

July 15, 1930.

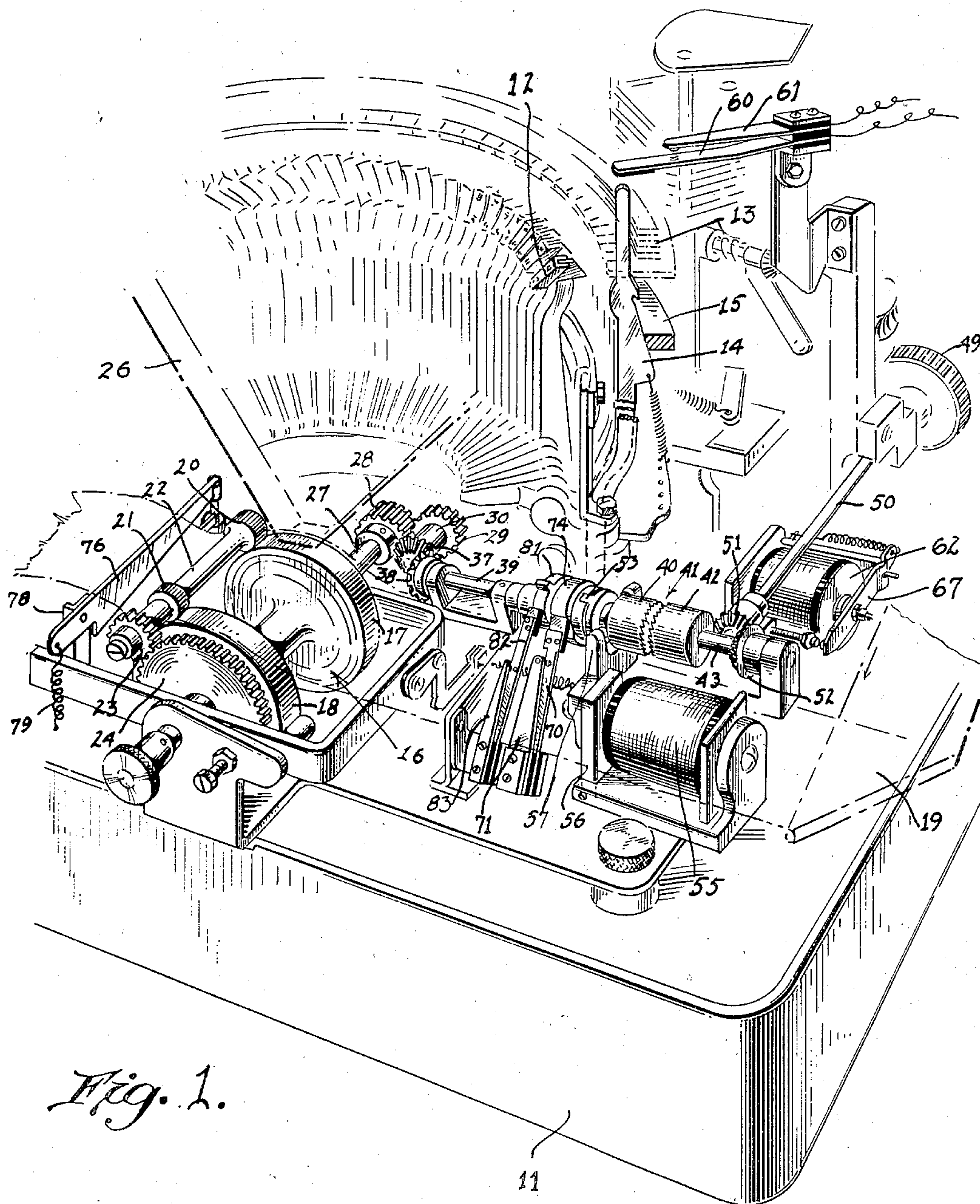
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1,770,888

COUPON FEED MECHANISM FOR TELEGRAPH PRINTERS

Filed July 27, 1929

5 Sheets-Sheet 1



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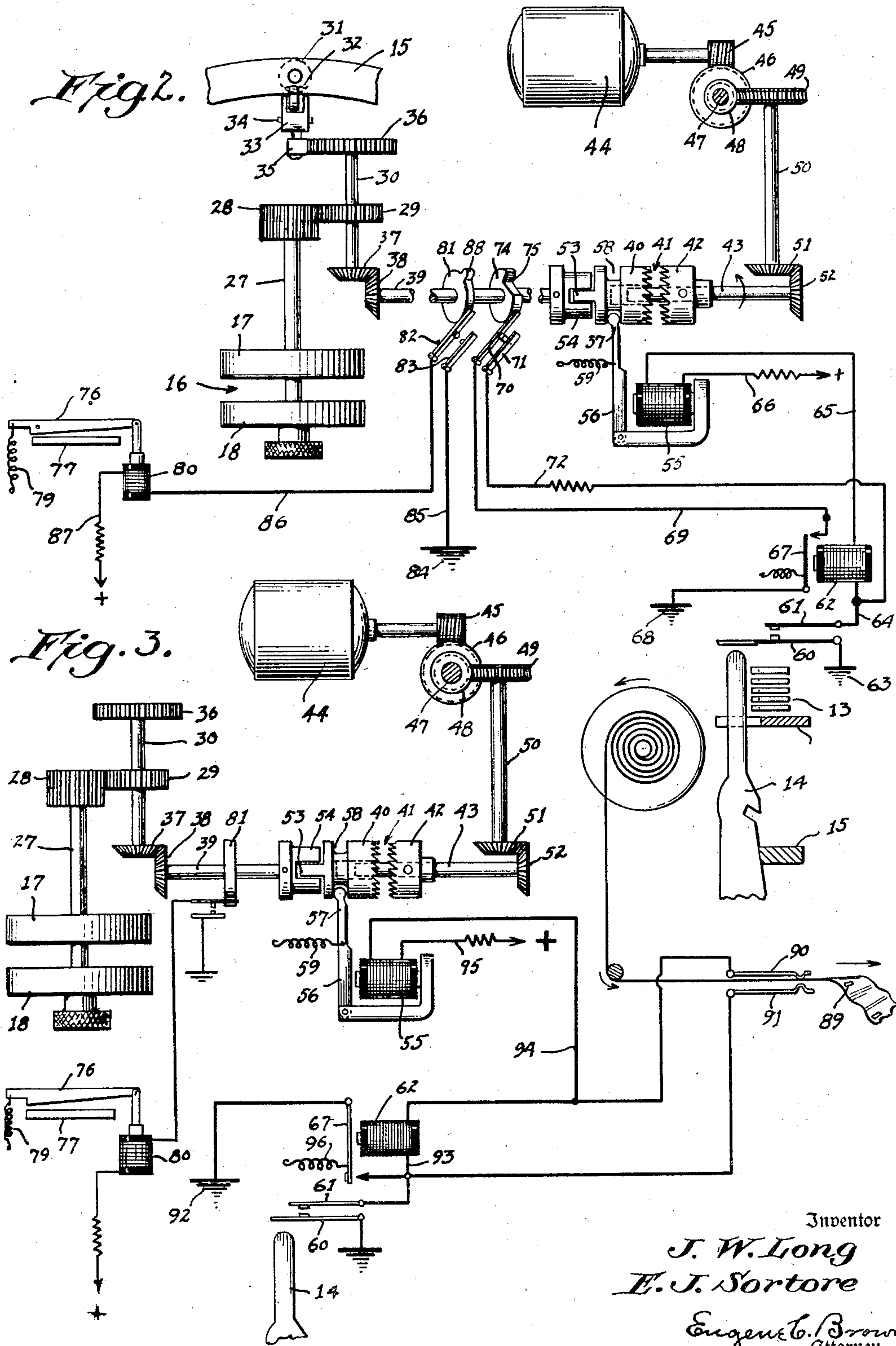
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5 Sheets-Sheet 3

Fig. 4.

