June 19, 1923. 1,459,403.

C. W. KECKLER ET AL

SIGNALING SYSTEM

Filed Sept. 22, 1919 2 Sheets-Sheet 1

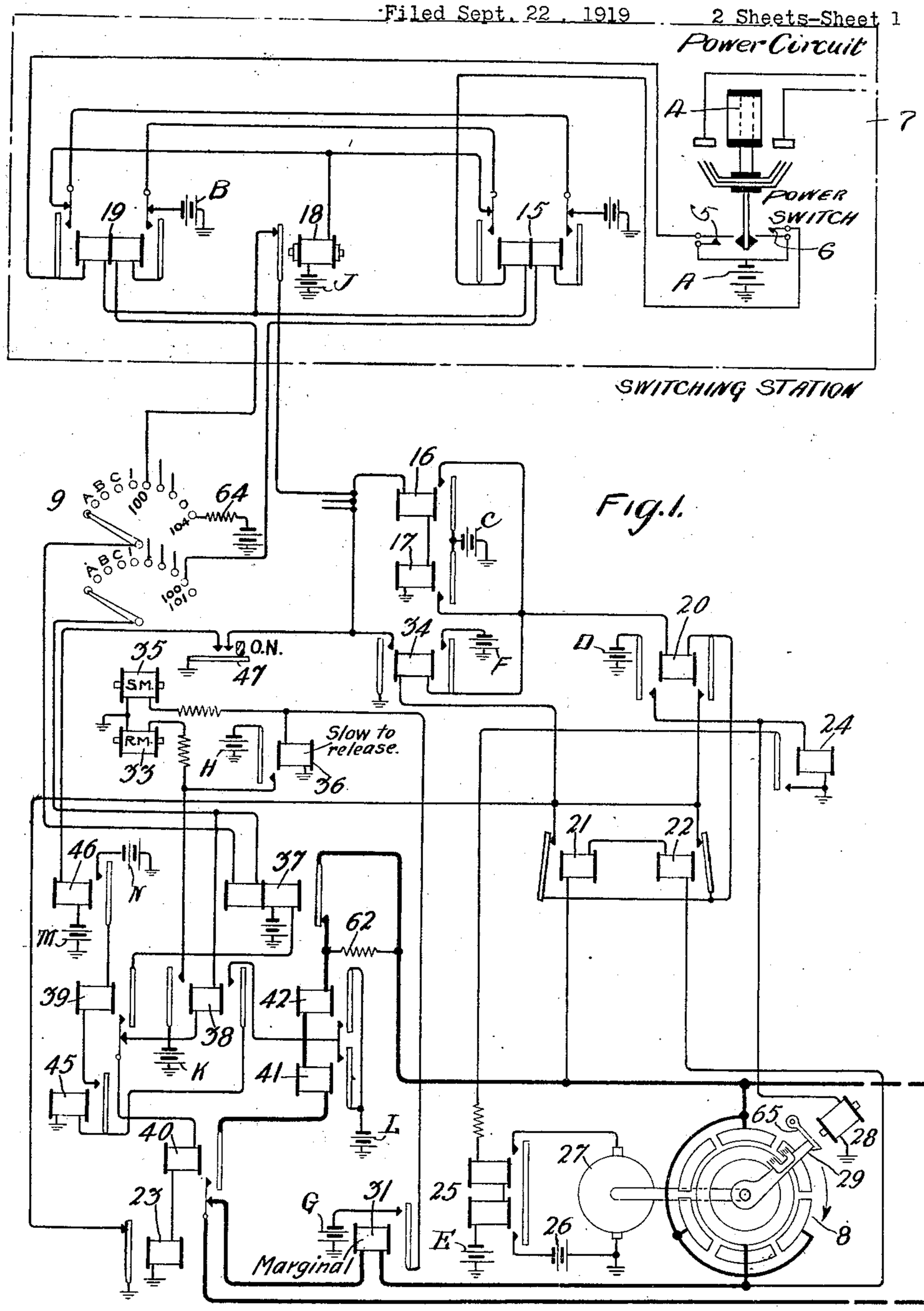

Fig. 1.

