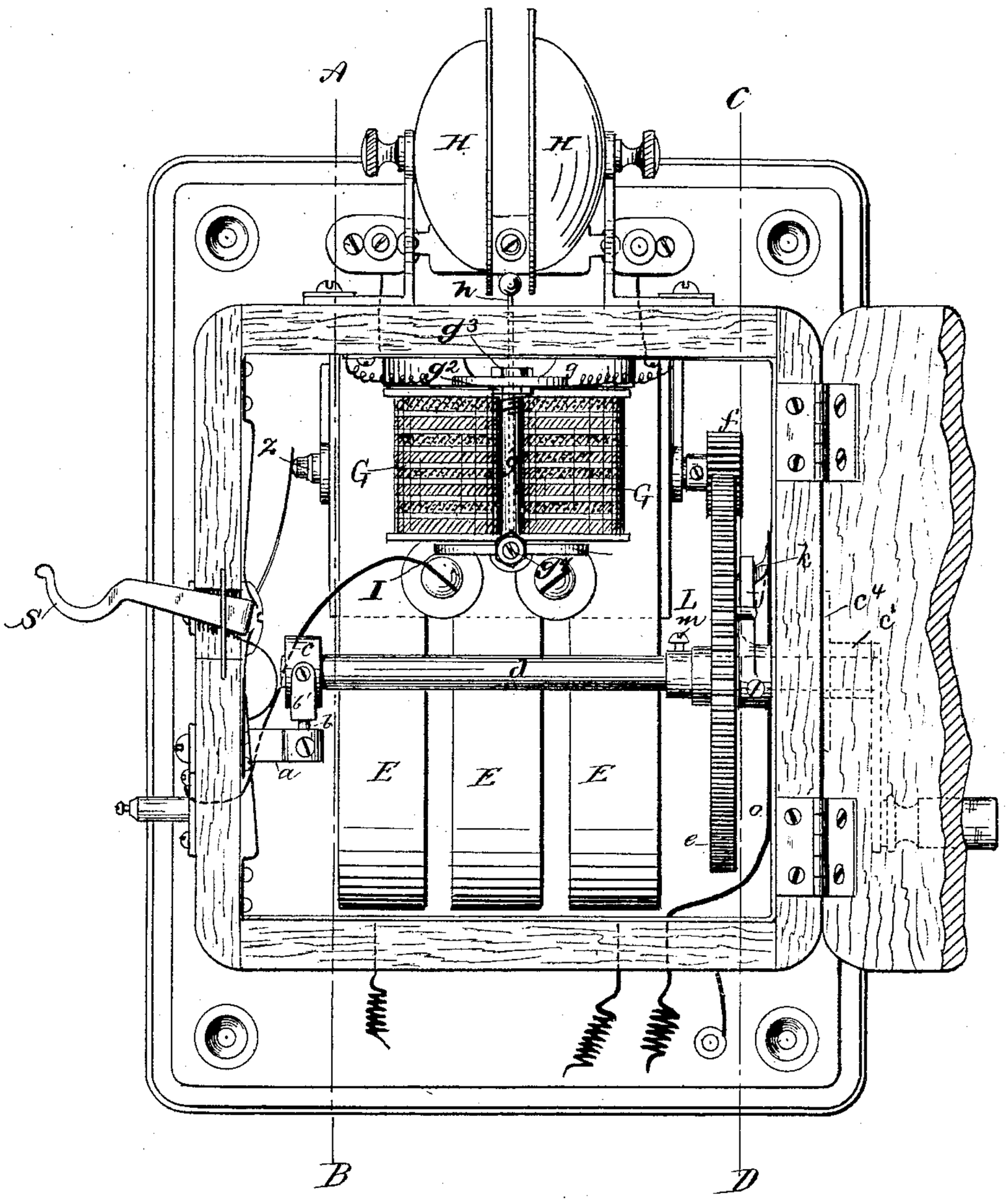
(No Model.) 3 Sheets—Sheet 1.

H. T. O. FRASER.

MAGNETO ELECTRIC CALL BELL.

No. 332,388. Patented Dec. 15, 1885.

