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BURGLAR AND FIRE ALARM APPARATUS

Filed July 25, 1921

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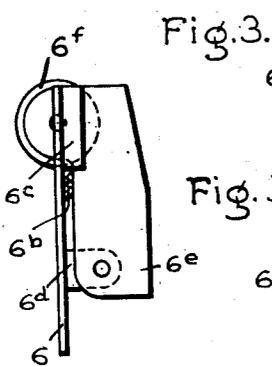
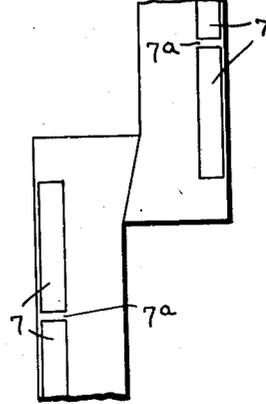
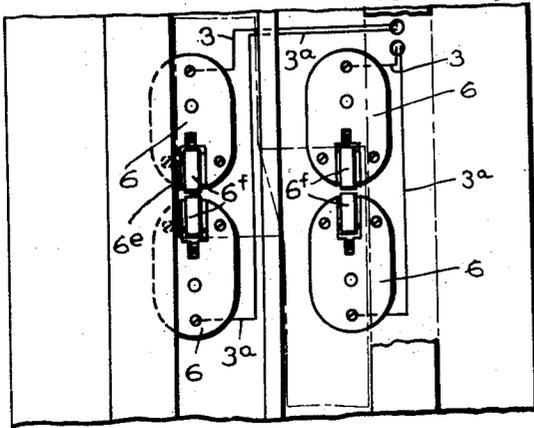


Fig. 3.

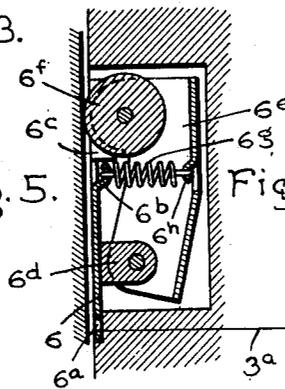


Fig. 5.

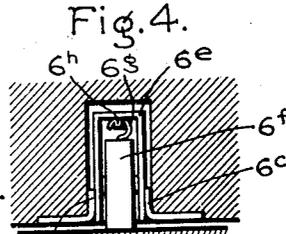


Fig. 4.

Fig. 6.

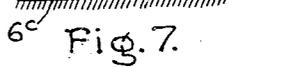


Fig. 7.

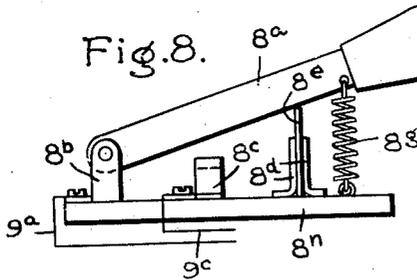


Fig. 8.

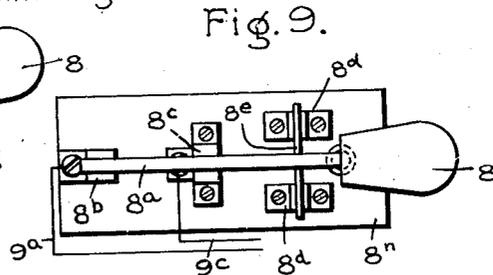


Fig. 9.

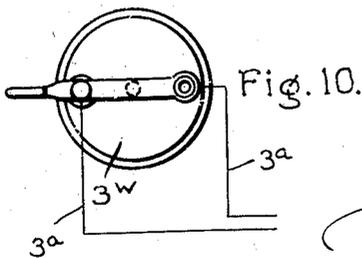


Fig. 10.

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BURGLAR AND FIRE ALARM APPARATUS.

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To all whom it may concern:

Be it known that I, RALPH H. ROSE, citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Burglar and Fire Alarm Apparatus; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification.

This invention relates to burglar and fire alarm systems, and includes novel means for giving audible and visual signals in case any door is opened or window sash is raised or fire occurs. The apparatus will sound an audible signal and display a visible signal to show where the burglar has entered, or where a fire in the building has started.

