No. 619,449. Patented Feb. 14, 1899.

J. TOMNEY.

ELECTRIC PROTECTIVE SYSTEM.

(Application filed June 24, 1898.)

(No Model.) 2 Sheets—Sheet 1.

Fig: 2.

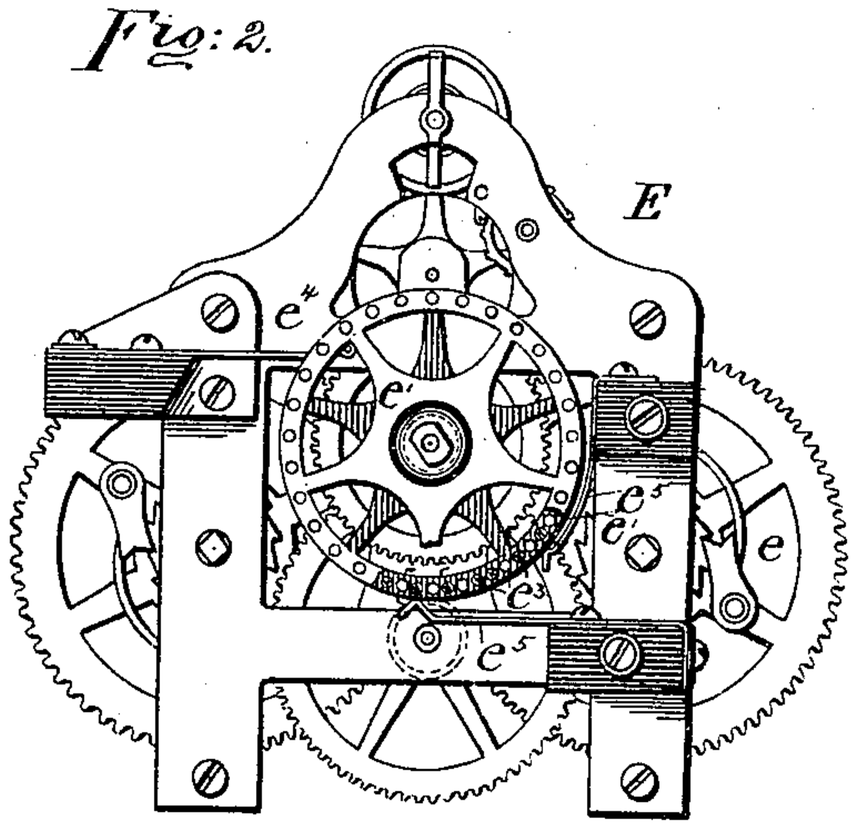

Fig: 1.

