

No. 730,576.

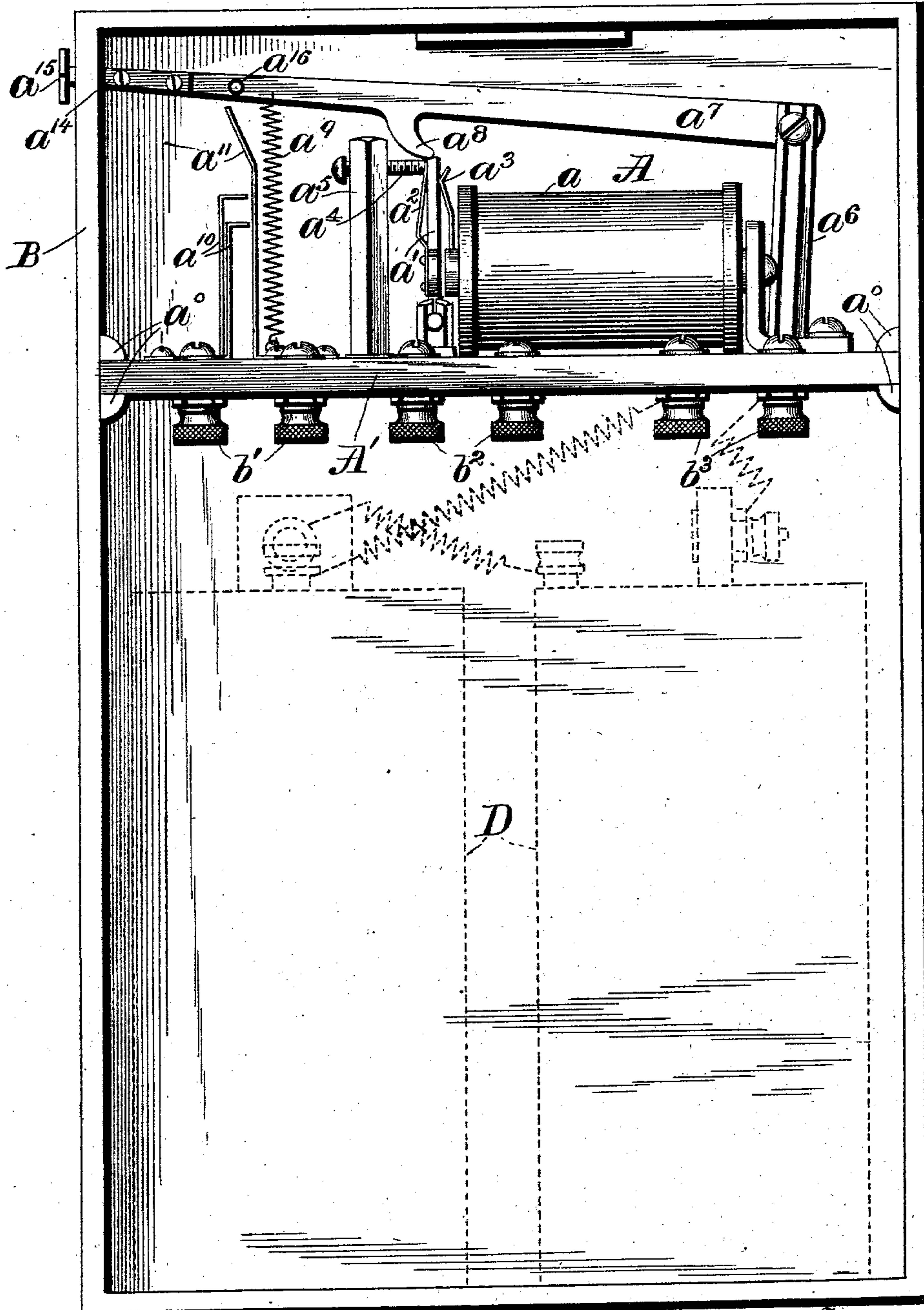
PATENTED JUNE 9, 1903.

