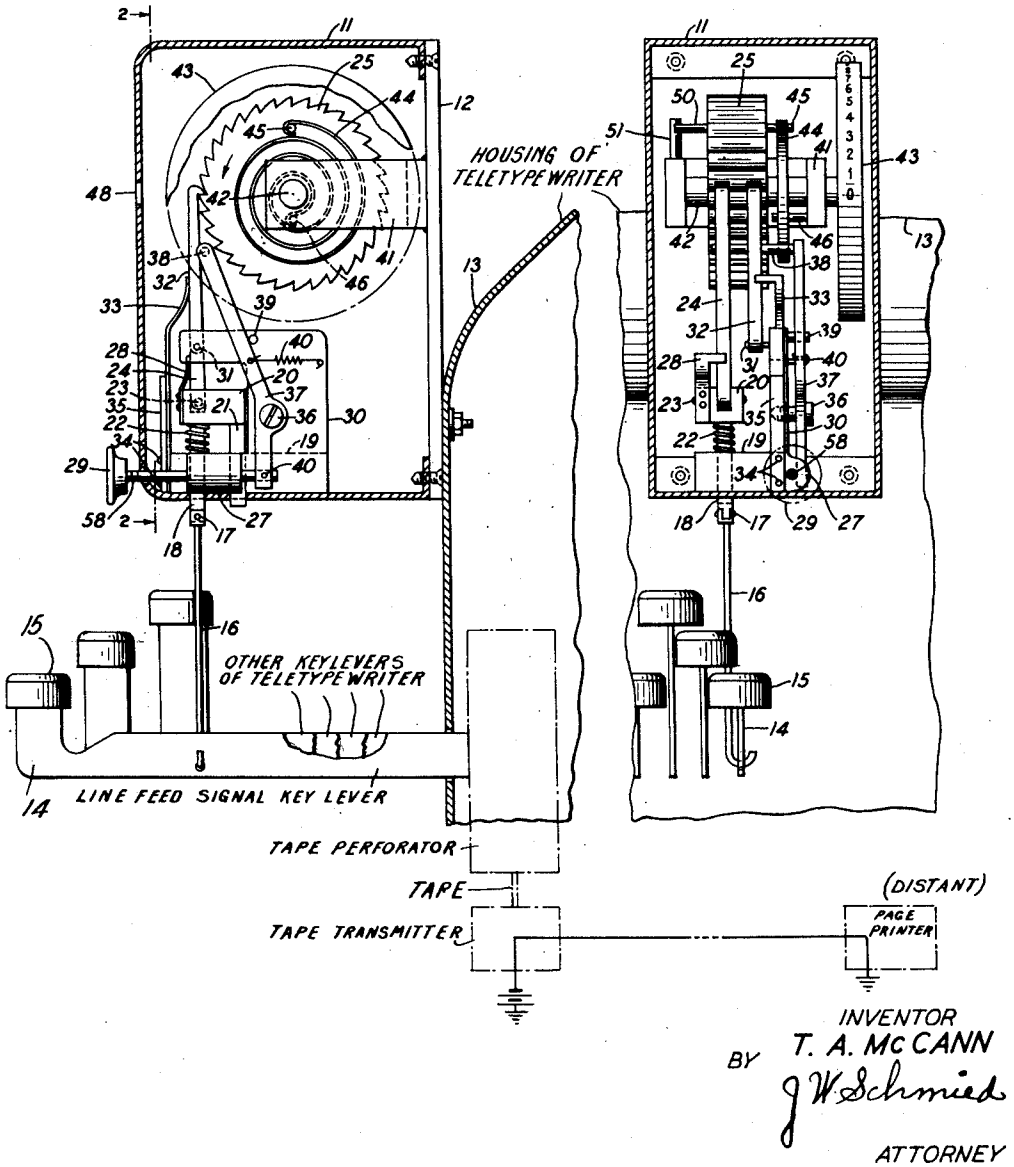
Feb. 27, 1940. T. A. McCANN 2,191,798

PRINTING TELEGRAPH COUNTING APPARATUS

Filed May 19, 1938

FIG. 1

FIG. 2



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PRINTING TELEGRAPH COUNTING APPARATUS

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4 Claims. (Cl. 178—17)

This invention relates to improvements in communication transmission apparatus, and more particularly to mechanism for indicating at the sending end of a communication circuit the number of line-feed signaling operations in a message transmitted with a telegraph printer.

