May 17, 1932. J. F. PORTER ET AL 1,859,165

AUTOMATIC TAPE CUT-OFF

Filed May 8, 1931 2 Sheets-Sheet 1

FIG. 2

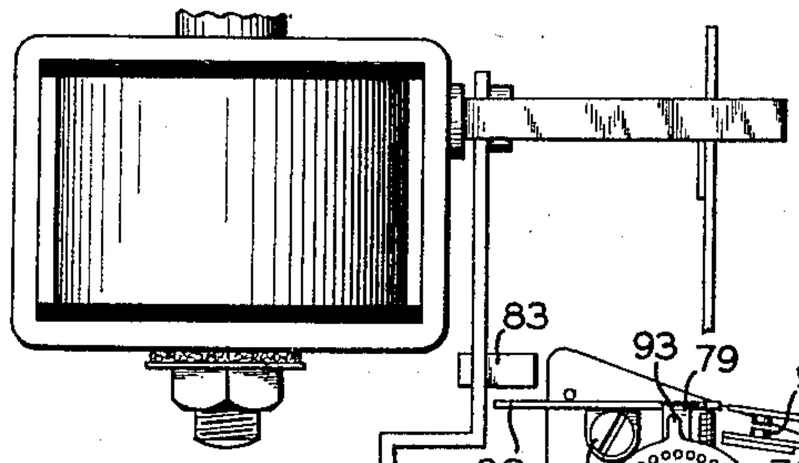

FIG. 1

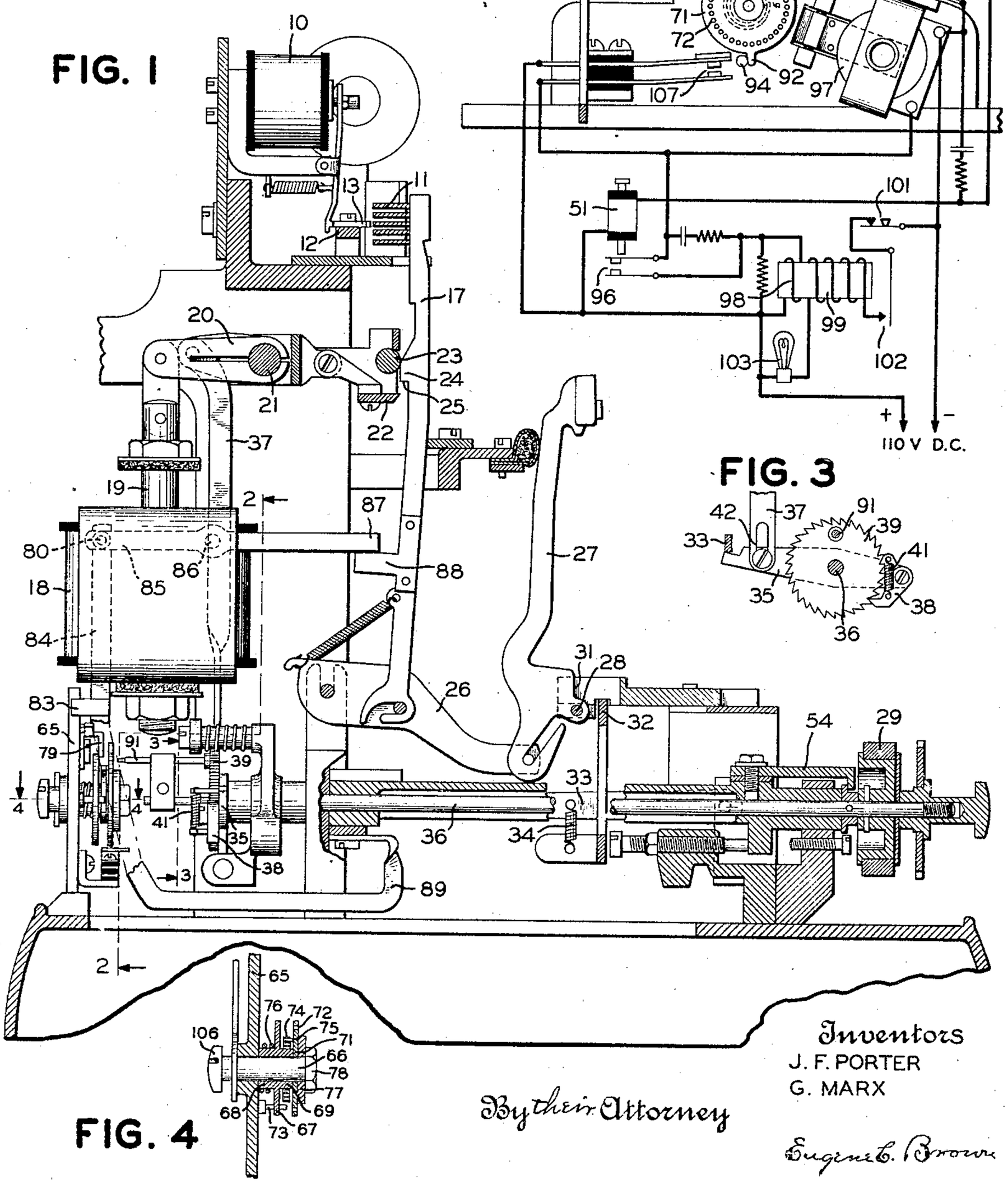

FIG. 3

FIG. 4

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AUTOMATIC TAPE CUT-OFF

Filed May 8, 1931 2 Sheets-Sheet 2

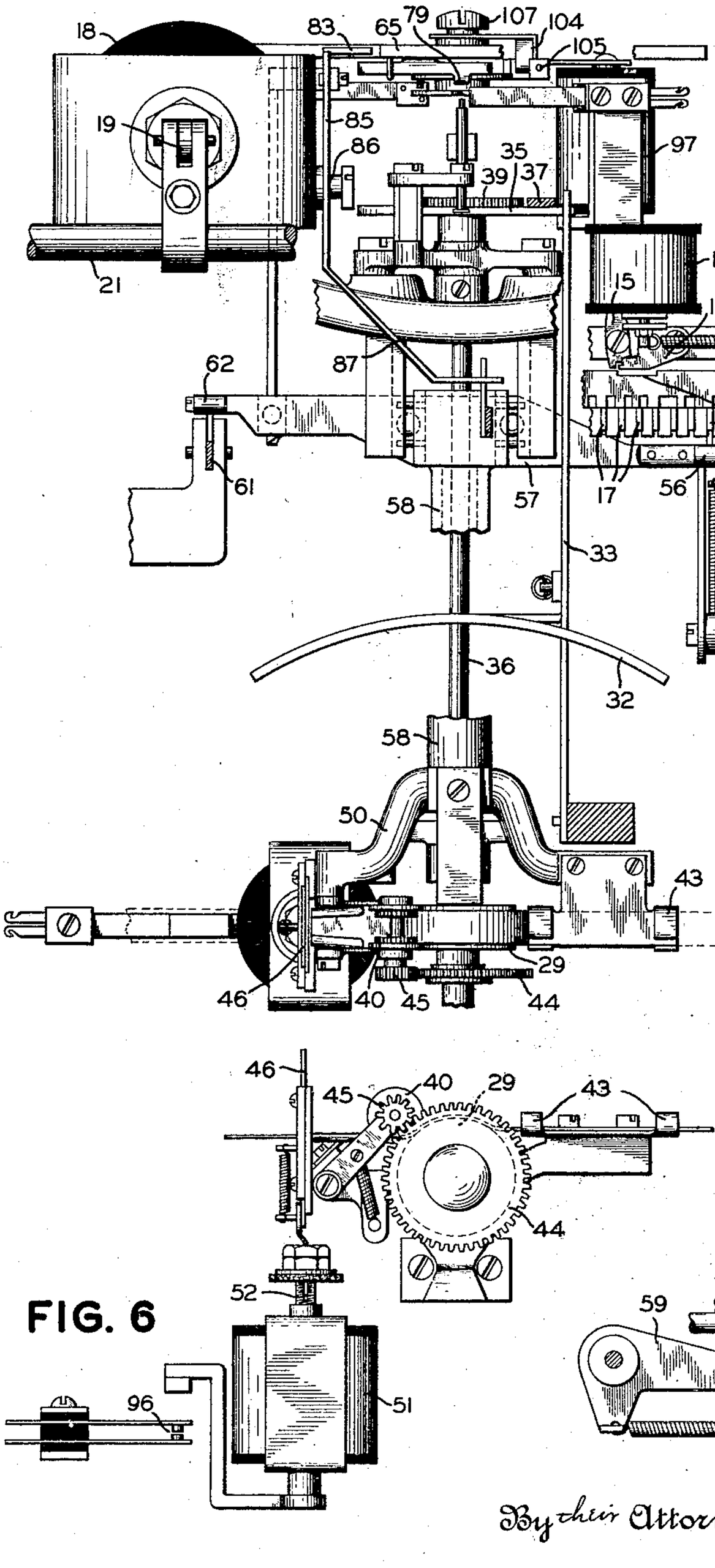

FIG. 5

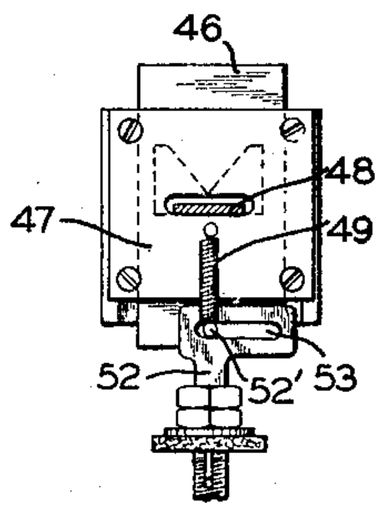

FIG. 7

FIG. 6

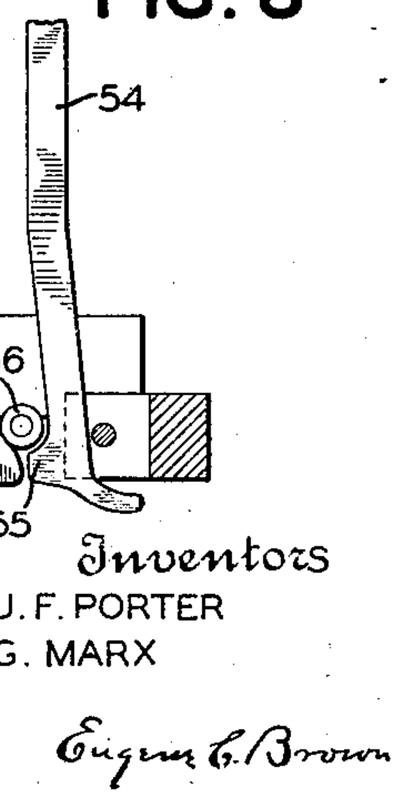

FIG. 8

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UNITED STATES PATENT OFFICE

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AUTOMATIC TAPE CUT-OFF

Application filed May 8, 1931. Serial No. 536,002.

This invention relates to a printing telegraph machine and more particularly to mechanism for performing auxiliary functions associated with the operation of the machine.