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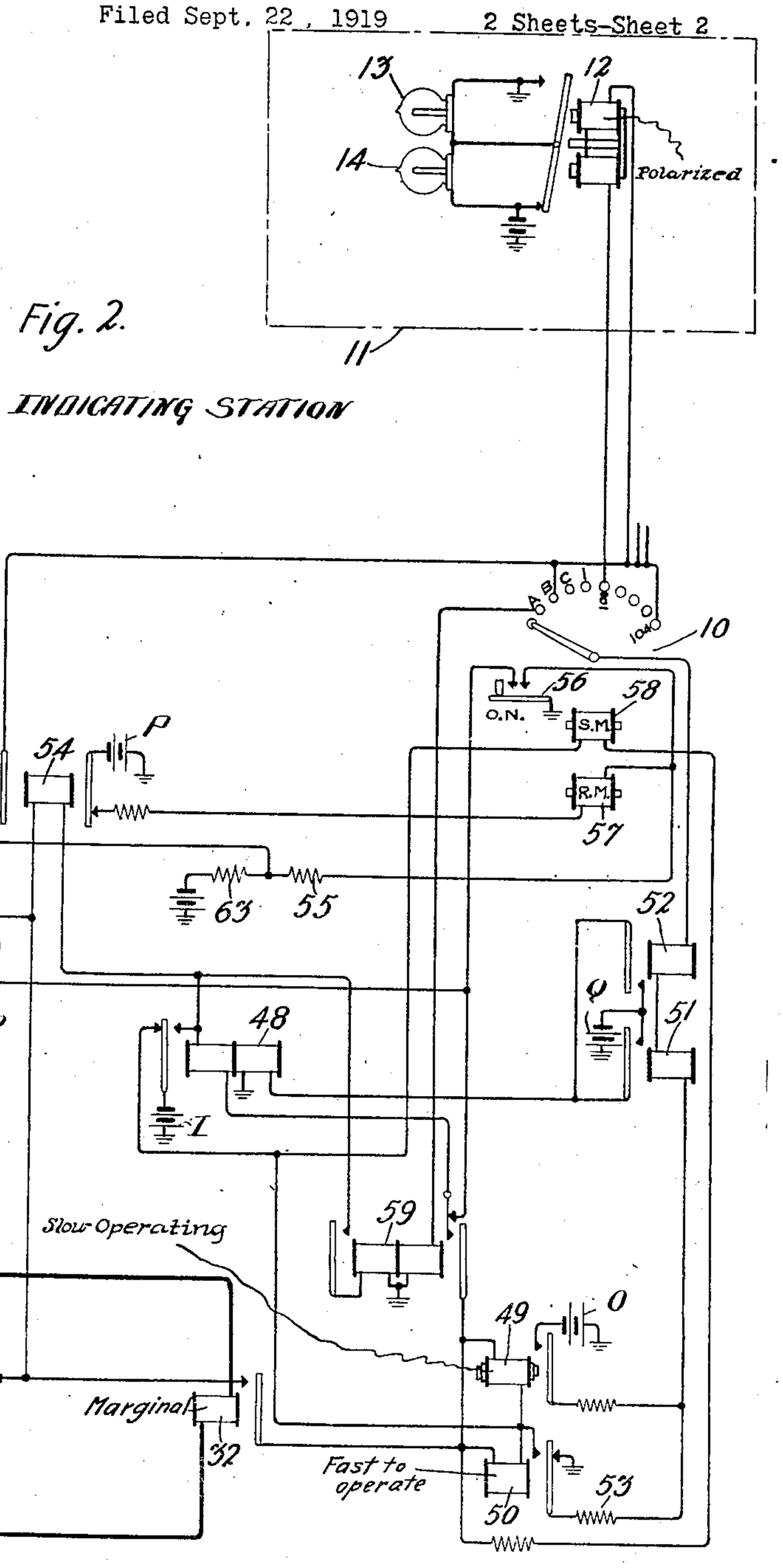

Fig. 2.

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Patented June 19, 1923. 1,459,403

UNITED STATES PATENT OFFICE.

CHARLES W. KECKLER, OF NEWARK, AND WALTER B. STRICKLER, OF EAST ORANGE, NEW JERSEY, ASSIGNORS TO WESTERN ELECTRIC COMPANY INCORPORATED, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

SIGNALING SYSTEM.

