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CALL SIGNAL AND MOTOR CONTROL FOR SIMPLEX PRINTERS

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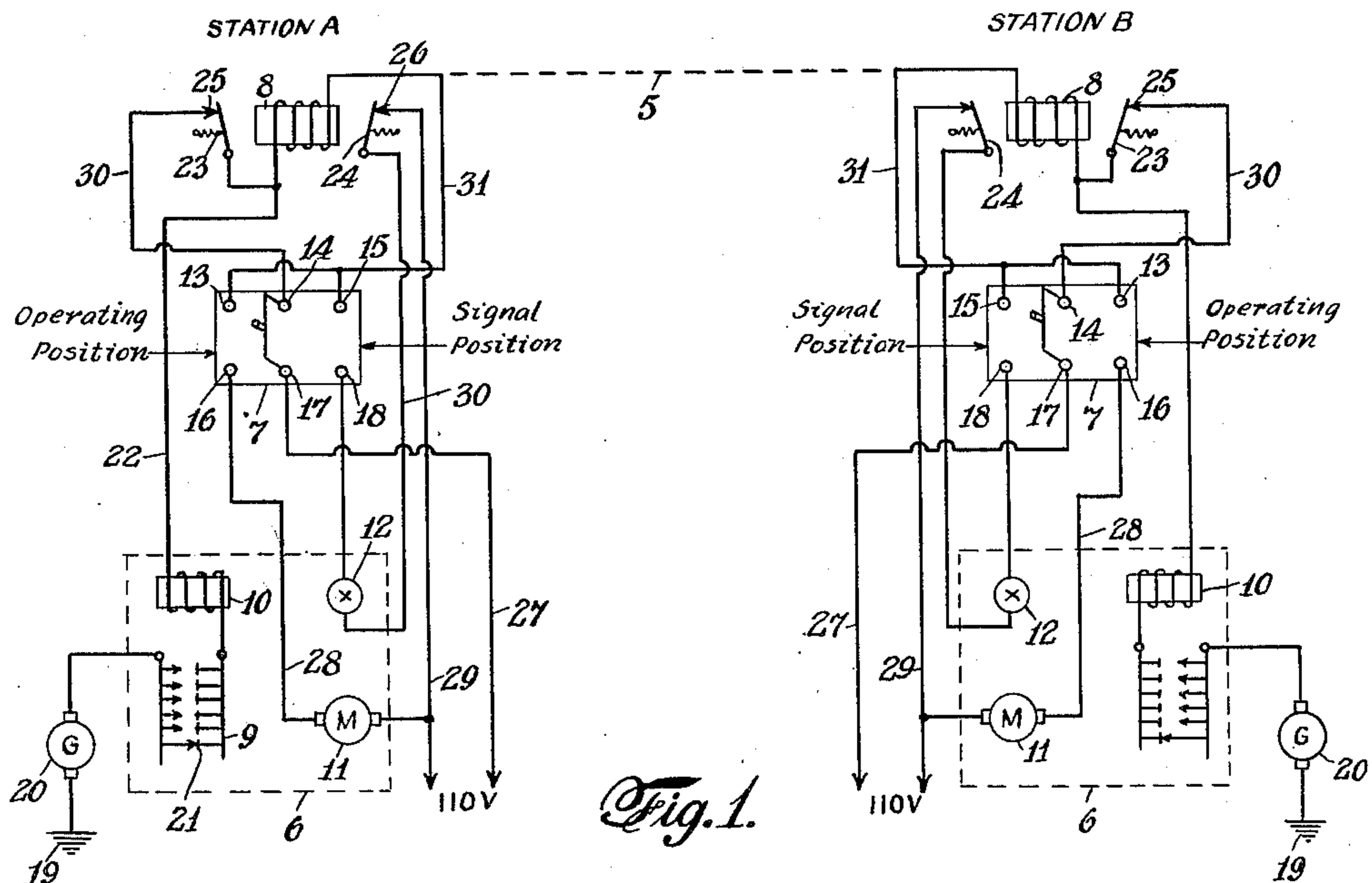


Fig. 1.

