

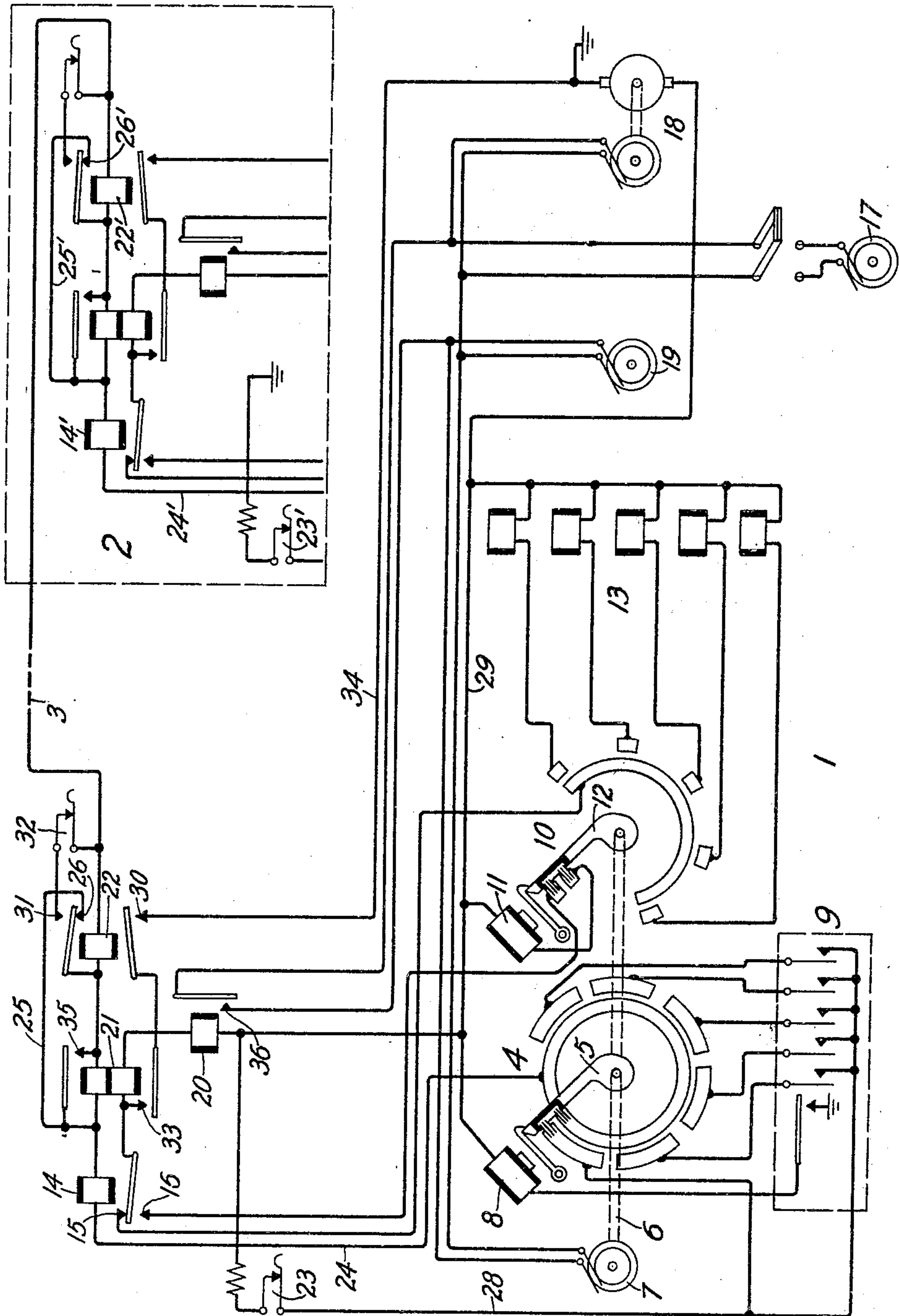
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G. S. VERNAM

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SIGNALING SYSTEM

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INVENTOR
G. S. VERNAM

BY

g. s. vernam

ATTORNEY

UNITED STATES PATENT OFFICE

GILBERT S. VERNAM, OF RIVER EDGE, NEW JERSEY, ASSIGNOR TO AMERICAN TELEPHONE AND TELEGRAPH COMPANY, A CORPORATION OF NEW YORK

SIGNALING SYSTEM

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This invention relates to control systems and more particularly to telegraph systems wherein local printing stations may be made operative from a distant point.