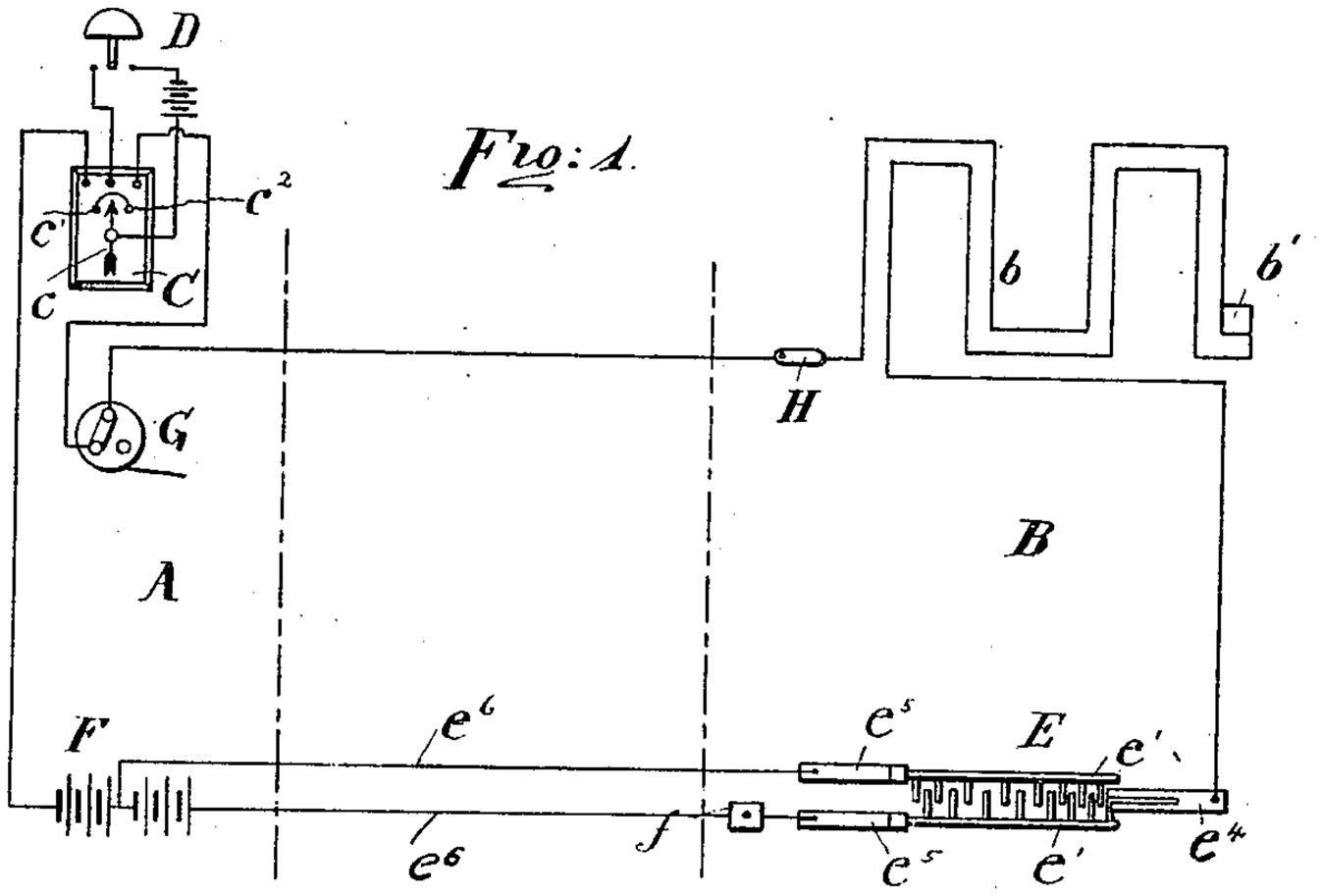

Fig: 3

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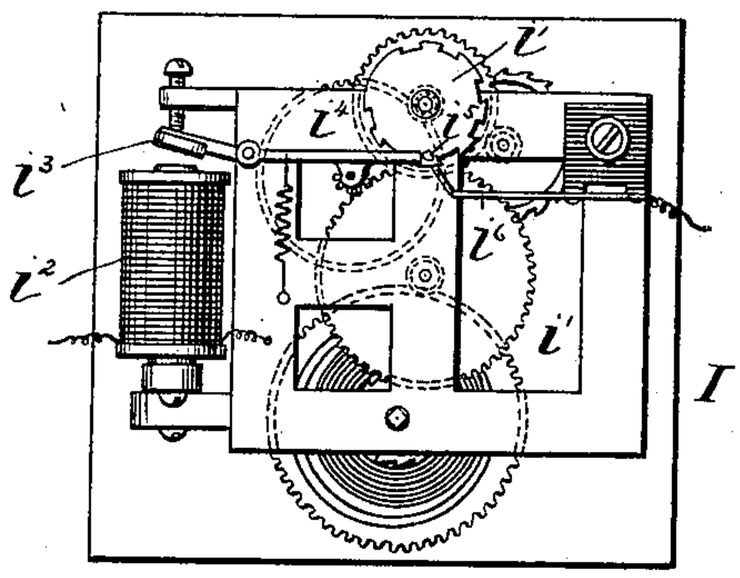
Fig: 5



