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TRANSCRIBER FOR INK RECORDER TAPES

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Fig. 1

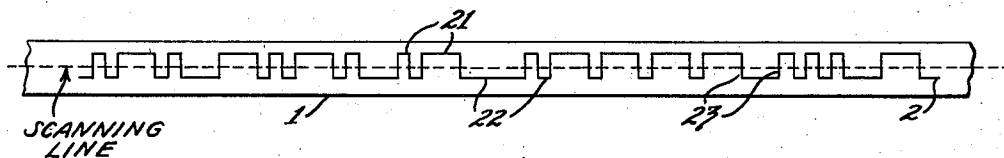
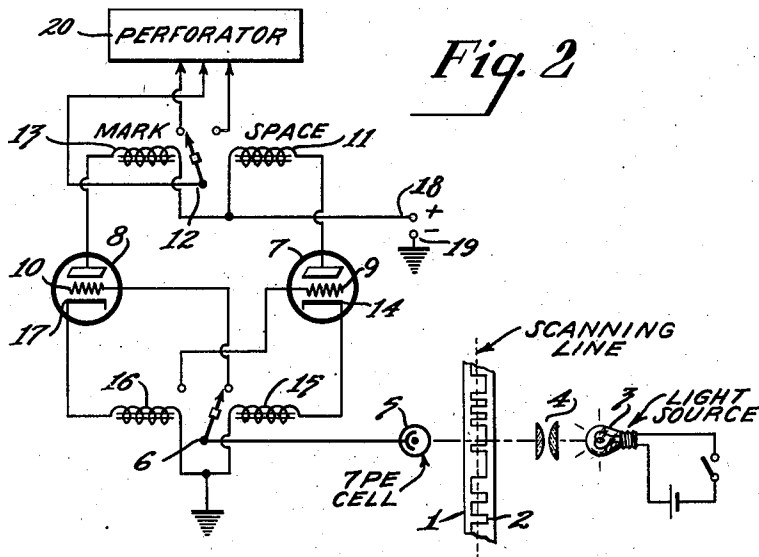


Fig. 2



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TRANSCRIBER FOR INK RECORDER TAPE

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6 Claims. (Cl. 178—17)

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This invention relates to telegraphic systems and more particularly to a system for transcribing signals from an ink recorder.

Under certain circumstances, it is desirable to transmit automatically a message which has been received and recorded on a tape in international Morse code by a system in which the mark and space elements have been punched into a tape.

Accordingly, it is a purpose of this invention to convert the mark and space signals as received on a standard tape recorder to plus and minus impulses so that an automatic perforator can be operated directly from the recording tape. The perforated tape may then be run through a printer for transcribing the signals in corresponding characters or may be retransmitted over lines adapted for use of the perforated tape.

Several devices have been conceived which would accomplish this purpose. However, the systems with which the applicant is familiar utilize either the tops of the transcribing signals as being representative of the mark spaces or the bottoms of the transcribing signals as being representative of the space signals. Such devices are open to objection in that where the tops or bottoms are not perfectly formed an erroneous signal is apt to be transcribed. It is, accordingly, a further object of this invention to provide a transcribing device which will produce strong plus and minus impulses corresponding to mark and space elements without necessitating a highly accurate transcribing system.

Briefly, in accordance with the invention, a photocell device is utilized to scan the middle of the signal recorded on an ink recorder tape representative of Morse signals so as to give a pulse of current each time a vertical or upright line passes the scanning point. These pulses are utilized so as to alternately operate the mark and space magnets of a perforating machine.

The above and other objects and advantages of this invention will be clear in a consideration of the following detailed description when taken in conjunction with the accompanying drawing in which:

Fig. 1 represents one type of recorded signals for which the invention is designed to operate; and,

Fig. 2 represents schematically an embodiment of the invention.

Throughout the drawings, like numerals are utilized to designate like parts.

In Fig. 1 there is illustrated a tape 1 upon which there has been transcribed a graphic representation 2 of the received Morse code signals. As is

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well known in the art, these signals are recorded in the form of a continuous line having upper relatively flat sections 21 representative of mark elements of the code and lower relatively flat sections 22 representative of space elements of the code interconnected by upright lines 23 which are substantially vertical and which are made during the transposition of the recording pen between mark and space positions.

Referring now to Fig. 2, it will be seen that there has been provided a light source 3 which is directed through a lens system 4 upon a photoelectric cell 5. The beam of the light is so adjusted in space relationship to the tape 1 that it passes midway between the upper and lower portions of the recorded signals. As will be understood, the photoelectric cell may be actuated by the beam of light passing through the tape, as shown, or by light reflected therefrom. The tape 1 is arranged to be drawn past the light beam by means of any suitable apparatus, not shown. As the upright portions of the recorded signals pass the light beam, pulses will be produced in the output of the photoelectric cell. The output from photoelectric cell 5 is led to the movable tongue of a two-way electro-mechanical switch 6. The switch 6 is of the type in which the tongue remains in the last position to which it is thrown and constitutes, in effect, a polar relay. Two electrical discharge devices 7 and 8 are provided. These devices are preferably of the type which are non-conducting in the absence of an applied voltage to their grids. Alternately, suitable grid biasing circuits such as are well known in the art may be utilized. It will be obvious, that if the pulses from the photoelectric cell are of insufficient amplitude to render the vacuum tubes conductive, they may be amplified by any well known means.

