

April 7, 1931.

J. W. LONG

1,800,190

COUPON FEED CONTROL MECHANISM FOR KEYBOARD TRANSMITTERS

Filed Aug. 3, 1929

3 Sheets-Sheet 1

Fig. 1.

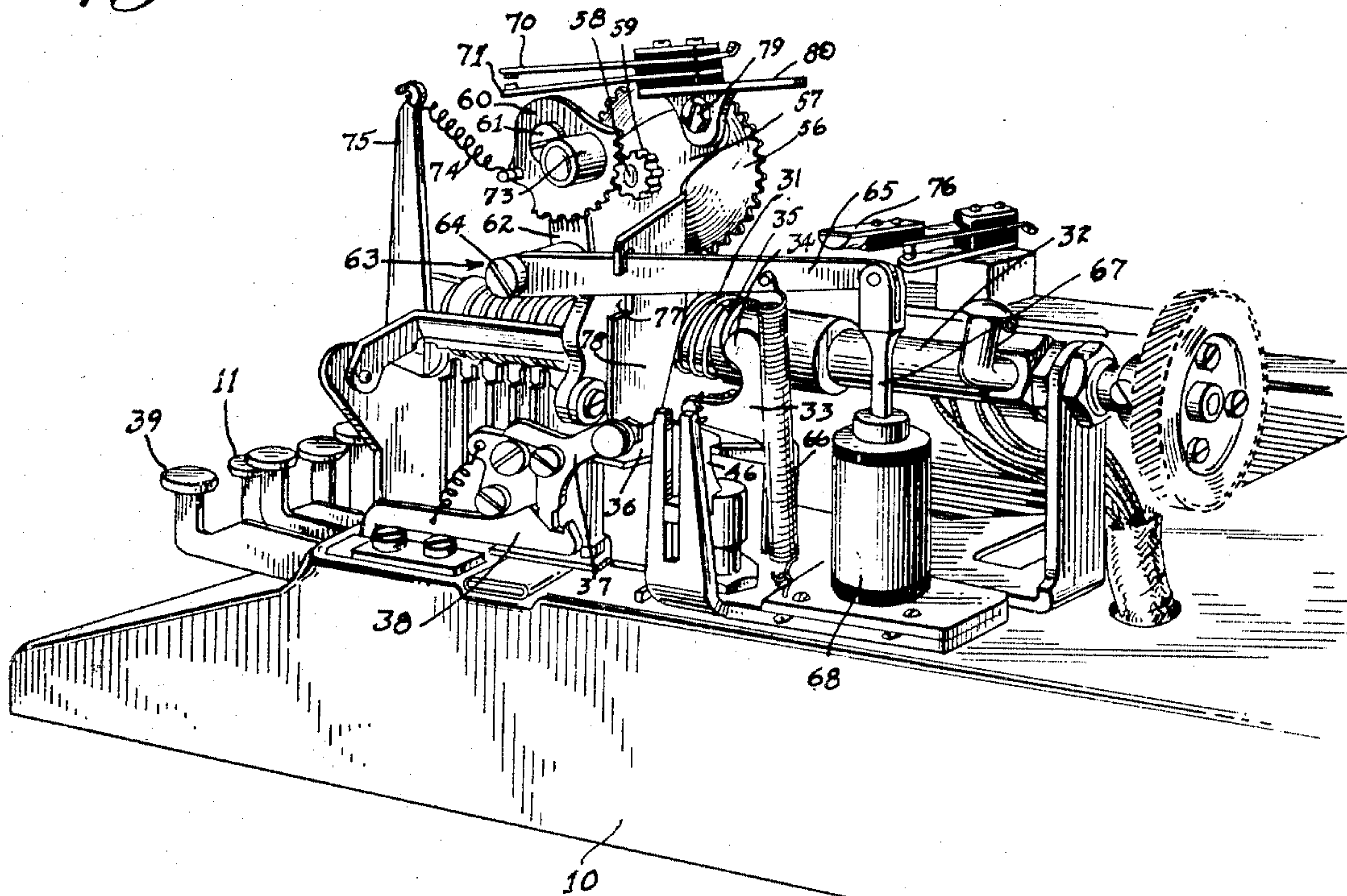


Fig. 2.

