J. H. BRUHN, JR.

AUTOMATIC FIRE ALARM.

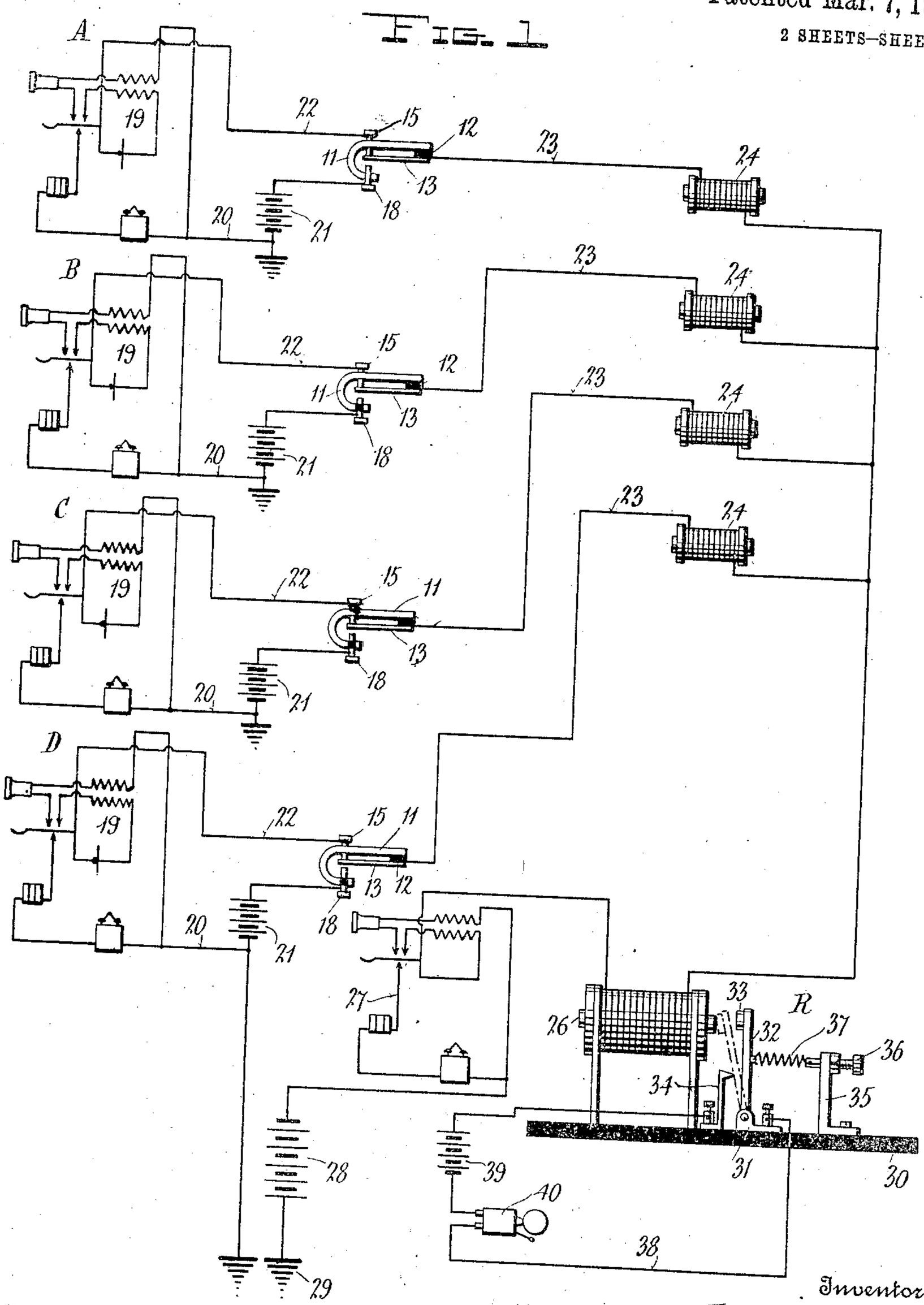
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986,355.

Patented Mar. 7, 1911.

2 SHEETS—SHEET 1.

FIG. 1



Witnesses

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2 SHEETS—SHEET 2.

