

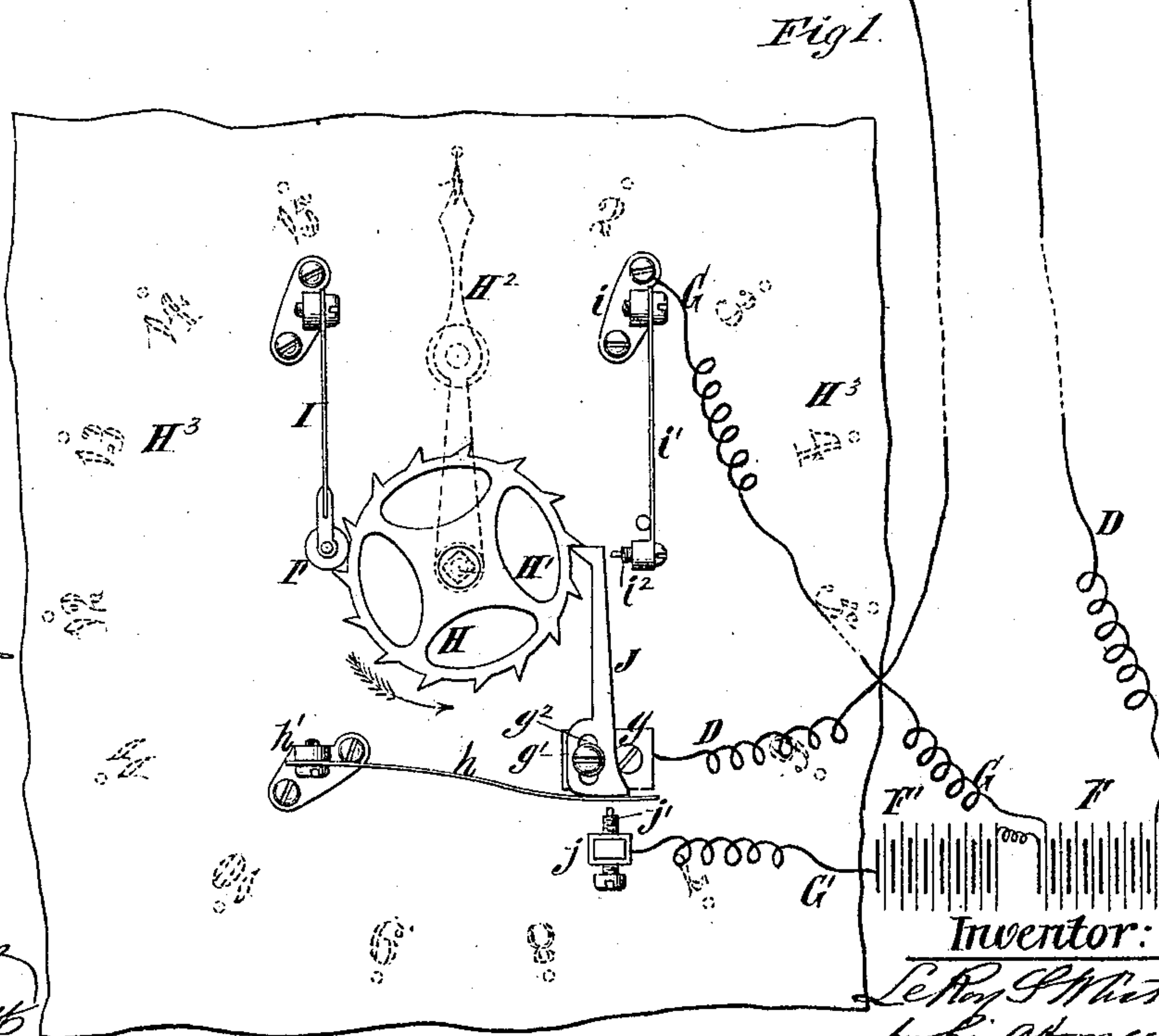
