proceeds. We desire to have it understood, however, that we do not intend to limit ourselves to the exact details shown or described, except as defined in the claims.

In the drawings:

Fig. 1 is a perspective view, partly broken away, showing our improved system applied to a room, such as a banking room.

Fig. 2 is a fragmentary rear elevational view of a bank cage, showing our improved gas projecting apparatus and the switching apparatus in relation thereto.

Fig. 3 is a vertical sectional view through the gas projecting apparatus on a somewhat enlarged scale.

Fig. 4 is a view partly in elevation and partly in section through the same, said view being taken substantially on the line 4-4 of Fig. 3.

Fig. 5 is a section taken on the line 5-5 of Fig. 3.

Fig. 6 is an enlarged section taken on the line 6-6 of Fig. 3.

Fig. 7 is a view partly in side elevation and partly in section of the switch actuating means used in our system, showing the same in normal position.

Fig. 8 is a similar view of the switch closing mechanism, showing the same in switch closing position.

Fig. 9 is a section taken on the line 9-9 of Fig. 7.

Fig. 10 is a section taken on the line 10-10 of Fig. 7.

Fig. 11 is a side elevation of the bomb and supporting means therefor.

Fig. 12 is a view thereof taken at right angles to Fig. 11.

Fig. 13 is a section taken on the line 13-13 of Fig. 11, on an enlarged scale, the gas producing material on the inside of the bomb being omitted.

Fig. 14 is a section through the bomb, taken on the line 14-14 of Fig. 13, the contents of the interior of the bomb being omitted.

Fig. 15 is a diagram, showing the wiring connections for our improved theft preventing system, and

Fig. 16 is a fragmentary enlarged sectional view through the rear portion of the cartridge and associated parts shown in Figs. 3, 4 and 6.

Referring in detail to the drawings, our improved theft preventing system, which is particularly adapted for use in semi-public places where money is handled, such as banks, is shown as being applied in the drawings, to a banking room having the outside doors 20, the usual teller's cages 21, having a wall portion 22 below the windows or openings in the same, the windows being indicated by the numeral 23, and being usually provided with shelves 24 extending forwardly at the bottom thereof.

Our improved theft preventing means comprises means for directing irritant gas through the slotted members 25 provided in the apertures below the shelves 24, and in any other apertures in the walls or counters, furniture or fixtures of the bank or other business that might be located in the room to which the theft preventing means is applied, and means for scattering irritant gas in all directions or in a plurality of directions, which may be located at any points in the room desired at an elevated point, such as adjacent the ceiling, the same being shown in Fig. 1 as being mounted in a fixture 26 adjacent the doors 20.

The gas scattering or distributing device is indicated in the diagrammatic view, Fig. 15, illustrating the system shown in Fig. 1, generally, by the numeral 26, and the gas directing projecting devices in the system are indicated generally by

the numerals 27, in Fig. 15. The system is connected with the usual electric service mains or any other electrical circuit the same being indicated by the numerals 28 and 29, the conductor 30 extending from the line wire 28 and being provided with the branches 31 and 32, which lead to the switches 33 and 33', said switches being identical, and while two are shown, it is obvious that any number thereof can be provided at any desired points, the wires 30 being divided into as many separate switch branches, such as the branches 31 and 32, as may be desired.

All of said switch wires or lines are united at a junction 34, from which the conductors 35 and 36 extend, the conductor 36 leading to a fusible electrical element mounted in the gas scattering apparatus 26 so as to actuate the same, and the conductor 37 leading from said fusible element to the line wire 29. The conductor 35 is divided into a plurality of branches, depending on the number of gas scattering and directing means 27 that are employed, the branches being indicated by the numerals 38 and 39, each leading to a fusible element in a member 27 for actuating said member 27 to release the irritant gas therefrom, and each being provided with a conductor extending from the opposite end of said fusible element, which conductors are indicated by the numerals 40 and 41, and which are connected with the conductor 42 leading to the line wire 29.

It will be seen that each of the members 26 and 27, no matter how many there may be, are connected in parallel with each other in the circuit so that it is immaterial whether the fusible elements are made so as to fuse at exactly the same current load, as the fusing of one thereof will not break the circuit through the others. All that is necessary is that all of said elements fuse at approximately the same current load. It will also be obvious that if any one of the switches in the branch lines of the conductor 30 are actuated, the irritant gas producing means will be actuated to produce the gas, and that all said means will be placed in action by the closing of any one of the switches.

