April 11, 1944. G. G. LIGHT 2,346,173

TRANSMISSION SYSTEM

Filed Jan. 29, 1942 3 Sheets-Sheet 1

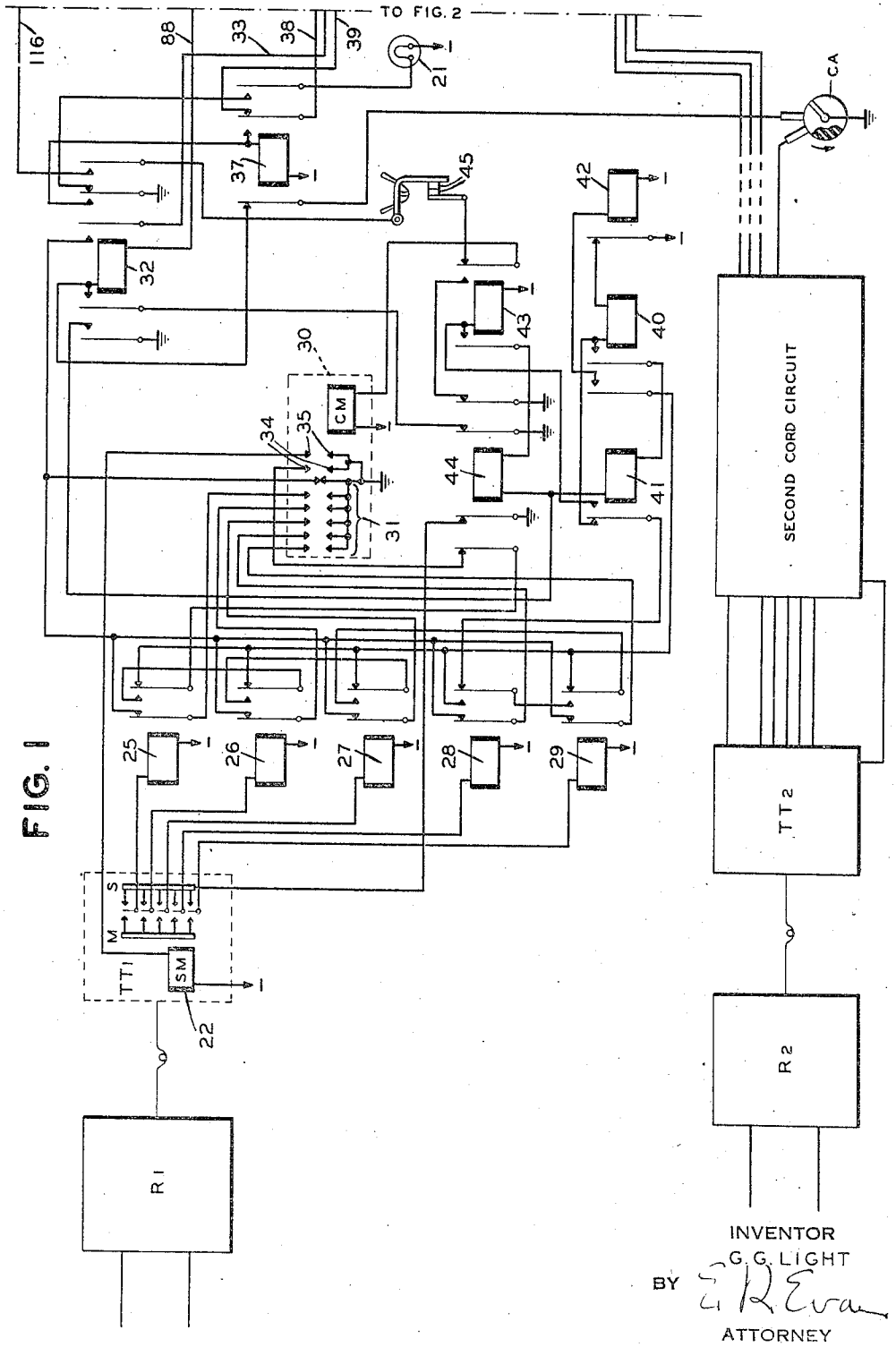


FIG. 1

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TRANSMISSION SYSTEM

