April 21, 1931. E. W. HEWITT 1,801,348

AUTOMATIC CALL SIGNAL AND MOTOR CONTROL FOR SIMPLEX PRINTERS

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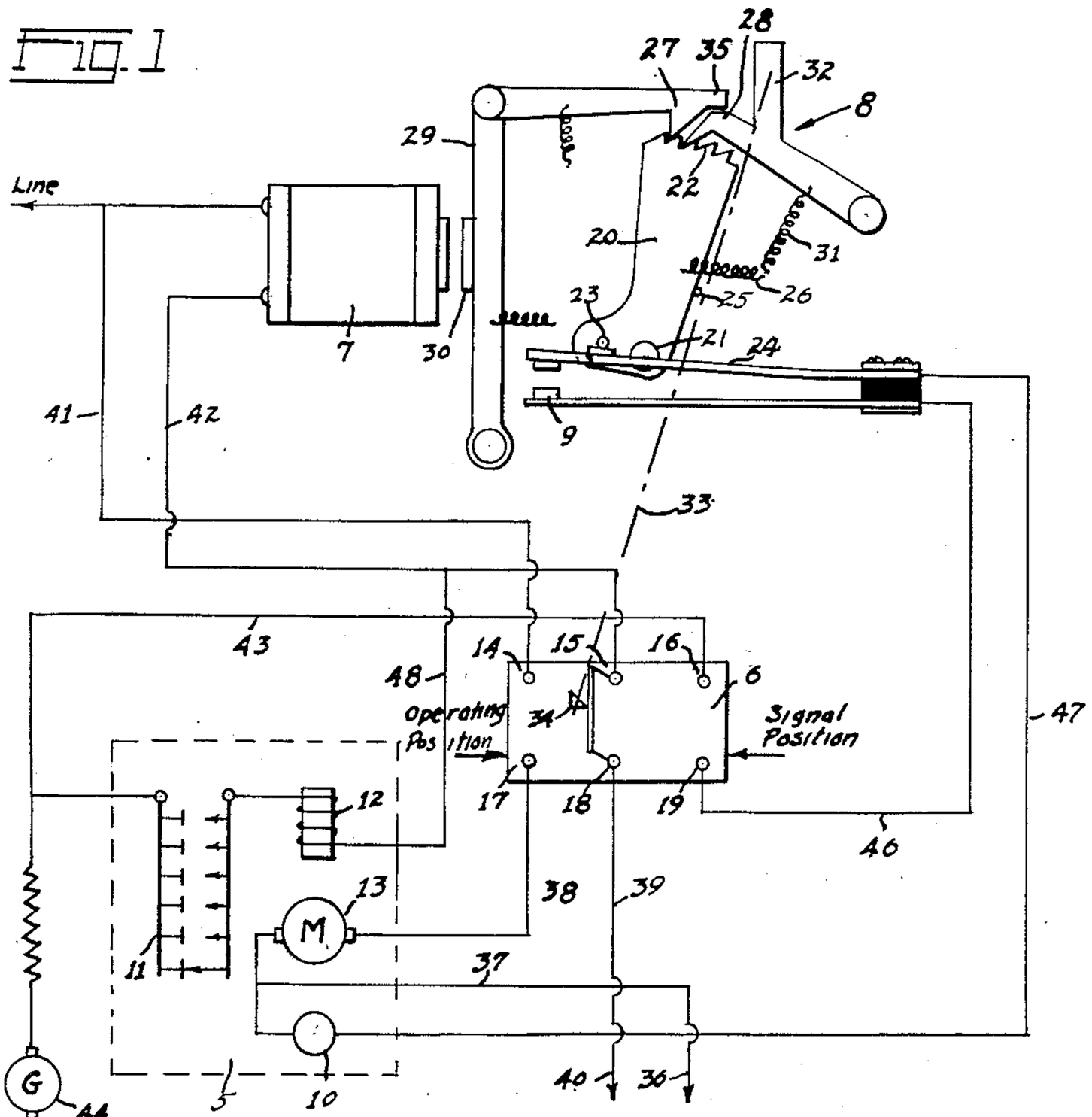
Fig. 1



