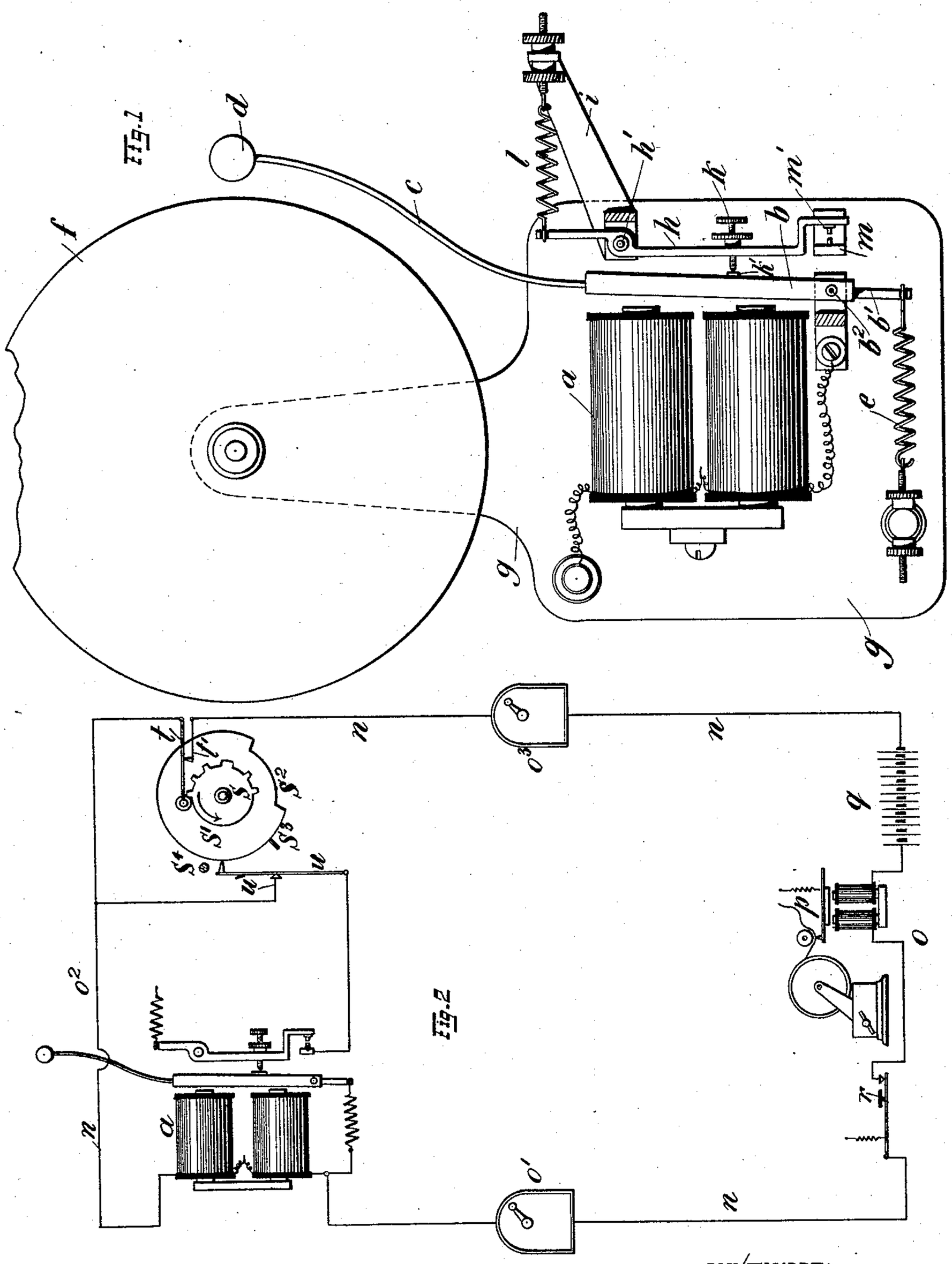
(No Model.)

C. E. SCRIBNER.

ELECTRIC SIGNAL BELL.

No. 572,220. Patented Dec. 1, 1896.



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ELECTRIC SIGNAL-BELL.

SPECIFICATION forming part of Letters Patent No. 572,220, dated December 1, 1896.

Application filed May 31, 1894. Serial No. 513,072. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. SCRIBNER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Electric Signal-Bells, (Case No. 349,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to electric signal-bells. It concerns more particularly signal-bells adapted to be included in electric circuits with other apparatus and arranged to short-circuit or cut out their magnet-helices after being operated to remove their resistance from the circuit.

The object of my invention is to permit such signal-bells to transmit several successive signals, the number of signals being controlled at the transmitting-point before short-circuiting itself.

My invention is particularly applicable to police call or signal systems, in which it is desirable that the operator at the central station may signal to any police box or substation in the event of failure to operate or of absence of the usual telephonic apparatus.

