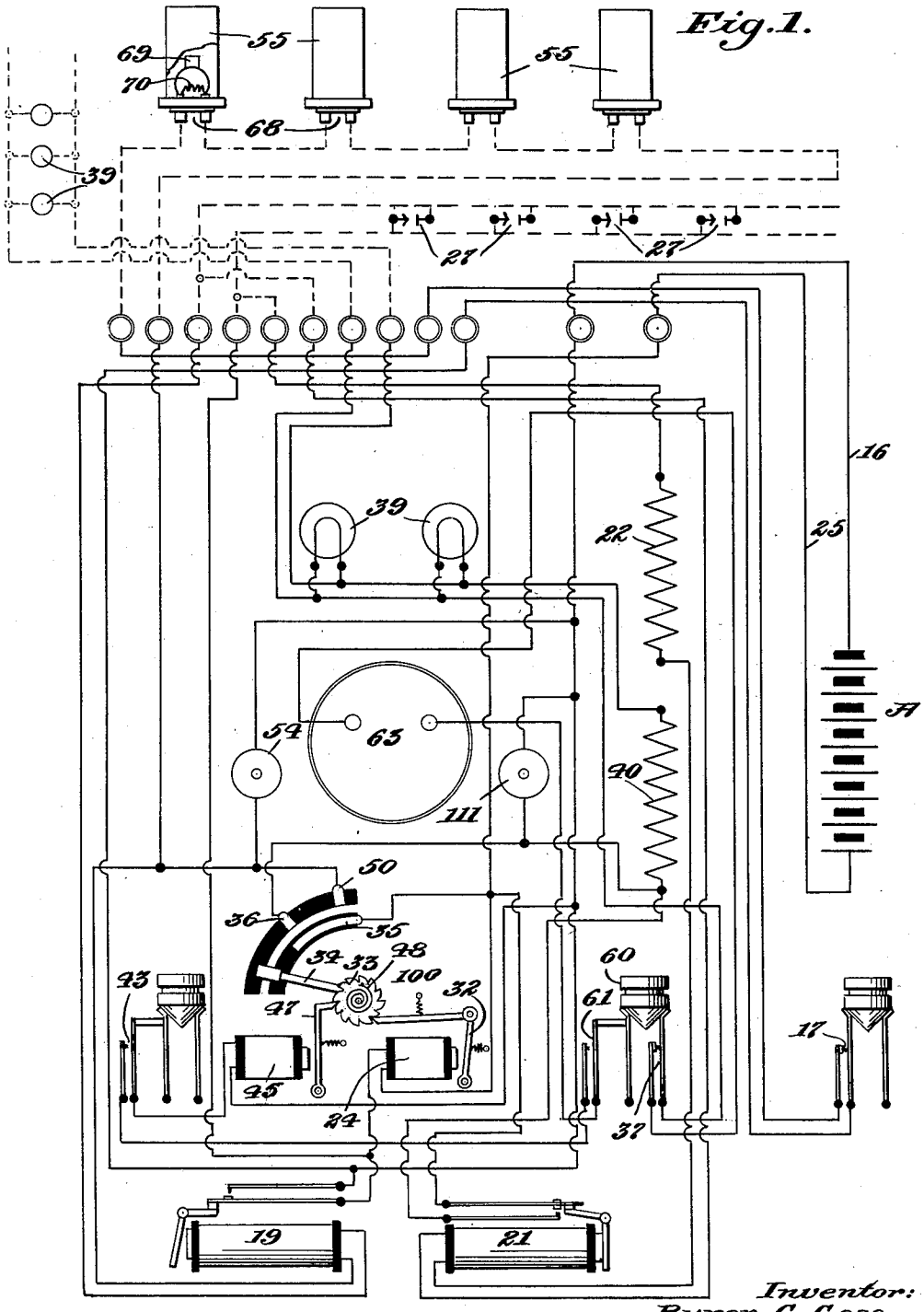
Aug. 29, 1933. B. C. GOSS 1,924,783

ELECTRICAL GAS DAYLIGHT HOLD-UP PROTECTION SYSTEM

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Fig. 1.



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Fig. 9.

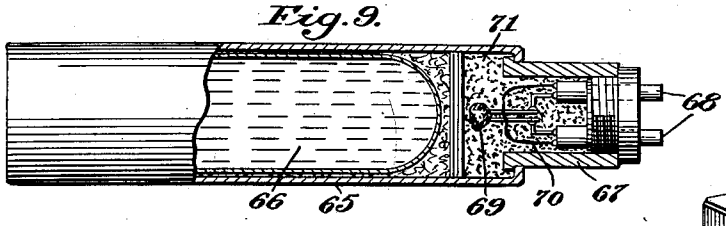


Fig. 15.

