

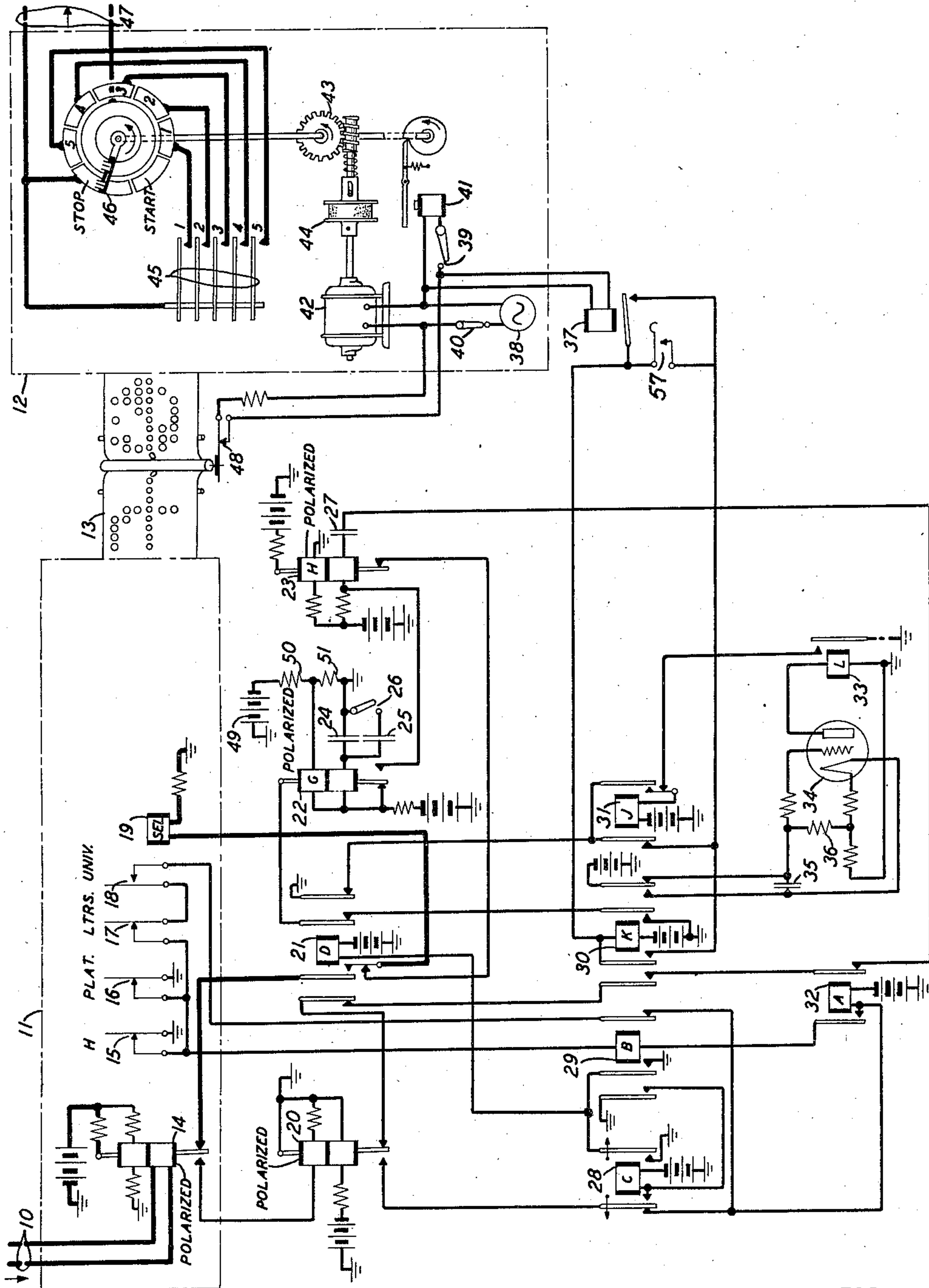
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2,403,441

TELEGRAPH SYSTEM

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2,403,441

TELEGRAPH SYSTEM

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1

This invention relates to telegraph systems and more particularly to receiving station circuits and equipment.

