June 9, 1942. A. K. ALLEN 2,285,790

WEB FEEDING MECHANISM

Filed Feb. 24, 1939 2 Sheets-Sheet 1

FIG. 1

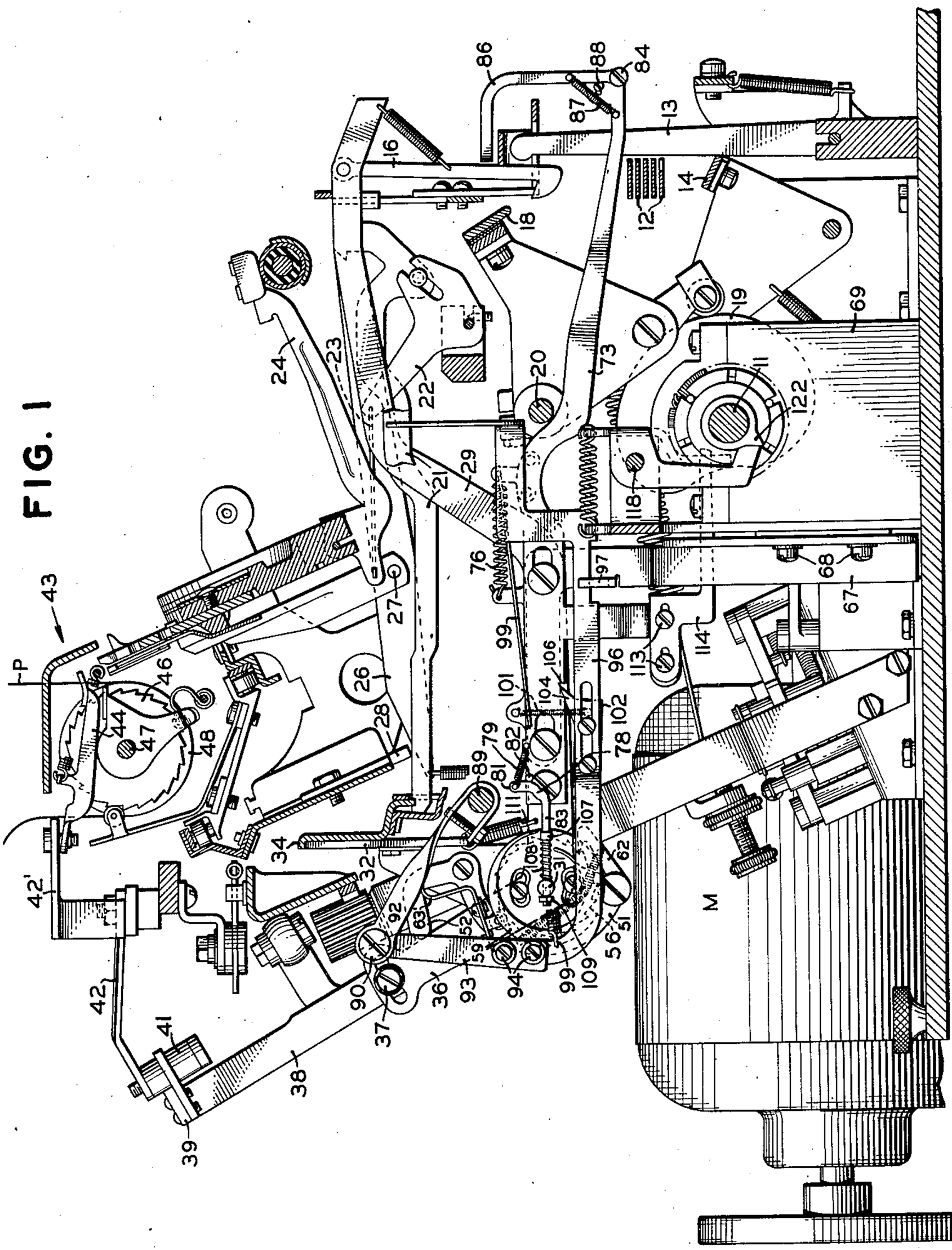

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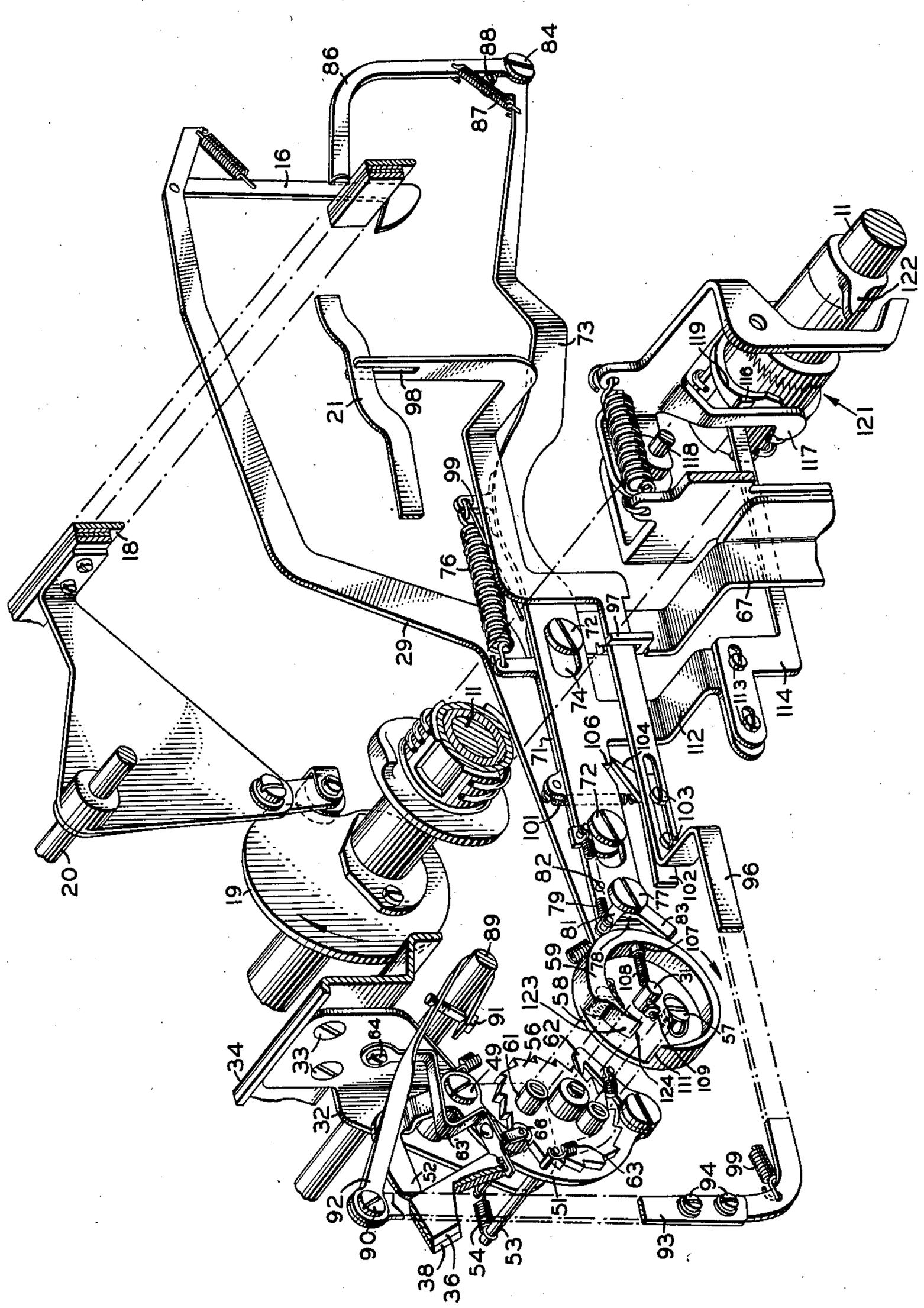
FIG. 2



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Patented June 9, 1942

2,285,790

UNITED STATES PATENT OFFICE

2,285,790

WEB FEEDING MECHANISM

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Application February 24, 1939, Serial No. 258,147

21 Claims. (Cl. 178—42)

This invention relates in general to web feeding mechanisms and more particularly to such mechanisms when used in conjunction with page type telegraph printers so that on the receipt of a predetermined signal at the end of the message the recording web or paper is automatically advanced an amount which varies inversely with the length of the message in order that message blanks of substantially uniform length are formed.

The invention is shown and hereinafter described as being attached to and operating in conjunction with a page printer of the type disclosed in the copending application of P. A. Noxon et al., Serial No. 66,906, filed March 3, 1936, and entitled "Telegraph printer"; however, the principles of the invention may readily be applied to various other types of printers.

In telegraph printers of the type mentioned above, the recording paper is usually supplied to the printer from a continuous roll from which it is desired to form message blanks of substantially uniform length. Heretofore the usual practice when employing such a roll of recording paper was to record the messages and at the end of each message transmit a sufficient number of line feed signals to advance clear sections of the paper so that each message blank was of substantially uniform length. As the message blanks came from the printer they were cut or torn at the proper places to separate the various messages and remove them from association with the printer. Devices have been developed to automatically advance the paper various amounts at the end of a message to form a blank of standard length in substantially equal intervals of time