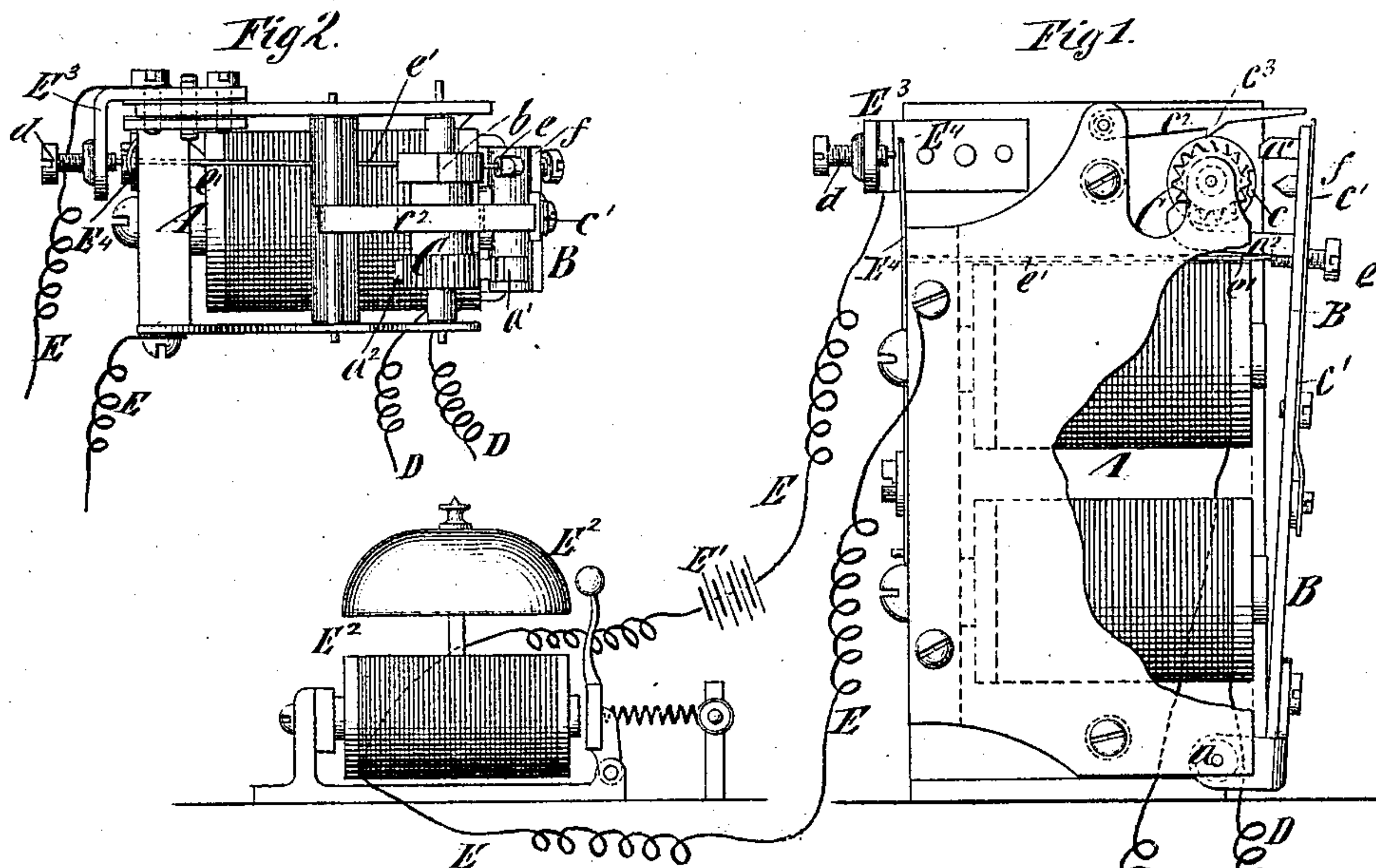
(No Model.)

