

(No Model.)

3 Sheets—Sheet 1.

H. E. WALTER.
ELECTRIC SIGNALING APPARATUS.

No. 529,985.

Patented Nov. 27, 1894.

Fig. 1.

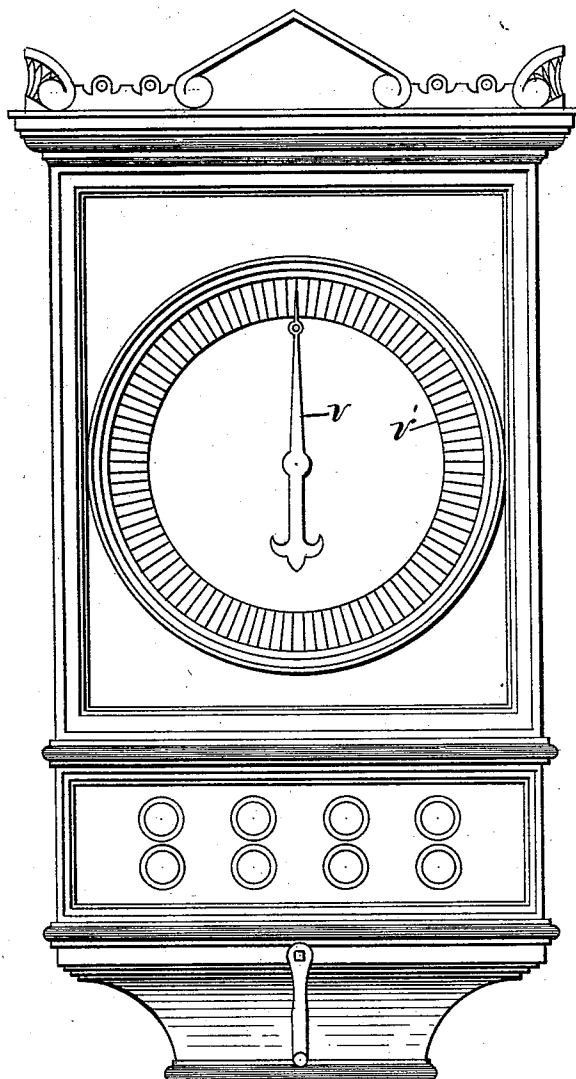
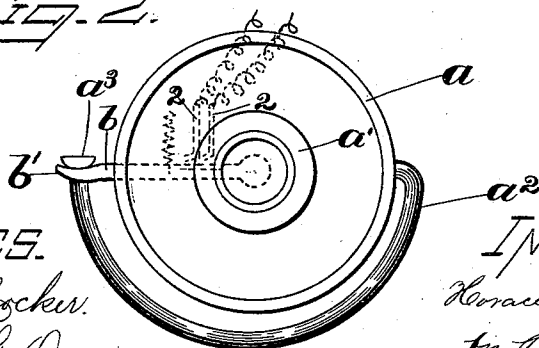


Fig. 2.