S. SCHWARZSCHILD.
ELECTRIC ALARM SYSTEM.
APPLICATION FILED JULY 25, 1902.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1



Witnesses

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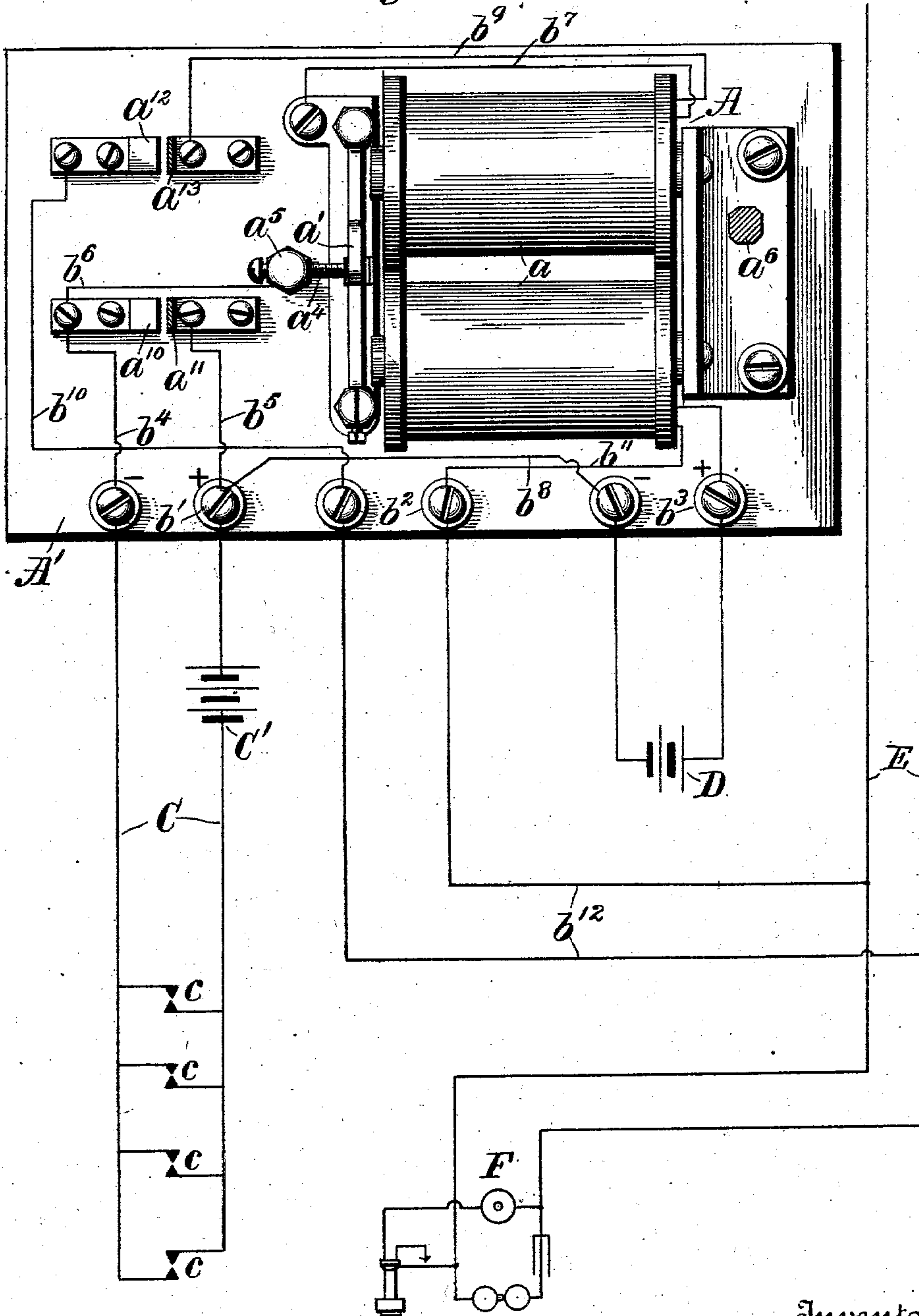
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APPLICATION FILED JULY 26, 1902.

NO MODEL.

2 SHEETS—SHEET 2.

Fig. 2.



Witnesses

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UNITED STATES PATENT OFFICE.

SOLOMON SCHWARZSCHILD, OF ROCHESTER, NEW YORK.

ELECTRIC ALARM SYSTEM.

SPECIFICATION forming part of Letters Patent No. 730,576, dated June 9, 1903.

Application filed July 25, 1902. Serial No. 116,999. (No model.)

To all whom it may concern:

Be it known that I, SOLOMON SCHWARZSCHILD, a citizen of the United States, residing at Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Electric Alarm Systems, of which the following is a specification.

This invention relates to improvements in electric alarm systems; and the principal object of the said invention is to provide protection to telephone subscribers against burglars, fire, and the like by combining with the telephone system an alarm system in which the telephone-circuit is used for the purpose of conveying the alarm-signal.