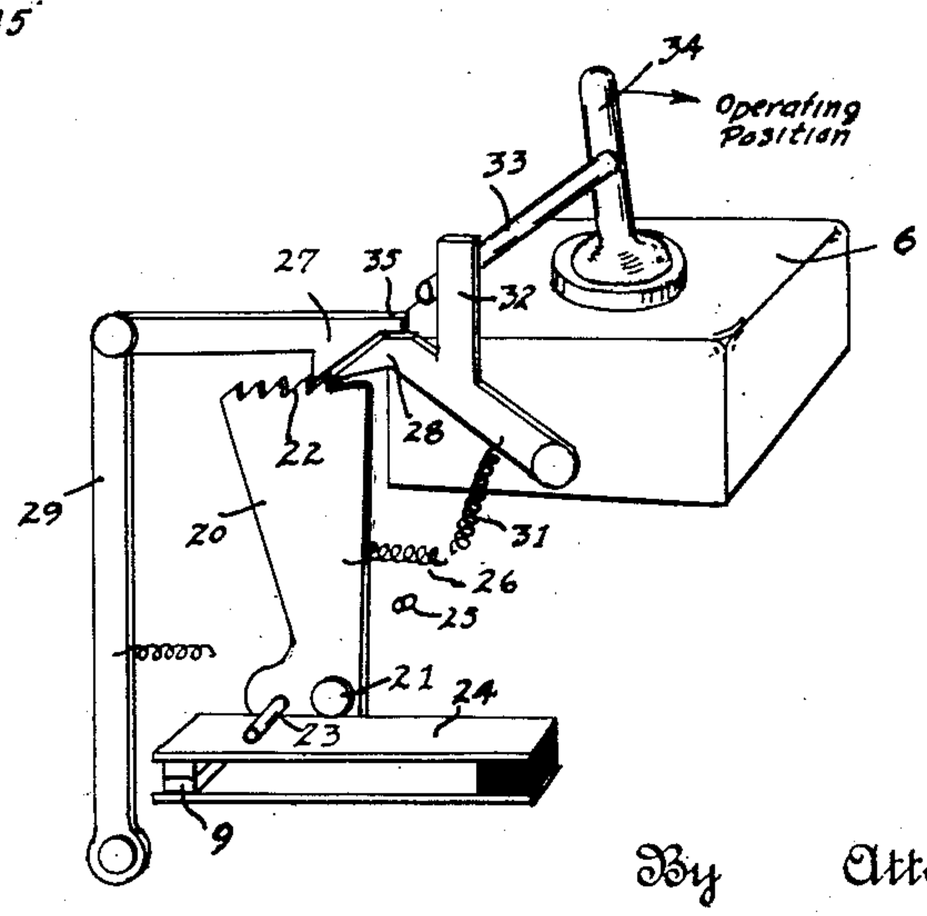


Fig. 2

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AUTOMATIC CALL SIGNAL AND MOTOR CONTROL FOR SIMPLEX PRINTERS