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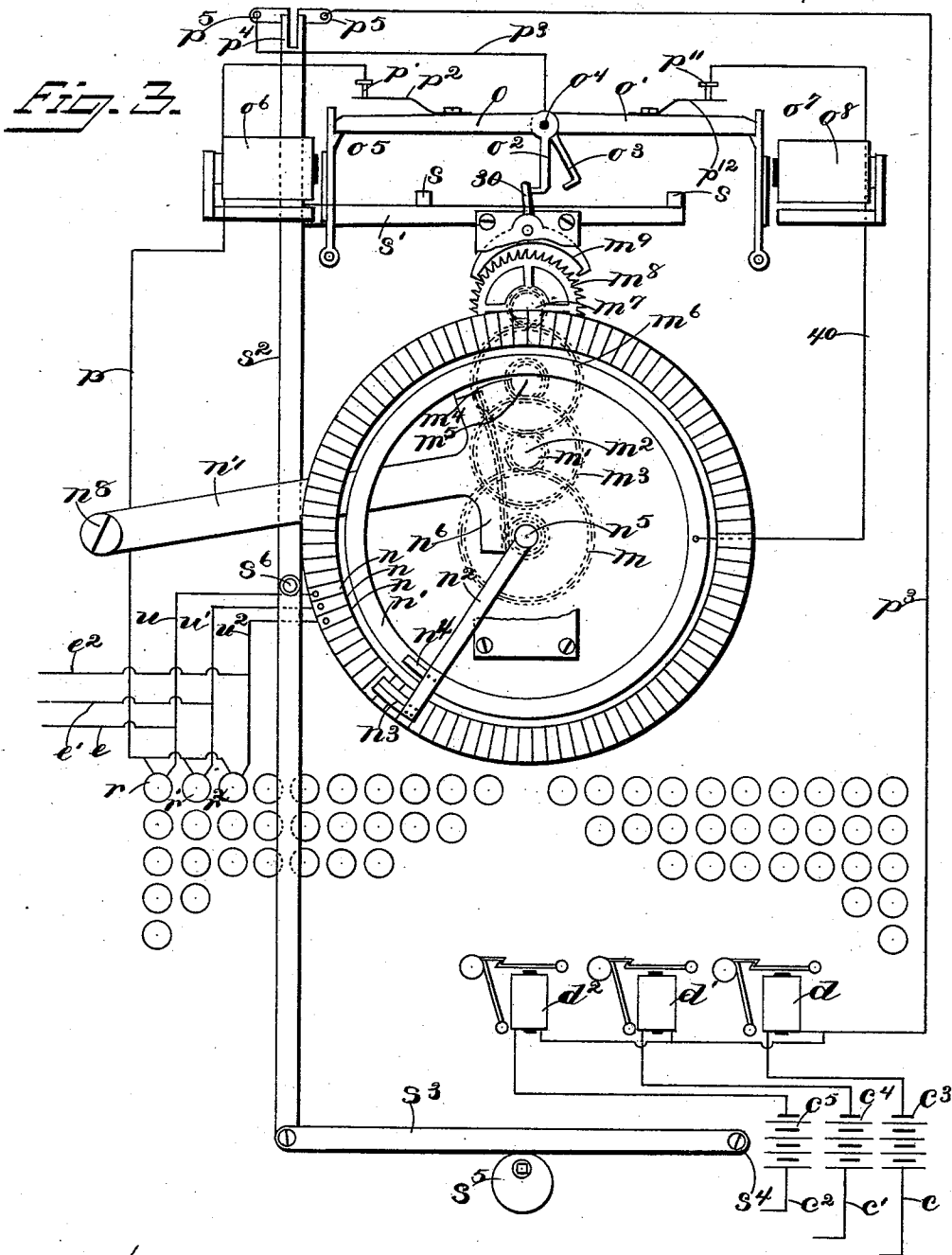
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Fig. 4.