Application filed September 22, 1919. Serial No. 325,403.

To all whom it may concern:

Be it known that we, CHARLES W. KECKLER, a citizen of the United States, residing at Newark, in the county of Essex, State of New Jersey, and WALTER B. STRICKLER, a citizen of the United States, residing at East Orange, in the county of Essex, State of New Jersey, respectively, have invented certain new and useful Improvements in Signaling Systems, of which the following is a full, clear, concise, and exact description.

This invention relates to signaling systems, but more particularly to such systems whereby indications may be automatically transmitted from one point to another.

An object of the invention is the provision of means whereby the position of a plurality of switches located at one station may be automatically indicated at a distant station.

In accordance with a feature of the invention, means are provided at the switching and indicating stations, whereby a signaling device at the indicating station will be operated to indicate the open or closed position of power switches located at the switching station.

In accordance with another feature of the invention, means are provided at the switching station, whereby an automatic switch at the indicating station will be operated in synchronism with the one at the switching station, for controlling the operation of a signaling device thereat, to give a distinctive signal.

In accordance with a further feature of the invention, means are provided at the indicating station, and so arranged that after the automatic switches are returned to normal subsequent to having set up an indication, the false operation of the automatic switch at the indicating station is prevented upon the opening and closing of the circuit connecting the two stations.

It is thought that a more definite understanding of the invention will be had from the following description considered in conjunction with the accompanying drawings, in which Fig. 1 shows the apparatus located at the switching station, and Fig. 2 shows that located at the indicating station.

Referring now to the particular embodiments of the invention, in Fig. 1 there is shown a power switch 4, a plurality of which are employed, but for the sake of clearness only one has been shown in the drawing. Each of these switches carries a contact connected to a source of current supply and such contact is designed to engage with one or the other of the contacts 5 and 6, allotted to each switch. Whether the contacts 5 or 6 of any switch is engaged, depends upon the position of the switch with which it cooperates. These contacts are designed to be only momentarily closed to permit the mechanism common to a plurality of switches to operate when another switch has been actuated. The power switches are merely provided with an additional contact so that, upon the opening or closing of these switches, a circuit will be momentarily completed through the respective contacts for effecting the operation of the switching mechanism. In the particular installation for which this system was designed, the power switches are motor driven, but the system is obviously also equally applicable to installations wherein the power switches are manually operated. Associated with each switch is a number of relays which function so as to cause the operation of other apparatus located at the same station for controlling the operation of a signaling device at the distant station. The apparatus shown in the dotted rectangle 7 is individual to each of the switches.

The other apparatus shown in Fig. 1 is common to a plurality of such switches as shown in the rectangle 7, and includes an interrupter 8 for controlling the operation of the selector switch 9, together with a plurality of relays, the function of which will be more clearly described in the description which is to follow. The selector switch 9 is of the two level type, one of which has its terminals individually allotted to the contacts engaged in the open position of the switches 4, and the other level has its terminals connected with the contacts engaged in the closed position of the switches 4.

In Fig. 2 there is shown the apparatus at the indicating station and which may be connected with that at the switching station by a pair of wires, or by a single wire if a ground connection is used as one conductor. A selector switch 10 is also employed at the indicating station which is adapted and arranged to be operated in synchronism with the one shown in Fig. 1. The apparatus

shown in the rectangle 11 is individual to the particular power switch 4 shown in rectangle 7 and includes a polarized relay 12 to control the lighting of the lamps 13 and 14. These lamps are of distinctly different colors so that their signals can easily be distinguished. The circuit arrangement of these lamps is such that one or the other of these lamps is lighted at all times thereby indicating whether the power switch to which they are individual is open or closed, since lamp 13 is lighted in the open position of the switch 4, while the lamp 14 is lighted when the switch 4 is in either of the closed positions. A relay 44 is employed at the indicating station which is energized upon the restoration of the switch 10 thereat to normal, for opening the line connecting the two stations. This prevents the operation of the relay 32 due to the capacitance of the line and thereby prevents the accidental re-operation of the selector switch 10. While a plurality of batteries have been shown for convenience, it is to be understood that in actual practice a single battery could or would be employed.

