

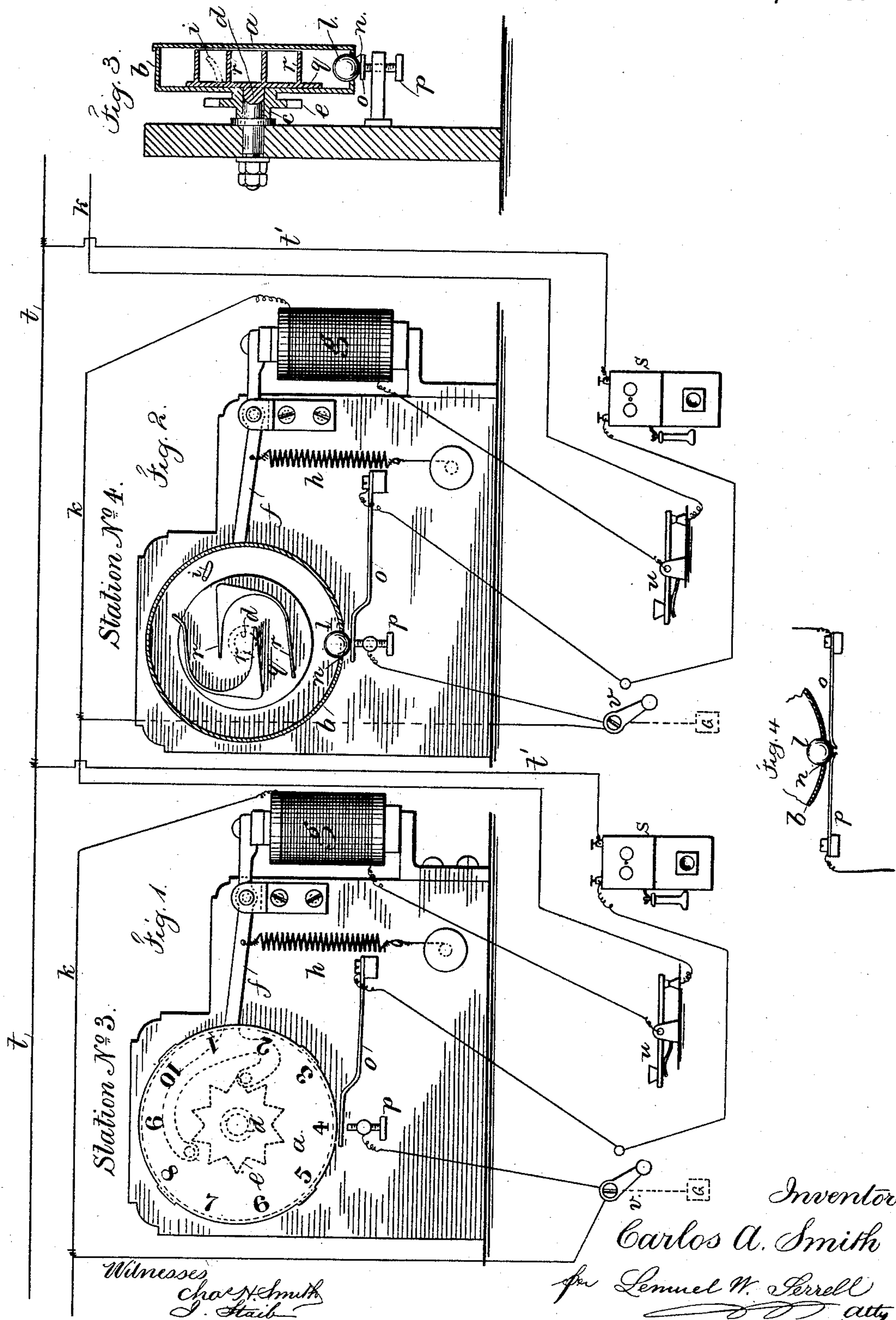
(No Model.)

C. A. SMITH.

ELECTRIC SIGNAL AND CALL APPARATUS.

No. 328,148.

Patented Oct. 13, 1885.



UNITED STATES PATENT OFFICE.

CARLOS A. SMITH, OF BROOKLYN, ASSIGNOR OF ONE-EIGHTH TO M. S. FROST & SON, OF NEW YORK, N. Y.

