

No. 667,727.

Patented Feb. 12, 1901.

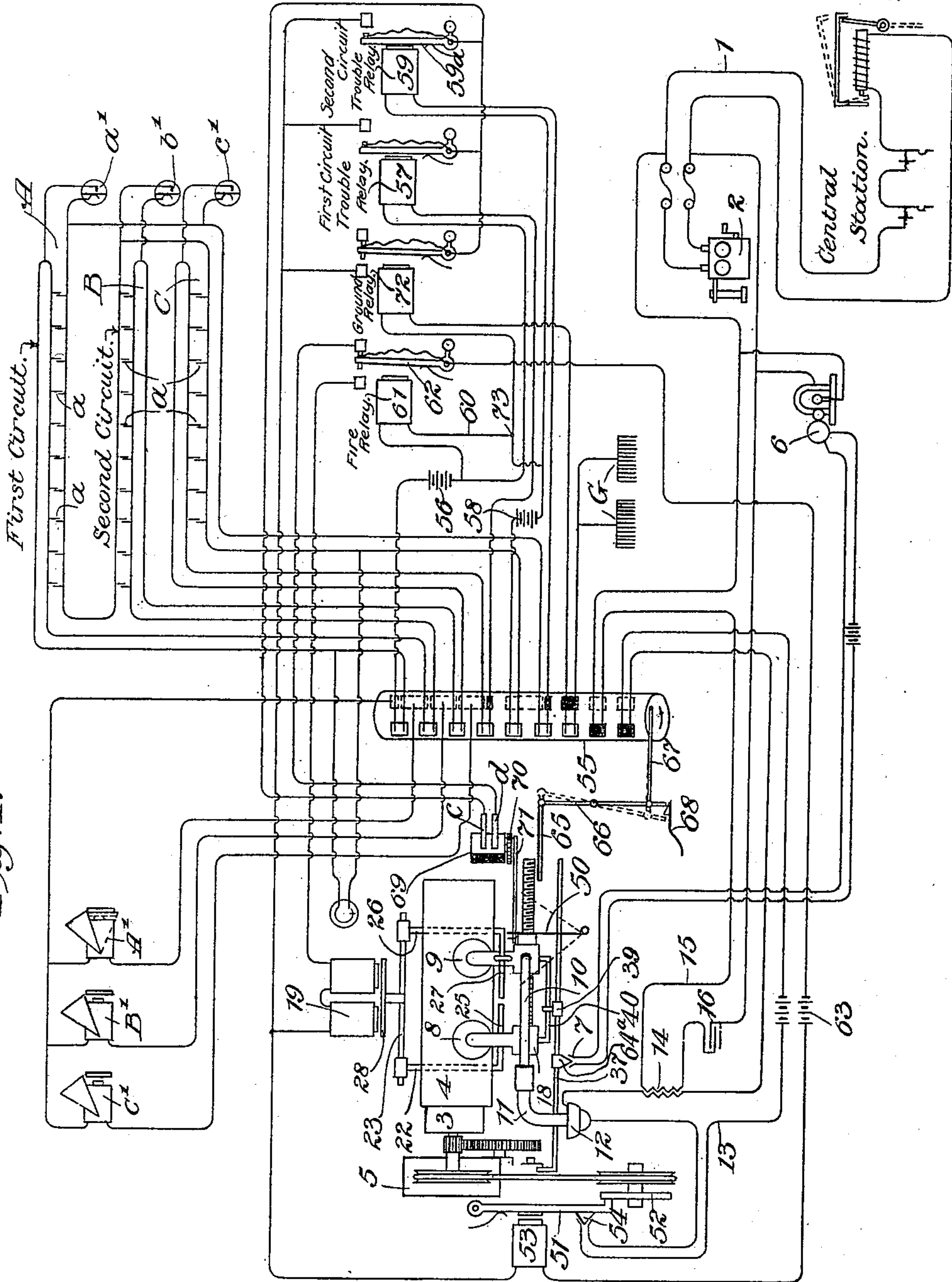
F. MCGLOIN.
AUTOMATIC ALARM SYSTEM.

(Application filed May 21, 1900.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.