FIG. 1



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(No Model.) 3 Sheets—Sheet 2.

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FIG. 2

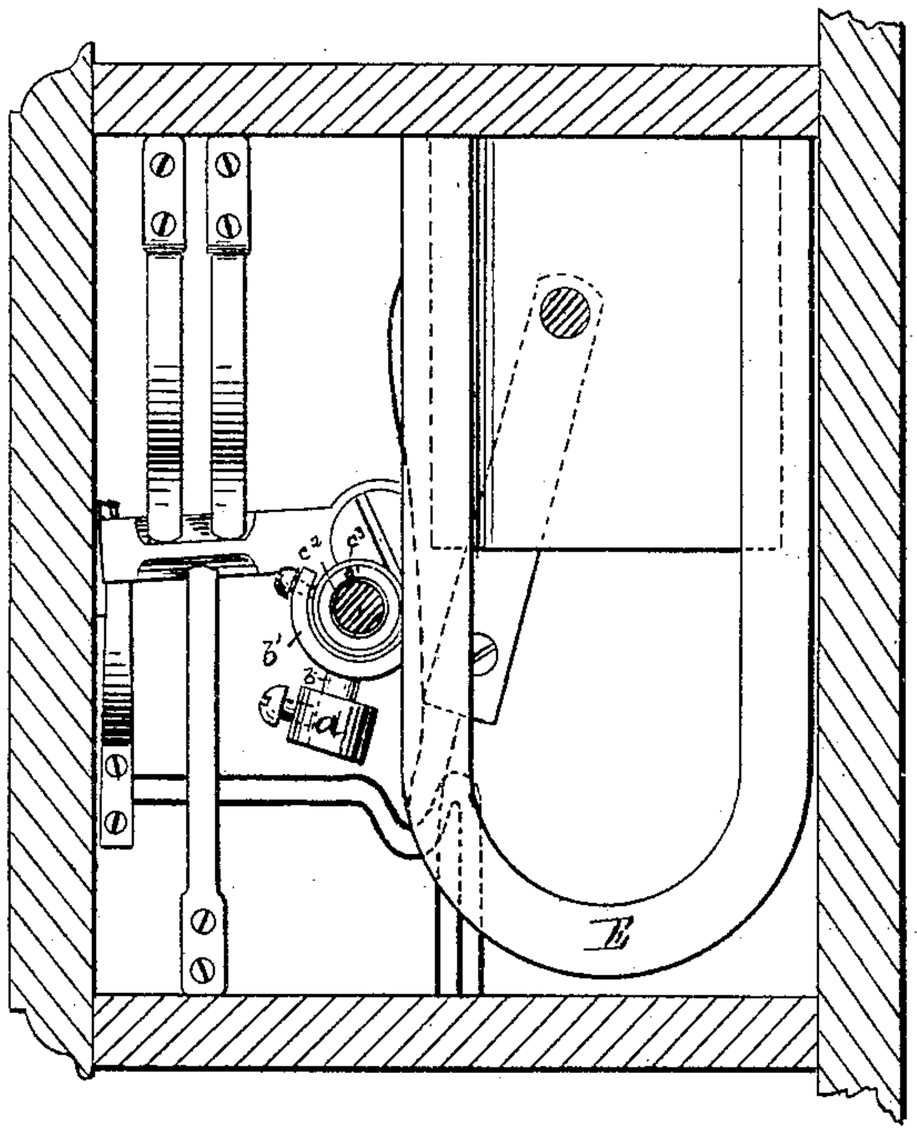