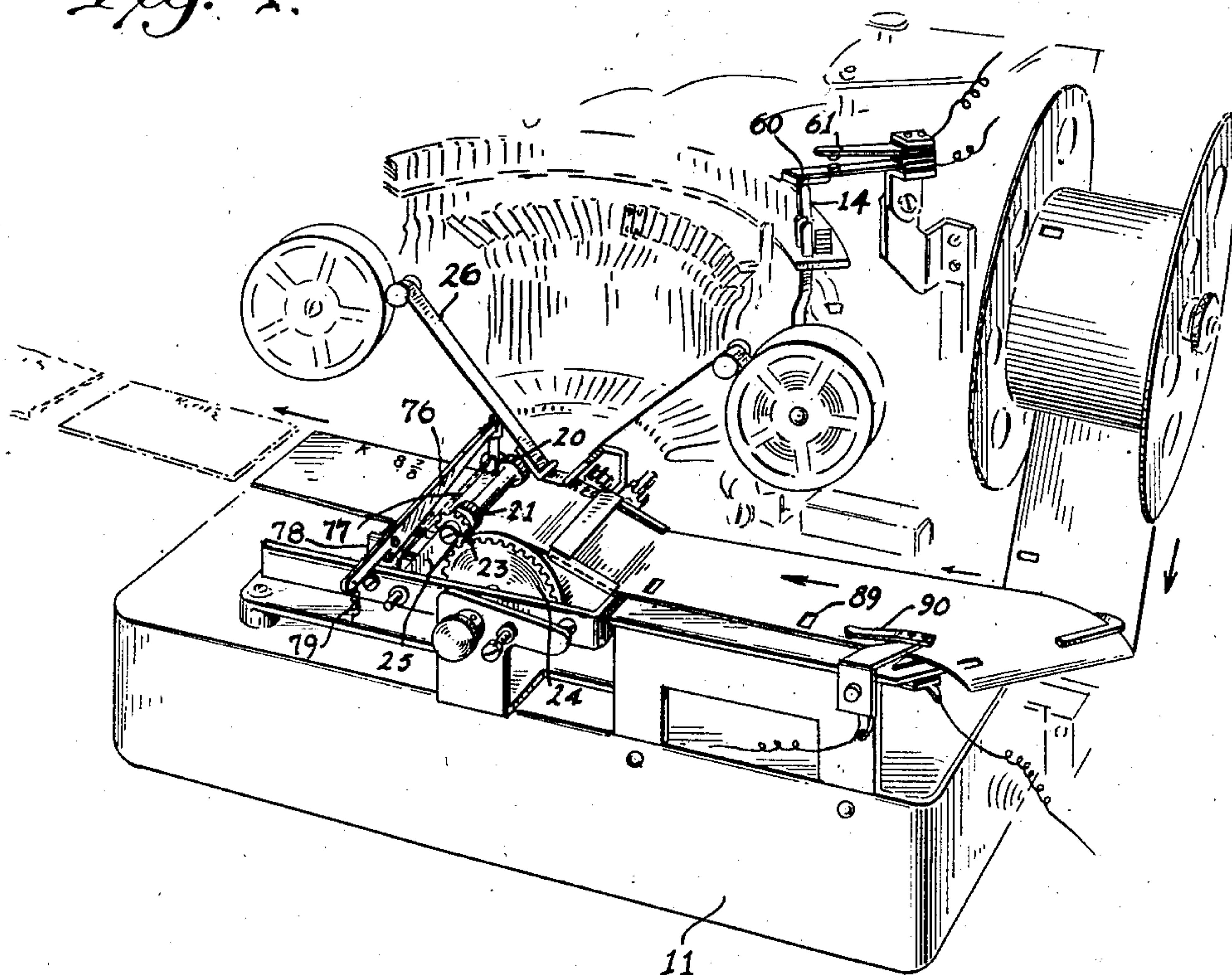


Fig. 5.

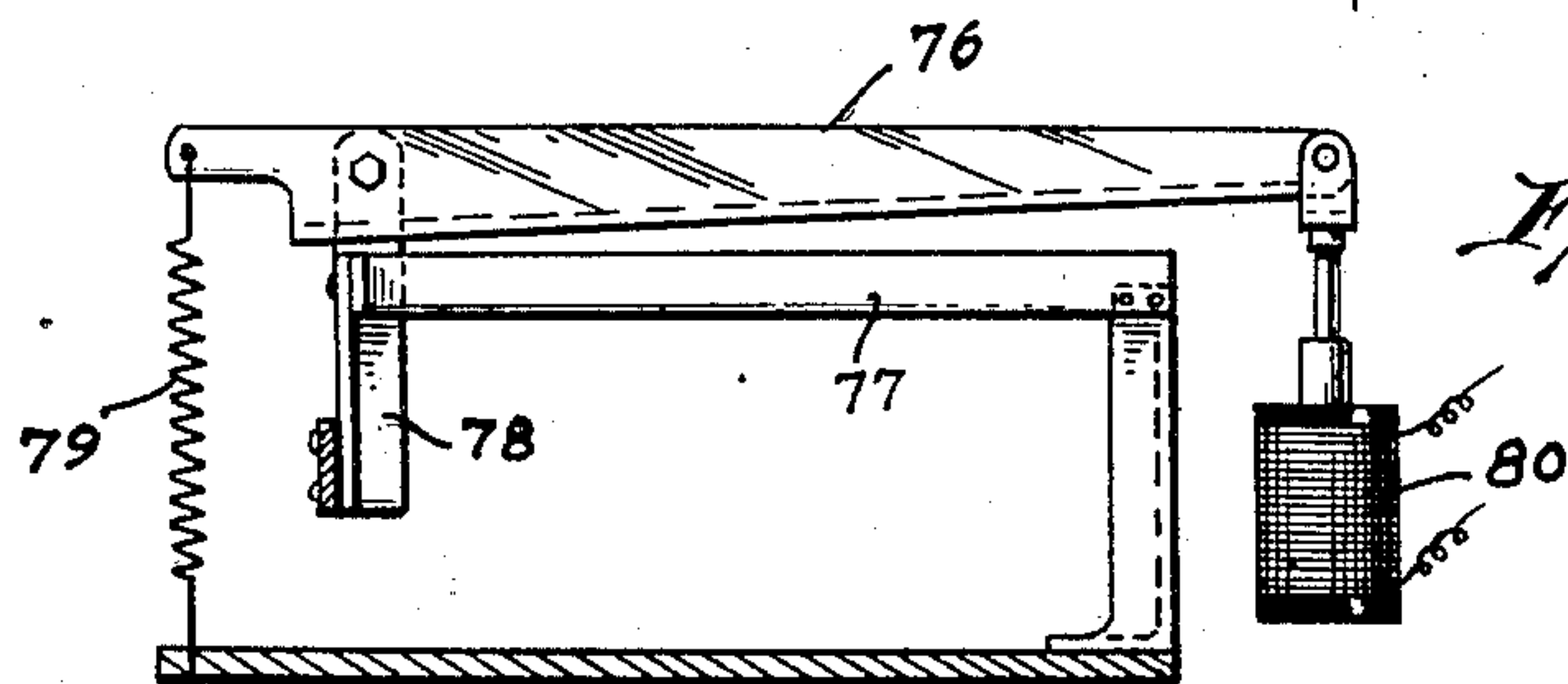
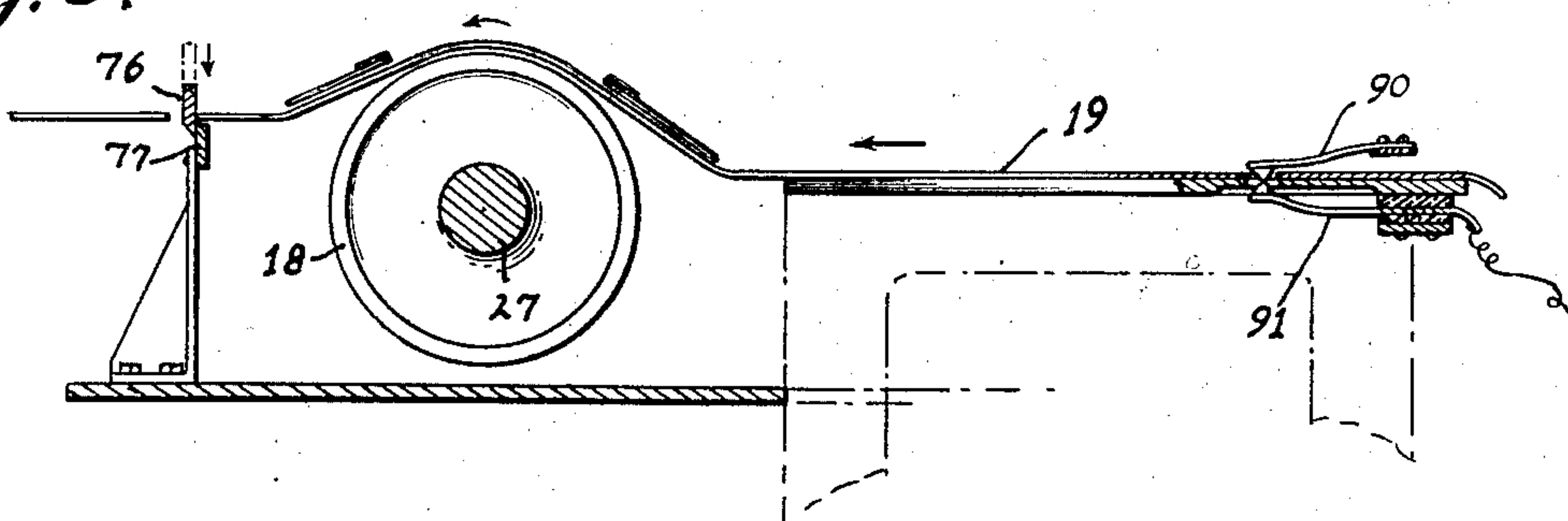


