A. GOLDSTEIN.

ELECTRICAL ALARM SYSTEM.

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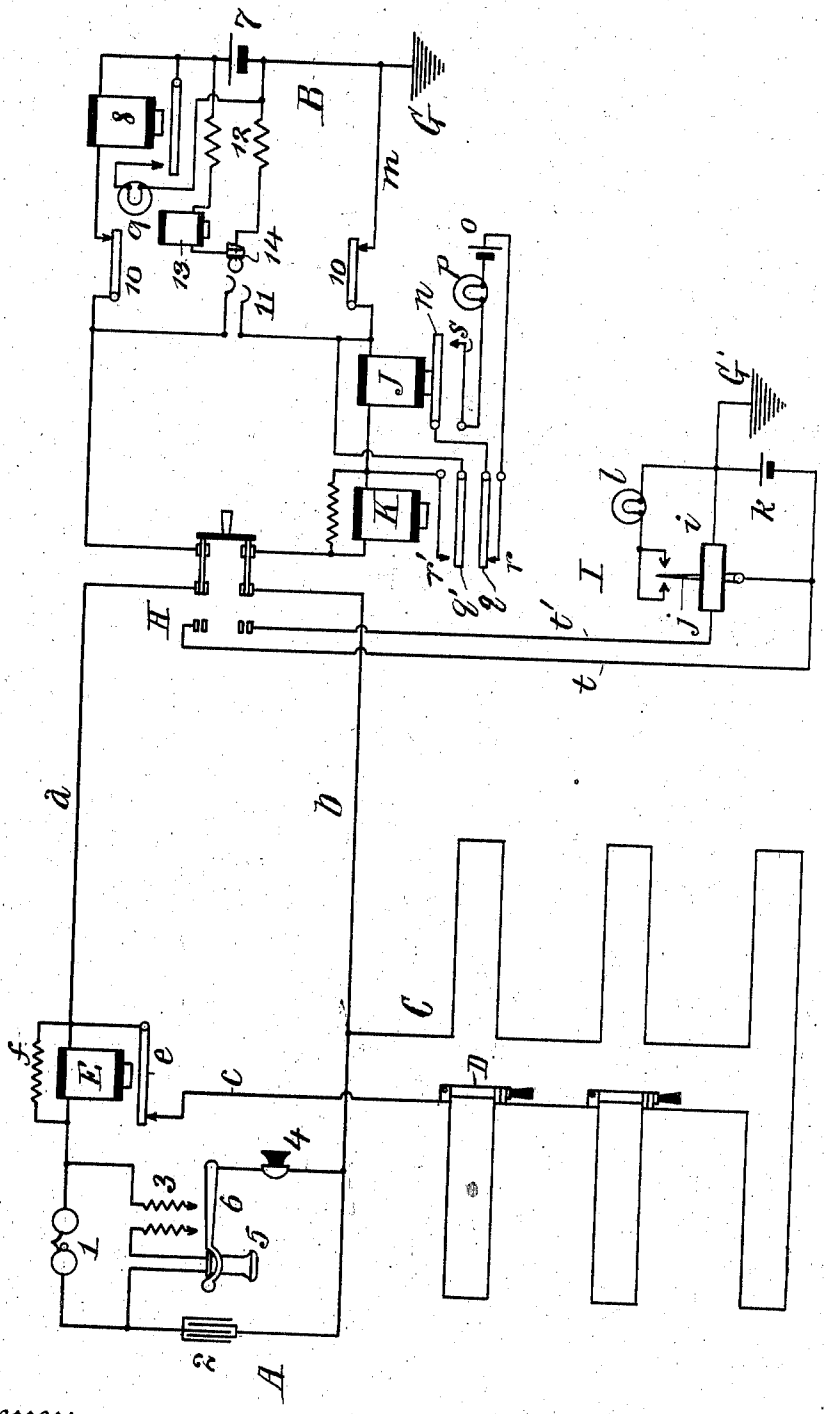
966,903.

Patented Aug. 9, 1910.



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UNITED STATES PATENT OFFICE.

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ELECTRICAL ALARM SYSTEM.

966,903. Specification of Letters Patent. Patented Aug. 9, 1910.

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To all whom it may concern:

Be it known that I, ALBERT GOLDSTEIN, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a certain new and useful Improvement in Electrical Alarm Systems, of which the following is a specification.