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FIG. 3

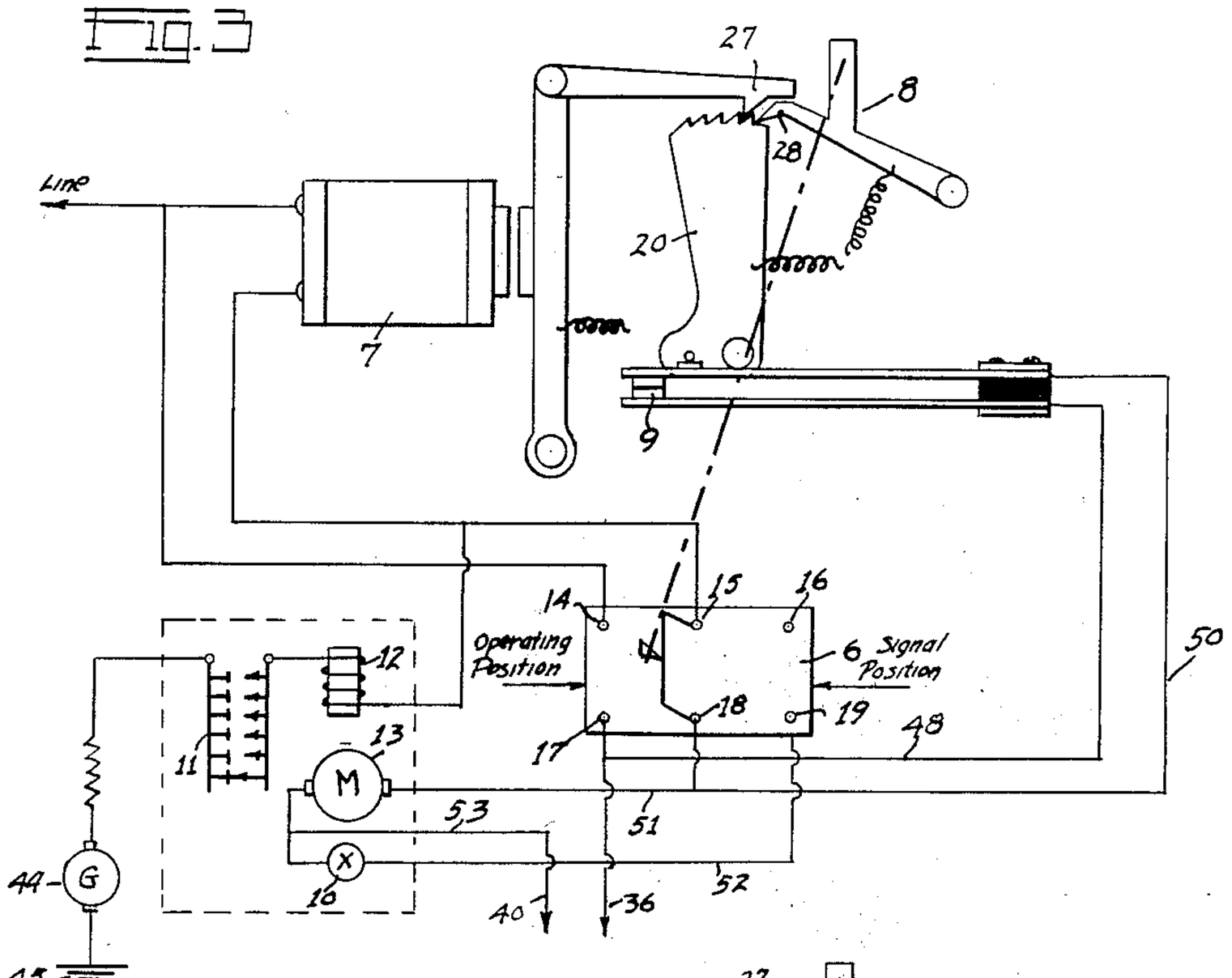
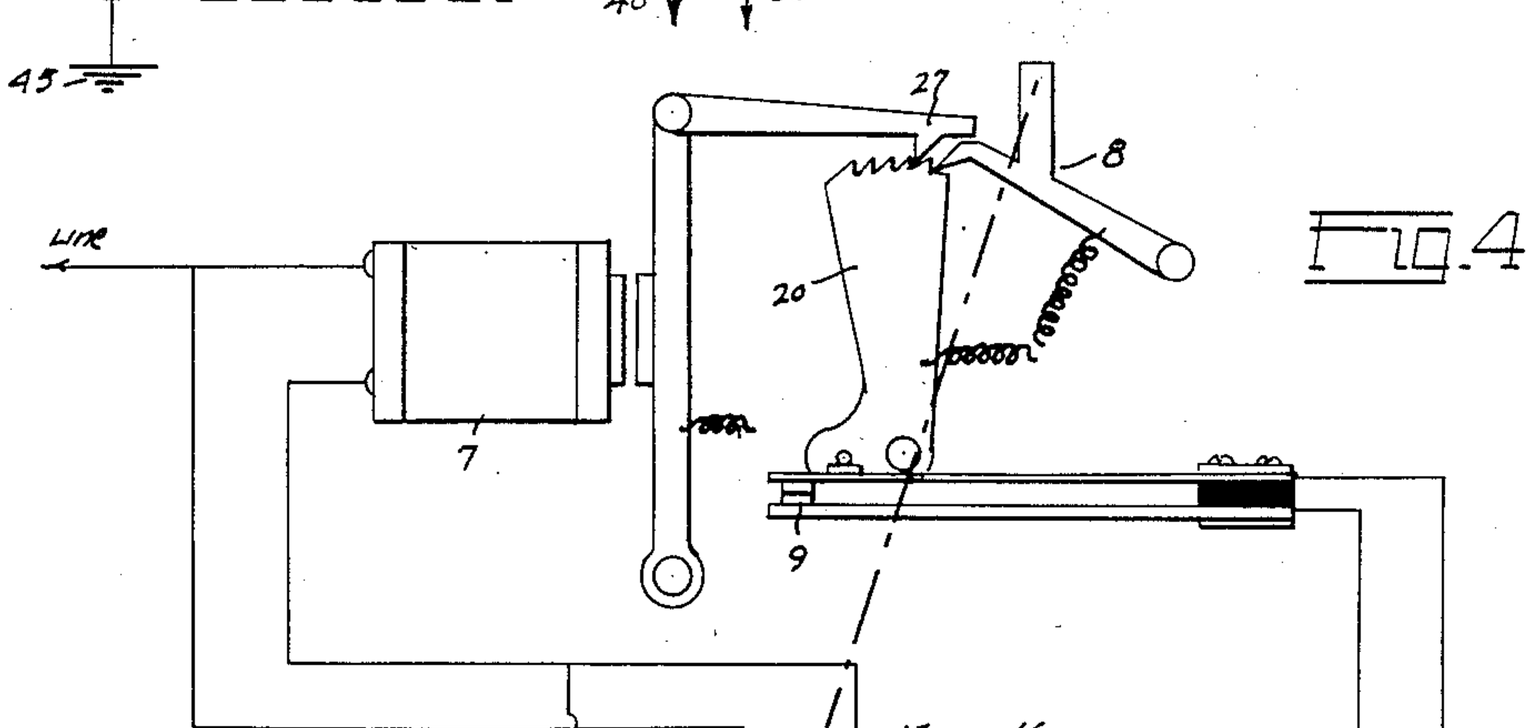


