

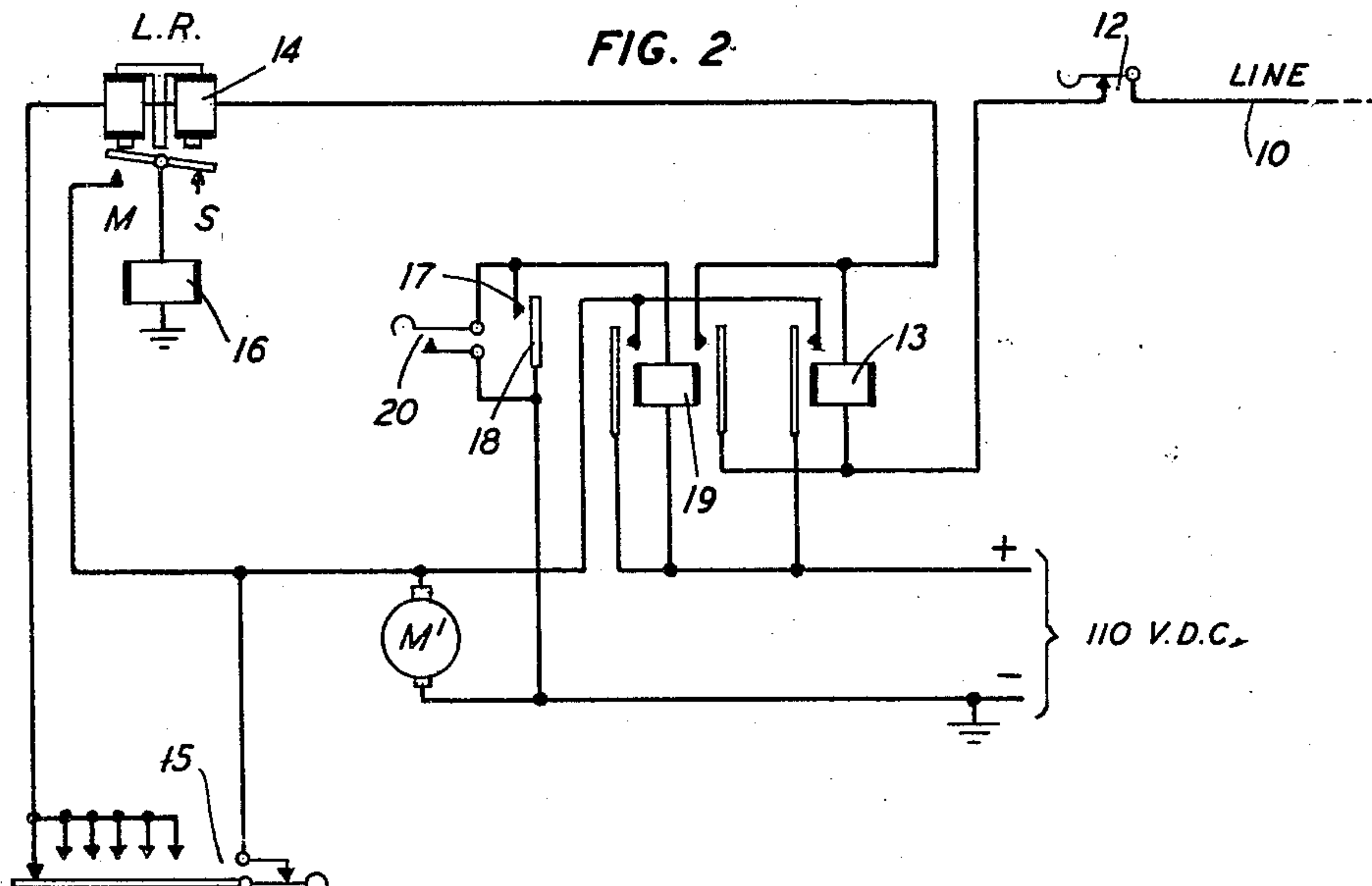
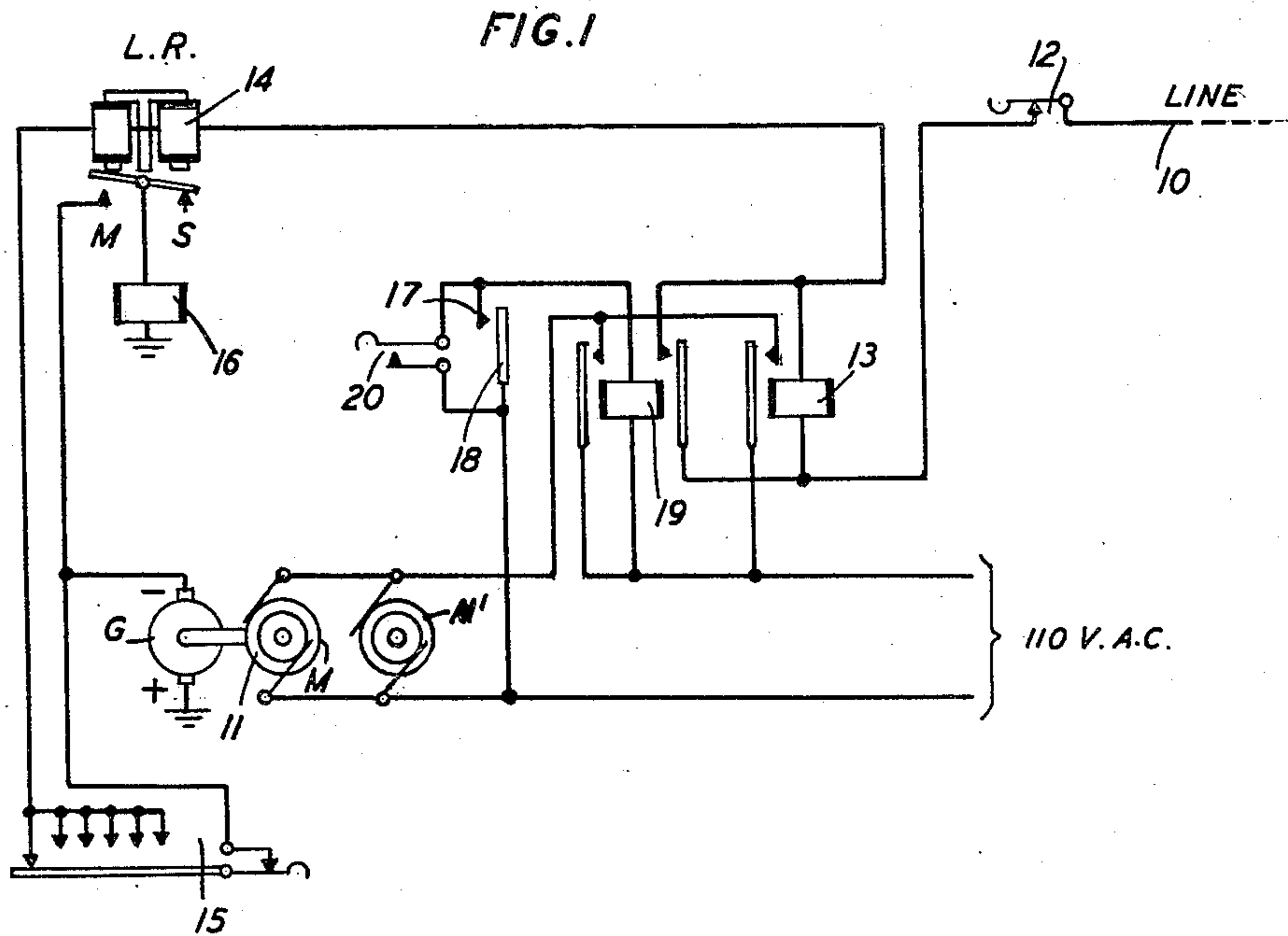
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PRINTING TELEGRAPH SYSTEM

