C. H. CARTER.

Electro-Magnetic Burglar-Alarm.

No. 202,630. Patented April 23, 1878.

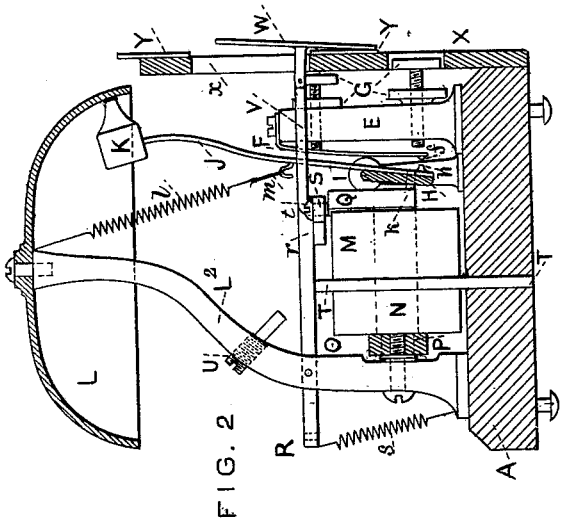

FIG. 2.

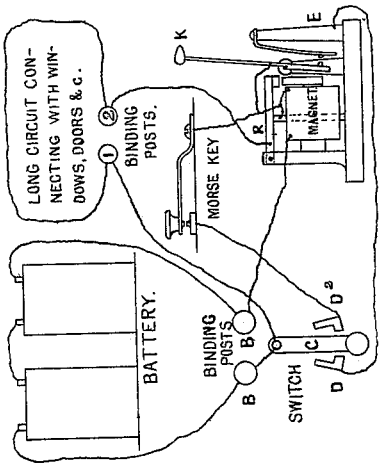

FIG. 4.

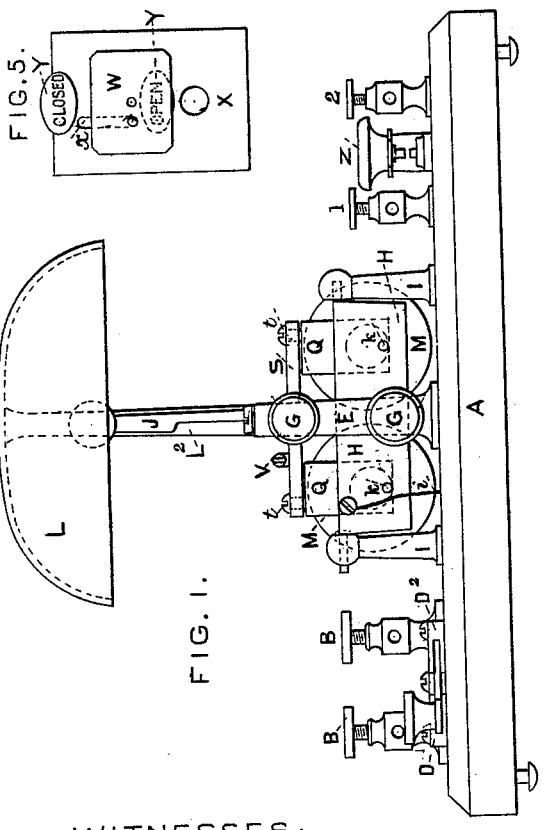

FIG. 1.

FIG. 3.

FIG. 5.

WITNESSES:

Sidney Deane

Wm. H. Hicks

Charles H Carter

INVENTOR.

UNITED STATES PATENT OFFICE.

CHARLES H. CARTER, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN ELECTRO-MAGNETIC BURGLAR-ALARMS.

Specification forming part of Letters Patent No. **202,630**, dated April 23, 1878; application filed April 20, 1877.

To all whom it may concern:

Be it known that I, CHARLES H. CARTER, of Brooklyn, Kings county, New York, have invented, made, and applied to use Improvements in the Construction of Electro-Magnetic Burglar-Alarms, of which the following is a specification of the same, reference being had to the accompanying drawings, making part of this specification, and to the letters of reference marked thereon, in which—

Figure 1 is a front elevation of my improved burglar-alarm. Fig. 2 is a transverse section of the same; Fig. 3, a top or plan view of the same; Fig. 4, a diagram of circuit and connections; Fig. 5, a front view of the annunciator.

