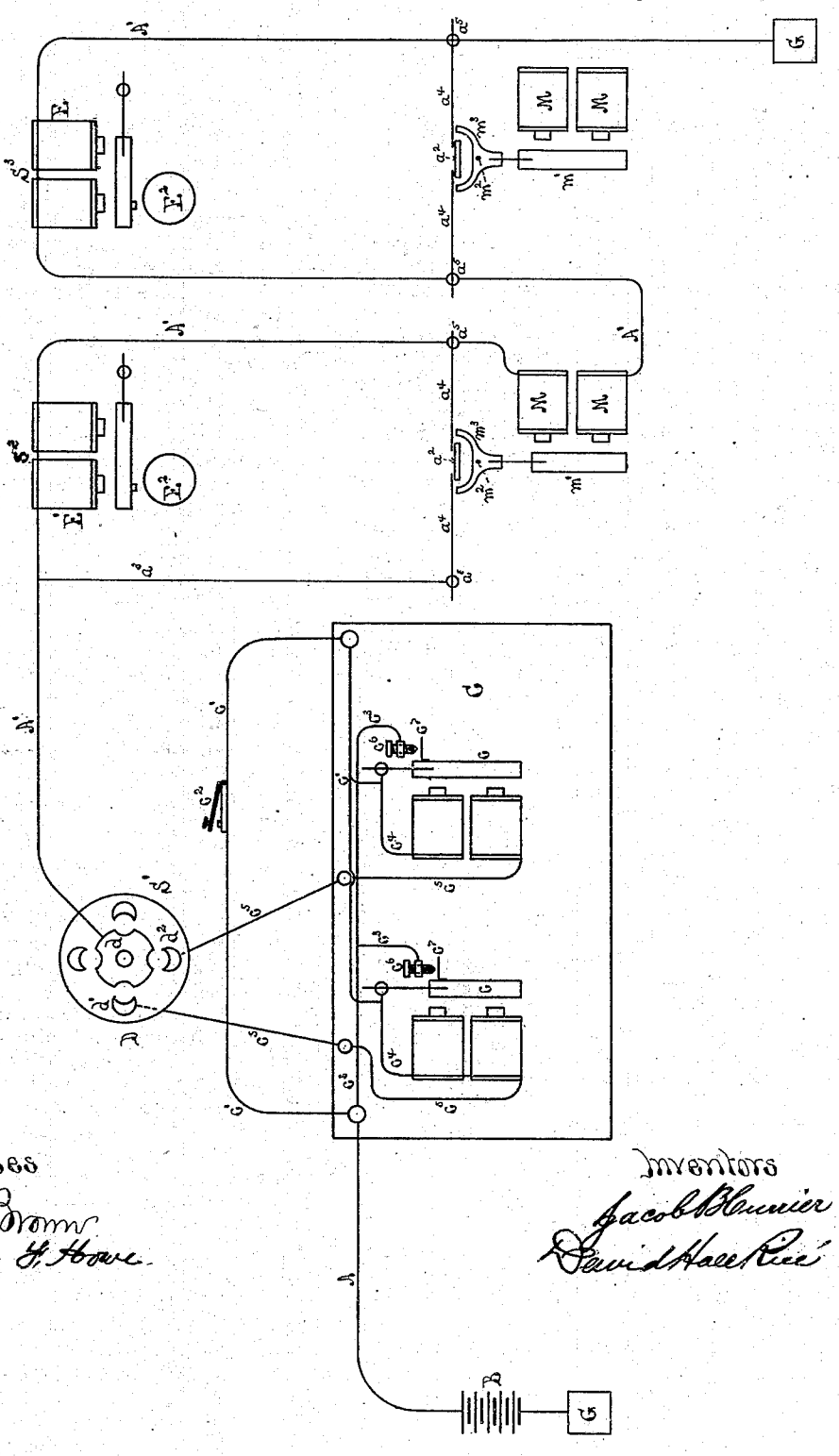
(No Model.)

J. B. CURRIER & D. H. RICE.

ELECTRIC CALL.

No. 276,960. Patented May. 1, 1883.