LE R. S. WHITE.

TRANSMITTER FOR ELECTRIC CALLS.

No. 250,859.

Patented Dec. 13, 1881.



Witnesses:

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TRANSMITTER FOR ELECTRIC CALLS.

SPECIFICATION forming part of Letters Patent No. 250,859, dated December 13, 1881.

Application filed September 15, 1881. (No model.)

To all whom it may concern:

Be it known that I, LE ROY S. WHITE, of Waterbury, in the county of New Haven and State of Connecticut, have invented certain
5 new and useful Improvements in Transmitters for Electric Calls and Signals, of which the following is a specification.

My invention relates to electric calls and signals which are specially intended for use
10 on telephone-lines for calling any one of a number of instruments without disturbing other instruments on the same line, and in which a ratchet-barrel is advanced by a step-by-step movement produced by the armature of an
15 electric magnet through which a succession of weak currents are sent. Such an instrument is shown in Letters Patent No. 239,207, granted to me March 22, 1881. In said patent a signal-controlling device is employed, consisting
20 of a wheel having in it a notch, or a notch in the aforesaid ratchet-barrel, into which passes a dent or tooth on the armature when the barrel is turned to bring the notch into the right position, and a strong current is passed through
25 the magnet to cause the armature to be strongly attached, so as to complete its full movement and close a circuit through a bell-magnet. When the notch in said wheel or barrel is not in a
30 position to receive the dent or tooth, if a strong current be sent through the magnet the dent or tooth will strike upon the periphery of the wheel or barrel and prevent the armature from moving sufficiently far to complete its
35 movement and close the bell-circuit. When any one instrument in a telephone-line is to be called from a central station a succession of weak currents are sent through the instruments by the operator at said central station
40 greater in number than the number of instruments on the line, for the purpose of bringing them all to a common starting-point, whereupon they are all released by a strong current. The notch in the wheel or barrel of each instrument occupies a different relation to the
45 starting-point, and after being released a succession of weak currents is sent through the instruments until the notch of the instrument which it is desired to call is in position to receive the dent or tooth on the armature. A
50 strong current is then sent which will cause the armature of that instrument to complete its

full movement and close its bell-circuit, while the armatures of all the other instruments will be prevented from closing their bell-circuits.

The object of my present invention is to enable the calling to be done more quickly and
55 with greater accuracy than heretofore; and the invention consists, essentially, in the combination, with the call and signal instruments, of a toothed wheel, a lever which is actuated by
60 said wheel when it is turned in one direction, to close a circuit to send a weak current, and which is actuated by said wheel when it is turned in the other direction to close a circuit
65 to send a strong current; and, preferably, also, a dial and index-finger, which enables the operator at the central station to properly manipulate said wheel.

In the accompanying drawings, Figure 1 represents a side view of a call and signal instrument, a vibratory bell, and a central-station instrument embodying my invention, the
70 dial of said central-station instrument being shown in dotted outline; and Fig. 2 represents a plan of the call and signaling instrument. 75

Similar letters of reference designate corresponding parts in both the figures.

Referring first to the call and signal instrument, A designates a horseshoe-magnet wound with wire, and B designates the armature there-
80 of, pivoted at *a*.

C designates a ratchet-barrel, pivoted in the side frames of the instrument and advanced by a step-by-step movement by pawls *a'* *a*² carried by the armature B, the pawl *a'* advancing
85 the barrel half a tooth at each attractive movement of the armature, and the pawl *a*² a half a tooth at each retractive movement thereof. The barrel C also has a notch, *b*, in its periphery, or in the periphery of a collar or wheel
90 mounted thereon, and has intermediately in its length, between the ratchet and the notch *b*, a second notch, *c*.