The switch 6 is arranged to complete a circuit from the photoelectric cell 5 to the grid 9 of tube 7 when its tongue is thrown to the left and to complete a circuit from the grid 10 of tube 8 when its tongue is thrown to the right.

In the plate circuit of tube 7 there is placed a magnet 11 arranged to throw the tongue of switch 12 to the right. A similar magnet 13 is placed in the plate circuit of tube 8 and is arranged to throw the switch 12 to the left. The switch 12 is similar in construction and operation to the switch 6.

In series with the cathode 14 of tube 7 there is placed a magnet 15 arranged to throw the tongue of switch 6 to the right. A similar magnet 16 is connected to the cathode 17 of tube 8

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and is arranged to throw the tongue of switch 6 to the left. A suitable source of supply for operating the tubes 7 and 8 is provided having its positive terminal 18 connected through magnets 11 and 13 to the anodes of tubes 7 and 8, respectively. The other terminal 19 of the power supply is grounded to complete a circuit to the cathodes of tubes 7 and 8 from ground through the magnets 15 and 16, respectively.

The switch 12 is arranged to complete a circuit to the perforator 20 actuating a mark impulse when thrown to the left and to complete a circuit to the perforator actuating a space pulse when thrown to the right. The tape perforator 20 is of standard construction and produces a tape carrying perforations representative of mark and space elements indicative of code characters.

A perforator suitable for such use is shown in U. S. Patent 1,150,326, granted August 17, 1915, to A. H. Annand. To adapt this perforator for use with the present invention it is only necessary to connect the three arrowheads shown going to the block 20 of Fig. 2 of the application to the wires 13, 14 and 15 of Fig. 1 of the patent.

It will be obvious that the perforator should be operated in substantial synchronism with the scanned tape. This may be readily accomplished by driving the tape bearing the recorded signals from the motor shown in the aforementioned patent.

Assuming that the device is set as shown in the drawing, an impulse will be generated by the photoelectric cell each time an upright portion of the recorded signal passes the light beam. The first pulse will be conducted to the grid 10 of tube 8 rendering it momentarily conductive. Current will then flow through a circuit from ground, through magnet 16, tube 8, magnet 13 and the positive terminal 18. Magnet 13, associated with switch 12 will be energized and cause the tongue of the switch to assume a position to the left corresponding to a mark element. Similarly, magnet 16 will be energized and cause the tongue of switch 6 to assume a position to the left.

When the tongue of switch 6 is thrown to the left, it will open the grid circuit of tube 8 rendering it non-conductive. At the same time it will complete a circuit between the photoelectric cell 5 and grid 9 of tube 7. Accordingly, the next succeeding pulse produced from the photoelectric cell as the scanning of the recorded signal continues will render tube 7 conductive. Current will then flow from ground through magnet 15, tube 7, magnet 11 to the positive terminal 18. The energization of magnet 11 throws the tongue of switch 12 to the right completing the circuit to the perforator indicative of a space pulse. At the same time, the energization of magnet 15 causes the tongue of switch 6 to be thrown to the right, opening the circuit to the grid of tube 7 and restoring the apparatus to its original position. It will be clear that there will thus be produced from successive upright lines of the recorded signals, pulses which will cause the perforator to punch mark and space indications in a tape in accordance with the signals being scanned. Since the scanned tape will normally be passing the optical system at a constant linear rate, these pulses will be produced in timed relationship indicative of dots and dashes.

It may appear that chattering will occur in the operation of the switches 6 and 12 which would be the case if the device worked absolutely simultaneously. However, the signal pulse from the photoelectric cell first passes through the contacts

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of switch 6 before any action occurs and, having passed there and outlived its usefulness there, there will be no chattering as the inertia of the relay prevents simultaneous action and, therefore, there would be no signal present by the time the switch would otherwise start to chatter. Therefore, the device will set itself for the next signal without chattering.

While the invention has been described in particularity, it will be clear that various modifications may be made therein without departing from the spirit of the invention. Thus the transcribed signal from an ink recorder may be replaced by any recorded signals which would have on a single line marks which would indicate the start and end of mark and space signals. Similarly, the output circuits could be used to actuate apparatus other than a perforator. Accordingly, it is to be understood that the embodiment of the invention described is for purposes of illustration and is not to be construed as limited to the particular devices and arrangement shown.