It is frequently desirable to transfer telegraph messages from one line or system to another line or system, which systems or lines are so arranged that it is impossible or impractical to repeat the messages from one system to another by means of the usual type of telegraph repeating instruments due to the fact that the lines operate at different speeds or due to the fact that various types of supervisory signals or circuits are required for each of the systems which may or may not be the same. Such systems frequently are unable to transmit to other systems through the usual type of telegraph repeater, for example, due to the fact that one system may not be prepared to receive messages when the messages are transmitted from the other system. Under these and other circumstances it has been the practice to receive the signals on a reperforating instrument and thus store the signals for transmission over any other desired line or system at a later time. In some instances a storage controlled transmitter which usually takes the form of a tape control transmitter is associated with the reperforator unit and the tape passes from reperforator unit directly to the transmitter unit. In other cases it is desirable to remove the tape from the reperforator and carry it to some transmitter for transmission over a desired line.

In order to insure that the entire message will be transmitted when required or that the entire message can readily be removed from the reperforator it is necessary to make some provision for advancing the tape out of the reperforator. In the past this has been accomplished either manually or by providing a special reperforator unit to enable the recording medium to be advanced through the mechanism when no signals are being received. In accordance with the present invention an improved arrangement is provided in which it is unnecessary to provide a special reperforator unit or to incorporate additional elements in the reperforator to cause it to feed out additional tape.

In accordance with the present invention circuits and relay equipment are provided adjacent to and at the same location as the reperforator for generating the signals locally and for operating the reperforator in accordance with these signals to automatically advance the tape out of the machine.

Any suitable signal may be generated locally and transmitted to the reperforator but the

2

locally generated signals form no part of any message received by the reperforator and need not be added to the message as subsequently transmitted. Signals of this type are sometimes called "non-intelligence" or "non-message" signals which terms, for the purposes of this specification and the claims appended hereto are used to describe and designate any signals or permutation code groups of pulses which do not form a part of the subject-matter of any message as transmitted from the station of origin and recorded at the station of ultimate destination thereof. Due to the characteristics of the different code combinations generally employed to actuate the reperforator and other telegraph apparatus and due to the functions and symbols represented by the respective code combinations, certain of these code combinations are considered more desirable than others to be generated locally for advancing the recording medium through the recording instrument. In accordance with the specific embodiment of the invention described herein, circuits are arranged to generate the so-called letters signals which comprise a spacing start pulse followed by five significant selective pulses and a stop pulse, all of which are marking.

Preferably in accordance with the present invention, circuits are so arranged that it is necessary to precede each message by one or more letters signals for properly conditioning the reperforator and insuring that it will properly receive the message to be transmitted to it. These signals are followed by the message proper after which an end-of-message signal is transmitted over the line to the reperforator.

The end-of-message signal conditions the local circuits so that if an associated tape controlled transmitter transmits all the available tape a group of letters signals will be generated locally and supplied to the reperforator for an interval of time sufficiently long to insure that the entire message will be transmitted by the associated transmitter.

If no tape controlled transmitter is associated with the reperforator, then the end-of-message signal will condition the circuits so that the operator may cause the reperforator to advance the recording means through it by operating a special key. In this case also circuits operate sufficiently long to insure that the entire message will advance out of the reperforator.

When desired, manual control may also be provided when an automatic transmitter is associated with the reperforator.

The local generation of the signals for advanc-

3

ing the recording medium through the reperforating instrument is interrupted in the event that the additional signals are received over the line, thus insuring that the local generation of signals whether started manually or automatically will not in any way interfere with the reception of succeeding messages transmitted to the storage or reperforator unit.