ELECTRIC SIGNAL AND CALL APPARATUS.

SPECIFICATION forming part of Letters Patent No. 328,148, dated October 13, 1885.

Application filed May 1, 1885. Serial No. 164,143. (No model.)

To all whom it may concern:

Be it known that I, CARLOS A. SMITH, of Brooklyn, in the county of Kings and State of New York, have invented an Improvement in Electric Signal and Call Apparatus, of which the following is a specification.

District-messenger boxes have been placed in series upon a single-line wire, and so, also, have telephones. My improvement is available with such electric instruments as telephones and call-boxes in which communications are intended to be sent and received between a central station and a distant station, or between any two of the stations upon the circuit. In some instances dials have been used, and contacts or circuit-connections made in succession by means of the different dials, so that all the dials being rotated simultaneously by electro-magnets in the circuit, the dials closed the circuit-connections successively and in the order in which the stations are numbered. In devices of this kind difficulty has arisen in consequence of each signaling-circuit being closed in succession by the dials as they are turned, and false signals or calls are frequently given at the intermediate stations while the dials are being turned.

My improvement is made for allowing a small interval of time to elapse between the setting of the revolving dial and the closing of the signaling-circuit. This small interval of time allows for turning the circuit-closing dials without necessarily closing the signaling-circuit, so that all the circuit-closing disks in a series in a line-circuit can be rotated without any signal being given; but when the dials indicate the number of the station that is to be called up, a pause in the pulsations of the current allows the signaling-circuit at that particular station to be closed automatically, thus placing that one station into electric connection, and none other, through the agency of the revolving dial.

In the drawings, Figure 1 is an elevation representing one of the circuit-closing dials in elevation. Fig. 2 is a similar view with the dial-box in section. These two figures form portions of a diagrammatic view showing the circuit-connections between several stations. Fig. 3 is a section vertically through the dial-

box, and Fig. 4 is a section of a modification in the spring circuit-closer.

The dial *a* is the face of a circular box, *b*, which is provided with a tubular axis, *c*, that can be revolved upon and around a fixed gudgeon or shaft, *d*, by means of an escapement-wheel, *e*, that is attached at the back of the box *b*. This escape-wheel *e* is acted upon by pallets upon the armature-lever *f*. These pallets should be wedge-acting, so as to move and lock the dial and box at each pulsation of the current in an electro-magnet, *g*. *h* is the armature-spring to move the armature away from the electro-magnet.

It is to be understood that there are as many divisions upon the dial *a* as there are teeth upon the escapement-wheel, and each pallet moves the dial half the space of a tooth, so that the dial and box will be turned one division by the making and breaking of the circuit upon the line-wire *k*.

Within the box *b* there is a lifter, *i*, and a marble or globular weight, *l*, and there is an opening in the rim of the box *b*, into which this globular weight *l* rolls when the box is so turned that this opening *n* is at the bottom. The opening is not large enough to allow the globular weight to escape, but such weight projects sufficiently to rest upon the circuit-closer *o* and press the same into contact with the point or adjusting-screw *p*. It will now be apparent that if the opening *n* in the box *b* of the dial No. 1 is adjacent to or in line with the No. 1 marked on the dial, and the opening in the box *b* at the second station be adjacent to or in line with the No. 2 marked on that dial, and so on throughout all the signal-boxes at the different stations in the circuit, the circuits will be closed in succession between *o* and *p* at the stations by the action of the weights *l* in the respective dial-boxes.

The devices thus described might be used in connection with the circuit-connections hereinafter detailed, but each call would be rung in succession at all the stations on the line up to the one actually desired. For instance, should a call be sent from the central station for station No. 4, all the dials and boxes would be turned together, and the circuit-closing spring *o* at station No. 1 would first be moved to make and break contact. Then the