My invention consists in a vibrating bell-lever, contact-points controlled by the bell-lever adapted to close together at one point in the vibration of the lever, and springs acting upon the vibrating lever and upon the contact-points adjusted to bring the lever to the position in which the contact-points are closed together when the electromagnet is inert. Thus as long as the vibrating lever which carries the bell-armature is attracted, or as long as it is in oscillation, the contact-points are separated and the circuit through them, which may be a short-circuit about the electromagnet, is open.

My invention further comprises a method of operating such a bell, which consists in so timing the frequency and the durations of the pulsations of signaling-current at the signal-transmitting instrument with relation to the period of oscillation of the vibrating lever of the bell that the bell-lever may either be prevented from assuming the position in which the circuit controlled by the contact-points is closed or may be permitted to come to rest in that position, as desired.

My invention is illustrated in the accompanying drawings, and may be more clearly described with reference to the drawings.

Figure 1 of the drawings represents a plan view of my improved signaling-bell. Fig. 2 is diagram of a police signal-circuit including the usual register, battery, a signal-transmitting key at a central station, and three signaling-stations, at one of which the apparatus is shown in some detail.

In my improved bell I provide the usual electromagnet a, before whose poles a pivoted armature b oscillates, the armature carrying at the extremity of a somewhat flexible tongue c a bell-hammer d. The armature b is provided with an extension or prolongation b' beyond its pivotal point b^2, to which an adjustable retractile spring e is attached. The armature b and the parts b' and c, rigidly connected with it, constitute what I have termed the "oscillating" or "vibrating" lever. It is preferable that these parts should be made somewhat heavy with relation to the tension of spring e, or should be otherwise so constructed that the oscillating lever shall have a considerable period of vibration, although this is not essential to the operation of the invention. A gong f is mounted upon the frame g of the bell in position to be struck by hammer d.

Parallel with the armature b I provide a lever h, which is pivoted at h' in a bracket i, fixed to the frame g. A contact-point k is carried by the lever h in position to register with a contact-surface k' upon the armature b. An adjustable retractile spring l acts upon an extension of lever h, pressing the contact k normally against its contact anvil or surface k'. An insulated stop m is fixed upon the frame g to arrest the movement of lever h toward the armature b before the latter has reached the electromagnet a. The tension of the retractile spring l is so adjusted with relation to that of spring e that the oscillating lever comes to rest in an intermediate position of its range, as shown in the drawings. The force of spring l is then exerted in pressing the lever h against the stop m, partly in opposition to the pressure of the oscillating

lever against contact *k*, the spring *e* being insufficient to raise the lever *h* in opposition to its retractile spring. In this position of the mechanism, then, the contact-pieces *k k'* are closed together, while the contact-surface *m'* upon lever *h* is closed upon its contact *m*. If by any means the armature *b* were attracted to magnet *a*, the contact-points *k k'* would be separated, the points *m m'* remaining closed together. If then the armature *b* were suddenly released, its momentum would carry it beyond the point at which it came to bear upon the contact-points *k*, and the lever *h* would thus be raised, separating the contact-points *m m'*, which it controls. The oscillating lever may thus be vibrated to the extremities of its range by properly-timed pulsations of current in magnet *a* without permitting both sets of contact-points *k k'* and *m m'* to be simultaneously closed for any appreciable length of time. If the current in magnet *a* be maintained continuously, contact-points *k k'* will be separated; but if the current be permanently interrupted the ramature *b* will, after a few oscillations, take up its intermediate position, as described, with both sets of contact-points *k k'* and *m m'* closed together. When this bell is used for the police signal system, the contact-points *k k'* and *m m'* are included in series in a short circuit or shunt about magnet *a*, one terminal of the magnet being connected with contact-point *k'* and the other with the stop *m*.

In Fig. 2 the signaling-circuit *n* is shown extending from a central station *o* through three substations *o' o² o³*. The line *n* includes at the central station the electromagnet of a register *p*, a battery *q*, and a signaling-key *r*. At the substation the magnets *a* of the bell are included directly in the line-circuit. This circuit is normally closed or completed through each police-box, so that a current from battery *q* is constantly upon the line. Each substation is provided with a break-wheel *s* in the signal-box, adapted to transmit a distinctive signal through the instrumentality of springs *t t'*, which serve to produce a succession of interruptions of the line-current, depending upon the number and position of the teeth of wheel *s*, in the usual way. When employed with this bell, the break-wheel is also provided with a pair of contacts *u u'*, included in the short circuit or shunt about magnet *a*. In the drawings the contact *u* is represented as a spring bearing upon the edge of a disk S', attached to the break-wheel and pressed outward thereby against its anvil *u'*. A notch S² is made in this disk in such position that it comes under the spring *u* just after the transmission of the box-signal, and permits the spring to fall away from its anvil *u'*. When the break-wheel has completed its revolution and the pin S³ has come against the stop S⁴, the edge of disk S' again comes under the spring *u* and forces it outward against anvil *u'*.

