

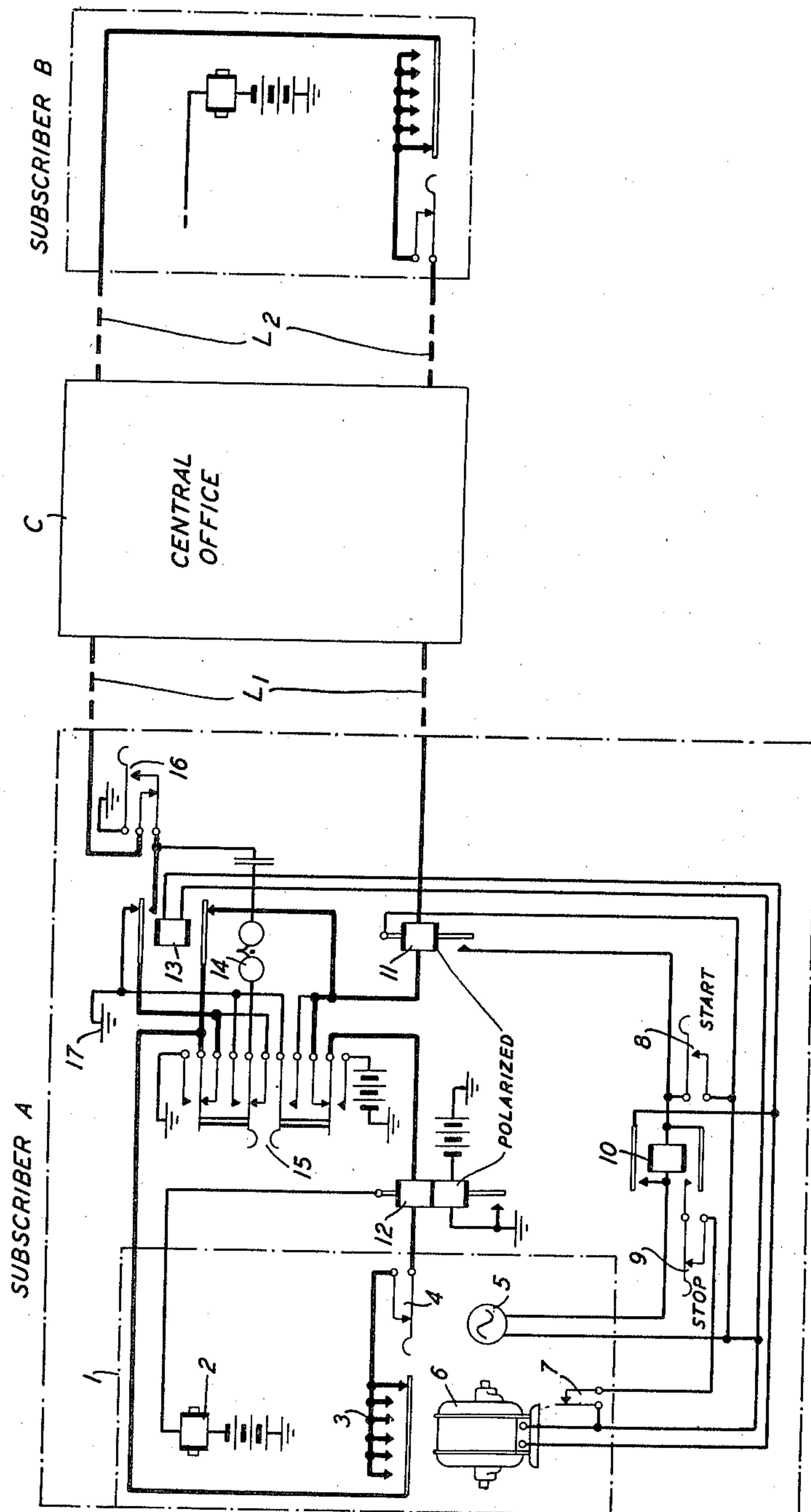
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TELETYPEWRITER SYSTEM

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TELETYPEWRITER SYSTEM

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1 Claim. (Cl. 178—2)

This invention relates to improvements in teletypewriter systems and, more particularly, to means for conditioning a subscriber's station set for improved remote control of its teletypewriter motor.

For the purpose of illustration, the invention is described with reference to printing telegraph machines of the type shown in Patent 1,904,164 granted April 18, 1933 to S. Morton et al. and to a teletypewriter system having a teletypewriter central office and subscriber's teletypewriter station set of the type described in Patent 1,965,383 granted July 3, 1934 to C. C. Lane in which the motor of the teletypewriter at the subscriber's station is adapted to be started by remote control by reversing the polarity of the current normally flowing over the line, and is designed to be stopped by remote control in the manner described in the aforementioned Morton et al. Patent 1,904,164 and also in Patent 1,931,672 issued October 24, 1933 to S. Morton et al. by transmitting two successive preassigned permutation code signals over the line as will be discussed in more detail hereinafter. The disclosure of these two Morton et al. patents and the disclosure of the Lane patent are each incorporated herein by reference as a part of this specification. It is to be understood that the invention is not limited to use with teletypewriters of the type disclosed in Morton et al. Patent 1,904,164 and is also not limited to the type of subscriber's station and central office shown in the Lane patent nor to the remote control means of the type mentioned above, but that the invention is described with reference to the apparatus disclosed in the above-mentioned patents purely for illustrative purposes and that the invention is capable of application to other forms of apparatus and to other systems of remote control.