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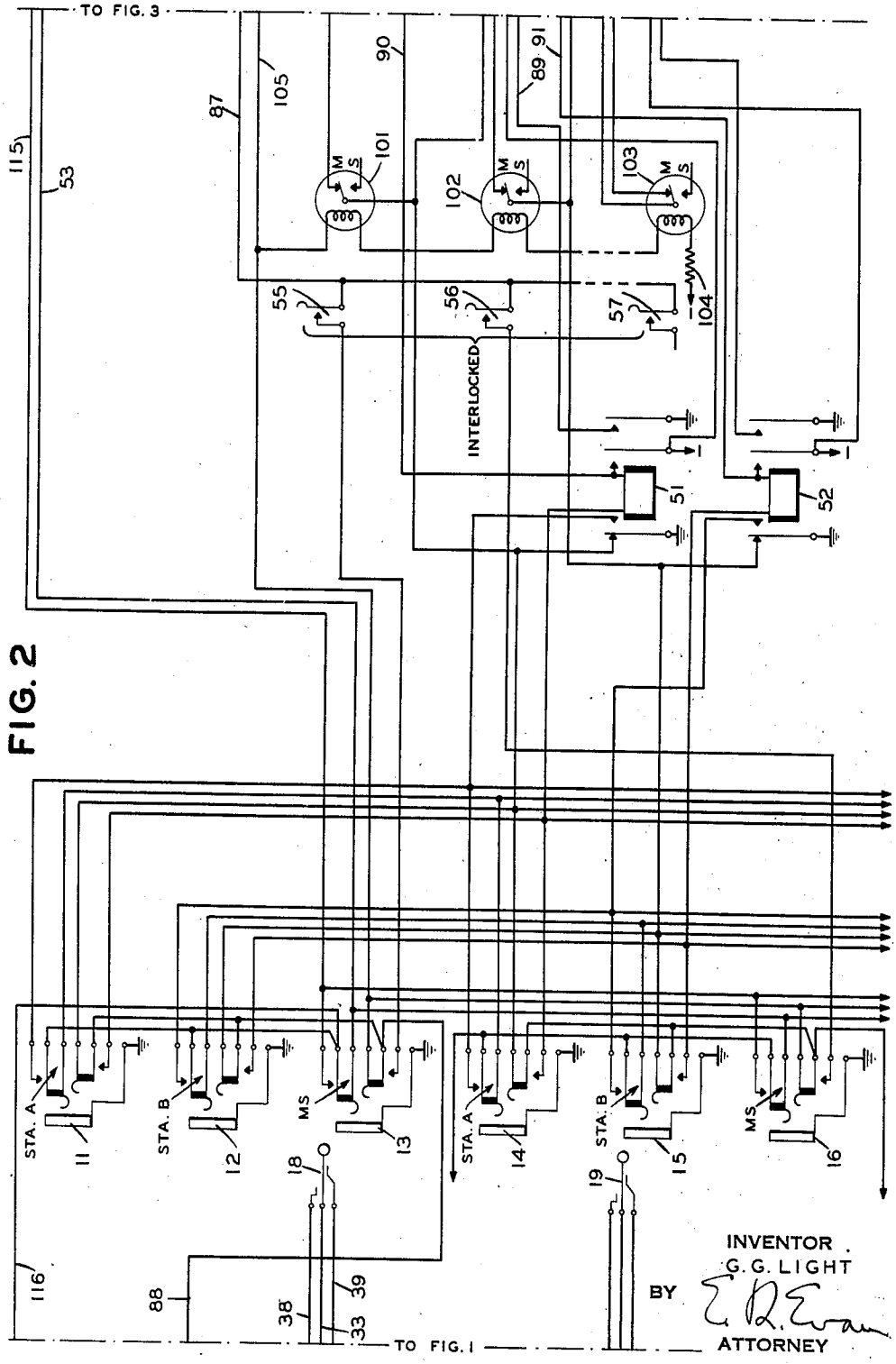


FIG. 2

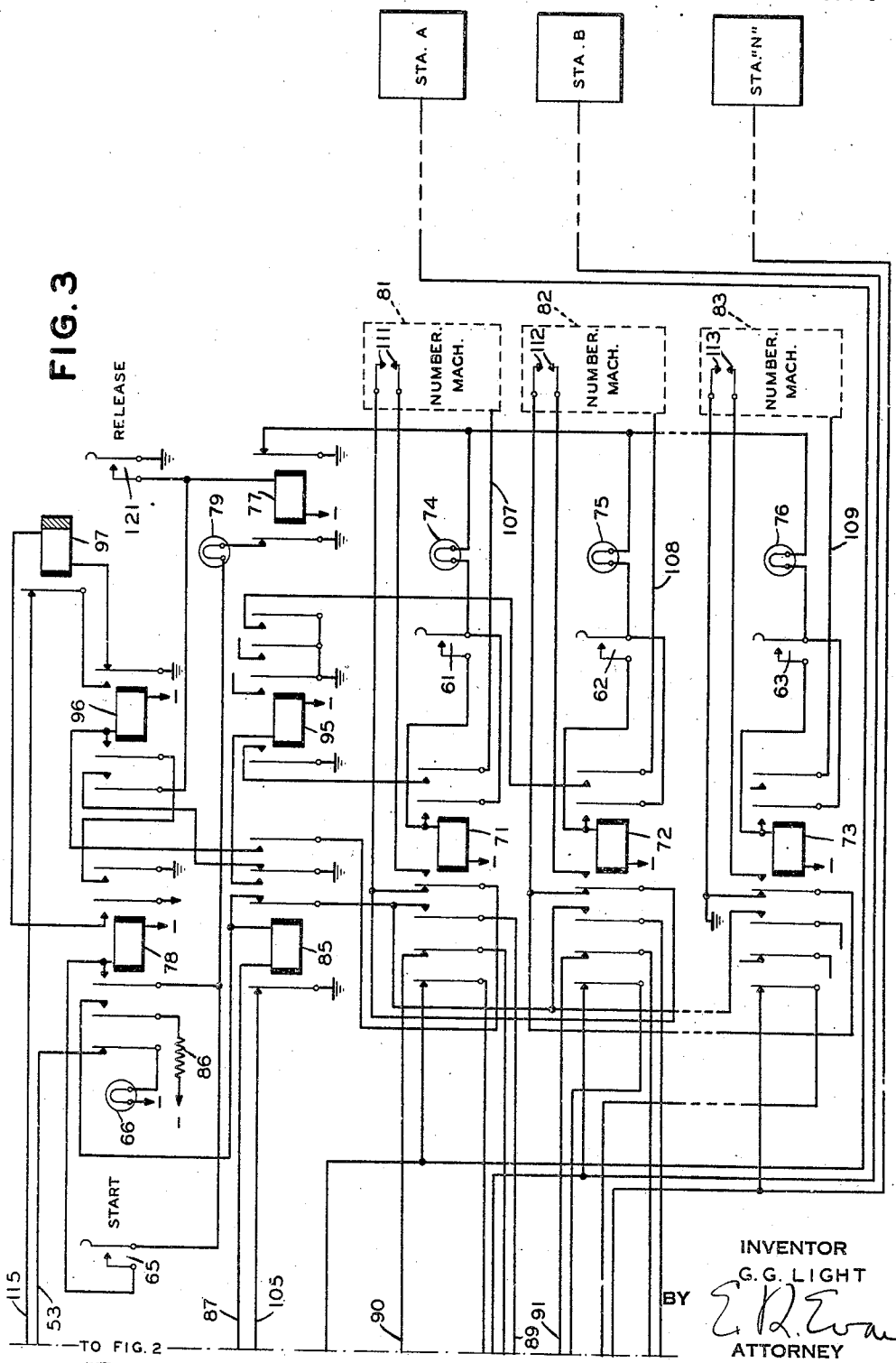
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TRANSMISSION SYSTEM