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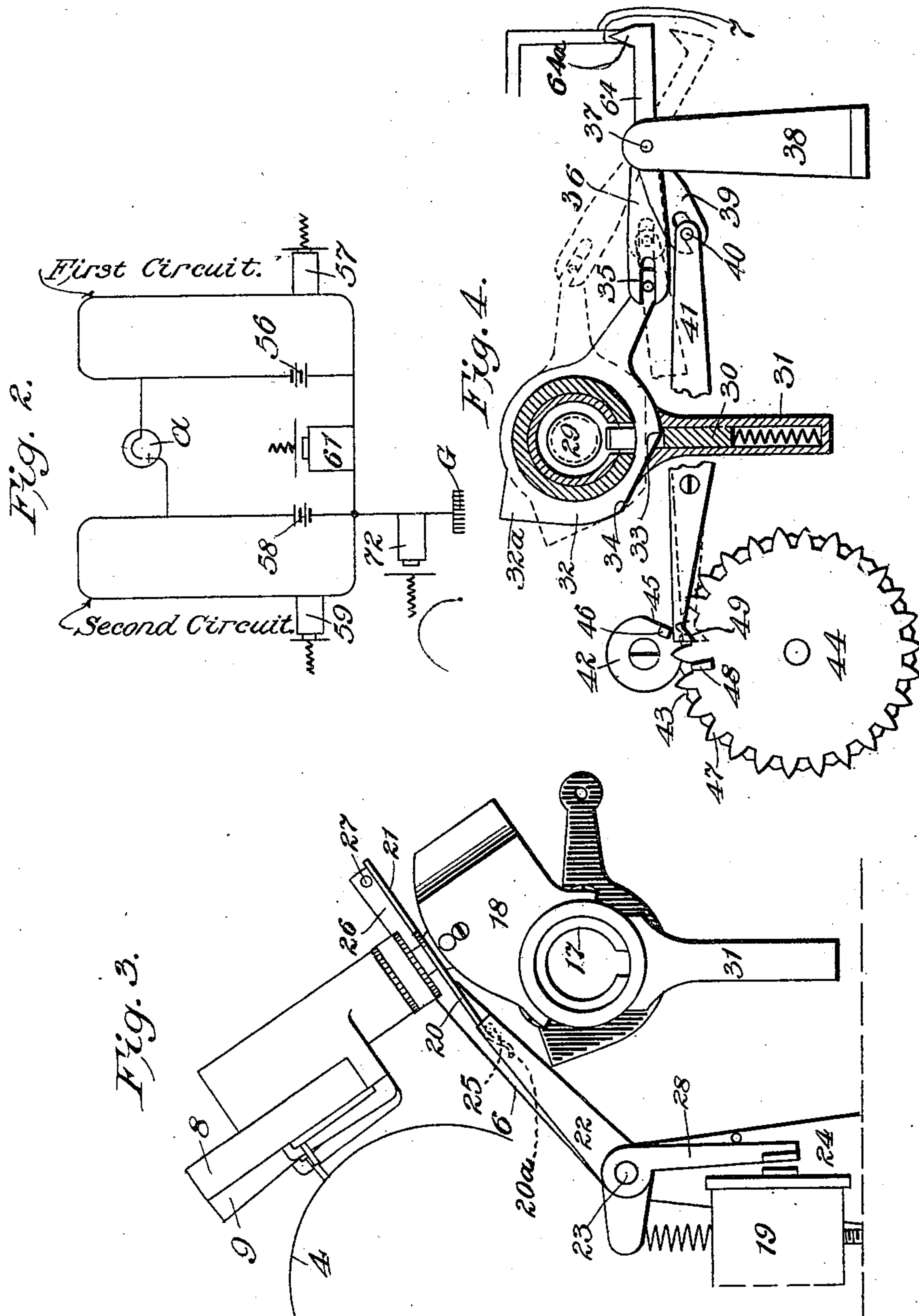
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UNITED STATES PATENT OFFICE.

FELIX MCGLOIN, OF NEW YORK, N. Y., ASSIGNOR TO THE AUTOMATIC FIRE ALARM COMPANY, OF SAME PLACE.

AUTOMATIC ALARM SYSTEM.

SPECIFICATION forming part of Letters Patent No. 667,727, dated February 12, 1901.

Application filed May 21, 1900. Serial No. 17,340. (No model.)

To all whom it may concern:

Be it known that I, FELIX MCGLOIN, a citizen of the United States, residing at New York city, county and State of New York, have invented certain new and useful Improvements in Automatic Alarm Systems, of which the following is a full, clear, and exact description.

