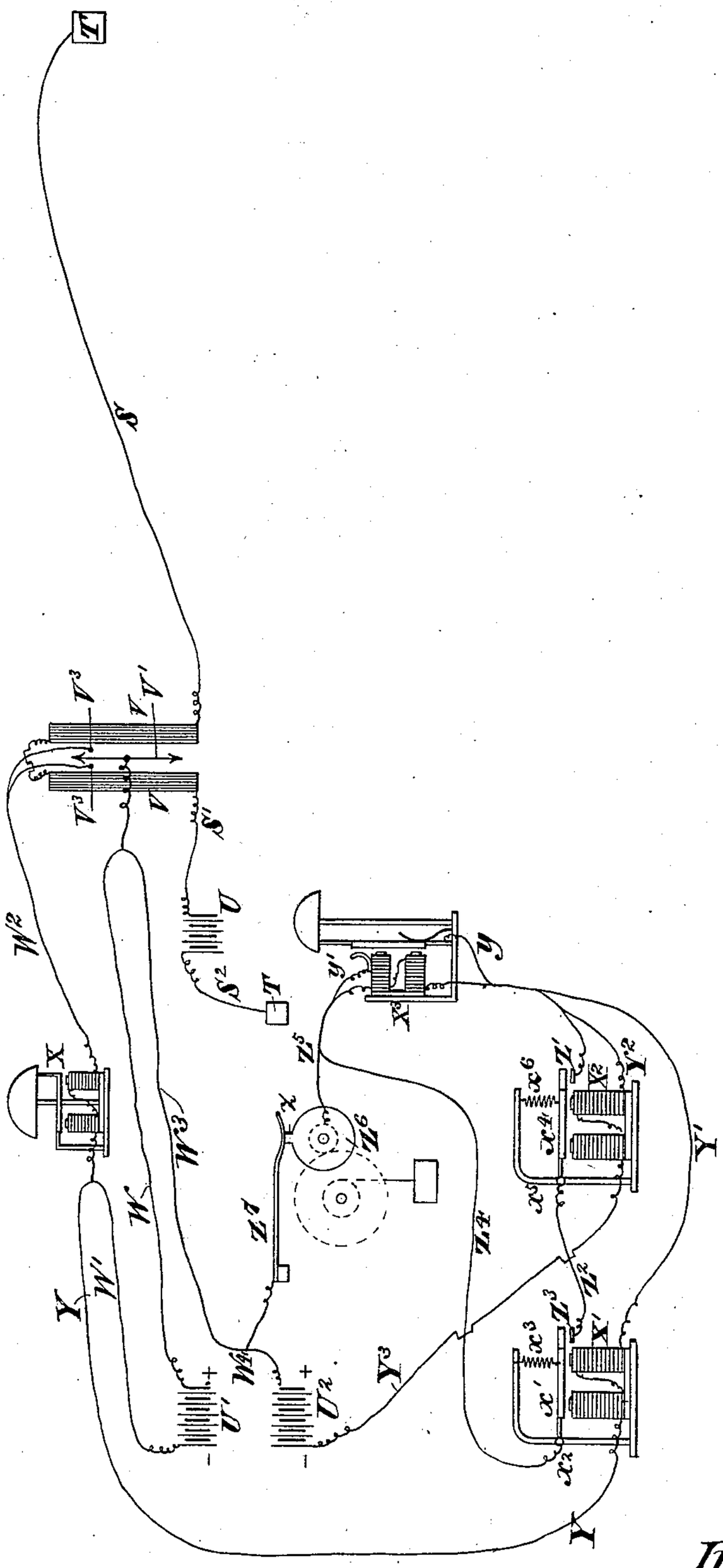
(No Model.)

H. C. ROOME.

ELECTRIC ALARM AND SIGNAL.

No. 316,183. Patented Apr. 21, 1885.



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ELECTRIC ALARM AND SIGNAL.

SPECIFICATION forming part of Letters Patent No. 316,183, dated April 21, 1885.

Application filed September 15, 1884. (No model.)

To all whom it may concern:

Be it known that I, HENRY C. ROOME, of Jersey City, in the county of Hudson and State of New Jersey, have invented a certain new and useful Improvement in Electric Alarms and Signals, of which the following is a specification.

My improvement relates to an electric alarm or signal of the kind wherein the opening or the closing of a main electric circuit or the varying of the resistance therein operates to close a local circuit for the purpose of giving an alarm or signal. It is scarcely necessary to remark that the efficiency of an alarm or signal of the kind referred to depends largely upon the operativeness of the local circuit. Obviously, it is possible in such alarms or signals, as they are ordinarily constructed, for the battery of the local circuit to become inoperative without indicating that fact, and while those who are using the alarm or signal are depending upon its operating properly. It is the object of my improvement to provide a means whereby an alarm or signal will be given in the event of the giving out of a battery, which operates in conjunction with the said local circuit.

I will describe in detail an alarm or signal embodying my improvement, and then point out its novel features in claims.

