

1,225,934.

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FIRE-ALARM SYSTEM.

1,225,934.

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To all whom it may concern:

Be it known that I, DAVID G. DEE, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Fire-Alarm Systems; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the reference-numerals marked thereon.

The present invention relates to fire alarm systems, having reference particularly to their application to telephone lines whereby an alarm may be sent in over the telephone line from any subscriber's station, and it has for its object to provide a system of this character adapted for use with magneto telephone lines, provision being made for sounding a fire alarm at the central office upon the manual operation of the alarm box at a subscriber's station, and also for sounding a trouble alarm at the central office in case of a permanent grounding on the line. To these and other ends the invention consists in certain improvements and combinations of parts, all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

The drawing is a diagrammatic view illustrating a preferred embodiment of the invention, and showing its application to a telephone line of the magneto type.

The subscriber's circuit is designated at A, being provided with the usual answering jack J and drop D at the central office, and with the receiver R, transmitter T, battery B, and ringing bell C, at the subscriber's station, arranged as usual in magneto telephone lines.

The line A is connected from the subscriber's station to the central office through the spring contact *a*, which is arranged in the alarm box E, as shown, and adapted to be controlled by the alarm wheel *c*, in a manner that will presently be described. The alarm box E is connected to ground at G and adapted to be connected to the subscriber's circuit through the spring contact *d*, which is engaged by the alarm wheel when the latter is rotated, closing the circuit as many times as there are projections on the alarm wheel and thus giving the proper number of impulses or signals to the

central office, corresponding to the number of the alarm box, all as will hereinafter be made clear. The alarm box is preferably actuated by a hand lever, not shown, the movement of which serves to wind up a spring mechanism, and when the hand lever is released, the alarm wheel is rotated by said spring mechanism to send in the alarm, in a manner that is well known in the art of fire alarm boxes.

The fire alarm circuit is completed at the central office, being bridged off from the telephone line through a switch S, there being one such switch for each telephone line, a second line A' being shown in the present embodiment, connected to the fire alarm circuit by the switch S'.

The fire alarm circuit is connected to ground at G' through a battery B', and relays R', R², there being provided one relay in the fire alarm circuit for each telephone line, as shown. The relays R' and R² control the armatures F, F', and F², F³, respectively, one pair of armatures for each subscriber's circuit, armatures F, F² being arranged to control the alarm mechanism, and the armatures F', F³ being arranged to control a trouble signal that will presently be described.

The fire alarm comprises the tap bell H, and register K, these being included in a circuit with the battery B² and armature F. Thus, whenever the alarm box E is operated to close the fire alarm circuit, the latter is grounded at G and G', battery B' serving to energize relay R' and thus cause the armature F to close the circuit which it controls, whereby the tap bell H and register K are operated by battery B² to give the fire signal, indicating the particular box that has been actuated.

In case of a permanent ground on the subscriber's line, it is desirable to give an indication of such trouble to the central office, and to this end I provide a continuously ringing bell L arranged in the circuit with armatures F', F³, and battery B³, by which the bell is operated when armature F' or F³ is operated by its respective relay to close the circuit. In this manner, in case of a ground anywhere in one of the subscriber's lines, the signal L will operate to give an indication of the trouble. The particular line on which it occurs can then be determined and such line cut out of the system by its re-

spective switch S, S', and so forth, until the trouble is corrected.

In some cases, there may be a break on one side of the subscriber's line, and in order that the alarm may be transmitted to the central office over the other side under such condition, I provide a supplemental connection M with the other side of the subscriber's circuit, and arrange a spring contact *n*, adapted to be engaged by the contact *d* when the latter is raised by the alarm wheel. Upon initial movement of the alarm wheel, the alarm circuit is closed through contact *d*, and upon further movement, also through contact *n* so that in case of a break on either side of the subscriber's line, or a reversal of the current, the impulses of the alarm wheel will be transmitted to the central office through one side of the line or the other, and the alarm given.

It will be noted that in the normal operation of the system, the drop D will be operated at the time each alarm is given and in case several alarms should be given simultaneously, or should follow each other in close succession, causing confusion in the operation of the register, the numbers of the respective boxes can be determined from the drops.

While I have shown the invention in a particular arrangement, it is to be understood that I am not limited to the precise combination of elements herein shown and described, but intend to cover by this application any modifications of the system as may come within the terms of the claims hereinafter.

I claim as my invention:

1. In a fire alarm system for magneto telephone lines, the combination with a subscriber's metallic circuit terminating in a spring cut-off line jack, adapted for the insertion of an operator's connecting plug, and a ring-down drop adapted to be eliminated from the subscriber's circuit upon the insertion of the operator's connecting plug in the spring cut-off line jack, of a fire alarm circuit connected to both sides of the subscriber's circuit and to ground, whereby the ring-down drop will be operated when the operator's connecting plug is inserted in the line jack aforesaid.

2. In a fire alarm system for magneto

telephone lines, the combination with a subscriber's metallic circuit terminating in a spring cut-off line jack adapted for the insertion of an operator's connecting plug, and a ring-down drop connected to both sides of the subscriber's circuit, of a fire alarm circuit connected to the subscriber's circuit and to ground, an alarm box in the fire alarm circuit, a battery and relay also included in the fire alarm circuit, an alarm controlled by said relay, and means for closing the fire alarm circuit when the alarm box is operated, the subscriber's circuit being closed when the alarm box is idle and open when the alarm box is operating.

3. In a fire alarm system for magneto telephone lines, the combination with a subscriber's metallic circuit terminating in a spring cut-off line jack adapted for the insertion of an operator's connecting plug, and a ring-down drop connected to the subscriber's circuit, of a fire alarm circuit normally open and connected to the subscriber's circuit, and an alarm controlled by the fire alarm circuit and adapted to be operated when the latter is closed, and means for closing the fire alarm circuit through either side of the subscriber's circuit.

4. The combination with a subscriber's line circuit, of an open alarm circuit connected to both sides of said subscriber's line circuit and to ground, a normally open auxiliary alarm circuit, a normally open trouble alarm circuit, and a relay in said alarm circuit for simultaneously closing both the auxiliary alarm circuit and trouble alarm circuit upon the closing of a circuit through either side of the subscriber's circuit and the ground.

5. The combination with a subscriber's line circuit, including a ring-down drop bridged across the same, of a normally open alarm circuit connected to both sides of said subscriber's circuit and to ground, and means operable upon the alarm circuit for despatching impulses over either side of the subscriber's line circuit and the ground irrespective of the connections between the drop and the subscriber's line circuit.

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