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FIG. 3



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Patented Apr. 11, 1944 2,346,173

UNITED STATES PATENT OFFICE

2,346,173

TRANSMISSION SYSTEM

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Application January 29, 1942, Serial No. 428,647

17 Claims. (Cl. 178—2)

This invention relates to telegraph transmission systems, and more particularly to multiple selective transmission systems wherein a single message is transmitted concurrently to two or more selected lines or stations.

The principal object of the invention is to provide a system in which messages may be broadcast to different groups of stations selected at the time of transmission, and in which the selected lines over which a particular message is broadcast and also the group selection equipment are automatically released and restored to normal at the end of each broadcast message so that the lines are immediately available for the transmission of other messages.

Another object of the invention is to provide improved restoring means for the group selection means in a broadcast or multiple circuit transmission system.

In accordance with the invention as embodied in a telegraph exchange system having a plurality of lines to outlying branch offices or stations terminating at a main switching office or exchange, means are provided whereby any two or more of the lines may be seized for simultaneous transmission of a message to any two or more selected branch offices or stations. Selective manually operable means, such as a series of key switches, is provided for seizing the desired lines as soon as they become idle, and after all of the lines selected have become idle, a stored message at the exchange is transmitted simultaneously to all of the branch offices or stations on the selected lines. At the end of the message the selected lines are released for other calls and the manually operable control equipment restored to normal so as to avoid any delay in transmission of subsequent messages for any of the stations involved in the broadcast transmission. Preferably, the release of the lines and restoration of the control equipment is effected in response to code combinations appended to the message and forming an end-of-message signal, but, if desired, other means may be provided whereby these functions are effected (after the message is transmitted) from the operator's position associated with the storage and repeating equipment.

For a better understanding of the invention, reference may be made to the following detailed description of a preferred embodiment of the invention shown in the accompanying drawings, wherein:

Figs. 1, 2 and 3, taken together, illustrate diagrammatically a telegraph exchange system according to the invention. The figures of the drawings illustrate the repeating equipment and the selective control apparatus at a main switching station or exchange in which messages stored in the form of perforated tape may be transmitted to selective stations through selective switching apparatus of the manual switchboard type. Fig. 3 also illustrates the outgoing line circuits extending to three remote branch offices or stations.

Referring to Fig. 1 of the drawings, tape transmitters TT1 and TT2 represent two sources of signals associated with cord circuit control equipment whereby messages stored in the tape at the tape transmitters may be repeated over a line selected at the switchboard represented by the jacks 11 to 16, shown in Fig. 2. The jacks 11 and 14 represent the switching terminals of one branch office line at two positions of the switchboard, whereas the jacks 12 and 15 represent similar terminals of a second line. The jacks 13 and 16 are the multisend jacks at each position employed for transmitting a single message concurrently to any two or more selected lines as determined by the control equipment shown in the right hand half of Fig. 2 and in Fig. 3. It will be understood that, while only two line jacks at each of two positions of the switchboard are shown, similar jacks would be provided for additional lines and, if additional positions were required, the switchboard jacks at such additional positions would be multipled to those shown in the same manner as the two positions illustrated.