The accompanying drawing is a diagram illustrating an electric burglar alarm or signal embodying my improvement.

S designates a wire forming part of a main electric circuit. It is shown as connected at one end with an earth-plate, T, and at the other end with one end of the coils V of a galvanometer, V V′.

S′ designates another wire forming part of the main circuit, and extending from the other end of the coils of the galvanometer to one pole of an electric battery, U, of any approved form. A wire, S^2, also forming part of the main electric circuit, extends from the other pole of the said battery to an earth-plate, T′. As shown, this main circuit is a normally-closed circuit. The needle V′ of the galvanometer V V′ will be deflected in one direction out of its normal position if the main circuit be opened, and it will be deflected in one direction or the other if the resistance of the main circuit be altered. My improvement is not confined to use in conjunction with a normally-closed main circuit. It may be used with a normally-open main circuit. The closing of the main circuit would then cause the deflection of the galvanometer-needle.

The galvanometer-needle is shown as having combined with it two contact-points, V^2 V^3, against one or the other of which it will impinge when sufficiently deflected.

Having described the main electric circuit of the alarm or signal shown, I will now proceed to describe the other features of the alarm or signal.

U′ designates an electric battery of any approved style. W designates a wire extending from one pole of the battery U′ to the pivot of the needle V′ of the galvanometer V V′. As here shown, this wire W is connected to the positive electrode of the battery U′. A wire, W′, extends from the other electrode of the battery U′ to one end of the coils of an electro-magnet comprised in an electro-magnetic bell, X. From the other end of the coils of this electro-magnet a wire, W^2, extends to the contact-points V^2 V^3, with which the needle of the galvanometer operates. The electro-magnetic bell may be of any desirable form.

The circuit composed of the wires W W′ W^2, the battery U′, and the electro-magnetic bell X forms the local circuit of the alarm or signal. This electro-magnetic bell X is the device which is relied on for giving an alarm when any change occurs in the main circuit. The battery U′, that supplies the electric current for operating the electro-magnetic bell X, is the one which I desire to guard by providing for the sounding of an alarm in the event of its becoming inoperative.

U^2 designates an electric battery which is of the same potential as the battery U′. The positive pole of the battery U′ is connected with the positive pole of the battery U^2 by the wire W, a wire, W^3, leading from the wire W, and a wire, W^4, leading from the wire W^3 to the battery U^2. The negative electrode of the battery U′ is connected with the negative electrode of the battery U^2 by the wire W′, a wire, Y, extending from the wire W′ to the coils of an electro-magnet, X′, a wire, Y′, extending from the coils of this electro-magnet X′, a wire, Y^2, extending from the wire Y′ to the coils of an electro-magnet, X^2, and a wire,

Y^3, extending from the coils of the electro-magnet X^2 to the battery U^2.

Owing to the manner in which the batteries U' U^2 are connected, they will be neutralized, so that they will produce no magnetic effects while the current of both batteries is confined to the wires already mentioned.

The electro-magnet X' is provided with an armature, x', pivoted at x^2, and retracted from the poles of the electro-magnet X' by a spring, x^3, when the said electro-magnet is not energized.

The electro-magnet X^2 has an armature, x^4, pivoted at x^5. This armature is retracted from the poles of the electro-magnet X^2 by a spring, x^6, when this electro-magnet is not energized.

From the wire Y^2 a wire, Z, extends to a contact-point, Z'. When the armature x^4 of the electro-magnet X^2 is attracted by the electro-magnet, it will impinge against the contact-point Z'. The wire Z will then be in electric communication with the armature x^4. From the armature x^4 a wire, Z^2, extends to a contact-point, Z^3. When the armature x' of the electro-magnet X' is attracted by the said electro-magnet, it impinges against the contact-point Z^3, and is then in electric communication with the wire Z^2. From the armature x' a wire, Z^4, extends to a wire, Z^5. The wire Z^5 is connected to one end of the coils of an electro-magnet comprised in an electro-magnetic bell, X^3. The wire Y' is connected to the other end of the coils of the electro-magnet of this electro-magnetic bell. This electro-magnetic bell is of the kind wherein the attraction of the armature by the electro-magnet effects the closing of a shunt-circuit, whereby the electro-magnets are shunted out. This shunt-circuit consists of wires y y', leading from the wires Y' Z^5, respectively, the wire y being connected to the armature of the electro-magnet, and the wire y' being provided with a contact-point, against which the armature will impinge when attracted by the electro-magnet. A spring is employed to retract the armature when the electro-magnet is de-energized.

The wire Z^5 extends from the coils of the electro-magnet comprised in the electro-magnetic bell X^3 to the metal shaft of a rotary wheel, Z^6, which is also made of metal. This wheel is one wheel of a train of wheels operated, preferably, by a spring or weight, and at a comparatively slow rate of speed. The wheel Z^6 is provided with a spur, z, which once in each rotation makes electrical contact with a metallic finger, Z^7, connected with the wire W^4.

Having now described the various features of the alarm or signal illustrated, I will describe the operation of the parts embodying my improvement.