The operation of the apparatus used in carrying out this invention is as follows: Let it be assumed that the power switch 4 is in its closed position, thereby momentarily engaging contact 6. Such engagement establishes an energizing circuit for relays 15, 16 and 17, and may be traced from battery A, through a contact of the power switch 4, contact 6, left-hand winding of relay 15, contact of relay 18, and the windings of relays 16 and 17 in series, to ground. Relay 15, in operating, establishes a locking circuit for itself extending from battery B, through the right-hand normal contact of relay 19, left-hand winding of relay 15, contact of relay 18, and the windings of relays 16 and 17 in series, to ground. Relays 16 and 17 are thereupon operated and in closing their contacts cause the operation of relay 20 over a circuit extending from battery C, through the contacts of relays 16 and 17 in multiple, winding of relay 20, alternate contacts of relays 21 and 22 in parallel and the normal contact of relay 23, to ground. The relays 21 and 22 have their windings normally in bridge of the open contacts of the interrupter 8, so that under normal conditions they are continuously operated. The energizing circuit for these relays may be traced from battery 30, through the winding of relay 32 at the indicating station, left-hand normal contact of relay 44, see Fig. 2, windings of relays 21 and 22 in series, winding of relay 31, see Fig. 1 and the normal contact of relay 40, to ground. Relays 31 and 32 are of the marginal type and will not operate until the circuit is intermittently completed by the operation of the interrupter 8. Should the line at any time become open, short-circuited or a fuse blow at the indicating station, relays 21 and 22 will release their armatures. However, if any switches have been actuated during this period the relays individual thereto will be energized, but due to the open contacts of relays 21 and 22, the remainder of the system remains inoperative until the operating circuit for the relays 21 and 22 is again closed. An energizing circuit for relay 24 extends from battery D, through the left-hand alternate contact of relay 20, and the winding of relay 24, to ground. A circuit including the windings of relay 25 is established upon the operation of relay 24 which extends from battery E, through the two windings of relay 25, and the contact of relay 24, to ground. The operation of relays 16 and 17 also causes the energization of relay 34, the energizing circuit of which may be traced from battery C, through the alternate contacts of relays 16 and 17 in multiple, winding of relay 34, and the contact of relay 23, to ground. The windings of relays 16 and 17 are short-circuited upon the closure of the left-hand contact of relay 34, and thereupon release their armatures. Relays 34 and 20 are, however, maintained operated the first over a circuit extending from battery F, through the right-hand contact and winding of relay 34 and the contact of relay 23, to ground; the second over a circuit extending from battery F, through the right-hand contact of relay 34, winding of relay 20, contacts of relays 21 and 22 in multiple, and the contact of relay 23, to ground.

On the energization of relay 25, its armature is attracted and completes a circuit including the motor 27 and the battery supply 26. The motor is associated with the interrupter 8 so that when operated it causes the rotation of the interrupter 8. The contact arm 29 of the interrupter 8 is held in its normal position by means of a pawl 65 which is under the control of relay 28. This contact arm in its normal position is on a dead segment so as to prevent the false operation of relay 32. The release magnet 28 is, however, operated upon the energization of relay 20 over a circuit extending from battery D, through the left-hand alternate contact of relay 20, and the winding of release magnet 28, to ground. The energization of release magnet 28 thereby attracts its armature which allows the contact maker 29 to be revolved under the power of the motor 27.

The interrupter 8, in passing over its contacts, makes and breaks a circuit which includes a 125 volt current supply 30, this circuit including the windings of marginal relays 31 and 32 and effecting their alternate operation and release during the actuation of the interrupter 8. These relays being in series open and close their contacts corre-

