

1,395,007.

Patented Oct. 25, 1921.

2 SHEETS—SHEET 1.

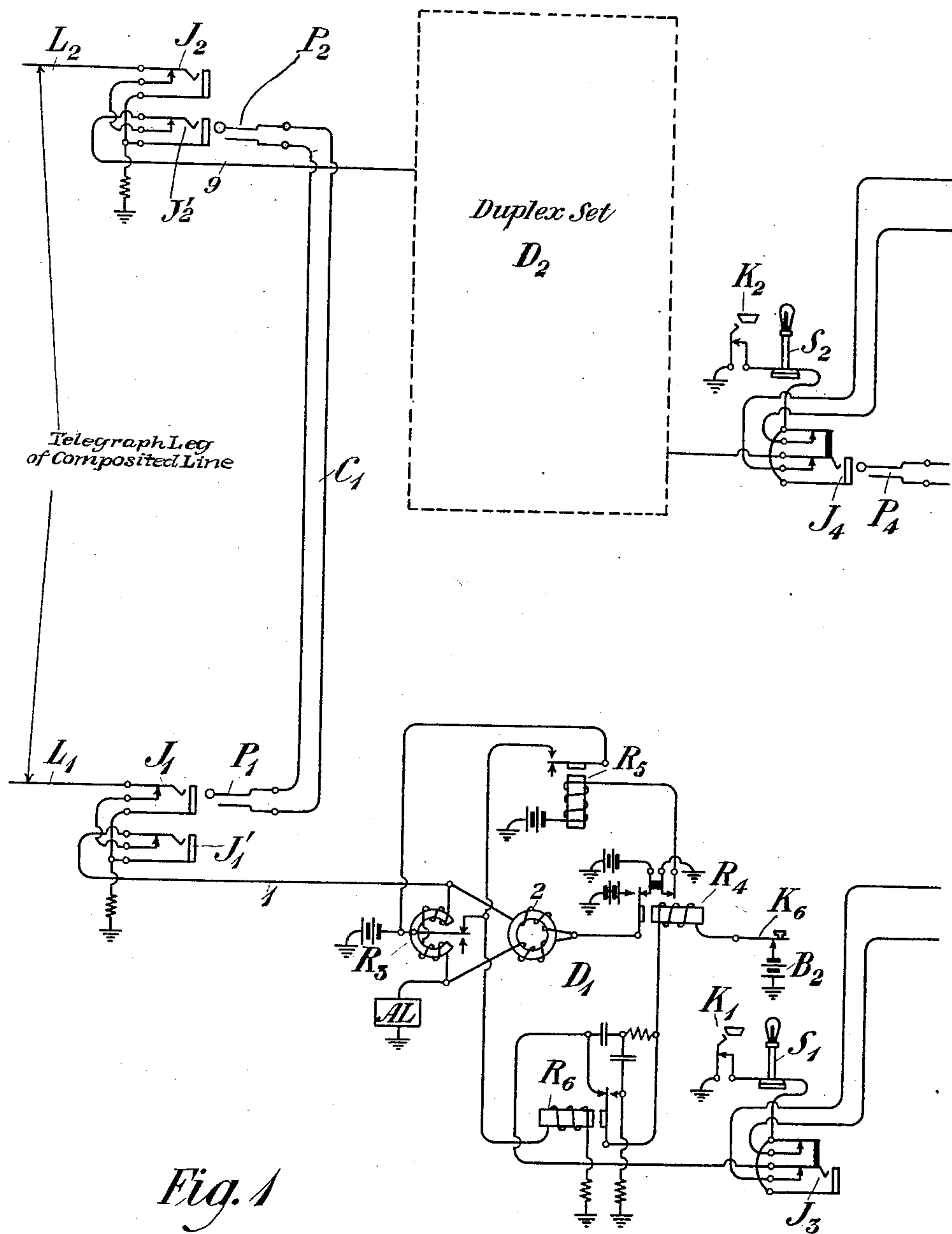


Fig. 1

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2 SHEETS—SHEET 2.