The invention also provides novel means whereby when desired the entire system may be cut out of action at the will of the owner; or, in case of fire, while the fire is being extinguished. The invention also includes novel circuit closing devices for attachment to windows; also novel heat controlled circuit closers whereby the apparatus will be automatically operated in case of fire. It also includes other new and novel minor features hereinafter explained.

I will explain the invention with reference to the accompanying drawings and will then summarize in the claims the essentials of the invention and novel features of construction and novel combinations of parts for all of which protection is desired.

In said drawings:

Fig. 1 diagrammatically illustrates the complete system as applied to a dwelling.

Fig. 2 is an enlarged view of the main circuit controlling switch.

Fig. 3 is a detail view of the novel circuit closers applied to the window frame.

Fig. 4 is a detail view showing the co-acting circuit closing strips applied to the window sash.

Fig. 5 is a side view of one of the window frame circuit closers detached.

Fig. 6 is a longitudinal sectional view of Fig. 5.

Fig. 7 is an end view of Fig. 6.

Fig. 8 is a side view of the automatic fire alarm circuit closer.

Fig. 9 is a top plan view of Fig. 8.

Fig. 10 is a detail view of one of the circuit cut outs.

I will explain the invention as applied to an ordinary dwelling to enable others to readily adopt and use the same, it being understood that the invention is of course adapted for use in connection with private dwellings, factories, stores, apartment houses, and any building or structures where burglar alarms and fire alarms may be desired.

At any desired place such as the bedroom of the owner of a dwelling may be placed the signal board and circuit controlling devices indicated at 1 in Fig. 1.

These devices may be mounted on any suitable support. I prefer to place them in a box of any suitable kind having a removable cover. These devices include multiple pole switch 2, which is shown as a triple pole switch having three blades 2^a. The size of said switch would depend upon the number of circuits to be made or broken through it, and the number of signal devices contained in the system for which separate indications are desired to be given. If over six circuits are to be employed I would use a four or five blade switch which could be readily used for low voltage. For a single circuit a single blade switch could be used.

The switch as shown has three pairs of related contact points 2^b and 2^c, and three blades 2^a each adapted to establish electrical connection between the related points 2^b—2^c when the switch is closed.

To each contact point 2^b of the switch 2 is connected a wire 3 to which is connected a light 3^x on the signal board; each wire 3 also is connected to one member of a circuit closing device 4 (hereinafter explained), attached to the window or to the door frame in a room of the building. Wires 3^t connect all contacts 2^c to one terminal of bell 5^v and wires 3^e connect contacts 2^b to one terminal of lights 3^a respectively (as indicated in Fig. 1). The other member of this circuit closing device 4 is connected by a wire 3^a through switch 3^s to one pole of a suitable source of electricity.

The electricity may be supplied from any suitable source. As shown wire 3^a is connected to one pole of a suitable source of

electricity indicated at E and the other pole of this source of electricity is connected by wires 5^a, switch 5^x, 5^o, 5^t, 5^e, to lights 3^x, 3^y, 3^a, and bell 5^y, so that when the circuit closing device 4 is closed a circuit is established from the battery E through the lights 3^x, 3^a, 3^y and bell 5^y as will be obvious from the drawing and hereinafter explained.

Preferably a cut out 3^w of any suitable construction may be placed in series in each wire 3^a adjacent the circuit closer 4, so that if desired the circuit through this particular circuit closer may be broken by opening the cut out 3^w. Normally the cut out 3^w should remain closed.

One circuit closer or breaker 3^w may be put in for each circuit closer 4 (or each sash) and directly in circuit with the related circuit closer; and by opening 3^w the related sash can be raised or lowered from the inside without giving any alarm, and still leave the rest of the system in effective operation.

Each contact point 2^b is also preferably connected by a wire 3^e to a light or visual signal of any suitable construction. As shown the wire 3^e connects to one contact point of a lamp 3^a (indicated in dotted lines in Fig. 1) which may be placed in the box 1 behind a transparent sign 1ⁿ, hereinafter referred to, and the other pole of the light socket is connected by a wire 5^o to the wire 5^a, consequently when the circuit is closed through the wires 3, 3^a, 5^a, 5^o, 3^e, the related lamps 3^x and 3^a are lighted. These lights will not be lighted as long as the circuit through the wire 3, 3^a is broken or cut out, but these lights will remain lighted whenever the circuit is closed by the circuit closer 4 (as hereinafter described).