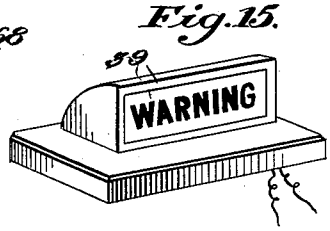


Fig. 10.

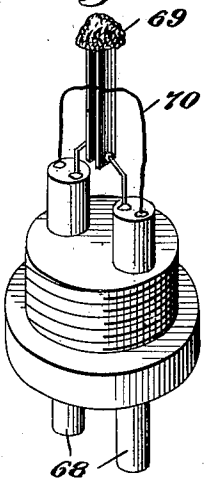


Fig. 11.

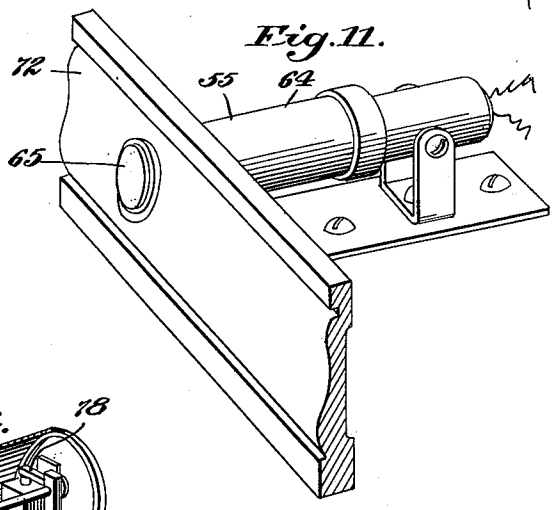


Fig. 12.

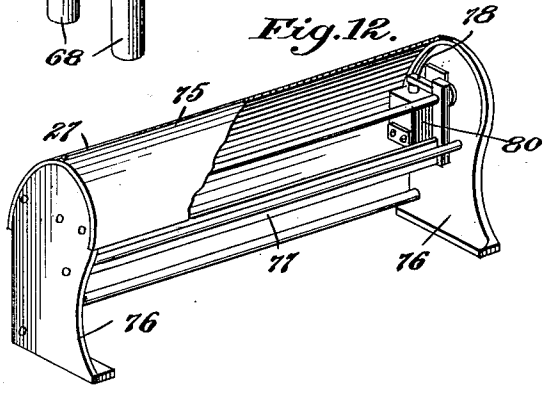


Fig. 14.

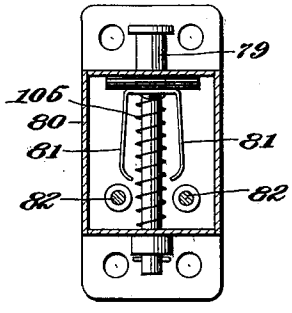
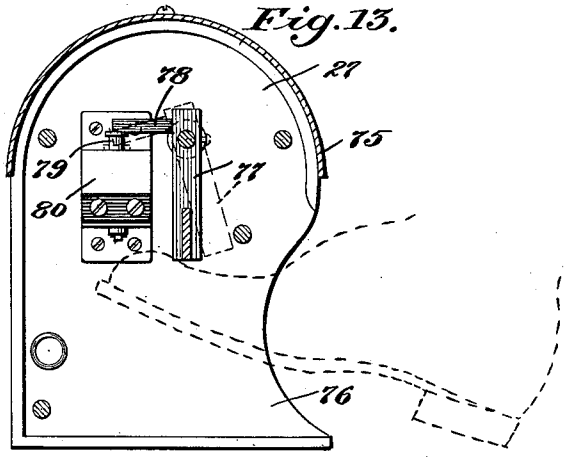


Fig. 13.



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ELECTRICAL GAS DAYLIGHT HOLD-UP PROTECTION SYSTEM

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Fig.2.

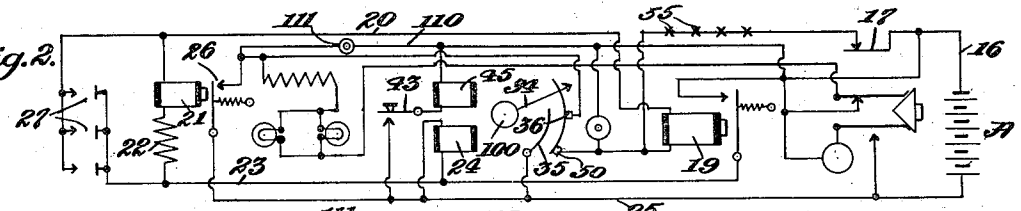


Fig.3.