The foregoing object and features, as well as other objects and features, of the present invention may be more readily understood from the following description when read with reference to the attached drawing which shows in detail one specific embodiment of the invention. It is to be understood, however, that the invention as defined in the claims appended hereto is not to be limited in any way to the specific embodiment described herein.

In the specific embodiment of this invention shown in the drawing the relays are normally maintained in the position shown in the drawing. Current flowing through the upper windings of relays 22 and 23 and the lower winding of relay 20 maintains the armatures of these relays in their marking positions, that is in the positions shown in the drawing.

The selector magnet 19 of the reperforator 11 is maintained operated in a circuit extending from ground through its winding and the left-hand inner break contacts of relay 21 to battery, through the right-hand contact and armature of relay 23. Relay 14 is maintained in its marking position as shown in the drawing so long as a marking condition is received over line 10.

Normally the motor of the transmitter 12, as illustrated at 42 in the drawing, is connected to source of power 38 through the closed switch 40 and is continuously operating. In a similar manner a motor for operating the reperforator 11, not shown in the drawing, is connected to a source of power and continually operating as is well understood by those skilled in the art.

As pointed out above, the first signals transmitted over line 10 to the recording instrument 11 will generally comprise one or more "letters code" combinations. Relay 14 will respond to these code combinations and cause its armature to move to its spacing contact in response to the reception of the spacing start pulse of this code combination. As is well understood by those skilled in the art, every start-stop code combination is preceded by a spacing start pulse. Consequently, the armature of relay 14 will move to its left-hand position at the beginning of any code combination received over line 10, it being understood that while this invention is not so limited the specific embodiment of this invention described herein is adapted for use in telegraph systems employing the so-called start-stop method of synchronizing.

When the armature of relay 14 moves to its left-hand position an obvious circuit is completed through the upper winding of relay 29, the current through which overcomes the effect of the current flowing through the lower winding of this relay and causes its armature to move to its spacing or left-hand position. The operation of relay 20 to its left-hand position completes a circuit for the operation of relay 32 from battery through the winding of relay 32, the left-hand break contacts of relay 28 to ground through the left-hand contact and armature of relay 20. The operation of relay 32 prepares a circuit for the operation of relay 29 and for maintaining itself operated which circuit becomes effective upon the opera-

4

tion of relay 20 at the end of the first spacing pulse from battery through the winding of relay 32, the left-hand operated contacts of relay 32 and the winding of relay 29 to ground through the normally closed contacts 15 and 16 controlled by the reperforator unit 11.

Relay 29 in operating completes an obvious circuit for the operation of the slow-release relay 28. Relay 28 in operating interrupts the operating circuit of relay 32 and completes a circuit for maintaining itself operated from battery through its winding and left-hand operated contacts to ground through the left-hand contact and armature of relay 20. Relay 28 is slow in releasing so that it will remain operated due to current flowing in the circuit through the left-hand contact and armature of relay 20 during the time relay 20 is following the signals received over line 10 and repeated by relay 14 to relay 20.

The operation of either relays 28 or 29 completes a circuit for the operation of relay 21 from battery through the winding of relay 21 to ground, through the operated contacts of either relays 28 or 29.

The operation of relay 21 transfers the circuit of the selector magnet 19 of the reperforator 11 from the contacts of relay 23 to the contacts of line relay 14. Consequently, thereafter the selector magnet 19 will follow the signals transmitted over line 10. One or more letters signals transmitted preceding the message is required in order to allow sufficient time for the various relays described above to operate, as well as to allow sufficient time for stopping the automatic local generation of signals as will be described hereinafter.

Thereafter the circuits will remain in the position described during the remainder of the reception of the message.