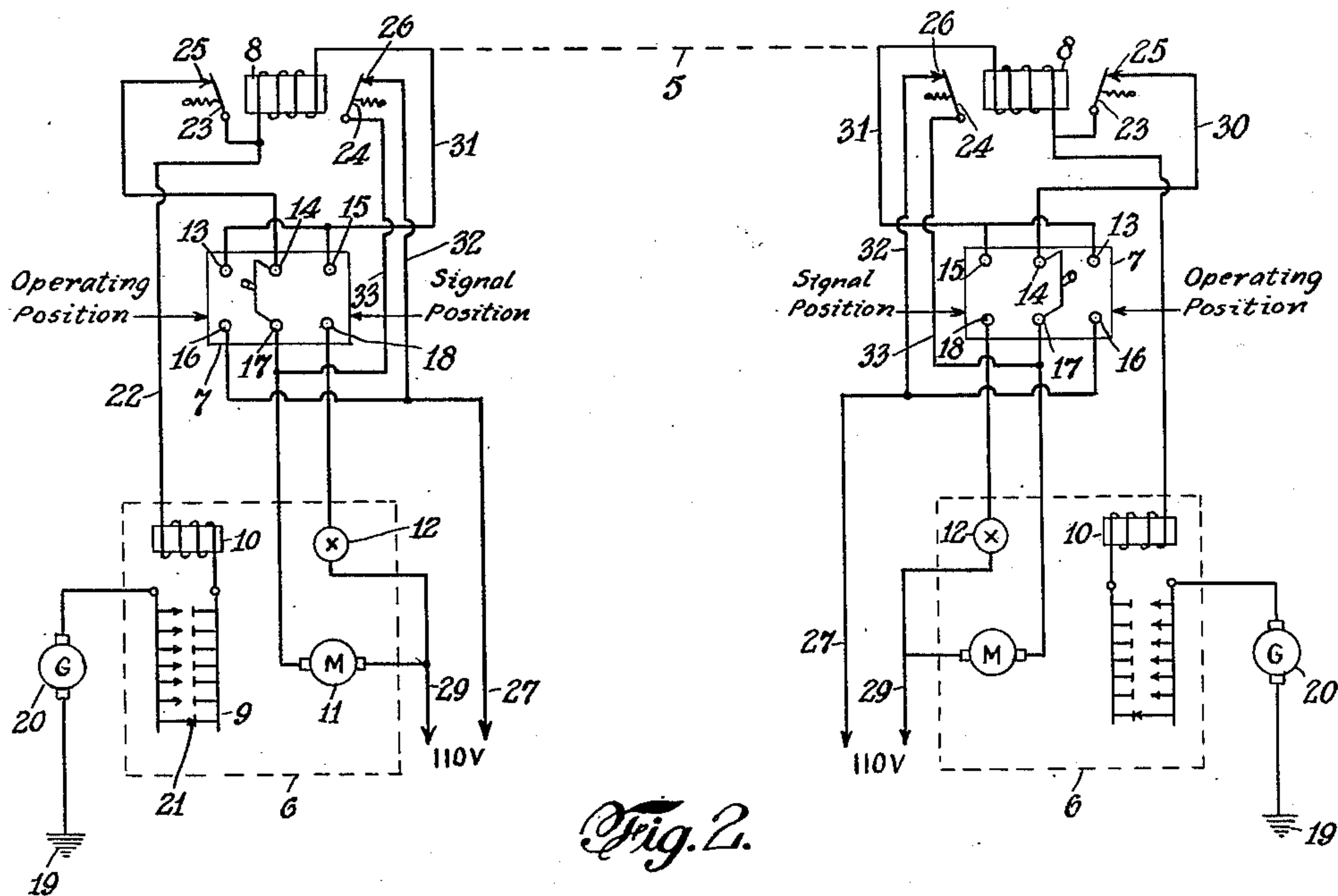


Fig. 2.

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CALL SIGNAL AND MOTOR CONTROL FOR SIMPLEX PRINTERS

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This invention relates to a call signal for a telegraph system and more particularly for a system employing simplex printers.

