

No. 659,499.

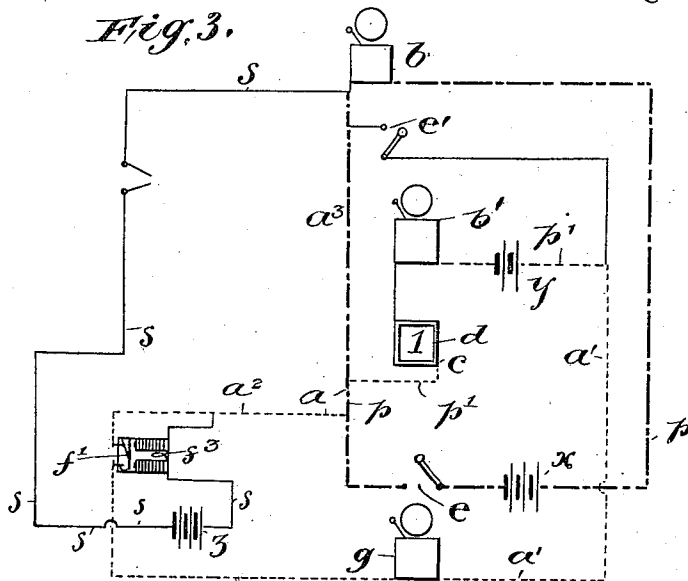
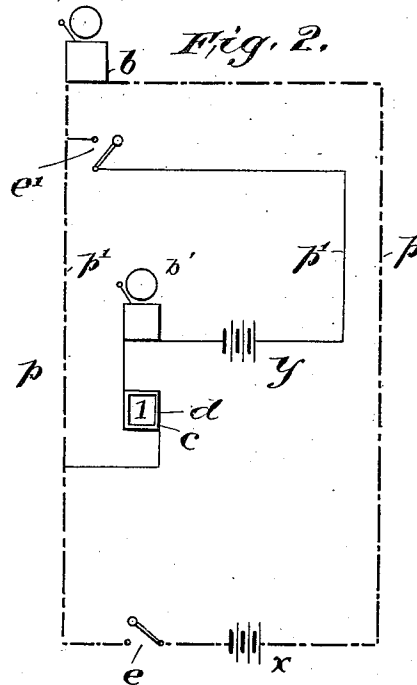
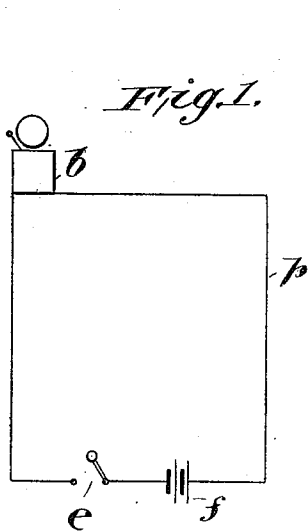
Patented Oct. 9, 1900.

I. W. ULLMAN.
SIGNAL SYSTEM.

(Application filed Nov. 17, 1899.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:
C. W. Benjamin
Herman Meyer

