This invention relates to improvements in telegraphic receiving perforators.

When transmitting communications by telegraphic methods, they are frequently stored in storage tapes, particularly in perforated tapes, in order to be transmitted later on. The subscriber sets of the selector central offices are generally equipped with so-called answer-back devices which are released by the calling subscriber, for instance, with the aid of a particular impulse combination, the so-called "who are you" combination, and which then transmit the name of the subscriber. According to the service instructions, the "who are you" combination is transmitted by depressing a key in general immediately after the establishment of the connection. This "who are you" combination presents under certain circumstances difficulties in operation when using receiving perforators and tape transmitters. These difficulties are caused by the timely overlapping of the transmission of a communication from the sending to the receiving subscriber with the retransmission of the "who are you" combination from the receiving to the sending subscriber, and may effect a mutilation of the message, as will be explained more fully hereafter.

The main object of the invention is to eliminate these difficulties without departing from the basic principles of operation and construction of telegraphic systems of the above-mentioned type. To this end, the invention provides a telegraphic receiver for preparing storage tapes in accordance with a communication to be retransmitted while suppressing the recording of the "who are you" combination. This object and the means provided by the invention for affording the desired improvement will be understood from the following description in conjunction with the appended drawings, in which—

Fig. 1 is explanatory and shows diagrammatically two interconnected telegraph networks in which storing receivers according to the invention may be employed, and

Fig. 3 is a perspective illustration of a receiving perforator embodying the features of the invention proper.

In order to elucidate the above-mentioned difficulties arising in the known telegraph system when applying perforating or the like receivers in cases where a "who are you" combination is retransmitted, and for more fully explaining the object and function of apparatus according to the invention, two examples of customary teleprinter networks may at first be referred to in a general way.

Fig. 1 represents two teleprinter networks N1 and N2. N1 is, for instance, a private teleprinter exchange network whose subscribers T1 and T2 may communicate with each other through an exchange office VA1. For example, the subscribers T1 and T2 may be central offices and branch offices of a bank or the like organization, while the network N2 is a public teleprinter network. In operation, it often occurs that the subscriber T1 must transmit a communication to the subscriber T3 of the public teleprinter network, i.e. a branch exchange of a private network, which branch exchange is not a subscriber of the public teleprinter network, may desire to transmit a communication to any subscriber of the public network. This is accomplished in the manner that the subscriber T1 establishes a connection with the subscriber T2 and transmits his communication to a receiving perforator. The subscriber T2 dials the subscriber T3 over the public central exchange VA2 and transmits the perforated tape just received to this subscriber T3 with the aid of a tape transmitter. Consequently, if the subscriber T1 demands the name of the subscriber T3 with the aid of the "who are you" key, the subscriber T2 dials the subscriber T1 with the aid of the "who are you" combination and immediately thereafter the identification signals transmitted from this apparatus are punched in the perforated tape of the subscriber T2. If now the communication stored in the perforated tape is transmitted by the tape transmitter of the subscriber T3 in the network N2, the answer-back device of the subscriber T3 is released during the transmission of the signals punched in the tape, and, since this transmission cannot be interrupted, there results a reciprocal mutilation of the answer-back signals sent by the subscriber T2 and of the signals sent by the subscriber T1 with the aid of the perforated tape.

Similar difficulties may also arise within a single network. In Fig. 2 is shown the normal lay-out of a teleprinter-connection. The subscriber T1 is connected with the subscriber T2 through the connecting line L1, the preselector VW, the group selector GW, the final selector LW, and a connecting line L2. If the subscriber T2 is engaged, a storage position SPL may be provided in a known manner to which the connection is changed over automatically. This storage position may have a receiving perforator...
to which the subscriber T1 transmits the communication. Also in this case the "who are you" combination punched in the tape, when causing the perforated tape to transmit the stored communications to the subscriber T2, would release the answer-back device of the subscriber T2 and thereby cause the same mutilations of the text as occurs in the above-described instance.

The receiving perforator according to the invention removes the drawbacks by automatically suppressing or rendering ineffective the recording of the "who are you" combination. According to a more specific aspect of the invention, and under the assumption of a standardized teleprinter alphabet code and of the usual teleprinter exchange traffic, the "who are you" combination is rendered ineffective by suppressing the paper feed upon the reception of the "who are you" combination. If each receiver and each receiving tape recorder is provided with an answer-back device, the letter shift combination—which has been internationally agreed—is the first combination of the answer-back signals—follows the "who are you" combination. As the letter shift combination in the five-unit code contains only impulse elements which correspond, for instance, to perforations of a perforated tape, the letter shift signal is substituted for the "who are you" combination already perforated in the same row.