My invention relates to an improved automatic alarm system; and one of my objects is to provide a system which by the variation in the electrical condition of an electric circuit will automatically send in an alarm. This is particularly useful in a fire-alarm system; but it will be obvious that it may be applied to send in a burglar or other alarm. I prefer to employ the system in connection with the common telephone-circuit in general commercial use at the present day, and in such case I provide a talking-machine so arranged as to send in an alarm-message over the telephone-circuit, such as "There is a fire at 41 Park Row. Please notify the fire department," an electric protective circuit, and means to automatically send a signal over said telephone-circuit when a certain variation in the electrical condition of said protective circuit, such as a closing of the circuit, takes place. This will call attention to the fact that an alarm-message is to be sent. The signal is then interrupted and the talking-machine sends the alarm-message over the telephone-circuit. All this takes place automatically on said variation in the electric protective circuit. I prefer to provide the talking-machine with a plurality of records to indicate the different causes of different variations in the protective circuit, and I have provided in this embodiment electric circuits, preferably independent and forming parts of the protective circuit, which will also send a signal in case of trouble on the wires, such as a break or a ground, and automatically select the proper record to indicate this trouble and cause the talking-machine to send a "trouble-message," such as "There is trouble on the wires at 41 Park Row," over the telephone-circuit. I have also provided a construction by which the record is passed over by the reproducer a plurality of times before the alarm-message is interrupted, so

that the signal and message are repeated over the telephone-circuit, thus insuring their being received.

I prefer to operate or control the parts by means of suitable electrically-operated apparatus; but it will be obvious that this is not essential.

In the preferred embodiment of my invention shown in the drawings, Figure 1 represents my system diagrammatically. Fig. 2 is a condensed detail diagram of some of the connections. Fig. 3 is a detail of the mechanism for selecting the proper reproducer, and therefore the proper record; and Fig. 4 is a detail of the carriage for the reproducers and other parts connected therewith.

In the above diagram of the preferred embodiment 1 represents an electric circuit provided with means to communicate intelligence at a distance, preferably, as has been stated heretofore, a telephone-circuit, such as is in common commercial use at the present day. This circuit is provided with a subscriber's transmitting and receiving instrument 2, and the circuit passes through a central or receiving station.

3 is a machine to send a message over the circuit 1, in this case a talking-machine, such as a phonograph, having a cylindrical record 4, actuated by a motor, such as a spring 5, through suitable gear connections.

6 is a device, such as an interrupter, for transmitting a signal over the telephone-circuit, such as ringing the bells of the subscriber's instrument and also causing a signal-annunciator to be operated in the central station. The circuit through this interrupter is normally open, as shown at 7, and the secondary of the interrupter is connected in the present case in parallel with the subscriber's instrument. The record-cylinder 4 is preferably provided with a plurality of records, such as a "trouble-record," to indicate that there is some trouble with the wires, and also a "fire" or other record, and each of these records is preferably provided with a reproducer. These reproducers 8 and 9 are preferably both carried on the carriage 18 and are provided with a sound-carrying tube 10, which slides in and out of a stationary sound-tube 11, connected with a telephone-trans-

mitter 12 in an electric circuit 13. This circuit through the transmitter 12 is preferably normally open and is connected with the telephone-circuit, preferably, across the subscriber's instrument. In the present case the circuit 13 is not connected mechanically with the telephone-circuit, but electrically through the secondary of the induction-coil 14 in the circuit 15, which is in parallel with the subscriber's instrument.

16 is a condenser.

Referring now to Figs. 3 and 4, showing details of the mechanism, 17 is a shaft forming a track along which the carriage 18, which carries the reproducers 8 and 9, travels. The reproducers are connected to the carriage, preferably, by a pivot, so as to move independently of each other. They can therefore be moved into or away from their operative position with relation to the record independently of each other. The reproducer 9, as shown in Fig. 3, is in its operative position ready to travel over its record. To automatically remove the reproducer 9 from its operative position with relation to the record and place the reproducer 8 in its operative position, I have provided a magnet 19 and connections therefrom which will accomplish this result automatically on the energizing of said magnet.

20 is a projection in the form of an arm attached to the reproducer 8, and 21 is another projection in the form of an arm attached to reproducer 9.

22 is a lever attached to a rod 23, pivoted in the frame 24 and carrying a pin 25, which extends underneath the arm 20.