To this end the said invention consists, among other things, in locating upon the premises to be protected a local alarm-circuit operated by unauthorized entrance, breaking out of fire, and other causes for which an alarm may be sounded and providing means controlled or initially actuated by said local circuit adapted to send an alarm-signal over the telephone-circuit.

The invention further relates to that class of alarm systems in which upon the operation of the local alarm-circuit a call is sent into the central telephone-exchange, actuating the line-drop or other device used for the same purpose and sounding in the operator's telephone-receiver the alarm-call upon the establishment of connection between the calling-line and the operator's set, whereupon the said operator notifies police headquarters, the fire department, or other proper persons of the occurrence and location of the trouble.

The invention more especially relates to the improved form of apparatus for sending this alarm-signal over the telephone-line and the providing of means whereby said apparatus after having been started or initially controlled by the local alarm-circuit operates independently thereof for the time that it is sending in a given alarm.

The invention further consists of the combination and arrangement of parts hereinafter described, and particularly pointed out in the claims.

The preferred embodiment of the invention is shown in the accompanying drawings, in which—

Figure 1 represents the apparatus embodying my invention in side elevation, with the lid of the box which contains the said apparatus removed; and Fig. 2 represents the apparatus in top plan view and partly in section removed from the case and also shows in diagram the electric circuits connected to and operating in conjunction therewith.

Similar letters refer to similar parts throughout both views.

The apparatus herein described I have designated by the trade name of "phonolarm" and consists, among other parts, of an induction-coil A, having, preferably, double magnets and coils a , and a pivoted armature a' , which latter, together with the springs a^2 a^3 , constitutes the interrupter of the said induction-coil. This interrupter is held normally by the spring a^3 against an adjustable screw a^4 , carried by an upright a^5 .

Pivoted in the metal upright a^6 at the rear of the induction-coil is an arm a^7 , which is provided with a downwardly-extending lip or lug a^8 , which normally rests upon the upper end of the armature a' and far enough to one side of the screw a^4 to clear the same when the said armature is removed from the said lug or lip a^8 . A spring a^9 , attached to the said arms, tends normally to pull the same in a downward direction.

The induction-coil and its related parts are all mounted upon a base A' , preferably of insulating material, which is adapted to be held between the lugs a^0 upon the inside of a box or casing B. Secured to this base A' are the upwardly-extending metallic contact-strips a^{10} a^{11} and a^{12} a^{13} . These contact-strips form the normally open contacts of certain electric circuits, which will be hereinafter described. The arm a^7 extends at its end a^{14} through the casing B and is provided at that end with an indicator a^{15} , which indicates, respectively, the "up" and "down" positions of the said arm. This arm also carries an insulated pin a^{16} , which extends from each side of the said arm. The function of this pin is to engage the strips a^{11} and a^{13} and

send them into engagement, respectively, with the strips a^{10} and a^{12} for the completion of the electric circuits hereinafter described.

Upon the base B, I locate suitable binding-posts b^1 , b^2 , and b^3 . The binding-post b^3 connects with a local circuit C, which is provided with switches or contacts c of any desired kind to be operated upon the unauthorized entrance into a building, structure, or premises, or upon the breaking out of a fire in said building, structure, or on the premises. Devices adapted to close or open electric circuits upon the abnormal rise in the temperature due to the breaking out of fire are well known in the art and need not here be described. This circuit C constitutes the local alarm-circuit and is provided with suitable battery or other source of current C' . The negative binding-post of this alarm-circuit connects by wire b^4 to the contact-strips a^{10} , while the positive binding-post connects by wire b^2 to the contact-strips a^{11} . The strip a^{10} also connects, as by wire b^6 , with the interrupter of the induction-coil through the upright a^5 , and thence through the said interrupter to the primary b^7 of the induction-coil. The other terminal of the primary winding of the said induction-coil connects to the plus binding-post b^3 , and thence through a battery D with the negative binding-post of the pair b^3 . This negative binding-post is then connected by wire b^8 to the positive binding-post of the pair b^1 of the alarm-circuit.

The secondary circuit of the induction-coil comprises the secondary windings on said coil, the wire b^9 , normally open contact a^{12} , wire b^{10} , b^{11} , and binding-posts b^2 . The binding-posts b^2 are then connected to the main telephone-circuit E, as by wire b^{12} , as shown. If the circuit is traced from the positive pole of the battery D, it will be seen that the batteries C' and D are arranged in series, from which it will also be seen that the apparatus could be operated by battery D alone in cases where the resistance of the local circuit is low; but for many reasons it is preferable to use the second battery C' also, since this insures a positive initial action of the apparatus. Other reasons for using the battery C' in addition to the battery D will be stated later on.