If in particular cases no answer-back device should be connected to the receiving tape recorder, the suppression of the "who are you" combination, according to the invention, is caused in another manner, for instance, by suppressing the punching.

The embodiment of a receiving perforator according to the invention exemplified in Fig. 3 is adapted for use on a standard teleprinter receiver having selector bars. The unperforated paper tape 1 is stored in a pay-out reel 2 and fed to the apparatus through guide rollers 3, 4. A roller 5 is provided for the advancement of the tape. A roller 6 biased by a spring 7 is pressed against the roller 5 with the aid of a lever 8 which is so shaped as to serve also as a guide for the paper tape. The roller 5 may be operated by a hand-operated stepping wheel 9, but is, as a rule, actuated in a manner to be hereinafter described through a ratchet wheel 10. The tape 1 is guided along a tape track 11. To feed the tape to the punching mechanism in an unchangeable manner also when the width of the tape varies within small limits, a lateral wall 12 rotatable about an axis 13 is pressed against the tape by a spring 14. The above-described tape transport means cooperate with a recording device to be described presently. Five punches 15, of which only one is illustrated, are suspended in a frame 16. They are, when assembling the apparatus, inserted in a gap or in bores of the frame.

The punches are of the circular cross-section but flattened at the point where they are guided in the frame so that they may be moved in both directions when threaded in the frame. The flattened portion of the punches is somewhat longer in the longitudinal direction than the width of the frame so that there is a certain clearance in the direction of punching movement. The frame is not only secured to the punching hammer 20 which is guided in a bar in a manner not shown. Below the tape 1 is arranged a perforated plate in a known manner (not shown) in which the punches are inserted during the punching operation. Above the tape is provided a uniformly perforated plate (not shown) in order to prevent the punches in the upper end position from being displaced in the lateral direction. The tape transport means and the punching device are actuated by a common drive mechanism and more particularly by a cam shaft 25. The punching hammer 20 is driven by means of a lever 21 fulcrumed about a stationary shaft 22. The second arm of the lever 21 is designed in the form of a claw 23 and embraces an eccentric 24 secured to the shaft 25. The shaft 25 ends in a coupling member 26 mounted on a coaxial drive shaft 27. Each of the two coupling members has only one coupling tooth. A control lever 28 serves to bring the coupling member 26 into engagement with the coupling member 27 under the action of a spring 29 so that the drive shaft 30 operatively drives the apparatus in accordance with the arrival of telephonic signals. In the present case, in which the apparatus is designed as a perforator attachment for a teletypewriter, the coupling member 26 belongs to the perforator, whereas the coupling member 27 and the shaft 30 belong to the teletypewriter proper so that the drive of the apparatus is effected by the same motor as the drive of the teleprinter proper.

The transmission of the combination values is effected by means of a scanning device which comprises selector bars 31 of which five are provided in the teleprinter when employing the five unit code. Only one of these bars 31 is illustrated, since the arrangement and operation of the others are similar as regards their coaction with the perforator. The perforator has five scanning levers 32 fulcrumed at 33 and disposed intermediate the five selector bars 31 and the five punches 15, respectively, only one of the scanning levers 32 being shown for the sake of clarity. Each scanning lever 32 has a lug 34 to contact the corresponding selector bar 31. A lever 34, fulcrumed about a stationary axle 35, serves to release the levers 32 against the action of springs 36, respectively, and is controlled by a cam 33 firmly mounted on shaft 25. In order to adjust the selector bars 31, the levers 32 are released by the cam 33 and lever 34 so that they are lowered onto the selector bars 31 under the action of the springs 36 and scan the position of the selector bars 31.

The bar 31 has an upstanding lug 41 adapted to cooperate with a downwardly extending lug 43 on the lever 32, in a manner described hereafter. If the lug 43 is not stopped in its downward movement by lug 41, the bell crank lever 9, which is pivotally mounted at 38, is rotated in a clockwise direction under the action of a spring 63 and pulls at its other end the control slide 39 to the left, control slide 39 being pivotally connected to the lever 37 at 40. If then the punching hammer is forced downward under the influence of eccentric 24, the punch 15 will not punch. However, if the lug 33 finds a support on the extension 41 of the selector bar 31, when the punching hammer is being lowered, the lever 32 cannot be moved in response to the tension of the spring 35 so that the slide 39 remains in the position shown, that is, its right hand position. In this case a hole is punched upon the downward movement of the punching hammer. The levers 32 and 37 are held in engagement with each other.
by a spring 43 attached to an extension 42 of the lever 32. A pawl 44 serves to advance the tape 1 in the case of a continuous reception. The pawl 44 is pivotally mounted on a lever 45 and held against the ratchet wheel 10 by a spring 53. The lever 45 is rotatable about a stationary fulcrum at 45' and engages an eccentric 46 of shaft 25 under the action of a spring 47. The ratchet wheel 10 is stopped in the corresponding position by a detent 48 which is under the action of a spring 49. To advance the tape by hand when inserting it in the apparatus, the control wheel 9 may be employed. A lever 59 serves to move the tape stepwise in the backward direction in case false signals have been perforated. The lever 60 has a stationary fulcrum at 59' and cooperates with two stationary stops 51' which limit the lever movements. A pawl 51 mounted on lever 59 serves to engage the ratchet wheel 10 but in general is held out of engagement by the spring 47.