The gas projecting and directing devices 27 are shown more in detail in Figs. 3 to 6 inclusive, and comprise a casing having a tubular rear portion 43, and a flattened flaring portion 44, which serves as a directing nozzle or spreader member for the gas produced in the tubular portion 43 thereof. The side walls of the portion 44 diverge toward the open end thereof, as will be obvious from Fig. 4, and the top and bottom walls 46 thereof converge toward said open end to provide a wide flat orifice for the discharge of the gas from the apparatus, which is in the form of an elongated slot, the slot being indicated at 25 in Fig. 1 as coinciding with a slot in the wall 22. The opening in the wall is made to fit the member 44, and the same may project very slightly beyond the wall 22, as shown in Fig. 3, if desired.

The gas scattering device 27 is mounted in position on the wall 22 by means of a bracket secured to the rear face of the wall and to the tubular portion 43, said bracket comprising a transversely extending member 47, which has the bowed out portion 48 intermediate the ends thereof, and which forms half of a clamping member, the other half of which is formed of a member 49, which is secured to the member 47 by means of the bolts 50 to clamp the member 47 to the tubular portion 43 of the member 27.

Swingly mounted on the bolts 51 on the

outer ends of the transversely extending member 47, are the arms 52 of said bracket, which have the feet 53 thereon, which are secured by any suitable securing members 54 to the wall 22. Said members 27 are usually secured under the shelf 24, which extends inwardly from the wall 22 into the cage 21, so that said apparatus is hidden from view, the slotted aperture 25 being even hidden, due to the fact that the shelf 24 projects over the same inwardly of the wall 22.

Mounted within the rear portion of the tubular member 43, is a shell or cartridge 55, which is made in a well known manner, and contains irritant gas producing means in the forward end thereof and gun powder 56 in the rear end thereof, projecting and releasing the gas producing means in the forward end of the shell or cartridge so that the gas is projected forwardly into the tubular portion 43 and into the flaring or nozzle portion 44 thereof, and the metallic casing or shell of the cartridge is indicated by the numeral 57. When the gas is projected forwardly it is caused to spread in the nozzle 44, the spreading action being increased by means of the indentations 108 in the walls 46 providing a constricted passage 109 therebetween.

A metallic electrical fusible element 58, having its reduced or fusible portion 59 mounted substantially centrally within the gun powder 56 in the shell 55, is provided, extending transversely through the same, and being preferably made of the usual link fuse used for electrical purposes. The amperage under which the fuse operates may be of any desired amount that may be preferred, a low amperage fuse being, of course, used. The fusible element extends through the casing 57 and through a screw-threaded metallic cap 60 provided on the rear portion of the tubular member 43, the same being insulated from the metal of the members 57 and 60 on one side thereof by means of a sleeve-like member of insulating material 61, such as rubber tubing.

The conductors leading to the fuse, such as the conductors 38 and 40, are secured to the outer ends of the fuse 58 in such a manner that no strain is placed on the fuse by a pull on the wires 38 and 40. Said wires and the ends 62 of the fuse 58 are secured under the binding posts 110 and 110' provided on the cap member 60, being insulated from the binding post 110 by means of the insulating washer 111 and the sleeved insulating washer 112, and clamped in electrical contact with each other by the binding nuts 113. The binding screws, outer ends of the fuse and conductors are embedded in a coating 63 of paraffin to insulate the same from the casing 57 and to indicate any damage or breakage to the connections, or tampering therewith, which will be indicated by breakage in the paraffin coating 63. While a paraffin coating is referred to, it is obvious that any other insulating coating material, which can be broken when it is necessary to remove the cap 60, may be used. The paraffin is also poured into the space between the cap 60 and the shell 55 to seal the same.

One of the gas spreading or scattering devices 26 is shown in Figs. 11 to 14 inclusive, the same comprising an insulating stem portion of rubber or similar material 106, which is electrically connected with an electrical screw plug 107, which can be screwed into the usual electric socket, such as a lamp socket. The stem portion 106, has the conductors 64 mounted therein, the same being insulated from each other and being connected with the contacts 65 mounted on the insulating

members 66 and 66', said contacts having the heads 67 thereon extending through to the outer side of the insulating member 66 and having the opposite ends of a conductor 68 secured thereto. The conductor 68 extends through a substantially conical insulating sleeve 69, which may be made of rubber or similar material, around which is coiled a spring 70, said spring extending into the socket 71 formed in the lower enlarged end of the member 106, the conical sleeve 69 insulating the conductors 68 and the contacts 67 from the spring 70, and having a lip portion 72 that insulates the outer end of the spring from the portion of the conductor which extends around the bomb 73 in a manner to be described below.

The shell portion or casing of the bomb 73 is made of metal or other suitable material, and is made of two separable halves loosely fitted together so that the same will separate, releasing the gas forming material within the same so as to form the tear gas or other irritating gas that may be provided in the bomb.