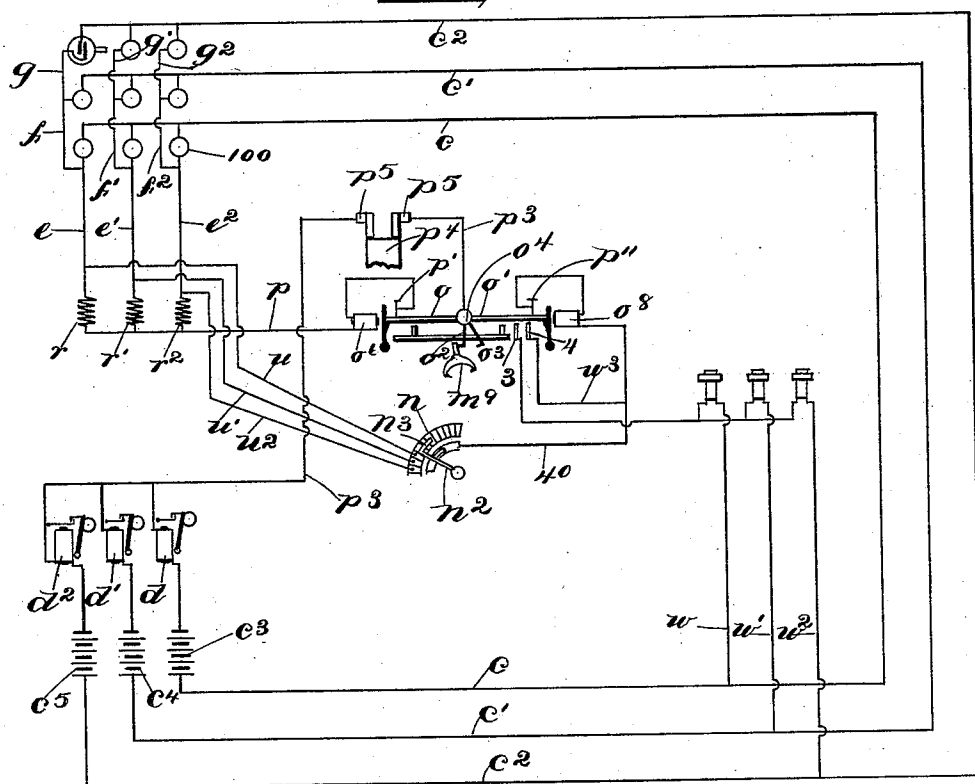


Fig. 5.

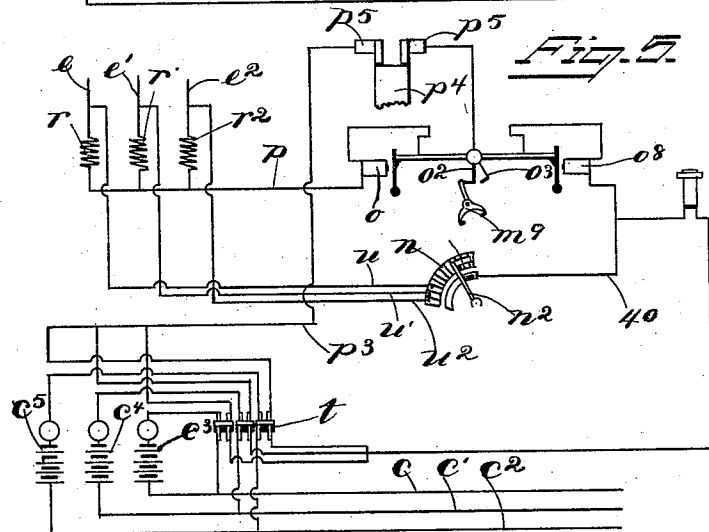
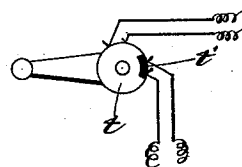


Fig. 6.



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UNITED STATES PATENT OFFICE.

HORACE EVERETT WALTER, OF RICHFIELD SPRINGS, NEW YORK.

ELECTRIC SIGNALING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 529,985, dated November 27, 1894.

Application filed March 26, 1894. Serial No. 505,064. (No model.)

To all whom it may concern:

Be it known that I, HORACE EVERETT WALTER, of Richfield Springs, county of Otsego, State of New York, have invented an Improvement in Electric Signaling Apparatus, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

10 This invention has for its object to construct and arrange an electric signaling apparatus or system, by which any sub-station or distant point, which may be any room of a hotel, may automatically call up a central station, which may be the office of the hotel, and establish or cause to be established proper electrical connection, whereby telephonic communication may be thereafter carried on between the central office and the sub-station or room calling.