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PRINTING TELEGRAPH SYSTEM

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This invention relates to telegraph systems and particularly to printing telegraph systems wherein the local power supply at the printer is controlled from a remote point.

5 An object of this invention is to render telegraph equipment effective automatically when required for use and to disable it when its service is no longer needed.

This invention is particularly adaptable to those systems wherein the printer sets are 10 idle for a considerable part of the time during which it is desired to have no parts in motion. Accordingly, a particular embodiment of this invention comprises a circuit arrangement whereby the motor driving means 15 at a printer station may be started and stopped from a remote point by the operation of suitable circuit controlling instrumentalities. Considering this arrangement more specifically, the operation of a non-locking 20 switch at one station for a slight interval of time starts the motor driving mechanism at that station into operation. The circuit is arranged so that the subsequent release of the non-locking switch, after the 25 system is in condition for communication, does not affect the motor driving mechanism, current being now supplied to the motor mechanism under control of special motor 30 contacts in the printer mechanism. At the distant station relays are caused to function by the initial operation of the non-locking key to supply power to start the motor mechanism thereat. The control of these re- 35 lays is transferred immediately upon their actuation from the transmission line circuit to a special motor control contact arrangement in the printer mechanism which functions as soon as the system is in condition for 40 communication. In stopping the motor driving means, the motor control contact arrangement is adapted to respond to a special code signal comprising a group of impulses transmitted by the keyboard.