During the operation of the reperforator 11, contacts 18 close once during the reception of each and every code combination received by the reperforator 11. The circuit of these contacts, however, is open at the right-hand operated contacts of relay 29 at this time so that the closure of these contacts during the reception of a message performs no useful function. Contacts 17 are closed by the selector of the receiving device 11 in response to the reception of a letters code combination. In other words, contacts 17 open once in response to the reception of each letters signal received by the reperforator 11. Similarly, contacts 15 are momentarily operated once by the reception of each code combination usually employed to represent the letter H. Each of the contacts 15, 17 and 18 are operated momentarily in response to the reception of the respective code combinations by the selecting mechanism of reperforator 11. Contacts 16, however, are operated in response to the reception of a figures code combination and remain operated until a letters code combination is received which causes the contacts to be restored or closed as shown on the drawing. In addition to the closure of contacts 16 in response to a letters signal, the selecting equipment is frequently arranged to cause contacts 16 to close in response to the reception of a space code combination. While these contacts, as described above, are arranged to be actuated in response to the specifically enumerated code combinations, it will be readily apparent to those skilled in the art that any other suitable code combinations may be employed to control these contacts.

For a more detailed description of typical

selector arrangements for selectively closing contacts in response to received telegraph signals reference is made to United States Patents 2,120,235, granted Beattie et al. on June 14, 1938; 2,112,234, granted to Beattie et al. on March 29, 1938; and 2,154,547, granted to Walker on April 18, 1939, all of which patents are hereby made a part of this application as if fully included herein.

So long as these contacts are individually operated, as described above, the switching circuits controlled by them are not actuated. However, when a figures code combination is followed by an H code combination, the locking circuit of relay 32 and the operating circuit of relay 29 is interrupted, thus permitting these relays to release. Contacts 16 are opened in response to the reception of the figures signal and remain open until closed by a letters or spacing signal. Contacts 15 are momentarily opened in response to the H signal so when the H signal follows a figures signal when no letters signal or spacing signal is interposed between them the circuit of relays 29 and 32 is interrupted.

Relay 29 in releasing interrupts the operating circuit of relay 28. If additional signals are received over line 10 following the figures and H code combinations, relay 28 will be maintained operated due to current flowing through its winding and its left-hand operated contacts to ground through the spacing contact and armature of relay 20. As described above, relay 20 follows the signals transmitted over line 10 and maintains the circuit through its left-hand contacts closed for a sufficiently great proportion of time during the reception of signals to maintain relay 28 operated.

The first signal following the figures and H signal which is not a letter signal will again complete a circuit for the operation of relay 32 from battery through the winding of relay 32, the right-hand break contacts of relay 29, the momentarily operated contacts 18, contacts 17 to ground through contacts 15 and 16 in parallel. Relay 32 in operating again prepares the above described circuit for the operation of relay 29 and for maintaining itself operated which circuit becomes fully effective when contacts 18 open. Thereafter, the circuit remains in the above described condition throughout the remainder of the reception of message signals by the reperforator 11.

If, however, no signals are received immediately following the figures signal and the subsequent H signal, the release of relay 29, as described above, in response to the reception of these two code combinations interrupts the operating circuit of relay 28. Under these circumstances, the armature of relay 20 will be maintained in its right-hand position as shown in the drawing where it interrupts the locking circuit of relay 28. Consequently, a short interval of time after the release of relay 29, relay 28 will release. The release of relay 28 at this time interrupts the operating circuit of relay 21, thus permitting relay 21 to release. Relay 21 in releasing transfers the operating circuit of the selector magnet 19 from the contacts of relay 14 to the contacts of relay 23.

Thereafter, the circuits remain in the condition described unless additional signals are received over line 10 in which case the circuits operate as described above. If the tape controlled transmitter 12 is supplied with tape 13 from reperforator 11, transmitter 12 will generally continue to transmit the signals stored in tape 13 until the

supply of tape between the reperforator 11 and transmitter 12 is reduced to some predetermined minimum quantity at which time contacts 48 are opened.

In order for the transmitter 12 to transmit, an operator or attendant closes switch 39 which completes an obvious circuit from a source of power 38 through the winding of start magnet 41 which magnet releases the transmitter shaft 43 and permits the brush arm 46 to be rotated through one revolution by motor 42 through friction clutch 44 in the well-known manner. Contacts 45 are controlled by the perforations of tape 13, as is well understood by those skilled in the art.