FIG. 4



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UNITED STATES PATENT OFFICE

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AUTOMATIC CALL SIGNAL AND MOTOR CONTROL FOR SIMPLEX PRINTERS

Application filed August 3, 1929. Serial No. 383,376.

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 printing units idle when the circuits are not in operation, but to have the printing units immediately available when it is desired to transmit thereto.

It has been proposed heretofore to operate a call signal by a single open condition of a line, but there are certain installations in which so-called "concentrators" are employed at one terminal of the line in which such systems are not well adapted, since there is an opening of the line of from one to two seconds when the concentrator operator removes her cord from the line jack, which would produce a false operation of the call signal. The concentration unit comprises a number of operating positions with a number of simplex printing lines disposed before each position so that any one of the operators may plug into any one of the lines to receive or transmit over the line.

One of the objects of the present invention is to provide a call signal for a simplex printer which may be employed at an outer office having a line terminating at a main office in a concentration unit, and which may be readily operated by the concentrator operator.

Another object is to provide a call system which will not be operated by an accidental or intentional single opening of the line but which requires a succession of open and closed conditions of the line for its operation.

Another object is to provide a simple and reliable call signal and motor control system for a telegraph receiving apparatus operable from the transmitting station.

Other objects and advantages will hereinafter appear.

In accordance with my invention I provide a call system for a simplex printer having 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 idle, a magnet operable directly or through a relay from the line and a step-up mechanism having a switch moved by said magnet in response to a succession of open and closed circuit conditions of the line to close the signal circuit and thereby actuate the signal device. The operation of the signal notifies the attendant that the calling station desires to transact business therewith and in furtherance of such desire he throws the manual switch to its "operating" position so as to start the printing motor. The movement of the switch to the "operating" position re-sets the step-up mechanism for the next signal, and short circuits the magnet.

The motor of the printing and transmitting unit may be automatically started simultaneously with the operation of the signal, if desired, in which case it will not be necessary for the transmitting operator to wait for the attendant at the called station to start the motor manually, before commencing to transmit.

The printer is stopped when the exchange of business has been concluded by the 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 of a call system applied to a simplex printer for effecting the operation of the call signal;

Figure 2 is a perspective view of the step-up mechanism and the manual switch;

Figure 3 is a circuit diagram of the system showing an arrangement for simultaneously operating the call signals and starting motor of the printing and transmitting unit; and

Figure 4 is a modification in which the signal is maintained in operation during the entire period of operation of the printing and transmitting unit.

In Figures 1, 3 and 4 I have shown the apparatus and circuit connections at one station only, it being understood that the op-

posite end of the line may terminate in a concentration unit or, where it is desired to call in either direction, similar apparatus may be provided at each station of the simplex line.

The essential apparatus at the station to be called comprises the printing and transmitting unit 5, a manual switch 6, a magnet 7, a step-up device indicated generally at 8 having a signal controlling switch 9 and a signal lamp 10.

The printing and transmitting unit which is diagrammatically illustrated includes the transmitting contacts 11, selecting magnet 12 and driving motor 13. The signal lamp 10 is shown associated with the printing and transmitting unit, but may be located with the call signal device.