15 In accordance with this invention telephonic apparatus is arranged at each sub-station, as in each room of a hotel for instance, such apparatus preferably consisting of any ordinary or special form of magneto telephone, and a motor-driven searching or selecting device or apparatus is employed at the central office, which when set in operation selects the particular room calling, and indicates the same on a suitable dial or in any other suitable manner. Telephonic apparatus, preferably similar in its construction to that employed at the different rooms, is also provided at the central office which is used to carry on telephonic communication with any room calling.

20 The operation of the selecting device or apparatus is controlled by two electro-magnets, one of which releases the normally wound motor which operates said releasing device and the other of which stops said motor, and said releasing electro-magnet is controlled by circuit-closers at the rooms, while the stopping electro-magnet is controlled by the combined action of said circuit-closers and of the selecting device. The circuit-closers at the rooms may be operated automatically, if desired. The telephonic apparatus or included in circuit by an automatic or manually operated switch.

Figure 1, shows in front elevation the central office selecting device, of my electric signaling apparatus; Fig. 2, a front elevation of one of the magneto telephones at a room; Fig. 3, an interior and diagrammatical view of the central office selecting device or apparatus; Fig. 4, a diagrammatical view of electric signaling apparatus embodying this invention; Fig. 5, a modified diagrammatical view of the same, and Fig. 6, a detail showing one of the manual switches for the central office telephone.

25 The sub-station apparatus or that apparatus contained in the room of the hotel consists of a telephone of the class commonly known as magneto telephones, and represented in Fig. 2, as comprising an outer case *a* having a suitable mouth piece *a'*, and containing a diaphragm and permanent magnet, and a hearing tube *a²* leading from one side of said outer case *a* and having a trumpet end piece *a³*. This magneto telephone is or may be connected in or with the circuit or branch line in any usual manner. A circuit switch such as *b* is also provided at each room for the circuit thereat, the action of which is normally to retain the circuit open, but which when operated or permitted to operate closes said circuit. In order that this switch may be operated automatically it is herein represented as having a forked end *b'* which receives and holds the trumpet end-piece *a³* of the hearing tube of the telephone, and when said hearing tube is supported by said switch arm *b* the circuit will be opened, but when said tube is removed from its support for use, the circuit will be automatically closed by the switch arm *b* being drawn up by a spring and closing upon the contact pens 2, 2. See dotted lines Fig. 2. I do not desire however to limit my invention to any particular form or construction of switch or means for operating it, as many forms of such devices are well known, but the form shown is simple and possesses many advantages, particularly as it is operated automatically.

30 The wires to the different rooms all radiate from a central office and are connected with a common return or battery wire, and while it is obvious that many different arrangements of wiring may be employed, depending

upon the arrangement of the rooms in the building, one arrangement is represented in Fig. 4, wherein a main or battery wire is provided for each floor at c, c', c^2 , each containing a battery c^3, c^4, c^5 , and also an annunciator drop as d, d', d^2 , said annunciator drops indicating upon which floor the room calling is located. Branch wires e, e', e^2 , lead from the battery wire or floor wire c to the central office, each including the aforesaid telephone and circuit closing switch or device $b, 2, 2$, at each room; and other branch wires f, f', f^2 , lead from the battery wire or floor wire c' , being connected respectively with the branch wires e, e', e^2 ; and other branch wires g, g', g^2 , lead from the battery wire or floor wire c^2 , being connected respectively with the branch wires f, f', f^2 . With this arrangement of branch wires it will be seen that all the rooms numbered 1, 101, 201, may call to the central office over the branch line e , and all the rooms numbered 2, 102, 202, may call to the central office over the branch line e' and so on, but while this arrangement of wiring possesses many advantages particularly in hotels wherein the rooms are numbered in such manner as to indicate both the location and floor, yet a separate branch wire may be provided for each room extending directly to the central office.