5 Heretofore various schemes of this sort have been proposed. Some of these involve the use of extra relays in the line circuit and are therefore unsuited to those circuits in which line resistance must be kept low. 10 Others employ devices cooperating with the printer mechanisms and require special development at considerable expense.

The object of this invention is a simple, inexpensive control system capable of starting a distant telegraph set without impairing the quality of the line for signaling purposes. 15

In accordance with the general features of the invention two motor starting relays at each station operative when the line is momentarily opened and then reclosed, start the printer and distributor motors and shunt their own windings out of the line circuit during the transmission of the message. The open impulse releases the first relay to 25 prepare a circuit for a control relay and put its own winding in parallel with a local stop key. The closed impulse operates the second relay to complete the motor control circuit and start the motors, shunts its own winding out of the line and is locked up by the control relay current. A momentary opening of the stop key reoperates the first relay which in turn opens the locking circuit of the second, thereby putting the local station out of service. 35

A further feature resides in preventing faulty operation of the printer at the beginning of a message by arranging the distributor release magnet so that it may be energized only after the line is reclosed. 40

The drawing illustrates the invention as applied to a start stop telegraph system comprising two stations, 1 and 2 operating over a line 3. Each of these stations is equipped with complete transmitting and recording mechanisms, but for the sake of simplifying the drawing they have been shown only schematically at station 1 and omitted altogether at station 2. 45

50 The transmitting equipment comprises

transmitting distributor 4 which has a brush arm 5 frictionally mounted on the shaft 6 driven by a motor 7 and arranged to be stopped periodically by a release magnet 8. The brush arm 6 is provided with a brush 55 for consecutively bridging a plurality of segments with a continuous ring, as shown, and these segments are connected with the contacts of a transmitter 9 which may be either of the automatic or manual type. The receiving mechanism comprises a receiving distributor 10 which like the transmitting distributor 4 is provided with a release magnet 11 for periodically arresting the rotation of the brush arm 12 also frictionally mounted on the shaft 6. The segments of the distributor 10 are connected with the selecting magnets 13 of the printer, not shown. 60 65

Each of the stations 1 and 2 also is provided with a line relay 14 which controls through its front contact 15 the energization of the selecting magnets 13 upon the passage of the brush carried by brush arm 12 over the segments of the receiving distributor 10 to which the selecting magnets are connected. Relay 14 through its back contact 16 controls the release magnet 11 of the receiving distributor. A power source 17, which in most cases will be the local alternating current power mains, supplies energy constantly to the motor generator set 18 and to the printer and distributor motors 19 and 7 when the control relay 20 is operated. 70 75 80

For purposes of illustration it will be assumed that the operator at station 2 desires to send a message to station 1. At this time, the motor generator at each station will be running, but all other motors will be stopped. The armatures of the motor starting relays 21 and 22 will be in the position shown and the closed line circuit may be traced from ground at station 2, through start key 23', the transmitting distributor (not shown), conductor 24', line relay 14', conductor 25', front contact 26' of relay 22', winding of that relay, line conductor 3, relay 22, front contact 26, conductor 25, line relay 14, conductor 24, transmitting distributor 4, conductor 28, start key 23, conductor 29 to the positive terminal of the generator. 85 90 95 100