When contacts 48 open, as described above, the circuit through the winding of relay 37 will be interrupted. Consequently, relay 37 will release. If no further signals have been received over line 10 by this time, a circuit will be completed by the release of relay 37 for the operation of relay 30 from battery through the winding of relay 30, the break contacts of relay 37, the left-hand break contacts of relay 31 to ground through the right-hand outer break contacts of relay 21.

Relay 30 in operating completes a circuit for maintaining itself operated from battery through its winding and left-hand operated contacts to ground through the left-hand break contacts of relay 31 and the right-hand outer break contacts of relay 21.

Relay 30 in operating removes negative battery from the right-hand terminal of condenser 35 and grid of tube 34 and connects negative battery to the filament of tube 34. The filament of tube 34 is thereby energized but tube 34 will not pass sufficient anode current to cause relay 33 to operate at this time due to the high negative potential of the right-hand terminal of condenser 35. The constants of condenser 35, resistance 36, as well as the constants of tube 34 are such that it requires an appreciable period of time, say of the order of 15 seconds, for the high potential of the right-hand terminal of condenser 35 to discharge through the high resistance 36 sufficiently to permit sufficient anode current to flow through tube 34 to operate relay 33. A more detailed description of the manner of operation of the time measuring or time delay circuit of this type is disclosed and the novel features thereof claimed in a copending application of Hopper, Serial No. 407,410, filed August 19, 1941, now Patent No. 2,327,791, granted August 24, 1943, which application is hereby made a part of this present application as if fully included herein.

The operation of relay 30 connects ground to the armature of relay 22 which, in turn, reverses the current flowing through the upper winding of relay 22 so that the current now flows from battery 49 through resistance 50, the upper winding of relay 22, and the left-hand contact and armature of relay 22 to ground through the right-hand inner break contacts of relay 21 and the right-hand inner operated contacts of relay 30. This reversed current flowing through the upper winding of relay 22 tends to operate the armature of this relay to its right-hand position but is prevented from doing so by a current having a much greater effect flowing through the lower winding of this relay. Prior to the operation of relay 30, battery was connected to the left-hand terminal of condenser 24 through the lower winding of relay 22. Upon the operation of relay 30, however, ground is connected to the left-hand

7

terminal of condenser 24 through lower winding of relay 22. Hence, condenser 24 will discharge through the lower winding of relay 22 in such a direction as to maintain the armature of relay 22 in the position shown in the drawing. The constants of condenser 24, the resistance of the lower winding of relay 22 and the constants of this relay are such that it requires an appreciable interval of time before the discharged current from condenser 24 falls to its sufficiently low value to permit the reverse current flowing through the upper winding of this relay to move its armature to its right-hand position.

When the armature of relay 22 moves to its right-hand position, it disconnects ground from the left-hand contacts of this relay and thus restores the current flowing through the upper winding of this relay to its normal direction where this current will tend to operate the relay to the position shown in the drawing. However, at this time condenser 24 will start to charge to battery potential through the lower winding of relay 22. The charging current of condenser 24 will produce an effect upon the armature of this relay which overcomes the effect of the current flowing through the upper winding of this relay for an appreciable interval of time. When relay 22 finally operates to its left-hand position the above cycle of operations will be repeated.

During the interval of time the armature of relay 22 remains in its right-hand position it connects ground to the left-hand winding of terminal of the lower winding of relay 23. Prior to the operation of relay 22 to its right-hand position, battery was connected to the left-hand terminal of condenser 27 through the lower winding of relay 23. Upon the connection of ground to the left-hand winding terminal of the lower winding of relay 23, condenser 27 will start to discharge through the lower winding of relay 23 and overcome the effect of the current flowing through the upper winding of this relay and operate the armature of this relay to its left-hand position where it interrupts a circuit to the selector magnet 19. At a later interval of time, either condenser will become sufficiently discharged or relay 22 will operate in the position shown in the drawing, as described above. When ground is disconnected from the left-hand terminal of the lower winding of relay 23, condenser 27 will start to charge to battery potential through this winding and cause relay 23 to be operated to the position shown in the drawing or maintained in this position if it was previously operated by the current flowing through the upper winding of this relay when condenser 27 became sufficiently discharged. This relay is then maintained in this position by current flowing through its upper winding, as described above.