At the central office a selecting device or commutator is provided which is so constructed and arranged as to be set in operation by a closure of the circuit at any one of the rooms, and to be stopped when the movable member of the selecting device or commutator arrives at the proper position to indicate the room at which the circuit is thus closed. This selecting device or commutator, see Fig. 3, consists of a series of segments or terminals n arranged in a circle, and secured to a hard rubber disk, or otherwise supported, and a continuous solid ring n' , arranged concentrically with relation to the terminals n' , and a trailing arm n^2 having upon it trailing fingers n^3, n^4 , one of which, as n^3 , co-operates with the terminals n , and the other of which as n^4 co-operates with the solid ring n' . The trailing or selecting arm n^2 is secured to a shaft n^5 carrying a ratchet and also a pinion, which latter is engaged by a sector n^6 on the end of a sector-carrying arm n^7 pivoted at n^8 . The sector is made quite heavy and is normally elevated, and serves as the actuator for the trailing or selecting arm. A toothed wheel m is also connected to the shaft n^5 which engages a pinion m' secured to a shaft m^2 carrying a toothed wheel m^3 , which engages a pinion m^4 secured to a shaft m^5 , carrying a toothed wheel m^6 , which engages a pinion m^7 secured to a shaft carrying an escape wheel m^8 , with which co-operates a suitable pallet m^9 , bearing an upright projection 30. Two independent stopping or retaining devices are provided for this train of gearing, each consisting of a horizontal arm o, o' , extended in opposite ways, and loosely mounted upon

the same pivot o^4 , or it may be different pivots located adjacent to each other, each arm having a depending leg o^2, o^3 , adapted to co-operate with the projection 30 of the pallet. The arm o is held up in its elevated position by a shoulder or projection upon the armature o^5 of an electro-magnet o^6 , and when in such position its depending leg o^2 engages and holds the projection 30 of the pallet, so as to restrain the movement of the train. The arm o' is likewise held up in its elevated position by a shoulder or projection upon the armature o^7 of an electro-magnet o^8 , and when in such position its depending leg o^3 is normally out of engagement with said projection 30. The armatures of said electro-magnets o^6, o^8 are both normally retracted, but when the armature of the electro-magnet o^6 is attracted the arm o will be released, which in turn releases the train, and when the armature of the electro-magnet o^8 is attracted the arm o' will be released, which in turn throws its depending leg o^3 into engagement with the projection 30 and thereby stops the train. Hence electro-magnet o^6 , serves as the releasing electro-magnet, and electro-magnet o^8 as the stopping electro-magnet. When said arms o, o' , are released, they fall onto stops or projections s, s , rising from an arm s' which is attached to a vertical rod or bar s^2 , which is supported in any suitable way within the outer case containing the operating parts of the central office apparatus, and said rod or bar s^2 is loosely connected at its lower end to an arm s^3 pivoted at s^4 . A cam or eccentric disk s^5 is located beneath the arm s^3 , which when turned raises said arm with the stops s, s , thereon, thereby restoring the arms o, o' . A projection s^6 is also provided on the bar s^2 , beneath the sector-carrying arm n^7 for the purpose of raising said arm, restoring it to its normal elevated position, when the bar s^2 is raised by means of the cam disk above referred to.

The branch lines e, e', e^2 , each include at the central office a resistance coil r, r', r^2 , and said lines are thereafter connected by a common branch wire p with the releasing electro-magnet o^6 , so that said electro-magnet is common to all the branch lines, and hence its armature will be attracted by a closure of any one of them. The branch wire p leaving the electro-magnet o^6 extends to a circuit breaker, one contact of which as p' is made adjustable, and the other p^2 of which is borne by the arm o . The current traverses the arm o to the pivot o^4 , and a wire p^3 connects said pivot o^4 with the several battery wires c, c', c^2 . The wire p^3 includes a circuit breaker p^4, p^5 as represented in Fig. 3, one member p^4 of which is attached to the rod or bar s^2 , but insulated from said bar so that whenever the said rod or bar is operated to restore the parts the circuit will be opened. A series of branch wires u, u', u^2 , connect the branch lines e, e', e^2 , with the segments or terminals n of the selecting device which shunt the resistances r ,

r' , r'' , and as the trailing arm n^2 passes over and successively engages the terminals of the commutator, these branch wires u , u' , u'' , will be successively connected with the solid ring n' , and from said ring a branch wire 40 leads to the stopping electro-magnet o^8 , and from said electro-magnet to a circuit breaker p^{11} , p^{12} , and the current then traverses the arm o' to pivot o^4 .