26 is a lever similar to lever 22 and having a pin 27 standing above the projecting arm 21, as shown. As seen in Fig. 1, these pins are oppositely disposed, and of considerable length, so that the arms 20 and 21 on movement of the carriage 18 back and forth may slide freely over said pins. An arm 28, also attached to rod 23, forms an armature for the magnet 19 therefore when the magnet is energized. The arms 22 and 26 will be thrown downward and the pin 27 will contact with the arm 21, raising the reproducer 9 out of its operative position with relation to the record, and the pin 25 will be lowered and the reproducer 8 will drop down into its operative position.

The talking-machine, such as a phonograph, may have the usual rotating screw-shaft 29, to be engaged by a spring-pressed threaded plunger 30, carried in a box 31 on the carriage.

32 is a sleeve pivoted on the carriage and provided with a cam-surface 33, formed by a cut-away portion 34 for forcing the threaded plunger 30 away from engagement with the threads of shaft 29 and allowing the carriage to be returned to its initial position at the left of the record.

35 is a rod which slides between the jaws of a stationary rocking lever 36, fixed to a

shaft 37, pivoted in a support 38 on the frame for rocking the carriage. 39 is another arm attached to rod 37 and engaging a pin 40 on a pivoted lever 41.

64 is an arm attached to rod 37 and carrying contact-piece 64^a to close the circuit at 7, Fig. 1.

42 is a wheel rotated by the motor of the talking-machine and having a circular face which engages curved depressions 43 in the circumference of a gear-wheel 44. The gear-wheel 44 will therefore be locked in position while the curved portion of the wheel 42 is in a depression 43. The circumference of wheel 42 is, however, cut away at 45 to release the wheel 44 and allow it to revolve. As the cut-away portion 45 releases the wheel 44 a lug 46 on wheel 42 engages one of the teeth 47 on wheel 44 and rotates the same one tooth. The normal position of the parts shown in Fig. 4 is that indicated by dotted lines. When the wheel 44 has rotated sufficiently to bring the lug 48 against the projecting foot 49 on the lever 41, the lever will be thrown up into the position shown in full lines in said figure, and the carriage and both reproducers will therefore be raised by reason of the nose 32^a of sleeve 32 coming in contact with the end 20^a of arm 20 and through it rocking the carriage, throwing both reproducers out of their operative position, releasing the plunger 30 from engagement with the shaft 29, and closing the signal-circuit at 7, Fig. 1. The friction between the parts is sufficient to hold the carriage in either the position shown in dotted lines or in full lines in Fig. 4. A spring 50, Fig. 1, is provided for then throwing back the carriage to its initial position at the left. The parts will be retained in the position shown in full lines in Fig. 4 for only a short time, for the next rotation of the wheel 42 will bring the lug 46 in contact with the end of the lever 41 and throw the same back into the position shown in dotted lines, thus dropping one of the reproducers into contact with the record and breaking the signal-circuit at 7.

51 is a brake-lever-engaging wheel 52 to hold the motor 5 at rest, and this lever 51 forms the armature of a magnet 53. The lever 51 also carries a contact part 54, which when the magnet 53 is energized will close the circuit 13 as far as the switch 55 and also release the motor 5.

Let A, B, and C, Fig. 1, represent the different floors of a building or different buildings to be protected. Starting from the battery 56, a local circuit, marked "First circuit" in Fig. 1, passes through each of the floors A, B, and C, and is preferably closed through a magnet 57. Another local circuit, marked "Second circuit," starting from the battery 58, also passes through each of the floors A, B, and C, and is preferably closed through a magnet 59. 61 is an electromagnet whose winding is connected across the two local circuits. The magnet 61 is normally inactive because the two local circuits

are independent—that is, they are not normally connected electrically, so as to form a single closed circuit.