As indicated in Fig. 1, two reperforators R1 and R2 are associated with the respective tape transmitters TT1 and TT2 in order to record messages received over the line circuits terminating in said reperforators from distant stations (not shown). Obviously, tape for the tape transmitters could be prepared by local keyboard perforators, or other equivalent means of storing and repeating messages could be substituted for the tape perforating and transmitting equipment illustrated. The control apparatus and circuits in the "cord circuit" associated with the tape transmitter TT1 and terminating in the switchboard plug 18 are illustrated in some detail, the circuits and control equipment of the second cord circuit being similar to that illustrated in connection with the first cord circuit. The arrangement illustrated in Figs. 1 and 2 for storing a message received from a distant station, repeating the same over a selected line circuit as soon as the same becomes idle and releasing the line circuit at the end of the message is generally similar to that shown and described in the prior patent to Blanchard et al. 2,193,811, dated March 19, 1940, or the

patent to William B. Blanton No. 2,279,295, dated April 14, 1942, (Serial No. 299,408, filed October 14, 1939), or in the copending application of George G. Light and William B. Blanton, Serial No. 350,402, filed August 3, 1940. Reference may be had to these prior patents for a fuller explanation of the operation of the switching and repeating equipment, particularly in connection with the repeating of messages over single line circuits upon the insertion of a plug 18 in the jack 11 or 12, or the insertion of a plug 19 at the second position in the jack 14 or 15. It will be understood that the repeater including the transmitter TT1 may be plugged into the switchboard whether the selected line is busy or idle, and the operation of the tape transmitter will be initiated automatically when the line becomes idle under the control of the circuit allotter CA. The end-of-message signal, which for the purposes of the present description will be assumed to consist of a double "carriage return" signal, is employed for the purpose of stopping the tape transmitter, lighting the disconnect lamp 21 and releasing the line for transmission of another message which may be plugged into said line at another position of the switchboard.

The tape transmitter TT1, as shown for the purpose of explaining the invention, is of the type employed in the above-mentioned patents and comprises marking and spacing bus bars selectively engaged by five selectively operable contacts which are set in accordance with the perforations in the tape, together with a stepping magnet 22 arranged to step the tape through the transmitter and project and retract the tape feelers controlling the adjustable contacts. The contacts of the tape transmitter are connected to code reading relays 25, 26, 27, 28 and 29, which become energized whenever an associated transmitter contact engages the spacing bus bar and thus respond to each code combination transmitted. The usual distributor 30 is employed in connection with the tape transmitter, as well-known to those skilled in the art. The distributor 30 is provided with a series of transmitting contacts 31 which are closed in proper sequence during the operating cycle of the distributor to generate code impulses through the inner armatures of the relays 25 to 29, inclusive, which are transmitted through the inner right hand armature and front contact of relay 32 and the conductor 33 to the tip contact of the plug 18. The distributor is shown as provided with a clutch magnet which, when energized, releases a cam shaft for operation of the distributor contacts, but any suitable form of distributor may be employed. The distributor is further provided with two auxiliary pairs of contacts 34 and 35, contacts 34 being closed near the end of transmission of each code combination whereas the contacts 35 are closed after the fifth code impulse to energize the stepping magnet 22 of the tape transmitter.

The code reading relays 25 to 29, inclusive, are further provided with contacts forming a baffle circuit through the outer armatures of said relays which is closed when the "carriage return" code combination (No. 4 only marking) is set up in the tape transmitter. The control relays 40 to 44, inclusive, cooperate with the baffle circuit through the contacts of the code reading relays 25 to 29 to close a circuit to stop the transmitter upon the receipt of two successive "carriage return" signals. The stopping of the tape transmitter and release of the line upon the reception of the end-of-message signal is accomplished in substantially the same manner as set forth in the above-mentioned patents, but in accordance with the present invention the end-of-message signal is also utilized to restore the selective equipment associated with the multiple selective transmission apparatus shown in Fig. 3 in a manner that will be explained below. The holding relay 37 remains locked up through the conductor 38 and the sleeve contacts of the jack 13 and plug 18 until the plug is removed from the jack. The holding relay 37 further closes through its right hand outer armature and front contact the circuit of the disconnect lamp 21 which remains lighted until the plug is withdrawn from the jack. As shown, the tape lever contacts 45, which are opened when the tape between the reperforator R1 and the tape transmitter TT1 becomes taut, are disposed in the circuit of the clutch magnet of the distributor 30 to prevent operation of the distributor upon the occurrence of tight tape.

Since the operation of the system in repeating a stored message through the switchboard to any one of the line circuits is the same as in the systems described in the above-mentioned patents, the following description will be confined to the functions of the system involved in transmitting a message simultaneously to any two or more of the line circuits to stations A, B, etc. in Fig. 3. Each of the line circuits to the individual branch stations is provided with a line seizing relay such as relay 51, Fig. 2, for station A, or relay 52 for station B, said relays being energized when the line is selected at the switchboard and maintained energized until transmission of the message is completed. Since one or more of the lines selected for broadcast transmission may be in use at the time the multiple selection is initiated, actual transmission is delayed until the line seizing relays 51, 52 of the selected lines become deenergized to indicate that transmission of previous messages has been completed.