Whenever one of the circuit closers at a room is operated, as for instance that one in branch line e^2 , and represented at 100, a battery circuit is established, as for instance from battery c^3 over wire c , branch line e^2 , resistance r^2 , wire p , electro-magnet o^6 , circuit breaker p' , p^2 , arm o , pivot o^4 , wire p^3 , annunciator drop d to the battery c^2 . The armature of the electro-magnet o^6 is thus attracted and the arm o falls, releasing the selecting device or commutator, and at the same time breaking the branch wire p at p' , p^2 . The selecting device when thus released continues to operate until its trailing arm engages that terminal which is connected with the closed branch line, when the branch wire 40 will be included in the circuit, and the stopping electro-magnet o^8 therein, will be at once energized, attracting its armature, and permitting the arm o' to fall and thereby stop the train.

An indicator v moving over a dial v' , see Fig. 1, and secured to the shaft n^5 , will at such time indicate the number of the room on the floor, while the annunciator drop d , will indicate the floor.

If there should be a large number of rooms on a floor, and several floors, the arrangement of wiring and indicating shown in Fig. 3, would possess many advantages.

When several branch wires leading from the different rooms are connected with a single or common wire p , containing the releasing or operating electro-magnet o^6 , so that said magnet may be affected by any one of said branch wires, it will be seen that said branch wires are really all connected together, and they must be disconnected from said single wire, or from each other, before any particular branch wire can be selected by the selecting device or commutator, and to carry out this result the resistances r , r' , r'' are employed which are wound quite high, so that the battery is not strong enough to operate the stopping electro-magnet o^8 , and at the same time allow its current to pass through the resistances, or any two of them, and hence said magnet will not be operated until the commutator arm arrives at that terminal which is connected by the wire shunting the resistance. For example suppose said resistances were omitted and the branch wire e^2 closed at 100, then the circuit would be established and the electro-magnet o^6 operate, releasing the selecting device, but there would be a closed path from 100, over wire e^2 , and by wire p to all the other branch wires and thence to the selecting device, regardless of

the position of its arm and thence to the stopping electro-magnet o^8 , so that its armature would be attracted and the selecting device prevented from operating.

Referring to Fig. 4, a separate telephone is provided for each battery or floor wire, they being included in branch wires w , w' , w'' , and connected to an electric contact 3, and beside said contact 3, a similar contact 4 is arranged, which is connected by a wire w^3 with the wire 40, and when the arm o' falls said contacts 3, 4, will be closed, thereby automatically including the telephones in circuit, and at the same time shutting the batteries. In Fig. 5, however a single telephone is provided at the central office, and several manual switches are provided for including it in circuit, and at the same time shutting the batteries, so that in one case there are several telephones included by a single automatic switch, while in the other case there are several switches and a single telephone.

The manual switch which may be employed may consist of a cylinder of hard rubber t , see Fig. 6, having thereon a metallic segment t' , and a hand piece by means of which it is turned, and two pairs of contacts one of which is connected by wires with the line at one side of the battery and the other of which is connected by wires with the line at the opposite side of the battery, so that when turned to include the telephone, said battery or either of them will be shunted.

I claim—

1. In an electric signaling apparatus, the combination of several normally open branch lines radiating from a central office, and having a common return including a battery, a circuit closer for each branch line at a distant point, and a commutator at the central office comprising a series of terminals connected with said open branch lines, and a circuit closing device adapted to successively engage said terminals, a motor for rotating said device, an electro-magnet for releasing said motor operated by a closure of any one of said branch lines, an electro-magnet in electrical connection with said commutator which operates to stop said motor when the circuit-closing arm engages that terminal connected with the closed branch line, a telephone in each branch line at the distant point, and a telephone at the central office in a normally open shunt circuit around the battery, and a switch for closing said shunt circuit to include the telephone and short circuit of the battery, substantially as described.