Fig. 6.

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COUPON FEED MECHANISM FOR TELEGRAPH PRINTERS

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5 Sheets-Sheet 4

Fig. 7.

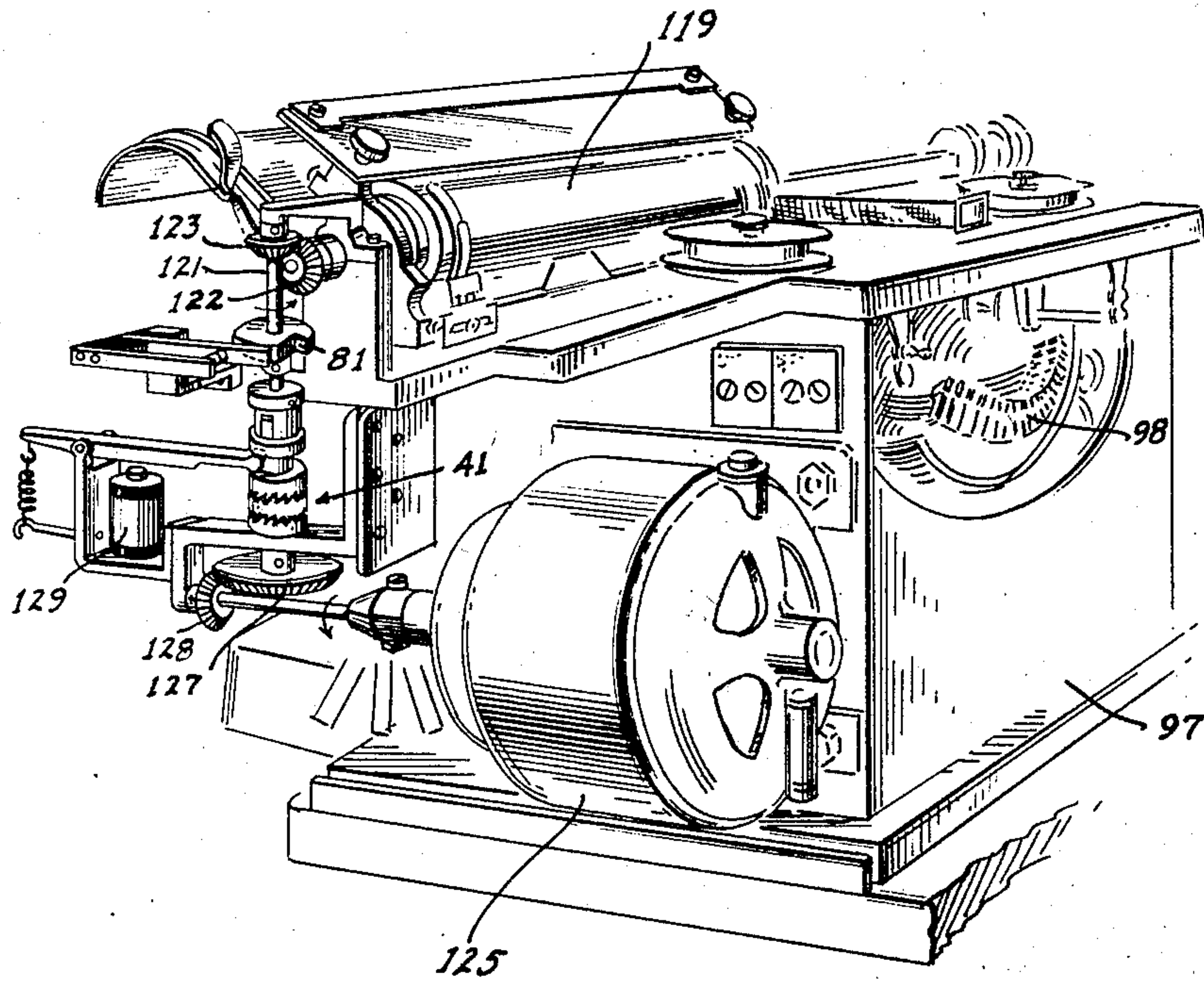


Fig. 9.