or the time required for one or two signal characters. However, since the messages vary in length the amount of paper to be advanced at the end of the messages varies, and where varying amounts of paper are advanced in substantially equal intervals of time, varying amounts of slippage of the paper occurs. Such arrangements also place an abnormal load on the printer motor. It is therefore one of the objects of this invention to provide an attachment for printers of the above type which in response to a predetermined signal enables the receiving printer to automatically perform varying numbers of line feed operations, so that the total number of line feed operations performed during the receipt of a message which are those performed in response to line feed signals and those performed in response to the predetermined signal are equal to a given number for each message. In this manner the number of line feed signals for each message are the same and the paper is advanced equal amounts for each message received.

Another object of the invention resides in the simplicity and the ease with which it is attached to the printer of the above type.

Another object of the invention is to free the selector mechanism of the printer during the successive line feed operations, with the exception of the first operation, and thus enable the printer to respond to other signals, such as the unshift and carriage return signals during the advancement of the blank paper through the printer.

These and further objects of the invention will be apparent from the following detailed description hereof when taken in conjunction with the drawings, in the latter of which:

Fig. 1 is a vertical sectional view taken substantially through the transverse center of the above mentioned printer, showing some of the more important operating elements and the manner in which the attachment comprising the invention is associated and cooperates therewith to accomplish the above objects; and

Fig. 2 is a perspective view, partly in section, of the attachment comprising the invention showing the manner in which it cooperates with the operating elements of the associated printer.