Upon the back of the armature B is a spring, *c'*, and directly in line therewith is a pivoted
95 stop, *c*², which carries a tooth or dent, *c*³, that rests upon the barrel C in the path of the notch *c*. If a succession of weak currents be sent through the magnet A the armature B will be attracted, and the pawls *a'* *a*² will advance the barrel C
100 until the notch *c* comes opposite the tooth or dent *c*³ on the stop *c*², whereupon the said tooth

or dent will drop into the notch and the end of the stop will be obtruded in the way of the spring c' . The spring c' is strong enough to resist the weak current and prevent the armature B from moving, and by sending a succession of weak currents greater in number than the teeth of the ratchet-barrel and the number of instruments on the line through the magnet A it will be readily seen that the ratchet-barrels of all the instruments will be brought to a common stopping-point, the armatures of all the instruments being held by the stops c^2 . The springs c' of the instruments are not strong enough to resist a strong current, and if one now is sent through the magnets A of all the instruments the armatures B will be moved far enough for their pawls to act, and the barrels C will all be started from a common point.

D designates the main circuit, and E designates a branch or bell circuit, in which is a battery, E' , and a vibrating bell, E^2 .

E^3 designates a bracket attached to the frame of the instrument, but insulated therefrom, and with which one end of the branch or bell circuit E is connected.

E^4 designates a spring, which is secured to the frame of the instrument, and with which the other end of the branch or bell circuit E is connected through the frame of the instrument, the spring not being insulated.

In the bracket E^3 is a set-screw, d , the end of which forms a contact-point, and it is obvious that if the spring E^4 be pressed against said screw the branch or bell circuit will be closed and the bell E^2 sounded.

In the armature B is a screw, e , and to the end thereof is affixed a wire or rod, e' , which passes through the instrument, as best seen in Fig. 2, and is adapted to act upon the spring E^4 when the armature is attracted by a strong current.

Upon the armature B is a tooth or dent, f , which is in line with the path traveled by the notch b in the barrel C, and when the armature is attracted by a strong current the said tooth or dent f will ordinarily strike upon the periphery of the barrel, and the wire e' will not move the spring E^4 into contact with the screw d , and the bell-circuit will not be closed. If, however, the notch b is opposite the tooth or dent f and a strong current be sent, the said tooth or dent will enter the notch and allow the armature to move far enough to move the spring E^4 into contact with the screw d and close the bell-circuit. The notches b in the barrels of the several instruments occupy different positions relatively to the starting-point of the barrels, or rather the notches c therein. For example, the notch b in the barrel of the instrument No. 1 is two teeth from the ratchet from the notch c ; the notch b in instrument No. 2 is three teeth from the notch c ; in instrument No. 3 four teeth, and so on.

As before stated, the ratchet-barrels of all the instruments are started simultaneously by a strong current; and if instrument No. 1 is to

be called a weak current and a strong current are sent, thereby bringing the notch b in the ratchet of instrument No. 1 opposite the tooth or dent f on the armature. If instrument No. 2 is to be called, two weak currents and one strong current are necessary. If instrument No. 3, three weak currents and one strong current are necessary, and so on.

Turning, now, to a description of the instrument at the central station, which comprises a battery for sending weak currents, and an auxiliary battery, which is combined therewith to send strong currents, F designates the principal battery and F' the auxiliary battery. The current returns from the magnet A through the conductor D to the principal battery F, and the current passes out from the principal battery through the conductor G, and from the main and auxiliary batteries, when both are used, through a conductor, G' , both the conductors G G' joining the main conductor or circuit D, as clearly seen.

H designates a toothed wheel, somewhat similar to an escapement-wheel, and which is adapted to turn with a spindle or axis, H' , whereon is secured an index-finger, H^2 , which also serves as a handle for turning the wheel. The wheel H is held against turning accidentally by means of a yielding stop, which consists of a spring-arm, I, and a roller, I' , pivoted therein, and adapted to run upon the wheel and be acted upon by the teeth thereof. The spindle H' projects through a dial, H^3 , which is only shown in dotted outline, and which has a circular series of numbers corresponding with the numbers of the several instruments on the line and with the teeth of the wheel H.