In the normal operation of tape printing telegraph machines in which the messages are received upon a gummed tape, the receiving operator, in addition to applying the printed and gummed tape to the telegraph blanks, has a number of other duties to perform and consequently, at times a considerable length of printed tape may accumulate before the operator has an opportunity to apply the tape to the blanks. This causes an appreciable lag in the passage of the message through the office. While this delay is not sufficient to become of importance with regard to the usual run of messages, it becomes so in the case of an urgent or rush message which should be given preference at each stage in its transit through the office.

Accordingly, it is one of the objects of the present invention to provide mechanism associated with a telegraph printer for expediting the handling of such rush or flash messages and to eliminate unnecessary delay in the application of such messages to the telegram blanks for further routing of the message through the office.

Another object is to indicate to the receiving operator when a message is being received which should take preference over previously received messages.

Another and more specific object is to provide a telegraph printer which will respond to a predetermined code combination of impulses, to sever the tape or to mark it for severance immediately preceding and/or immediately following the printed flash message so as to produce the special or preference message upon an individual length of tape ready for immediate application to the telegram blanks.

It will be obvious to those familiar with the operation of tape printing telegraph machines that it is not feasible to cut the tape at the printing position but that it must be advanced beyond the printing position an appreciable distance so as to free it from the platen and other printing mechanism, before the severing is accomplished.