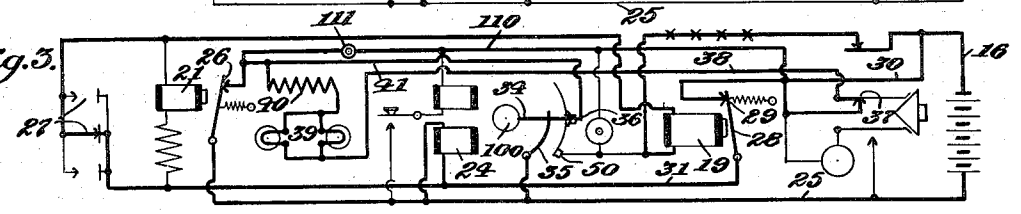


Fig.4.

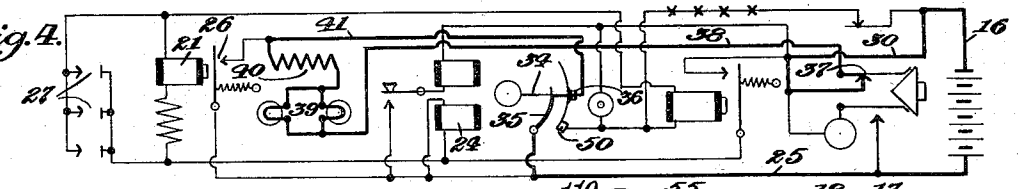


Fig.5.

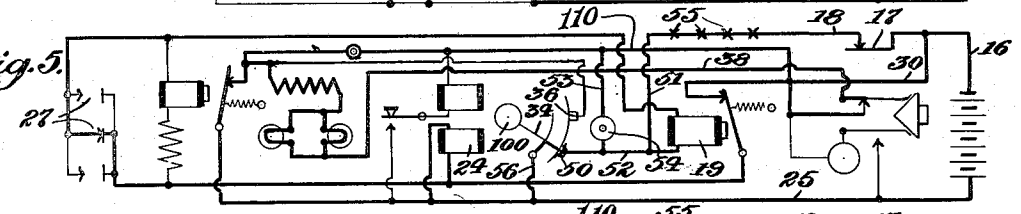


Fig.6.

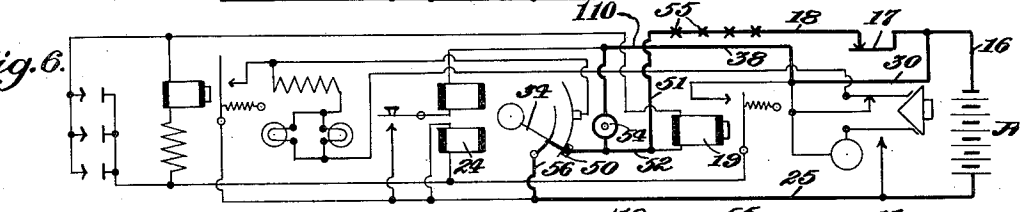


Fig.7.

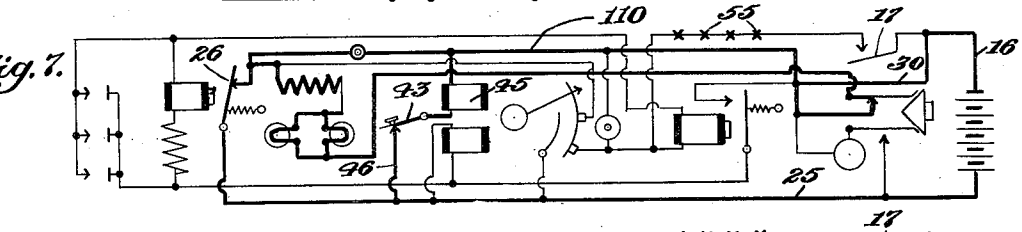
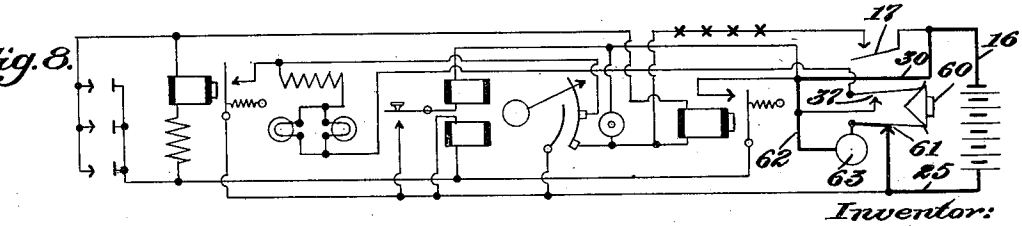


Fig.8.