In the drawings, like parts of the invention are designated by the same letters of reference.

This invention relates to certain improvements in electro-magnetic burglar-alarms; and it consists, principally, in operating the armature of the vibrating bell-hammer and the armature of the automatic circuit-breaker from one and the same magnet, substantially as hereinafter more fully set forth.

To enable those skilled in the arts to make and use my invention, I will describe its construction and operation.

A shows the base for supporting the operative parts of the apparatus, provided with proper openings, through which are passed the wires connecting the apparatus to the positive and negative poles of a battery. Upon the face of this base are placed the binding-posts B, constructed in the usual manner; also, a "two-point" switch, C, the upper end of which is pivoted between the plates of metal *c*, the switch C being free to turn between the points D and D^2, placed on each side of it.

E is a post or standard, secured about centrally upon the forward portion of the base A, to the upper end of which is fastened one end of the vibrating spring F, the lower end of which is provided with a platinum point, *f*. Through the post E pass the regulating-screws G, by which the position of the vibrating spring relatively to the armature H is regulated. H shows the armature, formed from a plate of soft iron, and free to vibrate between the posts I, secured upon the base A. The armature is provided at its lower portion with a platinum point, *h*, directly in line with the platinum point *f*. Upon the vibrating spring F the armature has secured upon it, about centrally, the lever J, supporting the hammer K, for operating the gong L.

Connection between the armature H and the magnets M is established in the present instance by means of a wire, *i*, one end of which is secured upon the face of the armature H, and its opposite end is connected with the right-hand coil of the magnets M. The armature H has set into it rubber studs or non-conductors *k*, the object of which is to prevent the electricity supplied to the magnet-cores from the battery passing into the armature H.

L shows the gong of the apparatus, constructed in the usual manner, and supported upon the curved standard L^2, properly positioned upon the base A; and in this instance the hammer K is received within the gong L, and a spiral spring, *l*, one end of which is attached to the face of the curved standard L^2, and its opposite end to some non-conductor, *m*, connected in turn to the lever J, for supporting the hammer K, is employed, the object of employing the non-conductor *m* being to prevent the electricity supplied to the curve standard L^2 from passing through the spring *l*, and to the lever J, secured upon the armature H.

M are the magnets, formed of the cores N, of soft iron, upon which are wound the wires O, which cores are connected by the strip of soft iron P, which strip is in turn secured to the curved standard L^2. Upon the faces of these magnet-cores are secured the soft-iron plates Q, serving to form an extension of the faces of said magnets M.

R shows an automatic circuit-breaker, consisting of a lever, *r*, having attached to its forward end an armature, S, placed at right angles to the lever *r*, and made of sufficient length to enable it to cover the upper surface of the plates of metal Q, forming an extension of the faces of the magnets M. This lever *r* is pivoted, as shown, to the curved standard L^2, and to its rear end is attached one end of a spiral spring, *s*, the opposite end of which is attached to the end of the curved standard L^2.

In the ends of the armature S are secured

the non-conductors of magnetism *t*, formed of brass, rubber, or any suitable material. These non-conductors *t* project below the face of the armature S, and, when the automatic circuit-breaker is depressed, are first brought into contact with the upper surfaces of the plates Q.

T is an anvil, formed of a metallic pin or stop placed between the fixed magnets M, and made higher than the upper surfaces of the plates of metal Q, so that when the automatic circuit-breaker R is depressed the under side of the lever *r* is brought into contact with it before the armature S is brought into contact with the upper surfaces of the plates Q.

Through the curved standard L^2 is passed a regulating-screw, U, which governs the movement of the automatic circuit-breaker R. To the armature S is attached a lever, V, upon the forward end of which is hinged a drop, W.

Upon the front of the base A is secured a support, X, for the plates Y, having upon them the words "closed," "open." The support is slotted, as at *x*, through which slot projects the forward end of the lever V, upon which the drop W is hinged, the end of the lever projecting a sufficient distance to allow the drop W to be brought over or in advance of the plates Y, as required. Z represents a spring Morse key, constructed in the usual way, the use of which will be hereinafter set forth. 1 and 2 are binding-posts, intended to receive the ends of the wires connecting the doors, windows, and other parts of the house to be protected with the alarm.