The invention relates to an electrical alarm system and has for its object the utilization of a telephone circuit also as a burglar alarm circuit.

At the transmitting or subscriber's station are arranged the usual telephonic transmitting devices, and also the protective circuit which may comprise a number of loops in series so as to extend to various localities—as, for example, windows and doors—in a building which it is desired to protect. The protective circuit is in shunt from the main line circuit, and is normally closed. When the telephone receiver is removed from its switch arm, the closing of main circuit by said arm in the ordinary way, causes a magnet in said main circuit to become energized from the distant or receiving station, and said magnet thereupon moves its switch to open said protective circuit. Hence said protective circuit shunt is automatically cut out while the subscriber is talking, and does not interfere with speech transmission. At the receiving or central office end of the line are provided the usual translating devices and an alarm circuit associated therewith, which alarm circuit is so constructed as that upon the occurrence of a break or other abnormal electrical condition on the line, the alarm will be sounded. Also at the receiving station is another and separate alarm circuit which is never connected to the apparatus at said receiving station, but which, by means of a suitable switch, may be brought into circuit with the apparatus at the transmitting station, the connection of the said apparatus with the translating devices at the receiving station being at the same time broken. When, therefore, the switch is thrown to connect the telephonic apparatus at the transmitting station with the translating devices at the receiving station, the ordinary conditions of telephonic transmission are present, with the addition that accidental breaks or disturbances on the line will be indicated at the receiving station. When the switch is thrown to connect the telephonic apparatus at the transmitting station with the independent alarm circuit at the receiving station, then speech transmission is prevented; but the protective circuit at the transmitting station is directly connected with said independent alarm circuit, so that any interruption of said protective circuit results in operating the alarm circuit to give an alarm. By reason of this construction, a telephone subscriber may, at any desired hour, notify his telephone exchange that for some stated period of time he desires his telephone service cut off and burglar alarm made effective. The operator at the exchange then simply throws the switch before noted, and thereafter any tampering with the subscriber's protective circuit or abnormal condition on the line is at once announced by the alarm at said exchange.

The accompanying drawing is an electrical diagram, showing the application of my invention to a typical "Bell" telephone circuit.

The line circuit, of which the members are shown at *a*, *b*, unites the subscriber's station at A to the central office at B. The usual apparatus here shown at the subscriber's station includes the bell 1, condenser 2, induction coil 3, transmitter 4, receiver 5 and switch 6 controlled by the receiver to open and close circuit at the terminals of the induction coil and with the transmitter in the ordinary way. The usual apparatus here indicated at the receiving station or central office at B, includes the battery 7, line relay 8, line lamp 9, switches 10 of the cut off relay, (not shown) jacks 11 (only one shown) and the cord circuit in shunt around the battery, which cord circuit includes two windings 12 of the repeating coil, supervisory relay 13 and plug contacts 14, which contacts, when the subscriber is talking, connect with any jack 11; switch arms 10 then being opened by the cut off relay. The operation of all these parts, which are in common use, is well known.

At the subscriber's station is the protective circuit C in shunt with the main line, and comprising as many loops in series as circumstances may demand. In connection with any or all of these loops may be provided short-circuiting levers D, so that any loop may be manually cut out of circuit by the subscriber when and for as long as he

may desire. In the member *a* of the line circuit is a magnet E which, by its switch lever *e*, opens and closes the protective circuit through the shunt conductor *c*. A non-inductive shunt *f* is provided around the magnet E, so that the magnet will not injuriously affect the speech transmission.

At the central station is a switch H, by means of which the line may be connected either to the telephonic translating devices at B, or to a separate alarm circuit at I. Said circuit includes an alarm of any suitable type; here shown as a galvanometer coil *i* connected to ground at G′ and containing a balanced needle arm *j* which, when swung in either direction, closes circuit from battery *k* to a glow lamp *l*.