Further each contact point 2^c is connected by wires 3^t to one terminal of an electric bell 5^y which may be conveniently mounted in or on the board 1; and the other terminal of this bell is connected by a wire 5^t to the wire 5^o so that when the circuit is closed through the lights 3^x, 3^a, the bell will be simultaneously rung.

If desired a second bell 5^z may be located at any desired point outside the building or at a sub-station and connected by a wire 3^h to wire 3^t by a wire 5^h to wire 5^t so that both bells will be rung when the alarm is given.

Small electric lights 3^y may be put on switch 2 one terminal of light may be connected to the positive side of the source of current by wire 5^s connecting to the negative side of the source of current from the switch, so when circuit closer 4 is closed lighting lights 3^x and 3^a these lights 3^y will also be illuminated.

The lights 3^y are connected in small sockets properly insulated and made fast to bars of switch 2 so that the lamps connect to the negative side of the source of current

direct through the switch bar to which the socket is attached and to the positive side through wire 5^s.

When switch 2 is opened it breaks the circuit through bells 5^y and 5^z and lights 3^x, and all other lights, except in the circuit where a circuit closer 4 is closed.

For convenience wires 3, 3^e, 3^a, 3^t, 3^h, 3^e, 3^t have been designated negative wires since they are attached to the negative terminal of the battery E; and wires 5^a, 5^o, 5^t, 5^e, 5^h and 5^t have been designated positive wires since they start from the positive terminal of the battery E. However reversing the terminals of the battery would not affect the working of the system.

When switch 2 is closed if any circuit closer 4 is closed a circuit is made through the lights 3^a and bells 5^y and 5^z.

It will be understood that there is a complete circuit such as above described from one terminal of lights 3^a and bell 5^y to each room in the building and back to the other terminal of lights 3^a and bell 5^y and each window opening in each room may be provided with a circuit closing device as 4; the several circuit closing devices 4 in the same room being preferably connected in parallel with the wires 3, 3^a, as indicated in Fig. 1; thus each pair of related contact points 2^b, 2^c, control the circuit to bell 5^y from a given room or set of rooms, windows or doors; and the similar parts of like circuits are similarly numbered, and it is unnecessary to describe each circuit in detail. The doors may also be provided with suitable circuit closers if desired.

A cut out switch 5^x may be interposed in the wire 5^a so that the whole system may be cut out of circuit if desired to repair the same or if the owner wishes to leave the property temporarily unprotected by the system.

An electric lamp 3^z may be provided in each room or adjacent each door or window, and connected by a wire 3ⁱ to the wire 3, and by a wire 5ⁱ with the wire 5^a. A cut out switch 5^w may be placed in the wire 5ⁱ so the light 3^z can be placed in or out of circuit at will. The switches 2, 5^x, 5^w and cut outs 3^w should be normally closed, but the circuit closers 4 are normally open. When any circuit is closed by any circuit closer 4 in any of the rooms, being closed by a burglar or person making an unauthorized entry, switch 2 being normally closed an audible alarm is given by the bells 5^y and 5^z and all lights 3^a, 3^z, 3^x, 3^y are illuminated in building, as all lights operate through circuit closers 4 or circuit closers 4 and switch 2 combined. For instance as shown in Fig. 1 with switch 2 closed, and the circuit closer 4 in the right hand window of the "basement" closed—tracing the circuit through lamps 3^z in the basement window one termi-

nal of lamps 3^z is each connected by wire 5^1 , through closed switch 5^w , to wire 5^a , and hence to one pole of battery E. The other terminal of lamps 3^z are each connected by

terminals of lights 3^a are connected by wires 3^e , to the contacts 2^b to switch 2 in the identical manner as are lights 3^x . The operation hence is the same in both cases.