When the key 23' is momentarily opened, relays 22 and 22' will release. The operation of the other relays will be described with reference to station 1 only, but it is understood, of course, that a similar cycle of the operations will be taking place at station 2. In releasing, relay 22 at its lower contact 30 prepares a circuit for the subsequent operation of power control relay 20. At its upper contact 31, it transfers the line circuit from conductor 25 to the main winding of relay 21 and connects the stop key 32 in parallel with the winding of relay 22. When the key 23' is released, the line circuit is again complete, so that relay 21 is energized and in operating completes the operating circuit for relay 20 at its lower contact 33. This circuit may then be traced from the positive terminal of the generator over conductor 29, winding of the relay 20, holding winding of relay 21, contacts 33 and 30, conductor 34 to grounded negative. At its upper contact 35, relay 21 short-circuits its main winding thereby reducing the line resistance to a minimum during the time signals are being transmitted. Current from the generator will maintain relay 21 operated and operate relay 20 to complete the circuit for motors 7 and 19 at contact 36. The system is then in condition to transmit the message.

In many systems of this general nature proposed heretofore, the open line impulse used for starting the printer motors also energized the release magnet of the receiving distributor, so that this distributor was rotating at the time the subsequent closed impulse was received and thereby caused a letter to be recorded at the beginning of the message which had not been sent from the transmitting station. In the present invention, however, this objection is overcome and the release magnet 11 is energized only upon the receipt of the first open impulse of the message itself. The first open impulse for the purpose of putting a station in operation releases line relay 14 as well as the motor starting relay 22, so that the contact 16 is closed, but it should be noted that at this time motor starting relay 21 is de-energized so that the start magnet circuit is open at contact 33, even after relay 22 has released.

When the message has been completed, the distant operator will be advised of that fact by transmitting to him a predetermined signal. Upon receipt of this signal, he will open momentarily, key 32 which has been carrying the line current during the transmission of the message. This current will now flow through the winding of relay 22, reoperating it and opening the circuits of relays 20 and 21 at contact 30. The relay 20 will thereupon release to open the circuit of motors 7 and 19 at contact 36. Relay 21 will also be released and will remain de-

energized when the line circuit is subsequently closed at the contacts of key 32 as the circuit now extends through contact 26 and conductor 25 which effectively short circuit the main winding of relay 21. The station is then restored to its normal inoperative condition and the motor starting relays 21 and 22 are in the proper condition to respond to the next starting impulse.

While the features of this invention have been described with reference to a particular system employing a constantly operating generator, it is obvious that they may be incorporated in systems of various other kinds and it is intended that the invention shall be limited only by the following claims.

What is claimed is:

1. In a telegraph system, a plurality of stations, a line connecting the stations, recording apparatus at one of the stations, a source of power for the apparatus and two line relays responsive to an open and a subsequent closed condition of the line for connecting the source of power to the apparatus.
2. In a telegraph system, a plurality of stations, a line connecting the stations, recording apparatus at one of the stations, means, including two relays controlled by line current from another of these stations, associated with the apparatus for rendering it operative, a key associated with one of the relays to render the apparatus inoperative and connections shunting the relays out of the line when the apparatus is operative.
3. In a telegraph system, a plurality of stations, a line connecting the stations, recording apparatus at one of the stations, a source of power for the apparatus, a control relay for connecting the source of power to the apparatus, a second relay responsive to an open condition of the line to prepare a circuit for the control relay, a third relay responsive to a subsequent closed condition of the line for completing the circuit and making the control relay independent of changes in the condition of the line, and a key associated with the second relay for rendering the apparatus inoperative.
4. In a telegraph system, a plurality of stations, a line connecting the stations, recording apparatus at one of the stations, means including a plurality of relays operated by line current and a distributor release magnet associated with the apparatus for rendering it operative, means for rendering it inoperative, and circuit connections for the release magnet to prevent it from functioning prematurely.
5. In a telegraph system, a plurality of stations, a line connecting the stations, recording apparatus at one of the stations, means including a plurality of relays operated by line current and a distributor release magnet associated with the apparatus for rendering it operative, means for render-

ing it inoperative, and circuit connections for the release magnet to prevent it from functioning prior to the energization of the recording apparatus.

5 In testimony whereof, I have signed my name to this specification this 1st day of November, 1928.

GILBERT S. VERNAM.

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