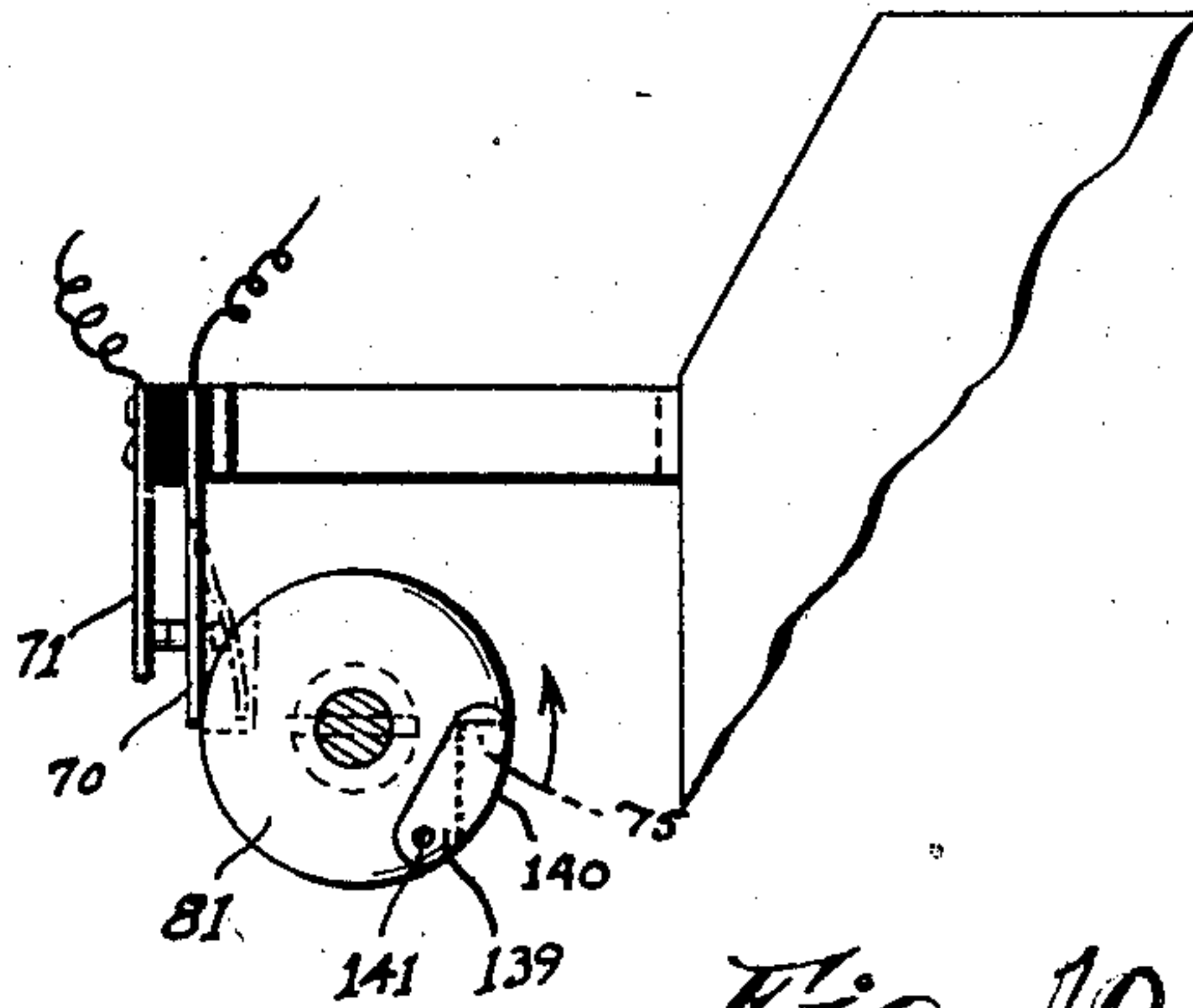
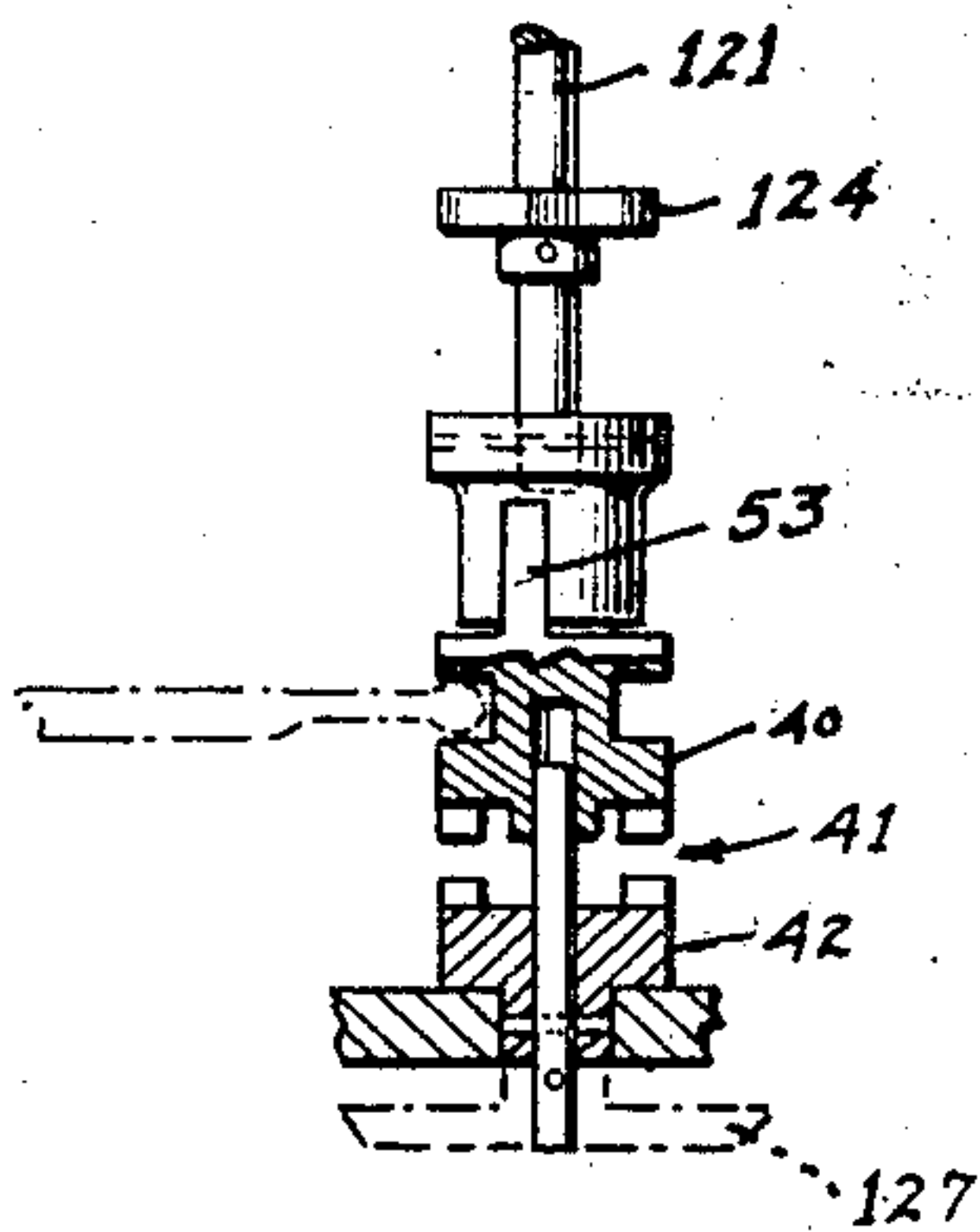


Fig. 10.