To control the mechanism for sending the signal and alarm message, I have provided an electric protective circuit which when its electrical condition is varied or changed automatically causes the alarm to be given. In the present embodiment the protective circuit is normally open, and its electrical condition is changed by the closing of the circuit. This is accomplished in the present instance by an electrical connection between the two local circuits, such as by one of the thermostats *a a*. The protective circuit, starting from battery 56, will when so closed be through the first circuit to the thermostat *a*, which has been moved through that thermostat to the second circuit, through battery 58, and through the coils of "fire-magnet" 61. When the electric condition of the protective circuit is thus changed, the fire-magnet 61 is energized, thus attracting its armature 62 and closing the circuit from the battery 63 through magnets 19 and 53. Energizing the magnet 19 will raise the reproducer 9 out of engagement with the record and drop the reproducer 8 into engagement therewith, and as the circuit is closed through magnet 53 the talking-machine will be set in motion. A message will not, however, be at once sent over the telephone-circuit, because the circuit 13 from the transmitter 12 will not yet have been closed by switch 55. The wheel 42, however, starts to revolve, thus rotating the wheel 44, and the carriage 18 will start to travel toward the right in Fig. 1. When the lug 48 strikes the inclined foot 49, the parts will be rocked into the position shown in full lines in Fig. 4, and the nose 64, attached to the rod 37, will close the contact-points at 7, Fig. 1, and thus energize the interrupter 6 and sending the cautionary signal over the telephone-circuit, in this case ringing up the bell in the subscriber's instrument 2 and dropping the annunciator in the central station. This signal will, however, continue only while wheel 42 is making one rotation, because the circuit at 7 will be broken when the lug 46 throws the parts back to the position shown in dotted lines. 55 is a switch for automatically making other connections when it has been thrown. As the carriage 18 moves to the right it strikes a projection 65 on a pivoted lever 66, which is attached to the switch 55 by link 67, and will push projection 65 to the right until the lower end of the lever 66 is engaged by the catch 68, thus rotating switch 55. The contact parts of the switch which make connection with the ends of the different circuits in the first position of the switch 55 are shown at the left on the switch, and at the right the line of contact-points which make the connections at the second position of the switch. The dark blocks are insulations. The carriage will then be released (see Fig. 4) and will be moved to the left by spring 50 and the signal discon-

tinued, as before explained. The switch 55 has now closed the circuits 13 and 15 from the transmitter 12, and as the carriage will then move to the right the reproducer 8 will then travel over its record and send the message over the telephone-circuit. This may be a "fire-message" or otherwise, as desired. When the carriage 18 has reached the end of its traverse to the right, the lug 48 on the wheel 44 will strike the foot 49 and again release the carriage, as before explained, which will then be moved to the left for another repetition of the message. The cautionary signal will therefore be given by closing the contacts at 7 and the message be sent over the telephone-circuit at each traverse of the carriage. The reproducer 9 is normally in its operative position with relation to the record, in this embodiment in contact with the record-cylinder 4, which record may be such as to indicate that there is trouble on the wires—for instance, "There is trouble on the wire at No. 41 Park Row." When the electrical condition of the open protective circuit is changed—for instance, when either of the local circuits is opened—the cautionary signal will be sent over the telephone-circuit and the trouble message will then be sent in. If the local circuit (indicated in Fig. 1 by the second circuit) is broken, the circuit through magnet 59 will be broken and its armature will spring to the right. This will close a circuit from the battery 63, through the armature 62 of the "fire-magnet" 61, through the uninsulated portion of switch 69, back through the armature-lever 59^a, and through magnet 53, thus releasing the motor 5 and setting the mechanism in motion. There- producer 9 will remain in its operative position, as shown in Fig. 3, because the magnet 19 will not have been energized. The same result will take place if the first circuit is broken, except that the magnet 57 will be de- energized instead of magnet 59. The cautionary signal and then the trouble-message will therefore be sent over the telephone-circuit at each traverse of the carriage 18 to the right except the first, when the signal only will be sent; but as it is not so important that immediate attention be drawn to the trouble-alarm as to the "fire-alarm" I have provided means for preventing the repetition of the trouble-alarm more than a fixed number of times. This I accomplish by the switch 69, which has an insulated part (shown in black) and a conducting part, (shown in white.) This switch is rotatable, and the conducting part bridges the contact-points *c* and *d*. Attached to this rotatable switch 69 is a ratchet-wheel 70, engaged by a dog 71, moved by the carriage 18. At each traverse of the carriage, therefore, the switch 69 will be turned a certain part of a revolution, depending on the length of time the dog 71 engages with the ratchet 70. I prefer to make the contacting part of the switch 69 only sufficient in extent to allow the trouble-message

from the reproducer to be repeated three times. The insulated part of the switch 69 will then reach the contact-points *c* and *d* and break the circuit through magnet 53, thus
5 stopping the mechanism.