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UNITED STATES PATENT OFFICE

1,924,783

ELECTRICAL GAS DAYLIGHT HOLDUP PROTECTION SYSTEM

Byron C. Goss, Cleveland, Ohio

Application June 30, 1930. Serial No. 464,992

3 Claims. (Cl. 177—314)

This invention relates to electrical gas daylight hold-up protection systems, for use in protecting banks, stores, etc., from robbery, by discharging irritating gases, for example tear gases, into the room in which the robbery is being perpetrated.

The invention aims to provide a protective system for protecting banks, stores, etc., from robbery by distributing a number of suitable contacts at readily accessible places, for example foot operated contacts under the desk of a clerk, or salesman, or push buttons on the desks of employees or officials of the banks, or the stores, etc., the contacts being normally concealed and readily operated. In order to avoid actuating the protection system accidentally, the system requires a succession of contacts, for example two or more contacts, a later contact actuating the protection system.

An object of the invention is to provide a control system for discharging irritating gases into a room during an attack by bandits;

A further object is to provide a gas discharge system that will not be readily set in operation by accident;

A further object is to provide a gas discharging system that is actuated electrically, and in the circuit of which a weak current called a "supervisory current" flows constantly; a current of increased strength being used to actuate the protection system;

A further object is to provide an electrically operated gas discharge system in which a suitable signal is given if a break should occur at a vital point in the wiring, or at the switches or other devices in the circuit;

A further object is to provide a plurality of visual and audible signals to be actuated either by the failure of the system due to a defective circuit, or by the sending of a signal, or making a first contact; the visual signals to be located on desks or in front of persons who are to be informed of the conditions which necessitated the sending of the signal, whereby immediate action will be taken in the matter by responsible parties;

A further object is to provide a gas protection circuit which requires a succession of signals before the important signal is given, thereby preventing an accidental contact of a circuit closure from discharging the "danger" signal, and liberating the gas;

A further object is to provide a "reset" circuit to restore the circuit devices to their normal condition after either an accidental signal, or after the danger signal has been given;

Further objects of the invention will be apparent to those skilled in the art after reading the specification.

In the accompanying drawings,

Fig. 1 is a diagram showing circuit connections including actuating devices for practicing the invention;

Figs. 2 and 8 inclusive are simplified diagrams showing the successive circuit connections set in operation during the actuation of the signal system;

Figs. 9, 10, and 11, are illustrations of a gas gun and cartridge, showing details;

Figs. 12, 13, and 14, are illustrations of details of one type of a foot control contact; and

Fig. 15 is a diagram of one form of visual signal, called a "warning lamp" in the specification.

The entire system of circuits illustrated in Fig. 1 is divided into two groups, one group in solid lines, within a suitable cabinet not shown, and the other, shown in dotted lines, suitably located in the bank or store to be protected. The circuits are shown in their simplest form in Figs. 2 to 8. In Fig. 2, the battery A is shown as supplying current to a closed high resistance or "supervised" circuit, flowing from the plus pole of the battery through wire 16, "tamper switch 17" "gas guns" 55, 50 ohm magnet 19, wire 20, 1800 ohm magnet 21, 2000 ohm resistance 22, wire 23, 8.5 ohm magnet 24, wire 25, to negative of battery. Owing to the high resistance of the magnet 21, and the 2000 ohm resistance 22, the current flowing is very weak, but is sufficient to energize the magnet 21, and keep the contact 26 open. Suitable push buttons, foot contacts, etc., 27, are located at desired places in the bank or store. Upon closing one of the foot contacts 27, the 1800 ohm magnet 21 and 2000 ohm resistance 22 are short circuited, and the current then flows as indicated by the heavy lines in Fig. 3, through magnets 19 and 24 in series, providing a current strong enough to energize magnet 19 which attracts the armature 28, closing contact 29, and connecting the 8.5 ohm magnet 24 through wires 16, 30, 31 and 25 direct to the battery. A bell-ringing current also flows from the positive pole of the battery through wires 16, 30, 110, bell 111, contact 26, wire 25, to the negative side of the battery. The increased current flowing through wire 30, contact 29, armature 28, and wire 31 energizes magnet 24 thereby actuating the armature 32 (Fig. 1) of the intermittent feed device 100, which then turns the