spondingly in response to the impulses caused by the interrupter 8 in passing over its contacts. The energization of relay 31 causes the operation of slow-release relay 36 over a circuit extending from battery G, through the contact of relay 31, and the winding of relay 32, to ground. Relay 36, in operating, causes the energization of the release magnet 33 over a circuit extending from battery H, through the contact of relay 36, and the winding of release magnet 33, to ground. In case the line should be opened or short-circuited during the stepping period, relay 31 will be released thereby causing the release of relay 36. Relay 36 will thereby cause the deenergization of the release magnet 33 of the selector and restore the selector switch 9 to normal. The stepping magnet 35 is also controlled through the contacts of relay 31, the energizing circuit of this magnet extending from battery G, through the contact of relay 31, and the winding of the stepping magnet 35 of the selector, to ground. Relay 32 (see Fig. 2) in opening and closing its contact, due to the impulses of current transmitted over the line from the interrupter 8, effects corresponding changes in a circuit extending from battery I, through the normal contact of relay 48, winding of stepping magnet 58, contact of relay 32, and the right-hand contact of relay 44, to ground. The stepping magnet 58 is thereupon operated for stepping the selector switch, corresponding to the operation of relay 32. Since relays 31 and 32 are initially in the same circuit, they are correspondingly actuated and thereby cause the two switches 9 and 10 to step in synchronism.

The selector switches 9 and 10 advance, step by step until the selector switch 9 completes a circuit with contact No. 100 which is associated with the apparatus individual to the power switch 4. A circuit is thereupon established extending from battery J, through the winding of relay 18, left-hand normal contact of relay 19, right-hand alternate contact and winding of relay 15, contact No. 100 on the lower level of the selector switch 9, selector wiper arm thereof, winding of relay 38, normal contact of relay 39, winding of relay 40, and the winding of relay 23, to ground. The completion of the circuit just traced causes the operation of relays 18, 38, 40 and 23. Relay 23, in operating, opens at its contact the energizing circuit of relays 20 and 34 which are thereupon released. The release of relay 20 causes the deenergization of relay 24 which in turn causes the release of relay 25. Relay 40, in operating, opens at its contact the energizing circuit of relay 31, which is released, cutting out the interrupter 8 from the loop circuit and establishing another loop circuit through its alternate contact which includes relays 40 and 41 which are then energized. The release magnet 33 is maintained energized upon the release of relay 31, due to the subsequent release of relay 31, and the operation of relay 38. The new energizing circuit therefor extends from battery K, through the left-hand contact of relay 38, and the winding of release magnet 33, to ground. The establishment of the new loop circuit causes the operation of relays 41 and 42, the energizing circuit thereof extending from one side of battery 30, through the winding of relay 32, left-hand normal contact of relay 44, contact of relay 37, the windings of relays 42 and 41 in series, and the alternate contact of relay 40, to the other side of this battery. Relay 45 is operated upon the energization of relays 41 and 42 over a circuit extending from battery L, through the contacts of relays 41 and 42 in multiple, right-hand alternate contact of relay 38, and the winding of relay 45, to ground. The instant that selector switch 9 moves from its normal position, an energizing circuit for relay 46 is established extending from battery M, through the winding of relay 46 and the contact 47, which is closed as soon as selector switch 9 moves from its normal position, to ground. An energizing circuit for relay 39 is established upon the operation of relays 45 and 46, extending from battery N, through the contact of relay 46, winding of relay 39, and the contact and winding of relay 45, to ground. The operation of relay 39 is, however, prevented due to the previous operation of relays 41 and 42, which also connects a source of battery supply to the winding of relay 39 upon the operation of relay 45, the circuit of which may be traced from battery, through the contacts of relays 41 and 42 in multiple, right-hand contact of relay 38, contact of relay 45, to the winding of relay 39. In practice a common source of battery supply is used so that a low resistance path is placed around the winding of relay 39 when relays 41, 42 and 46 are operated, thereby diverting sufficient current so as to prevent its operation. It is, therefore, evident that relay 39 is prevented from operating as long as relays 41 and 42 are operated, due to the short circuit placed around the winding of this relay.

The operation of relay 32 in closing its contact completes the following circuit extending from battery I, through the normal contact of relay 48, the windings of relays 49 and 50 in parallel, contact of relay 32, and the right-hand contact of relay 44, to ground. Relay 50 is of the fast-to-operate and slow-to-release type, and accordingly operates in response to the first impulse, due to the operation of relay 32, while relay 49 is slow-acting and does not operate until relay 32 is operated for an appreciable length of time. The new loop circuit pro-