An object of the present invention is to indicate at the sending end of a communication circuit an accurate count of the number of lines in a message as it is being perforated or transmitted. More specifically stated this object is to indicate at the transmitting end an accurate count of the number of lines recorded on form sheets at a remotely located page printer which is writing invoices or the like on a single sheet or attached sheets wherein the successive forms or invoices may be of uniform vertical length but on which are typed a variant number of lines of typed material.

In printing telegraph practice there have come to be used two general types of devices, one in which the record is printed on a continuous strip of material and where the printing element is stationary with respect to the platen such as is exemplified by United States Patent 1,745,633 granted to S. Morton et al. on February 4, 1930, and another in which the record is printed transversely by a movable, or floating, printing element upon a page or bulletin as is disclosed in United States Patent No. 1,904,164 granted to S. Morton et al. on April 18, 1933. These two general classes of devices differing structurally as may be seen from the references are nevertheless controllable by and capable of transmitting the same class of signaling impulses so that the devices of either class may be connected with those of the other and operated associatively. Since, however, the former class of device, which for convenience will be referred to hereinafter as "tape printers" are adapted to print consecutively without interruption for purposes of carriage return or line-feed operation, and since in contradistinction therewith the latter class of device, which for convenience will be referred to hereinafter as "page printers" may not be thus continuously operated, but must of necessity receive line-feed and carriage-return signals, this sole distinction makes it impracticable commercially to use the two classes of devices together, that is, in communication with each other without some means of indicating in connection with the transmitter associated with the tape printer the approach of the end of a line of page printing. Accordingly, when it is desired to use the two printers together a character counter such as described in United States Patent 2,018,368, granted to R. A. Lake on October 26, 1935, may be attached to a tape printer which will record the character operations individually and indicate by a special signal when a predetermined number of characters have been transmitted.

The character counter is also useful wherein the transmitted message is first perforated in tape preparatory to its automatic transmission through the line later. For applications in which the received copy is typed on organized printed forms, however, the character counter is insufficient. A line-feed counter is required to indicate to the perforator or tape printer operator the number of line-feed operations used in the message, so that a sufficient number of additional line-feed operations may be included to bring the succeeding form in the receiving machine into position for the first line of the next message. A further need for the line-feed counter is to afford the operator indications of lines which are to be left blank so that the organized form may be properly typed with respect to the printed headings, line and spaces on the form. Further, a line-feed counter is required when it is desired to have each message occupy uniform lengths of continuous roll stationery wherein the printer is not typing on forms scored at uniform vertical intervals.

According to the present invention a line-feed counter is provided for ordinarily indicating at the sending end of a communication circuit during transmission, an accurate count of the number of lines comprising a transmitted message, whether blank lines or lines of type material. Such uniform organization of messages is particularly applicable where the messages are received on form sheets such as are usually employed for recording orders, invoices, bills of goods, bills of lading, etc., that may be transmitted between stations of an intercommunication system. However, uniform lengths of messages are also desired at stations receiving them on continuous roll plain stationery. In transmitting information that must be recorded on forms or sheets of uniform length at a receiving station, it is, in many cases, necessary to skip, or leave blank, certain lines in order to reach a line wherein information must be furnished in answer to some stock question contained on the form or sheet. The counter of the present invention is concerned most with the skipping of lines, that is, leaving blank a predetermined number of lines at various points

in the message that is being transmitted and with sending the proper number of line-feed signals to bring the succeeding forms into position for the first line of typing. Whether or not, but in particular when the transmitting or perforating operator is working "blind" that is when no printed record of the transmitted message on a printed form similar to that in the receiving page printer is recorded at the sending point, the order or invoice would be correctly received on the form sheet at a distant point if the transmitting or perforating operator is provided at all times with an accurate indication of the number of line-feed operations used in typing the particular message on which the operator is working.

A feature of the invention is the provision of a simplified arrangement for operating the counting or stepping mechanism, without the use of electric circuits and for mechanically restoring the stepping mechanism and indicator whenever some predetermined number of line-feed signals have been transmitted.