The above mentioned printer is fully described in the copending application Ser. No. 66,906, and the description thereof will hereinafter be limited to its general operation and to the operation of the elements which cooperate with the invention. In general, the printer consists of a constantly rotating power shaft 11, Fig. 1 and 2, driven by an electric motor M, to which are clutched various operating cams for one revolution at a time in conjunction with each character group of signals received. The operating cams through appropriate linkages and mechanisms perform the various functions of the printer. A set of notched permutation bars 12 shown in section in Fig. 1 are selectively positioned in accordance with received code groups by a selector mechanism (not shown) in the well known manner and for each combination of settings of the permutation bars 12, a notch in each of the bars is in alignment with the notch in each of the other bars. Following the selective positioning of the permutation bars 12, a group of drop-in bars 13 are allowed to approach the notched sides of the permutation bars and the one opposite the aligned row of notches is

allowed to pivot a slight amount further than the rest. A bail 14 controls the operation of the drop-in bars, which in turn is controlled by a cam (not shown) driven from the main operating shaft 11. Associated with the upper end of each of the drop-in bars 13 is a pivoted hook 16, each one of which is in turn pivotally attached to an operating or function control lever in the printer. When a drop-in bar 13 enters a row of aligned notches in the permutation bars 12, it engages its associated hook 16 to pivot the same beneath an operating bail 18. The operating bail 18 pivots on a shaft 20 and is controlled from an operating cam 19 on the shaft 11 to move downward once for each received character group or for each revolution of the cam 19. As the bail 18 moves downward, it engages the actuated hook 16 and through its associated operating lever performs a printing operation or a printer function depending upon which one of the drop-in bars 13 enters a row of aligned notches in the permutation bars 12. When the bail 19 returns to its normal position, the hook it engages also returns to its normal position as at this time the drop-in bars 13 have returned to their normal positions.

Each printing operation is performed by a type bar operating lever, such as 21, pivotally mounted at its rear or left hand end, as shown in Fig. 1. Associated with each type bar operating lever 21 is a bell crank 22 which by a link 23 operates the associated type bar 24. Another operating lever 26, pivotally mounted at 27, controls the elevation of the platen carriage in the well known manner to permit the printing of either one or the other of the two characters on each type bar 24. When the lever 26 is actuated in response to the shift signal, the left hand end engages a plate 28 on the movable carriage to elevate the same to its shift position. A latch (not shown) thereupon latches the carriage in its elevated shift position and the operation of another operating lever (not shown) actuates the latch to allow the carriage to return to its lower or unshift position in response to the unshift signal. A line feed operating lever 29, Figs. 1 and 2, is adapted to perform a line feeding operation on each operation thereof. The line feed operating lever 29 is pivoted on a horizontal stud 31 supported in a bracket 32, which in turn is attached by screws such as 33 to a frame member 34 at the rear of the printer. The lever 29 has an upwardly extending arm 36 adjacent its left hand end to which is adjustably secured by a screw 37 an arm 38. The lower end of the arm 38 is supported on the stud 31 and the upper end thereof carries a bail member 39 which extends transversely of the printer. Associated with the bail 39 is a roller 41 pivotally supported on the movable platen carriage, indicated in general by reference numeral 43. The other arm 42' of the bell crank 42 has pivotally attached thereto a pawl member 44, which cooperates with a ratchet 46 on the platen shaft 47, to rotate the platen shaft a predetermined amount for each operation of the line feed operating lever 29. The bail 39 is in operative relation with the roller 41 for any position of the platen carriage 43, and therefore the platen shaft 47 can be rotated with the carriage in any of its transverse positions. The platen shaft 47 has secured thereto for rotation therewith the platen roller 48 and the recording paper P is held in engagement with the platen roller 48 by spring biased rollers (not shown) and therefore each time the platen is rotated the paper is advanced a corresponding amount.

Pivotally mounted on a shoulder screw 49 extending from the bracket 32 is a lever 51. A leftwardly extending arm 52 at the upper end of the lever 51 is in alignment with and normally engaged with the right hand edge of the upwardly extending arm 36 of the line feed operating lever 29. A spring post 53 extending from the lever 51 has a spring 54 attached thereto and biases the lever 51 in its normal position. Pivotally mounted on the stud 31 is a ratchet wheel 56 and secured thereto for rotation therewith by screws such as 57 is a circular disc 58 which has formed integral therewith a plate or face cam 59. Spacers 61 on the screws 57 space the ratchet 56 and disc 58 a slight distance apart. Pivotally carried in the lower end of the lever 51 is a pawl 62 which is held by a spring 63 in operative relation with the periphery of the ratchet wheel 56. Each time the hook 16 associated with the line feed operating lever 29 is pivoted beneath the operating bail 18 in response to a line feed signal and the lever 29 pivoted in a clockwise direction as hereinafter described, the lever 51 pivots a slight amount in a clockwise direction. As the lever 51 is thus pivoted the pawl 62 associated therewith engages a tooth on the ratchet wheel 56 and rotates the same an amount equal to the distance between two consecutive teeth. The subsequent return of the line feed operating lever 29 to its normal position allows the spring 54 to pivot the lever 51 in a counterclockwise direction, whereupon the pawl 62 engages the next tooth on the ratchet wheel 56. A flexible member 63', secured to the bracket 32 by a screw 64, pivotally carries in the free end thereof a detent roller 66. The roller 66 presses against the periphery of the ratchet wheel 56 and prevents rotation thereof in a counterclockwise direction as the pawl returns to its normal position to pick up another tooth. For reasons hereinafter apparent, the number of teeth on the ratchet 56 are equal to the number of line feed operations that are necessary to advance the blank recording paper a distance equal to one message blank and therefore the ratchet 56 makes one complete revolution while the recording paper is being advanced the length of one message blank.