45 Heretofore, in telegraph systems wherein the motor driving mechanisms of printer stations are adapted to be started and stopped from remote points, it has been customary to employ separate sources of cur- 50 rent supply for the printer motors and for

the relay apparatus. Several such arrangements are disclosed in United States Patents 1,648,974 and 1,648,975 to G. S. Vernam, November 15, 1927, 1,655,448 to E. F. Watson, January 10, 1928, and 1,712,528 to B. S. Swezey, May 14, 1929. One advantage of the present invention is that only a single source of current supply is employed for operating both the relay apparatus and the motor driving mechanism. 55

Referring to the drawings: 60

Figure 1 illustrates, diagrammatically, a printer station circuit adapted to function with an alternating current source of supply embodying the principles of this invention; and 65

Fig. 2 illustrates a modification of the circuit of Fig. 1 adapted to function with a direct current source of supply.

In Fig. 1 is shown a printer station circuit 70 connected to a transmission line 10 which extends to a remote printer station (not shown). For the purposes of the present explanation it may be assumed that the circuit at the remote printer station is similar in design to that of the near station. Normally, when the telegraph system is not in use, the printer circuit will be as indicated in the drawing. Under such a condition motor generator 11 and printer motor M' will not 80 be running and there will be no current in the line.

If the remote station wishes to communicate with the near station a voltage will be applied to far end of the line, in a manner 85 to be subsequently described, and a current of somewhat less than half normal current will flow through the circuit, over a path traced from the transmission line 10, through the normal break contacts of stop key 12, 90 windings of relay 13 and line relay 14, sending contacts of the printer 15 to ground through the generator at 11. This current, which may be of the order of 20 to 25 milliamperes, will operate relay 13. 95

The operation of relay 13 closes an obvious circuit through its contacts from the 110 volt A. C. source to the motor-generator 11 and printer motor M'. The motor-generator, in operating, will build up sufficient voltage to 100

cause a current of approximately 60 milliamperes to flow in the line on a circuit traced from the negative side of the generator through the sending contacts 15 of the printer and the winding of line relay 14, through the winding of relay 13 to the line 10. This flow of current is in such direction as to add to the initial flow of current caused by the application of the voltage at the remote station. Line relay 14 will operate over this last circuit, in turn, operating selector magnet 16 on a circuit over the armature and marking contact of relay 14. At this time, motor control contacts 17 and 18 in the printer mechanism close. These contacts form a part of the printing mechanism and are maintained closed independently of the operation of line relay 14 in a manner well known in the art. The closure of contacts 17 and 18 causes the operation of relay 19 over an obvious circuit. Relay 19, in operating, locks up over contacts 17 and 18 and short-circuits the winding of relay 13 through its right make contacts, thus closing through to the line relay the path for the message signals. The motor driving mechanism is now supplied with the 110 volt A. C. source through the left make contacts of relay 19. Communication may now take place.

When it is desired to stop the motor driving mechanism it is necessary for either station to transmit a special code signal comprising a combination of impulses which will cause the actuation of a special code bar in the printer mechanism to open motor control contacts 17 and 18 in a manner well known in the art. E. F. Watson Patents 1,566,295, December 22, 1925 and 1,655,448, January 10, 1928, disclose similar arrangements. The opening of contacts 17 and 18 in the printer mechanism opens the energizing circuit for relay 19 which will release, in turn, removing the short circuit around the winding of relay 13. Relay 13 will now reoperate and the motor mechanism will continue to run, current now being supplied to the motors through the make contacts of relay 13. The removal of the voltage at the far end of the line at this time will cause the release of relay 13 and the stopping of the motor driving mechanism. It should be understood, of course, that the removal of the voltage from the far end of the line occurs immediately after the transmission of the special code signal, otherwise the contacts 17 and 18 in the printer mechanism will again soon reoperate.

If the near station wishes to start the motor apparatus at the remote station, non-locking key 20 will be depressed and kept operated for a slight interval of time until the system is in condition for communication. The operation of key 20 will cause the operation of relay 19 from the 110 volt A. C. source over an obvious circuit. Relay 19, in

operating, will short-circuit the winding of relay 13 and will apply the 110 volt A. C. supply to the motor mechanism which will function in the same manner as hereinbefore described. The generator will build up and send a current of about 25 milliamperes out over the transmission line 10 to the remote station which will start in a manner similar to that described in connection with starting the near station. It is to be understood of course, that the generators at both the near and far ends of the line are connected in such manner that their polarities aid and do not oppose. When the current in the line has built up to about 60 milliamperes, which will occur when the remote station starts functioning, and the motor control contacts 17 and 18 caused to close, non-locking key 20 will be released.