The manual switch 6 is illustrated as a double pole, double throw, knife switch having contacts 14, 15, 16, 17, 18 and 19 as indicated; although it is to be understood that any other suitable form of switch having the necessary contact facilities may be employed. The contacts 14 and 17 comprise the "operating" position of the switch and the contacts 16 and 19 the "signal" position.

The step-up mechanism comprises a ratchet sector 20 pivoted at 21 and having a number of ratchet teeth 22. A pin 23, on the sector contacts with the upper arm 24 of the switch 9 and, in one position of the sector, closes the switch contacts. In the normal position of the sector, when the circuit is idle, the sector is held against a stop pin 25 by a retractile spring 26, and the switch 9 is maintained open, as shown in Figure 1.

The teeth of the ratchet are engaged by a spacing pawl 27 and a locking pawl 28. The spacing pawl is pivoted to an extension 29 of the armature 30 of the magnet 7. The locking pawl is held in engagement with the ratchet teeth by a spring 31 and has a vertical extension 32 which is engaged by pin 33 protruding from the switch lever 34, of the manual switch 6, (see Figure 2).

The spacing pawl has a rearward extension 35 which overlies the locking pawl so that upon movement of the vertical extension 32 to the right, both the locking and holding pawls will be raised so as to disengage the sector and permit it to move against the stop pin 25.

While the switch 6 has been illustrated diagrammatically in Figures 1 and 3 and 4 as a knife switch, in practice I prefer to employ a tumbler switch, as illustrated in Figure 2.

Referring to Figure 1, it will be noted that with the switch 6 in the operating position, the motor circuit is closed from one side 36 of a power line, through the conductor 37, motor 13, conductor 38, switch contacts 17 and 18, and conductor 39 to the opposite side 40 of the power line. In this same position of the switch the magnet 7 is short-circuited through the conductor 41, switch contacts 14 and 15 and conductor 42.

In the signal position of the switch, the motor circuit is open at the contact 17 and the winding of the magnet 7 is disposed in series with the line through the conductor 42, switch contacts 15 and 16, conductor 43 and generator 44 to the ground at 45. The circuit is also prepared for the signal lamp 10 from the side 40 of the power line, contacts 18 and 19, conductor 46, normally open switch 9, conductor 47, lamp 10 and conductor 37 to the opposite side 36 of the power line.

The operation of the system is as follows:

With the circuit idle and the switch 6 in the signal position, if an operator at the concentrator desires to call the outer office equipped with the call apparatus, he opens and closes the line a number of times depending upon the number of teeth on the ratchet sector 20. This can be accomplished by the use of the regular key-board or by any other suitable method. Each opening and closing of the line steps up the ratchet sector one tooth until the contact pin 23 closes the switch 9, thus completing the circuit to the signal lamp 10 to operate the same and signal the operator.

As soon as the operator receives the signal he throws the manual switch 6 to the operating position, thus starting the motor of the printing and transmitting unit and short-circuiting the magnet 7 so as to exclude the resistance and inductance thereof from the line. The line circuit is then completed through conductor 41, switch contacts 14 and 15, conductor 48 to the selecting magnet 12 of the printer and through the transmitting contacts 11 and the generator 44, to the ground.

The manual movement of the operating lever 34 of the switch 6 to the operating position releases the pawls 27 and 28 from the sector 20 and permits the sector to be re-set by its spring 26, for the next call.

If the line terminates at the opposite end in a concentration unit, the sector will be moved up one tooth at the completion of the exchange of business should the concentration operator disengage the cord after the attendant at the outer office has thrown the switch to the signal position, since as previously stated this produces a momentary open circuit of the line.

Consequently, it will require one less opening and closing of the line to complete the succeeding call.

After the completion of the business, the attendant discontinues the operation of the motor by throwing the switch 6 back to the signal position.

In Figure 3 I have illustrated a slightly different circuit arrangement in which the step-up mechanism simultaneously operates the call signal and automatically starts the motor of the printing and transmitting unit.

In his modification the signal lamp 10 and motor 13 are disposed in parallel when the switch 6 is in the signal position and the contact 9 closed by the successive opening and closing of the line. The circuit may be traced from the power conductor 36 through the conductor 48, switch 9, conductor 50 to the contacts 18 and 19, at which point the current divides, part going through conductor 51 to the motor 13 and part through conductor 52 to the signal lamp 10, thence by the common conductor 53 to the power conductor 40.