Inventor:
Isaac H. Ullman
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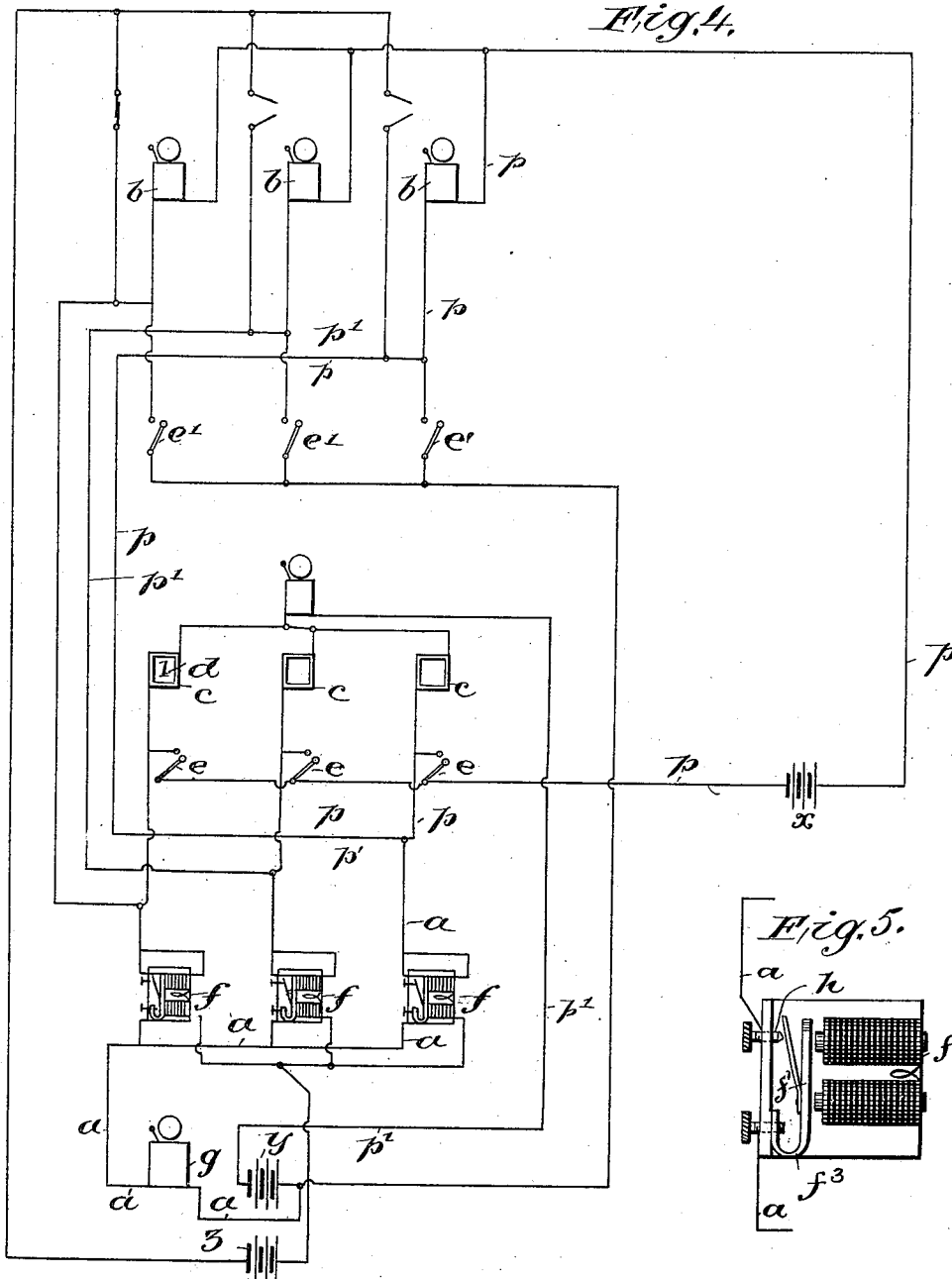
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UNITED STATES PATENT OFFICE.

ISAAC W. ULLMAN, OF NEW YORK, N. Y.

SIGNAL SYSTEM.

SPECIFICATION forming part of Letters Patent No. 659,499, dated October 9, 1900.

Application filed November 17, 1899. Serial No. 737,291. (No model.)

To all whom it may concern:

Be it known that I, ISAAC W. ULLMAN, a citizen of the United States, residing in the city of New York, county of New York, and State of New York, have invented a new and useful Improvement in Signal Systems, of which the following is a specification.

My invention relates to alarm signal systems electrically operated; and its novelty consists in the means employed to extend the use of the ordinary push-button and annunciator system until it is converted into and made part of an alarm signal system without disturbing the normal purpose or function of the original system and at slight expense.

Practically all hotels and many private houses are provided with the ordinary push-button and annunciator signal system, whereby the pushing of a button in one room completes an electrical circuit connected with a source of supply of electrical energy, like a battery, actuates an alarm tinkle-bell, and drops a tablet upon an annunciator, which displays a number corresponding to that of the room from which the signal is sent. This is a common form of device and needs no further explanation to those skilled in the art.

To provide a hotel or private house with an automatic fire or burglar system has always been and continues to be expensive. It necessitates much wiring, the use of many batteries, signal-gongs or similar means of attracting attention, and some simple means of indicating the place of origin of the alarm. In other words, it is, in effect, a separate system, like the push-button and annunciator system, only it is brought into operation by the completion of a circuit by the melting of a fusible metal or the opening of a window or the like.

