

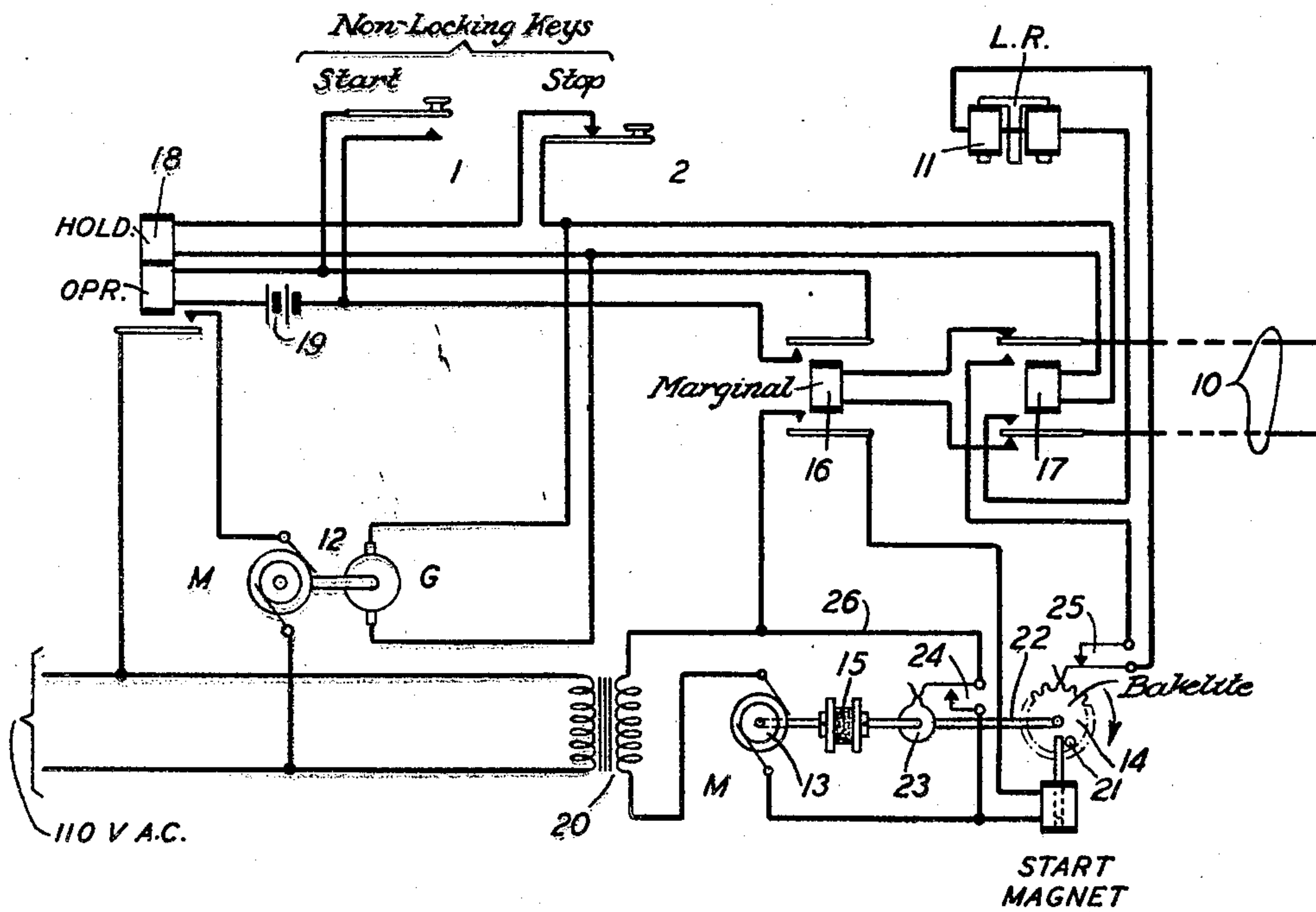
Oct. 4, 1932.

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1,880,311

PRINTING TELEGRAPH SYSTEM

Filed Sept. 2, 1931



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PRINTING TELEGRAPH SYSTEM

Application filed September 2, 1931. Serial No. 560,815.

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 required.

10 A further object is to indicate to a calling party at a remote station when the proper station has been called and is in condition to receive message signals. This is accomplished by providing a circuit for automatically repeating back to a calling party an
15 answer-back signal corresponding to the code designation of the called station. This circuit may be started into operation when the printer at the called station is in condition for the reception of message signals.