To stop both stations a special code signal is transmitted over the line from the printer keyboard 15 which causes the opening of motor control contacts 17 and 18 in the printer mechanism and the consequent release of relay 19 and the reoperation of relay 13. Stop key 12 is actuated momentarily at this time to open the circuit through the winding of relay 13, which now releases and restores the circuit to normal.

Fig. 2 shows the circuit of Fig. 1 modified to function on direct current. The application of a voltage at the far end of the transmission line 10 in a manner to be subsequently described will cause the operation of relay 13 on a current of somewhat less than half of normal strength over a circuit traced from transmission line 10 through the contacts of stop key 12, windings of relay 13 and line relay 14, sending contacts 15, windings of printer motor M' to one side of the direct current source. The operation of relay 13 will connect the positive side of the 110 volt direct current source of supply to printer motor M' and to the line 10 through the make contacts of relay 13. Relay M' will now operate; current in the line will build up to 60 milliamperes and line relay 14 will move to its marking contact, in turn, operating selector magnet 16. It is to be understood of course that the source of current supply at the remote station at the far end of the line is connected in such manner that the polarities at both ends of the line aid in building up the line current. Motor control contacts 17 and 18 in the printer mechanism will now close and relay 19 will operate and lock up thereover, in a manner identical with that hereinbefore described in connection with the circuit of Fig. 1. The operation of relay 19 will short-circuit the winding of relay 13 through its right make contacts and will supply the 110 volt direct current power to the printer motor M' through its left make contacts.

The circuit may be returned to its normal

condition in a manner identical with that hereinbefore described in connection with the stopping of the motor mechanism of Fig. 1, namely, the transmission of a special code signal to cause the opening of motor control contacts 17 and 18 followed by the operation of stop key 12.

To start the operation of the motor driving mechanism at both the far and near ends of the line, non-locking key 20 is depressed. The actuation of key 20 will operate relay 19 over an obvious circuit. Relay 19, in operating, will short-circuit the winding of relay 13 and will supply a voltage from the direct current source to the line in a manner mentioned above. Current of less than half normal strength will flow in the line until the mechanism at the far end of the line functions and builds up the line current, at which time, line relay 14 will operate to its marking contact and the motor control contacts 17 and 18 in the printer mechanism will close to lock up relay 19. Start key 20 may then be released.

What is claimed is:

1. A printing telegraph station having, in combination, motor driving mechanism, circuit controlling instrumentalities for starting said motor mechanism into operation, a single source of power for both said motor driving mechanism and for said circuit controlling instrumentalities, and means for disabling said circuit controlling instrumentalities to stop said motor mechanism.

2. In a telegraph system, a printing telegraph station circuit having, in combination, motor driving mechanism, circuit controlling instrumentalities for starting said mechanism into operation, a switching key adapted to be serially connected in the transmission line for opening and closing the line, and means including a set of contact elements responsive to the transmission of a special group of impulses over said line followed by the opening of said switching key for disabling said circuit controlling instrumentalities and for stopping the operation of said motor mechanism.

3. A remote control system for controlling the motor mechanism of a printer station from a remote point, comprising a printing telegraph station, a second station, a transmission line extending between said stations, a circuit controlling instrumentality at each station responsive to a current over said line of approximately half normal value for starting into operation the motor driving means at that station, and another circuit controlling instrumentality for short-circuiting said first instrumentality when said line current builds up to its normal value.

4. A printing telegraph system comprising a printer station, a second station, motor mechanism at each station, a transmission line extending from said first station to said

second station, a source of power at each station, switching means at said first station for starting the motor mechanism at that station and for supplying current from said source of power to the line, circuit means at said second station responsive to the flow of current in the line for starting the motor mechanism at said second station, and circuit means at each station including mechanism responsive to a special code signal for stopping said motor mechanism.

5. A printing telegraph station having, in combination, a source of current supply, motor driving mechanism, a relay responsive to a current of considerably less than normal value flowing over the transmission line for starting said motor mechanism into operation, and circuit controlling instrumentalities responsive to a current of normal strength flowing in the transmission line for conditioning said station for the reception of message signals.

6. In a telegraph system a printing telegraph station having, in combination, a motor-generator, an alternating current source of supply, a relay serially connected in the transmission line circuit and adapted to respond to a flow of current over the line, said relay being arranged when operated to associate said alternating current source with said motor-generator for driving same, and an additional relay responsive to the operation of said motor-generator for disabling said first relay and for enabling the continued association of said alternating current source with said motor-generator.

In testimony whereof I have signed my name to this specification this 21st day of August, 1931.

ALLAN WEAVER.