In the particular machine disclosed in the accompanying drawings, it was found advisable to space the cutting mechanism a distance corresponding to about fourteen letter spaces, beyond the printing position, to enable the cutting mechanism to be operated without interference. Consequently, if the cutting device is controlled by a special code signal transmitted immediately before the first character of the flash message, it is necessary to delay the actual severance of the tape until the last character of the preceding message has been advanced past the cutting position.

Accordingly, another of the objects of the invention is to provide a counting or timing mechanism, responding to a predetermined code combination of impulses, which serves to operate the severing mechanism only when the tape has been advanced a definite number of letter spaces past the printing position after the receipt of such code combination.

More broadly stated, it is an object of the invention to provide, in a printing telegraph machine, mechanism the operation of which is initiated by a code signal but the complete functioning of which is delayed until after a substantial number of subsequent printing cycles have been completed.

Other objects and advantages of the invention will appear from the following description and the appended claims.

In accordance with the preferred embodiment of our invention we provide a cutting mechanism disposed in the path of travel of the tape and spaced from the printing position a distance corresponding to the number of letter spaces. A counting or control device is arranged to be set into operation only in response to a predetermined code signal, so as to be advanced over a predetermined path, step-by-step, as each succeeding character code combination is received. The control device serves to operate the cutting mechanism, when the tape has been advanced past the printing position sufficiently to bring the character printed immediately before the reception of said special code signal, past the cutting point. The operation of the cutting

mechanism serves to complete a signal circuit to indicate such operation to the operator and at the same time to restore the counting mechanism to normal. The signal remains operated until manually interrupted by the receiving operator.

We have in our preferred embodiment shown the cutting mechanism as operated electrically by means of circuits completed by the counting or timing mechanism, but it is to be understood that the operation may be entirely mechanical and we contemplate such obvious modifications as come within the scope of the appended claims.

In order that the invention may be fully understood reference will now be had to the accompanying drawings in which;

Figure 1 is a side elevation, partly in section, of a multiplex printing telegraph machine embodying the present invention;

Figure 2 is a sectional view, substantially on the line 2—2 of Figure 1, showing a portion of the counting mechanism and the circuits completed thereby;

Figure 3 is a sectional view on the line 3—3 of Figure 1.

Figure 4 is a sectional view on the line 4—4 of Figure 1.

Figure 5 is a plan view of the principal operating parts of the machine, associated with the tape feed, counting and severing mechanism;

Figure 6 is a front elevation of the cutting mechanism in its relation to the printing position of the machine;

Figure 7 is a detail of the cutting members; and

Figure 8 is a detail showing the means for shifting the platen to the upper case position.

The particular type of telegraph printing machine with which the preferred embodiment of the present invention has been shown, is known as multiplex printer 21—A, extensively used by The Western Union Telegraph Company and well known to those versed in telegraph practice. Therefore, the printer has not been illustrated in detail but only the essential working parts necessary for an understanding of the invention have been shown. In this type of printer the printing is done on a narrow gummed tape which as it emerges from the machine, is moistened and applied to a message blank. The printing is effected by type bars selected by a series of five selector bars controlled by individual selecting magnets. These magnets are electrically connected to the receiving segments on the multiplex distributor so as to receive the code impulses in succession.

The selecting magnets are located transversely across the top of the machine, one only being shown and indicated at 10. The five selector bars 11, which are controlled by the selecting magnets, are disposed one above the other, an individual selecting magnet being provided for each selector bar. The selector bars are notched on their front edge and are moved longitudinally, in different combinations, to bring a single vertical row of notches into alignment. Normally, all of the selector bars are held in their extreme right hand position. Mounted to the rear of the selector bars is a slidable selector carriage 12 which is parallel and of substantially the same length as the selector bars. The selector carriage carries selector bar pawls 13, an individual one of which is provided for each selector bar, under the control of one of the five selecting magnets. Each of the selector bars, opposite its individual pawl, is provided on its rear side with a notch 14 into which the pawl is moved by its selecting magnet. Each pawl as it moves into its notch 14 is locked therein by an individual latch 15.