In accordance with the invention a bracket member 67 is secured by means of screws 68, Fig. 1, to the rear side of a bearing block 69. The bracket member 67 has a horizontal section 71, Fig. 2, at its upper end and supported in the section 71 in horizontal spaced relation are two shoulder screws 72. Slidably mounted on the shoulder screws 72 is a so-called substantially horizontal blank ejecting control lever 73, in which elongated slots 74 permit longitudinal movement thereof within the limits of the slots as will be hereinafter described. A spring 76, one end of which is secured to the bracket member 67 and the other to the blank ejecting control lever 73, tends to slide the lever 73 toward the left. However it is normally maintained in its right hand position by means hereinafter described.

Pivotally mounted on a shoulder screw 77 in the left hand end of the blank ejecting control lever 73 is a bell crank 78. With the lever 73 in its normal right hand position as shown in Fig. 1 a spring 79, attached to the upwardly extending arm 81 of the bell crank, holds the same against a stop pin 82 in the lever 73. When the

bell crank 78 is in this position the arm 83 thereof is in a substantially horizontal position for certain positions of the plate cam 59, as hereinafter described. Pivotally mounted on a shoulder screw 84, Figs. 1 and 2, in the right hand end of the blank ejecting control lever 73 is an inverted L shaped lever 86, the upper leftwardly extending end of which is in alignment with the hook 16 associated with the line feed operating lever 29. A spring 87, secured to the lever 73 and the member 86, normally holds the lever against a stop 88. When the lever 73 is in its normal or right hand position the upper end of the member 86 is a slight amount in front of the hook 16 on the line feed operating lever 29.

A transverse rod 89 in the printer is adapted, as fully described in the above mentioned application, to pivot a slight amount in a counterclockwise direction as the carriage moves from its unshift to its shift position. Likewise the rod 89 pivots a slight amount in a clockwise direction when the carriage moves from its shift to unshift position. Clamped to the rod 89 by a screw 91 for pivotal movement therewith is an arm 92. The arm 92 extends toward the left and pivotally supports in the free end thereof by means of a shoulder screw 90, a depending link 93. Secured to the lower end of the link 93 by screws 94 is the left hand end of a so-called floating lever 96. The floating lever 96 is guided adjacent its center by a bent slotted section 97 of the bracket member 67 and the upwardly extending right hand end thereof has a bifurcation 98 therein. A predetermined one of the type bar operating levers 21 is engaged in the bifurcated end of the floating lever 96 and in the preferred embodiment of the invention it is the operating lever which controls the operation of the F typebar. A spring 99, one end of which is attached to the floating lever 96 and the other to the blank ejecting control lever 73, normally tends to pivot the floating lever and link 93 in a counterclockwise direction about the shoulder screw 90. Another spring 101 vertically disposed is secured to a catch 102 on the floating lever 96 and tends to elevate the front end thereof. The catch 102 is adjustably attached to the floating lever 96 by screws such as 103 and a wedge-shaped portion 104 thereof is in operative relation with a notch 106 in the underside of the blank ejecting control lever 73 disposed thereabove. The wedge-shaped portion 104 and the notch 106 cooperate at predetermined times, as will be hereinafter described, to hold the blank ejecting control lever 73 in its forward or right hand position.

In the forward end of the stud 31 is a horizontal hole perpendicular to the axis thereof and slidably mounted in the hole is a plunger 107. The plunger 107 is in the same horizontal plane as the shoulder screw 77 on the blank ejecting control lever 73. A compression spring 108 coiled about the plunger 107 tends to slide the plunger toward the right and keeps the end of the plunger in engagement with the inside surface of the plate cam 59.

In Fig. 1 the plate cam 59 is shown in the position it assumes when the recording paper is in position to have the first line of a message recorded thereupon. In this position of the plate cam 59 the gap therein is opposite the right hand end of the plunger 107 and the right hand end of the plunger is in engagement with the left hand end of the arm 83 of the bell crank 78. A stop 109 on the left hand end of the plunger 107 limits the amount of movement of the plunger toward the right and the spring 108 on the plunger is of sufficient strength to overcome the strength of the spring 76 tending to move the blank ejecting control lever 73 to the left, and therefore the lever 73 is held in its right hand position.

Let is be assumed that a message is received and that it required eight lines to record it on the recording paper, accordingly during receipt of the message there will be seven line feed operations which will leave the recording paper with the last line of the message in printing position. The first line feed operation during the receipt of the message causes the plate cam 59 and ratchet wheel 56 to rotate as hereinbefore described in a clockwise direction the distance of one tooth on the ratchet wheel. As the plate cam 59 is thus rotated, the leading edge 111 thereon engages the upper surface of the end of the arm 83 of the bell crank 78 and pivots it a slight amount in a counter-clockwise direction. At the same time the leading edge 111 of the plate cam 59 passes in front of the right hand end of the plunger 107, the adjustment of the stop 109 being such that the right hand end of the plunger is just clear or to the left of the leading edge 111 of the cam 59. As the bell crank 78 pivots in a counter-clockwise direction as above described, the arm 83 thereof is no longer in line with the direction of movement of the blank ejecting control lever 73 and therefore the attached spring 76 is allowed to move the same a slight amount toward the left or until the end of the wedge-shaped portion 104 of the catch 102 engages the vertical section of the notch 106. The catch 102 therefore stops further movement of the blank ejecting control lever 73 toward the left. This movement of the blank ejecting control lever 73 toward the left is not sufficient to allow the end of the arm 86 to engage with the front side of the hook 16 associated with the line feed operating lever 29 and therefore the hook 16 on the line feed operating lever continues to be under the control of its associated drop-in lever 13.