20 A particular feature of this invention resides in the disc arrangement and its associated motor control circuit for automatically transmitting the answer-back signal over the system.

25 Other objects and features will appear in the subsequent detailed disclosure.

In general, this invention comprises a circuit for a printing telegraph station whereby the printer apparatus at the station may be
30 conditioned from a remote point for the reception of signal impulses. At the station an answer-back signal arrangement is provided which comprises essentially, a bakelite disc attached to a small motor which is started
35 into operation automatically upon the conditioning of the printer apparatus for the reception of signals. The periphery of the disc is engraved with Morse characters which correspond with the code designation of the
40 printer station. Resting on the periphery of the disc are contact elements which are serially connected in the transmission line. As the disc revolves, the contact elements on the periphery are caused to open and close in accordance with the characters of the answer-back signal which it is desired to transmit.
45 The small motor and disc revolve for only one revolution, thus causing a single code combination comprising a group of impulses to be transmitted back over the line. This sin-

gle code combination may comprise any desired group of characters depending upon the construction of the periphery. The spacing between the raised portions of the periphery may be adjustable and will be described later. 55

An advantage of this invention is that the answer-back signal feature may be employed at any printer station in a telegraph system regardless of whether it is a receiving only station or a receiving and transmitting
60 station.

The invention has been illustrated in the accompanying drawing which shows a subscriber's station circuit to which a remote station may be connected over transmission
65 line conductors 10. Line relay 11, adapted to be serially connected in the line conductors, is responsive to the message signals and operates the printer apparatus not shown. The motor-generator mechanism for driving the
70 printer apparatus has been shown in diagrammatic form at 12. A small motor 13 is also provided for driving a bakelite disc 14 by means of a slip clutch arrangement 15 for transmitting an answer-back signal, corresponding to the code designation of the sub-
75 scriber's station, back over the line conductors 10. Relay 16 is a marginal relay which is adjusted to operate on about 60 mils current.

Referring now to the operation of the circuit, the motor-generator 12 may be started
80 by an operation performed at a remote station connected to line conductors 10. If desired, conductors 10 may be connected to a central office where an operator may quickly
85 and efficiently establish communication between any two or more subscriber stations connected to the system.

The application of a line current of about
90 60 mils to transmission line 10 will operate marginal relay 16 over a circuit traced from one side of line 10 through the upper break contacts of relay 17, winding of relay 16, through the lower break contacts of relay
95 17 to the other side of line 10. Relay 16, in operating, will close an obvious circuit over its upper contacts to operate relay 18 on a path traced from dry cell battery 19 through the lower operating winding of relay 18. The operation of relay 18, in turn, will apply
100

110 volts A. C. to the motor-generator 12 to start the motor mechanism. Motor-generator 12 will now start and furnish current to the upper winding of relay 18 to hold the relay in an operated position. Relay 16, in operating, also closes a circuit to start the small motor 13 causing the rotation of the bakelite disc 14 for one revolution in the direction indicated by the arrow. This circuit is traced as follows: current from the 110 volt A. C. source through transformer 20, lower make contacts of relay 16, winding of the start magnet, motor 13, and back to transformer 20. This last circuit causes the operation of motor 13 and of the start magnet which, in operating, withdraws its start lever from engagement with stop pin 21. Bakelite disc 14 is driven by motor 13 through a slip friction clutch 15 and shaft 22. Shaft 22 will only rotate when the start lever of the start magnet has been withdrawn from engagement with stop pin 21. Attached to shaft 22 is a cam device 23 which is adapted, when the shaft starts rotating, to close a circuit through contacts 24. In a normal position, i. e., when the shaft is at rest, contacts 24 are arranged to be opened by cam 23.

Returning now to the starting of the motor-generator 12, hereinbefore described, current furnished from the generator will operate relay 17 over an obvious circuit. Relay 17, in operating, will transfer the circuit including transmission line 10 from relay 16 to line relay 11. Relay 16 will now release, and line relay 11 will be serially connected in the transmission line circuit through the operated contacts of relay 17 and contacts 25 resting on the periphery of disc 14. The release of relay 16 will open the 110 volt A. C. supply circuit to motor 13 and the circuit of the start magnet which formerly was closed through the lower contacts of the relay. The start magnet will release and cause its lever to engage stop pin 21 when the pin again returns to its original position at the end of one revolution of the disc. Motor 13, however, will continue to have current from the 110 volt A. C. source supplied to it, at this time, to keep it rotating. This last circuit is traced from transformer 20, lead 26, through the operated contacts 24 to the motor 13 and back to the transformer.