When a selecting magnet receives an impulse from its distributor segment, its armature is attracted and the lower end thereof strikes the rear edge of the corresponding selector bar pawl 13 and rotates it around its pivot point, thus causing it to enter the notch 14 of its selector bar, whereupon the latch 15 drops into the rear of the pawl and locks the latter in its forward position.

The operation of any selector magnet closes the circuit for a relay, not shown, for completing the circuit from one of the segments of the multiplex distributor, not shown, to the selector carriage magnet 16. After the complete code combination has been received, the magnet 16 operates and through its armature shifts the selector carriage to the left, causing all of the forward pawls, through engagement in the notches of their respective selector bars, to shift the latter to the left. When the chosen selector bars have been moved sufficiently, five notches, one in each bar, will have been lined up to the rear of one of the selected pull bars 17. As the selector carriage approaches the limit of its motion to the left, it closes contacts, not shown, which completes a circuit to the printing solenoid 18. Thereupon the printing solenoid pulls down its plunger 19 and through a rock arm 20 connected to the upper end thereof, it rocks the transverse printing shaft 21, thus raising the printing bail 22 and roller 23 upward in an arc. The roller 23 and bail 22 extend back of the pull bars, one of which is provided for each type bar. As the roller moves upwardly, it passes off of the enlargement 24 of the pull bar and permits the selected pull bar to drop into the previously aligned slots of the selector bars. Continued upward movement of the printing bail 22 causes the front edge of the bail to engage in the notch 25, of the pull bar which was moved inwardly thereby forcing it upwardly. This motion of the pull bar is transferred, through a horizontal bar 26, to the corresponding type bar 27, thus causing it to rotate about the type

bar fulcrum 28 so as to strike downwardly against the platen 29 to effect printing.

As the type bars move down, the flat portions 31 thereof strike the rim of an arcuate universal, bar 32, depressing it through mechanism to be described, effecting the forward feed of the tape.

The selector carriage and selector bars are returned to their normal or right hand position upon de-energization of the magnet 16, to condition the same so as to respond to the succeeding code combination.

Pivoted at the front of the printer and extending to the rear thereof is a lever 33, which is connected to one side of the universal bar 32 by a coiled spring 34. This lever at its free end rests on a spacing beam 35, pivoted about the platen shaft 36. This beam has its left end attached to a spacer connecting link 37, operated by the printing shaft 21 and on its right hand it carries a spacing pawl 38 held in engagement with a ratchet wheel 39, by means of a coiled spring 41.

When the universal bar is depressed, it carries the spacing beam lever 33 down with it, the spacing beam moving in the slotted end 42 of the link 37. This rotates the spacing beam through a small arc so that the pawl, at its outer end moves up and engages a new tooth on the spacing ratchet 39.

Upon the completion of printing, the return or upward stroke of the solenoid plunger 19 imparts to the spacing link 37, an upward movement, thus rotating the spacing beam and ratchet the distance of one tooth. The ratchet 39 is rigidly secured to the platen shaft 36, thus rotating the platen the distance of one character.

The tape upon which the printing is done, passes through guides 43 and thence across the upper face of the platen 29, between the platen and a knurled pressure roller 40 driven from the platen shaft by gears 44 and 45. Rotation of the platen shaft therefore feeds the tape forward one letter space to bring a new portion of the tape into printing position.

All of the mechanism so far described is the standard construction of the printer, and alone, forms no part of the present invention.

To the left of the platen there is arranged a cutting mechanism for the tape comprising a blade 46 which slides vertically in a frame 47 having an aperture 48 through which the tape passes. The blade is normally held upward away from the tape by a spring 49 and is moved downwardly to sever the tape by a solenoid 51. The solenoid plunger 52 is connected to the blade by means of a pin 52′ engaged in horizontal slot 53, formed in the upper end of the plunger. The frame 47 and platen 29 are carried upon the supporting framework 50 of the platen, so as to move forwardly or rearwardly with the platen, as the platen is shifted to print either upper or lower case characters.

The platen shifting is effected by a special code combination which selects a predetermined or shift pull bar. The lower end of the upper case shift pull bar 54 is shown in Figures 4 and 7 and is provided with a curved heel portion 55, adapted to engage a roller 56 carried upon the right end of a crossarm 57, thus shifting the crossarm forwardly, by cam action, as the pull bar is raised. The crossarm has a forward extension 58 to which the platen frame 50 is rigidly secured, so as to move the platen mechanism forwardly. A detent lever 59 engages the roller 56 in both its forward and rear positions to lock the same in either shifted position. The platen 29 is shifted in the opposite direction by another pull bar 61, the forward side of which engages a roller 62, carried by the opposite end of the crossarm 57, from the roller 56.