Since in the position of rest also the pawl 44 is out of engagement with the ratchet wheel 10, the tape is moved in the reverse direction when actuating the lever 59, for instance, manually.

To facilitate the feed of the tape, the lever 21 is provided with a third arm 52 which controls a lever 53 rotatable about a stationary fulcrum at 54.

The lever 53 is provided with a pin 55 pressed against a leaf spring 56 which in turn carries the paper guide roller 3. Upon each movement of the eccentric 24 the lever 53 is rotated in counterclockwise direction, thereby pressing the spring 56 in the downward direction so that the paper is turned by the roller 3. When the paper is again tensioned or stretched upon reception of the next signal the lever approaches more or less the position shown, depending upon the consumption of the paper.

To enable the scanning of certain impulse combinations, the lever 31 is mounted as part of an auxiliary scanning device, and to this end is provided with teeth 57. These teeth are cut in the same manner as is the case with those of the selector bars, however, only for some impulse combinations. A control lever having three arms 59, 60, 61 is rotatable about a stationary fulcrum at 60' against the action of a spring 63 and controlled by an eccentric 58 mounted on the shaft 25. Upon each rotation of the eccentric 58, the arm 59 of the three-armed control lever is released so that the lever is rotated in the clockwise direction under the influence of the spring 62 as soon as a gap between the teeth 67 lies opposite the arm 61. If therefore the teeth 57 are so cut that a gap is offered to arm 61 as soon as the "who are you" combination is received, the lever arm 60 is moved in the downward direction so that it rotates the pawl 44 against the action of the spring 63 in the counterclockwise direction and the pawl 44 comes out of engagement with the ratchet wheel 10. When the "who are you" combination is utilized, the ratchet wheel 10 is therefore not advanced.

In the case of the internationally standardized five-unit code, the "who are you" combination is allotted to the figure case and corresponds to the letter "d" (----). The "who are you" combination is therefore transmitted always before the transmission of the impulse combination "figure no." A scanning means is utilized for the combination, "who are you" follows the transmission of the answer-back impulses.

It has been internationally agreed that the answer-back signals always begin with the impulse combination "letter shift." The impulse combination "letter shift", however, is composed as follows: ++++-+. Since this impulse combination is perforated in the same row as the "who are you" combination, only the letter shift combination is perforated, because the paper tape is not advanced and hence the whole row of five markings is already punched when the "who are you" combination (+---+) is superposed. The perforated tape contains therefore the impulse combinations "letter shift" and then the answer-back signals. The impulse combination "who are you" is suppressed.

As will be easily apparent from Fig. 3, instead of the advancement of the tape, the punching may be suppressed. This can be obtained, for instance, by having the lever 59 act on an intermediate member between the punch hammer 20 and the lever arm 21. Such a construction, which is somewhat more complicated than that illustrated, would be necessary, if the tape receiver is not associated with the answer-back device. However, such a case is rare in practice.

The invention may, of course, also be used if the storage of the impulse combinations is not effected by perforating, but in another manner. It is, for instance, possible to record impressions or embossings which are retransmitted by a photoelectric method.

What is claimed is:

1. A recording retransmission receiver for telegraph systems provided with answer-back devices for transmitting to the sending station a "who are you" combination of signals identifying the receiving station, comprising a recording device having transport means for accommodating a recording tape and recording means in cooperative relation to said transport means for recording signals on said tape in accordance with a communication to be retransmitted, and means responsive to said "who are you" combination and associated with said recording device for rendering the latter ineffective in response to the receipt of said combination so as to prevent a permanent record of said combination on said tape.