vided upon the operation of relay 40 at the sending station maintains relay 32 continuously energized, thereby causing the operation of relay 49. When relay 40 operates, relay 32 holds up and relay 49 is thereby energized and applies negative battery O to its contacts, windings of relays 51 and 52, switch arm and contact 100 of switch 10, winding of polarized relay 12, left-hand armature and contact of relay 54, resistance 55, and the off-normal contact 56 of the selector switch 10 to ground. Relays 51 and 52 and the polarized relay 12 are thereby energized over the circuit just traced. The contact 56 is closed as soon as the selector switch 10 moves from its initial position so that release magnet 57 is operated as soon as this contact is closed over a circuit extending from battery P through the right-hand contact of relay 54, winding of release magnet 57, and the contact 56 to ground. Relay 12, in operating, removes a short-circuit from around lamp 14 and places a short-circuit around lamp 13, thereby extinguishing lamp 13 and lighting lamp 14. Relays 51 and 52, in operating, establish an energizing circuit for relay 48 which extends from battery Q through the alternate contacts of relays 51 and 52 in multiple and the right-hand winding of relay 48 to ground. A locking circuit is established upon the operation of relay 48 extending from battery through the alternate contact and left-hand winding of this relay, right-hand normal contact of relay 59, and the contact 56 of selector switch 10 to ground. The circuit including the winding of relay 54 extends from battery through the alternate contact of relay 48, winding of relay 54, and the right-hand contact of relay 44 to ground. The release magnet 57 is deenergized upon the operation of relay 54 and causes the selector switch 10 to be restored to normal.

As soon as the selector switch 10 returns to normal, slow-operating relay 60 is operated over a circuit extending from battery through the alternate contact and winding of relay 48, normal contact of relay 59, winding of relay 60, and the right-hand contact of relay 44 to ground. The operation of relay 60 connects through its contact battery R to the winding of relay 61 which is thereupon operated. Relay 61, in operating, causes the operation of relay 44 over a circuit extending from battery R through the contact of relay 61 and the right-hand winding of relay 44 to ground, and the energizing circuit of relays 48, 54, 60, and 61 is thereby opened; these relays being thereupon released. Relay 44 also in operating opens at its left-hand normal contact the energizing circuit of relays 41 and 42 which are momentarily released. In order that relay 32 will not be energized upon the release of relay 44, due to any charge that might have accumulated in the respective conductors, a shunt circuit is placed about the winding of relay 32. Thus, upon the deenergization of relay 44, current is prevented from traversing the winding of this relay, as contact 68 is completed before contact 69 is broken. Therefore, any charge which might have accumulated on the conductors extending between the two stations, passes through this shunt circuit so established, thereby preventing the momentary operation of relay 32 and the subsequent operation of the switch 10 for the giving of a false indication.

Relay 44, in operating, momentarily opens the line loop at its left hand contact including the windings of relays 41 and 42 at the switching station, which are momentarily released removing the short-circuit from about relay 39, which thereupon operates. The holding circuit for relays 23, 40, 38, and 18 is broken upon the operation of relay 39, causing in turn the release of relays 38, 15, and 18. The release of relay 38 first opens at its left-hand contact the energizing circuit of the release magnet 33, which allows the selector switch 9 to return to normal; second, opens the original energizing circuit of relay 45 which prevents the short-circuit from being reestablished around the winding of relay 39 when relays 41 and 42 are again operated. Relay 39, in operating, closes at its alternate contact the energizing circuit of relay 37 which extends from battery through the right-hand winding of relay 37, alternate contact of relay 39, and the windings of relays 40 and 23 in series to ground. Relays 40 and 23 are thereupon maintained operated. The operation of relay 37 opens at its contact the short-circuit from around the resistance 62 and prevents the reoperation of relay 32 when relay 44 momentarily opens and closes the loop circuit. When the selector switch 9 returns to normal, the energizing circuit for relay 46 is broken, thereby causing the release of this relay and the opening of the holding circuit of relays 39 and 45. These relays in releasing, cause the release of relays 37, 40 and 23.