The constants of relay 22, as well as the values of resistances 50 and 51 are so chosen that relay 22 remains in the position shown in the drawing for a greater proportion of the time and is operated to its right-hand position for only a small proportion of the time. Consequently, relay 23 interrupts a circuit of the selector magnet 19 for only short intervals of time followed by appreciable longer intervals of time during which a circuit of the selector magnet is closed. The constants of condensers 24 and 27 and the resistances of the windings of relays 22 and 23 and the adjustment of these relays, as well as the values of resistances 50 and 51, are so selected that relay 23 interrupts the circuit of the selector magnet for a time interval sufficiently

8

long for the selector magnet 19 to interpret this interruption as a start signal. Thereafter, relay 23 completes a circuit for the selector magnet 19 and maintains this circuit closed sufficiently long so that the selector magnet 19 interprets the following circuit closure as a letters signal. Thereafter, the above described operation is repeated and a series of letters signals generated and supplied to the selector magnet 19. The selector magnet 19 in responding to these signals causes the tape 13 to be advanced through the recording device 11 so that the end of the message which was still within the reperforator 11 will be advanced out of this mechanism and through the transmitter 12. If for any reason the signals generated by relays 22 and 23 are interpreted by the reperforating mechanism 11 as any signal other than a letters signal, a circuit will be completed for the operation of relay 32 from battery through the winding of relay 32, the right-hand break contacts of relay 29 to ground through the universal contacts 18 and the letters contacts 17 to ground through contacts 15 and 16. This circuit is not completed in response to letters signals received by the selector magnet 19 during normal operation because the letters contacts 17 open a short interval of time before the universal contacts close and the universal contacts open a short interval of time before the contacts 17 reclose. However, when any signal other than letters signals is received by the selector magnet 19 at this time, the above described circuit through the letters contacts and universal contacts is completed for the operation of relay 32 because the letters contacts will not open in response to any signals except letters signals. Relay 32 operates and upon the opening of the universal contacts 18 a circuit is completed for the operation of relay 29 and for maintaining relay 32 operated as described above. Relay 29 in operating completes circuits for the operation of relays 28 and 21. The operation of relay 21 interrupts the local generation of letters signals and restores the circuits to their normal or idle condition in the same manner as described herein when signals are received during the automatic generation of letters signals for advancing the recording medium 13 through the reperforator 11.

The operation of the circuits in generating letters signals and causing the tape 13 to be advanced out of the reperforator 11 continues under normal conditions during the discharge time of condenser 35, as described above. At the end of the time interval measured by the discharge circuit of condenser 35 and tube 34, relay 33 will operate and complete a circuit for the operation of relay 31 from battery to the winding and right-hand break contacts of relay 31 to ground through the operated contacts of relay 33.

It frequently is desirable to extend the circuit from the contacts of relay 33 through an additional interrupter to ground or through some other switching circuits which contacts and circuits are indicated by the dotted line extending between the armature of relay 33 and ground.

When ground is applied to this circuit, relay 31 operates and completes a circuit for maintaining itself operated from battery through its winding and right-hand operated contacts to ground through the right-hand break contacts of relay 21. The operation of relay 31 also interrupts both the operating and locking circuits of relay 30, thus permitting relay 30 to release. The release of relay 30 disconnects ground from the armature of relay 22 whereupon the armature of this relay

is restored to the position shown in the drawing and the armature of relay 23 operated to its right-hand position. The release of relay 30 also restores the circuit of condenser 35 and tube 34 to their normal or idle condition. Thus, the generation of letters signals is interrupted and thereafter the circuits remain in the condition described above until additional signals are received over line 10.