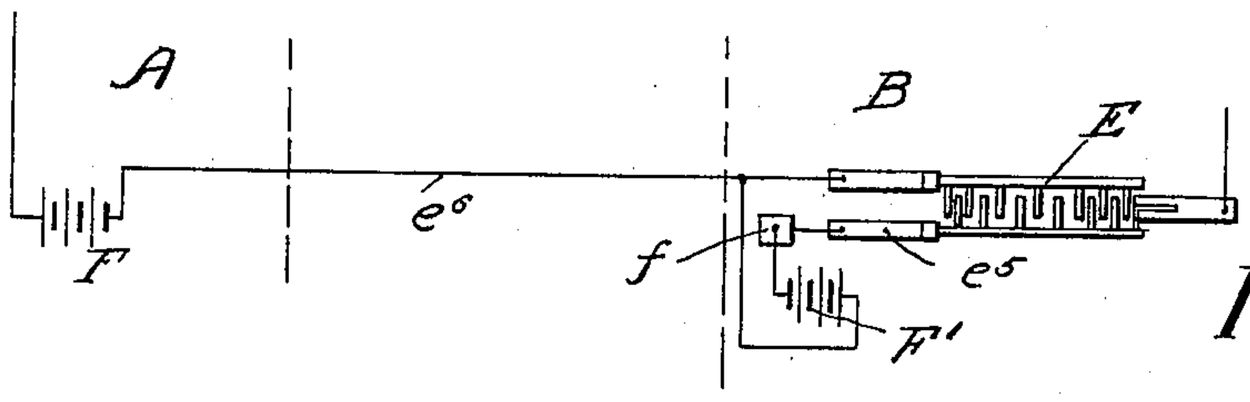
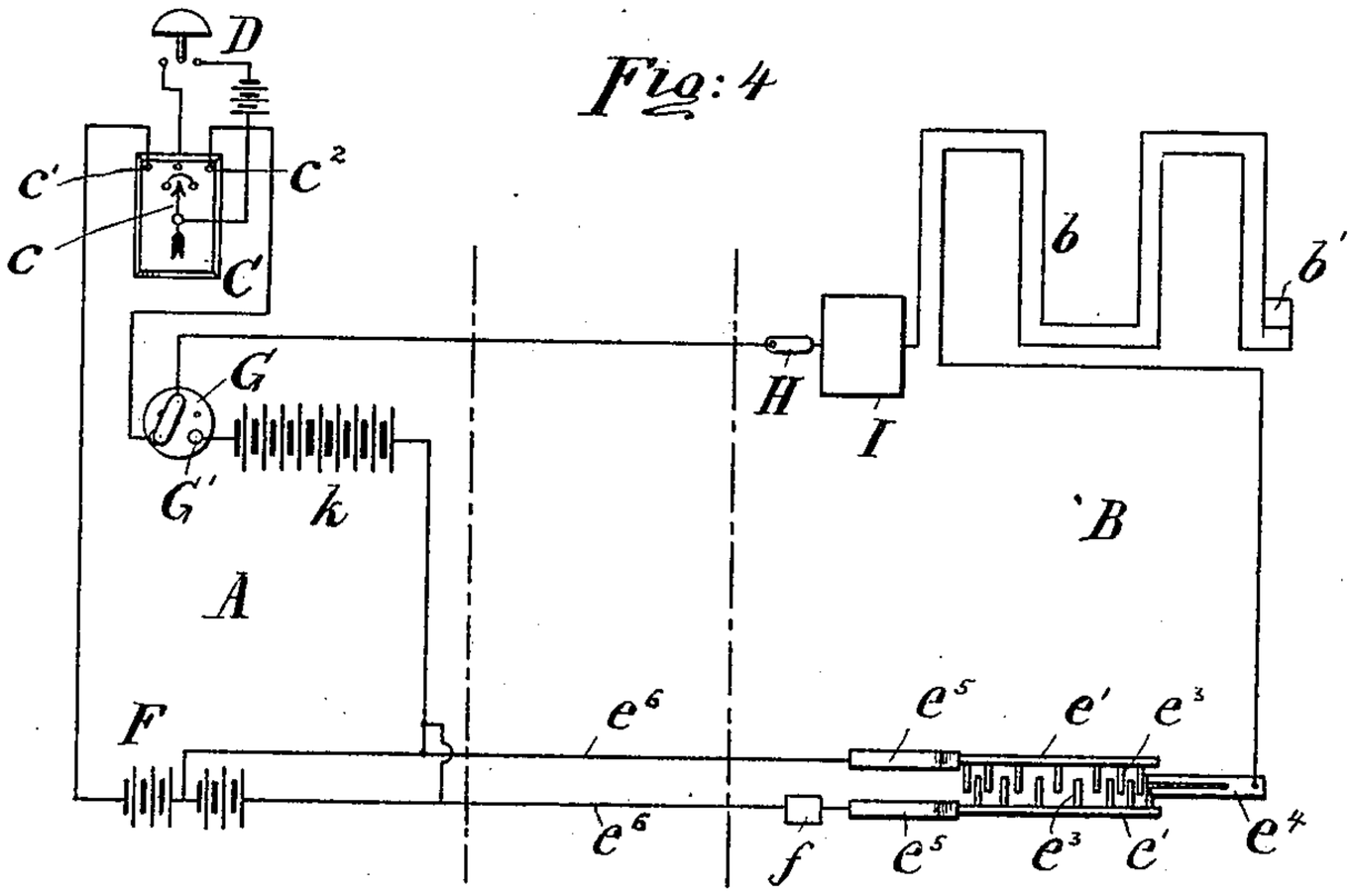


Fig: 6.

