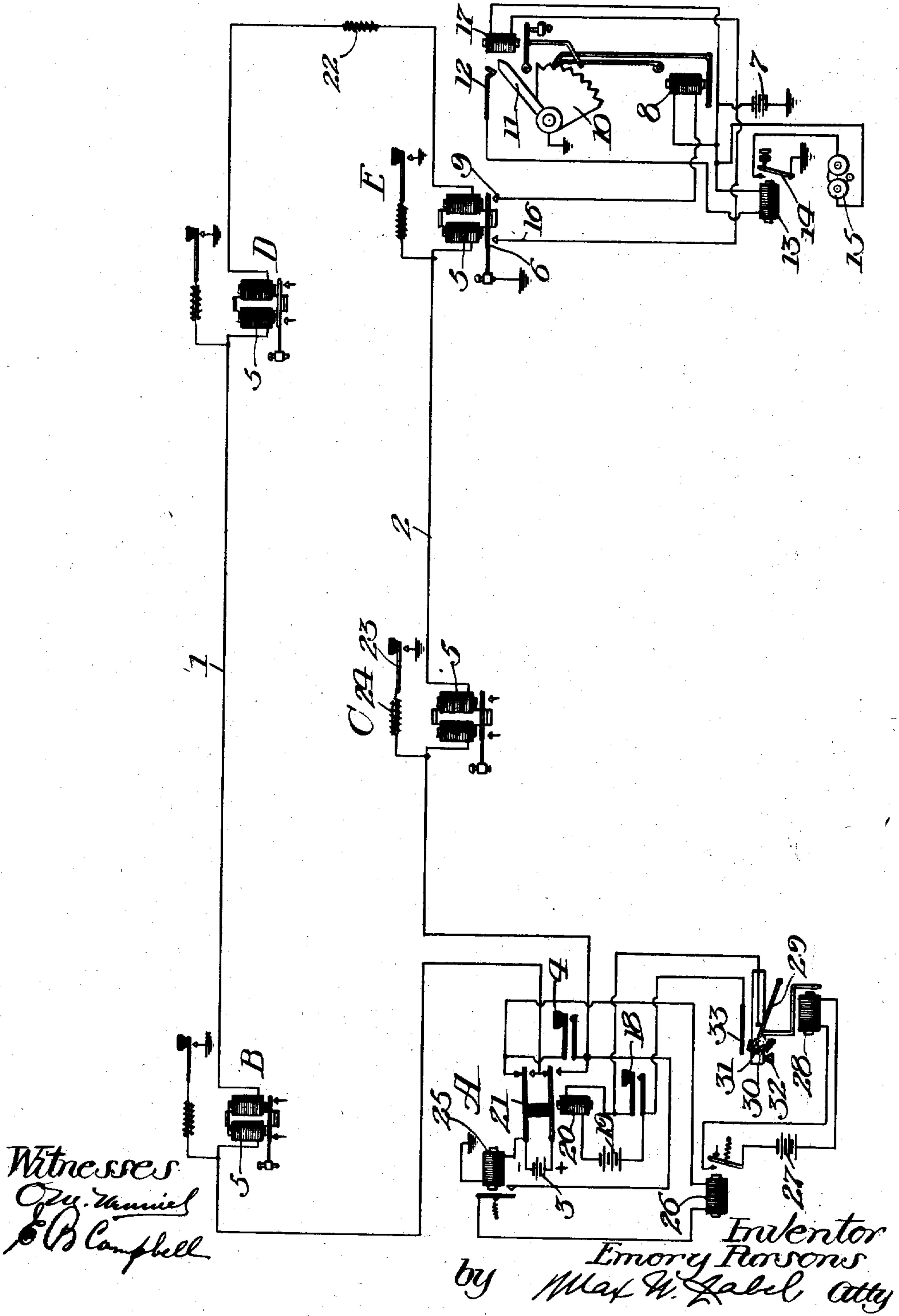


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 SIGNALING SYSTEM.
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EMORY PARSONS, OF CHICAGO, ILLINOIS.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, EMORY PARSONS, citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Signaling Systems, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to signaling systems, and has for its object the provision of a novel system wherein it is possible for the various stations on a selective signaling line to selectively call any of the stations on the line.

More particularly my invention contemplates a plurality of signal receiving and sending stations all on the same line, together with novel means at each station for calling selectively any station on that line.

I will describe my invention in detail in connection with the accompanying drawing illustrating one embodiment thereof.