The battery D usually consists of two cells, which are carried within the casing, as indicated in dotted lines in Fig. 1.

F represents in diagram a conventional form of subscriber's telephone instrument working upon a metallic circuit, though I do not wish to limit my invention to any particular kind of telephone instrument or circuit.

Assuming that the apparatus is in the set position—that is, in that position with the arm a^7 resting upon the upper end of the armature a' —the operation is as follows: The switches c , located in the local circuit C and

operated either by the unauthorized entrance, by fire, or other causes, act to close the local circuit C. This completes the local circuit, which may be traced as follows: from the positive pole of the battery D, through the positive binding-post b^3 , primary of the induction-coil, wire b^7 , interrupter, wire b^6 , wire b^4 , through the negative binding-post b^1 into the local circuit, through the battery C' , positive binding-post b^1 , and thence by wire b^8 through the negative binding-post b^3 , back to the negative pole of the battery D. The circuit thus completed energizes the magnets of the induction-coil and causes them to start the interrupter. The interrupter being thus started will cause the armature a' thereof to be drawn from engagement with the lip a^8 of the arm a^7 . This will allow the said arm to drop, sending the insulating-pins a^{16} into engagement with the upright strips a^{11} and a^{13} . The said strips being thus engaged by the said pins will be sent into contact, respectively, with the strips a^{10} and a^{12} . This taking place will complete the secondary circuit of the said induction-coil through the contact-strips a^{12} and a^{13} and at the same time will also complete a shunt-circuit, comprising the wire b^5 , from the plus binding-post of the local alarm-circuit to the negative binding-post thereof, through the contact-strips a^{10} and a^{11} , thus cutting the local alarm-circuit out of the primary circuit of the induction-coil. The primary circuit, however, will continue to receive current from the battery D and the vibrator will continue to vibrate until some one lifts the arm a' into its "up" position.

The effect of the above operation is to send a rapid succession of induced electrical impulses over the telephone-circuit to the central exchange or other desired point. The closure of the telephone-circuit in the manner described in the transmission of said impulses into the central exchange will actuate the ordinary line-drop or other indicating device in said exchange and will indicate to the operator the line calling, at the same time producing in the telephone-receiver of said operator a sharp buzzing sound, indicating immediately upon forming connection between the operator's set and the line calling the nature of the call thus received—that is, that the call is an alarm and not a line-call of the usual kind. After the alarm apparatus is operated and the arm a^7 falls and connects the shunt across the local alarm-circuit, as described, this places the main battery D and the alarm apparatus entirely beyond the control of the local circuit, and therefore renders the apparatus entirely independent of the said local circuit. A continuous alarm from the apparatus could not be relied upon if its operation depended upon the continued action of the local circuit, since in the event of fire the local circuit might be burned off or otherwise interrupted immediately after the apparatus

is actuated and possibly before the central operator could catch the signal or some unauthorized person might raise a window and close it again before the signal could be sent to the central exchange; but the positive short-circuiting of the wires outside of the main battery and the alarm apparatus proper insures a positive continuous action of the apparatus which is wholly independent after starting of the local circuit.

The apparatus inclosed in the casing B may be located in any desired place, so as to be readily connected to both the local circuit and to the telephone-circuit and forms no part whatever of the subscriber's telephone instrument.

Having described my invention, it is obvious that the same is capable of various changes and modifications which may be made without departing from the spirit of the said invention; but

What I claim, and desire to secure by Letters Patent of the United States, is—

1. In an electric alarm system of the character described, the combination with a telephone-circuit, of electromagnetic inductive means for sending over said telephone-circuit a telephonic signal characterized by a sound peculiar to the signal thus transmitted, a local alarm-circuit initially controlling said electromagnetic means, and means operated by the initial actuation of said electromagnetic means for continuing the operation of the same independent of the exterior local circuit.

2. In an electric alarm system of the character described, the combination with a telephone-circuit, of electromagnetic inductive means for sending over said telephone-circuit a telephonic signal characterized by a sound peculiar to the signal thus transmitted, a local alarm-circuit initially controlling said electromagnetic means, and means operated upon the initiation of said electromagnetic means for shunting the said local alarm-circuit and continuing the action of said electromagnetic signaling means independent of the exterior local circuit.

