

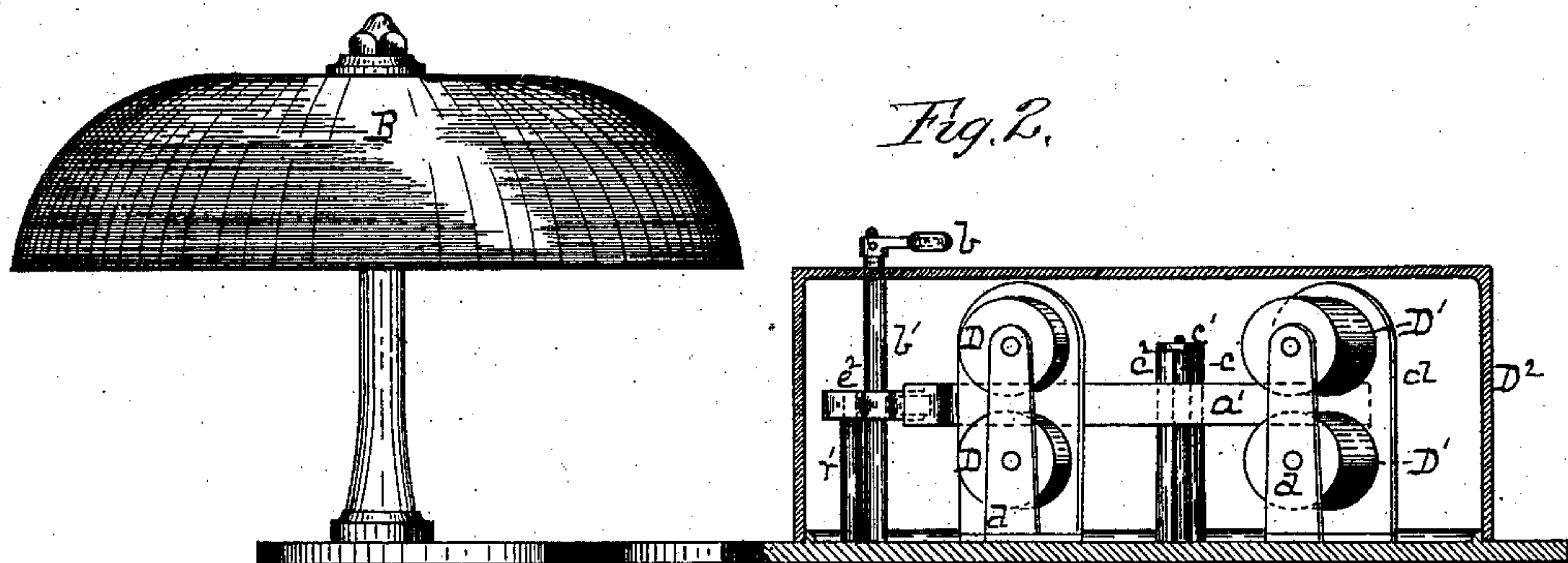