Referring to the drawing, I have shown signaling line wires 1 and 2, which pass through all of the stations, which stations are preferably staggered throughout these wires 1 and 2, and which stations are preferably a central station A and auxiliary stations B, C, D and E. The central station A has some instrumentalities which I prefer to place only at this station, although, of course, it is possible to have all of the equipment at all of the stations if necessary, but to simplify matters I have shown in this drawing the central station as thus being equipped to call the various stations, and for this reason have provided a battery 3, the positive pole of which is connected with the line wire 1 and a key 4, by means of which negative battery current may be connected with the line wire 2, thus to form a closed circuit to operate the polar relays 5 at each substation. The polar relays 5 are provided with a floating armature which makes contact with one terminal when positive current flows through the relay and makes connection with the second terminal when the battery current is reversed. The further connections of the polar relay 5 are shown in detail in connection with the station E that are omitted for the sake of clearness from the station B, C and D.

Referring more particularly to station E, I have shown a battery 7, which is connected

with the relay 8, so that when the armature 6 makes contact with the contact point 9, said relay 8 is operated, and by virtue of its armature causes a movement of the step-up mechanism 10 the required number of notches to bring its lever 11 into electrical association with the spring 12, thus to close contact therewith, so as to operate when this contact is of sufficient time duration to actuate the slow-acting relay 13 whereby the armature 14 of this slow-acting relay closes a circuit through the signal 15 and calls this particular station. A mere passing contact between the lever 11 and the spring 12 is not of sufficient time duration to operate the relay 13, and it is only when the lever 11 stops in electrical association with the spring 12 that sufficient time is allowed for the relay 13 to operate thereby to actuate the bell 15. A reverse operation of the floating armature 6 makes contact with the contact pin 16, thus to close circuit through the release magnet 17, which allows the step-up mechanism 10 to fall back into its normal position. Thus to call any station from the central station A, it is necessary to step-up the mechanisms at the various stations by means of the key 4, and the desired station will be signaled through the agency of the slow acting relay 13. After the signal has been sent, the release key 18 is actuated, which closes circuit through the battery 19 and a reversing relay 20, thus to operate the reversing switch 21 and a current of a reverse polarity is sent over the transmission lines 1 and 2 to cause an opposite movement of the respective armatures 6, thus to operate the release magnet 17 and to restore them all to normal position.

I provide an impedance coil 22 at the farthest extremity between the line wires 1 and 2, which forms no part of this invention, but is used when my system is adapted for telephone purposes, and is shown included, as it will then form part of the serial circuit. I further provide at each station B, C and D a key 23, whose front contact is preferably connected to ground, and whose lever is preferably connected through the agency of an impedance coil 23 with the line wire with which the particular station is associated.

The novel features of my invention will now be apparent: Supposing that station C for instance is desirous of calling station B, or any other station on the line: the key

23 is actuated to momentarily ground the line wire with which the station is associated. This causes current of the required polarity to pass through line wires 1 and 2 by reason of the fact that a circuit is established from a ground at the auxiliary relay 25, through said relay 25, through the battery 3, through line wire 1, line wire 2, impedance coil 24, and key 23 back to ground. This is a high resistance path, and of itself does not permit sufficient current to thread the polar relays 5 to operate them, but the operation of the relay 25 causes a closure of contacts through its associated armature, which is the same thing as is accomplished when operating the key 4. Thus operating key 23 sends the required impulses over the line wires and causes operation of the step-up mechanism 10 as desired through the agency of the relay 25. When the desired number of impulses have been sent to operate the step-up mechanism in position for the desired station, the key 23 is held in its closed position during the time that a signal is operating at the desired station and maintaining the closure of the contacts of the key 23 while this signal of the desired station is operating effects another result at the station A, which is as follows: Whenever relay 25 operates it also operates relay 26, which closes a contact and establishes a circuit through battery 27 and relay 28. Thus relay 28 operates conjointly with the relay 25. When relay 28 operates, it releases a spring 29, which by means of the pin 30 holds a pivoted weighted bar 31 in position against a stop 32. When relay 28 thus momentarily operates to release the spring 29 from the pin 30, the bar 31 tends to move upwardly, but the rapid pulsations due to stepping up the selector mechanism at the required stations does not give a sufficient time interval to permit the bar 31 to move far enough to effect a change of circuit conditions. When, however, the key 23 is held down for any length of time, relay 28 remains in its energized condition, and thus allows sufficient time for the bar 31 with its associate contact to come upwardly and establish a circuit with the spring 33. It will be seen that when the bar 31 closes circuit with the spring 33, the same electrical condition results as results from operation of the release key 18, thereby sending current of a different polarity over the line wires 1 and 2 and releasing all of the mechanisms at the substations, thus putting them in their normal condition to receive another signal. It will be understood therefore that each station B, C, D and E has means for calling every other station.