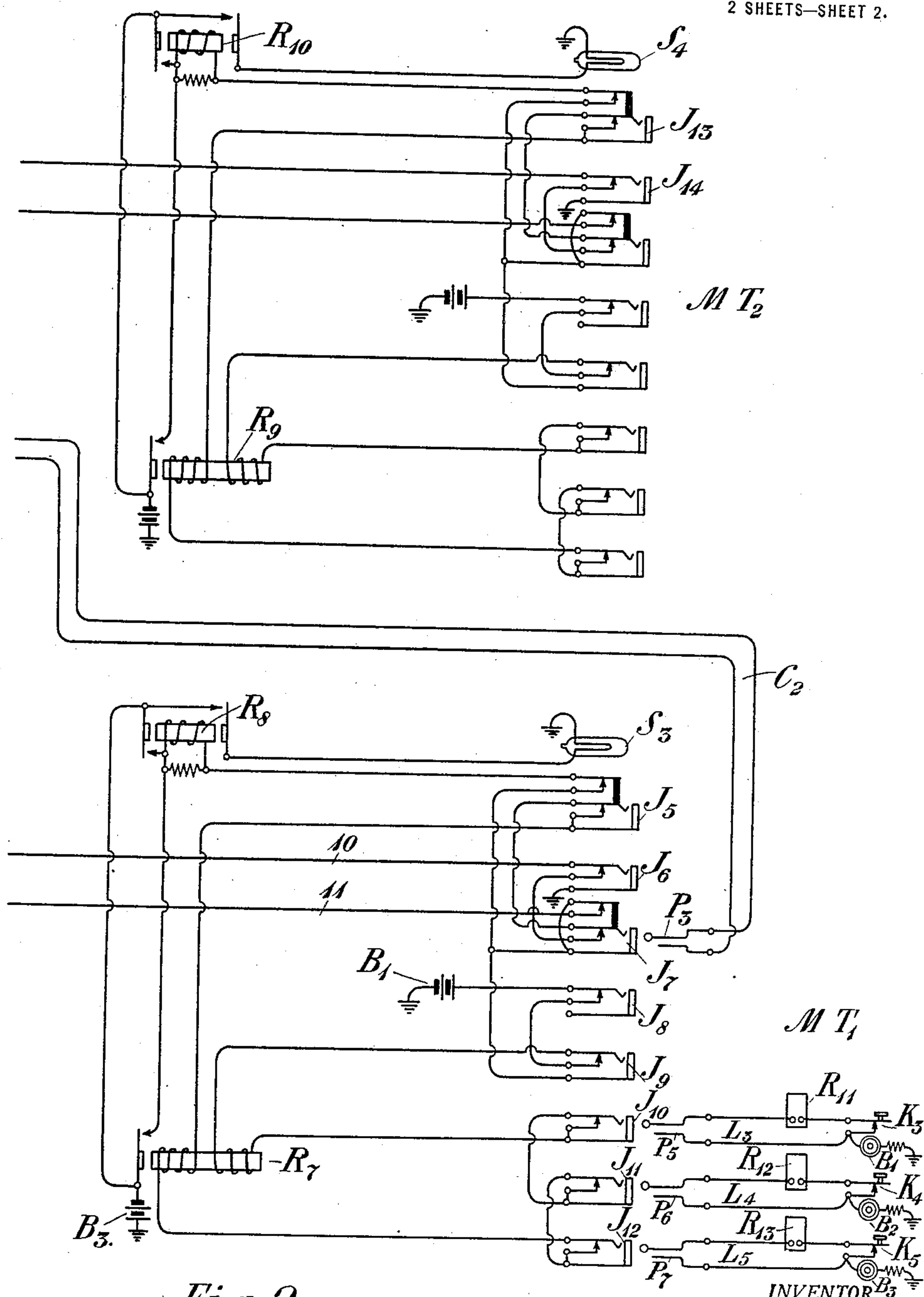


Fig. 2

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ARTHUR W. POST, OF WESTBURY, NEW YORK, ASSIGNOR TO AMERICAN TELEPHONE AND TELEGRAPH COMPANY, A CORPORATION OF NEW YORK.

TELEGRAPH SYSTEM.

1,395,007.

Specification of Letters Patent.

Patented Oct. 25, 1921.

Application filed March 20, 1920. Serial No. 367,572.