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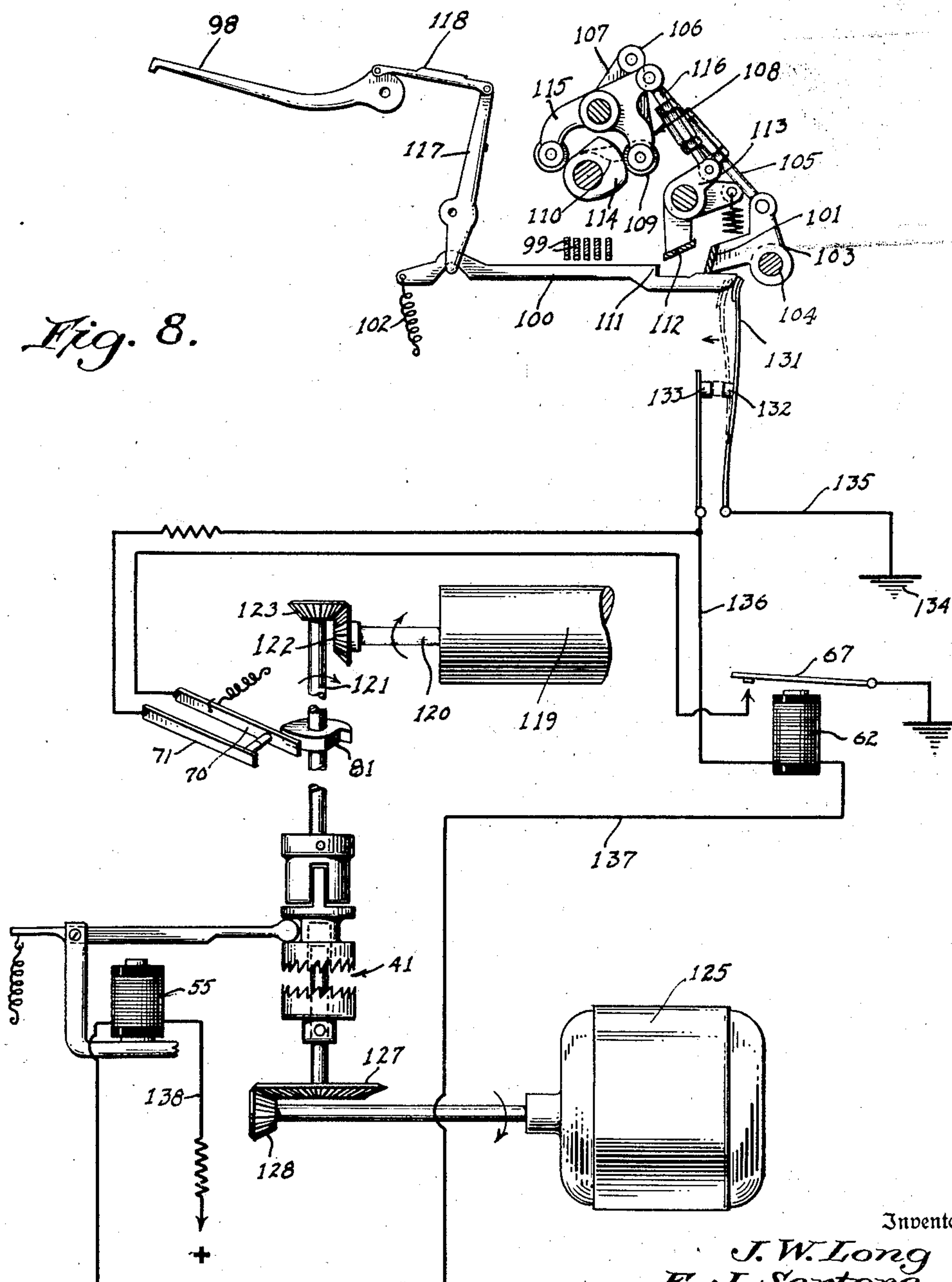
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COUPON FEED MECHANISM FOR TELEGRAPH PRINTERS

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5 Sheets-Sheet 5



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COUPON-FEED MECHANISM FOR TELEGRAPH PRINTERS

Application filed July 27, 1929. Serial No. 381,567.

This invention relates to printing telegraph machines of the type in which the selection of the printing character is determined by a combination of electrical impulses, and more particularly to a paper feed mechanism for a printer of this nature, and to the control of said paper feed mechanism.

In printing telegraph systems employing machines of this nature, it is usual to employ, at the transmitting station, a key-board transmitter, which, when a definite character key is depressed sends out a combination of electrical impulses, usually of five or six units, which are transmitted to the receiving station where the selecting mechanism of a printing unit, selects the particular type-bar on which the desired printing character is mounted. The selected type-bar is then moved against the tape or sheet of paper to form an impression, and the tape or page fed forward one letter space. The key-board transmitter and printing unit at each station are usually combined into a single machine operated by a common motor, but may constitute separate units.

The present invention is especially concerned with the printing unit, but the mechanism embodying the invention is under the control of the operator, at the transmitting station, through the key-board transmitter. A type of key-board transmitter which may be employed in connection with this invention is disclosed in the patent to Krum, 1,595,472 granted August 10, 1926, and entitled Telegraph apparatus.

Telegraph printing machines, as heretofore constructed, are adapted only for continuous writing, that is, for each signal combination transmitted, the paper is fed forward a single letter space only. It is desirable, however, in certain kinds of business, such as brokerage houses, mail order concerns, department stores, banks, hotels and the like to transmit from one distant point to another, individual orders or messages consisting only of a few characters, and in order to facilitate the handling and filing of such orders it is desirable that they be received on individual slips or coupons of uniform size, somewhat larger than that required for the order or

message alone. For instance, in the case of brokerage houses, the orders should be of the same size and style as those written out upon the regular order blanks and delivered to the brokerage house by messenger, mechanical conveyor or by any of the forms of delivery in common use.

The invention is particularly adaptable to the brokerage business in which a large proportion of the telegraphic traffic consists of "buy" and "sell" orders of only a few characters in length.

One of the objects of the present invention is to provide an apparatus for use in conjunction with a telegraph printing unit which will enable the operator at the transmitting station to transmit the order or message to the receiving printer and at the completion of the order to automatically space out the proper length of tape or sheet to form an individual slip or coupon of uniform length in each instance.

A further object is to provide a printing telegraph machine for producing, in response to transmitted signals, a message slip of uniform size independent of the length of the message, and for detaching or indicating the place of detachment of the slips or coupons from the roll or paper web.

Another object is to provide means enabling the length of the slip or coupon to be varied.

Other objects and advantages will appear as the description proceeds.

It is possible, of course, with the prior forms of tape printing telegraph machines to produce a coupon of any desired length by actually counting the number of message characters transmitted in each instance and then spacing out the tape to the desired length by successively operating a space or non-intelligence character key lever at the key-board transmitter, but this is impractical since the number of message characters differs in each instance, and the procedure is tedious and susceptible to errors on the part of the operator.

In accordance with our invention we provide the printing unit in addition to the main step by step paper feeding mechanism controlled by the transmitted message, with an

auxiliary paper feed mechanism which is set into operation after the message has been completed, by the actuation of a definite key lever of the keyboard transmitter, to feed the paper automatically an additional distance, such that the coupons will be of the same length in each case irrespective of the length of the message. In the embodiments of the invention disclosed herein, the actuation of the auxiliary tape feed key lever of the key-board transmitter causes a predetermined signal combination to be transmitted to the printing unit which, through the regular typebar selecting mechanism of the printer, causes an electrical contact to be closed, thus completing a circuit through a magnet which operates a clutch mechanism for connecting the shaft of the auxiliary paper feed mechanism to a source of power.

The shaft of the auxiliary paper feed mechanism rotates the paper feed rollers to advance the tape through the printer. This auxiliary paper feed mechanism, after it is once set into operation, continues to feed the paper until its operation is discontinued by an automatic timing device controlled by the movement of the paper or of the paper feed mechanism. The timing device is actuated by both the main paper feed mechanism and the auxiliary paper feed mechanism when the correct length of paper has been advanced through the machine, irrespective of the length of the message.

At the termination of the paper feeding operation, the coupon may be severed from the paper web, perforated, scored or otherwise marked to indicate the proper length of the coupon.