Each succeeding line feed operation performed in response to a line feed signal of which there are seven for the assumed message, rotates or steps the ratchet wheel 56 and plate cam 59 one tooth for each line feed signal and at the end of the message the ratchet wheel 56 and cam 59 will be an amount equal to seven teeth from their normal position.

If it is assumed that eighteen line feed operations are necessary to advance the recording paper an amount equal to the length of one telegraph blank, then for the assumed message of eight lines in which there were seven line feed signals, eleven more line feed signals are necessary to advance the recording paper the length of one telegraph blank for such a message. In accordance with the invention, as will hereinafter be described, the transmission of a predetermined signal causes the recorder to perform successive line feed operations until the total number of line feed operations performed in response to line feed signals during the receipt of the message itself and those automatically performed in response to the predetermined signal equal a given number, which in the assumed case is eighteen. The predetermined signal which initiates the successive line feed operations in accordance with the invention is a shift of F. Such a signal, as well known in the art, is an F signal

code combination received with the recorder in a shifted position. Therefore at the end of the message a shift signal is transmitted if the printer happens to be in an unshift signal and is followed by a code combination representing the letter F. As hereinbefore described the shift and unshift signals elevate and depress, respectively, the platen carriage 43 so that lower and upper case characters can be recorded and during such movement of the platen carriage the rod 89 rotates a slight amount in a counter-clockwise direction in response to shift signals and a slight amount in a clockwise direction in response to unshift signals. As the rod 89 rotates in a counter-clockwise direction the lever 92 rotating therewith depresses the link 93 and the left hand end of the floating lever 96. During such movement of the floating lever 96 the wedge-shaped portion 104 on the catch 102 attached adjacent the center of the lever 96 acts as a pivot point and consequently the forward right hand end of the floating lever rises. This upward movement of the right hand end of the floating lever 96 places the bottom of the bifurcation 98 in the lever 96 in engagement with or a slight amount below the lower edge of the F typebar operating lever 21 to operate therewith as will hereinafter be described. When the platen carriage 34 is in its unshift position the bottom of the bifurcation 98 in the right hand end of the floating lever 96 is an appreciable amount below the bottom edge of the F typebar operating lever 21 and during the operation of the lever 21 with the carriage in this position it does not engage the bottom of the bifurcation 98. Therefore the operation of the lever 21 with the carriage in its unshift position has no effect on the floating lever 96.

With the right hand end of the floating lever 96 elevated, as described in response to a shift signal, the next time the F operating lever 21 is actuated downward, the lower edge thereof engages the bottom of the bifurcation 98 and pivots the floating lever downward with the shoulder screw 90 at the upper end of the link 93 serving as a pivot point. This movement of the floating lever 96 lowers the catch 102 attached thereto and withdraws the wedge-shaped portion 104 from out of engagement with the notch 106 on the lower edge of the blank ejecting control lever 73. Thereupon the spring 76 attached to the lever 73 is allowed to slide the lever toward the left to some such position as shown in Fig. 2, as limited by the slots 74 therein engaging the shoulder screws 72.

As the blank ejecting control lever 73 moves to the left the arm 86 on the forward end thereof engages and pivots the hook 16 associated with the line feed operating lever 29 beneath the operating bail 18 and as long as the lever 73 remains in this position the line feed operating lever 29 will be operated to perform a line feed operation, as hereinbefore described, each time the bail 18 operates. A depending section 112 of the blank ejecting control lever 73 has adjustably attached thereto, by screw such as 113, an auxilary clutch trip lever 114. The trip lever 114 has a hook 116 adjacent its forward end, which is in operative relation with the main operating clutch throwout lever 117. The throwout lever 117 is pivotally mounted on a rod 118 and it cooperates with a throwout cam 119 to control the operation of a toothed or positive drive clutch indicated in general by reference numeral 121 in the well known manner. Normally the throwout lever 117 is operated by a cam 122 rotated in response to the start signal of each code group to release the operating cam such as 19 for one revolution at a time. However when the blank ejecting control lever moves into its left hand position the hook 116 engages the throwout lever 117 and holds it in an operated position as long as the lever 73 remains in its left hand position. Therefore the toothed clutch 121 remains engaged and the operating cams such as 19 continue rotating as long as the lever 73 remains in its left hand position.

During each revolution of the cam 19 the print bail 18 is operated and since the hook 16 on the line feed operating lever 29 is at this time held in operative alignment with the bail 18, a line feed operation will be performed during each revolution of the cam 19 for the above described conditions. As described above, each line feed operation causes the ratchet wheel 56 and plate cam 59 to be rotated a distance equal to one tooth on the ratchet 56 and as the cam 59 rotates the inner surface thereof which is of progressively decreasing radius and in engagement with the right hand end of the plunger 107, slides the plunger toward the left. This movement of the plunger 107 compresses the spring 108, the compression of which, as hereinafter described, is employed to reset the blank ejecting control lever 73 to its normal position. When the plate cam 59 has completed nearly a revolution, a cutaway section or notch 123 in the outer periphery thereof rotates opposite the end of the arm 83 of the bell crank 78. With the notch 123 in the cam 59 in this position, the spring 79 is allowed to pivot the bell crank 78 against the stop 82 and place the end of the arm 83 thereof opposite the end of the plunger 107. This operation occurs near the end of a revolution of the plate cam 59 and on the eighteenth line feed operation since the start of the message the cam 59 completes a revolution. During the eighteenth step of the cam 59 the trailing edge 124 thereof rotates down past the end of the plunger 107 whereupon the spring 108 is allowed to move the plunger to the right. During such movement of the plunger 107 the right hand end engages the left hand end of the arm 83 of the bell crank 78 and as the arm 83 at this time is parallel to the slots 74 in the blank ejecting control lever 73 this movement of the plunger moves the bell crank 78 and the lever 73 to the right, the spring 108 being of sufficient strength to overcome the tension in the spring 76. When the blank ejecting control lever 73 moves to the right, back into its normal position, the arm 86 at the front end thereof allows the hook 16 on the line feed operating lever 29 to pivot out from beneath the operating bail 18 and at the same time the trip lever 114 in moving toward the right allows the throwout lever 117 to be operative to disengage the clutch 121 when the operating cams complete their current revolution.