A circumferential rib 74 is provided on the bomb at the point 75 between the halves thereof, and a band of insulating material 76 extends around the bomb over the joint between the halves thereof, said insulating strip having the ends 77 thereof separated slightly, and having an opening 78 in the top thereof. The insulating strip 76 is provided with a widened portion 79, which has slits cut in the edges thereof so that the same will fit around the bomb 73, said wide portion being located surrounding the opening 78, and provides a seat for the end of the spring 70 on the bomb. The member 76 has a pair of parallel ribs 81 on the inner face thereof, which fit on opposite sides of the rib 74, the rib 74 being seated in the groove 82 between the ribs 81.

The conductor 68 extends around the bomb 73 on the exterior of the insulating strip 76 so as to be insulated from the bomb 73, and extends across the gap between the ends 77 of the member 76 having a weakened portion at 83 in said gap, which serves as a fusible element when electric current is passed through the conductor. The fusing of the portion 83 of the conductor 68 will cause the same to part at this point, and will release the bomb from the supporting means therefor, the spring 70 aiding in the separation of the bomb from the supporting means by tending to project the same downwardly. When the same hits a surface below the same, such as the floor 84, it will separate at the joint 75, releasing the irritant gas producing means within the same.

The switch operating mechanism is shown in Figs. 7 to 10 inclusive, and is used in conjunction with any desired form of switch, a push button switch 85 being shown, which is closed by pushing the projecting push button 86 thereon inwardly. The same is mounted on an upstanding bracket 87 on a base 88 of the switch operating means, said bracket 87 having a laterally extending flange or projection 89 thereon, under which the lever 90 is loosely mounted, said lever being made in the form of a flat bar having the upturned end 91 thereon at one end thereof, and having a substantially U-shaped yoke 92 provided thereon on the other end thereof. The yoke 92 is located near the opposite end of the lever 90, and the lever has a short projecting portion 93 extending endwise beyond the yoke.

The base member 88 has an upturned flange 94 on the end thereof opposite that carrying the bracket 87, which terminates in an inturned

lip 95, and the projection 93 is ordinarily seated in the groove formed under the lip 95 when the switch is in open position and the switch operating member is in normal inoperative position. The base member also has a housing provided thereon, which has the upstanding side walls 96 serving as guide members for guiding the vertical movement of the lever 90, and a transversely extending top portion 97, to which the spring 98 is secured, which bears on the upper surface of the lever 90. The base 88 may be provided with flanges 99 for securing the same to the floor or other supporting surface.

To operate the switch actuating mechanism to move the switch to closed position, or from the position shown in Fig. 7 to the position shown in Fig. 8, it is necessary to insert the foot within the yoke 92 on top of the housing 97 and shift the same slightly to the right, as viewed in Figs. 7 and 8, against the tension of the spring 101, to move the end 93 of the lever out from under the lip 95, and then to raise the same with the foot by engagement of the foot with the upper transverse portion of the yoke to move the lever 93 out of alignment with the member 94, which acts as a stop, and while in such raised position to shift the yoke to the left, as viewed in Figs. 7 and 8, by means of the foot within the yoke 92, which will cause the upwardly extending arm or flange 91 on the lever 90 to engage with the push button 86 to actuate the switch 85 to circuit closing position. Thereupon the fusible elements 58 and 83 are caused to fuse, and the powder 56 is ignited, releasing the gas from the cartridge 55, whereupon the same is directed out through the nozzle 54 and releasing the bomb 73, which drops to the supporting surface 84 and is opened by contact therewith to release the gas producing material therein to contact with the air.

In Fig. 2, one location for the switch operating means is shown adjacent one of the windows of the cage on the floor 84, although, obviously, other locations for the switch operating means and as many switch operating means as may be desirable may be utilized.

What we claim is:—

1. A theft prevention system comprising tear gas apparatus and means for actuating said tear gas apparatus comprising an electric current supply, an element associated with said gas apparatus fusible upon the passage of electric current therethrough and means for closing the electrical circuit between said current supply and said fusible element comprising switch actuating means movable to circuit closing position only by a plurality of movements in different directions.

2. A theft prevention system comprising tear gas apparatus and means for actuating said tear gas apparatus comprising an electric current supply, an element associated with said gas apparatus fusible upon the passage of electric current therethrough and means for closing the electrical circuit between said current supply and said fusible element comprising foot operated switch actuating means movable to circuit closing position only by a plurality of movements in different directions.