The mechanism of the signal-bell comes to rest, as described, in the position shown in the drawings. The circuit *n* is thus completed at the signal-box through the armature *b*, contacts *k' k*, lever *h*, and contacts *m' m*, thence through the contact-points *u* and *u'*, the magnet *a* being thus shunted out of circuit. When the signal-box is operated, the contact-points *u u'* remain closed together while the signal of brake-wheel *s* is being transmitted. Immediately after this spring *u* is permitted to fall away from contact *u'*, thus opening the short circuit about bell-magnet *a*. The latter is thus energized by current from battery *q* and draws up armature *b*. The operator at the central office may now signal to the operator at the substation *o²* by operating the break-key *r*. He depresses the key *r* an instant, during which armature *b* falls away from magnet *a* to the extent of its range of oscillation and is immediately drawn up again to magnet *a* upon the reëstablishment of current in circuit *n*. This operation may be repeated at whatever intervals and as often as desired, provided only that the key *r* shall not maintain the circuit open for a sufficient length of time to permit the armature *b* to cease oscillating and come to rest. As many strokes may be thus struck upon bell *f* as desired to transmit a signal. This being done, the operator at the central office depresses the key *r* for a considerably longer time, perhaps ten seconds. The oscillating lever of the signal-bell is thereby permitted to come to rest, closing the contact-points *k' k* and *m' m*, and thus short-circuiting bell-magnets *a*. The resistance of the signal-bell magnets is thus removed from the line, so that it does not interfere with the transmission of signals from or to other substations upon the circuit *n*.

It is obvious that the use of my invention is not limited to signal-bells, but that it may be employed, in connection with an electromagnet, for numerous other purposes. It is also plain that the function of the contact-points *k k' m m'* need not be that of opening a short circuit about the bell-magnets, but may be to open or close any other auxiliary or independent circuit.

I claim, broadly, as new and desire to secure by Letters Patent—

1. The combination with an electromagnet, of a pivoted armature therefor adapted to oscillate to and from the magnet-poles, two pairs of contact-points controlled thereby to be simultaneously closed together at a point of the oscillation of the armature intermediate between the extremities of its range, and an electric circuit including the said contact-points in series, substantially as described.

2. The combination with an electromagnet and the oscillating armature thereof, of a contact-point carried by the armature, a pivoted contact-lever carrying a contact-point adapted to register with the contact-point upon the armature, a resting-contact for said contact-lever adapted to limit its movement toward

the magnet, and an electric circuit including both pairs of contact-points in series, substantially as described.

3. The combination with an electromagnet in an electric circuit, of a pivoted armature therefor, a pivoted contact-lever and registering contact-points, one carried upon the armature and the other upon the said contact-lever, a retractile spring for said armature, and an opposing spring acting upon said contact-lever, another contact-piece upon said contact-arm, and a resting-anvil therefor adapted to intercept the movement of said contact-lever in following the armature-lever, the retractile spring of the armature-lever being insufficient in force to lift the contact-lever from its resting-stop, and an electric circuit including in series both pairs of contact-points, substantially as described.

4. The combination with an electromagnet in an electric circuit, of a pivoted armature therefor, a pivoted contact-lever and registering contact-points, one carried upon the armature and the other upon the said contact-lever, a retractile spring for said armature, and an opposing spring acting upon said contact-lever, another contact-piece upon said contact-lever, and a resting-anvil therefor adapted to intercept the movement of said contact-lever in following the armature-lever, the retractile spring of the armature-lever being insufficient in force to lift the contact-lever from its resting-stop, and a shunt-circuit about said electromagnet including both pairs of contact-points in series, substantially as described.

5. In an electric signal-bell the combination with the bell-magnet, of a vibrating armature therefor provided with a retractile spring, a pivoted contact-lever, registering contact-points, one carried by said armature and the other by said contact-lever, and a spring acting upon said contact-lever tending to maintain the contact-points closed, a fixed resting-contact for said contact-lever, the retractile spring of the armature being insufficient to lift the contact-lever from its resting-contact, a shunt-circuit about said bell-magnet including both pairs of contact-points, and an electric circuit including said bell together with a battery and a signal-key, substantially as described.

6. The herein-described method of transmitting several successive signals by means of an electric bell provided with a short circuit about its magnet and with mechanism adapted to break the continuity of said short circuit while the armature is in oscillation, which consists in transmitting in the electric circuit containing the bell, pulsations of electric current at intervals of insufficient duration to permit the oscillating lever of the bell to cease its vibration.

7. The method of preventing the short-circuiting of a bell provided with a short circuit about its magnet and with mechanism thrown into oscillation by the excitement of the magnet, adapted to break the said short circuit, which consists in sending an electric current through the bell before the oscillating lever has ceased vibrating after the first interruption of current, as described.

In witness whereof I hereunto subscribe my name this 25th day of January, A. D. 1894.

CHARLES E. SCRIBNER.

Witnesses:
D. E. WILLETT,
ELLA EDLER.