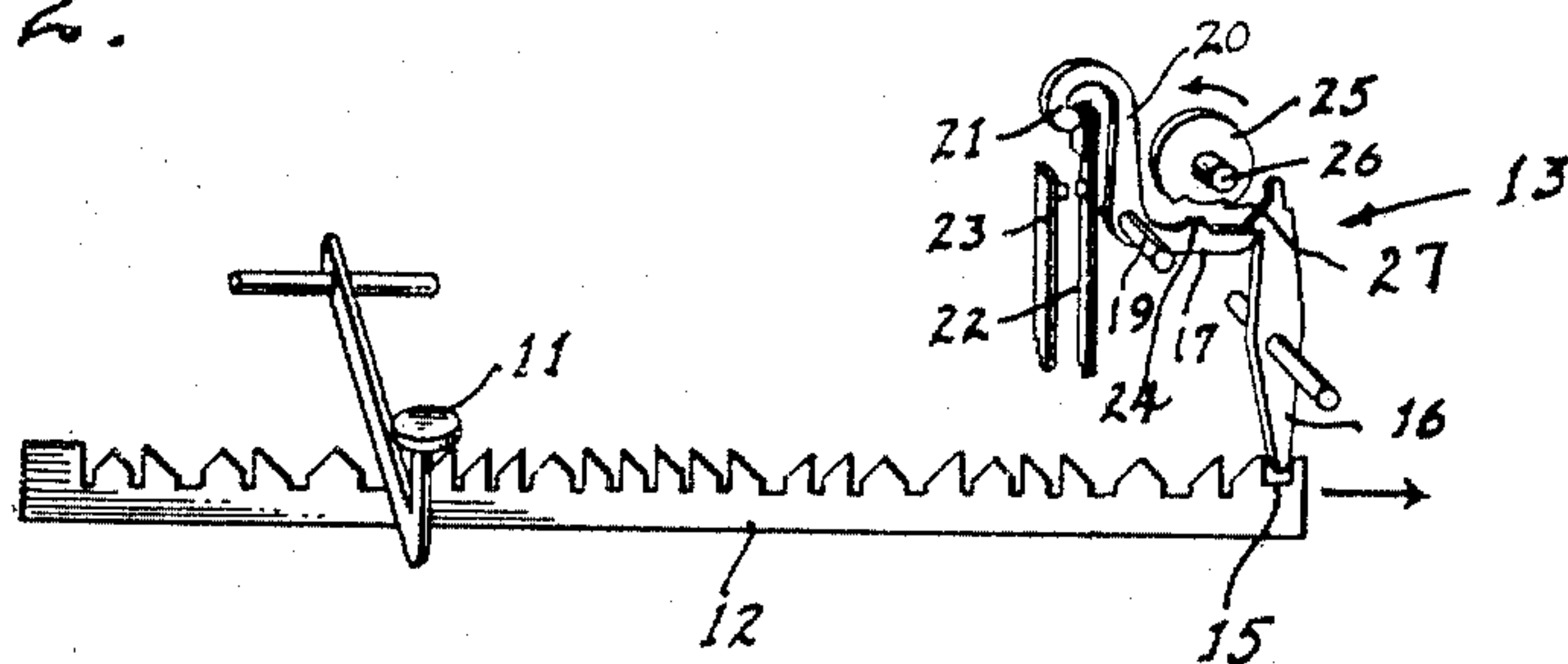
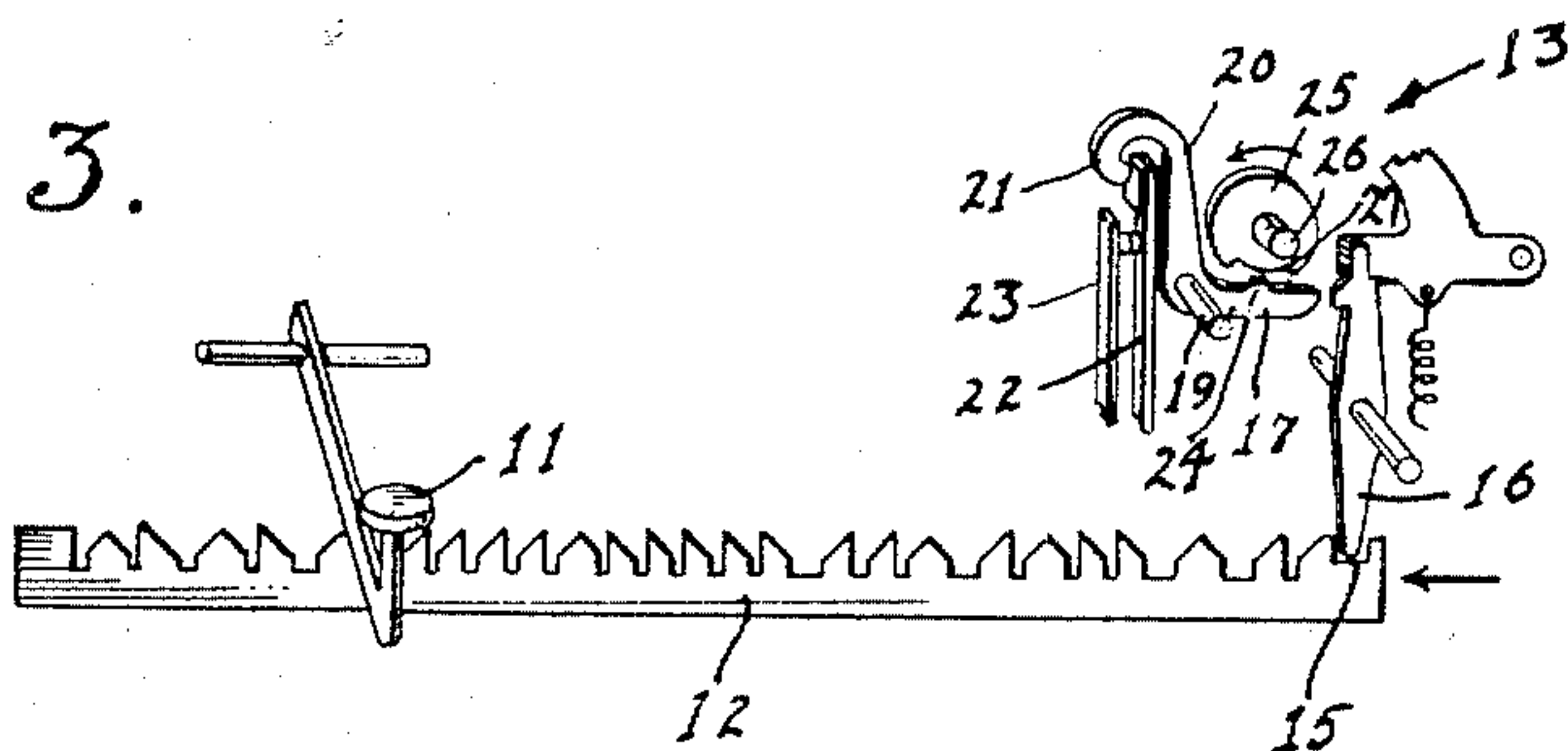


Fig. 3.