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JACOB B. CURRIER AND DAVID HALL RICE, OF LOWELL, MASSACHUSETTS.

ELECTRIC CALL.

SPECIFICATION forming part of Letters Patent No. 276,960, dated May 1, 1883.

Application filed March 10, 1883. (No model.)

To all whom it may concern:

Be it known that we, JACOB B. CURRIER and DAVID HALL RICE, of Lowell, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Electric Calls, of which the following is a specification.

Our invention relates to individual electric calls of the general character of those shown in the German patent to Maron, No. 1,944 of 1877, and in the patent to said Currier and Rice, No. 240,010, dated April 12, 1881; and it consists in placing a series of ordinary electric call-bells at different stations on the electric circuit, and placing in a shunt around each of said bells an electric make-and-break device controlled by a vibrating armature working isochronously with an electric make-and-break mechanism at a distant station, by which make-and-break mechanism said vibrating armature is operated by means of a magnet placed in the main circuit in proper position with relation to it; and it further consists in arranging a shunt around an electric bell placed in the main circuit, which is normally closed, and in breaking the said shunt by the operation of an isochronously-vibrating armature vibrating in unison with a pulsatory or intermittent electric current passing over the circuit and through the magnet of said armature; and it further consists in an improved form of shunt-circuit around the magnet of the circuit-breaker.

In the drawing, the figure represents an electric circuit provided with a battery and calling mechanism for the central station and alarm and shunt mechanisms for the subscribers' stations.

S′ represents the central station, and S^2 and S^3 the subscribers' stations, upon the electric circuit A A′.

B is the battery.

G G are grounds of the circuit.

C is the calling device, of a well-known construction, having vibrating circuit-breakers *c c* for breaking the electric circuit and producing a vibratory current of electricty to ring the individual alarm at the respective stations S^2 S^3.

c' is a shunt-circuit to be closed by the key c^2, in order to send an impulse of electricity to line through the magnet of the circuit-breaker directly, without passing through the latter to start the circuit-breaker in vibration.

c^3 c^3 are the electric connections through the circuit-breaker from whence the circuit leads through c^4 to the circuit-breaker magnet, and thence by line c^5 to the switch D and to main circuit A′. The switch D has a central piece, *d*, to which is connected the circuit A′, while the lines c^5 c^5 are connected to metal pieces d' d^2. By inserting a metal plug between *d* and d' or d^2 either may be electrically connected at pleasure without disturbing the other.

At the station S^2, E′ is the bell, which consists of a spring-hammer, its magnet in circuit, and the gong e^2, so placed that any electrical impulse over the circuit of average power will strike the gong.

a' is a shunt leading around the bell at station S^2, and composed of the wire a^3, springs a^4 a^4, and metal block a^2. The springs a^4 a^4 are secured in the posts a^5 a^5 at one end, the whole being placed upon a backing of insulating material, so as to compel the electricity to pass over the circuit or shunt, as described. In their normal position the springs a^4 a^4 are in electrical contact with the metal block a^2, and the electric current will pass over the shunt composed of a^3, a^5, a^4, a^2, a^4, and a^5, as being a line of less resistance than the main circuit through the bell-magnet.

M is a magnet placed in the main circuit just below the shunt.

m' is an armature pivoted at m^2 and moved by electric impulses through the magnet M, similar to a pendulum. This armature may be hung upon a spring instead of a pivot, if desired. This armature carries attached to it the curved bar m^3, the projecting ends of which come underneath the springs a^4 a^4 at such a distance that no movement of the armature, resulting from the passage of a vibratory current of electricity through the magnet M, which is not synchronous, or nearly so, with the vibrations of m', will cause these ends of m^3 to reach the springs a^4 a^4, due regard being of course had to the adjustment of the distance between the poles of its magnet and armature m'; but when a vibratory current of electricity is passed through the magnet M synchronous with the vibration of the armature m' its ex-

tent of movement will be augmented until the points of the arm m^3 alternately reach and strike the springs a^4 a^4 at each end of the beat of the armature, and, breaking the electric circuit through the shunt, force the electric current to pass through the alarm-magnet of station S^2 and cause the alarm to be struck. The pivot m^2, upon which the armature m' and curved bar m^3 oscillate, is insulated from its point of support to insure the break of the shunt-circuit.