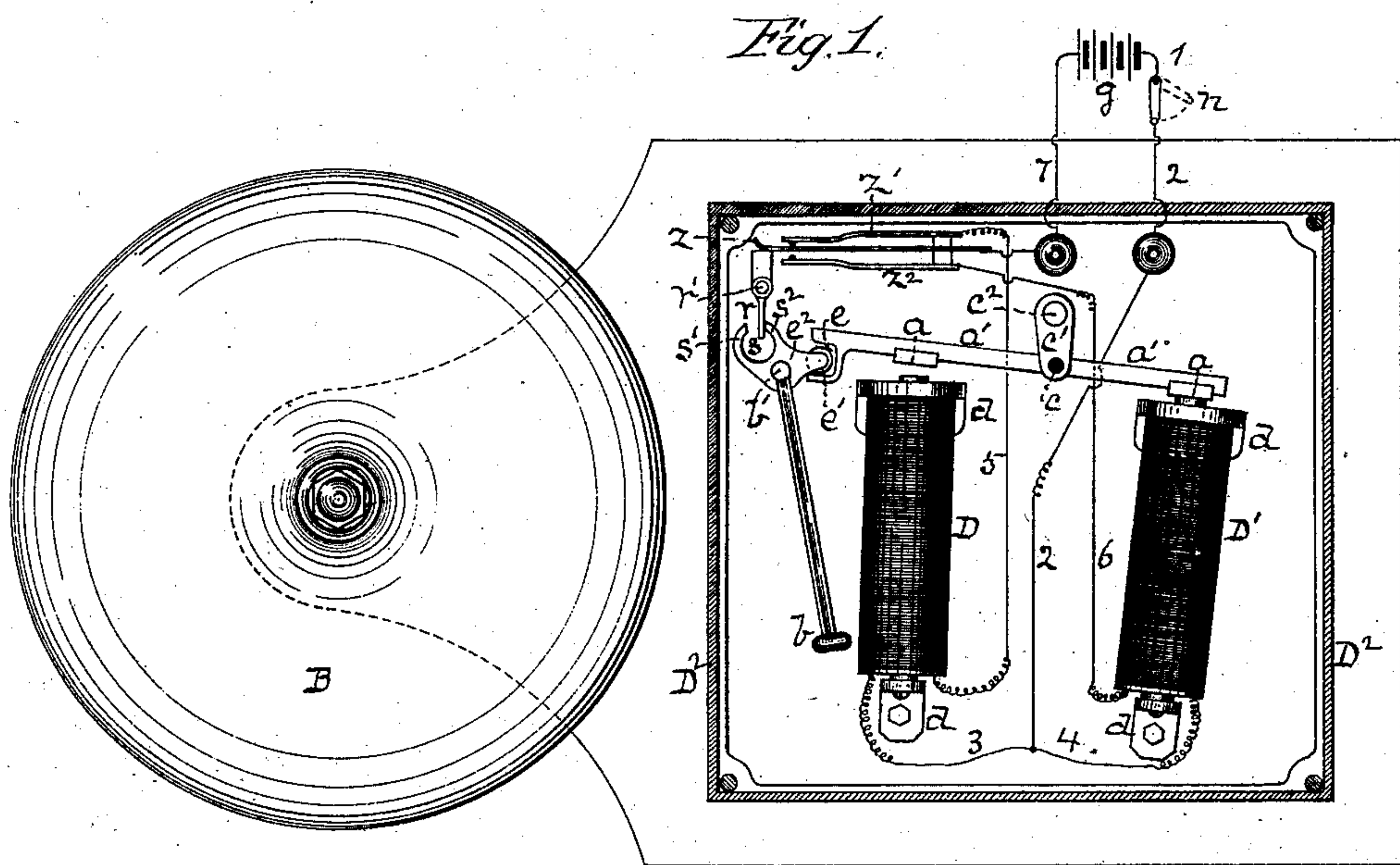
(No Model.)