To all whom it may concern:

Be it known that I, ARTHUR W. POST, residing at Westbury, in the county of Nassau and State of New York, have invented certain Improvements in Telegraph Systems, of which the following is a specification.

This invention relates to telegraph systems and more particularly to an arrangement to facilitate signaling between a Morse line subscriber and the attendant at a relay office.

In telegraph systems it has been customary to terminate telegraph lines, having duplex sets, repeaters, etc. associated therewith, at a plurality of jacks known as the Morse line terminal which was located at a test board. The Morse subscriber loops terminated at the same testboard in a plurality of plugs adapted for insertion in the jacks of the Morse line terminal in order to connect the subscribers with the line circuits. Associated with each Morse line terminal was a signal under control of a push button connected with the subscriber's loop circuit. Whenever a Morse subscriber desired to attract the attention of the attendant at the testboard he pressed the button which caused the operation of the signal associated with the Morse line terminal with which his particular loop was connected. Upon receiving this signal the attendant would go in on the circuit at the duplex table and communicate with the subscriber.

If, however, it is desired to substitute another duplex set for the set that is normally connected between the line and the Morse line terminal at which the subscribers' loops are terminated, the substitution has been effected by connecting, by means of a patching cord, the drop jack of the said Morse line terminal with the receiving leg jack of the second duplex set and connecting the said second duplex set with the telegraph line circuit by means of a suitable patching cord. Since the signal at the testboard is associated only with the Morse line terminal and not with the duplex set, if a Morse subscriber signals the office after his circuit has been patched to another duplex set the repeater attendant at the office would, upon receiving the signal at the particular Morse line terminal, have to consult a record in order to determine the particular duplex set with which

the said Morse line terminal was connected before he could take the proper action required.

It is the object of this invention to provide signaling means individual to the duplex sets which will be responsive to signals transmitted from any subscriber's loop with which the said duplex set may be connected.

This invention will be more clearly understood from the following description when read in connection with the attached drawing which, when Figure 2 is placed to the right of Fig. 1, represents the terminal telegraph circuits in which the invention is embodied.

In Fig. 1, L_1 and L_2 represent two telegraph line circuits or telegraph legs of composited telephone circuits which terminate at the testboard in the jacks J_1 and J_2 respectively. The line L_1 loops through the jacks J_1 and J_1' , and is connected by means of conductor 1 with a duplex set D_1 . This set comprises a bridge coil 2, a polar relay R_3 , a pole changing relay R_4 , a repeating sounder R_5 and a control relay R_6 , together with suitable associated apparatus. In a similar manner the line L_2 loops through the jacks J_2 and J_2' , and is connected by means of conductor 9 with a duplex set indicated by D_2 . The sets D_1 and D_2 are located at a duplex table and have associated therewith the signals S_1 and S_2 respectively and their control keys K_1 and K_2 respectively. These signal devices are indicated as lamps which may be supported on high standards so as to readily attract the attention of the attendant to the particular duplex set with which they are respectively associated. The said duplex sets D_1 and D_2 have also associated therewith the receiving leg jacks J_3 and J_4 respectively, through which the line circuit loops to the Morse line terminals MT_1 and MT_2 .

The Morse line terminals, which are similar, comprise a plurality of jacks the functions of which are broadly to terminate the line from the duplex set and to afford means for connecting a plurality of subscribers' loops to a particular line. Thus the Morse line terminal MT_1 comprises a looping jack J_5 , and a line jack J_6 , drop jacks J_7 and J_9 , a battery jack J_8 and three Morse loop jacks, J_{10} and J_{11} and J_{12} . The line jack is connected through the conductor 10, with

the receiving leg jack J_3 of the duplex set D_1 . The drop jack J_7 is connected through conductor 11 with the jack J_3 and is thereby connected with the signal lamp S_1 . Associated with the jacks J_{10} , J_{11} and J_{12} are the plugs P_5 , P_6 and P_7 of the subscribers' loops L_3 , L_4 and L_5 having associated therewith the standard subscriber equipment comprising the keys K_3 , K_4 and K_5 respectively and relays R_{11} , R_{12} and R_{13} respectively, and also push buttons B_1 , B_2 and B_3 respectively adapted to connect the sleeve side of the line to ground thereby controlling the operation of the signals connected with the Morse line terminal and the duplex set. Also associated with the Morse line terminal MT_1 are the relays R_7 and R_8 , R_7 being connected in balanced condition in the line circuit but adapted to be unbalanced by the operation of one of the said push buttons so as to set in operation the signaling apparatus heretofore referred to. The equipment associated with the Morse line terminal MT_2 is similar to that associated with the terminal MT_1 and needs no detailed description.