The rotation of disc 14 will cause contacts 25 to open and close in accordance with the Morse characters engraved on the periphery of the disc. These characters may be attached to the periphery by screws or by any other desired means so as to make their position adjustable. The openings and closures of the transmission line circuit caused by the rotation of the disc are arranged to correspond to the particular code designation of the printer station and comprises the answer-back signal. At the end of one revolution of the cam 23, corresponding to one revolu-

tion of the shaft 22 and of disc 14, contacts 24 will be opened by the action of the cam, thus removing the current supply circuit from the motor 13 which, in turn, will cease turning. The start lever of the start magnet will engage stop pin 21 and will prevent over-travel of the disc. It should be noted that even though motor 13 may continue running for a short interval of time due to the inertia of the moving parts of the motor mechanism, after the current supply has been removed therefrom, the cam 23 and disc 14 which are connected to the motor through slip clutch 15 will not rotate for more than one revolution. In the meantime, the answer-back signal has been transmitted over transmission line 10 by the action of bakelite disc 14 and contacts 25.

If desired, the motor-generator set 12 may be started locally by the operation of a non-locking start key 1 which will cause the operation of relay 18 in a manner identical with that hereinbefore described in connection with the operation of relay 16. However, it is to be noted that in such case no answer-back signal will be transmitted over the line since no circuit has been closed through the start magnet.

To stop the motor-generator set, stop key 2 is used. The operation of key 2 will open the circuit through the holding winding of relay 18 which will release, in turn, opening the path of the 110 volt A. C. supply to the motor-generator. The stopping of the motor-generator will cause the release of relay 17, in turn, reconnecting the winding of the relay 16 to the transmission line conductors 10.

What is claimed is:

1. In a telegraph system, a calling station, a called station, a circuit interconnecting said stations, a motor at said called station, a signal transmitting device at said calling station for starting said motor, an answer-back signal arrangement at said called station comprising a disc driven by said motor, the periphery of said disc being irregular in form to correspond to a signal code combination representing the call number of the called station, contact elements resting on the periphery of said disc and arranged to open and close in accordance with the irregularities on the periphery of said disc as said disc revolves, an electrically operated element at said called station responsive to a signal from said transmitting device for automatically causing said disc to rotate through one revolution to thereby transmit to the calling station the signal code combination of the called station.

2. A printing telegraph station having, in combination, a transmission line, a circuit controlling instrumentality, a motor for driving said instrumentality, relay apparatus responsive to transmission line current

for starting said motor and for associating said circuit controlling instrumentality with said transmission line circuit for transmitting a plurality of signals thereover for an interval of time equal to the time it takes the motor to complete one revolution.

5 3. In combination, in a printing telegraph station, a motor driving mechanism, a second motor driving mechanism, a source of current supply, a circuit controlling instrumentality, a marginal relay serially connected in the transmission line circuit and responsive to a signal transmitted thereover for connecting said source of supply to both
10 said first and second motor driving mechanisms relay mechanism responsive to the operation of said first motor driving means for disabling said marginal relay and for associating the circuit controlling instrumentality with the transmission line circuit,
15 said circuit controlling instrumentality being adapted to be driven by said second motor driving mechanism to open and close said line circuit in accordance with a predetermined code signal.

25 4. A system as outlined in claim 3 including switching devices at said station for locally starting and stopping said first motor driving mechanism.

30 5. A printing telegraph station having, in combination, a motor-generator, an auxiliary motor, an alternating current source of supply, a relay responsive to current of a predetermined value transmitted over the transmission line for associating said alternating
35 current source with said motor-generator and said auxiliary motor for driving same, and means responsive to the operation of said motor-generator for disabling said relay and
40 for associating the transmission line with the printer mechanism for communication purposes.

6. In a telegraph system, means for controlling the motor driving mechanism of a
45 printing telegraph station from a remote point comprising, a source of current supply, a transmission line extending from the station to a remote point in the system, a relay serially connected in the line and adapted
50 to respond to current over said line, said relay being arranged when operated to associate said source of current with the motor mechanism of said station for driving same, and an additional relay responsive to the
55 operation of said motor mechanism for disabling said first relay and for associating the transmission line with the printer mechanism at the station for communication purposes.

In testimony whereof, I have signed my
60 name to this specification this 28th day of August, 1931.

HARRY B. BOOSE.