FIG. 3

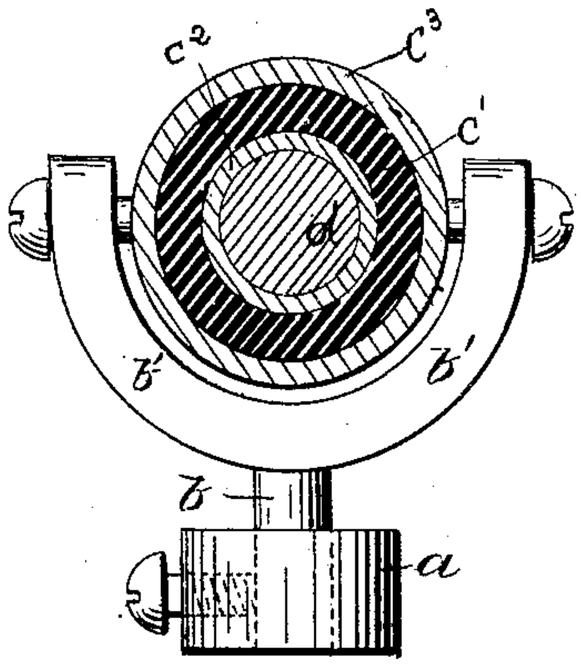

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FIG. 4

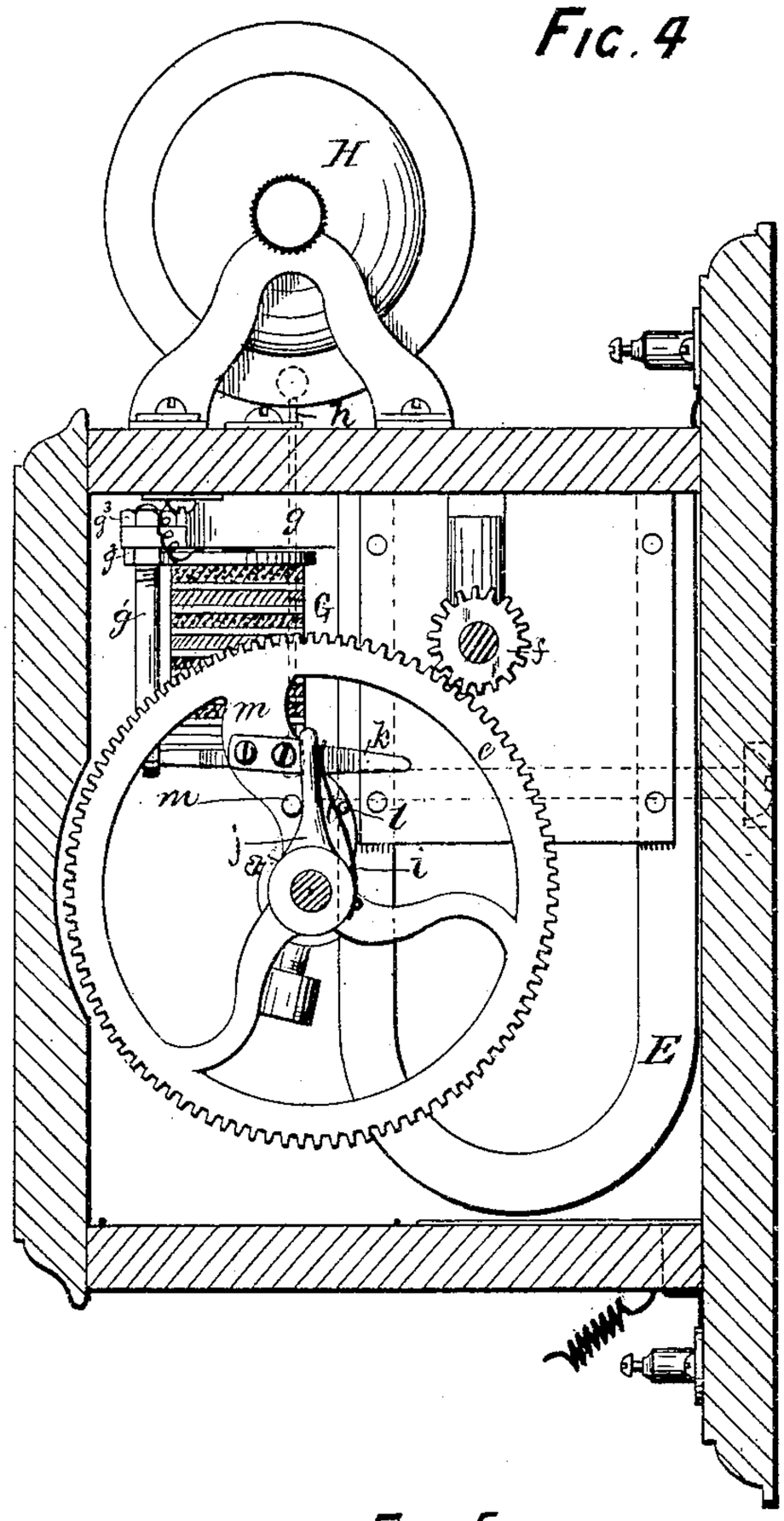
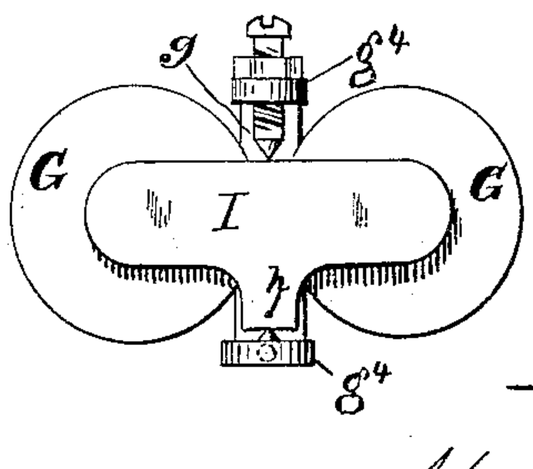