Having in mind the foregoing description of the apparatus and of the function of each part, this invention will be clear from the following description of its mode of operation. Let it be assumed that the subscribers' loop circuits L_3 , L_4 and L_5 , for example, are connected with the Morse line terminal MT_1 which is adapted to terminate the telegraph line L_1 with which is normally connected the duplex set D_1 . If in the course of operation the subscriber upon loop L_3 desires to attract the attention of the attendant at the testboard at which the line L_1 terminates and in which office the duplex set D_1 is located he will press the button B_1 which serves to ground the sleeve side of the loop L_3 . This results in a flow of current from battery B_1 through contacts of jacks J_8 and J_9 , the right hand winding of relay R_7 , sleeve contacts of jacks J_{10} and plug P_5 and through the button B_1 to ground, which serves to unbalance the relay R_7 , and thereby effect the operation of the said relay.

It will be seen that relay R_7 is normally in a balanced condition by the flow of equal amounts of current in opposite directions through its windings from battery B_1 , contacts of jacks J_8 and J_9 , right hand winding of relay R_7 through the plurality of loop circuits in series, the left hand winding of relay R_7 , contact of jack J_5 , contact of jacks J_7 and J_6 , conductor 10, contact of jack J_3 , contact of relay R_6 and the winding of the pole changing relay R_4 , telegraph key K_6 and battery B_2 to ground. As the result of the operation of the button B_1 and the unbalancing of relay R_7 current will flow from battery B_3 over its left hand contact through the winding of relay R_8 , upper contact of

jack J_5 , upper contact of J_7 , upper contact of jack J_3 and through the signal lamp S_1 and key K_1 to ground, thereby operating the lamp S_1 . Relay R_8 will also be operated and locked up through its left hand contact thereby lighting the lamp S_3 associated with the Morse line terminal MT_1 and if desired, setting in operation a buzzer associated with the said lamp but not shown. Upon the lighting of the lamp S_1 the repeater attendant will go to the duplex table at which the set D_1 is located and operate the key K_1 thereby releasing relay R_8 and extinguishing the lamps S_1 and S_3 and will get in communication with the Morse subscriber by the operation of the telegraph key K_6 .

If the duplex set D_1 , associated normally with the Morse line terminal MT_1 , is defective, or if, for any other reason it is desired to connect another duplex set D_2 with the line L_1 with which the subscriber's loops L_3 , L_4 and L_5 are associated, a two-conductor patching cord C_2 terminating in the plugs P_3 and P_4 may be used by inserting the plug P_3 in the drop jack J_7 and plug P_4 in the receiving leg jack J_4 associated with the duplex set D_2 . In order to connect the duplex set D_2 with the line L_1 a similar cord C_1 having plugs P_1 and P_2 may be used by inserting plug P_2 in jack J_2' of the line L_2 and the plug P_1 in the line jack J_1 of the line L_1 . This results in the connection of the line L_1 through the tip contacts of jack J_1 and plug P_1 and the cord C_1 with the tip contacts of plug P_2 and jack J_2' with the conductor 9, which connects with the bridge coil of the duplex set D_2 . The receiving leg of the duplex set D_2 is connected through the tip contacts of jack J_4 and plug P_4 , cord C_2 , and the tip contacts of plug P_3 and jack J_7 with the conductors of the Morse line terminal MT_1 with which the loop circuits are connected.