Such being the construction, the operation may be thus described: The alarm is connected with a battery by means of wires, the ends of which are received and held within the binding-posts B. From one of these posts runs a wire, terminating in the left-hand coil of the magnets M, and from the other binding-post runs a wire to and held in the binding-post 1. From the binding-post 1 runs the wire connected with the doors, windows, or other parts of the house to be protected, and held and terminating in the binding-post 2. From binding-post 2 runs a wire connected with the curved standard L^2. The anvil T is also connected to the right-hand coil of the magnets M by a wire. This completes the house or long circuit.

The short or bell circuit is formed by a series of wires passing from one of the binding-posts B to the plates *c* of the switch C; from the plates *c* to one of the points D of the switch; from the point D to the standard or post E, and from the armature H into the right-hand coil of the magnets M, and the wire connecting the binding-post B with the left-hand coil of the magnets M (already referred to) forms part of this circuit. If an attempt be made to enter the house through any of the parts protected by the alarm, by which the house-circuit is broken, the plates of metal Q cease to attract the armature of the automatic circuit-breaker, and the spiral spring, which was expanded when the armature was depressed upon the plates of metal Q, contracts, and the same is thrown up, thus breaking the circuit between the anvil T and the curved standard L^2. Simultaneously with the upward movement of the automatic circuit-breaker the armature H vibrates from the plates of metal Q, and the platinum point *h* is brought into contact with the platinum-point *f* upon the vibrating spring F, the spiral spring *l*, expanded when the armature is in contact with the plates of metal Q, contracting. When the platinum points are brought into contact the electric current passes from the post or standard through the spring and armature to the right-hand coil of the magnets, and the plates upon the same attract the armature and the hammer strikes upon the gong, and this striking is continued or repeated until the lever of the automatic circuit-breaker is depressed upon the anvil T and the house-circuit is closed. When the automatic circuit-breaker is depressed the drop W covers the plate having upon it the word "open," and the plate having upon it the word "closed," employed to indicate that the house-circuit is closed, is in plain sight. The upward movement of the automatic circuit-breaker removes the drop W from its position over the plate "open," and brings the same in front of and over the plate "closed," indicating that the house-current is open or broken. The connection between the battery and the alarm may at any time be broken or suspended by shifting the switch from the point D to the point D^2.

Where two or more alarms constructed as in the present instance are placed in different houses or buildings and connected together, communication may be established by using the Morse spring-key as a means of vibrating the hammer of the gong, a single depression of the key causing one stroke of the hammer upon the gong. In this instance the circuit is formed in both instruments by a series of wires passed from one of the binding-posts B directly to the left-hand coil of the magnets, and from the other binding-post to the plates *c* of the switch; from the plates *c* to the point D^2; from the point D^2 to the anvil of the key; from the end of the key to the right-hand coil of the magnets.

The advantages of combining with the fixed magnets the plates of metal are, that the use of two pairs of magnets is dispensed with, thus economizing space and cost, and that by so doing the faces and upper surfaces of the plates are utilized—the one for the armature of the vibrating hammer, the other for the armature of the automatic circuit-breaker—and that they also serve to operate the annunciator.

By constructing the automatic circuit-breaker as described, and using it as a means for operating the drop of the annunciator, economy of cost and space is secured, and the an-

nunciator is rendered more reliable in its operation.

By combining with an alarm constructed as set forth a Morse spring-key, the alarm may be operated so as to convey intelligence from one party to another by a series of signals previously agreed on, and may be employed to call assistance, if desired.

Having now set forth my invention, what I claim as new is—

A burglar-alarm mechanism consisting of an electro-magnet provided with two armature-levers, one of which carries the bell-hammer and the automatic break, and the other of which carries the annunciator-card, and is provided with an armature arranged opposite a rectangular extension from the magnet's core, in combination with a circuit-closing stop or anvil, T, and a bell, L, all arranged substantially as described.

CHARLES H. CARTER.

Witnesses:

A. SIDNEY DOANE,

W. V. H. HICKS.