I have also provided an arrangement which will send in the trouble-alarm when the electrical condition of the open protective circuit is changed by one of the local circuits becoming grounded.
10

72 is an electromagnet normally deenergized. One end of this magnet-winding is grounded, as at *g g*, and the other end is connected to the winding of the magnet 61, as
15 shown at 73, and to the second circuit. When a ground occurs on either of the local circuits, the magnet 72 will be energized, its armature drawn toward it, and the circuit through magnet 53 completed, as in the former case.
20 The cautionary signal and the trouble-alarm will therefore be sent over the telephone-circuit, as before. In the present method of connection, as shown in diagram in Fig. 1, the windings of the magnets 61 and 72 are in
25 series when a ground occurs on the first circuit. To prevent the fire-magnet 61 being energized at the same time with the ground-magnet 72, I have in this embodiment wound the magnet 72 with many turns of fine wire
30 and the magnet 61 with only a few turns of large wire. The magnet 72 will therefore be energized by a current which will not be strong enough to energize the fire-magnet 61. When I say that a device is operated by the
35 different variations of the protective circuit separately, I mean that there are a plurality of variations which may occur any one of which will operate the device. In the present embodiment either the "fire," the "break,"
40 or the "ground" variation will send in an alarm.

A' B' C' are annunciator-drops, which indicate the location of the fire, and *a', b', and c'* are spring-contacts normally separated by a
45 glass diaphragm, which may be manually broken to cause the contacts to meet, and thus close the protective circuit.

It will be obvious that many changes may be made in the construction and arrangement
50 herein disclosed without departing from the spirit of my invention. I therefore do not desire to be limited to the particular arrangement or construction shown and described.

What I claim is—

55 1. An electric circuit provided with means to communicate intelligence at a distance, means to send a message over the same, an electric protective circuit, a device to give a cautionary signal, means to automatically
60 energize said first circuit to operate said device on a variation in the electrical condition of said protective circuit, in combination with automatic means to deenergize said first circuit and cause said machine to then send a
65 message over said first circuit.

2. A telephone-circuit, a talking-machine

adapted to send a message over the same, said machine being normally unconnected with said telephone-circuit, an electric protective circuit, means to automatically send a signal
70 over said telephone-circuit on a variation in the electrical condition of said protective circuit, in combination with means, including an automatically-operated switch to connect said talking-machine with said telephone-circuit, to cause said talking-machine to then
75 send a message over said telephone-circuit.

3. A telephone-circuit, a talking-machine adapted to send a message over the same, an electric protective circuit, a device to give a
80 cautionary signal, means to automatically energize said telephone-circuit to operate said device on a variation in the electrical condition of said protective circuit, in combination with automatic means to deenergize said telephone-circuit and cause said machine to then
85 send a message over said telephone-circuit.

4. A telephone-circuit, a talking-machine adapted to send a message over the same, an electric protective circuit, means to automatically send a signal over said telephone-circuit
90 on a variation in the electrical condition of said protective circuit, a thermostat to cause said variation, in combination with automatic means to cause said talking-machine
95 to then send said message over said telephone-circuit.

5. A telephone-circuit, a talking-machine adapted to send a message over the same, a normally open electric protective circuit,
100 means to automatically send a signal over said telephone-circuit on the closing of said protective circuit, in combination with automatic means to cause said talking-machine
105 to then send a message over said telephone-circuit.

6. A telephone-circuit, a talking-machine adapted to send a message over the same, a normally open electric protective circuit,
110 means to automatically send a signal over said telephone-circuit on the closing of said protective circuit, a thermostat to close said circuit in combination with automatic means
115 to cause said talking-machine to then send said message over said telephone-circuit.

7. A telephone-circuit having a subscriber's receiving and transmitting instrument, a talking-machine adapted to send a message over
120 said telephone-circuit and provided with a transmitting-circuit in parallel with said subscriber's instrument, an electric protective circuit, means to automatically send a signal over said telephone-circuit on a variation in the electrical condition of said protective circuit, in combination with automatic means
125 to cause said talking-machine to then send said message over said transmitting and telephone circuit.

8. In combination, an electric circuit, a machine having a plurality of records to indicate
130 the cause of different variations in the electrical condition of said circuit, means oper-

ated by the different variations separately to cause the machine to select the proper record and give forth the proper message.