Fig: 4



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ELECTRIC PROTECTIVE SYSTEM.

SPECIFICATION forming part of Letters Patent No. 619,449, dated February 14, 1899.

Application filed June 24, 1898. Serial No. 684,381. (No model.)

To all whom it may concern:

Be it known that I, JAMES TOMNEY, a citizen of the United States, residing at New York city, in the county and State of New York, have invented certain new and useful Improvements in an Electric Protective System, of which the following is a specification.

My invention relates to an electric protective system or burglar-alarm system; and it has for its object to prevent any tampering with the circuit or circuits extending from a guarded structure to a central office or indicating-point. To accomplish this, I provide means for putting into the circuit an additional amount of electric current and at the same time enough resistance to compensate for the added current. I may also provide a multiplicity or plurality of paths which form the return of said circuit from the guarded structure to the central office or indicating-point and change from one path to another.

I will describe a system embodying my invention and then point out the novel features in the claims.

In the drawings, Figure 1 is a diagrammatic view of a burglar-alarm system embodying my invention. Fig. 2 is a view in elevation of a mechanism for changing the path of the circuit. Fig. 3 is a detail horizontal sectional view. Fig. 4 is a diagrammatic view of a system similar to that shown in Fig. 1, in which a signaling device is shown. Fig. 5 is a view in elevation showing a device for producing a signal. Fig. 6 is a part of a diagrammatic view similar to Figs. 1 and 4 and showing a modification.

A represents a central station or indicating-point, and B a protected premises or guarded structure. In the central office A, I have provided a galvanometer C, of any desired construction, the needle *c* of which oscillates over a scale between the ends c' c^2 and an alarm D, the circuit for which embraces the needle *c* of the galvanometer and the ends c' c^2 of the scale.

In the guarded structure B, *b* represents the wiring throughout the same, which may be in a wooden cabinet surrounding a safe or connecting with the windows and doors of a building, b' a resistance-coil placed in said circuit, and E a device for throwing into the path of the circuit from the guarded structure to the central office an additional amount of electricity and compensating resistance. This device is preferably automatic, and in addition to the function just stated it may also change the return-path when a plurality of paths are employed.

The device E comprises a clock mechanism *e* or other motive force operating an arbor to which two rings or skeleton disks *e* are secured, so that they will turn with the arbor. As shown in Fig. 3, the disks are fixed to a block of insulated material e^2, and they are each provided with inwardly-projecting pins e^3, which alternate. The wiring *b* in the structure is connected with a split spring-finger e^4, carried by and insulated from the clock-frame, which bears upon the pins e^3. Bearing against each disk is a spring-finger e^5, which is also carried by and insulated from the clock-frame. To these fingers e^5 the return wires or paths e^6 of the circuit are connected, and in the return I place a battery F or other source of electricity. One of the wires of the return includes only a portion of the battery, while the other wire includes all of the battery, so that there will be more current in one circuit than in the other. In the return-path that includes all of the battery to compensate for the increased amount of current and to prevent any deflection of the galvanometer-needle I place a resistance-coil *f*. It may be stated at this time that the galvanometer-needle will not be affected when the path of the current is changed, owing to the form of the split spring-finger. One part of this finger is slightly longer than the other, and as one pin is moved out of engagement with it the shorter part will drop onto the next pin, thereby sending the current through both return-wires, and when the pin on which the long portion of the finger rests is entirely moved away the current through one wire will be completely broken and completely made in another.

The system as shown operates in the following manner: Starting from the battery, which may be placed in the central office, the current passes through the galvanometer, switch G, line-wire to the guarded structure, through the key H, wiring and resistance-coil to the device E, and through the device to the starting-point in the battery. Placed in

connection with the wiring in the guarded structure are any of the ordinary devices for crossing or opening the circuit, whereby the opening of windows, doors, or other protected openings will shunt or break the circuit, thus diverting the path of the current from the resistance-coil, and thereby affecting the needle of the galvanometer so as to bring it in contact with either end of the scale to close the circuit of the battery operating the alarm and produce an audible signal.

The circuit, as shown in Fig. 1, starting at the battery F, will be through the galvanometer C, switch G, signal-key H, wiring in the guarded structure, and resistance-coil b' therein to the device E. The current will then pass through either disk or ring, according to whether the spring-finger is on the pins of one disk or the other, thus controlling the amount of current and resistance in the circuit and also the return-path from the guarded structure. As shown, it will pass through a resistance-coil f and through all of the battery or other source of electricity. When the device E is operated to turn the disks, the path of the current will then be through the other disk and only a part of the battery. It will be understood that the galvanometer is regulated for the lowest amount of current in any circuit and any change in the amount of current is compensated for by an equal amount of resistance, or vice versa. A greater or less number of return-paths may be provided for.