The operation of the system having been traced for the condition when the power switch 4 is in its closed position, let it now be assumed that the power switch 4 is in its open position. The contact of the power switch 4, as shown in the drawing, will thereby be momentarily in contact with contact 5 which causes the operation of relays 19, 16, and 17 over a circuit extending from battery through the contact of the power switch 4, contact 5, the left-hand winding of relay 19, contact of relay 18, and the windings of relays 16 and 17 in series to ground. The operation of the remainder of

the system is the same as described for the closed position and the switch indication until the contact arm reaches segment No. 100 is identical. The battery being now fed through the winding of relay 18, left-hand normal contact of relay 15, right-hand alternate contact and winding of relay 19 through segment No. 100 and selector wiper arm on the upper level of the selector switch 9, left-hand winding of relay 37, winding of relay 38, normal contact of relay 39, and the windings of relays 40 and 23 in series to ground. The operation of relay 37 opens the shunt around the resistance 62, and prevents relay 32 from holding up when relay 40 operates for establishment of the loop circuit. The open contact of relay 32 now causes the release of relay 50, and since the selector switch 10 has been advanced to seize contact 100 in the manner previously described battery will be applied to the winding of relay 12 in the opposite direction to that for the closed position, so that the armature thereof will remove the shunt circuit from around the lamp 13, and again place the shunt around the lamp 14, causing the extinguishment of the lamp 14 and the lighting of the lamp 13 as described for the closed position. The energizing circuit for relay 12 extends from battery through resistance 63, left-hand contact and armature of relay 54, winding of polarized relay 12, contact 100 and the switch arm of the selector switch 10, windings of relays 52 and 51 in series, resistance 53 and the back contacts of relay 50 to ground.

In cases where several switches have been operated simultaneously in such sequence that the selector will be behind in transmitting indications, relays 16 and 17 will again be energized the instant contact 48 is broken and the selector will search out each switch by clearing those connected to the lowest numbered segments first.

Should the line at any time become short-circuited, relay 32 will operate and remain operated until the short-circuit is removed. The operation of relay 32 causes the energization of stepping magnet 58 as previously described to effect the operation of the selector switch 10. A circuit is established upon the connection of the arm of the selector switch 10 with contact A which extends from battery through the contact of relay 49, windings of relays 51 and 52 in series, contact arm, and contact A of selector switch 10, and the right-hand winding of relay 59 to ground. Relay 59 will operate and open the circuit for relay 60 which opens the energizing circuit for relay 61. Relay 48 will lock up in the usual manner and release the selector switch and at the same time establish a locking circuit for relay 59, which extends from battery through the alternate contact of relay 48, and left-hand contact and winding of relay 59 to ground. Relays 48 and 59 will remain operated under the control of relay 32 which will not be released until the short-circuit is removed for restoring the system to normal.

At the indicating station segment No. 101 of the selector switch 10 is connected with battery, through the left-hand contact of relay 54 and the resistance 63, so that in case the wiper arm of this switch should pass over segment No. 100, the apparatus will function in the usual manner to restore the selector to normal. At the switching station segment No. 101 of the switch 9 is connected to battery through the resistance 64, so that if the wiper arm passes segment No. 100, it will find battery on this segment and the apparatus will function in the usual manner.

What is claimed is:

1. A signaling system comprising a first and a second station, a plurality of switches located at said first station, a rotary interrupter operative upon the actuation of one of said switches, a loop circuit, an automatic selector switch at each of said stations, means in the loop circuit operated by said interrupter for driving the automatic selector switches in synchronism, a signal device at the second station individual to each of the switches at the first station, and means responsive upon the connection of the automatic selector switch with a desired one of the contacts thereof for causing the operation of said signaling device to furnish a distinctive signal.

2. A signaling system comprising a first and a second station, a plurality of mechanisms at the first station, an automatic selector switch at each of said stations, a signaling device individual to each of said mechanisms and located at the second station, a connecting link circuit terminating at each of said stations, a rotary interrupter operative in response to the actuation of one of said mechanisms, means responsive to the operation of said interrupter for driving said automatic selector switches in synchronism, and a relay at the second office individual to each of said mechanisms energized upon the seizure of the line associated therewith to cause said signaling device to furnish a distinctive signal.

3. A signaling system comprising a first and a second station, a plurality of mechanisms at the first station, a signaling device individual to each of said mechanisms and located at the second station, an automatic selector switch at each station, a loop circuit connecting the two stations, a relay in each end of the loop circuit for controlling the operation of said automatic selector switches, means for intermittently operating said relays, means responsive to the connection of the automatic selector switch at the

first station with a line associated with an actuated one of said mechanisms, means operated upon the operation of said second mentioned means for causing said signaling device to furnish a distinctive signal, and a relay operated due to the restoration of the automatic selector switch at the second office to normal, to momentarily open the loop circuit for preventing the re-operation of the automatic selector switch of the second station.