In order to transmit a message stored in the storage and repeating equipment R1, TT1 of Fig. 1 simultaneously to stations A and B, the operator inserts the plug 18 in the multisend jack 13 of Fig. 2, closes the cord circuit selector key switch 55 corresponding to the cord circuit terminating in the plug 18 and actuates the line selecting key switches 61 and 62, Fig. 3, and the master start key 65. It is to be noted that only one multisend jack 13 or 16 is provided for each cord circuit or operator's position, and the cord circuit selection key switches 55, 56 and 57 are interlocked so that only one switch may be operated at a time, the operated switch remaining closed until multiple transmission from another cord circuit is desired. Thus, only one cord circuit will be operative to transmit to a selected group of lines or stations, although more than one cord circuit plug may be inserted at the same time in the series of multisend jacks such as 13, 16.

When the plug 18 is inserted in the multisend jack 13, as described above, a circuit is closed from ground through the sleeve contacts of the jack 13 and plug 18, the conductor 38, the right hand inner armature and back contact of the holding relay 37, the conductor 39, the ring contacts of the plug 18 and jack 13, the conductor 53 and the left hand outer armature and back contact of relay 78 for lighting the "request" lamp 66 to indicate at a point adjacent the multisend control equipment that the equipment is desired by one of the operators.

Upon the momentary actuation of the keys 61 and 62, which are of the non-locking type, the

associated selector relays 71 and 72 become operated and are locked up through their right hand inner armatures and front contacts and the supervisory lamps 74 and 75 to ground at the armature of relay 77.

On the actuation of the non-locking start key 65 after the circuit selection keys 61 and 62 have been actuated as described above, a circuit is closed from ground through the left hand armature and back contact of relay 77, supervisory lamp 79, the contacts of the key 65 and the winding of relay 78 to battery, whereupon relay 78 becomes energized and locks up through its left hand inner armature and front contact independently of the contacts of the key 65. The energization of relay 78 closes a circuit through its inner right hand armature and front contact for operating slow-release relay 97. If the selected circuits to stations A and B are idle at this moment, the operation of the numbering machines 81 and 82 is initiated, after which the transmitter TT1 is started to transmit the message simultaneously to stations A and B. Operation of the transmitting equipment is initiated by start relay 85 through a circuit extending from battery through the resistance 86, the left hand middle armature and front contact of relay 78, the winding of relay 85, the conductor 87, the contacts of the locking key 55, the lower make contacts of the jack 13, conductor 88, winding of the start relay 32 of the cord circuit, the left hand armature and back contact of relay 37 and the contacts of the circuit allotter CA to ground.

However, if either of the selected circuits is in use, for example, that to station A, the winding of relay 85 is short-circuited through the right hand inner armature and back contact of said relay, the second left hand armature and front contact of relay 71, conductor 89, and the right hand outer armature and front contact of the line-seizing relay 51, which, as stated above, remains energized until the circuit becomes idle. Similarly, the circuit through the right hand outer armature and front contact of relay 52 maintains the start relay 85 deenergized as long as the line to the second station is in use. Furthermore, when transmission of a previous message is completed over either of said line circuits, the operating circuit for the relay 51 or 52, including conductor 90 or 91, is opened at the third left hand armature and back contact of relay 71 or 72 to prevent the subsequent seizure of said line at the switchboard until the broadcast transmission has been effected.

The lines extending to the branch stations A, B, etc., Fig. 3, terminate at the main switching office or exchange on the marking contacts of the line relays 101, 102 and 103, the windings of which are connected in a series circuit extending from negative battery through the resistance 104 and conductor 105 to the tip contacts of the multisend jacks 13, 16, etc. The transmitting circuit from the tape transmitter TT1 may be traced through the inner armatures and back contacts of the code reading relays 25 to 30 set in accordance with the successive code combinations in the tape, the right hand inner armature and front contact of relay 32, the conductor 33 to the tip contact of jack 13. After the operation of the master start key 65 and until broadcast transmission is commenced over each of the selected line circuits, the conductor 105 is grounded at the left hand armature and back contact of the start relay 85 to prevent the opening of any of the line circuits by the line relays 101, 102, etc.

When the selected line circuits become idle, relay 85 becomes energized over the above-described circuit including the conductor 87 and the operated cord circuit selector key switch 55, 56, etc., whereupon circuit is closed from ground through the second right hand armature and front contact of relay 85 and the winding of relay 95, whereupon relay 95 becomes energized. The energization of relay 95 closes circuits through the right hand outer armatures and front contacts of the selected circuit relays 71 and 72 to energize the start circuits 107 and 108 to the numbering machines 81 and 82 associated with the selected lines. These numbering machines, which may be of the type described in the above-mentioned patent to Blanchard et al. No. 2,193,811 or in the patent to Dirkes et al. No. 2,193,809, are operative to transmit a number or other desired service code signal group over the associated line circuit preceding each message. At the end of the number or code signal group, contacts 111 and 112 of each machine are closed momentarily, as described in the above-mentioned patents, whereupon a circuit is closed through the winding of relay 96, the right hand outer armature and front contact of relay 85, the left hand inner armature and front contact of relay 71, contacts 111, the left hand inner armature and front contact of relay 72, contacts 112, and the left hand inner armatures and back contacts of the unoperated relays of unselected circuits corresponding to relay 73, to ground.