The counting or control mechanism for effecting the operation of the cutting device, is mounted upon a cross plate 65 carried at the rear of the machine and includes a stub shaft 66 which passes loosely through the plate 65 and on its forward end carries a disk 67 having hub portions 68 and 69. Also mounted upon the shaft 66 is a second disk 71 provided with an annular series of perforations 72. The disk 67 is held against rotation by a pin 73 extending outwardly from the plate 65 through an aperture in the rim of the disk 67. The disk 71 is loosely mounted for rotation relative to the disk 67 and is connected thereto through a spiral spring 74, anchored to the hub portion 69 and to a pin 75 carried by the perforated disk 71. The disks 67 and 71 are urged forwardly by a compression spring 76 contained between the disk 67 and the plate 65. A washer 77 and a retaining nut 78 complete the assembly.

The disks 67 and 71 are normally held in a rearward position against the compression of the spring 76 by a latch 79 which extends in front of the plate 67. The latch 79 is pivoted to the plate 65, at 81 and has a tail portion 82 which may be engaged by a finger 83 carried by a link 84 (Fig. 1) under prescribed conditions as will presently appear.

The link 84 is pivoted to the end of a horizontal lever 85, which in turn is pivoted at 86 to the frame of the solenoid 18. The forward end 87 of the lever 85 extends over a lug 88 carried by one of the pull bars 17, preferably a pull bar associated with a type bar which carries no character in the upper case position. The lower end of the link 84 extends forwardly at 89 and is secured to the crossarm 57, through which the shifting of the platen is effected.

The operation of the counting or control device is as follows: When it is desired to sever the tape following a particular character or preceding a flash message, a combina-

tion of code impulses is transmitted for selecting the upper case shift bar 54, to move the crossarm 57 forward, thereby rocking the link 84 about its pivot 81 and positioning the finger 83 directly over the tail of the latch 79. Thereupon the special pull bar carrying the lug 88 is selected by transmitting the code combination representative thereof and upon the upward movement of this pull bar, the lever 85 is rocked, forcing the link 84 downward and tripping the latch 79. Thereupon, the disks 67 and 71 are moved forward by the spring 76, bringing the plate 71 into engagement with a pin 91, extending horizontally from the rear face of the ratchet wheel 39. The perforations 72 correspond to the angular positions assumed by the platen shaft 36 so that in whatever angular position this shaft may be one of the apertures 72 will be positioned opposite the end of the pin 91 and will be entered by the pin, thereby locking the platen shaft and the disk 71 together. At this time the end of the latch 79 will rest upon the periphery of the disk 67.

Upon the transmission of subsequent printing signals and the consequent rotation of the platen shaft to advance the tape, the disk 71 will be carried around, step-by-step, with the platen. The disk 71 is provided with a pair of radial extensions 92 and 93, the former of which, in the normal or release position of the disk, is held against a stop pin 94, by means of the spiral spring 74. Upon engagement of the disk 71 with the pin 91, the radial extension 92 is rotated counter clockwise with the platen shaft until it engages the contacts 95 to close the same. This occurs after the tape has been advanced from the printing position at the top of the platen into position beneath the blade 46 of the severing device. Upon closing of the contacts 95 a circuit is completed from the negative side of the supply main through the contacts 95 and winding of the solenoid 51 of the cutting device, to the positive side of the supply main. The solenoid 51 is thereby energized to sever the tape and upon the downward movement of its plunger, to close a pair of contacts 96, thus completing a second circuit from the negative side of the line, magnet 97, contacts 96 and the winding 98 of a relay 99, to the positive side of the line. The relay 99 thereupon closes its contacts completing a locking circuit through the manual key 101, armature and front contact 102 of the relay and a signal lamp 103.