ratchet wheel 33 one notch and moving the arm 34 which is secured to the ratchet wheel 33, and closing a circuit through contact plate 35 and contact 36, the current then flows from the plus end of the battery through wires 16, 30, contact 37, wire 38, "warning" lamps 39, which are distributed in the bank, ten ohm resistance 40, wire 41, contacts 36, 34, 35, wire 25 to the negative of the battery. Upon releasing the foot contact 27, the magnet 21 is again energized, opening the contact 26, deenergizing magnet 19 and leaving the circuit as illustrated in heavy lines in Fig. 4, with the signal or warning lamps 39 burning. The warning lamps 39, shown in Fig. 15, are located on the desks of the bank clerks, also in the several offices, etc., and serve to give notice that a foot contact 27, or a push button, has been operated. If the foot contact or push button was operated by accident, the circuit may be restored to the original condition (Fig. 2) by an operator opening the cabinet door (not shown), which automatically opens the "tamper switch" 17 actuated by the door, and the operator then closing the "reset" switch 43 (Fig. 7) which closes the circuit through wires 16, 110, 8 ohm reset magnet 45, reset switch 43, wires 46 and 25; the reset magnet 45 attracts armature 47, Fig. 1 and permits the spring 48 to restore the ratchet wheel 33 to its original position, breaking the circuit 34, 35, 36, (Figs. 3 and 4,) and reestablishing the circuit shown in Fig. 2.

If an attack by bandits, etc., is being made upon the bank or store, a clerk or other official of the bank, etc., operates any one of the foot contacts or push buttons 27, twice or more in succession; the first contact closes the circuits described above, and illustrated in Figs. 2, 3, and 4; the final operation of the foot contact or push button 27, establishes the circuit shown in Fig. 5, in which the magnet 24 is again energized, drawing the armature 32, which turns the ratchet wheel 33, thereby shifting the contact arm 34 from contact 36, as in Figs. 3 and 4, to contact 50, Figs. 5 and 6; a new low resistance circuit is established through wires 16, switch 17, wire 18, gas guns 55, wires 51, 52, contact 50 wires 56 and 25 to the battery; a circuit is also established through the alarm bell 54 from wires 16, 30, 110, 53 bell 54 to wire 52, contact 50, wires 56 and 25. The increased current flowing in the circuits established by the second operation of the foot contact 27, and illustrated in Figs. 5 and 6, discharge the gas guns 55 and continuously ring the alarm bell 54, which may be located outside of the building. Upon release of the foot contact after the second or subsequent operation, the circuit shown in Fig. 6 is permanently established until the gas guns 55 have exploded, upon which the current in wire 18 is interrupted if the resistance 70 is destroyed, but the circuit through the bell 54 remains intact, continuously sounding an alarm until an operator opens the cabinet and closes the reset switch 43, (Fig. 7) which actuates the reset 8 ohm magnet 45, thereby restoring the contact arm 34 to the original position (Fig. 2) as above described, the contact arm 34 breaking the circuit through the contact 50 and restoring the circuit connection illustrated in Fig. 2. New gas cartridges are then inserted in the gas guns 55. The above description and ratchet feed 100 show that the guns 55 are exploded on the second or subsequent contact of the foot contact 27; however the intermittent feed device 100 may be made to require three successive contacts, or any desired number of successive contacts, to discharge the guns 55.

The gas guns 55 shown in Figs. 9, 10, and 11, consist of tubular receivers 64, in each of which is placed a cartridge 65 containing an irritating and disabling gas composition, for example a tear gas composition 66; the cartridges mounted on a socket 67 and provided with contact terminals 68. Within the socket is an electric fuse 69, and a resistance wire 70 in shunt with the fuse 69; within the socket 67 is a firing powder 71. The guns 55 are suitably mounted at desirable locations, and may be placed in a molding 72 along the counters, shown in Fig. 11, or at other suitable places and finished to be in keeping with the surroundings, so as not to be readily noticed by outside parties. When fired, the cartridges are exploded and the irritating gas liberated and blown out into the room. New cartridges are thereafter inserted by pressing the same into the empty gun tubes 64 from the exposed end shown in Fig. 11. As above noted, the electric fuse 69 and resistance wire 70 are in shunt, the wire 70 providing a permanent path for the current should the fuse 69 be defective; the wire 70 may be destroyed by the firing of the gas guns 55, but is preferably so constructed and located as not to be destroyed by the firing of the gun, thereby providing a continuous and uninterrupted circuit in the event that one cartridge should be exploded before the others; the continuous circuit through the wire 70 thereby prevents an open circuit by the discharge of one gun, and maintains the current until all of the guns have been discharged.