In printing telegraph systems it is desirable, in order to save wear on the printing machines, eliminate noise and conserve on the current consumption of the machines, to maintain the driving motors idle when the circuit is not in operation but to have the printing units immediately available when it is desired to transmit thereto.

In Simplex printer telegraph systems each character signal group consists of a stop impulse, a start impulse and either five or six character code impulses. The selecting mechanism ordinarily comprises a plurality of cams, one for each of the five or six character impulses, rotated successively into position to engage corresponding selecting members for selecting the desired character on the type bar or type wheel. A single selecting magnet responsive to each signal impulse, cooperates with the selecting members to determine whether they are to be moved by the cams into a spacing or marking position. It is essential that each cam rotate into operating position at the time the magnet is under the control of the received impulse. If the received impulses were perfect block signals a considerable period of the impulse would be available in which to operate the selecting levers, that is, if the cam moved into operating position at any time during the major portion of each impulse, correct operation would result. However, signals received over long lines are not block signals, the corners thereof being rounded off and signals being considerably distorted so that usually only a narrow portion of the peak is available in which to operate the selecting levers. The portion of the signal impulse during which the selecting cams must come in contact with the selecting levers to operate them, is termed the range. Any appreciable inductance added to the printer magnet circuit increases materially the time required for the current to build up and die out in the printer magnet circuit, and therefore reduces the operating range of the printer, thereby limiting the speed, length of line, weather conditions,

etc., under which the printer may be operated.

One of the objects of the present invention is to provide a call signal for a simplex printer system which will not increase the inductance in the printer magnet circuit during operation thereof.

Another object is to provide a simple and reliable system for calling the attendant at a distant station and, if desired, for automatically starting the operation of the printing unit, which system may be conveniently controlled by the transmitting operator.

Other objects and advantages will appear as the description proceeds.

In accordance with our invention we provide at each station of a simplex printing telegraph system, an audible or visible signal, a manually operated switch having two positions, i. e. a motor "operating" position and a "signal" position, in the latter of which the switch is placed when the printing and transmitting unit is not operating, and a relay.

The relay is inoperative when the manual switch is in the motor "operating" position, but when the manual switch is in the "signal" position, the relay is responsive to line signals. The relay, in response to an open circuit condition of the line, produced by the transmitting operator at a distant station, closes contacts for operating the signal device to call the attendant at the called station so that he may throw the manual switch to the "operating" position. The relay also closes a short circuit for its winding so as to maintain it in an unenergized condition and at the same time, if desired, may effect the automatic starting of the printer motor so that the printing unit is immediately placed in an operating condition.

The motor of the printing and transmitting unit is stopped when the exchange of business has been concluded by the receiving attendant returning the manual switch to the "signal" position.

In order that the invention may be more fully understood, reference will be had to the accompanying drawings, in which:

Figure 1 is a circuit diagram illustrating

our call system applied to the operation of a call signal only, and

Figure 2 is a circuit diagram illustrating a system for simultaneously operating a call signal and automatically starting the printing motor.

In these figures we have shown diagrammatically the apparatus and circuit arrangements at two stations A and B connected by a line 5, the apparatus at each station being identical.

The apparatus at each station comprises a printing and transmitting unit 6, a manual switch 7 and a relay 8. The printing and transmitting unit comprises the transmitting contacts 9, selecting magnet 10 and operating motor 11. A signal lamp 12 is also shown associated with the printing and transmitting unit. The manual switch 7 is illustrated as a double pole, double throw, knife switch having contacts 13, 14, 15, 16, 17 and 18, as indicated, although it is to be understood that any other suitable form of switch, having the necessary contact facilities, may be used.

Referring first to Figure 1 and assuming the switch 7 at each station to be in the "signal" or non-operating position, the line circuit is completed from the ground 19 through the generator 20, normally closed stop contact 21 of the transmitting mechanism, selecting magnet 10, conductor 22 and winding of the relay 8 to the line 5 and similarly through the corresponding apparatus at the opposite station. The relays 8 are maintained energized by the steady line current, and the contact tongues 23 and 24 thereof, are held out of engagement with the back contacts 25 and 26, respectively.