If signals are received over line 10 during the time the letters signals are being generated, a circuit for the operation of relay 32 is completed, as described above, and relay 32 in operating prepares a circuit for the operation of relay 29 which relay operates as described above and completes a circuit for the operation of relay 21. Relay 21 in operating interrupts the operating and locking circuit of relay 30 and permits this relay to release and interrupt the generation of letters signals and restore the circuits and relays involved in the generation of the letters signals to their normal or idle condition. Inasmuch as the selector mechanism of the reperforator 11 may not be in its idle or normal condition when these signals are received, it is desirable to precede the message by one or more letters signals to insure that the selector mechanism will be synchronized with the incoming signals and be in condition to properly respond to the first code combination of the message being received.

In case tape 13 is not supplied to a tape controlled transmitter 12 or in case it is desired to detach it from the reperforator 11 and carry it to some other transmitter, the operator or attendant may wish to manually cause the reperforator 11 to advance the tape 13 through the mechanism so that the entire message may be removed from the machine. For this purpose, a key 57 is provided which the operator may operate after a figures H signal at the end of a message has been received and, if no further signals are received at this time, the operation of key 57 serves the same purpose as the release of relay 37, as described above, and causes the mechanism to automatically advance the record medium 13 through the mechanism. At the end of the time interval measured by condenser 35, resistance 36 and tube 34, the automatic generation of letters signals is interrupted and the circuits restored to their idle condition as described above.

The circuits of transmitter 12 may be arranged to discard the additional letters signals perforated in tape 13, as is understood by those skilled in the art.

Details of suitable types of reperforating mechanisms are disclosed in United States Patents 1,884,743, granted to Kleinschmidt on October 25, 1932; and 2,042,788, granted to Krum on June 2, 1936.

It is also apparent to those skilled in the art that the mechanism 11 may comprise a printing reperforator such as is described in United States Patents 2,273,909 and 2,273,910, granted to Swan on February 24, 1942; and 2,255,794, granted to Lake on September 16, 1941. All of the above-identified patents are hereby made a part of this application as if fully included herein.

In case a printing reperforator is employed, it is frequently desirable to arrange the printing and perforating mechanisms and to select the signals generated for automatically advancing the record medium through the mechanisms so that no symbol or character is printed upon the record medium by the mechanism in response to the signals generated by the local circuits for advancing

ing the record medium through the receiving instrument.

Under other circumstances, it may be desirable to cause the printing mechanism to print some predetermined specific character or symbol which forms no part of any message when transmitted after messages such as a period, dash, or any other suitable letter or symbol, as will be readily apparent to those skilled in the art.

Furthermore, the invention is not limited to the employment of any particular time measuring device as disclosed in the specific embodiment of said invention and described herein. In addition, it may be desirable to arrange the timing circuits of relay 22 so that they may be readily adapted for use in cooperation with receiving reperforators operating at different speeds. For this purpose, the condenser 25 and switch 26 has been included. When the switch 26 is closed, condensers 24 and 25 are connected in parallel, thus further delaying the operation of relay 22 and adapting a circuit arrangement including this relay and relay 23 to generate signals at a lower speed than when switch 26 is open, as shown in the drawing.

What is claimed is:

1. In a telegraph system, a channel of telegraphic transmission, a recording instrument for recording permutation code signals received over said channel upon a recording medium, and apparatus for generating a plurality of predetermined code combinations for advancing said medium through said recording instrument and means jointly responsive to received signals and to the demand for said record medium from said recording instrument for conditioning for operation said apparatus for generating a plurality of predetermined code combinations.