Thus for the assumed message comprising for example eight lines wherein seven line feed signals were transmitted to perform line feed operations, the transmission of a predetermined end-of-message signal, such as the shift F, at the end of the message will automatically initiate or condition the line feeding mechanism to perform eleven additional and successive line feed operations or so that the total number of line feed operations performed in conjunction with each message received is equal to some predetermined number such as eighteen. In this way the amount of paper fed through the printer for each

message is the same regardless of the length of the message, provided the length of the message does not exceed a predetermined length. Obviously if a message comprising more than eighteen line feed operations was received, the transmission of the end-of-message signal would allow the cam 59 to complete a revolution wherein the paper would be advanced an amount equal to some multiple of eighteen line feed operations.

With the above arrangement all that the operator at the sending point has to do at the end of the message is to transmit the predetermined end-of-message signal to form message blanks of equal length where heretofore the operator had to count the number of lines in the message transmitted and then transmit line feed signals until the total number of line feed signals transmitted equalled a given number such as eighteen.

Another advantage of the above arrangement is that as the operating cam 19 is not stopped after each revolution during the performance of the successive line feed operations intiated in response to the end-of-message signal, less time is required for the receiving printer to perform a given number of such successive line feed operations than would be required to perform an equal number of line feed operations in response to individual line feed signals. Therefore, the above arrangement effects a saving in line time and allows the transmitting operator time for duties such as arranging messages, etc., while the receiving printer is advancing the message blank in response to the end-of-message signal. Where the line feed operations are thus successively performed in response to an end-of-message signal, there is no abnormal load imposed upon the printer motor as there would be if a length of the recording paper equal to two or more line feed operations were advanced in the interval of one signal period. Accordingly, the printer motor can be of a minimum size. By changing the number of teeth on the ratchet wheel 56, the number of line feed operations necessary for it to make one complete revolution can be changed and therefore the number of line feed operations to advance the recording paper in response to a message can be shortened or lengthened. As the selector mechanism of the printer is not operating during other than the first of the successive line feed operations it can be operated in response to various signals, such as carriage return and unshift signals, permitting the associated function to be performed concomitantly with one or more of the successive line feed operations, thereby effecting an additional saving in line time. A special operating lever responsive to an end-of-message signal to operate the blank ejecting control lever 73 could be employed which operated independently of the shift and unshift positions of the printer and thereby advance blank paper with the printer in either position, the above arrangement of initiating the advancement of blank paper in response to an end-of-message signal, such as the shift of F, being chosen merely for the purpose of illustration.

It is obvious, of course, that various modifications of the apparatus shown and described herein may be made without departing from the spirit or essential attributes of the invention, and it is desired, therefore, that only such limitations shall be placed thereon as are imposed by the prior art or are specifically set forth in the appended claims.

What is claimed is:

1. In combination with a telegraph receiver having shift and unshift positions, a recording paper, a line feed operating lever for advancing said paper through said receiver a predetermined amount on each operation thereof, said line feed operating lever normally being operative once in response to each received line feed signal and means operative in response to a predetermined signal with said telegraph receiver in one of said shift positions when preceded by at least one operation of said line feed operating lever in response to a line feed signal for conditioning said line feed operating lever for a plurality of successive operations whereby the number of operations thereof performed in response to line feed signals and in response to said predetermined signal invariably equals a given number.

2. In combination with a telegraph receiver having shift and unshift positions, a recording paper, a line feed operating lever for advancing said paper through said receiver a predetermined amount on each operation thereof, said line feed operating lever normally being operative once in response to each received line feed signal, means for rendering said line feed operating lever operative in response to a predetermined signal with said receiver in one of said shift positions to perform a plurality of line feed operations and means for returning said line feed operating lever to normal when the total number of line feed operations performed in response to said line feed signals and said predetermined signal is equal to a given number.

3. In a telegraph machine responsive to received signals and employing a recording web upon which the signals are recorded, a recording web advancing means adapted to advance said web a predetermined amount on each cycle of operation thereof, signal controlled means for conditioning said web advancing means for one cycle of operation in response to each received web advancing signal, means responsive to another predetermined signal for conditioning said medium advancing means for a plurality of successive cycles of operation and means dependent upon the number of cycles of operation of said web advancing means when conditioning for operation in response to said web advancing signals for determining the number of cycles of operation of said web advancing means in response to said predetermined signal.

4. In a telegraph machine responsive to received signals and employing a recording web upon which the signals are recorded, a recording web advancing means adapted to advance said web a predetermined amount on each cycle of operation thereof, signal controlled means for conditioning said web advancing means for one cycle of operation in response to each received web advancing signal, means responsive to another predetermined signal for conditioning said medium advancing means for a plurality of successive cycles of operation, means for performing said successive cycles of operation of said web advancing means when conditioning for operation in response to said predetermined signal in less time than that required to perform an equal number of cycles of operation when conditioning for operation in response to successive web advancing signals and means dependent upon the number of cycles of operation of said web advancing means when conditioning for operation in response to said web advancing signals for determining the number of cycles of opera-

tion of said web advancing means in response to said predetermined signal.