In the lead *m* of the main circuit at the receiving station which connects to ground G are two magnets J, K. J is a high resistance magnet and is normally energized by battery *l*. The magnet K is to be constructed of sufficiently low resistance as not to be energized by the current which energizes J. The resistance of magnet J and loop circuit C is to be such as that the relay 8 is not energized by the normal current in the circuit. Magnet J controls switch *n* to open and close a local circuit including battery *o* and lamp *p*, when switch arm *q* closes said circuit at *r*. Switch arms *q* and *q′* are controlled by magnet K to open and close circuits at *r* and *r′*. The effect of closing circuit at *r′* is to short-circuit magnet J. Assuming, for illustration, that the separate alarm circuit I is to be put into operation only between certain designated hours; at other times the switch H is placed, as shown in the drawing, to connect the subscriber's transmitter with the telephonic apparatus at B. Magnet J being normally energized, moves its switch *n* to open circuit at *s*. Hence any break or ground on the line will cause magnet J to fail, thus closing circuit at *s*, and lighting the lamp *p*. Magnet J, therefore, keeps the circuit under automatic test. When the subscriber removes his receiver 5 from the switch hook, a low resistance circuit is closed between the members *a*, *b* of the line, through transmitter 4, hook switch 6, and one winding of the induction coil 3. This energizes magnets E and K and also relay 8. Magnet E then moves its switch *e* to open the protective circuit C. Magnet K moves its switch *q′* to close contact at *r′*, thus short-circuiting magnet J, and also through switch *q* opens contact at *r*. Magnet J then fails, so that the switch lever *n* closes contact at *s*, but because circuit is broken at *r*, its lamp *p* does not light. Relay 8 actuates its switch to close circuit to operate the line lamp 9, in the usual way. This condition with respect to magnets E, K and J, is maintained as long as the receiver is off the hook, and on its replacement the normal state of affairs is resumed. At the time fixed for establishing the alarm circuit, the switch H at the central station is moved to close the alarm circuit I, and cut out the telephone apparatus at B. Circuit is then established from non-grounded pole of battery *k* by wire *t*, to switch H, wire *a*, switch *e*, by wire *c* to the subscriber's protective circuit C, and so back by wire *b* to switch H, wire *t*, coil *i* to ground G′. The switch levers at D are, of course, open. Hence when any abnormal condition occurs on the alarm circuit C—such as break, ground or crossing—the needle *j* is swung, and alarm is given by the lamp *l* at the central station.

I claim:

1. The combination of a line circuit extending between distant stations, and at one station (A) telephonic receiving and transmitting devices, and a shunt protective circuit, and at the other station (B) telephonic translating devices, a separate alarm circuit (I), and a switch: the aforesaid switch operating to connect the telephonic apparatus at said station A either to the translating devices or to the said separate alarm circuit at station B.

2. The combination of a line circuit extending between distant stations, and at one station (A) telephonic receiving and transmitting devices, a switch for making and breaking circuit to the same, a shunt protective circuit, and means controlled by said switch for controlling said protective circuit, and at the other station (B) telephonic translating devices, and a source of current energizing said controlling means.

3. The combination of a line circuit extending between distant stations, and at one station (A) telephonic receiving and transmitting devices, a switch for making and breaking circuit to the same, a shunt protective circuit, and means for controlling said protective circuit, and at the other station (B) telephonic translating devices and a local alarm circuit, a source of current, and a switch: the said source of current energizing said protective circuit controlling means to close said circuit, and the said switch operating to connect the telephonic apparatus and shunt protective circuit at said station A either to the translating devices or to the separate alarm circuit at station B.

4. The combination of a line circuit extending between distant stations, and at one station (B) telephonic translating devices, and a source of current, and at the other station (A) telephonic transmitting and receiving devices, a normally closed shunt protective circuit, a magnet for opening said circuit energized by said current source, and a pivoted switch arm controlling said means and itself controlled by the application to or removal therefrom of the telephone receiver.

5. The combination of a line circuit extending between distant stations, and at one station (A) telephonic receiving and transmitting devices, and a shunt protective circuit, and at the other station (B) telephonic translating devices, a local alarm circuit associated therewith, a separate local alarm circuit, and a switch, the aforesaid switch connecting the telephonic devices and shunt protective circuit at said station A to said separate alarm circuit or to said translating devices at station B, means actuated by an abnormal change in electrical conditions on the line for operating said separate alarm circuit to give an alarm when connected by said switch to said apparatus at station A, and means similarly actuated for operating the other alarm circuit to give an alarm when said switch connects said other alarm circuit and said translating devices to said apparatus at station B.

6. In combination with a telephone circuit including transmitting and receiving apparatus, a normally energized magnet in said circuit, a local alarm circuit controlled by said magnet, and a second magnet controlled by abnormal variations in the current on said circuit to short-circuit said first magnet and open said local alarm circuit.

In testimony whereof I have affixed my signature in presence of two witnesses.

ALBERT GOLDSTEIN.

Witnesses:
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