If the operator at station B, for instance, desires to transmit to station A, he first moves the switch 7 to the "operating" position to start the motor of his printing and transmitting apparatus. The circuit for the motor extends from one side 27 of the power line, contacts 17 and 16, conductor 28 and motor 11, back to the opposite side 29 of the power line. With the motor operating the operator next opens the line by depressing any one of the transmitting key-levers.

The opening of the line de-energizes relays 8 at both stations, closing the contacts 25 and 26. The contact 25 short-circuits the relay winding through the conductor 30, contact 14, contact 13 or 15 (depending upon the position of the knife blade) and the conductor 31 to the line 5. The short-circuiting of the relay winding maintains the relays in an unenergized condition and thus insures the maintenance of the contact 26 closed.

Upon closing of the contact 26 at the calling station (station B) nothing occurs since the circuit including this contact is open at the switch contact 18. At station A, however, the closing of the contact 26 completes the circuit to the signal 12 from the power

line conductor 29, contact 26, relay tongue 24, conductor 30 through the signal device 12 and thence across the contacts 18 and 17 of the switch 7 to the opposite side 27 of the power line. The signal 12 is thereby operated and due to the short-circuiting of the windings of the relay 8, remains in operation until the attendant at station A discontinues the same by throwing the switch 7 to the "operating" position and thus opens the signal circuit at the contact 18.

The movement of the switch 7 to the "operating" position starts the printing motor 11 and conditions the printing unit for the reception of the message. Since the windings of the relays 8 are retained out of the line circuit by the shunt path no extra inductance or resistance is added to the line during operation.

When the business between the two stations has been concluded the manual switches are returned to their "signal" position and during the movement of the switch from the "operating" to "signal" position there is a short interval when the switch blade is on neither of the contacts 13 or 15. During this period the relay short circuit is opened and the relay winding energized by the steady line current so as to attract the relay tongues away from the contacts 25 and 26. Hence, when the manual switch reaches the "signal" position, the signal 12 will not operate, and the system will be in readiness to respond to the next call.

The system illustrated in Figure 2 is similar to that of Figure 1 except that the circuit is modified to cause the motor 12 to automatically start simultaneously with the operation of the call signal, the motor being connected in parallel with the signal device so that its circuit is also closed by the relay tongue 24.

Upon opening of the line to transmit the call signal and thus to close the contact 26, a circuit is completed for the motor 11 and signal 12 from the power line conductor 27, conductor 32, relay contact 26, relay tongue 24 and conductor 33 to the switch contact 17, at which point the current divides, part going through the motor 11 and part from the contact 18 through the signal 12, back to the opposite side 29 of the power line. The motor of the printing unit is thus started and the unit placed in a condition ready to receive, immediately, the transmitted signals. The attention of the attendant at the called station will be directed to the operating condition of the machine by the signal and he will thus be notified to throw the switch 7 to the operating position so as to close the motor circuit through the switch contacts 16 and 17.

The continued operation of the motor will then not be dependent upon perfect electrical connection at the relay contact 26.

At the completion of the business the man-

ual switches at both stations are returned to their signal positions by the operating attendants thus breaking the closed circuit condition of the relays 8 and opening the contacts 25 and 26.

It will be noted that we have provided a call system which involves the use of only a simple relay and switch and which is simple in construction and operation. It is to be understood, of course, that numerous changes may be made therein without departing from the invention and therefore we do not desire to be limited to the specific arrangements shown except in accordance with the appended claims.

What is claimed is:

1. A call system having printer mechanism for a simplex telegraph system comprising a switch having an operating and a signal position, a relay having its winding normally in circuit with the printer mechanism, a signal device and a circuit for said device, said relay, when the switch is in the signal position, responding to an open circuit condition of the line to complete the circuit to said signal device, and to short-circuit the relay winding whereby to maintain said signal circuit closed and to eliminate the winding from the printer circuit.