The purpose of my invention is to use the annunciator system and its annunciator as an essential part of the alarm system, using in part the same battery, so as to lessen the expense. In carrying out my purpose it is important to remember that the annunciator system, which I shall hereinafter call the "primary circuit," consists of a circuit normally open and provided with a battery and an annunciator, and that there is a secondary circuit used to signal back from the annunciator to the place of origin of the original

alarm and fed from a separate battery. To this I add an auxiliary circuit, deriving its energy from the same battery as the primary circuit, containing an alarm-gong in the circuit, and which auxiliary circuit is normally open. To this, again, I add what I call the "alarm-circuit." This circuit derives its energy from a third battery, is provided with an electromagnet, and is normally closed. The armature of the electromagnet is so arranged, however, with reference to the conductors of the auxiliary circuit that when the alarm circuit is opened part of the conductor of the auxiliary circuit is attracted from its normal position, so as to close the auxiliary circuit, actuate the alarm-gong in the auxiliary circuit by closing the primary circuit, and drop the tablet in the annunciator, so as to indicate the place of origin of the alarm. In order to open the alarm-circuit, (supposing the device to be used as a fire-alarm,) I make that portion of the alarm-circuit designed to guard the room or other locality of readily-fusible metal, running it, for instance, around the room within the picture-molding or over the sash-frames and doors. By such means if the heat in the room as the result of a fire becomes sufficiently great to melt the metallic conductor its continuity is broken and the alarm-circuit is broken, the tablet in the annunciator drops, and the gong rings, calling attention to the disaster. In a similar manner a portion of the conductor may be so arranged—for instance, over a window-sash frame—that by moving the window by the raising of the sash the circuit is broken, as before, and the alarm is sounded.

In the drawings, Figure 1 represents a diagram of a simple electrical circuit normally open and closed by a push-button. Fig. 2 represents the primary and secondary circuits, the latter being shown in dotted outlines and the portion p' being common to both circuits. Fig. 3 represents these same two circuits as shown in Fig. 2, with the addition of the auxiliary circuit (shown in dotted outlines, with the exception of the part a , common to the primary and secondary circuits, and that between the annunciator and its bell common to the primary) and the alarm-circuit, (shown in full line, with the exception of the part a^2 , which is common to the aux-

iliary circuit, the part a , which is common to the several circuits of the system, and the part a^3 , which is common to the primary and secondary circuits.) Fig. 4 represents a plurality of circuits, such as are represented singly in Fig. 3; and Fig. 5 is an enlarged detail view of the electromagnet and its connections.

In the drawings, Fig. 1 represents a diagram of a simple electrical circuit which is normally open and in which p is the conductor, f is the battery, e is a push-button, of usual form, for closing the circuit, and b is a bell caused to ring by the completion of the circuit in the usual manner. In Fig. 2 I represent, essentially, the same circuit in dotted outline, but show the addition of an annunciator-circuit. (Shown in part in unbroken line.) In this figure c is the annunciator of common form, d is one of the drops of the same, y is one battery and x is another, and e' a push-button. The portion p' of the conductor is common to both systems. This is known in the trade as a "return-call" system. If the push-button e is closed, the bell b rings by the closing of the circuit through the battery x and continues to ring so long as the push-button e is closed. If now the push-button e' is closed, the return-circuit, with the annunciator, becomes operative through the battery y , and a signal is thus returned to the point of origin of the first call.

In Fig. 3 everything is shown which is illustrated in Fig. 2, with the addition of an auxiliary circuit and an alarm-circuit. The auxiliary circuit is normally open and consists of the conductor a' , (shown in dotted outline,) the conductor a , which forms part of all the annunciator-circuits, the conductor p' , and that part of the annunciator-circuit between the annunciator c and the bell b' . It also contains the gong g' , and the armature f' , and is fed from the battery y .

The alarm-circuit consists of the conductor s , shown in full line, with the addition of the section a^2 of the auxiliary circuit and the section a , which is common to all of the circuits, and the section a^3 , which is common to the primary and secondary circuits.

The electromagnet f^3 is mounted in any suitable frame, and near it is a suitably-supported contact-post h . The armature f' forming part of the auxiliary circuit, the said circuit is kept open as long as the armature is attracted toward the magnets by the energizing of the latter. Such energizing continues so long as the alarm-circuit, of which the conductor s and the battery z forms a part, is closed. Therefore if the alarm-circuit is broken the magnets are deenergized, the retraction of the spring f'' , which forms a part of the armature f' , moves the latter toward the contact-post h , and the auxiliary circuit is thereby closed. This causes the gong g to ring and the annunciator-drop d to ring and its tinkle-bell b to ring.

To recapitulate, in the systems shown in Fig. 3 I have the secondary circuit normally

open. If now the push-button e is operated, this circuit is closed and the bell b rings. The signal so given may be answered by pushing the button e' , in which case the annunciator-drop d falls and its bell b' rings, being actuated by the battery y in the return-circuit. If, however, the secondary circuit be closed in any other manner than by the operation of the push-button, the same signal is given.