same thing would occur at stations 2 and 3 in succession, even though the current on the line should be pulsated with ordinary rapidity. To prevent this occurring I make use of
 5 a detainer within each box, the same being formed of a stationary disk, *q*, upon the end of the gudgeon *d*, and upon this disk are guide-flanges *r*, forming zigzag inclines. The position of the lifter *i* upon the inside of the
 10 box *b* in relation to the opening *n* is such that this lifter *i* has brought the globular weight *l* nearly to the top of the first incline, *r*, when the dial-box pauses at the number preceding the number corresponding to the
 15 station-number; hence, when the line-pulsation, acting through the magnet *g*, turns the dial-box so that its opening *n* is immediately at the bottom, the weight *l* is simultaneously raised and rolls off the lifter *i*, down the suc-
 20 cessive zigzag incline *r*, and falls upon the inside of the rim and rolls to the opening *n*, and, projecting through the same, closes the circuit at *o p*. This movement of the weight *l* occupies a sufficient length of time so that
 25 the weight does not come into action instantly, and in setting a number of dial-boxes none of the circuits are closed until after the pulsations on the line *k* cease; hence the weights in the respective dial-boxes will not be oper-
 30 ative to close the circuit except at that dial-box where the opening *n* is at the bottom, and that box is the one at the station to which the communication is to be sent.

It will now be understood that this circuit-
 35 closing device can be availed of with several of the signal-call instruments already in the market, and it can also be used with telephones and with police-signal calls.

In the drawings, I have indicated at S an
 40 ordinary telephone and call-box to illustrate the manner in which my improvement may be applied; but I do not limit myself in this particular.

t represents a telephonic line-wire, the
 45 branch *t'* from the same passing through the telephone call-instrument to the spring *o*, and the circuit may be completed from the contact *p* to the ground *G*, or by a branch to the line-wire *k*. Let *u* represent a key that normally
 50 is closed. Suppose, now, a party at station No. 3 desires to communicate with station No. 4, he depresses his key *u*, opening and closing circuit and revolving all the dial-boxes on the line simultaneously until his dial and all the
 55 other dials indicate station 3. The movement of the key *u* now being stopped, the weight *l* at station No. 4 rolls down its incline zigzag and closes the circuit at *o p*, putting the tele-
 60 phone-instrument S at station No. 4 into circuit, and allowing station No. 3 to communicate direct with station No. 4, and so on either station can communicate direct with either of the other stations.

It will be understood that the respective
 65 dial-boxes can be rotated by a key at the central station, and that for the telephone-service the circuits can be arranged so that

the central station can be called up in the ordinary manner, and that the operator at the central station can rotate all the dial-boxes in
 70 the manner before described to put into communication the desired instrument with the party sending in the call to the central station.

Where the call is made direct from one
 75 station to another, a switch may be used at *v* to enable the party sending out the call to complete the circuit through his own telephonic instrument. All the dials on the line indicate the number of the station in use, 80 and after the communication between the stations is finished all the dials are to be turned back to their normal position.

If the ball is of metal, it may be made to close the circuit by falling in between the spring *o*
 85 and a contact bar or spring, *p*, as indicated in Fig. 4.

I claim as my invention—

1. The combination, with the magnet, armature-lever, pawls, and escapement-wheel, of a
 90 dial and box, a weight within the box, and a circuit-closing spring acted upon by the weight, substantially as set forth.

2. The combination, in an electric signaling-apparatus, of an electro-magnet in the circuit,
 95 an armature-lever, a dial rotated or controlled by the armature-lever, a weight connected with the dial, and a spring acted upon by the weight to close the circuit, substantially as set forth. 100

3. The dial-box and means for rotating the same, in combination with a globular weight within the box, and a circuit-closing spring,
 105 the weight projecting through an opening in the box to act upon the spring, substantially as specified.

4. The combination, in an electric circuit, of two or more dial-boxes, one at each station,
 110 an electro-magnet and armature to rotate the same, a weight within each dial-box, a circuit-closing spring acted upon by the weight, and a second electric circuit passing through the circuit-closing spring, and containing a telephonic or other electrical instrument, sub-
 115 stantially as set forth.

5. The combination, in an electric circuit, of a dial-box, a magnet and armature to rotate the same, a circuit-closing weight within the box, a detainer to act upon the weight, and a
 120 circuit-closing spring outside of the box, against which the weight acts, substantially as set forth.

6. The dial-box having a tubular shaft and an opening in the rim of the box, in combination with the fixed axis upon which the box is
 125 revolved, a globular weight within the box, the lifter *i*, and the stationary zigzag inclines connected to the axis, substantially as set forth.

Signed by me this 27th day of April, A. D. 1885.

C. A. SMITH.

Witnesses:

GEO. T. PINCKNEY,
 WILLIAM G. MOTT.