2. A call system for a simplex telegraph system comprising a relay, a signal device and a circuit for said device, said relay normally being in the line circuit and responding to an open circuit condition of the line to complete the circuit to said signal device and at the same time to short-circuit the relay winding whereby to maintain said signal circuit closed and to eliminate said winding from the circuit.

3. A call system for a simplex telegraph system comprising a switch having an operating and a signal position, a signal device and means responsive to an open circuit condition of the line to operate said signal device, when the switch is in the signal position, a motor, and a circuit for operating said motor, completed independently of said means, when the switch is in its operating position.

4. In a simplex telegraph system having a printing unit and a driving motor therefor, a call system comprising a switch having an operating position and a signal position, a relay, a signal device, a circuit for said signal device, and a circuit for said motor, said relay operating in response to an open circuit condition of the line, when said switch is in the signal position, to close the signal circuit and short-circuit the relay winding, said switch in the operating position opening said signal circuit and closing the motor circuit.

5. In a simplex telegraph system having a printing unit and a driving motor therefor, a call system comprising a signal device,

a circuit for said device, a circuit for said motor, a switch having an operating and a signal position and a relay normally in circuit with said printing unit, said relay operating in response to an open circuit condition of the line, when said switch is in the signal position, to close the signal circuit and short-circuit the relay winding, and said switch in the operating position closing the motor circuit.

6. In a simplex telegraph system having a printing unit, and a driving motor therefor, a call system comprising a signal device, a circuit therefor, a circuit for said motor, a switch having an operating and a signal position and a relay, said relay operating in response to an open circuit condition of the line, when said switch is in the signal position, to close the signal and motor circuits, and at the same time to short-circuit the relay winding, said switch, in the operating position, opening said signal circuit and closing said motor circuit independently of said relay.

7. In a simplex telegraph system having a printing unit, and a driving motor therefor, a call system comprising a signal device, a circuit therefor, a circuit for said motor, a switch having an operating and a signal position and a relay, said relay operating in response to an open circuit condition of the line, when said switch is in the signal position, to close the signal and motor circuits, and at the same time to short-circuit the relay winding, said switch, in the operating position, closing said motor circuit independently of said relay.

8. A telegraph system comprising a normally closed line, a plurality of stations connected to said line, a signal receiving apparatus at one of said stations, means at the other station for opening and closing said line, an electromagnetic device at said first station normally in the circuit with said signal receiving apparatus responsive, when said line is open, to control a local circuit and to eliminate said electromagnetic device from the circuit of said signal receiving apparatus during subsequent open and closed conditions of the line.

9. A telegraph system comprising a normally closed line, a plurality of stations connected to said line, a signal receiving apparatus and a motor therefor at one of said stations, means at the other station for opening and closing said line, an electromagnetic device at said first station normally in circuit with said signal receiving apparatus responsive, when said line is open, to effect the operation of said motor and to eliminate said electromagnetic device from the circuit of said signal receiving apparatus during subsequent open and closed conditions of the line.

10. A telegraph system comprising a nor-

mally closed line, a plurality of stations connected to said line, a signal receiving apparatus, a motor therefor and a call signal at one of said stations, means at the other station for opening and closing said line, an
5 electromagnetic device at said first station normally in the circuit with said signal receiving apparatus responsive, when said line is open, to effect the operation of said call
10 signal, means for starting said motor to render said signal receiving apparatus responsive to subsequent open and closed conditions of the line, and means for eliminating said electromagnetic device from circuit with said
15 signal receiving apparatus during operation thereof.

11. A telegraph system comprising a normally closed line, a plurality of stations connected to said line, a signal receiving apparatus, a motor therefor and a call signal at
20 one of said stations, means at the other station for opening and closing said line, an electromagnetic device at said first station normally in the circuit with said signal receiving
25 apparatus responsive, when said line is open, to effect the operation of said call signal, to start said motor to render said signal receiving apparatus responsive to subsequent open and closed conditions of the line and to eliminate
30 said electromagnetic device from the circuit of said signal receiving apparatus during the operation thereof.

In testimony whereof we affix our signatures.

35 SAMUEL W. ROTHERMEL.
ERNEST W. HEWITT.

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