O. GASSETT.

ELECTRIC BELL RINGING APPARATUS.

No. 293,571.

Patented Feb. 12, 1884.



WITNESSES:

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OSCAR GASSETT, OF BOSTON, MASSACHUSETTS.

ELECTRIC BELL-RINGING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 293,571, dated February 12, 1884.

Application filed January 19, 1883. (No model.)

To all whom it may concern:

Be it known that I, OSCAR GASSETT, of Boston, county of Suffolk, State of Massachusetts, have invented or discovered a new and useful Improvement in Electric Bell-Ringing Apparatus; and I do hereby declare the following to be a full, clear, concise, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—like letters indicating like parts—

Figure 1 is a view in elevation of my improved bell-ringing apparatus, but with the lid or cover of the case removed within which the electro-magnets are inclosed for protection; and Fig. 2 is a bottom edge view thereof, but with the corresponding side of the box or case removed.

My invention relates to that class of electric bell-ringers in which a continuous bell-ringing action or effect is desired for a greater or less length of time, as at railway-track or street crossings, or in burglar-alarms, or for other kindred uses in which such an apparatus is needed or is desired.

When constructed in what I believe to be its best form, my apparatus consists, in general terms, of two electro-magnets or other electromotors brought automatically and alternately into action, so as to operate in succession the opposite ends of an armature-lever, the operation of which shall impart to a swinging hammer before it strikes the bell such amount or degree of momentum that not only shall the bell be struck, but also a circuit changer or commutator shall be shifted or reversed thereby with reference to the throwing one electromotor out and the other into action.

In the drawings, B represents a bell or other alarm device suitable for the purpose, and *b* is the hammer. Two electro-magnets, D and D', are employed, and they are supported by clips *d*, or in other suitable manner in a case, D², or other suitable support, so that they may alternately and in immediate succession be brought into and cut out of the circuit of a battery, *g*, and may, in succession and alternately, be operative on the armatures *a* of an armature-lever, *a'*. The latter is pivoted at or near its middle point on a pivot-shaft, *c*,

which, by clips *c'*, is hung to fixed shaft *c*², so that the armature-lever *a'* may have a little freedom of endwise motion, if so desired. The end of the armature-lever *a'* next the bell has a recess, *e*, in which a friction-roller, *e'*, plays, and this friction-roller is mounted in one arm of a rocker, *e*², which is fixed on the pivot-shaft *b'*, which at its outer end carries the hammer *b*. The opposite end or arm of the rocker is recessed, as at *s*, so as to form two prongs, *s'* *s*², which come on opposite sides of the lower end of a pivoted circuit-changer, *r*, of which *r'* is the pivot-shaft. The upper end of this circuit-changer alternately engages and presses up, and disengages or allows to come down by a spring action, a flexible spring contact-strip, *z*, or other movable conductor, in such manner that when the latter is pressed up it makes electrical contact with a metallic strip or conductor, *z'*, and breaks contact with a like strip or conductor, *z*², and when it comes down it reverses its contacts.

A key or switch, *n*, may represent and stand for any suitable make-and-break mechanism, such as the purposes for which the apparatus is to be used may require.

For railway-track and street crossings, a train-actuated circuit-closer or circuit-changer should be employed, and, as many such are known in the art and the manner of their application is well understood, I do not deem it necessary to show or describe them in detail. For other alarm purposes, a circuit closer or changer adapted to the work required may be employed. The lines of circuits may then be completed by wires 1 and 2, the latter dividing into two branches, 3 and 4, one of which leads through the helix or coil of D, and thence by wire 5 to *z*, and the other, 4, leads through the helix or coil of D', and thence by wire 6 to *z*². The flexible strip *z* is connected to the other battery-pole by wire 7.

In the position of the devices shown in Fig. 1 the hammer is in position at the end of its back-stroke, and while coming to that position the prong *s*² has been caused to engage the lower end of the circuit-changer *r*, so as to cause its upper end to press the flexible or movable conductor *z* out of electrical contact with *z*² and into electrical contact with *z'*. This breaks the circuit through electro-mag-

net D' and closes the circuit through D. As a result of this the right-hand armature is released from electro-magnetic influence, and the left-hand armature is attracted and drawn to the magnet-poles of D with a rapidly-increasing force as it moves toward the poles. The armature-lever a' then, acting by recess c through roller e' on the rocker e^2 , and through it on the shaft b' and hammer b , causes the hammer to move with a constantly-accelerated velocity toward the bell. By preference the parts are so proportioned and constructed that the armature strikes the magnet pole or poles, or comes to the end of its movement in that direction just before the hammer strikes the bell, and as the armature toward the end of its movement acts with comparatively considerable force, a considerable momentum will then have been imparted to the hammer, and this momentum should be such that the hammer-stroke will be completed, so as to give the desired audible signals, and still further will cause the prong s' to engage the downwardly-projecting arm of the circuit-changer r , and turning the latter on its pivot will cause its upper end or arm to clear or pass away from the flexible strip or movable conductor z to such extent that the latter may break contact with z' and make contact with z^2 , and thus the circuit through D will be broken and the circuit through D' will be restored. The right-hand end of the armature-lever a' will then be drawn down, and the upward movement of the left-hand end will cause the hammer to swing back to the position shown, and as D' will then be acting with a constantly-accelerated force, it will, in the manner above described with reference to D, impart such momentum to the hammer b that after the lever a' ceases to move, the hammer motion will continue, and so cause the prong s^2 to engage the lower arm of the circuit-changer r and shift it back to the position shown, with the result of breaking the circuit through D' and restoring it through D, and so again causing the bell to ring. The actions described will then go on continuously and in succession so long as the battery g is kept in circuit, as shown. It will be observed that for the purpose of thus working the circuit-changer r not so much by the direct action of the electro-magnets as by their indirect action through the momentum imparted to the hammer the recess c in which the roller e' works is made a little larger than the roller, and that the points of the prongs s' s^2 are at a little distance apart, and preferably so far apart, and in such position relative to the lower arm of the circuit-changer, that they will each engage such arm at or about the time the corresponding movement of the armature-lever ceases. This feature of invention—namely, operating the circuit-changer by the momentum imparted to the hammer—is of advantage, among other things, in this, that the circuit cannot be changed until after the electro-magnet included therein has completed its