In order that the invention may be more fully understood, reference will be had to the accompanying drawings in which:

Figure 1 is the perspective view, from the front, of a telegraph tape printing unit showing our invention applied thereto;

Figure 2 is a diagrammatic view of the apparatus shown in Figure 1 with its associated electrical control circuits;

Figure 3 is a diagrammatic view similar to Figure 2 but showing a modification in which the length of the coupon is controlled by the paper itself;

Figure 4 is a perspective view of a printing unit showing the mechanism of Figure 3 applied thereto;

Figure 5 is a vertical sectional view through the front of the machine of Figure 4 showing the tape feed controlling contacts and tape severing means;

Figure 6 is an elevational view of the tape severing mechanism;

Figure 7 is a side perspective view of a page printing telegraph unit embodying our invention;

Figure 8 is a diagrammatic view of the auxiliary paper feeding mechanism shown in

Figure 7 with its associated selecting mechanism.

Figure 9 is an elevation, partly in section, of the clutch mechanism employed for connecting the auxiliary paper feed mechanism to the driving motor, and

Figure 10 a front view of an adjustable timing cam for determining the period of operation of the auxiliary paper feed mechanism.

Referring first to Figures 1 and 2, we have shown a printing unit employed at a telegraph receiving station for translating the signals sent out by the transmitting station into printed characters. The machine has the usual base 11 upon which the printing and tape feeding mechanism is mounted. The various printing characters are disposed on typebars 12 arranged in a semi-circle and striking downward. The typebars are selected in the usual manner by a group of semi-circular notched code bars 13 controlled by selecting cams (not shown) in response to the received combination of electrical impulses, to bring a single set of notches in the code bars into alignment, whereby the pull bar 14, corresponding to the selected character, will be pulled into the aligned notches and thus brought into a position to be engaged by the operating bail 15 on upward movement thereof. The operation of the pull bar, actuates the corresponding typebar. After each movement of the operating bail 15 the paper is stepped ahead one letter space preparatory for the succeeding printing signal.

This form of printing telegraph machine is well known in the art and forms no part of the present invention, except in so far as it operates in conjunction with our auxiliary paper feed mechanism, and controls the operation thereof through the received signal combination. Therefore, it will not be necessary to describe the same in further detail for a proper understanding of the present invention.

The parts of the printing unit forming the subject matter of our invention are shown in heavy lines in Figure 1. A platen 16 is provided with spaced paper supporting rollers 17 and 18 to permit the use of a relatively wide tape 19, shown in dotted lines in Figure 1. The tape passes from right to left over the platen and under the spaced pressure rollers 20 and 21, mounted upon a shaft 22 driven by the platen through gears 23 and 24. These pressure rollers are mounted on a crank arm 25, shown in Figure 4, and are pressed against the platen by a spring, not shown, to hold the tape thereagainst so that it will be moved forward during the rotation of the platen. An inking ribbon 26 is disposed immediately above the platen roller 17.

The platen is rigidly secured to a shaft 27

which is provided on its inner end with a driving gear 28 mating with a gear 29 secured to the end of a main paper feed shaft 30 disposed parallel to the platen shaft. The driving gear 28 is of substantially double the width of the gear wheel 29 so as to permit the platen to be shifted, by means of the usual mechanism, not shown, to print either of the two sets of characters disposed upon the typebars.

The normal forward feed of the tape during the printing of the order or message is accomplished through the usual ratchet and pawl paper feed mechanism controlled by the operating bail 15. The operating bail is mounted upon a vertical plunger 31 (see Figure 2) having a cam face 32 which engages the horizontal arm 33 of a bell crank lever pivoted at 34. Upon upward movement of the plunger the horizontal arm 33 of the bell crank lever moves into the depression formed by the cam surface of the plunger and through the vertical arm of the bell crank lever moves the ratchet pawl 35 downward.

The ratchet pawl is arranged so as to engage one of the teeth of the spacing ratchet 36 upon the downward movement thereof so as to rotate the ratchet through one space upon the subsequent upward movement thereof.

The upward movement of the pawl occurs when the operating plunger is returned to its normal lower position. Rotation of the ratchet 35 advances the paper through the machine through the rotation of the platen.

In addition to this regular paper feed mechanism, we have provided an auxiliary paper feed mechanism which is set into operation after the completion of the message by the depression of a special "tape feed" key lever of the key-board transmitter. This auxiliary paper feed mechanism continues the feeding of the paper until the predetermined length has been advanced through the machine.

A gear 37 is mounted upon an extended part of the main paper feed shaft 30, opposite the spacing ratchet 36. The gear 37 meshes with a bevel gear 38 mounted on the end of the auxiliary paper feed shaft 39 which is disposed at right angles to the shaft 30.

A driven member 40 of a clutch 41 is disposed at the opposite end of the shaft 39 from the gear 38. The driving member 42 of the clutch is secured to a shaft 43 driven by a motor 44 by worm-wheels 45 and 46, vertical shaft 47, worm-wheels 48 and 49, horizontal shaft 50 and bevel gears 51 and 52. The motor 44 preferably, also constitutes the source of power employed to operate the printing mechanism, but if desired separate operating motors may be used.

The clutch 41 may be of any convenient type and as shown consists of the two crown gears 40 and 42, the gear 42 being rigidly

fixed upon its shaft 43, and the gear 40 being slideable longitudinally on its shaft but connected by a key and slot connection 53 to a fixed element 54 secured to the shaft 39 so as to rotate therewith. The driven element 40 of the clutch may be moved into engagement with the continuously operating driving member 42 to transmit motion to the shaft 39. The operation of this clutch is controlled by a magnet 55, the armature 56 of which has a yoke 57 attached thereto. The legs of the yoke engage in an annular recess 58 of the driven clutch member 40 and move the two clutch members into engagement and disengagement upon energizing or deenergizing the magnet. A spring 59 disengages the clutch upon deenergization of the magnet.

With the foregoing mechanism it will be noted that the paper may be fed forward either by the normal feed mechanism including the pawl and ratchet 35 and 36 or by the auxiliary paper feed mechanism, controlled by the clutch 41.

The energizing of the magnet 55 for initiating the operation of the auxiliary paper feed is controlled through the keyboard transmitter.

At the conclusion of the transmission of the order or other message, during which a definite quantity of tape has been fed, if it is desired to cause enough blank tape to be automatically and additionally fed out so as to give a uniform length of slip or coupon, the transmitting operator depresses the special "tape feed" key to transmit a signal combination which will operate one of the pull bars 14 which is so disposed as to engage a pair of normally open contacts 60 and 61 to close the same and thus complete a circuit through the magnet 55 and a locking relay 62, from the ground 63 by way of conductors 64, 65 and 66. The relay 62 through its armature 67 completes a locking circuit through the winding of the magnet 55 and the relay 62 from the ground 68 by way of the armature 67, conductor 69, contacts 70 and 71, conductor 72, relay 62, conductor 65, magnet 55 and conductor 66.

The contacts 70 and 71 form part of a timing device, the purpose of which is to discontinue the operation of the auxiliary paper feed mechanism after the desired length of tape has been fed to form the coupon. The contacts 70 and 71 are controlled by a cam 74 mounted upon the shaft 39. The cam 74 has a recess 75 in one side thereof which at the beginning of the operation of printing a coupon is opposite the contact 70, so as to enable the contacts to be open. Upon the printing of the first character of the order or message, the normal tape feeding mechanism is operated through the pawl and ratchet 35 and 36 to advance the tape and at the same time to rotate the cam 74 through

the gears 37 and 38. The rotating of the cam 74 in response to the first printing signal causes the contacts 70 and 71 to close. The cam is moved around with each subsequent printing signal.