Inventor

J. W. Long

Eugene C. Brown
Attorney

April 7, 1931.

J. W. LONG

1,800,190

COUPON FEED CONTROL MECHANISM FOR KEYBOARD TRANSMITTERS

Filed Aug. 3, 1929

3 Sheets-Sheet 2

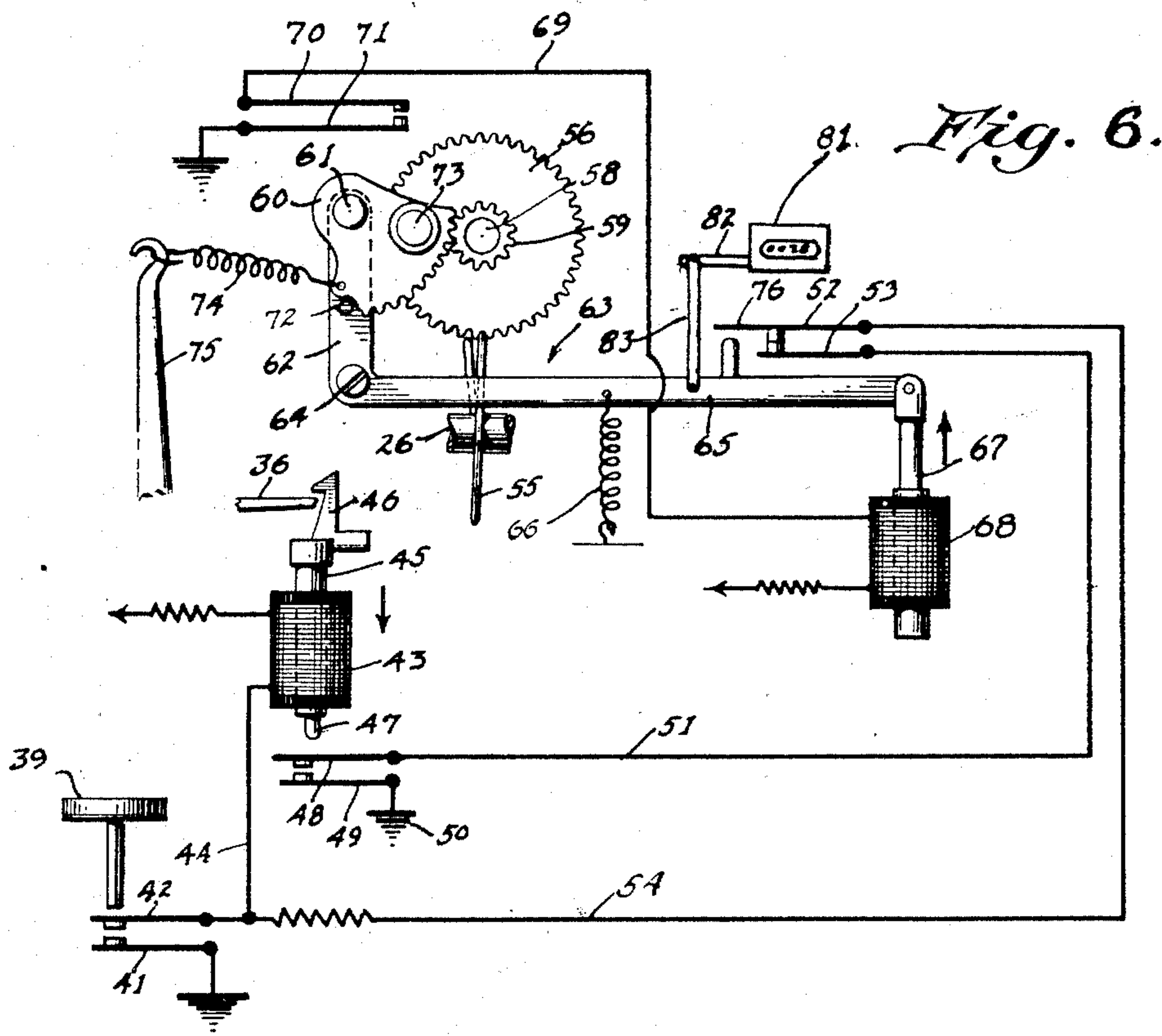


Fig. 4.