5 wires 3^1 to wires 3, through the closed circuit closer 4, and through wires 3^a and closed switch 3^s to the opposite pole of battery E. The lamps 3^z in the door and windows of the garage have one terminal each connected
10 by wire 5^1 to wire 5^a leading to one pole of battery E. The opposite terminals of said lamps are connected through wires 3^1 to the wire 3 leading to the middle terminal 2^b of the switch 2, and switch 2 being closed up
15 through the middle blade 2^a of the switch, through wire 3^1 down through the right hand blade 2^a and through the wire 3 leading from the right hand terminal 2^b down to and through the same closed circuit closer
20 4, and from thence as above traced to the opposite pole of the battery E. Similarly, the lights 3^z in the "library" have one terminal each connected by wires 5^1 and 5^a to one pole of battery E, and the other terminals of said lights connected by wires 3^1 to
25 wires 3 leading to the left hand blade 2^a of switch 2 and up through said left hand blade, through wire 3^1 , and down through wire 3 leading from the right hand blade 2^a to and through the same closed circuit closer
30 4, and to the opposite pole of the battery E. Hence all lights 3^z will be illuminated and if switch 5^w is then opened all lights 3^z will be cut out of the circuit. If switch 5^w is closed, and switch 2 opened then only the
35 lights 3^z in the room where a circuit closer 4 is closed will remain lighted due to the fact that the blades 2^a no longer connect the contacts 2^b with the shunted contacts 2^c .

40 Tracing the circuits through lights 3^x with switch 2 closed and any one of the circuit closers 4 closed—each lamp 3^x has one terminal connected by wire 5^s to wire 5^e , wire 5^a , switch 5^x , to one pole of battery E, and the other terminals of the lamps 3^x are
45 connected by wires 3 through the blades 2^a of switch 2 and shunt wire 3^1 to the wire 3 leading from the right hand blade of switch 2 down to and through the same closed circuit closer 4 (at the right hand window of
50 the "basement") and hence through wire 3^a to the opposite pole of the battery. Hence all lights 3^x are lighted, but if switch 2 is then opened, since blades 2^a no longer connect contacts 2^b with 2^c , only the
55 light 3^x in the circuit including the closed circuit closer 4 will remain lighted. If switch 5^x is opened, all lights 3^x are out of circuit.

60 As regards lights 3^a , when switch 2 is closed, and any one circuit closer 4 is closed, all lights 3^a are lighted in a similar manner to the operation of lights 3^x , since one terminal of lights 3^a are connected by wires 5^e to wire
65 5^a and one pole of battery E, and the other

Since we have shown that when switch 2 70 is closed and any one circuit closer 4 is closed the three blades 2^a of switch 2 are connected through wires 3 and 3^a to one pole of the battery E, and since lamps 3^y have one terminal connected to the blades 75 and the other terminal to the other pole of battery E through wires 5^s , 5^e and 5^a , lamps 3^y will also be illuminated but if switch 2 is opened all lamps 3^y are out of circuit.

Naturally the first thing the person 80 aroused or alarmed wishes to do would be to stop the ringing of the bell and he can do this by opening switch 2. Thereupon the bell ceases and all lights 3^y , 3^x , 3^z , 3^a are cut out except that one in the particular circuit in which the contact 4 is closed, for
85 the lights 3^a , 3^x , 3^z in such circuit will remain lighted.

The lights 3^y on the switch 2 make it a self-lighted switch. The switch 5^w should 90 be left open on retiring. If alarm is made however after throwing out switch 2, switch 5^w should be closed which turns on the light 3^z at each opening in the circuit which has been closed. If there is no watchman the
95 switch 5^w could be left closed so that should a window be raised it would automatically close the circuits through the lights 3^z at each of the openings.

One contact of light 3^z is connected with 100 the negative pole of the source of electricity through the wire 3^1 , the other is connected with the positive pole of the source of electricity through wire 5^1 . When the circuit closer 4 is closed a complete circuit is estab-
105 lished, beginning at 3^y through wire 5^a , switch 5^x , wire 5, switch 5^w , and wire 5^1 , through light 3^z , wire 3^1 , wire 3, contact 7, and wire 3^a , back to 3^y .

If it is desired to employ more than three 110 circuits on the three pole switch an additional set or sets of contact points 2^{bx} could be placed in position to be engaged by the switch bars 2—as indicated in Fig. 2.