4. A signaling system comprising a switching and an indicating station, a plurality of mechanisms at the switching station, an automatic selector switch at each of said stations, a signaling device individual to each of said mechanisms and located at the indicating station, a connecting link circuit terminating at each of said stations, a periodically rotating interrupter operative upon the actuation of any one of said mechanisms, a pair of relays in said link circuit operated upon the rotation of said interrupter for driving said automatic selector switches in synchronism, and means operative upon the seizure of a line associated with an actuated mechanism to cause said signaling device to furnish a distinctive signal.

5. A signaling system comprising a switching and an indicating station, a plurality of mechanisms at the switching station, an automatic selector switch at each of said stations, a signaling device individual to each of said mechanisms and located at the indicating station, a connecting link circuit terminating at each of said stations, a periodically rotating interrupter having a plurality of open and closed segments operative in response to the actuation of any one of said mechanisms, means responsive to the operation of said interrupter for driving said automatic selector switches in synchronism, and a relay at the indicating station individual to each of said mechanisms energized upon the seizure of the line associated therewith to cause said signaling device to furnish a distinctive signal.

6. A signaling system comprising a switching and an indicating station, a plurality of mechanisms at the switching station, a signaling device individual to each of said mechanisms and located at the indicating station, a normally closed connecting link circuit terminating at each of said stations in a relay, an automatic selector switch at each of said stations, a rotary interrupter released upon the actuation of any one of said mechanisms for intermittently energizing said relays, means responsive to the operation of one of said relays to operate said automatic selector switch at the switching station to seize a line associated with an actuated one of said mechanisms, means at the indicating station responsive to the operation of the relay thereat to operate the other automatic selector switch to seize a line associated with a signaling device individual to the mechanism whose line has been seized, and means operated upon the seizure of said line to operate said signaling device to furnish a distinctive signal.

7. A signaling system comprising a switching and an indicating station, a plurality of mechanisms at the switching station, a signaling device individual to each of said mechanisms and located at the indicating station, an automatic selector switch at each station, a loop circuit connecting the two stations, a relay in each end of the loop circuit for controlling the operation of said automatic selector switches, means for intermittently operating said relays, means responsive to the connection of the automatic selector switch at the first station with a line associated with an actuated one of said mechanisms, means operated upon the operation of said second mentioned means for causing said signaling device to furnish a distinctive signal, and means operated due to the restoration of the automatic selector switch at the second office to normal to momentarily open the loop circuit for preventing the re-operation of the automatic selector switch at the indicating station.

8. A signaling system comprising a switching and an indicating station, a plurality of mechanisms at the switching station, a signaling device individual to said mechanisms and located at the indicating station, an automatic selector switch at each station, a loop circuit connecting the two stations, means in each end of the loop circuit for controlling the operation of said automatic selector switches, a periodically rotary interrupter for intermittently operating said means, means responsive to the connection of the automatic selector switch at the switching station with a line associated with an actuated one of said mechanisms, a relay operated upon the operation of said second mentioned means for causing said signaling device to furnish a distinctive signal, and a relay operated due to the restoration of the automatic selector switch at the indicating station to normal to momentarily open the loop circuit to prevent the re-operation of the automatic selector switch at the indicating station.

9. A signaling system comprising a first and a second station a plurality of power switches located at the first station and provided with contacts, a signaling device at the second station individual to each of said power switches, a normally closed loop circuit connecting the two stations, an automatic selector switch at the first station having a plurality of groups of lines leading to the contacts representing the open and closed positions of said power switches, a

second automatic selector switch at the second station, means to operate said automatic selector switch at the first station to seize a line in one of said groups, means to operate the other of said automatic selector switches to seize a line associated with a signaling device individual to the mechanism whose line has been seized, and means to operate said signaling device in a distinctive manner.

In witness whereof we hereunto subscribe our names this 17th day of September A. D., 1919.

CHARLES W. KECKLER.
WALTER B. STRICKLER.