The energization of relay 96 is, therefore, effected immediately upon the completion of the transmission of the numbers or service code signal groups over the selected lines, and said relay becomes locked up through its left hand inner armature and front contact to ground at the right hand outer armature and front contact of relay 78. The energization of relay 96 opens the circuit of slow-release relay 97 and, after a short interval, the latter relay becomes deenergized and closes a circuit that may be traced from ground through the right hand armature and front contact of relay 96, the armature and back contact of relay 97, the conductor 115, the upper make contacts of the jack 13, conductor 116, the right hand outer armature and front contact of the seize relay 32 of the cord circuit, the tape lever contacts 45, the right hand armature and back contact of relay 43 and the winding of the clutch magnet of the distributor 30 to initiate transmission of the message stored in the tape at the transmitter TT1. The line relays 101 and 102 which are connected to the tip circuit of the plug 18 and jack 13, as described above, respond to the successive code combinations sent from the transmitter TT1 and thus the message stored in the tape is transmitted simultaneously to stations A and B, Fig. 3. The operation of the line relay 103 does not affect the electrical conditions of the line circuit extending to the third station, since the transmitting contacts of said relay are short-circuited through the left hand outer armature and back contact of the deenergized selection relay 73 individual to the unselected station.

At the end of the message, the code reading relays 25 to 29, inclusive, and the associated control relays 40 to 44, inclusive, respond to the end-of-message signal to stop the transmitter, release the line circuits and restore the multiple circuit selection equipment of Fig. 3. When the

"carriage return" code combination, consisting of No. 4 marking, is set up in the tape transmitter TT1, relays 25, 26, 27 and 29 become energized, and relay 28 remains deenergized. Thereupon a circuit is closed from battery through the armature and back contact of relay 42, the winding of relay 40, the left-hand armature and back contact of relay 41, the right hand outer armature and back contact of relay 29, the right hand outer armatures and front contacts of relays 29, 27, 26 and 25, the left hand outer armature and back contact of relay 44 and the intermittently operated contacts 34 of the distributor 30 to ground, whereupon relay 40 becomes energized. At the end of the transmission of the "carriage return" code combination, the contacts 34 of the distributor open, and relay 40 locks up through its inner armature and front contact and the winding of relay 41 to ground at the left hand armature and front contact of relay 32. If the next code combination is not a "carriage return," reset relay 42 becomes energized in an obvious manner and releases the counting relays 40 and 41. If, however, the next code combination is also a "carriage return," a circuit is closed from battery through the winding of relay 43, the armature and front contact of relay 41 and the above-described baffle circuit through the contacts of relays 25 to 29, whereupon relay 43 becomes energized and locks up in series with relay 44 at the end of the code combination when the contacts 34 of the distributor 30 open. The operation of relay 44 opens the locking circuit of relay 32, thus deenergizing said relay, which in turn releases relays 40, 41, 43 and 44. When the circuit of relay 32 is opened, as described above, relay 85 in series relation with said relay becomes deenergized, whereupon a circuit is closed through the right hand middle armature and back contact of said relay and the left-hand middle armature and front contact of relay 96 for operating the release relay 77. The energization of relay 77 opens the locking circuits of relays 71 and 72, whereupon said relays become deenergized and the supervisory lamps 74 and 75 are extinguished. The deenergization of relay 85 also opens at its right hand armature and front contact the circuit of relay 95, whereupon said relay is restored to normal. The energization of relay 77, as described, opens at its left hand armature and back contact the locking circuit of relay 78, whereupon said relay becomes deenergized and opens at its right hand outer armature and front contact the locking circuit of relay 96. The supervisory lamp 79 in series with the relay 78 is extinguished. In this manner the operated equipment associated with the multiple selection circuit control of Fig. 3 is restored to normal in response to the end-of-message signal perforated in the tape at the transmitter TT1. It will be noted that a release key 121 is provided for operating the release relay 77 in the event that a mistake is made in initially operating one of the selection keys 61, 62 or 63, since the operation of relay 77 will release the associated selection relays 71, 72 and 73 and permit a mistake to be corrected and the proper keys operated.

While the release of the manually operable selection equipment of Fig. 3 is described as being effected automatically in response to the end-of-message signal appended to each message being transmitted, obviously the equipment could be restored after the message had been transmitted when the plug 18 is removed from a jack or by the operation of a switch associated with the cord circuit arranged to release relay 85 when the message has been transmitted to the selected branch stations.

Various other modifications in the specific circuit diagram shown and described above, and in the type of transmitting, repeating and control elements employed could be made without departing from the scope of the invention as defined in the appended claims.