115 Preferably dry cell batteries are used for the source of electricity as they are less expensive than storage batteries and more reliable than an electric supply system, because burglars ordinarily cut the usual electric wires before attempting to enter, but
120 the source of electricity to be employed can be selected by the owner. The exterior wires are preferably placed in metallic conduits to insure against cutting.

A switch 3^s may be installed in any convenient 125 place in wire 3^a (see Fig. 1) by which the whole burglar system can be cut out of operation if desired leaving the fire alarm circuit intact.

The circuit closers 4 are illustrated in de- 130

tail in Figs. 3 to 7. The circuit closers are employed in pairs, each member of each pair being constructed alike. Each member comprises a plate 6 which is preferably stamped out of metal and is provided with perforations 6^a for the fastening screws; a hook 6^b for engagement with an actuating spring; and parallel guide ears 6^c. Affixed to this plate is a block 6^d to which is pivoted one end of a sheet metal housing 6^e bent into U-shape. In the free end of the housing 6^e is mounted a roller 6^f which is guided between the ears 6^c of the plate. A spring 6^g is engaged with the hook 6^b and the hook 6^a on the housing plate 6^e and normally tends to project the roller as shown in Fig. 5. As stated these contact members are used in pairs, and one of the plates 6 is connected to the conductor 3 and the other related plate to the conductor 3^a. These housings 6 could be both connected to one base plate if properly insulated but I prefer to keep them separate to avoid trouble with undesirable contacts and each can be readily taken out and examined.

The plates 6 are secured in the guide grooves of the window frame as indicated in Fig. 3 so that the rollers 6^f project into the path of the sash and are adapted to engage metal contact strips 7 attached to the upper and lower sash as indicated in Figs. 3 and 4. When one of strips 7 contacts with the rollers of the related contact plates they form electrical contact therewith and the circuit is closed thereby between the connected wires 3, 3^a.

The spring 6^g yielding projects the roller, into the groove of the sash and insures contact with the metal strips 7, as the sash is raised or lowered.

The strips 7 may be of any desired length. I preferably form them in sections slightly spaced apart as shown at 7^a, so that if the sash is adjusted until one of the spaces lies between the contact rollers the circuit will be open. Symbols or marks (not shown) could be placed on the sash corresponding to the gaps 7^a between the strips so as to show where to stop the sash to keep from making contact. Circuit breakers 3^w enable the window sash to be raised or lowered from the inside, if desired, without sounding the alarm, or adjusted to different positions without necessarily keeping the circuit closed. These breaks 7^a would enable the windows to be partly opened at night by the owner, but cause an alarm if a burglar attempted to move the sash up or down. I prefer to use the roller contact fixtures described, but I do not consider the invention limited in its broader aspects to the particular kind of roller contact shown in Figs. 3-7.

The signal box or board is preferably made of wood. Bell 5^v, switch 2, switch 5

may be mounted on the switch box but the lights 3^x and 3^f and all wiring is preferably concealed therein and the box may be provided with holes for lights 3^x to extend thru, as lights 3^x are only intended to give light to party awakened suddenly and probably confused and excited, making it easy for him to find the switch box. Openings are preferably cut in the cover of the signal box opposite the lights 3^a which openings are covered by frames each bearing a transparent sign as indicated, so that when the cover is closed the sign would be over the related light. Should the light burn out the glass could be slid out and the bulb removed and replaced. The cover may be also provided with holes through which the lamps 3^x can be readily inserted or removed.

To utilize the same system, also to give fire alarm in case of fire, novel automatic circuit closers 8 are employed, see Figs. 8 and 9. These automatic fire alarm switches are constructed like single pole switches, each having a blade 8^a pivotally connected to a contact stud 8^b and adapted to engage a contact member 8^c attached to the base plate 8^a. Mounted on the base 8^a at opposite sides of the blade 8 are a pair of slotted members 8^d which are adapted to retain a removable sheet of suitable material 8^e preferably of celluloid or other material which will ignite or give away at a predetermined dangerous temperature. This sheet 8^e normally holds the bar 8^a out of position to contact with the member 8^c, but if the sheet 8^e is destroyed or gives way when heated above a certain temperature, then the blade 8^a is automatically closed by spring 8^f connected to the base and blade in such manner as to bring the blade into engagement with the contact 8^c.