FIG. 2

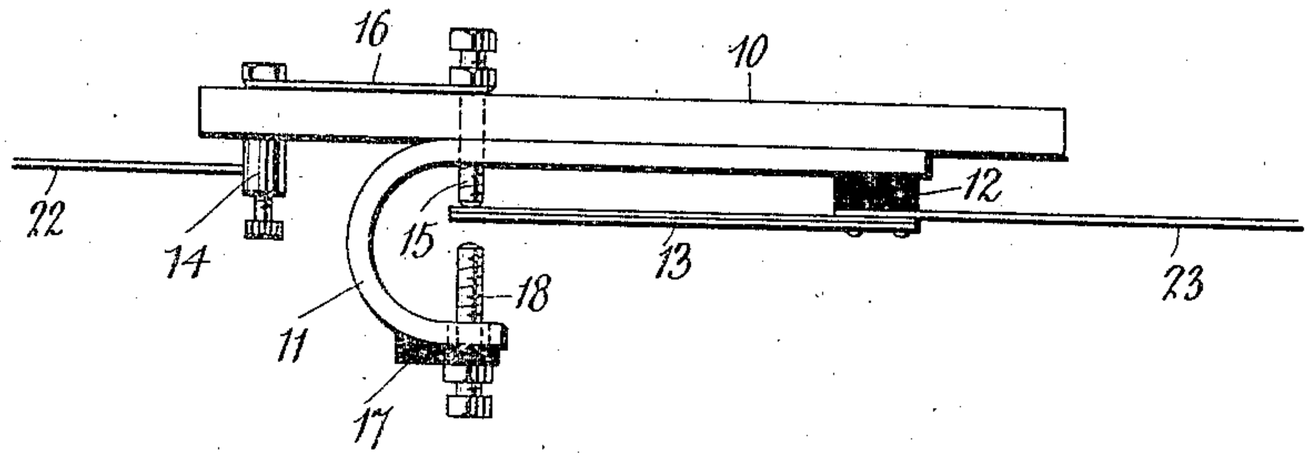
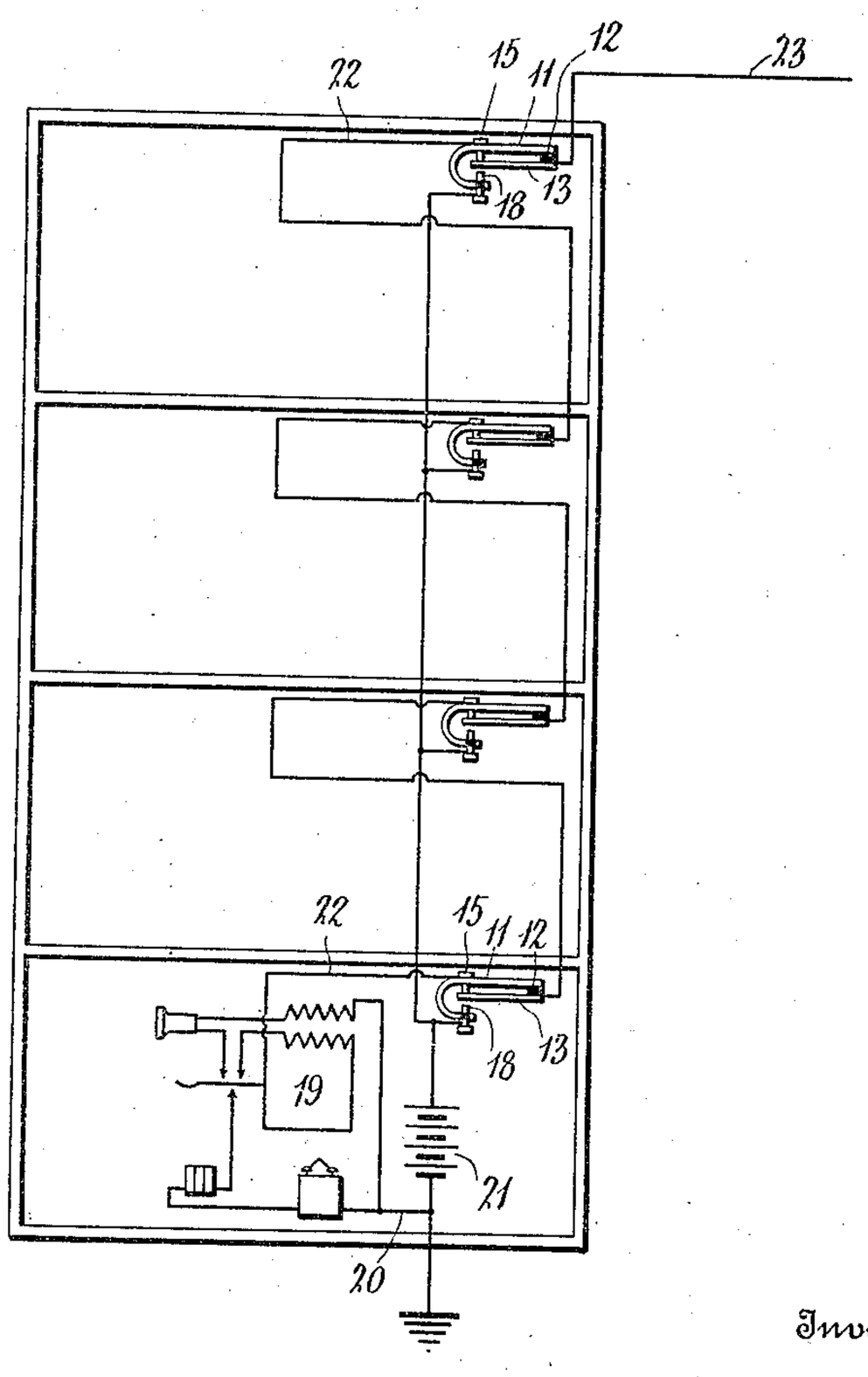