The operation of the device will be understood, but to recapitulate: In the operation of the key 23 to call station E, for instance, assuming that it requires four im-

pulses to bring the selector mechanism to properly signal the station E, key 23 is given four taps and on the fourth tap is held in its closed position. While it is being held in its closed position, the signal 15 at station E operates until such time as the bar 31 requires to come into contact with the spring 33, at which time the entire mechanisms are again released and replaced to normal.

While I have herein shown and particularly described the preferred embodiment of my invention, what I claim as new and desire to secure by Letters Patent is:

1. A signaling system, comprising a plurality of stations, a source of operating current at one of said stations, a signal at each station, controlling apparatus at each station for operating the signal at said station, and selecting devices at a plurality of stations for calling selectively any desired station, said devices performing their function through the agency of the single source of current aforesaid, in combination with means for selectively changing the polarity of the operating current furnished by said source.

2. A signaling system, comprising a plurality of stations, a source of operating current at one of said stations united by a common line circuit, signal receiving apparatus at each station, and associated with said circuit, and calling devices at a plurality of stations for operatively actuating any signal receiving apparatus aforesaid independently, said devices performing their functions through the agency of the single source of current aforesaid, in combination with means for selectively changing the polarity of the operating current furnished by said source.

3. A signal system, comprising a plurality of stations united by a common line circuit, a source of operating current at one of said stations, signal-receiving apparatus at each station and associated with said circuit, calling devices at a plurality of stations for operatively actuating any signal-receiving apparatus aforesaid independently, and instrumentalities operable from a plurality of stations for restoring said signal-receiving apparatus to normal after operation, said instrumentalities including means for selectively changing the polarity of the operating current furnished by said source.

4. A signal system, comprising a plurality of stations, a source of operating current at one of said stations, a signal at each station, controlling apparatus at each station for operating its associated signal, and selecting devices at a plurality of stations for selectively actuating said controlling apparatus to operate any desired signal, said devices performing their func-

tions through the agency of the single source of current aforesaid, in combination with means for selectively changing the polarity of the operating current furnished by said source.

5. A signaling system, comprising a plurality of stations, a source of operating current at one of said stations, a signal at each station, controlling apparatus at each station for operating its associated signal, selecting devices at a plurality of stations for selectively actuating said controlling apparatus to operate any desired signal, said devices performing their functions through the agency of the single source of current aforesaid, and instrumentalities operable from a plurality of stations for restoring said controlling apparatus to normal after operation, said instrumentalities including means for selectively changing the polarity of the operating current furnished by said source.

6. A signaling system, comprising a plurality of stations, a source of operating current at one of said stations, a signal at each station, controlling apparatus at each station for operating its associated signal, a common line circuit with which said controlling apparatus is operatively associated, and selecting devices at a plurality of stations for selectively actuating said controlling apparatus to operate any desired signal, said devices performing their functions through the agency of the single source of current aforesaid, in combination with means for selectively changing the polarity of the operating current furnished by said source.

7. A signaling system, comprising a plurality of stations, a source of operating current at one of said stations, a signal at each station, controlling apparatus at each station for operating its associated signal, a common line circuit with which said controlling apparatus is operatively associated, selecting devices at a plurality of stations for selectively actuating said controlling apparatus to operate any desired signal, said devices performing their functions through the agency of the single source of current aforesaid, and instrumentalities operable from a plurality of stations for changing the polarity of the current impressed on the circuit by said source whereby to restore said controlling apparatus to normal after operation.

8. A signaling system, comprising a plurality of stations, a source of operating current at one of said stations, a signal at each station, controlling apparatus at each station for operating its associated signal, a common line circuit with which said controlling apparatus is operatively associated, and selecting devices at a plurality of stations and operative over said line circuit,

for selectively actuating said controlling apparatus to operate any desired signal, said devices performing their functions through the agency of the single source of current aforesaid, in combination with means for selectively changing the polarity of the operating current furnished by said source.

9. A signaling system, comprising a plurality of stations, a source of operating current at one of said stations, a signal at each station, controlling apparatus at each station for operating its associated signal, a common line circuit with which said controlling apparatus is operatively associated, selecting devices at a plurality of stations and operative over said line circuit for selectively actuating said controlling apparatus to operate any desired signal, said devices performing their functions through the agency of the single source of current aforesaid, and instrumentalities operable from a plurality of stations for changing the polarity of the current impressed on the circuit by said source whereby to restore said controlling apparatus to normal after operation.