The magnet 97 has an armature 104 (Fig. 5) pivoted at 105, the free end of which is forked and extends around the shaft 66 between the plate 65 and the head 106 of the shaft. Upon energization of the magnet following the cutting operation, the shaft 66 is drawn rearwardly by the armature of the magnet, compressing the spring 76 and allowing the latch 79 to drop in ahead of the plate 67, thereby locking the counting device free of the pin 91. Upon release of the disk 71 from the pin 91, the disk rotates to its original position with the lug 92 against the stop pin 94, thereby opening the contacts 95 and deenergizing the solenoid 51, which in turn opens its contacts 96, deenergizing the magnet 97. The relay 99, however, remains locked up and the signal lamp 103 operated until it is manually released by the attendant operating the key or switch 101. The system is now in a condition to respond to a subsequent cutting signal which may be transmitted immediately following the last character of the flash or rush message.

The lug 93 is provided as a precautionary means in case the solenoid 51 is not operated for any reason upon the closing of the contacts 95. It is spaced relative to a pair of contacts 107 so that normally it does not come into engagement therewith. However, if the system is not restored to normal by the sequence of operations following the closing of contacts 95 further rotation of the disk 71 will bring the extension 93 into engagement with the contacts 107, thereby closing the same and completing a circuit from the negative battery through the restoring magnet 97, contact 107 and positive battery, thereby withdrawing the disk 71 from the pin 91 and allowing the system to restore to normal. It will be understood, of course, in this latter event that the severing operation does not take place.

It is to be understood that the counting or control mechanism is not restricted to the operation of a tape cutting device but may be employed for effecting other operations where it is desired to delay such operations for a predetermined number of signals after the transmission of the control signals. For instance, it may be desired to operate a time stamp following the completion of the transmission of each message, the stamp being disposed to one side of the printing position.

It is to be understood therefore, that we are not limited to the exact details of construction shown and described but contemplate all modifications thereof and all uses of the invention that fall within the scope of the appended claims.

What we claim is:

1. In a telegraph printing machine, a tape feed mechanism, means responsive to groups of code impulses for operating said tape feed mechanism, a tape severing device, a normally inoperative counting device, means responding to a group of code impulses for rendering said counting device operative and means for advancing said counting device one step for each subsequent group of code impulses received, said counting device after it has been advanced a predetermined number of steps, causing the actuation of said tape severing device.

2. In a telegraph printing machine, a tape feed mechanism, means responsive to groups of code impulses for operating said tape feed mechanism, a tape severing device, a normally inoperative counting device, means responding to a group of code impulses for rendering said counting device operative and means for advancing said counting device one step for each subsequent group of code impulses received, said counting device after it has been advanced a predetermined number of steps, causing the actuating of said tape severing device, and means for automatically restoring said counting device to its initial position upon the operation of said severing device.

3. In a telegraph printing machine, a normally inoperative counting device, means responsive to code signals for rendering said counting device operative, means for advancing the counting device one step for each subsequent group of code signals received and a control circuit completed by said counting device after it has been advanced a predetermined number of steps.

4. In a telegraph printing machine, a normally inoperative counting device, means responsive to code signals for rendering said counting device operative, means for advancing the counting device one step for each subsequent group of code signals received and means actuated by said counting device after it has been advanced a predetermined number of steps for performing functions auxiliary to the main printing function of said machine.

5. In a telegraph printing machine, a normally inoperative counting device, means responsive to code signals for rendering said counting device operative, means for advancing the counting device one step for each subsequent group of code signals and a signal operated by said counting device after it has advanced a predetermined number of steps.

6. In a telegraph printing machine, a normally inoperative counting device, means responsive to code signals for rendering said counting device operative, means for advancing the counting device one step for each subsequent group of code signals, means actuated by said counting device after it has been advanced a predetermined number of steps for performing a function auxiliary to the main printing function of said machine, and means for restoring said counting device to inoperative condition after said auxiliary function has been completed.

7. In a telegraph printing machine, a normally inoperative counting device, means responsive to code signals for rendering said counting device operative, means for advancing the counting device one step for each subsequent group of code signals received, means actuated by said counting device, after it has been advanced a predetermined number of steps, for performing a function auxiliary to the main printing function of said machine, a signal and means for operating said signal after said auxiliary function has been completed.