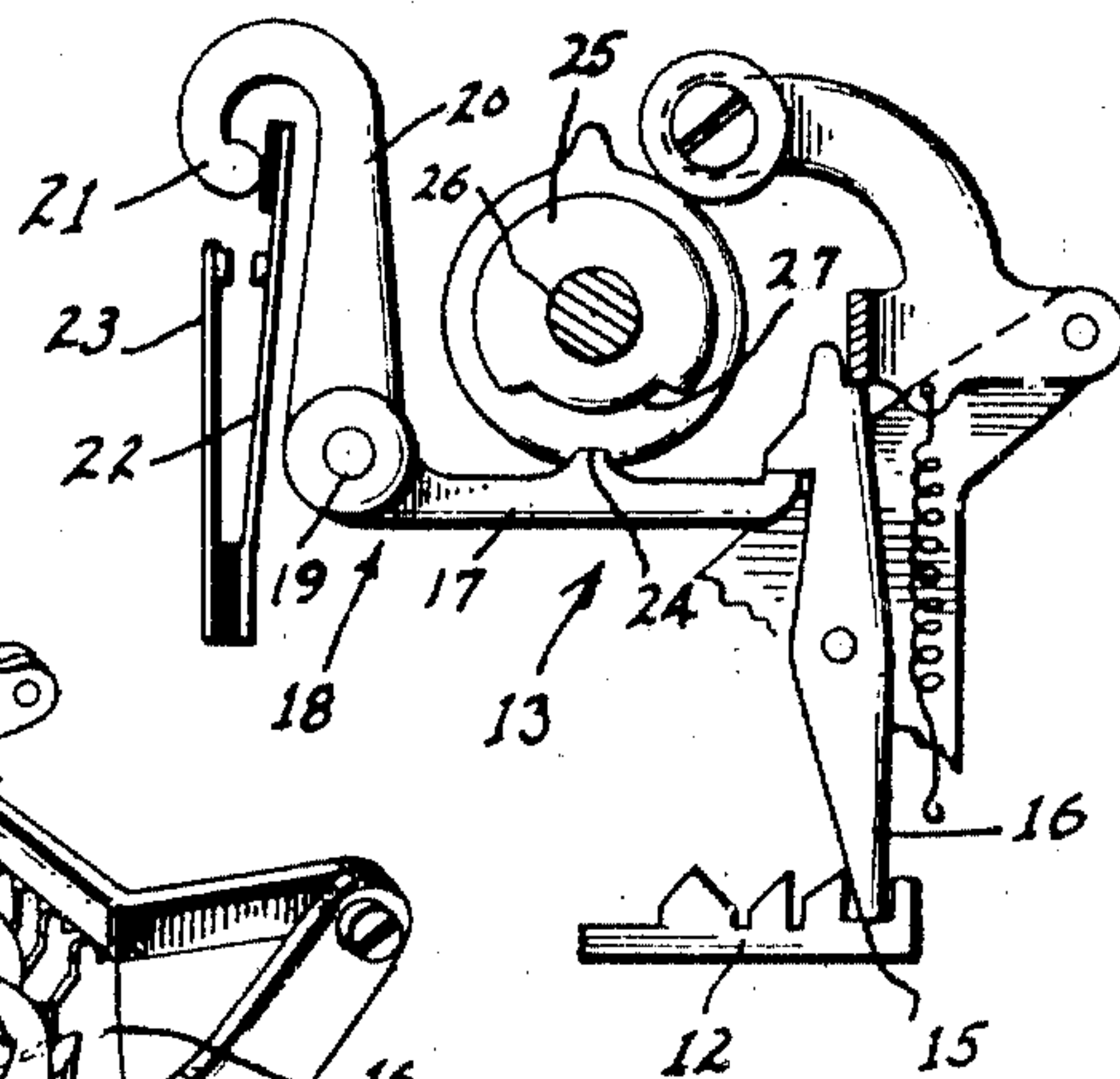
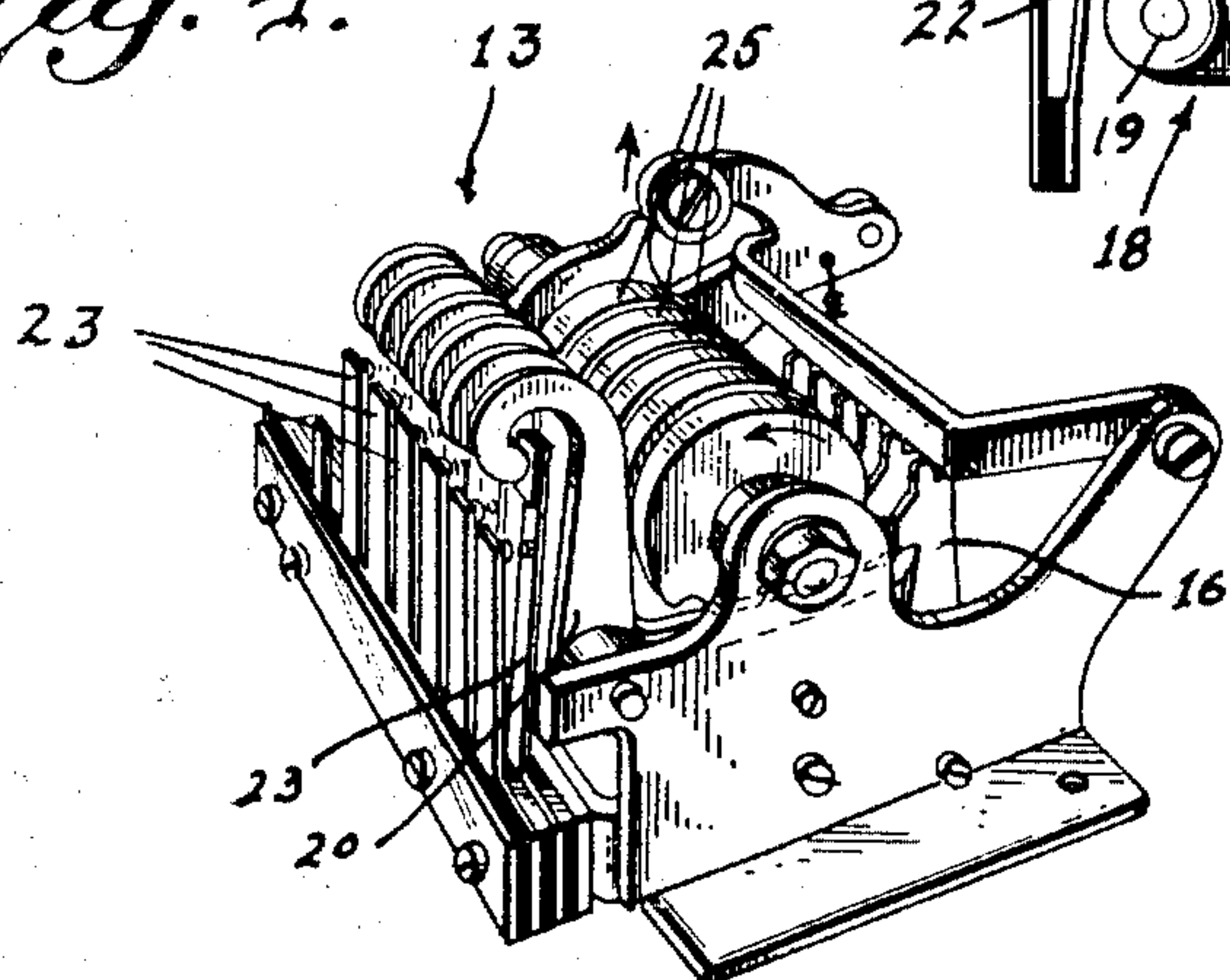