The foot contacts 27, or push buttons, or other circuit closures, are suitably located at the desks or counters or at other desirable places. One form of a foot contact 27 is illustrated in Figs. 12, 13, and 14, and preferably consists of a metal structure 75, supported on ends 76, and containing an upwardly or outwardly movable bar 77 controlled by the spring 105 in the switch 80, and moved by the upper movement of the foot, as shown in Fig. 13. The bar 77 is suitably swiveled, and is provided with a pressure arm 78 which rests on the spring controlled plunger 79 of a suitable contact switch 80, Fig. 14, within which are mounted contact blades 81, contacts 82 and spring 105. When the foot is raised, Fig. 13, the bar 77 is moved outwardly, as shown in dotted lines, thereby pressing the arm 78 against the plunger 79, which closes the contacts 81, 82, shown in Fig. 14. When in a normal position the contacts 27 are open as shown in the circuit in Fig. 2; upon making a contact once, the circuit in Fig. 3 is established; upon making a second contact with the foot contact 27, the circuits of Figs. 5 and 6 are established and the gas guns exploded as described above. If a break should accidentally occur in any of the vital parts of the circuit, the current through the 1800 ohm magnet 21 and 2000 ohm resistance 22 would be interrupted, thereby closing the contact 26 and ring the alarm bell 111 thereby calling attention to the fact that the protection system was out of order. Upon repairing the defective part, the circuit would be restored to the condition shown in Fig. 2.

When it is desired to test the battery A, the operator opens the cabinet, opening tamper switch 17, and presses the button switch 60, Fig. 8, thereby opening the contact 37 and closing the contact 61, establishing the circuit through wires

16, 30, 62, ammeter 63, contact 61, and wire 25. Upon releasing the button switch 60, contact 61 is broken and contact 37 is reestablished, and the circuit restored as shown in Fig. 2.

I claim:

1. In a daylight robbery gas protection system the combination comprising a normally closed circuit, a source of current, a high resistance, a first relay coil, a second relay coil, and gas guns, all included in said circuit, circuit closers, means connecting the circuit closers across the said resistance and across the first relay coil whereby the said resistance and coil will be short circuited when one of the said circuit closers is closed, an electric alarm, means for controlling the alarm operated by the first relay coil when said first relay coil is de-energized, means operated by the second mentioned relay coil upon closing, opening and again closing one of said circuit closers to increase, decrease, and again increase the current through the second relay coil to connect said gas guns directly across the source of current, whereby the gas guns will be discharged.

2. In a daylight robbery gas protection system, the combination comprising a normally closed circuit, a source of current, a high resistance, a first relay coil, a second relay coil, and gas guns, all included in said circuit, circuit closers, means connecting the circuit closers across the said resistance and across the first relay coil whereby the said resistance and coil will be short circuited when one of the said circuit closers is closed, an electric alarm, means for controlling the alarm operated by the first relay coil when said first relay coil is de-energized, step-by-step switch means, said step-by-step switch means operated by the second mentioned relay coil when the current through the second relay coil is increased by the said short circuit, a second closing of one of said circuit closers causing the second relay coil to advance the step-by-step switch means, a second step to connect the gas guns directly across the source of current, whereby the gas guns will be discharged.

3. In a daylight robbery gas protection system the combination comprising a normally closed circuit, a source of current, a high resistance, a first relay coil, a second relay coil, and gas guns, all included in said circuit, circuit closers, means connecting the circuit closers across the said resistance and across the first relay coil whereby the said resistance and coil will be short circuited when one of the said circuit closers is closed, an electric alarm, means for controlling the alarm operated by the first relay coil when said first relay coil is de-energized, step-by-step switch means, said step-by-step switch means operated by the second mentioned relay coil when the current through the second relay coil is increased by the said short circuit, a second closing of one of said circuit closers causing the second relay coil to advance the step-by-step switch means, a second step to connect the gas guns directly across the source of current whereby the gas guns will be discharged, and other means to reset the step-by-step switch means to its normal position.

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