Other objects and features will be noted in the following detailed description when taken in connection with the attached drawing and appended claims of which:

Fig. 1 is a cross-sectional end elevational view of the operative structure of the line-feed indicator shown attached to the housing of a teletypewriter machine; and

Fig. 2 is a front elevational view of the line-feed counters which view is taken along the dot and dash line 2—2 of Fig. 1.

Referring to Figs. 1 and 2, housing 11 of the indicator device is fixedly attached, as shown, to upright plate 12 which is securely fastened to housing 13 of the teletypewriter printer. Member 14 to which is securely fastened key cap 15 is one of a series of key levers of a teletypewriter employed for transmitting signals over an outgoing circuit. Loosely connected to key lever 14 is rod 16 which is pivotally connected by pin 17 to a bar 18. Bar 18 slidably extends through a cast base block 19 of solid material to a U-shaped block 20 with which it is integrally formed. At the right end of block 20 and integraly formed therewith is a guide member 21, which is arranged to extend downward through an aperture in the bottom of housing 11. A coil spring 22 is positioned on bar 18 so that when key 15 is depressed, block 20 and its guide member 21 are drawn downward to develop a potential energy in coil spring 22 so that when key 15 is released block 20 and guide member 21 will automatically restore to normal. Pawl 24 is pivotally mounted on pin 23 connected across the side arms of the U-shaped block 20. Pawl 24 is held in engagement with ratchet wheel 25 by a spring member 28 which is securely fastened by screws to the end of the left arm of bar 20 as shown in Fig. 2.

The right end of block 19 has integrally formed therewith a half cylinder 27, through the center of which is a boring into which is slidably arranged a key rod 58. On the free end of key rod 58 is securely fastened a button 29. Immediately to the rear of the half cylinder formation is a vertical plate 30 which is cast as an integral part of block 19. To the vertical support 30 is fastened a pin 31 on which is pivotally mounted pawl 32 maintained in engagement with ratchet wheel 25 with spring member 33. Spring member 33 is securely fastened to the left end of block 19 (Fig. 1) by screws 34 and is held rigid for more than half of its length by vertical plate 35 which is also secured to block 19 by screws 34. Also to the vertical support 30 but on the opposite side to pin 31, is pivotally mounted by means of screw 36 a release lever 37. Release lever 37 is pivotally connected to the end of key rod 58 as shown in Fig. 1. At the free, or upper, end of release lever 37 is securely fastened an elongated pin 38 which extends sufficiently to contact both pawls 24 and 32. Rigidly mounted at the upper part of vertical plate 30 is stop pin 39 for restraining the backward movement of release lever 37 against the tension of spring 40.

Fixedly supported by upright plate 12 is a U-shaped member 41 for providing a bearing for shaft 42. Fixedly mounted on shaft 42 are ratchet wheel 25 and indicator dial 43. Positioned around shaft 42 is an involute coil spring 44, one end of which is fixed to the ratchet wheel by pin 45 and the other end is fixedly attached by pin 46 to support 41. A stop pin 50 is securely fastened to the ratchet wheel to serve in conjunction with a stop pin 51 securely fastened to U-shaped member 41 as shown in Fig. 2, as a means of stopping the rotation of the ratchet wheel when pawls 24 and 32 are moved out of engagement with the wheel and the wheel is thereby permitted to rotate to its normal position under the energy stored in coil spring 44.

Indicator 43 has arranged around its periphery consecutive numbers, 0, 1, 2, 3 etc., up to say 66 or any number representing the number of lines provided for an order or invoice form. To provide the operator with a visual indication of the number of line-feed operations, an aperture 48 is cut in housing 11 so that only one number on dial 43 is visible at any time.

Operation

Upon transmission of a line-feed signal by depressing key 15, pawl 24 is drawn downward following the motion of the key lever 14 through the linkages 16, 18 and 20. When key lever 15 is at the bottom of its downward travel the ratchet wheel 25 has been advanced counter-clockwise one tooth with respect to retaining pawl 32. Retaining pawl 32 through the action of resilient member 33 thereby engages the succeeding tooth on ratchet wheel 25 thereby restraining clockwise rotation of the ratchet wheel imparted by coil spring 44. By this means ratchet wheel 25 remains in the advanced position when key 15 is released and the succeeding digit on the indicator dial 43 is observed through aperture 48. When key 15 is released it is returned to the normal position shown in Figs. 1 and 2 by action of spring 22 on bar 18. In this position pawl 24 engages the same tooth on ratchet wheel 25 as pawl 32 and the mechanism is in condition to indicate the next line-feed operation in the manner just described.