9. In combination, a telephone-circuit, an electric protective circuit, a talking-machine having a plurality of records to indicate the cause of different variations in the electrical condition of said latter circuit, and means operated by the different variations separately to cause the machine to select the proper record and transmit the proper message over the telephone-circuit.

10. In combination, a telephone-circuit, an electric protective circuit, a talking-machine having a plurality of records to indicate the cause of different variations in the electrical condition of said latter circuit, and means operated by the different variations separately to cause the machine to select the proper record and then transmit the proper message over the telephone-circuit, and means to cause the record to be passed over a plurality of times.

11. In combination, a telephone-circuit, an electric protective circuit, a talking-machine having a plurality of records to indicate the cause of different variations in the electrical condition of said latter circuit, and means operated by the different variations separately to send a signal over said telephone-circuit and cause the machine to select the proper record and transmit the proper message over the telephone-circuit.

12. In combination, a telephone-circuit, an electric protective circuit, a talking-machine having a plurality of records to indicate the cause of different variations in the electrical condition of said latter circuit, and means operated by the different variations separately to send a signal over said telephone-circuit and cause the machine to select the proper record and transmit the proper message over the telephone-circuit, and a thermostat to cause one of said variations.

13. In combination, a telephone-circuit, a protective circuit, a talking-machine having a "trouble" and also a "fire" record, said machine being adapted to normally operate upon said "trouble-record," and means operated by a variation in the electrical condition of said protective circuit to cause the machine to select the "fire-record" and transmit the "fire-message" over the telephone-circuit, and a thermostat to cause such variation.

14. In combination, a telephone-circuit, a normally open electric protective circuit, a talking-machine having a "trouble" and also a "fire" record, said machine being adapted to normally operate upon said "trouble-record," and means operated by the closure of said protective circuit to send a signal over said telephone-circuit and cause the machine to select the "fire-record" and transmit the "fire-message" over the telephone-circuit and a thermostat to cause such closure of said protective circuit.

15. In combination, a telephone-circuit, a

normally open electric protective circuit, a talking-machine having a "trouble" and also a "fire" record, said machine being adapted to normally operate upon said "trouble-record," a circuit including a magnet, and means to automatically operate said magnet on the closure of said protective circuit to cause a signal to be sent over said telephone-circuit, and also cause the machine to select the "fire-record" and transmit the "fire-message" over the telephone-circuit, a thermostat to cause such closure of said protective circuit, and means to cause the record to be passed over a plurality of times.

16. In combination, a talking-machine, a telephone-circuit connected therewith, a plurality of independent electric circuits, and means operated by an electrical connection at any point between said circuits to start said talking-machine.

17. In combination, a talking-machine, a telephone-circuit connected therewith, a plurality of normally closed independent electric circuits and means operated by an electrical connection at any point between said circuits to start said talking-machine.

18. In combination, a talking-machine, a telephone-circuit connected therewith, a plurality of independent electric circuits, and means operated by an electrical connection between said circuits to send a signal over the telephone-circuit and cause said talking-machine to then send a message over said telephone-circuit.

19. In combination, a talking-machine, a telephone-circuit connected therewith, a plurality of independent electric circuits, and means operated by an electrical connection between said circuits to start said talking-machine, and a thermostat to make said connection.

20. In combination, a talking-machine having a plurality of records and a reproducer for each record, a carriage to support said reproducers, said reproducers having independent movement on said carriage and means to automatically move one toward and the other away from the operative position with relation to said records.

21. In combination, a talking-machine having a plurality of records and a reproducer for each record, each of said reproducers having a projection and said projections being oppositely disposed, a carriage to support said reproducers, said reproducers having independent movement on said carriage, and a magnet and a pair of arms moved thereby and engaging said projections and adapted to automatically move one reproducer toward and the other away from the operative position with relation to said records.

22. In combination, a talking-machine having a plurality of records and a reproducer for each record, a carriage to support said reproducers, said reproducers having independent movement on said carriage, and a magnet and connections between the same and

said reproducers to automatically move one reproducer toward and the other away from the operative position with relation to said records.

5 23. In combination, a talking-machine having a plurality of records and a plurality of reproducers, one of said reproducers being normally in its operative position with relation to its record, an electric protective circuit, and means operated by a change in the

electrical condition of said protective circuit to automatically remove said reproducer from its operative position and place the other reproducer in its operative position and start said talking-machine.

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