Having described my invention, what I claim is:

1. Telegraphic apparatus utilizing a tape which has signal markings thereon, comprising, in combination, means for scanning said signal markings and producing a control pulse at the start and at the end of each element of the signal character under consideration, a pair of operating circuits, a tape perforator, means in one of said operating circuits for actuating said perforator to produce a perforation indicative of a mark element, means in the other of said operating circuits for actuating said perforator to produce a perforation indicative of a space element, switching means arranged to deliver the control pulses produced by said scanning means to one or the other of said operating circuits, and means in each of said operating circuits arranged to actuate said switching means upon the reception of one of said pulses to transfer the next succeeding pulse to the other of said operating circuits.

2. In a device for controlling an automatic perforator from a Morse signal recorded on an ink recorder tape in the form of a continuous line having upper relatively flat sections representative of mark elements of said signal and lower relatively flat sections representative of space elements of said signal interconnected by upright portions which are substantially vertical and which are made during transposition of the recording pen between mark and space positions, means for scanning said upright portions of said recorded signal and producing a control pulse as said upright portions pass the scanning point, a pair of operating circuits, switching means arranged to deliver the control pulses thus produced to one or the other of said operating circuits, and means in each of said operating circuits arranged to actuate said switching means upon the reception of one of said pulses to transfer the next succeeding pulse to the other of said operating circuits.

3. In a device for controlling an automatic perforator from a Morse signal recorded on an ink recorder tape in the form of a continuous line having upper relatively flat sections representative of mark elements of said signal and lower relatively flat sections representative of space elements of said signal interconnected by upright portions which are substantially vertical and which are made during transposition of the recording pen between mark and space positions, means for scanning said upright portions of said recorded tape and producing a control pulse as

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said upright portions pass the scanning point, a pair of operating circuits, a tape perforator, means in one of said operating circuits for actuating said perforator to produce a perforation indicative of a mark element, means in the other of said operating circuits for actuating said perforator to produce a perforation indicative of a space element, switching means arranged to deliver the control pulse produced by said scanning means to one or the other of said operating circuits, and means in each of said operating circuits arranged to actuate said switching means upon the reception of one of said pulses to transfer the next succeeding pulse to the other of said operating circuits.

4. Telegraphic apparatus utilizing a tape which has signal markings thereon, comprising, in combination, means for scanning said signal markings and producing a control pulse at the start and at the end of each element of the signal character under consideration, a pair of operating circuits, a normally non-conducting electric discharge device in each of said operating circuits, each of said electric discharge devices having a cathode, an anode and a control grid, switching means arranged to deliver said control pulses to one or the other of said control grids, said pulses being of such polarity as to render said electric discharge devices conductive, a source of electric current, a mark actuating solenoid connected between one terminal of said source and one of said anodes, a space actuating solenoid connected between said terminal of said source and the other of said anodes, and means connected in the cathode path of each of said electric discharge devices arranged to actuate said switching means when one of said electric discharge devices is conducting so as to transfer the next succeeding pulse to the control grid of the other of said electric discharge device.

5. Telegraphic apparatus utilizing a tape bearing graphic representations of marking and spacing signals, comprising, in combination, means for scanning said representations and producing a control pulse as each such representation is scanned, a pair of operating circuits, a normally non-conducting electric discharge device in each of said operating circuits, each of said electric discharge devices having a cathode, an anode and a control grid, switching means arranged to deliver said control pulses to one or the other of said control grids, said pulses being of such polarity as to render said electric discharge devices conductive, a source of electric current, a mark actuating solenoid connected between one terminal of said source and one of said anodes, a space actuating solenoid connected between said termi-

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nal of said source and the other of said anodes, and means connected in the cathodes path of each of said electric discharge devices arranged to actuate said switching means when one of said electric discharge devices is conducting so as to transfer the next succeeding pulse to the control grid of the other of said electric discharge device.

6. In a device for controlling an automatic perforator from a Morse signal recorded on an ink recorder tape in the form of a continuous line having upper relatively flat sections representative of mark elements of said signal and lower relatively flat sections representative of space elements of said signal interconnected by upright portions which are substantially vertical and which are made during transposition of the recording pen between mark and space positions, means for scanning said upright portions of said recorded tape and producing a control pulse as said upright portions pass the scanning point, a pair of operating circuits, a normally non-conducting electric discharge device in each of said operating circuits, each of said electric discharge devices having a cathode, an anode and a control grid, switching means arranged to deliver said control pulses to one or the other of said control grids, said pulses being of such polarity as to render said electric discharge devices conductive, a source of electric current, a mark actuating solenoid connected between one terminal of said source and one of said anodes, a space actuating solenoid connected between said terminal of said source and the other of said anodes, and means connected in the cathode path of each of said electric discharge devices arranged to actuate said switching means when one of said electric discharge devices is conducting so as to transfer the next succeeding pulse to the control grid of the other of said electric discharge device.

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