Each contact member 8^b of the several automatic fire alarm circuit closers is connected by a wire 9^a to a wire 9^b which is connected to the negative pole of the source of electricity 3^v. The contact member 8^c of each fire alarm circuit is connected by a wire 9^c to a wire 10 which leads to the contact 2^{bx} of the switch 2. A light 10^a (similar to the lights 3^x) may be placed on the switch-board and connected in circuit in the wire 10 as shown in Fig. 1.

A wire 10^b leads from the said contact point 2^{bx} to a light 10^c on the signal board which light is also connected to the wire 5^e, see Fig. 1. The electrical connections are such that if any one of the fire alarm circuits closers 8 is operated by heat of fire destroying sheet 8^e the bells 5^v and 5^w will be caused to ring, and the visual signals and lights illuminated as above described. By opening switch 2 the bells and burglar alarm lights are eliminated—but the fire alarm sign, and the related light 10^a remain illuminated.

By opening the switch 3^a the entire burglar alarm system will be cut out of operation, but the fire alarm will remain in operative condition.

5 The fire alarm switches are shown in the drawings as attached to the lower part of the window casings, but they may be placed wherever deemed advisable or desirable.

10 In the drawings the heavy black lines indicate wires leading to say the positive pole of the battery and the lighter lines indicate the negative pole of the battery.

The wire 3^a is connected at one end to one pole of the battery 3 and at the other end to one of the roller contacts 6. Wire 3 is a continuation of wire 3^a one end of which connects to the other roller contact and other end to switch clip 2^b and to one terminal of light 3^x; then the negative conductor continues from 2^c to 5^y, also from 2^b to 3ⁱ. Hence switch 2 is a circuit breaker in the negative conductor only, leaving the positive conductor running from battery E thru switch 5^x (which is the only means of cutting out positive conductor) the positive conductor continues from switch 5^x to lights 3^a and to bells 5^y and 5^z. 5^z is a positive connection running to lights 3^x and 3^y and when circuit closer 4 connects wires 3 and 3^a it establishes a complete circuit.

Lights 3^x operate the same as lights 3^z but are connected to the positive side of the current source thru different wires. They should not be on same positive conductor as lights 3^x are to give light to party at switch board. Lights 3^z are controlled by switch 5^w and are intended to scare a burglar away or enable the watchman to turn the light upon him when he is entering a window.

What I claim is:

1. In an alarm apparatus for a structure having a plurality of openings; an alarm at each opening; a circuit for each alarm including means at the respective opening operable by an attack at said opening for closing its respective circuit; a source of electricity common to all of said circuits; and means common to all of said circuits for normally connecting all of said circuits in parallel whereby an attack at any opening will give an alarm at all openings, said

means being operable to disconnect all of said alarms except at the opening attacked.

2. In an alarm apparatus for a structure having a plurality of openings; an alarm at each opening; a circuit for each alarm including means at the respective opening operable by an attack at said opening for closing its respective circuit; a source of electricity common to all of said circuits; a switch comprising a plurality of blades and a plurality of cooperating contacts; means electrically connecting all of said blades together; and means connecting each of said alarms respectively to one contact on said switch, whereby when the switch is closed an attack at any opening will operate the alarms at all openings, and when the switch is opened the alarm only at the opening attacked will be operated.

3. In an alarm apparatus for a structure having a plurality of openings; a switch comprising a plurality of blades and a plurality of cooperating contacts; means electrically connecting all of said blades together; a plurality of alarms, one at each of said openings; a circuit for each alarm including means at the respective opening operable by an attack at said opening for closing its respective circuit; a source of electricity common to all of said circuits; means connecting one of said contacts on said switch to each of said circuits respectively between the alarm and the first mentioned means; whereby when the switch is closed an attack at any opening will operate the alarms at all the openings, and when the switch is opened the alarms only at the opening attacked will be operated.

4. In an alarm apparatus as set forth in claim 3, a plurality of annunciators, one being provided for each said alarm circuit, and means connecting said annunciators between the source of electricity and the respective contacts on said switch, whereby when the switch is closed an attack at any opening will operate all of said annunciators and when the switch is open only the annunciator for the circuit closed by an attack will be operated.

In testimony that I claim the foregoing as my own I affix my signature.

RALPH H. ROSE.