2. In an electric signaling apparatus, the combination of several normally open branch lines radiating from a central office and having a common return including a battery, a circuit closer for each branch line at a distant point and a commutator at the central office comprising a series of terminals connected with said open branch lines, and a circuit closing device adapted to successively

engage said terminals, a motor for rotating said device, an electro-magnet for releasing said motor operated by a closure of any one of said branch lines, an electro-magnet in electrical connection with said commutator which operates to stop said motor when the circuit closing device engages that terminal connected with a closed branch line, a telephone in each branch line at the distant point, a telephone at the central office, and an automatic switch for including it in circuit operated by the stopping electro-magnet, substantially as described.

3. In an electric signaling apparatus, the combination of several normally open branch lines radiating from a central office and having a common return including a battery, a circuit closer for each branch line at a distant point, and a commutator at the central office comprising a series of terminals connected with said open branch lines, and a circuit closing arm adapted to successively engage said terminals, a motor for rotating said arm, an electro-magnet for releasing said motor operated by a closure of any one of said branch lines, an electro-magnet in electrical connection with said commutator which operates to stop said motor when the circuit closing arm engages that terminal connected with a closed branch line, an interrupting device for said electrical connection operated by said electro-magnet, a telephone in each branch line at the distant point, and a telephone at the central office adapted to be included in the circuit, substantially as described.

4. In an electric signaling apparatus, the combination of several normally open branch lines radiating from a central office, and having a common return including a battery, a circuit closer for each branch line at a distant point, and a commutator at the central office comprising a series of terminals connected with said open branch line, and a circuit closing arm adapted to successively engage said terminals, a motor for rotating said arm, an electro-magnet included in a branch wire common to all the open branch lines for releasing said motor, and a circuit breaker for said branch wire operated by said electro-magnet, an electro-magnet in electrical connection with said commutator which operates to stop said motor when said circuit closing arm engages that terminal connected with a closed branch line, and a restoring device for restoring said circuit breaker and for also winding the actuator of the commutator, a telephone in each branch line at a distant point, and a telephone at the central office, adapted

to be included in the circuit, substantially as described.

5. In an electric signaling apparatus, the combination of several normally open branch lines radiating from a central office and having a common return including a battery, a circuit closer for each branch line at a distant point, and a resistance for each branch line at the central office, a commutator at the central office comprising a series of terminals connected with said open branch lines, and a circuit closing arm adapted to successively engage said terminals and thereby successively shunt the resistances, a motor for rotating said arm, an electro-magnet for releasing said motor operated by a closure of any one of said branch lines, an electro-magnet in electrical connection with said circuit-closing arm which operates to stop said motor when the circuit-closing arm engages that terminal connected with a closed branch line, a telephone in each branch line at the distant point, and a telephone at the central office adapted to be connected with the circuit, substantially as described.

6. In an electrical signaling apparatus, the combination of several battery wires leading from a central office to the different floors of a building each including an annunciator, normally open branch lines returning from said battery wires by way of the different rooms to the central office, substantially as shown, a circuit closer for each branch line at each room, and a resistance included in each branch line at the central office, a commutator at the central office comprising a series of terminals connected with said open branch lines, and a circuit closing arm adapted to successively engage said terminals and thereby successively shunt the resistances, a motor for rotating said arm, an electro-magnet included in a branch wire common to all said open branch lines for releasing said motor, an electro-magnet in electrical connection with said circuit-closing arm which operates to stop said motor when the circuit-closing arm engages that terminal connected with a closed branch line, telephones in the branch lines at each room, and one or more telephones at the central office, and switches for including them in circuit, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HORACE EVERETT WALTER.

Witnesses:

ANNA M. WALTER,
C. E. PAWLING.