10. A signaling system, comprising a plurality of stations, a source of operating current at one of said stations, an electro-magnetic device, a signal at each station, controlling apparatus at each station for operating its associated signal, a common line circuit with which said controlling apparatus is operatively associated, and selecting devices at a plurality of stations and operative over said line circuit, for selectively actuating said controlling apparatus to operate any desired signal, through the agency of said electromagnetic device governing the operative inclusion of current supplying means aforesaid with said line circuit.

11. A signaling system, comprising a plurality of stations, a source of operating current at one of said stations, an electro-magnetic device, a signal at each station, controlling apparatus at each station for operating its associated signal, a common line circuit with which said controlling apparatus is operatively associated, selecting devices at a plurality of stations and operative over said line circuit for selectively actuating said controlling apparatus to operate any desired signal through the agency of said electro-magnetic device governing the operative inclusion of current supplying means aforesaid with said line circuit, and instrumentalities operable from a plurality of stations for restoring said controlling apparatus to normal after operation.

12. A signaling system, comprising a plurality of stations, an electro-magnetic device, a signal at each station, controlling apparatus at each station for operating its associated signal, a common line circuit with

which said controlling apparatus is operatively associated, selecting devices at a plurality of stations and operative over said line circuit for selectively actuating said controlling apparatus to operate any desired signal through the agency of said electromagnetic device governing the operative inclusion of current supplying means with said line circuit, and instrumentalities operable from a plurality of stations for restoring said controlling apparatus to normal after operation, said last aforesaid instrumentalities including a releasing device at each station.

13. A signaling system, comprising a plurality of stations, an electro-magnetic device, a signal at each station, controlling apparatus at each station for operating its associated signal, a common line circuit with which said controlling apparatus is operatively associated, selecting devices at a plurality of stations and operative over said line circuit for selectively actuating said controlling apparatus to operate any desired signal through the agency of said electromagnetic device governing the operative inclusion of current supplying means with said line circuit, instrumentalities operable from a plurality of stations for restoring said controlling apparatus to normal after operation, said last aforesaid instrumentalities including a releasing device at each station, and a slow acting device for controlling the operations of said releasing device.

14. A signaling system, comprising a central station, and a plurality of substations united by a common line circuit, a signal at each substation, controlling means at each substation and associated with said line circuit for operating when properly actuated its associated signal, instrumentalities at the central station for selectively operating the controlling means aforesaid, instrumentalities at the central station for restoring said controlling means to normal after operation, and devices at a plurality of substations for operating at will the two last aforesaid instrumentalities.

15. A signaling system, comprising a central station and a plurality of substations united by a common line circuit, a signal at each substation, controlling means at each substation and associated with said line circuit for operating when properly actuated its associated signal, instrumentalities at the central station for selectively operating the controlling means aforesaid, said instrumentalities including current supplying means, a slow acting device at each substation co-operating with said instrumentalities, instrumentalities at the central station for restoring said controlling means to normal

after operation, and devices at a plurality of substations for performing at will the functions of the two last aforesaid instrumentalities.

16. A signaling system, comprising a central station and a plurality of substations united by a common line circuit, a signal at each substation, controlling means at each substation and associated with said line circuit for operating when properly actuated its associated signal, instrumentalities at the central station for selectively operating the controlling means aforesaid, said instrumentalities including current supplying means, a slow acting device at each substation co-operating with said instrumentalities, instrumentalities at the central station for restoring said controlling means to normal after operation, devices at a plurality of substations for performing at will the functions of the two last aforesaid instrumentalities, through the agency of an electromagnet operatively associated with the first aforesaid instrumentality, and a second electromagnet associated with a slow acting circuit closing device.

17. A signaling system, comprising a plurality of stations on the same circuit, a central source of operating current at one of said stations, each station having a signal, and means at each station for selectively operating any desired signal through the agency of the central source of current aforesaid in combination with means for selectively changing the polarity of the operating current furnished by said source.

18. A signaling system comprising a plurality of stations all on the same circuit, a signal at each station, selective controlling apparatus for each signal, a central station with devices for selectively operating the controlling apparatus to call any desired station, and instrumentalities at a plurality of stations for operating over the said same circuit the devices aforesaid.

19. A signaling system comprising a plurality of stations all on the same circuit, a signal at each station, selective controlling apparatus for each signal, a central station with devices for selectively operating the controlling apparatus to call any desired station and release same, and instrumentalities at a plurality of stations for operating over the said same circuit the devices aforesaid.

In witness whereof, I hereunto subscribe my name this third day of August A. D., 1908.

EMORY PARSONS.

Witnesses:

E. B. CAMPBELL,
MAX W. ZABEL,