FIG. 5



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UNITED STATES PATENT OFFICE.

HARRY THOMAS OGILVY FRASER, OF CLERKENWELL, COUNTY OF MIDDLESEX, ENGLAND.

MAGNETO-ELECTRIC CALL-BELL.

SPECIFICATION forming part of Letters Patent No. 332,388, dated December 15, 1885.

Application filed January 29, 1885. Serial No. 154,371. (No model.)

To all whom it may concern:

Be it known that I, HARRY THOMAS OGILVY FRASER, a subject of Her Majesty the Queen of Great Britain, residing at Saint James' Street, Clerkenwell, in the county of Middlesex, England, have invented a certain new and useful Improvement in Magneto-Electric Call-Bell Apparatus, of which the following is a specification.

The object of my invention is to produce a magneto-electric call-bell of considerable power, and one in which the driving of the magneto-electric generator will produce the least possible noise, further objects being to obtain economy in manufacture, simplicity in construction, compactness, and greater efficiency in operation. To attain these ends, I proceed as follows: Instead of employing two separate magnets, I utilize the compound magnet of the generator to polarize the electro-magnet of the ringer; and to obviate the wearing of journals by friction or band wheels I use toothed wheels, and overcome the objection to toothed wheels—viz., the noise made by running them in a hollow case—by employing universal compound journals, while the main toothed driving-wheel also operates the cut-out, all being arranged as hereinafter fully described, reference being made to the accompanying drawings, which form part of this specification, and in which like letters refer to like parts in all the figures in which such letters occur.

Figure 1 is a front view when the top or front of the case is open. Fig. 2 is a sectional elevation on line A B, Fig. 1. Fig. 3 represents, on an enlarged scale, the compound journal shown in Figs. 1 and 2. Fig. 4 is a sectional elevation on line C D, Fig. 1, and Fig. 5 is an end view, on an enlarged scale, of the vibrating armature.

I will now proceed to describe my invention in detail, and in such a manner that others skilled in the art to which it pertains may use and practice the same.