As is described in Morton et al. Patent 1,904,164, this type of printing telegraph machine is provided with apparatus which is designed to short-circuit the sending contacts in the teletypewriter when the teletypewriter is in its receiving condition. However, this shunt path is not always completed and, even when it is completed, it does not short-circuit the subscriber's break contacts and for these reasons a certain amount of trouble has been experienced from three sources.

One class of trouble has been caused by an operator improperly transmitting a series of successive remote stop signals in spite of instructions to the contrary. Reception of such a succession of stop signals sometimes results in the remote

subscriber's teletypewriter stopping with one of its sending cams in an open position thereby leaving the line open which is undesirable as it prevents a disconnect signal from being effected, prevents the subscriber from being called and also prevents the subscriber's motor from being started by remote control.

A second source of trouble is caused by improper adjustment of the contacts in the subscriber's break mechanism which is of the type described in Patent 1,980,284 issued November 13, 1934 to S. Morton et al. The disclosure of this Morton et al. patent is incorporated herein by reference as a part of this specification although it is to be understood that the invention is not limited to this type of break mechanism. The break contacts require delicate adjustment and occasionally a maintenance man does not properly adjust them. This improper adjustment sometimes results in unintentional operation of the so-called transmitting break contact (contact 46 in Morton et al. Patent 1,980,284) when only the so-called receiving or positive break contact (contact 48 in Morton et al. Patent 1,980,284) is intended to be operated. This unintentional operation will momentarily open the so-called transmitting break contact and, if the subscriber's motor should stop at this time, it cannot be started by remote control until the subscriber restores the apparatus to its normal condition.

The third type of trouble results from improper, or unauthorized operation of the break key when the teletypewriter is idle. This sometimes happens when some person, such as an office boy, passes through the subscriber's office and sees an idle unattended teletypewriter. Upon looking at the teletypewriter and noticing the break key, he becomes motivated by curiosity and presses this key thereby operating the break mechanism which then cannot be restored by remote control until the subscriber's motor has been started by the local operator. Ordinarily, the operator at the remote control station or central office does not realize the cause of the trouble and generally attributes it to something being out of order in the subscriber's machine. This sometimes results in a maintenance man being sent to the subscriber's station which is, of course, a needless expense.

Accordingly, it is an object of this invention to reduce the above types of trouble in teletypewriter operation, caused by weaknesses in the human element which is necessarily present, by conditioning a subscriber's station set for im-

proved remote control of its teletypewriter motor.

It is also an object of this invention to close a short circuit path around the line relay, sending contacts, and break contacts in the subscriber's set whenever the subscriber's local source of power supply is disconnected from his set by either local or remote control.

These objects are attained by modifying the subscriber's station circuit, shown in Fig. 1 of the abovementioned Lane patent, to include a shunt path across the subscriber's sending contacts, break mechanism, and line relay. Since the subscriber's power relay, or motor control relay, is not included in this shunt path and since the shunt path closes the line circuit through the power relay to ground, then, even if the sending contacts are open or the break mechanism has its contacts open, there is still a path closed from the line through the power relay to ground so that a remotely located operator may send control signals over this path to operate the subscriber's power relay which, in turn, closes the subscriber's power supply circuit and starts his teletypewriter motor.

These and other features of the invention will be more fully described in connection with the detailed description of the drawing which shows a subscriber's teletypewriter station set connected through a teletypewriter central office to another teletypewriter subscriber's station.

The drawing shows two subscribers' teletypewriter stations A and B connected together through a teletypewriter central office C by communication channels L₁ and L₂. Station A is shown to be a subscriber's teletypewriter station of the type described in the above-mentioned Lane patent. The station apparatus and circuits at the subscriber's station B have not been shown in their entirety as it is to be understood that they are similar to those at station A. The equipment at central office C has not been shown as this equipment is the same as that illustrated in Figs. 2 and 3 of the aforementioned Lane patent.

Station A is shown to include a printing telegraph sending and receiving unit 1 having a printer magnet 2, sending contacts 3, break contacts 4, a local source of power supply 5, a motor 6, and remote control contacts 7. Although the break apparatus is represented simply by contacts 4 for the sake of simplicity, it is to be understood that it actually comprises the break mechanism shown in Figs. 6 and 7 of the Morton et al. Patent 1,980,284 mentioned above. Likewise, the control contacts 7, which are provided for enabling an operator at a remote station, such as station B or central office C, to stop motor 6, actually comprise the control contacts 86 and 87 and their subsidiary apparatus shown and described in the above-mentioned Morton et al. Patent 1,931,672.