At station S^3 is placed an alarm, with its magnet and shunt in all respects similar to that at station S^2, and provided in like manner with a magnet M, its vibrating armature m' and attached bar m^3 vibrating upon the insulated pivot m^2, the only difference being that the weight of the armature m', or its distance from the pivot m^2, or both, so vary from those of the station S^2 that a vibratory electric current synchronous with the vibrations of the one armature will not cause the other to reach and break its bell-shunt.

The circuit-breakers of the caller C are each tuned to break the circuit synchronously with one of the shunt-breaking armatures at one station only, and thus the bell of only that one station, or its alarm only, will be sounded without sounding any of the others. The magnets M are preferably made of much less resistance than the alarm-magnets to insure the larger part of the electric current passing over the shunt and not sounding an alarm until its shunt is broken.

The starting mechanism for the circuit-breaker of the caller is operated as follows: The circuit-breaker contact-screws c^6 c^6 are placed so as to not quite touch the contact-springs c^7 c^7. By inserting the plug in the switch, between d and d', for instance, that circuit-breaker is connected to the circuit; but owing to the space between c^6 c^7 the circuit-breaker does not start. By pressing down the key c^2 the line c' is completed and the current passes through A, c', c^4, the vibrator-magnet, and c^5 to circuit A′, and pulls the circuit-breaker armature c toward its magnet. Upon releasing the key c^2 the armature c flies back and its spring c^7 makes contact with screw c^6, and the armature continues to vibrate and make and break the circuit until the switch-plug connecting d and d' is removed. This of course breaks the shunt at the distant station of the correspondingly-timed vibrator and sounds its alarm.

It is obvious that other modifications may be adopted without departing from the spirit of our invention. For instance, the armature m' may be made to strike and break the shunt directly, instead of through the medium of the curved bar m^3; or the armature m' may be made to operate some other device for breaking the circuit besides the arm m^3; or the springs a^4 a^4 may come directly into contact instead of resting upon the block a^2; but the essential features of our invention are an alarm mechanism constantly in circuit, and an electric shunt around said alarm mechanism capable of being broken, and a vibrating shunt-breaking armature operated by a vibratory current of electricity passing through its magnet in circuit synchronous with its rate of vibration; and, further, the placing of two such mechanisms at different stations, each adapted to vibrate and break its shunt in substantially a different time from that of the other.

Instead of a circuit-breaking mechanism, a device which sends regular undulatory currents over the circuit of sufficient variation and regularity in the undulations may be used— as, for instance, an electric generator driven by regulating mechanism at a proper and regular speed, which will produce undulations synchronous with the movement of the shunt-breaking armature.

What we claim as new and of our invention is—

1. In combination with the electric circuit A A′, a circuit-breaker, an alarm mechanism in the circuit, and a shunt around said alarm mechanism, with the magnet M and its vibrating armature m', adapted to make and break said shunt by synchronous pulsations of electricity, substantially as described.

2. In combination with the electric circuit A A′, two or more alarm mechanisms placed at different stations on the circuit, each provided with a shunt around it, and with the magnet M and its vibrating armature m', adapted to make and break said shunt, and having a substantially-different rate of vibration from that of the corresponding armature of the other stations, substantially as described.

3. In combination with the electric circuit A A′, two circuit-breakers placed at one station, and two alarm mechanisms placed at different stations on the circuit, each provided with a shunt around it, and with the magnet M and its vibrating armature m', adapted to make and break said shunt, and having a substantially-different rate of vibration from that of the other stations, substantially as described.

4. In combination with the electric circuit A A′, an alarm mechanism, an electric shunt around the same, the magnet M, and its vibrating armature m', adapted to alternately make and break said shunt, substantially as described.

5. In combination with the electric circuit A A′, the shunt c', having key c^2, and leading from the battery around the circuit-breaker, and to the magnet on the battery side of the same in the caller C, substantially as described.

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