After the message has been completed and it is desired to space out the tape to form the definite size coupon, the auxiliary tape feed mechanism is set into operation by actuation of the "tape feed" key lever and the subsequent energization of the clutch magnet 55 and the locking circuit, including the contacts 70 and 71. The auxiliary tape feed mechanism continues to operate until the cam 74 makes a complete revolution and the recess 75 again comes into position opposite the contact 70, at which time the contacts open and thus break the circuit through the clutch magnet 55 and the locking relay 62. The retractile spring 59 causes the disengagement of the clutch 41.

The length of the coupon is definitely determined by the cam 74, which being actuated by both the normal printing operation and the auxiliary paper feed mechanism causes the feeding of the paper to be uniform regardless of the number of characters in the message.

While we have shown the cam 74 as provided with a single recess, it is to be understood that any number of recesses may be provided so that a single revolution of the cam will control the feeding of several slips or coupons. The length of the coupons may be varied by changing the spacing of the recesses in the cam and/or by changing the ratio of the gears 37 and 38.

It may be desired to automatically cut-off the printed slip or coupon after the predetermined length thereof has been fed out. This is accomplished by passing the tape, as it leaves the printing platen, between the jaws 76 and 77 of a paper severing device. The jaw 77 is fixed and the jaw 76 is pivoted to a fixed support 78 and is normally held open by a spring 79.

The operation of the jaw 76 is effected by a solenoid 80 controlled by a second cam 81 mounted upon the shaft 39. A set of normally open contacts 82 and 83 are disposed adjacent the cam 81 so as to be periodically closed thereby to complete a circuit through the solenoid 80 from the ground 84 by way of conductors 85, 86 and 87 to a source of current. The cam 81 has a projection 88 which is disposed in such relation to the recess 75 of the cam 74 that the contacts 82 and 83 are closed at the termination of the paper feeding operation to operate the tape severing means.

In case it is desired to separate the slips at some later time or to have the tape marked so as to facilitate the subsequent separation of the coupons, a set of pins mounted in a row upon the jaw 76 may be substituted for

the shearing jaw to perforate the tape. Obviously other means controlled by the solenoid 80 may be employed to indicate the correct length of the coupon.

Referring to Figures 3 and 4, we have shown an alternative method of stopping the auxiliary tape feeding mechanism which may be used in place of the timing cam 74.

The roll of tape is perforated at uniform distances along one edge, as indicated at 89 before being placed in the printer; the spacing of the perforations being equal to the desired length of the coupons. The tape passes between two electrical contacts 90 and 91 normally held out of contact by the tape but permitted to move into contact with each other through the perforations in the tape. Upon depression of the tape feed lever of the key-board transmitter to initiate the operation of the auxiliary paper feed, the pull bar 14 is raised to close the contacts 60 and 61 whereby the clutch magnet 55 and locking relay 62 are energized as described above, and a locking circuit completed from the ground 92 by way of the armature 67 of the locking relay, conductors 93, relay 62, conductor 94, magnet 55 and conductor 95 to the source of current.

The operation of the auxiliary paper feed is continued until one of the perforations 89 of the tape is moved opposite the contacts 90 and 91 to permit the same to close. This short-circuits the winding of the locking relay 62 so that the armature thereof is withdrawn by a spring 96 thus opening the circuit to the clutch magnet and discontinuing the paper feed operation. The cam 81 which controls the severing device may be provided on the shaft 39 and adjusted so that it operates the paper severing blades at the completion of each coupon feeding operation.

In Figures 7 to 10 inclusive, we have illustrated our invention applied to a page printing machine as distinguished from the tape printing machine described above. In Figure 7 we have shown a page printing machine having a casing 97 within which the type bars 98 and the type bar selecting and operating mechanism is disposed. The type bar selecting and operating mechanism is shown diagrammatically in Figure 8 and it comprises the usual horizontal code bars 99 shiftable longitudinally in accordance with the receiving signal combination to align a single set of notches in the bars to permit a definite push bar 100 to move into the aligned slots. The push bars, one of which is provided for each type bar, are normally held away from the code bars by a depressing bail 101, against the action of a spring 102. The depressing bail is mounted on a crank 103 pivoted at 104 and connected by an adjustable link 105 to one arm 106 of a two armed lever 107. The second arm 108 of the lever has a roller 109 engaging with a cam 110

which normally holds the pawl 101 depressed. As soon as the code bars have been shifted in accordance with the received signal combination, the cam 110 revolves sufficiently to release the roller 109 and permit the depressing bail to be raised.

Spring 102 then moves the selected bar into the aligned slots so as to elevate the notch 111 in front of a striker bail 112 secured to a crank 113, which is actuated by a second cam 114, crank 115 and link 116 to move the push bar forward. The forward movement of the push bar throws the type bar 98 upward against the platen by means of the lever 117 and link 118.

This form of type bar selecting mechanism is well known in the art, and further description thereof is believed to be unnecessary.

The type bars move upwardly against a cylindrical platen 119 carried by a longitudinal shiftable carriage. The platen is mounted upon a square shaft 120 so as to rotate therewith to effect the line spacing operation but shiftable longitudinally thereof to effect the letter spacing operation. The line spacing is accomplished during the normal operation of the printer by a feed pawl engaging with a ratchet (not shown) fixed to the square shaft 120.

In the application of our invention to a page printer of this type, to automatically space out a definite length of paper after the termination of the message, we connect the square shaft 120 directly to a vertical shaft 121 by bevel gears 122 and 123 so that the normal line spacing operation will rotate the shaft 121 and with it the timing cam 81 secured to the shaft 121. The shaft 121 is connected to a continuously operating driving motor 125 by the clutch 41 and bevel gears 127 and 128. The clutch 41 is controlled by the magnet 55 as described in connection with Figures 1 and 2.

Upon completion of the message, the transmitting operator, if he desires to space out a uniform length of paper, depresses the "auxiliary paper feed" key to transmit a predetermined signal combination for selecting a push bar which controls the actuation of the auxiliary paper feed mechanism. For this purpose, one of the push bars engages at its free end with a contact arm 131 to normally maintain a pair of contacts 132 and 133 open. When the auxiliary paper feed signal is received, this push bar is actuated and upon forward movement permits the contacts 132 and 133 to close, thereby energizing the clutch magnet 55 and the locking relay 62 to set the auxiliary paper feed mechanism into operation.

The circuit for the clutch magnet and locking relay may be traced from the ground 134 through conductor 135, contacts 132 and 133, conductor 136, locking relay 62, conductor

137, clutch magnet 55 and conductor 138 to a source of potential.

The locking circuit for the clutch magnet is completed through armature 67 of the locking relay and the contacts 70 and 71, of the timing mechanism, as previously described, so as to terminate the operation of the auxiliary paper feed mechanism when the proper length of paper has been advanced through the machine.

In Figure 10 we have shown a timing cam 81 provided with an adjustable means for varying the length of the paper.

A small plate 139, having an arcuate surface 140 of the same radius of curvatures as the surface of the cam, is secured to the cam by a screw 141 in such position as to cover one of the recesses 75 and thus to maintain contacts 70 and 71 closed as the contact 70 passes over this portion of the cam. With the plate 139 in position, the length of the slip or sheet will be determined by a single revolution of the cam.

If it is desired to produce a coupon of half the length, the plate 139 may be shifted away from the recess, to the dotted line position, to uncover the recess and thus cause the contacts 70 and 71 to open at each half revolution of the cam.