In addition to the printing telegraph sending and receiving unit 1, station A is provided with subsidiary station apparatus comprising start key 8 for enabling a local operator to start motor 6, stop key 9 for enabling a local operator to stop motor 6, start relay 10 for completing the energizing circuit for motor 6, polarized remote control or power relay 11 for enabling an operator at a remote station to start motor 6, polarized line relay 12, control relay 13, ringer 14, local test key 15, and recall key 16. The operation and functions of both the printing telegraph sending and receiving unit 1 and the subsidiary station apparatus are fully described in the aforementioned Lane patent and need not be repeated here.

In the drawing, the circuit is shown in its idle condition with the subscriber's motor 6 not running and a shunt path closed from the winding of relay 11 over the bottom armature of control relay 13, which is normally not energized, and over the local test key 15 to ground 17. Due to this short-circuit being closed, the subscriber's sending contacts 3, break contacts 4, and line relay 12 are normally shunted out of the line circuit.

The subscriber at station A can start his motor 6 by momentarily operating his start key 8 which closes a path for energizing the start relay 10. Accordingly, relay 10 operates its armatures and locks-up through a path over its bottom armature and through the stop key 9. The operation of the top armature of relay 10 starts motor 6 by closing a path leading from the local source of power supply 5 to motor 6. At the same time, the operation of the top armature of relay 10 closes an energizing path from the power supply 5 to the control relay 13 which operates its armatures, the top armature switching the line circuit from ground 17 over the recall key 16 to the line L₁ and the bottom armature opening the short-circuit across the sending contacts 3, break contacts 4, and line relay 12. The circuit is now in condition for transmission and reception of messages.

When the circuit is in its normal idle condition shown in Fig. 1, an operator at central office C can start motor 6 by remote control in the following manner. One side of line L₁ is normally closed through the winding of the polarized remote control or power relay 11 and over the shunt path to ground 17. To start the motor 6 at the subscriber's station A, the operator at central office C reverses the polarity of the line current in the manner described in the Lane patent mentioned above thereby operating the polarized relay 11 at station A. The operation of relay 11 has the same effect as the operation of the local start key 8 in that it closes a path for enabling power supply to energize the start relay 10 which starts motor 6 and energizes relay 13 in the manner described above to place the subscriber's station circuit in condition for transmission and reception of messages.

The subscriber's station circuit can be restored to its normal idle condition by either local control exercised by the subscriber at station A or by remote control from an operator at central office C or another connected subscriber as, for example, the subscriber at station B. All that the subscriber at station A need do is simply open his stop key 9 momentarily thereby opening the locking-up circuit of relay 10 and causing it to release its armatures. The release of the top armature of relay 10 opens the energizing paths for motor 6 and relay 13. As a result, motor 6 will stop running and relay 13 will release its armatures, the top armature switching the line circuit to ground 17 and the bottom armature closing the short-circuit across the subscriber's line relay 12, break contacts 4, and sending contacts 3. The switching of line L₁ to ground 17 insures that the operation of stop key 9 will give a disconnect signal to the operator at the central office C in the manner described in the above-mentioned Lane patent.

To place the subscriber's station circuit in its idle condition by remote control, either the operator at central office C or another connected subscriber as, for example, the subscriber at station B, transmits a preassigned motor stop com-

5 bination of permutation code signals which are received by the receiving relay 12 to control the printer magnet 2 which actuates other apparatus (not shown in the drawing) to effect the opening of the remote control contacts 7 in the manner described in the Morton et al. patents mentioned above. The opening of contacts 7 has the same effect as the opening of the local stop key 9. Consequently, motor 6 will stop and relay 13 will release its armatures to switch the line circuit to ground 17 and to close the short-circuit around the subscriber's sending contacts 3, break contacts 4, and line relay 12.

15 Thus, whether the local source of power supply is disconnected from a subscriber's set by either local or remote control, a short-circuit will be closed in either case around the sending contacts 3, break contacts 4, and line relay 12 of the subscriber's set so that any false operation in the subscriber's printing telegraph sending and receiving unit 1 will not affect the condition of the line circuit. It insures that, during idle periods, the line circuit will have a closed path through the remote control relay 11 to ground 17 and that the station set will consequently be in a receptive condition for motor start signals

transmitted over line L₁ by an operator at central office C or by another connected subscriber, such as the subscriber at station B.

What is claimed is:

In a printing telegraph system, a printing telegraph central office, a subscriber's station having a printing telegraph set, a communication line for connecting the subscriber's station to the central office, said subscriber's station being provided with sending contacts and break contacts and also having a motor for operating the printing telegraph set, a local source of power supply for energizing the motor but normally disconnected therefrom, starting means for connecting the motor to the power supply, stopping means for disconnecting the motor from the power supply and for effecting a disconnect signal at the central office, and means for preventing an opening of the sending contacts and break contacts from interfering with the operation of the disconnect signal, said means including a ground at the subscriber's station and an instrumentality for connecting the communication line to the ground at the subscriber's station during idle periods of the motor.

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