3. A theft prevention system comprising tear gas apparatus, including a gas producing cartridge, and means for actuating said tear gas apparatus comprising an electric current supply, an element mounted in said cartridge fusible upon the passage of electric current therethrough and means for closing the electrical circuit be-

tween said current supply and said fusible element comprising switch actuating means movable to circuit closing position only by a plurality of movements in different directions.

4. A theft prevention system comprising tear gas apparatus including a gas releasing bomb, and means for actuating said tear gas apparatus comprising an electric current supply, an element associated with said bomb fusible upon the passage of electric current therethrough to release said bomb, and means for closing the electrical circuit between said current supply and said fusible element comprising switch actuating means movable to circuit closing position only by a plurality of movements in different directions.

5. A theft prevention system comprising tear gas apparatus including a gas producing cartridge and a gas releasing bomb and means for actuating said tear gas apparatus comprising an electric current supply, an element mounted in said cartridge fusible upon the passage of electric current therethrough, an element associated with said bomb fusible upon the passage of electric current therethrough to release said bomb and means for closing the electrical circuit between said current supply and said fusible elements comprising a switch actuating member movable to circuit closing position only by a plurality of movements in different directions.

6. A theft prevention system comprising tear gas apparatus including a gas producing cartridge and a gas releasing bomb and means for actuating said tear gas apparatus comprising an electric current supply, an element mounted in said cartridge fusible upon the passage of electric current therethrough, an element associated with said bomb fusible upon the passage of electric current therethrough to release said bomb and means for simultaneously closing the electrical circuit between said current supply and said fusible elements comprising a foot operated switch actuating member movable to circuit closing position only by a plurality of movements in different directions.

7. A theft prevention system comprising tear gas apparatus and means for actuating said tear gas apparatus comprising an electric current supply, an element associated with said gas apparatus fusible upon the passage of electric current therethrough and means for closing the electrical circuit between said current supply and said fusible element comprising switch actuating means movable to circuit closing position only by a plurality of movements in different directions, said switch actuating means comprising a lever, a stop holding said lever against movement toward switch closing position, said lever being movable transversely to its switch actuating direction to move the same out of alignment with said stop and thereupon movable into switch closing position.

8. In apparatus of the character described, foot operated switch actuating means comprising a switch actuating lever, a yoke thereon, a stop with which said lever is normally engaged to hold the same against movement toward switch closing position, said lever being movable by engagement of the foot with said yoke to lift the same out of engagement with said stop and thereupon movable substantially horizontally toward switch closing position.

9. In apparatus of the character described, foot operated switch actuating means comprising a switch actuating lever, a yoke thereon, a stop

with which said lever is normally interlocked to hold the same against movement toward switch closing position, said lever being movable by engagement of the foot with said yoke to shift the same out of interlocking relation with said stop and to lift the same out of engagement with said stop and thereupon movable substantially horizontally toward switch closing position.

10. In apparatus of the character described, foot operated switch actuating means comprising a switch actuating lever, a stop with which said lever is normally engaged to hold the same against movement toward switch closing position, said lever being movable by engagement of the foot therewith, to shift the same to move the same out of alignment with said stop by an upward movement of said lever and to move the same lengthwise of said lever in a substantially horizontal direction toward switch closing position.

11. In apparatus of the character described, foot operated switch actuating means comprising a switch actuating lever, a stop with which said lever is normally engaged to hold the same against movement toward switch closing position, said lever being movable by engagement of the foot therewith to first disengage the same from said stop and then move the same into switch closing position by a plurality of movements in different directions including an upward and a substantially horizontal movement of said lever at the engaged end thereof.

12. In apparatus of the character described, foot operated switch actuating means comprising

a switch actuating lever mounted for tilting and sliding movement, a stop with which said lever is normally engaged to hold the same against movement toward switch closing position, said lever being movable by engagement of the foot therewith, to successively tilt and slide the same to move the same out of engagement with said stop and into switch closing position.

13. In apparatus of the character described, a cartridge holder comprising a tubular portion and a flaring discharge passage, a cartridge in said tubular portion, a fusible electrical element extending through said cartridge and said tubular portion and having the ends thereof extending outside said holder, electrical conductors, means connecting said fusible element with said conductors and sealing material enclosing the exposed portion of said fusible element and said connecting means.

14. In apparatus of the character described, a cartridge holder comprising a tubular portion and a flaring discharge passage, a cartridge in said tubular portion, said tubular portion comprising a removable cap member, a fusible electrical element extending through said cartridge and said cap member and having the ends thereof extending outside said holder, electrical conductors, binding posts and nuts connecting said fusible element with said conductors and sealing material enclosing the exposed portion of said fusible element, said cap member, said binding posts and nuts.

ARTHUR E. BURCH, JR.
ENOS CORNWALL.