2. In combination, a permutation code-receiving instrument for perforating tape in accordance with received permutation codes having a selector magnet for controlling said receiving instrument, a local circuit for the operation of said selector magnet, apparatus for repeating received signals to said local circuit, and other apparatus for generating letters signals within said local circuit, and means for interrupting the operation of said apparatus for generating letters signals upon the operation of said repeating apparatus.

3. In combination, a telegraph signal storing device for storing signals in a medium, a circuit local to said signal storing device for controlling the operation of said signal storing device, apparatus for repeating signals to said local circuit, means for generating predetermined signals in said local circuit, and means responsive to signals in said local circuit other than said predetermined signals for interrupting the operation of said means for generating predetermined signals.

4. In combination, a telegraph printer for printing symbols on a record medium, a local circuit local to said printer for controlling said printer, a repeating device for repeating message signals to said local circuit, apparatus for generating predetermined signals in said local circuit for advancing said medium through said printer which signals cause no symbols to be printed on said record medium.

5. In combination, a telegraph printer for printing symbols on a record medium, a controlling circuit local to said printer, a repeating device for repeating message signals to said controlling circuit, apparatus for generating non-message signals in said controlling circuit for advancing said medium through said printer which

11

signals cause non-message symbols to be printed on said medium.

6. In combination, a telegraph recording instrument for recording message signals on a recording medium, apparatus for supplying a plurality of non-message signals to said recording instrument for advancing the recording medium therethrough, and means responsive jointly to predetermined signals and to the demand for said record medium from said recording instrument for initiating the operation of said apparatus for supplying predetermined non-message signals.

7. In combination, a telegraph recording instrument for recording message signals on a recording medium, apparatus for supplying a plurality of non-message signals to said recording instrument for advancing the recording medium therethrough, and means responsive jointly to predetermined signals and to manually operable switching means for initiating the operation of said apparatus for supplying predetermined non-message signals.

8. In combination, a telegraph receiving recorder for recording telegraph signals on a recording medium, a selector magnet for controlling said receiving recorder, a local circuit including a winding of said selector magnet for controlling said selector magnet, apparatus for repeating telegraph signals to said local circuit, and other apparatus for generating predetermined signals in said local circuit for advancing said record medium through said recorder.

9. In combination, a telegraph receiving recorder for recording telegraph signals on a recording medium, a selector magnet for controlling said receiving recorder, a circuit local to and including said selector magnet, apparatus for repeating telegraph signals to said circuit local to said selector magnet, other apparatus for generating predetermined signals in said circuit local to said selector magnet for advancing said record medium through said recorder, time delay apparatus for stopping said apparatus for generating predetermined signals after operation thereof for a specified interval of time.

12

10. In a telegraph system, a recording instrument for recording symbols in accordance with telegraph signals on a record medium, equipment for supplying telegraph signals to said recording instrument, apparatus for generating specified telegraph signals for advancing said record medium through said recording instrument, an automatic telegraph transmitter controlled by said recorded signals, apparatus jointly responsive to predetermined signals and to the supply of record medium between said recording instrument and said transmitter for initiating the operation of said apparatus for generating specified telegraph signals.

11. In combination, a telegraph printer for printing symbols on a record medium, a control circuit local to said printer, a repeating device for repeating message signals to said control circuit, apparatus for generating predetermined signals, and means operating independent of said repeating device for supplying said predetermined signals to said local circuit for advancing said medium to said printer in response to said predetermined signals which cause no symbols to be printed on said recording medium.

12. In combination, a telegraph receiving recorder for recording telegraph signals on a recording medium, a selector magnet for controlling said receiving recorder, a winding on said selector magnet, a local circuit including a winding on said selector magnet for controlling said selector magnet and said receiving recorder, apparatus for repeating telegraph signals to said local circuit, other apparatus for generating predetermined signals, equipment for supplying said predetermined signals to said local circuit for advancing the recording medium through said recorder in response to said predetermined signals supplied to said local circuit.

RITA SMITH KINKEAD.

Administratrix of the Estate of Fullerton S. Kinkead, Deceased.