If a subscriber connected with the loop L_3 now presses the button B_1 in order to attract the attention of the Morse line attendant, the relay R_7 associated with the terminal MT_1 will be operated. As a result of the operation of relay R_7 , current will flow from the battery B_3 through the contact of relay R_7 and the winding of relay R_8 , upper contact of jack J_5 , sleeve contacts of jack J_7 and plug P_3 , cord C_2 , sleeve contacts of plug P_4 and jack J_4 through the signal lamp S_2 of set D_2 and the key K_2 to ground, thereby operating the lamp S_2 . Relay R_8 will also be operated and locked up through its left hand contact thereby operating the lamp, S_3 , associated with the Morse line terminal MT_1 and operating a buzzer associated with said lamp but not shown. It will be seen also that through the opening of the upper contact of jack J_7 by the insertion therein of the plug P_3 the circuit through the lamp S_1 associated with the duplex set D_1 is

opened, thereby preventing the operation of the latter lamp. When the attendant notices the lighting of the lamp S_2 , he will go directly to the duplex table upon which the set D_2 is located and operate key K_2 , thereby releasing relay R_2 and extinguishing the lamps S_2 and S_3 and will get in communication with the subscriber from that point.

It will be seen that this arrangement provides a signaling device associated with the duplex set itself and controllable by means associated with any Morse loop that may be operating through the said duplex set. Furthermore, the signaling means are individual to the duplex set and consequently they may be disconnected from a particular Morse line terminal whenever the subscriber's loop circuits associated with that terminal are "patched" to another duplex set, the said other duplex set having similar signaling means associated therewith responsive to signals from any subscribers' loops that may be connected thereto.

Although this invention has been described in the foregoing specifications in connection with a telegraph duplex set, it is to be understood that it is not so limited but may be applied to various types of office apparatus designed to be interchangeably connected with similar apparatus normally connected with other line circuits.

Although this invention has been disclosed as embodied in a particular form it is to be understood that it is capable of embodiment in other and different forms from that shown without departing from the spirit and scope of the appended claims.

What is claimed is:

1. In a telegraph signaling system the combination of a duplex set having signaling apparatus associated therewith, a Morse line terminal having a relay associated therewith, a subscriber's loop circuit, and means associated with the said loop circuit to effect the operation of the said relay and thereby to cause the operation of the said signaling apparatus associated with the duplex set.

2. In a telegraph signaling system the combination of a duplex set having signaling apparatus associated therewith, a Morse line terminal connected with the said duplex set and having a relay associated therewith normally balanced by the flow of current through its windings, a plurality of subscribers' loop circuits connected with the said Morse line terminal and means associated with each of said loop circuits adapted to unbalance the flow of current through

said relay, thereby causing the operation of the signaling apparatus associated with the duplex set.

3. In a telegraph signaling system the combination of a plurality of duplex sets each having individual signaling apparatus associated therewith, a plurality of Morse line terminals, switching means to connect each set with one of said terminals, a subscriber's loop circuit connected with one of said Morse line terminals and having means to control the signaling apparatus of the associated duplex set, a patching cord adapted to effectively connect the said loop circuit of one Morse line terminal with the duplex set of the other Morse line terminal whereby the signaling apparatus of the latter duplex set may be controlled by the means associated with the said subscriber's loop circuit.

4. In a telegraph signaling system the combination of the telegraph leg of a composed line circuit having associated therewith a duplex set and a Morse line terminal, a second telegraph leg also having a corresponding duplex set and Morse line terminal, signaling devices individual to each duplex set, a subscriber's loop circuit associated with the said first Morse line terminal having means to control the operation of the signaling device associated with the duplex set, and patching cords adapted to connect said second duplex set with said first telephone line and said first Morse line terminal and also adapted to disconnect automatically the said first duplex set from its associated line and Morse line terminal and to bring the signaling device of the second duplex set within control of the said subscriber's loop circuit.

5. In a telegraph signaling system the combination of a plurality of telegraph legs of composed lines each having a repeater and a Morse line terminal associated therewith, signaling apparatus individual to each repeater, a plurality of subscribers' loop circuits connected with one of said Morse line terminals having means to control the operation of the repeater signaling apparatus, and switching means to interchange the line and the terminal connections of each of said repeaters, the said means being so designed as always to bring the signaling apparatus of the connected repeater within control of each subscriber's loop circuit.

In testimony whereof, I have signed my name to this specification this 18th day of March, 1920.

ARTHUR W. POST.