8. In a telegraph printing mechanism, a tape feed mechanism, a tape advanced by said tape feed mechanism past the printing position one step for each printing stroke, a tape severing device, means controlled by code signals for determining the operation of said tape severing device when a particular portion of said tape is in printing position, said tape severing device operating to cut the tape adjacent said particular portion after said portion has been advanced a predetermined distance beyond the printing position by successive printing strokes.

9. In a telegraph printing mechanism, a tape feed mechanism, a tape advanced by said tape feed mechanism past the printing position one step for each printing stroke, a tape engaging device positioned to one side of side printing position in the path of said tape, and means controlled by code signals for determining the operation of said tape engaging device when a particular part of the tape is in printing position, the operation of said tape engaging device being delayed until after said part of the tape has been advanced a predetermined distance beyond the printing position by successive printing strokes.

10. In a tape telegraph printer, a printing mechanism, a platen, means for rotating said platen to advance the tape thereacross upon each operation of the printing mechanism, a character counting device normally disconnected from said platen, means responsive to a code signal for connecting said counting device and platen whereby the counting device is operated in response to each movement of the platen, and a tape engaging member operated by said counting device after the platen is rotated through a predetermined arc.

11. In a tape telegraph printer, a printing mechanism, a platen, means for rotating said platen to advance the tape thereacross upon each operation of the printing mechanism, a character counting device normally disconnected from said platen, means responsive to a code signal for connecting said counting device and platen whereby the counting device is operated in response to each movement of the platen, a tape engaging member operated by said counting device after the platen is rotated through a predetermined arc, and means for disconnecting said counting device from the platen following the operation of said tape engaging member.

12. In a tape telegraph printer, a printing mechanism, a platen, means for rotating said platen to advance the tape thereacross upon

each operation of the printing mechanism, a character counting device normally inoperative, means responsive to a code signal to cause said counting device to operate in step with said platen, means controlled by said counting device in one position thereof for performing a function auxiliary to the normal printing operation and a second means controlled by said counting device in a different position thereof for performing an additional function.

13. In a tape telegraph printer, a printing mechanism, a platen, means for rotating said platen to advance the tape thereacross upon each operation of the printing mechanism, a character counting device normally inoperative, means responsive to a code signal to cause said counting device to operate in step with said platen, a circuit controlled by said counting device in one position thereof for performing a function auxiliary to the normal printing operation and a second circuit controlled by said counting device in a different position for rendering the counting device inoperative and restoring it to its initial position.

14. In a printing telegraph machine, a selecting mechanism having a definite cycle of operation, a normally inoperative control mechanism, means responsive to a predetermined operation of said selecting mechanism for conditioning said control mechanism to respond to said selecting mechanism, whereby each succeeding cycle of the selecting mechanism will advance the control mechanism along a predetermined path and means actuated by said control mechanism after a predetermined number of said subsequent cycles have been completed.

15. In a printing telegraph machine, a selecting mechanism having a definite cycle of operation, a normally inoperative control mechanism, means responsive to a predetermined operation of the selecting mechanism for conditioning said control mechanism to respond to each succeeding cycle of the selecting mechanism and auxiliary means actuated by said control mechanism after a plurality of said subsequent cycles have been completed.

16. In a printing telegraph machine, a selecting mechanism having a definite cycle of operation, a normally inoperative control mechanism, means responsive to a predetermined operation of the selecting mechanism, for conditioning said control mechanism to respond to each succeeding cycle of the selecting mechanism, auxiliary means actuated by said control mechanism after a plurality of said subsequent cycles have been completed, and means for restoring said control mechanism to its normal inoperative condition upon the operation of said auxiliary means.

17. In a printing telegraph machine, a selecting mechanism having a definite cycle of operation, a normally inoperative control mechanism, means responsive to a predetermined operation of the selecting mechanism for conditioning said control mechanism to respond to each succeeding cycle of the selecting mechanism, auxiliary means actuated by said control mechanism after a plurality of said subsequent cycles have been completed, means for restoring said control mechanism to its normal inoperative condition upon the operation of said auxiliary means, and separate means acting in response to additional cycles of said selecting mechanism to restore said control mechanism to its normal inoperative condition in case said auxiliary mechanism fails to operate.

In testimony whereof we affix our signatures.

JAMES F. PORTER.
GEORGE MARX.