I claim:

1. A multiple selective telegraph transmission system comprising a main switching office or exchange, a plurality of branch offices or stations, lines connecting said branch offices or stations to said main switching office, message repeating equipment at said main switching office, selective switching means for connecting said repeating equipment to selected lines over which messages are to be transmitted, operable means at said main switching office for selecting a plurality of lines over which a single message is to be transmitted concurrently from said repeating equipment, means to initiate the operation of said repeating equipment when all of the lines of a selected group become idle and means to restore to normal the said means for selecting a plurality of lines over which a single message is to be transmitted concurrently at the end of the message.

2. A multiple selective telegraph transmission system comprising a main switching office or exchange, a plurality of branch offices or stations, lines connecting said branch offices or stations to said main switching office, message transmitting equipment at said main switching office, selective switching means for connecting said transmitting equipment to selected lines over which messages are to be transmitted, other selective means for designating two or more of said lines over which a single message is to be transmitted simultaneously and for connecting said plurality of lines at the same time to said transmitting equipment and means responsive to an end-of-message signal appended to said single message for releasing said plurality of lines at the end of the message.

3. A multiple selective telegraph transmission system comprising a main switching office or exchange, a plurality of branch offices or stations, lines connecting said branch offices or stations to said main switching office, message transmitting equipment at said main switching office, selective switching means for connecting said transmitting equipment to selected lines over which messages are to be transmitted, other selective means for designating two or more of said lines over which a single message is to be transmitted simultaneously and for connecting said plurality of lines at the same time to said transmitting equipment, means for stopping said message transmitting equipment at the end of each message and means associated with said last-mentioned means for restoring said other selective means to normal in readiness for subsequent broadcast transmission.

4. A multiple selective telegraph transmission system comprising a main switching office or exchange, a plurality of branch offices or stations, lines connecting said branch offices or stations to said main switching office, message transmitting equipment at said main switching office, selective switching means for connecting said

transmitting equipment to selected lines over which messages are to be transmitted, other selective means for designating two or more of said lines over which a single message is to be transmitted simultaneously and for connecting said plurality of lines at the same time to said transmitting equipment, said last-mentioned means including a series of selecting relays, one for each line, and means for actuating the same when multiple transmission to a plurality of lines is desired, means to initiate transmission of a message to all of the selected lines and means operative at the end of the message to release said lines and restore said selecting relays to normal.

5. A multiple selective telegraph transmission system comprising a main switching office or exchange, a plurality of branch offices or stations, lines connecting said branch offices or stations to said main switching office, message transmitting equipment at said main switching office, selective switching means for connecting said transmitting equipment to selected lines over which messages are to be transmitted, other selective means for designating two or more of said lines over which a single message is to be transmitted simultaneously and for connecting said plurality of lines at the same time to said transmitting equipment, said last-mentioned means including a series of selecting relays, one for each line, and means for actuating the same when multiple transmission to a plurality of lines is desired, means to seize each of the desired lines as soon as idle, means to initiate transmission to all the desired lines after all have become idle and means responsive to an end-of-message signal appended to the message for releasing the selected lines and restoring said selecting relays to normal.

6. A multiple selective telegraph transmission system comprising a main switching office or exchange, a plurality of branch offices or stations, lines connecting said branch offices or stations to said main switching office, message transmitting equipment at said main switching office, selective switching means for connecting said transmitting equipment to selected lines over which messages are to be transmitted, other selective means for designating two or more of said lines over which a single message is to be transmitted simultaneously and for connecting said plurality of lines at the same time to said transmitting equipment, said last-mentioned means including a series of selecting relays, one for each line, and means for actuating the same when multiple transmission to a plurality of lines is desired, means to seize each of the desired lines as soon as idle, means to transmit a supervisory code signal group over at least one of the selected lines over which broadcast transmission is desired, means to initiate transmission of the broadcast message only after all of the desired lines have become idle and the supervisory code signal group has been transmitted and means including a control circuit closed at the end of the message for restoring said selecting relays to normal.

7. A multiple selective transmission system wherein concurrent transmission of messages over any two or more of a group of lines is effected and each message is terminated by an end-of-message signal, resettable elements, means including said resettable elements for selecting the desired ones of said lines over which transmission is to be effected simultaneously and means responsive to the end-of-message signal for resetting said elements to normal after transmission of the message.

8. A multiple selective transmission system wherein concurrent transmission of telegraph messages over any two or more of a group of lines is effected and each message is terminated by an end-of-message signal, busy guard means, means including said busy guard means to delay transmission of the broadcast message until all of the selected lines become idle and means responsive to the end-of-message signal to restore the system to normal for transmission of subsequent messages.

9. A selective telegraph transmision sytem for ending messages over selected lines comprising a transmitter, a manual switchboard including a connecting plug for extending the circuit of said transmitter, and jacks forming terminals of said lines, said switchboard also containing a multisend jack, means operative on the insertion of said connecting jack in said multisend jack to permit transmission from said transmitter simultaneously over a plurality of said lines, means associated with said multisend jack for seizing desired ones of said lines as they become idle and remote-control means for releasing the selected lines at the end of the mesage.