3. In an electric alarm system of the character described, the combination with a telephone-circuit connecting a subscriber's telephone instrument with an exchange, of electromagnetic inductive means for sending over said telephone-circuit to said exchange a line-call and a telephonic signal characterized by a sound in the central operator's receiver, peculiar to the signal thus transmitted, a local alarm-circuit initially controlling the said electromagnetic signaling means, and means operated upon the initiation of said signaling means, for continuing the action of said signaling means independent of the said local alarm-circuit external to the said signaling means.

4. In an electric alarm system of the character described, the combination with a telephone-circuit, of a local alarm-circuit, means

located in said local circuit for varying the electrical condition of said circuit, an induction-coil and interrupter initially operated by current in the local circuit upon a change in the electrical condition thereof, a switch operated by the magnet of said induction-coil for establishing electrical connection between said induction-coil and said telephone-line, and means for operating said induction-coil and interrupter after their initial actuation by the local circuit, whereby an alarm-signal is sent over the telephone-circuit.

5. In an electric alarm system of the character described, the combination with a telephone-circuit, of an alarm-signaling device comprising a combined induction-coil, interrupter and switch in which the magnet of the induction-coil forms a common actuating means for both interrupter and switch, means acting in conjunction with said switch when actuated for establishing electrical connection between the induction-coil and telephone-circuit, a local alarm-circuit for initially actuating said signaling device, and means for continuing the operation of said device after its initial actuation by said local circuit.

6. In an electric alarm system of the character described, the combination with a telephone-circuit, of a local alarm-circuit, alarm apparatus comprising an interrupter and means operating in conjunction therewith for sending an alarm-signal over said telephone-circuit, upon a change in the electrical condition of said local circuit, a switch controlled by said interrupter, and means operating in conjunction with said switch for completing the connection of said alarm apparatus to the telephone-line and continuing the operation of said apparatus independent of said local alarm-circuit external thereto.

7. In an electric alarm system of the character described, a telephone-circuit, a local alarm-circuit, means included in said local circuit for changing the electrical condition of the same, alarm-signaling apparatus comprising an induction-coil, an interrupter and a switch, said interrupter and switch both actuated by the magnet of said induction-coil, said induction-coil being initially excited by current in said local circuit upon a change in the electrical condition of said circuit, and means operating in conjunction with said switch for completing connection from the induction-coil to the telephone-circuit and continuing the operation of said alarm apparatus independent of the local circuit external thereto.

8. In an electric alarm system, of the character described, the combination with a telephone-circuit, of a local alarm-circuit, an induction-coil and interrupter connected in said local circuit and initially actuated upon a change in the electrical condition of said local circuit, a switch actuated by said interrupter upon the commencement of its operation and means operating in conjunction with said

switch for completing electrical connection from the secondary of said induction-coil to the telephone-line for continuing the operation of the said induction-coil and interrupter independent of the exterior local alarm-circuit.

9. In an electric alarm system of the character described, the combination with a telephone-circuit, of a local alarm-circuit, an induction-coil provided with an interrupter and having its primary normally connected in said local alarm-circuit, an armature forming a part of the interrupter of said induction-coil, conductors connecting the secondary of said induction-coil with the main telephone-circuit, a normally open contact located in said secondary circuit, a shunt-circuit connected across said local alarm-circuit and having a normally open contact connected therein, a pivoted arm normally supported by said armature, and adapted to disengage said armature and close both of the said normally open contacts upon the operation of the interrupter of said induction-coil, whereby the said secondary circuit is completed to the telephone-circuit and the shunt-circuit is completed across said local alarm-circuit, sending over the said telephone-circuit a call and a characteristic signal indicating the na-

ture of the call, and simultaneously rendering the local alarm-circuit temporarily inoperative.

10. In an electric alarm system of the character described, the combination with a telephone-circuit and a local alarm-circuit, of an alarm-signaling device comprising a combined electromagnetic switch, induction-coil and interrupter, initially actuated and controlled by said local alarm-circuit, a pair of normally open contacts forming a part of said switch and connected in shunt across said local alarm-circuit, a pair of normally open contacts and connections whereby the secondary of said induction-coil may be connected in said telephone-circuit, a pivoted arm normally supported by the vibrating armature of said induction-coil and adapted upon the initiation of the operation of said signaling device, to disengage said armature and close said normally open contacts, substantially as and for the purpose herein described.

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

SOLOMON SCHWARZSCHILD.

Witnesses:

W. W. WEBB,
A. W. ST. JOHN.