5. In combination with a telegraph receiver positionable into shift and unshift positions in response to shift and unshift signals respectively, a recording paper, a line feed operating lever for advancing said paper through said receiver a predetermined amount on each operation thereof, said line feed operating lever normally being operative once in response to each received line feed signal, means operative in response to a predetermined signal with said telegraph receiver in one of said shift positions for successively operating said line feed operating lever a plurality of times and means determined by the number of operations of said line feed operating lever in response to line feed signals occurring since the last one of said predetermined signals for determining the number of operations of said line feed operating lever in response to the instant one of said predetermined signals.

6. In combination with a telegraph receiver having a shift and unshift position, a recording paper, a line feed operating lever for advancing said paper through said receiver a predetermined amount on each operation thereof, said line feed operating lever normally being operative once in response to each received line feed signal, means operative with said receiver in one of said shift positions for rendering said line feed operating lever operable to perform a plurality of successive line feed operations in response to a predetermined signal and means for stopping to operation of said line feed operating lever when the total advancement of said recording paper in response to said line feed signals and said predetermined signal is equal to a given amount.

7. In combination, a web, a web advancing means adapted to advance said web in the direction of its length a predetermined amount on each operation thereof, a first means for conditioning said web advancing means for one operation at a time on each operation of said first means, a second means for conditioning said web advancing means for one or more operations at a time on each operation of said second means, means dependent on the number of operations of said first means following the last operation of said second means for determining the number of operations of said web advancing means when conditioned for operation again by said second means and means for performing said web advancing means operations when said web advancing means is conditioned for operation by said second means when said operations are more than one in less time than that required to perform an equal number of web advancing operations when said web advancing means is conditioned for operation by said first means.

8. In combination, a telegraph receiver employing a selector mechanism controlled by received telegraph signals, a recording web associated with said receiver, a recording web advancing means, dual means controlled by said selector mechanism for conditioning said web advancing means for operation, the first of said means conditioning said web advancing means for one operation at a time, the second of said means conditioning said web advancing means for one or more operations at a time and means controlled by the number of operations of said web advancing means when conditioned for operation by said first means following an operation of said second means for determining the number of operations of said advancing means when conditioned for operation by said second means.

9. In combination, a telegraph receiver employing a selector mechanism controlled by received telegraph signals, a recording web associated with said receiver, a recording web advancing means, dual means controlled by said selector mechaism for conditioning said web advancing means for operation, the first of said means conditioning said web advancing means for one operation at a time, the second of said means conditioning said web advancing means for one or more operations at a time, means controlled by the number of operations of said web advancing means when conditioned for operation by said first means following an operation of said second means for determining the number of operations of said advancing means when conditioned for operation by said second means and means for operating other selector mechanism controlled functions during the operation of said web advancing means other than the first one of said web advancing operations when said web advancing means is conditioned for operation by said second means.

10. In combination with a telegraph receiver positionable into shift and unshift positions in response to shift and unshift signals respectively, a recording paper, a recording paper advancing means for advancing said paper through said receiver a predetermined amount on each operation of said advancing means, means for operating said advancing means once in response to each of a first predetermined signal, means operative in response to a second predetermined signal with said receiver in one of said shift positions for operating said advancing means a plurality of times and means for preventing the operation of said advancing means on the receipt of said second predetermined signal with said receiver in the other of said shift positions.

11. In combination, a telegraph receiver selectively operable in response to received signals, a recording web, a recording web advancing means adapted to advance said web a predetermined amount on each operation thereof, a counting mechanism having a cycle of operation in which it is moved from a normal position through various operating positions back to said normal position, said counting mechanism being moved from one position to another on each operation of said advancing means, means operative on the receipt of each web advancing signal to operate said web advancing means to advance said counting mechanism to register the number of said advancing operations and means operative on the receipt of a predetermined signal to operate said advancing means a plurality of times until said counting mechanism is in said normal position.

12. In combination, a telegraph receiver selectively operable in response to received signals, a recording web, a recording web advancing means adapted to advance said web a predetermined amount on each operation thereof, a counting mechanism having a cycle of operation in which it is moved from a normal position through various operating positions back to said normal position, said counting mechanism being moved from one position to another on each operation of said advancing means, means operative on the receipt of each web advancing signal to operate said web advancing means to advance said counting mechanism to register the number of said advancing operations, means op-

erative on the receipt of a predetermined signal to operate said advancing means a plurality of times until said counting mechanism is in said normal position and means for stopping the operation of said web advancing means when said counting mechanism reaches said normal position.

13. In combination, a telegraph printer, said printer having various function levers operable in response to various received signals, a recording paper associated with said printer, a line feed function lever operable once in response to each line feed signal for advancing said paper through said printer a predetermined amount on each operation thereof, means responsive to a predetermined signal for initiating said line feed function lever into one or a plurality of successive operations, means dependent on the number of separate operations of said line feed function lever in response to separate line feed signals for determining the number of successive operations thereof when initiated into operation in response to said predetermined signal and means for operating other of said printer function levers during other than the first of the successive operations of said line feed function lever when initiated into operation in response to said predetermined signal.

14. In combination, a cyclically operable telegraph receiver having a selector responsive to received signals to control the operation thereof said receiver normally being operative through one paper feeding cycle of operation in response to each received paper feeding signal code group and means for operating said receiver through a plurality of separate and succeessive paper feeding cycles of operation in response to a single predetermined signal code group.