10. A selective telegraph transmission system for sending messages over selected lines comprising a transmitter, a manual switchboard including a connecting plug for extending the circuit of said transmitter, and jacks forming terminals of said lines, said switchboard also containing a multisend jack, means operative on the insertion of said connecting jack in said multisend jack to permit transmission from said transmitter simultaneously over a plurality of said lines, means including manually operable switches for selecting the desired ones of said lines for concurrent transmission through the multisend jack and means for placing said last-mentioned selecting means in readiness for another call in response to signals sent from the transmitter.

11. A selective telegraph transmission system for sending messages simultaneously over any two or more selected lines of a group comprising a series of selective key switches, one for each of the lines of said group, selective relays controlled by said key switches, a common locking circuit for said relays effective to maintain the operated relays energized when the key switches are restored and means for interrupting said locking circuit at the end of a message to reset the selective equipment to normal.

12. A selective telegraph transmission system for sending messages simultaneously over any two or more selected lines of a group comprising a series of circuit controlling elements, one for each of said lines, means for actuating selected ones of said elements corresponding to the lines to which concurrent transmission is to be effected, means including the contacts of the switching elements which have been actuated for delaying transmission until all of the selected lines are idle and for placing a busy guard condition upon the selected lines until after the transmission has been effected, and means for restoring said elements to normal in response to an end-of-message signal appended to the message transmitted to the selected lines.

13. A selective telegraph transmission system comprising a main switching office, a plurality of branch offices, lines connecting said branch offices to said main switching office, a plurality

of message transmitting devices at said main switching office, a first selective means for connecting one at a time said message transmitting devices to selected individual ones of said lines over which messages are to be transmitted, a second selective means for selecting a plurality of desired lines over which a single message from one of said message transmitting devices is to be transmitted simultaneously and for seizing the selected ones of said line as they become idle, means to initiate simultaneous transmission from one of said message transmitting devices to all of said desired lines after all have become idle and means to prevent the connecting of other of said message transmitting devices to said seized lines until after the simultaneous transmission of a message over the seized lines.

14. A multiple selective telegraph transmission system comprising a main switching office or exchange, a plurality of branch offices or stations, lines connecting said branch offices or stations to said main switching office, message transmitting equipment at said main switching office, selective switching means for connecting said transmitting equipment to selected lines over which messages are to be transmitted, other selective means for designating two or more of said lines over which a single broadcast message is to be transmitted simultaneously and for connecting said plurality of lines simultaneously to said transmitting equipment, means to seize each of the desired lines as they become idle and auxiliary transmitting means associated with each line for transmitting characteristic supervisory code signal groups thereover, means to initiate the transmission of said supervisory code signal groups from said auxiliary transmitting means after all the desired lines have been seized and means operative thereafter for transmitting the broadcast message to the seized lines.

15. A multiple selective telegraph transmission system comprising a main switching office or exchange, a plurality of branch offices or stations, lines connecting said branch offices or stations to said main switching office, message repeating equipment at said main switching office, selective switching means for connecting said repeating equipment to selected lines over which messages are to be transmitted, operable means at said main switching office for selecting a plurality of lines over which a single message is to be transmitted concurrently from said repeating equipment, means to initiate the operation of said repeating equipment when all of the lines of a selected group become idle, means to automatically restore to normal the said means for selecting a plurality of lines over which a single message is to be transmitted concurrently at the end of the message and manually operable means to restore said line selecting means to normal at any time prior to the operation of said automatically restoring means.

16. A selective telegraph system for sending messages over selected lines comprising a transmitter, a manual switchboard including a connecting plug for extending the circuit of said transmitter, and jacks forming terminals of said lines, said switchboard also containing a multisend jack, means for designating lines over which it is desired to transmit a single message, means operative on the insertion of said connecting plug in said multisend jack to permit transmission from said transmitter simultaneously over the plurality of desired ones of said lines, seizing means associated with said multisend jack for seizing desired ones of said lines as they become idle, and a single manually operable switch for disabling, prior to the transmission over the selected lines, said seizing means to release the seized ones of said lines and prevent further operation thereof.

17. A selective telegraph system for sending messages over selected lines comprising a transmitter, a manual switchboard including a connecting plug for extending the circuit of said transmitter, and jacks forming terminals of said lines, said switchboard also containing a multisend jack, means for designating groups of lines over which it is desired to transmit a message, means operative on the insertion of said connecting plug in said multisend jack to permit transmission from said transmitter simultaneously over the desired group of said lines, means associated with said multisend jack for seizing desired ones of said lines as they become idle, means operative for releasing the seized ones of said lines if any are seized and to prevent the seizure of other lines of the selected group whereby the designated lines composing a group to be seized may be changed.

GEORGE G. LIGHT.

Disclaimer

2,346,173.—*George G. Light*, Kew Gardens, N. Y. TRANSMISSION SYSTEM. Patent dated Apr. 11, 1944. Disclaimer filed Mar. 11, 1948, by the assignee, *The Western Union Telegraph Company*.

Hereby enters this disclaimer to claims 1, 2, 3, 4, 5, 7, 11, 13, and 15 of said patent.

[*Official Gazette April 13, 1948.*]