FIG. 3



Witnesses

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UNITED STATES PATENT OFFICE.

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AUTOMATIC FIRE-ALARM.

986,355. Specification of Letters Patent. Patented Mar. 7, 1911.

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To all whom it may concern:

Be it known that I, JOHN H. BRUHN, Jr., a citizen of the United States, residing at Spirit Lake, in the county of Dickinson, State of Iowa, have invented certain new and useful Improvements in Automatic Fire-Alarms; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to fire alarms and has special reference to a thermostatically controlled fire alarm adapted to be used in connection with the line wires of a telephone system.

The principal object of the invention is to provide a novel device of this character wherein the same wire which carries the current impulses due to telephoning or signaling to the central office will also be adapted for use to convey the current for actuation of a magnetic circuit closer arranged to close an alarm circuit.

With the above and other objects in view the invention consists in general of certain novel arrangements of details and combinations of parts hereinafter fully described, illustrated in the accompanying drawings, and specifically set forth in the claims.

In the accompanying drawings, like characters of refernce indicate like parts in the several views, and; Figure 1 is a diagrammatic view showing a telephone system arranged in accordance with this invention. Fig. 2 is a view of the thermostat used in connection with this invention. Fig. 3 is a diagrammatic view showing the wiring of a house having thermostats at different points.

The thermostat used in connection with this invention is properly speaking a two-point thermostatic switch and comprises a base 10 whereon is mounted a J-shaped metallic frame 11. At the end of the stem of this frame is an insulator block 12 upon which is supported one end of a thermostatic element 13 consisting of a pair of metallic bars having different linear coefficients of expansion under the influence of heat, the bars being riveted or otherwise secured together as is common in such devices. On the base 10 is a binding post 14 adapted for connection of the line wire as will be hereinafter described and through the base and frame extends a contact member 15 which is preferably threaded so that it may be adjusted to suit varying conditions. This contact member is connected to the binding post 14 by means of a wire 16. On the frame 10 is carried an insulator block 17 through which passes an adjustable contact member 18, the frame being provided with an opening for said member of sufficient size so that the member 18 does not at any time touch the frame 11, the insulating block preferably being provided with a bushing fitting said opening. These parts are so arranged that under normal heat conditions the thermostatic member 13 will have its free end in contact with the contact member 15 while under conditions of increase of heat this free end will swing over to the member 18 and complete a contact therewith.