The conductor D of the main circuit which leads to the magnet is connected to a binding-post, g , to which is pivoted a lever, J, which is shaped like a pawl, and has its end bearing upon the wheel H. The lever J is pivoted by a screw, g' , which passes through a slotted eye, g^2 , therein, so that the said lever may swing upon said screw and also move slightly longitudinally, and the end of the lever is pressed toward and against the wheel H by means of a spring, h , which is secured to a post, h' .

The conductor G, by which the current passes from the principal battery F, is connected to a binding-post, i , to which is secured a spring, i' , carrying a contact-point, i^2 .

The conductor G' , whereby the current passes from both the principal and auxiliary batteries $F F'$, is connected to a binding-post, j , wherein is a contact-screw, j' .

When the wheel H is turned in the direction of the arrow the lever J is raised by each tooth into contact with the contact-point i^2 , and a succession of weak currents is sent through the lever and main circuit D to the magnet A. When the wheel H is turned in the contrary direction to that indicated by the arrow the teeth of the wheel do not raise the lever J, but move it bodily backward against the force of the spring h sufficiently to make

contact through said spring between the contact-screw j' and the lever J, whereupon a strong current passes from the conductor G' through the screw j' , spring h , and lever J to the main circuit D, and thence through the magnet A. There must be a sufficient number of teeth on the wheel H and numbers on the dial to work the ratchet-barrel.

When any instrument is to be called the index-finger H^2 , which also constitutes a handle, is moved at least an entire revolution to insure the bringing of all the ratchet-barrels to a common starting-point and stopped at 1 on the dial. The said finger or handle is then pressed backward to send a strong current through the main circuit, and if instrument No. 1 is to be called the finger or handle is pressed backward a second time to send a second strong current.

If any instrument other than No. 1 is to be called, the finger or handle is not pressed back the second time at No. 1, but is moved forward, after pressing it back once, until the number of the instrument which it is desired to call is reached on the dial, when the finger or handle is pressed back and a strong current is sent through the main circuit.

By my invention I enable the operator at a central station to call any subscriber very quickly, and there is very little liability of his making mistakes.

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

1. In an electric call and signal apparatus, a main circuit containing call and signal instruments adapted to be operated by weak and strong currents, two batteries of different strength, a toothed wheel and circuit-closing devices adapted to be operated by the teeth of said wheel, all being so combined and organized that a succession of currents is sent through the circuit from the weaker battery by turning the wheel in one direction, and that a single current is sent through the circuit from the stronger battery by turning the wheel in the other direction, substantially as and for the purpose specified.

2. In an electric call and signal apparatus, a main circuit containing call and signal instruments adapted to be operated by weak and strong currents, two batteries of different strength, a toothed wheel, an index-finger moving therewith, and a dial over which said finger moves, and circuit-closing devices operated by the teeth of said wheel, all being so combined and organized that a succession of currents is sent through the circuit from the weaker battery by turning the wheel in one direction, and that a single current is sent through the circuit from the stronger battery by turning the wheel in the other direction, substantially as and for the purpose specified.

3. In an electric call and signal apparatus, two batteries of different strength, conductors leading therefrom, a main circuit, a lever in said circuit, and a ratchet toothed wheel upon which the end of said lever bears, all being so combined and organized that the teeth of the wheel will move said lever into contact with the conductor of the weaker battery when the wheel is turned in one direction, and into contact with the conductor of the stronger battery when the wheel is turned in the opposite direction, substantially as and for the purpose specified.

4. The combination, with the main and auxiliary batteries F F' , their conductors G G' , and contact-points $i^2 j'$, and the main circuit D, of the pawl-lever J, having a slotted eye, g^2 , and arranged in said main circuit, and the ratchet-wheel H, all substantially as specified.

5. The combination, with the main and auxiliary batteries F F' , their conductors G G' and contact-points $i^2 j'$, and the main circuit D, of the pawl-lever J, having a slotted eye, g^2 , and arranged in said main circuit, the ratchet-wheel H, the dial H^3 , and the index-finger and handle H^2 , all substantially as specified.

LE ROY S. WHITE.

Witnesses:

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