15. In combination a cyclically operable telegraph receiver having a selector responsive to received signals to control the operation thereof said receiver normally being operative through one cycle of operation in response to each received signal, means for operating said receiver through a plurality of separate and successive cycles of operation in response to a single predetermined signal and means dependent upon predetermined of the cycles of operation of said receiver prior to the receipt of said predetermined signal for controlling the number of said separate and successive cycles of operation thereof in response to said predetermined signal.

16. In a telegraph receiver selectively controlled by received code combinations of signals and having a series of operating levers operable to perform various receiver functions, a series of hooks, one associated with each of said operating levers, an operating bail normally operable once in conjunction with each received code combination, said hooks being selectively moved into operative relation with said bail to actuate the associated operating lever and normally returning to a normal position out of operative relation with said bail in conjunction with each code group, a first means responsive to a predetermined signal for operating said bail a plurality of times, a second means responsive to the same predetermined signal for moving and maintaining a predetermined one of said hooks in operative relation with said bail during the plurality of operations thereof.

17. In a telegraph receiver selectively controlled by received code combinations of signals and having a series of operating levers operable to perform various receiver functions, a series of hooks, one associated with each of said operating levers, an operating bail normally operable once in conjunction with each received code combination, said hooks being selectively moved into operative relation with said bail to actuate the associated operating lever and normally returning to a normal position out of operative relation with said bail in conjunction with each code group, a first means responsive to a predetermined signal for operating said bail a plurality of times, a second means responsive to the same predetermined signal for moving and maintaining a predetermined one of said hooks in operative relation with said bail during the plurality of operations thereof and means controlled by the number of operations of said predetermined hook prior to the receipt of said predetermined signal for determining the number of operations of said bail in response to said predetermined signal.

18. In a telegraph receiver selectively controlled by received code combinations of signals and having a series of operating levers operable to perform various receiver functions, a series of hooks, one associated with each of said operating levers, an operating bail normally operable once in conjunction with each received code combination, said hooks being selectively moved into operative relation with said bail to actuate the associated operating lever and normally returning to a normal position out of operative relation with said bail once for each received code group, a rotatable member having a normal position and adapted to be advanced through a predetermined part of a revolution on each operation of a predetermined one of said operating levers, an operating cam for said bail normally adapted to make one revolution and stop in a normal position for at least a predetermined length of time in conjunction with each received code combination, means operative on the receipt of a predetermined one of said code groups with said rotatable member in any other than said normal position for releasing said operating cam for a plurality of continuous revolutions and simultaneously moving and maintaining the hook associated with said predetermined operating lever in operative relation with said bail to operate said predetermined lever and advance said rotatable member a plurality of times and means controlled by said rotatable member at the completion of a revolution thereof for returning said hook to normal and stopping the rotation of said operating cam.

19. In a telegraph receiver selectively controlled by received code combinations of signals and having a series of operating levers operable to perform various receiver functions, a series of hooks, one associated with each of said operating levers, an operating bail normally operable once in conjunction with each received code combination, said hooks being selectively moved into operative relation with said bail to actuate the associated operating lever and normally returning to a normal position out of operative relation with said bail once for each received code group, a rotatable member having a normal position and adapted to be advanced through a predetermined part of a revolution on each operation of a predetermined one of said operating levers, an operating cam for said bail normally adapted to make one revolution and stop in a normal position for at least a predetermined length of time in conjunction with each received code combination, means operative on the re-

ceipt of a predetermined one of said code groups with said rotatable member in any other than said normal position for releasing said operating cam for a plurality of continuous revolutions and simultaneously moving and maintaining the hook associated with said predetermined operating lever in operative relation with said bail to operate said predetermined lever and advance said rotatable member a plurality of times, means controlled by said rotatable member at the completion of a revolution thereof for returning said hook to normal and stopping the rotation of said operating cam and means responsive to other code combinations for moving others of said hooks into operative relation with said bail during the continuous revolutions of said bail operating cam.

20. In a telegraph receiver selectively controlled by received groups of code signals, a recording paper adapted to be advanced through said receiver in the direction of its length, a series of operating levers including a line feed operating lever for advancing said paper through said receiver a predetermined amount on each operation thereof, an operating cam normally released for one revolution at a time in conjunction with each code group, a bail operable by said cam, a series of hooks one associated with each one of said operating levers and normally selectively movable beneath said bail to effect one operation of associated levers in response to each associated code group, means responsive to a predetermined signal when preceded by at least one operation of said line feed operating lever in response to a line feed code group for releasing said operaitng cam for a plurality of continuous revolutions and moving and maintaining a hook associated with said line feed operating lever beneath said bail during the operation thereof by the continuous revolutions of said cam, to successively operate said lever to advance said paper a plurality of times.

21. In a telegraph receiver selectively controlled by received groups of code signals, a recording paper adapted to be advanced through said receiver in the direction of its length, a series of operating levers including a line feed operating lever for advancing said paper through said receiver a predetermined amount on each operation thereof, an operating cam normally released for one revolution at a time in conjunction with each code group, a bail operable by said cam, a series of hooks one associated with each one of said operating levers and normally selectively movable beneath said bail to effect operation of associated levers once in response to each associated code groups, means responsive to a predetermined signal when preceded by at least one operation of said line feed operating lever in response to a line feed code group for releasing said operating cam for a plurality of continuous revolutions and moving and maintaining a hook associated with said line feed operating lever beneath said bail during the operation thereof by the continuous revolutions of said cam, to successively operate said lever to advance said paper a plurality of times and means dependent upon the number of single operations of said line feed operating lever in response to line feed code groups for determining the number of revolutions of said operating cam in response to said predetermined code group.

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