The telephone system comprises the usual subscribers' stations 19, the several stations being specifically indicated by the letters A, B, C and D respectively. In the system here shown there is indicated a single wire system, the return being through the ground and at 20 is indicated the ground wire of each station. At each of the subscribers' stations is an auxiliary battery 21 which is connected to the ground wire at one pole and to the respective contact 18 at the other pole. The line wires leading from the several stations are indicated at 22 and these line wires are connected to the contacts 15 of the respective thermostats. It will be seen by reference to Fig. 3 that where more than one thermostat is used in connection with a single subscriber's station the thermostats are arranged in series on the line wires 22 and that the local or auxiliary battery 21 is connected in multiple to the contacts 18 of the several thermostats. Leading from the thermostats are line wires 23 which run to the central station, each wire passing through the annunciator system as typically indicated by the magnets 24. The wires leading from the magnets 24 are connected in multiple to a wire 25 which is wound around a magnet core 26 and from this core passes through a central telephone station provided with the usual service battery 28 connected to the ground at 29. The magnet of which 26 is the core constitutes the circuit closing magnet of a relay indicated in general at R. This relay or circuit closer is provided with a base 30 whereon the magnet is supported and on this base is a fulcrum 31 having an arm 32 pivoted thereto, said arm being provided with an

armature 33 arranged for attraction by the magnet core 26 when the magnet is energized. The base is of insulating material and secured thereon is a contact member 34 which is arranged to be engaged by the arm 32 when the armature is drawn toward the magnet. At 35 is a post which carries a tension screw 36. Connecting the screws 36 and the arm 32 is a tension spring 37 which normally urges the armature 33 away from the magnet but which is arranged in such manner as to permit the movement of the armature to the magnet when the magnet has been energized to a sufficient degree. Connected to the contact member 34 and to the fulcrum member 31 are the ends of a normally open signal circuit 38 embracing a battery 39 and a bell or other signal 40.

The arrangement of the various parts is such that under the normal conditions arising from the flow of current from the battery 28 through the relay magnet the spring 37 will be tensioned sufficiently to prevent the armature 33 from being drawn toward the relay magnet and in consequence the circuit 38 which constitutes the secondary of the relay will remain open. When, however, under abnormal conditions to any one of the telephone stations, the thermostat closes the circuit through the battery 21 at that station and opens the telephone circuit the increased current flow due to cutting in the auxiliary battery 21 will increase the power of the magnet 26 to such extent that the armature 33 will be attracted to the magnet and the circuit through the battery 39 and signal 40 closed and the alarm given. Since the wires from the local or subscriber's telephone leads through the annunciator it will be plain at the same time that the alarm is rung the annunciator drops and indicates at which telephone the fire has taken place and the operator at the central station can immediately notify the fire department of the exact location of a fire.

In the arrangement of wiring shown in Fig. 3 it will be obvious that any one of the thermostats may operate to connect an auxiliary battery in the circuit without the others being affected.

There has thus been provided a simple and efficient device of the kind described and for the purpose specified.

It is obvious that many minor changes may be made in the form and construction of this invention without departing from the material principles thereof. It is not therefore desired to confine the invention to the exact form herein shown and described but it is wished to include all such as properly come within the scope of the appended claims.

What is claimed is:—

1. The combination with a main line telephone circuit including a line wire, a local telephone instrument, a central station annunciator and a two point thermostat switch holding the telephone in circuit under normal heat conditions, said line wire being connected to one point of said switch and the thermostat element of the switch, a battery connected to the remaining point of said switch, a normally open signal circuit, a magnetic circuit closer in said signal circuit and having its magnetic winding connected to said line wire, and means to hold said circuit closer open against current impulses from the local telephone instrument.

2. The combination with a telephone circuit including a service battery and a relay inoperable under the influence of the service battery; of a signal circuit controlled by the relay, a subscriber's station normally in the telephone circuit, an auxiliary battery, and thermostatic means for substituting the auxiliary battery for the subscriber's station in the telephone circuit.

3. The combination with a telephone circuit including a service battery and a relay inoperable under the influence of the service battery; of a signal circuit controlled by the relay, a subscriber's station, an auxiliary battery and a two point thermostatic switch in said telephone circuit and having its points connected respectively to the subscriber's station and the auxiliary battery.

4. The combination with a telephone circuit including a service battery, a relay inoperable under the influence of the service battery, a subscriber's station, and a series of two point thermostatic switches; of an auxiliary battery, a signal circuit controlled by the relay, and multiple connections between the switches and auxiliary battery whereby the operation of any switch will substitute the auxiliary battery for the subscriber's instrument in the telephone circuit.

In testimony whereof, I affix my signature, in presence of two witnesses.

JOHN H. BRUHN, Jr.

Witnesses:
WILLIAM H. EHLBECK,
ANNA BRUHN.