Fig. 5.

J. W. Long

Inventor

Eugene C. Brown
Attorney

April 7, 1931.

J. W. LONG

1,800,190

COUPON FEED CONTROL MECHANISM FOR KEYBOARD TRANSMITTERS

Filed Aug. 3, 1929

3 Sheets-Sheet 3

Fig. 7.

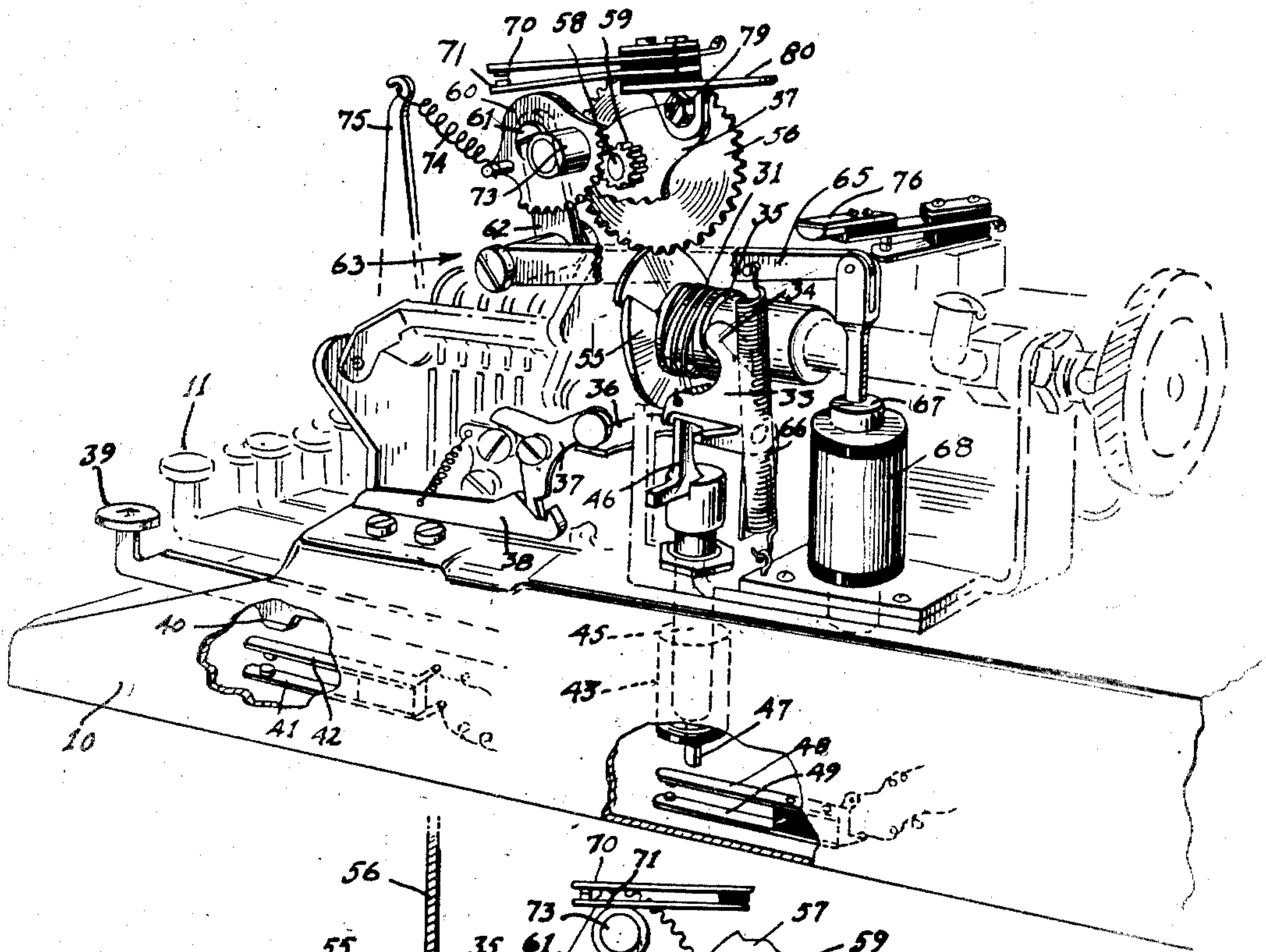


Fig. 8.