The purpose of the auxiliary circuit is to effect such closing and to make an alarm. This circuit consists in part of the primary circuit, in part of the secondary circuit, and contains the gong g to give the alarm and the annunciator c to tell the place of origin of the alarm. To close this auxiliary circuit, the means employed is the opening of the alarm-circuit, which by the deenergizing of magnets f^3 releases the armature f' to contact with the post h . Therefore in order that the alarm may be sounded it is necessary that the alarm-circuit shall be opened when the emergency to be guarded against arises.

The means employed to effect this purpose is to make that portion of the conductor which passes the room or locality to be guarded of readily-fusible metal, which by its being melted in case of fire opens the alarm-circuit and closes the auxiliary circuit, sounding the alarm and indicating its source. This is accomplished because that part of the primary circuit which contains the bell b' and annunciator c forms part of the path of this circuit, which is thus closed. The gong g rings because it is in the main line of the circuit.

The purpose of the gong is to indicate an alarm of a different character from the normal call. Without the gong the ringing of the tinkle-bell b' would indicate nothing unusual. It is obvious that the gong g should be a single-stroke gong in contrast to the tinkle-bell b' , which is a vibratory bell.

In Fig. 4 a plurality of circuits is represented. In such case the same alarm-gong is used for all the circuits and, as will be seen from an inspection of the diagram, the same number of batteries is used as in the system shown in Fig. 3. Likewise the button-battery conductor, the bell-battery conductor, and the alarm-battery conductor are common to all the circuits, and the only independent conductors necessary are conductors from the rooms to the annunciator.

An important advantage of my device is that if the battery z becomes exhausted the deenergizing of the magnets f^3 causes the closing of the auxiliary circuits, thereby causing the alarm-gong g and the tinkle-bell b' to ring, and thus automatically indicating the crippling of the system. Through this the entire system is under constant test.

What I claim as new is—

1. The combination with an electrical annunciator system, complete for independent operation as such, and including bells, an annunciator and manually-operated switches,

the circuit of said system being normally open, of means for automatically sounding a separate alarm from the bells of the annunciator and closing the circuit through the annunciator, embodying a normally-open auxiliary circuit formed partly by the annunciator-circuit and including said separate alarm-bell, and a normally-closed alarm-circuit having a magnet which breaks said auxiliary circuit when the alarm-circuit is closed and closes said auxiliary and annunciator circuits when the alarm-circuit is broken, said alarm-circuit also including means operating automatically to open it and thereby close the auxiliary and annunciator circuits, in certain events, as and for the purposes specified.

2. In an electrical alarm system, the combination with normally-open primary and secondary circuits, constituting a return-call annunciator system, said primary circuit including an alarm and a manually-operated circuit-closer, and said secondary circuit including an annunciator, an alarm and a manually-operated switch, of a means for automatically operating the annunciator and sounding a separate alarm-bell, comprising a normally-open auxiliary circuit, formed partly by said primary and secondary circuits and including said separate alarm-bell, and a normally-closed alarm-circuit including a magnet so related to the auxiliary circuit as to open the latter when the alarm-circuit is closed and close the same when the alarm-circuit is open, and said alarm-circuit also having fusible sections acting automatically to open it, substantially as described and for the purposes set forth.

3. The herein-described electrical alarm system, consisting of a normally-open pri-

mary circuit, including a bell and a manually-operated circuit-closer, a normally-open secondary circuit, including an annunciator, a bell and a manually-operated circuit-closer, each of said circuits having a battery and both circuits constituting a return-call annunciator system, and means for automatically closing the circuit through the annunciator, embodying a normally-open auxiliary circuit deriving its energy from the battery of the primary circuit and including an alarm-bell separate from those of the other circuits, and an alarm-circuit, including a battery and fusible sections, said alarm-circuit being normally closed and having an electromagnet so related to the auxiliary circuit as to open the same when the alarm-circuit is closed and to close the same when the alarm-circuit is open, substantially as described and for the purposes set forth.

4. The combination with a primary circuit provided with a battery, and containing an annunciator and tinkle-bell in circuit, a secondary circuit provided with a battery and bell, an auxiliary circuit provided with a gong in circuit and fed from the battery of the primary circuit and means for breaking the auxiliary circuit consisting of an alarm-circuit provided with a battery, whereby when the battery of the alarm-circuit is exhausted the gong of the auxiliary circuit will ring.

Witness my hand this 4th day of November, 1899, in the presence of two subscribing witnesses.

ISAAC W. ULLMAN.

Witnesses:

GEORGE H. ABBOTT,
MABEL K. WHITMAN.