work. The hammer is hung or adjusted in position by preference as shown in the drawings, so that, swinging in its movement somewhat like a pendulum, it will tend by its gravity, immediately after completing its stroke in either direction, to start on its return-stroke, and thereby coact with the electro-magnet newly brought into circuit in producing a complete movement, that being the time when electrical action is weakest. Toward the end of its stroke in either direction, when the resistance which it gives is greatest, the electro-magnet then in circuit is acting with a rapidly-increasing force, whereby to complete the stroke and give to the hammer the desired momentum; and, as further aid in this direction, I usually make the hammer-stem of spring or elastic metal, so that the rebound at the end of the stroke shall aid in producing the reverse stroke. The operation and effect thus set forth may be secured even if the hammer itself be made comparatively light, so that its momentum will be small or relatively inappreciable, provided only that devices moving therewith be so constructed and combined that the momentum of the same, under the conditions stated, shall in the manner substantially as set forth work a circuit-changer, or so complete its work that in effect the circuit shall not be wholly changed until after the corresponding electromotor has completed its work as a motor. The movement of the circuit-changer may be commenced before the end of the armature motion, and, in fact, by a nice adjustment, the armature motion and the circuit-changer motion may end at the same instant, provided that such end of motion occur before the hammer strikes the bell, and, further, provided that the hammer or devices connected thereto or moving therewith, or all jointly, then have such momentum as to effect the bell-stroke, and also to continue the movement of the circuit-changer, so as to make provision for any possible slowness in the action of the circuit-changer, and in like manner as to the reverse or back stroke of the hammer; also, the form or construction of the circuit-changer or commutator may be changed at pleasure and be combined with the hammer or its moving connections in any desired way, provided only that it receive the whole or some part of its motion from the momentum of the moving parts after the corresponding armature movement has ceased; and in like manner solenoids or other means of applying and transmitting electrical force may be substituted for the electro-magnets D D', and these and other like modifications, as well as substitution of mechanical equivalents, are included herein.

• In describing, as I have done, certain devices as "upward," "downward," "right and left hand," &c., it will be understood that I use these terms in a relative and not in their absolute sense, as the apparatus may be used, though perhaps less advantageously, in other than the position shown, or the invention, at least in some

of its features, may be incorporated in the construction of apparatus in which position would be comparatively unimportant.

The friction-roller e' may be omitted, if so desired, in which case the rocker-arm will work in the recess e without change in operation and effect.

I claim herein as my invention—

1. The armature-lever a' , recessed as at e , in combination with the three-pronged rocker e^2 and circuit-changer r , substantially as set forth.

2. The electro-magnets $D D'$ and their respective circuits, the armature-lever a' , re-

cessed at e , the three-pronged rocker e^2 , carrying a vibrating bell-hammer, b , the circuit-changer r , and contact-terminals $z z' z^2$, in combination with each other, with reference to reversing the current after and only after the corresponding armature motion has ceased, substantially as set forth.

In testimony whereof I have hereunto set my hand.

OSCAR GASSETT.

Witnesses:

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GEORGE H. CHRISTY.