The operator, knowing the line-feed length of the printed form or invoices on which the message is to be recorded by the distant page printer and the line-feed spaces required between the items of the message is provided with a facility for properly aligning the typed message to correspond to the spaces for these items provided on the form or invoice as may readily be illustrated by the following example: Assume that the forms in the distant page printer are eleven inches or sixty-six line-feed long, three lines are used for the address and ten lines further down on the page, space is provided for the first item of several which may be a list for example of a bill of goods. Assume further that the oper-

ator is required to prepare the message in perforated tape for subsequent transmission to the line. Starting with the indicator dial at zero, the tape is perforated. As described above the indicator is advanced one digit on each operation of the line-feed key. Completing the address the operator sees the digit 3 showing on dial **43**. Knowing that the first item of goods is to be typed, ten line-feed spaces down on the form, the operator depresses line-feed key **15** ten times or until dial **43** shows digit 13 through the aperture **48**. As many items as are required for the particular bill are then perforated in the tape. When perforation of these items is complete, suppose the operator notes that digit 56 is showing through aperture **48**. The operator simply perforates a continuation of line-feed signals until digit 66 is indicated on dial **43**. Thereupon, release button **29** is pushed causing pawls **24** and **32** to disengage the teeth on ratchet wheel **25** permitting it to rotate clockwise under action of involute coil spring **44** until stop pin **47** engages back stop **48**. Ratchet wheel **25** is now in the normal or starting position and digit 0 on dial **43** shows through aperture **48**. On restoring the indicator to normal, material for the succeeding form may be prepared in a manner described above. It is evident that the device is applicable to other operating conditions than that described in the example referred to as illustrative of this operation and is not limited to "blind" perforation of transmitting tape nor to the preparation of form material of any given or uniform length.

What is claimed is:

1. In a printing telegraph system, a tape printer, a source of signal potential connected to said tape printer, a page printer, a signal transmission medium interconnecting said printers, a line-feed signal key forming a part of said tape printer for causing a line-feed signal to be sent from said source to said page printer, and a counting device connected to said tape printer and mechanically operated by said line-feed signal key for counting the line-feed signals transmitted to said page printer.

2. In a printing telegraph system, a tape printer, a source of signal potential connected to said tape printer, a page printer, a signal transmission medium interconnecting said printers, a tape perforator including a moving tape and forming a part of said tape printer, a line-feed signal key forming a part of said tape printer for causing in conjunction with said source of signal potential a line-feed signal combination to be perforated in said perforator tape, a tape transmitter for impressing said line-feed signals perforated on said perforator tape on said transmission medium, and a device mechanically connected to and operated by said line-feed signal key for counting and indicating the number of line-feed signals perforated in said tape for subsequent transmission to said page printer.

3. In a printing telegraph system, a tape printer having a movable tape, a source of signal potential connected to said tape printer, a page printer having a movable page, a transmission circuit interconnecting said printers, a tape perforator including a moving tape and forming a part of said tape printer, a line-feed signal key forming a part of said tape printer for causing in conjunction with said source of signal potential a line-feed signal combination to be perforated in said tape, a tape transmitter for subsequently transmitting signals corresponding to said line-feed signal combinations over said transmission circuit, means in said page printer for moving said movable page in response to each of said line-feed signals received from said transmission circuit and a device mechanically connected to and operated by said line-feed signal key for counting and indicating during perforation the total number of line-feed signal combinations perforated in said perforator tape.

4. In a printing telegraph system, a tape perforating device, and a transmitter controlled by the perforated tape and adapted to impress upon an outgoing circuit electrical impulses determined by the perforations of the tape, and means enabling the operator of the tape perforating device to prepare tape records suitable for controlling a page printer at a distant point in the outgoing circuit comprising a line-shift key for performing a line-shift perforating operation in the tape, said means including an indicator mechanically connected to the line-shift key to be operated thereby whereby the operator is apprised of the position of a page which is being printed at the distant page printer.

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