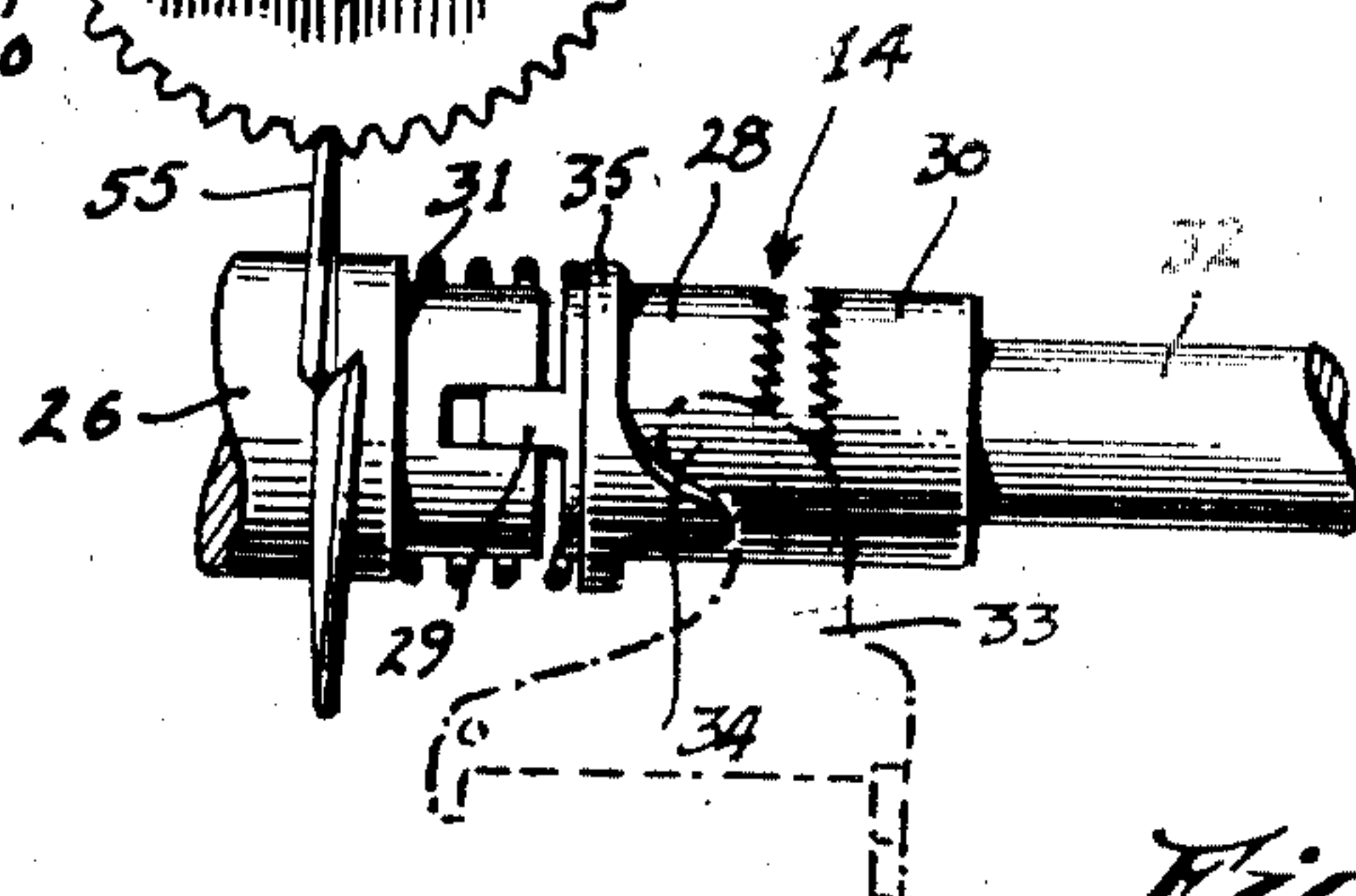
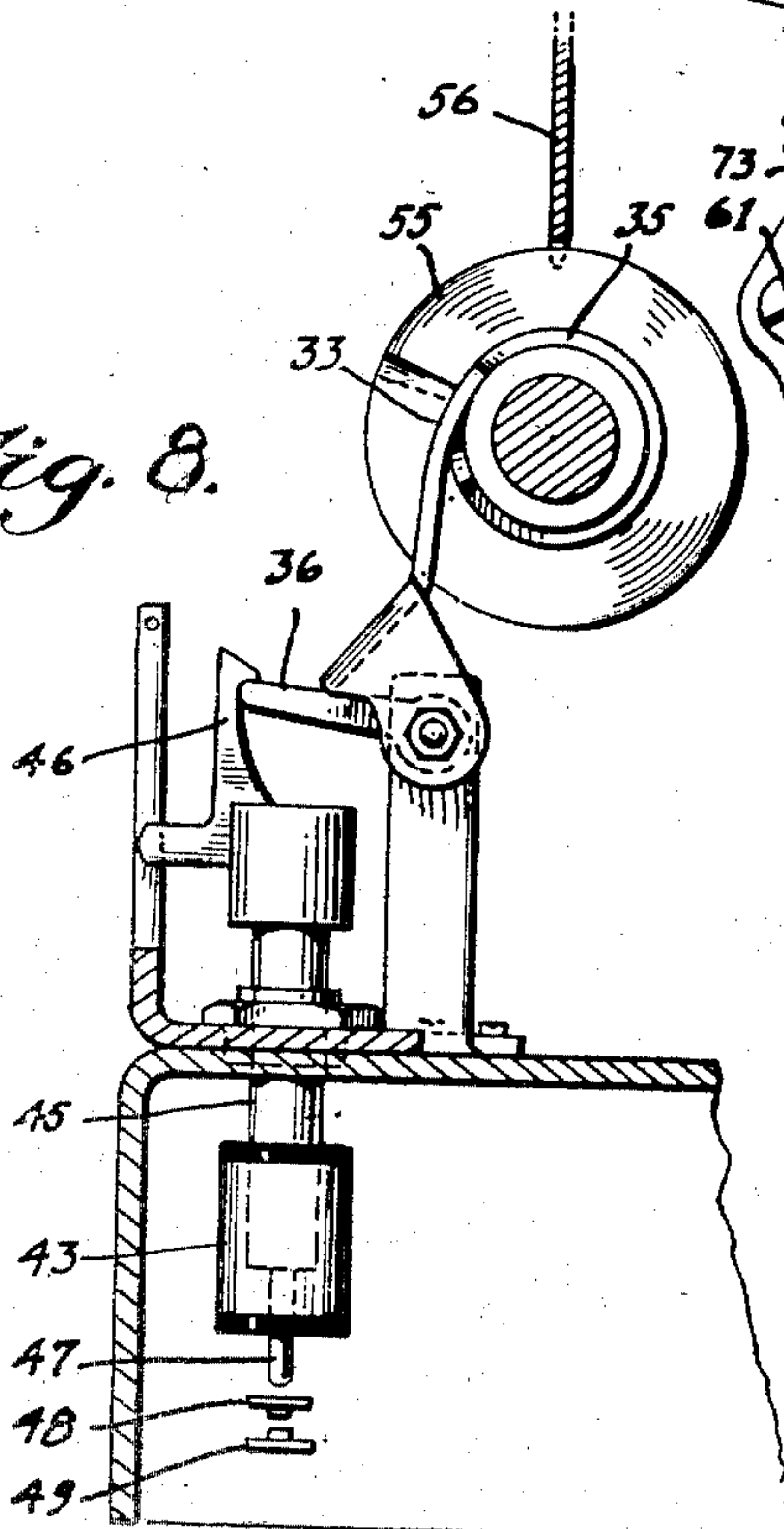