During those intervals of time when the spur of the wheel Z^6 is not in contact with the metallic finger Z^7 the electric currents produced by the batteries U' U^2 will neutralize each other, because their positive poles will be connected together, and their negative poles will also be connected together. Should the needles of the galvanometer V V' be deflected against either of the contact-points V^2 V^3, the electric current from the battery U' will pass along the wire W to the galvanometer-needle, and from the contact-point with which the needle happens to be in contact to and along the wires W' W^2 to the battery.

Whenever the spur of the wheel Z^6 makes contact with the metallic finger Z^7, the electric current from the battery U' passes along the wire W to the wire W^3, and thence along this wire to the wire W^4. The electric current from the battery U^2, as well as that from the battery U', passes along the wire W^4 to the metallic finger Z. Both electric currents pass along the metallic finger Z^7 to the wheel Z^6, thence along the wire Z^5 to the coils of the electro-magnet comprised in the electro-magnetic bell X^3. The electric current from the battery U' proceeds from the coils of the electro-magnet comprised in the electro-magnetic bell X^3 to the wire Y', thence to the coils of the electro-magnet X', thence to the wire Y, and thence along the wire W' to the said battery. The electric current from the battery U^2, after reaching the coils of the electro-magnet comprised in the electro-magnetic bell X^3, proceeds thence along the wire Y' to the wire Y^2, thence through the coils of the electro-magnet X^2 to the wire Y^3, and along the latter to the said battery U^2. The electric currents flow in this manner only momentarily at regularly-recurring periods on the contact of the spur of the wheel Z^6 with the metallic finger Z^7. When they thus flow, the electro-magnet of the electro-magnetic bell X^3 and the electro-magnets X' X^2 will attract their armatures. The movement of the armature of the electro-magnet comprised in the electro-magnetic bell X^3 causes a stroke of the bell to be made, and the attraction of the armatures of the electro-magnets X' X^2 to the said electro-magnets results in the shunting of the electric currents from the wire Z^5 to the wire Z^4, whence they proceed to the armature of the electro-magnet X', thence to the contact-point Z^3 and wire Z^2, thence along the armature of the electro-magnet X^2, and thence along the contact-piece Z' and wire Z to the wire Y^2. Here the electric currents separate, as before explained. The electric current of the battery U' proceeds thence to the wire Y', along the latter to the coils of the electro-magnet X', thence to battery and the wire Y to the wire W, and thence along the latter to the said battery U'. The electric current of the battery U^2 proceeds along the wire Y^2 to the coils of the electro-magnet X^2, and thence along the wire Y^3 to the said battery U^2. Owing to the coils of the electro-magnet comprised in the electro-magnetic bell X^3 being shunted out in this manner, the electro-magnetic bell will make but a single stroke while both batteries remain operative at each contact of the spur of the wheel Z^6 with the metallic finger Z^7. The

sounding of the electro-magnetic bell in this manner, therefore, indicates that the batteries are in order. Should an accident happen to the metallic finger Z^7, then the electro-magnetic bell X^3 will not ring at all; hence a failure of the bell to ring will indicate that the said finger is out of order.

If the battery U′ should become inoperative, the electro-magnet X′ will not be energized so as to attract its armature *x′;* hence the electro-magnet comprised in the electro-magnetic bell X^3 will not be shunted out by the action of the electro-magnet X′. Consequently this electro-magnetic bell will ring continuously, and thereby indicate that the battery U′ is out of order.

To recapitulate, my invention relates to a local circuit provided with a device for giving an alarm or signal when a main circuit is opened, closed, or altered in resistance. The local circuit is part of a larger circuit connecting the positive poles of two batteries, U′ U^2, together and their negative poles together. A conductor common to both batteries, and consisting of the metallic finger Z^7 and the wire Z^5, leads to an electric alarming or signaling device, which in the present example is an electro-magnetic bell, X^3. This common conductor has combined with it a periodical interrupter, shown as consisting of the wheel Z^6 and finger Z^7. Electro-magnets X′ and X^2 are arranged between the alarming or signaling device X^3 and the batteries U′ U^2, and branch connections $Z\ Z'\ Z^2\ Z^3\ Z^4$ are employed to enable the electro-magnets X′ X^2 to shunt out the electric signaling device when both the batteries are operative and the common conductor is closed.

What I claim as my invention, and desire to secure by Letters Patent, is—

The combination, with the local alarming or signaling circuit of an alarm or signal apparatus, of two electric batteries, a circuit comprising the local circuit aforesaid and connecting the positive poles of the said batteries together and their negative poles together, a conductor common to both batteries, a periodical interrupter for the common conductor, an electric alarming or signaling device to which the said common conductor leads, electro-magnets arranged, one in a portion of the circuit between the alarming or signaling device and the one battery, and the other between the alarming or signaling device and the other battery, and branch connections whereby the said electro-magnets may shunt out the alarming or signaling device when both batteries are operative and the common conductor is closed, substantially as specified.

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