A metallic stand, *a*, is screwed to the wall of the casing or cylinder, said stand having a hole drilled through, into which I insert a stud, *b*, with two arms, *b'*, which form a little more than half a circle. Near the extremity of the said arms I insert two pivot-screws, which hold the compound journal *c* suspended between them, and by this means the journal is allowed to move in any direction to suit the revolving shaft *d*, and will give it at the same time the full benefit of the surface of the journal. The compound journal is composed of india-rubber tube, felt, or any other suitable material, *c'*, which will tend to deaden noise. I put a brass or any other suitable metallic bushing, c^2, inside the said india-rubber or other tube, *c'*, as a journal or bearing for the crank or driving shaft *d* to run in. On the outside of the india-rubber or other tube, *c'*, I put another metal casing, c^3, a hole being drilled on each side to receive the points of aforesaid pivot-screws which pass through arms *b'*. The journal at the other or crank end of shaft *d* is also composed of a metallic bushing or sleeve, with india-rubber or other tubing, *c'*, outside, with a flange, c^4, to screw it to the outside or inside wall of the casing, as the case may be. This flange may be of india-rubber or of metal. I also put a thin lining of rubber between the bearings of the shaft *z*, which carries the armature L and the armature-driving pinion *f*, and the part of the casing to which it is fastened, and by these means I attain an almost silent action of the toothed wheels *e* and *f*, as the rubber bearing at the crank end of shaft *d* allows said shaft a limited amount of "play," while the compound journal *c* admits of such adjustment that all biting or striking of the teeth upon cogs *e* and *f* may be obviated and an even and accurate gearing obtained.

The iron base-plate *g* of the electro-magnet G of the ringer is screwed to the end or wall of the casing and in contact with the generator-magnets E, by virtue of which the cores of the electro-magnet G are powerfully polarized. Passing through and suspended by the base-iron *g* is a movable stem, *g'*, adjustable by two lock-nuts, g^2 g^3, on either side of the base-iron *g*. The stem *g'* is provided with projections g^4, through which pass two pointed center screws or pivots, upon which is pivoted the vibrating armature I. The end of the wire of the bell-hammer *h* is screwed into the said vi-

bratory armature I and passes freely through a hole in the wall of the casing, and terminates between the bell-domes H H in the usual way.

In order to simplify and insure greater precision and accuracy in the action of the cut-out of the generator, I employ, in place of the ordinary spiral tension-spring and the pins and insulating parts in connection therewith, two flat springs, *i k*, the first-named being affixed to the driving-arm *j* of the crank-shaft *d*, in encircling part of which it presses against a pin, *l*, on the arm or disk *m* of the driving-wheel *e*, and holds the driving-arm *j* of the crank-shaft *d* in its proper position when the instrument is at rest. Spring *k* is affixed to the arm *m* of the wheel *e*, which is loose upon the shaft *d*, and when in its normal position forms part of the circuit with the line through disk *o*, attached to the side of the box, the ringer-magnet, and the earth or return wire; but when the handle is turned, in order to ring up the distant station, the driving arm *j* of the crank-shaft *d* forces back spring *i* and presses against spring *k*, thereby disconnecting it from the disk *o*, and breaking the short circuit, and placing the generator-coil L in circuit with the line and ringer and the earth instead.

The ordinary wire-connections for telephonic or other purposes are made in the usual way, and these, being well understood by those versed in the art, need not be described, it being understood that while at rest the incoming current passes through the bell-magnet only, the generator being short-circuited by the spring *k* bearing on the disk *o*, and when it is desired to send a signal, the first movement of the crank breaks the short circuit of the generator, as described, before there is any movement of the armature; and as soon as the signal is completed the armature is automatically short-circuited by the spring *i* forcing the arm *j* against the pin *m*, allowing the spring *k* to make contact with the disk *o*.

The usual gravity telephone-switch, S, is shown, but as it operates as usual, need not be specifically described.

What I claim, and desire to secure by Letters Patent, is—

1. In magneto-electric call bells, the combination, with the driving-wheel loosely mounted on the shaft, of contact-spring *k*, carried by the wheel, arm *j* on the crank-shaft A, and disk *o*, all operating substantially as and for the purpose set forth.

2. In magneto-electric call-bells, the combination, with the generator and driving-shaft *d*, of a driving-wheel, *e*, loosely mounted on the shaft, the spring-contact *k*, carried thereby, arm *j*, rigidly connected to the shaft, spring *i*, stop *m*, and disk *o*, substantially as described.

In witness whereof I have hereunto set my hand this 12th day of January, A. D. 1885.

HARRY THOMAS OGILVY FRASER.

Witnesses:

PHILIP M. JUSTICE,

ALLEN P. JONES.