Fig. 9.

J. W. Long

Engineer & Attorney

UNITED STATES PATENT OFFICE

JAMES W. LONG, OF PLAINFIELD, NEW JERSEY, ASSIGNOR TO THE WESTERN UNION
TELEGRAPH COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK

COUPON-FEED-CONTROL MECHANISM FOR KEYBOARD TRANSMITTERS

Application filed August 3, 1929. Serial No. 383,197.

This invention relates to a key-board transmitter for a telegraph system employing a tape or page printing telegraph machine at the receiving end of the system, the operation of which is controlled by permutation of electric impulses transmitted by the key-board transmitter and more particularly to the control of the paper feed mechanism of the printing unit from the key-board transmitter.

10 In telegraph systems of the nature to which the invention is especially concerned, the depression of a definite character key of the key-board transmitter, sends out a combination of electrical impulses, usually of five or six units, 15 which are transmitted to the receiving station and through a printing unit, having mechanism responsive to the particular signal combination transmitted, effects the selection of the proper type-bar on which the desired 20 printing character is mounted. The selected type-bar is moved against the paper to form an impression and the paper fed forward one letter space preparatory for the next signal combination. One key of the transmitter is 25 provided for operating the paper feed of the printer to advance the paper one letter space independent of the printing operation. In such machines, as heretofore constructed, if it is desired to space-out the paper a number 30 of successive letter spaces it is necessary to successively depress the "paper feed" key a corresponding number of times.

It is desirable in certain kinds of business, such as brokerage houses, mail order concerns, department stores, banks, hotels and the like to transmit, from some distant point, individual orders or messages consisting of only a few characters and in order to facilitate handling or filing, it is desirable that 40 the messages or orders be received on individual slips or coupons of uniform size somewhat larger than that required for the transmitted order alone, so that, for instance in the case of brokerage houses, the orders will 45 be of the same size and style as orders written out on the regular order blanks and handed to the brokerage houses by messenger, mechanical conveyor or any of the other delivery methods in common use.

50 The invention is particularly adapted 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, but it is equally applicable to page printing machines for indexing or tabulating purposes. 55

One of the objects of the invention is to provide a keyboard transmitter to be used in conjunction with a telegraph printing unit, which will permit the key-board operator to 60 transmit the desired order or message, and thereafter to automatically space-out the proper length of paper through the receiving printing unit to form an individual slip or coupon of uniform length in each instance. 65

A further object is to provide a mechanism for a key-board transmitter for automatically successively repeating a definite signal combination a predetermined number of times.

A further object is to provide a mechanism 70 for a key-board transmitter for producing at the printing unit a message or order slip of uniform size irrespective of the length of the order.

Other objects and advantages will herein- 75 after appear.

It is possible, of course, with the present form of keyboard transmitter and tape printing machines to count the number of message characters transmitted in each instance 80 and then space-out the tape to the desired length by successively depressing the "paper feed" or non-intelligence character key lever of the key board transmitter. But this method of operation is impractical since the 85 number of characters varies for each message and the proceeding is tedious and susceptible to errors on the part of the operator.

In accordance with my invention I provide the key-board transmitter with a signal repeating mechanism which may be set into 90 operation by the single depression of a key-lever to successively repeat a definite signal combination a predetermined number of times. The repeat signal may be associated 95 with the paper feed key-lever so as to transmit a series of paper spacing signals for automatically advancing the paper through the printing unit, and may be so influenced by the proceeding message transmitted that the 100

total number of printing signal combinations and paper feed signal combinations will be constant in each instance, regardless of the length of the message.