It is to be understood that the invention is not limited to the specific form of printing unit disclosed herein, but is applicable to other types, and since the invention is susceptible to many modifications and variations, we do not desire to be limited to the specific details described and shown except in accordance with the appended claims.

What is claimed is:

1. In a printing telegraph machine, a printing mechanism, a main paper feed mechanism, an auxiliary paper feed mechanism, means for starting said auxiliary paper feed mechanism into operation, means for automatically discontinuing the operation of the auxiliary paper feed mechanism after a predetermined length of paper has been advanced through the machine, means engaging with the paper for indicating the total length thereof fed by both the main and auxiliary paper feed mechanism and an electro-magnetic device responsive to a condition of said auxiliary paper feed mechanism for operating said last mentioned means.

2. In a printing telegraph machine, a selecting mechanism, a printing mechanism, a platen coacting with the printing mechanism, a paper engaging said platen, means actuated at each printing operation to rotate said platen to feed the paper forward one letter space and auxiliary means controlled by said selecting mechanism in response to a single selecting condition for continuously rotating said platen independent of the printing operation to advance the

paper a plurality of letter spaces through the machine in the same direction.

3. In a tape printing telegraph machine, a selecting mechanism, a printing mechanism, a platen coacting with said printing mechanism across which a paper extends, a shaft for said platen, a main paper feed shaft geared to said platen shaft, means actuated by each printing operation to rotate said main paper feed shaft to advance said paper a single letter space, an auxiliary paper feed operating shaft geared to said main paper feed shaft, means controlled by said selecting mechanism for operating said auxiliary paper feed operating shaft independently of said printing operation to continuously advance the paper a number of letter spaces in the same direction and means for automatically discontinuing the operation of said auxiliary paper feed operating shaft after a predetermined movement of said paper in response to the movement of both the main and auxiliary paper feed operating shafts.

4. In a tape printing telegraph machine, a selecting mechanism, a printing mechanism, a platen coacting with said printing mechanism across which a paper extends, a shaft for said platen, a main paper feed shaft geared to said platen shaft, means actuated by each printing operation to rotate said main paper feed shaft to advance said paper a single letter space, an auxiliary paper feed operating shaft geared to said main paper feed shaft, a source of power, a clutch for connecting said source of power to said auxiliary paper feed operating shaft, means controlled by said selecting mechanism for effecting engagement of said clutch to operate said auxiliary paper feed operating shaft independently of said printing operation to continuously advance the paper a number of letter spaces in the same direction and means for automatically effecting disengagement of said clutch after a predetermined movement of said paper, to discontinue the operation of said auxiliary paper feed operating shaft.

5. In a printing telegraph machine, a selecting mechanism, a printing mechanism and a paper feed mechanism, a magnet for controlling the operation of said paper feed mechanism, a circuit for said magnet, a relay in said circuit, a switch operated by said selecting mechanism to energize said magnet and relay, an auxiliary holding circuit for said magnet completed by said relay, a timing switch in said holding circuit and means controlled by the operation of the paper feed mechanism for opening said timing switch and discontinuing the operation of the paper feed mechanism after a predetermined period of operation thereof.

6. In a printing telegraph machine, a selecting mechanism, a printing mechanism

and a paper feed mechanism, a magnet for controlling the operation of said paper feed mechanism, a circuit for said magnet, a relay in said circuit, a switch operated by said selecting mechanism to energize said magnet and relay, an auxiliary holding circuit for said magnet completed by said relay and means operating after a predetermined length of paper has been advanced through the machine for opening said holding circuit to discontinue the operation of the paper feed mechanism.

7. In a printing telegraph machine, a selecting mechanism, a printing mechanism, a main paper feed mechanism, an auxiliary paper feed mechanism, a source of power, a clutch for connecting said auxiliary paper feed mechanism to the source of power, a magnet for operating said clutch, a circuit for said magnet including a relay, means operated by said selecting mechanism for momentarily closing said magnet circuit, an auxiliary holding circuit for said magnet completed by said relay, a timing switch in said holding circuit and means for closing said switch upon the initial operation of the printing mechanism to prepare the holding circuit, said means operating after a predetermined length of paper has been fed through the machine to operate the timing switch to open the magnet holding circuit.

8. In a printing telegraph machine, a selecting mechanism, a printing mechanism, a main paper feed mechanism, an auxiliary paper feed mechanism, a source of power, a clutch for connecting said auxiliary paper feed mechanism to the source of power, a magnet for operating said clutch, a circuit for said magnet including a relay, means operated by said selecting mechanism for momentarily closing said magnet circuit, an auxiliary holding circuit for said magnet completed by said relay, a timing switch in said holding circuit and a cam operated by said auxiliary paper feed mechanism for closing said switch upon the initial operation of the printing mechanism to prepare the holding circuit, said cam operating after a predetermined length of paper has been fed through the machine to operate the timing switch to open the magnet holding circuit.

9. In a printing telegraph machine, a printing mechanism, a paper feed mechanism, means for feeding the paper one letter space in response to each printing signal, means for feeding the paper in the same direction, a variable number of letter spaces in response to a single paper feeding signal, and means for controlling the variable number of letter spaces in the same direction, so that the total length of paper fed by both of said paper feeding means will be the same for each cycle of operation.

10. In a printing telegraph machine, a printing mechanism, a paper feed mechanism

anism, means for feeding the paper one letter space in response to each printing signal, means for feeding the paper in the same direction, a variable number of letter spaces in response to a single paper feeding signal, means for controlling the variable number of letter spaces in the same direction, so that the total length of paper fed by both of said paper feeding means will be the same for each cycle of operation and means for varying the length of paper which will be fed during each cycle of operation.

11. In a printing telegraph machine, a platen, a printing mechanism, a paper feed mechanism for advancing paper in one direction past the printing position, means responsive to each received signal code combination to print a character on said paper and to advance the paper one letter space and means responsive to a particular code combination to advance the paper a plurality of letter spaces in the direction of the line of printing.

12. In a printing telegraph machine a selecting mechanism, a printing mechanism, a paper feed mechanism for advancing paper in a single direction past the printing position, means for printing a plurality of spaced messages on said paper and means responsive to a single selecting condition for spacing the paper a plurality of letter spaces intermediate each message.

13. In a printing telegraph machine a selecting mechanism, a printing mechanism, a paper feed mechanism for advancing paper in a single direction past the printing position, means for printing a plurality of spaced messages on said paper and means responsive to a single selecting condition for spacing the paper a plurality of letter spaces intermediate each message, such that the first character of each message will be spaced a predetermined distance from the first character of the preceding message.

14. In a printing telegraph machine, a printing mechanism, a paper feed mechanism, means for feeding the paper one letter space in response to each printing signal, means for feeding the paper in the same direction a variable number of letter spaces in response to a single paper feeding signal, means for controlling the variable number of letter spaces to be supplied so that the total length of paper fed by both of said paper feeding means will be the same for each cycle of operation and means engaging the paper to indicate the total length of paper fed by both of said paper feeding means.

15. In a printing telegraph machine, a selecting mechanism, a printing mechanism, a platen co-acting with the printing mechanism, a paper engaging said platen, means actuated at each printing operation to advance the paper one letter space and auxiliary means controlled by said selecting mechanism

in response to a single selecting condition for continuously advancing the paper a plurality of letter spaces through the machine in the same direction and means for severing the printed portion of the paper from the unprinted portion thereof at the conclusion of the operation of the auxiliary paper feeding means.

In testimony whereof we affix our signatures.

JAMES W. LONG.
EMERSON J. SORTORE.

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