The motor 13 is thus started into operation simultaneously with the lighting of the signal lamp and the message can be transmitted immediately without waiting for the attendant to throw over the manual switch to is operating position. However, as soon as the attendant's attention is attracted by the signal lamp, he moves the switch to the operating position this extinguishing the signal lamp, by opening of the contact 19 and resetting the step-up mechanism 8, by release of the pawls 27 and 28.

At the same time the magnet 7 is short-circuited through the contacts 14 and 15 to complete a circuit to the motor 13 from the power conductor 36 through the switch contacts 17 and 18, conductor 51, motor 13 and conductor 53 back to the power conductor 40.

In Figure 4 a further modification is illustrated in which the signal lamp 10 is maintained in a lighted condition during the entire period of operation of the printing and transmitting unit. This arrangement is desirable when there are a number of units operating in the same room, since it indicates visibly which of the machines are in operation at any time. With the switch 6 in the signal position, the circuit to the motor and signal lamp is closed from the power line conductors 36 and 40 through the contacts 18 and 19 and switch 9, and in the operating position of the switch the motor and signal lamp circuit is closed directly through the contacts 17 and 18.

It will be obvious that other arrangements can be devised and other functions accomplished by the step-up mechanism in response to a succession of open and closed conditions of the line and hence I do not desire to be limited to the particular arrangement illustrated and described except in accordance with the appended claims.

What is claimed is:

1. A call system for a simplex telegraph system comprising a switch having an operating and a signal position, a signal device, an electro-magnetic device responsive to line conditions, a step-up mechanism operated by said electro-magnetic device in response to a predetermined number of successive open and closed line conditions, to actuate said signal device when said switch is in its signaling position and an operative connection between said switch and step-up mechanism for restoring the same to normal upon movement of the switch from its signaling to its operating position, said step-up device being inoperative when said switch is in its operating position.

2. In a simplex telegraph system having a recording device and a motor therefor, a call system comprising a switch having an operating and a signal position, a signal device, an electro-magnetic device responsive to line conditions, a step-up mechanism operated by said electro-magnetic device in response to a predetermined number of successive open and closed conditions of the line to simultaneously actuate said signal device and motor when said switch is in its signal position, and means for discontinuing the operation of the signal device and completing a circuit to the motor independently of said step-up device, when the switch is in its operating position.

3. In a simplex telegraph system having a recording device, and a motor for driving said device, a call system comprising a switch having an operating and a signal position, a signal device, means responsive to a predetermined number of successive open and closed conditions of the line to simultaneously actuate said signal device and motor when said switch is in its signal position, and means for completing a circuit to the motor independently of said line responsive means when the switch is in its operating position.

4. In a simplex telegraph system having a printing machine and a driving motor therefor, a call system comprising a signal device, a circuit therefor, a switch having an operating and a signal position, a step-up mechanism, a local signal circuit, means responsive to a predetermined number of open and closed conditions of the line for operating said step-up mechanism to close said local signal circuit when the switch is in its signal position, and means for opening the local signal circuit and completing a circuit to the motor when the switch is in its operating position.

5. In a simplex telegraph system having a printing machine and a driving motor therefor, a call signal and motor control system comprising a switch having a motor operating position and a signal position, a signal device, a step-up mechanism operated by a predetermined line condition for actuating said call signal device when said switch is in the signal position, and means for re-setting said step-up mechanism upon the movement of the switch to its operating position.

6. In a telegraph system having a printing mechanism and a driving motor therefor, a call system comprising a circuit for said motor, a signal device, a local circuit for said signal device, electro-magnetic means responsive to a succession of open and closed conditions of the line for closing said local signal

circuit, and maintaining the same closed after termination of the call signaling condition, and manually operated means for opening said local signal circuit, closing said motor circuit and rendering said electro-magnetic means non-responsive to line conditions.

7. In a telegraph system having a printing machine and a driving motor therefor, a call signal system comprising a circuit for said motor, a signal device, a circuit for said signal device, electromagnetically operated means responsive to a succession of open and closed conditions of the line for closing said signal circuit and a switch for closing said motor circuit and restoring said electro-magnetically operated means to its original position.

8. In a call system for a telegraph system, a printing mechanism, a switch, having an operating and a signaling position, an electro-magnetic device, a step-up mechanism operated by said electro-magnetic device, a signal device actuated by said step-up mechanism, said electro-magnetic device being responsive to line conditions and said printing mechanism being unresponsive thereto when said switch is in its signaling position and said electro-magnetic device being unresponsive and said printing mechanism being responsive to line conditions when the switch is in its operating position.

In testimony whereof I affix my signature.

ERNEST W. HEWITT.