2. A recording retransmission receiver for telegraph systems provided with answer-back devices for transmitting to the sending station a "who are you" combination of signals identifying the receiving station, comprising a recording device having transport means for accommodating a recording tape and means for recording signals on said tape, scanning means for controlling said recording means in accordance with a communication to be retransmitted, and control means disposed between said recording device and said scanning means for rendering said device ineffective in dependence upon said scanning response to said "who are you" combination whereby the recording of said combination on said tape is suppressed.

3. A recording retransmission receiver for telegraph systems provided with answer-back devices for transmitting to the sending station a "who are you" combination of signals identifying the receiving station, comprising drive means, transport means coupled with said drive means for accommodating a recording tape, means for recording signals on said tape, as well as a device for causing said drive means to actuate said recording means in accordance with a telegraphic communication, and control means associated
with said scanning device for disengaging said transport means from said drive means in dependence upon said scanning device responding to said "who are you" combination in order to suppress the transport of said tape upon receipt of said combination, whereby the record of said combination is eliminated by the recording of the next following letter shift combination.

4. In a telegraph system operating with a five-unit code and having answer-back devices for transmitting to the sending station a "who are you" signal of the receiving station followed by a letter shift signal of the type +++++, a recording tape receiver comprising tape feed means for accommodating a recording tape, recording means to coat with said tape, scanning means for controlling said recording means in accordance with a communication to be recorded on said tape, and control means associated with said scanning means for rendering said feed means ineffective upon said scanning means responding to said "who are you" signal so as to suppress the tape feed after the recording of said signal, whereby the latter is eliminated by the recording of the following letter shift signal.

5. In a telegraph system operating with a five-unit code and having answer-back devices for transmitting to the sending station a "who-are-you" signal of the receiving station followed by a letter shift signal of the type +++++, a recording tape receiver comprising drive means, tape feed means coupled with said drive means for transporting a recording tape, recording means to coat with said tape, scanning means for controlling said drive means to actuate said recording means in accordance with a communication to be recorded on said tape, and control means associated with said scanning means for disconnecting said drive means from said feed means in dependence upon said scanning means responding to said "who are you" signal so as to suppress the tape feed after the recording of said signal, whereby the latter is eliminated by the recording of the following letter shift signal.

6. A recording retransmission receiver for telegraph systems provided with answer-back devices for transmitting to the sending station a "who are you" combination of signals identifying the receiving station comprising a recording device having transport means for accommodating a recording tape and means for recording signals on said tape, main scanning means for controlling said recording means in accordance with a communication to be transmitted, control means for rendering said recording device ineffective, auxiliary scanning means disposed intermediate said main scanning means and said control means and operatively connected with said main scanning means for causing said control means to suppress temporarily the operation of said recording device in dependence upon said main scanning means responding to said "who are you" combination, whereby a permanent record of said combination on said tape is prevented.

7. A receiving perforator for telegraph systems operating with answer-back devices for transmitting to the sending station a "who are you" combination of signals identifying the receiving station, comprising a recording device having transport means for accommodating a recording tape and recording means for perforating said tape, a cam shaft and each of said transport means and recording means respectively, scanning means for controlling said drive means so as to have said cam shaft actuate said transport means and said recording means in dependence upon said scanning means for releasing said drive means so as to temporarily suppress the operation of said recording device in dependence upon said scanning means responding to said "who are you" combination, whereby a permanent record of said combination on said tape is prevented.

8. A receiving perforator for telegraph systems operating with answer-back devices for transmitting to the sending station a "who are you" combination of signals identifying the receiving station, comprising transport means for accommodating a recording tape, punching means for perforating the tape, a driving cam shaft, a controllable connection between said cam shaft and said punching means, a ratchet wheel for actuating said punching means by said cam shaft to engage said cam shaft for advancing said ratchet wheel upon the rotation of said shaft, scanning means for controlling said connection so as to actuate said punching means in dependence upon signals to be recorded, and control means associated with said scanning means for controlling said ratchet means in dependence upon said "who are you" combination, whereby the advance of said tape is suppressed upon the receipt of said punching means of said "who are you" combination.

9. In a telegraph system operating with a five-unit code and having answer-back devices for transmitting to the sending station a "who are you" signal of the receiving station followed by a letter shift signal of the type +++++, a recording tape receiver comprising means for accommodating a recording tape, feed means for advancing said tape stepwise upon receipt of a signal, punching means for perforating said tape, scanning means for controlling said punching means in accordance with the signals to be recorded, common drive means for actuating said feed means and punching means, a controllable intermediate member connecting said drive means with said punching means, and control means associated with said scanning means and means for engaging said intermediate member for controlling said member so as to suppress the operation of said punching means in dependence upon said scanning means responding to said "who are you" combination, whereby the recording of said combination is prevented.

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