The circuit, as shown in Fig. 4, is effected in the same manner as described in connection with Fig. 1. In this circuit, however, I have shown a signaling device by which the circuit can be tested at any time. The current in the circuit is not strong enough to energize the magnets i^2 of the signal device, and for this purpose I provide a battery k, which may be thrown into the circuit when desired by the switch G. This change is only made for a short time, long enough to attract the armature so as to release the signal-disk, and it is then immediately cut out of the circuit, so that the signals will be made through the galvanometer and alarm.

The signaling device included in the system for testing it comprises a clock mechanism i, driving an arbor on which a signaling device i' is located. i^2 represents an electromagnet placed in the circuit, and i^3 an armature therefor, one end of which i^4, when the armature is not attracted, is in the path of a projection i^5 of the disk i' to prevent the same from turning. The current of the circuit passes through the magnet i^2 and framework of the clock mechanism to the spring-finger i^6, which is insulated from the framework to the wiring in the house. The signaling device is put in operation by shifting the switch G to throw in the battery k, thereby adding a sufficient amount of current to the circuit to attract the armature and release the disk. As soon as the armature is attracted the switch G is moved to its original position, so that the end i^4 of the armature will drop to position to stop the disk after the signal has been given. The signal is effected by the disk passing over the end of the arm i^6, and as a break is reached the line-circuit will be broken, thereby allowing the galvanometer-needle to move to one side and produce a signal corresponding with the breaks on the disk. The system shown in Fig. 4 is operated in precisely the same manner as is shown in Fig. 1.

In the system illustrated in Fig. 6 the return from the guarded structure is made through a single path e^6 instead of two, as shown in Figs. 1 and 4. The same form of means E for throwing into the circuit an additional amount of current F′ and compensating resistance f is employed. The additional current and resistance in this form may be placed in a shunt-circuit between the single return and a finger e^5, and as the said means E are operated, the additional current and compensating resistance are thrown into and out of the circuit. It will be understood that an indicating device is used in connection with this system, and a signaling device may also be used.

What I claim as my invention is—

1. In an electric protective system, the combination of a circuit, between the central office or indicating-point and a guarded structure, the return for which is made through a plurality of paths, an indicating device, a source of electricity, and resistance contained in said circuit, and means for including in the return of said circuit additional current and resistance, which resistance compensates for the additional current, said means also changing the return from one path to another, substantially as described.

2. A system for electrically protecting structures from a central office or indicating-point comprising a circuit between a guarded structure and the central office in which circuit an indicating device is placed, said circuit comprising a plurality of paths, a source of electricity in said circuit and with which the paths are connected so as to contain more or less current, resistances in the paths to compensate for the differences of current in them whereby the indicating device will be unaffected on a change of circuit from one path to another, and a device in the circuit for changing the current from one path to another substantially as described.

3. A system for electrically protecting structures from a central office or indicating-point, comprising a circuit between a guarded structure and the central office containing an indicating device, a source of electricity in said circuit, a return for said circuit from the guarded structure, through a plurality of paths, which are connected with the source of electricity so as to have more or less current in the several paths of the return, resistances in such return-paths to compensate for the difference of current in them, and a

device in said circuit automatically operated for changing the return-path of the circuit, substantially as described.

4. A system for electrically protecting structures from a central office or indicating-point, comprising a circuit between a guarded structure and the central office containing an indicating device, a return for said circuit through a plurality of paths, and a device for changing the path of the circuit comprising a suitable motive force, disks or rings insulated apart and rotated by said motive force and with which the return-paths are connected, said disks or rings being provided with pins and a finger in the circuit adapted to come in contact with the pins on the disks, substantially as specified.

5. A system for electrically protecting structures from a central office or indicating-point, comprising a circuit between a guarded structure and the central office containing an indicating device, a return for said circuit through a plurality of paths, a device for changing the path of the circuit comprising a suitable motive force, disks or rings insulated apart and rotated by said motive force and with which the return-paths are connected, said disks or rings being provided with pins and a finger in the circuit adapted to contact with the said pins, said finger being formed in sections of different lengths, so that one section will rest on one pin longer than on another whereby sudden changes from one path to another are avoided, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES TOMNEY.

Witnesses:
S. H. DILLONT,
GEO. E. CRUSE.