- 5 This is accomplished by a timing device which starts its period of operation at the beginning of the transmission of the first message character and is actuated each time a successive message character is transmitted.
- 10 After the completion of the message the key-board transmitter is locked up so as to send out the paper feed signals continually until the predetermined total number of printing and paper feed signal combinations have been
- 15 transmitted. The timing device will then stop further transmission.

It will be obvious that the repeat signal is not restricted to the paper feed signal combination, but may be applied to any signal combination to which the receiving printer is responsive.

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

- 25 Figure 1 is a side perspective view of a key-board transmitter having one embodiment of my invention applied thereto;

Figures 2 and 3 are perspective views of a key-board transmitter selector bar and its associated transmitting contacts and contact operating mechanism, in two positions of operation thereof;

Figure 4 is a perspective view of the transmitting contacts and contact operating mechanism;

Figure 5 is an elevational view of one set of transmitting contacts and contact controlling mechanism;

Figure 6 is a diagrammatic view of the essential elements shown in Figure 1, and constituting one embodiment of my invention;

Figure 7 is a side perspective view similar to Figure 1 with parts cut away to show the control contacts and contact making apparatus;

Figure 8 is an elevational view partly in section of the transmitter cam shaft and clutch stop arm operating mechanism, and

Figure 9 is an elevation, showing the timing device associated with the transmitting cam shaft.

A type of key-board transmitter with which the present invention may be associated is shown in patent to Krum 1,595,472, granted August 10, 1926 and entitled "Telegraph apparatus" and in the accompanied drawings I have illustrated my invention as applied to a key-board transmitter of this general type, only such features of the machine being illustrated as are essential for a proper understanding of the invention.

Briefly, the key-board transmitter consists of a suitable base forming a support for the operating mechanism, which comprises a bank of key-levers 11, a number of notched

selector bars 12, disposed of as to be engaged by the key-levers when depressed, a contact mechanism, indicated generally as 13, for setting up the selected signal combination and a clutch 14 by which the contact mechanism is driven from a source of power.

The selector bars, usually five in number, extend across the width of the key-board beneath the key-levers and are provided with triangular notches arranged according to the requirements of the signal code, so that they will be moved side-wise, either to the right or left, when the key-lever strikes the slanting sides thereof. At the right hand end of each selector bar is a slot 15, in which one end of a vertical locking latch 16 is set. The latch 16 is pivoted so that when the corresponding selector bar is moved to the right the upper end of the latch engages the horizontal arm 17 of a contact lever 18. The contact lever 18, one of which is provided for each selector bar, is pivoted at 19 and has a vertical arm 20 provided with a hooked end 21 engaging one of a pair of contacts 22 and 23. The contact levers, in combination with the locking latches, control the transmitting contacts 22 and 23 which are normally held open by the contact lever against the tension of the spring contact 22.

The horizontal arm of each of the contact levers has a hump 24 thereon engaging the edge of a cam 25 mounted upon a shaft 26. The cam has a depression 27 which when opposite the hump 24 permits the lever 18 to rock under the pressure of spring contact 22 to permit the contacts 22 and 23 to close, provided they are not held open by the locking latches 16. There is an individual cam for each contact lever arranged so that the depressions 27 oppose the humps 24 of the contact levers successively. By permitting certain of the contacts to close and others to remain open the desired character signal is formed. In addition to the contacts and contact levers, corresponding to the selector bars, there is an additional contact lever and operating cam the function of which is to transmit a "start" and "stop" impulse preceding and following the signal combination.

The cam shaft 26 is normally at rest and is permitted to make one complete revolution by means of the ratchet clutch 13, for each signal combination set up. The driven ratchet 28 of the clutch is keyed to the cam shaft by a key and slot 29 so as to be moved longitudinally into engagement with the driving ratchet 30 by a clutch spring 31. The driving ratchet is rigidly fixed to the driving shaft 32, which in turn is geared to the motor, not shown. The clutch faces are normally held out of engagement by a clutch stop arm 33 pivoted below the shaft and having a curved end 34 extending into the path of a collar 35 of the driven ratchet 28. The stop arm 33 has a horizontal extension 36 which

is engaged by a pivoted pawl 37, operated by a trip pawl 38, which is connected to a universal bar, not shown, extending beneath the key levers so as to be engaged by the key levers after the selector bars have been actuated to set up the desired signal combination. The depression of the universal bar moves the stop-arm out of engagement with the driven ratchet of the clutch so that the clutch faces will engage and cause the cam shaft to make one complete revolution. At the end of the revolution the clutch stop arm forces the driven ratchet out of engagement with the driving ratchet and the cam shaft comes to rest.

All the foregoing mechanism is well known in the art and has been described in some detail in order that the present invention, which is about to be described, will be more fully appreciated and its relation to this form of key-board transmitter better understood.

With the mechanism so far described and as heretofore constructed, if it is desired to repeat a particular signal combination, it is necessary to depress the key-lever controlling the signal combination each time the signal is to be transmitted. In accordance with my invention I provide an automatic repeating mechanism, for any particular signal combination and for this purpose one of the key levers 39 is provided with a downwardly extending projection 40 (see Figure 7) which, when the key lever is depressed, closes a pair of normally open contacts 41 and 42. The contact 41 is connected to the ground (see Figure 6) and contact 42 is connected to the winding of a solenoid 43, through a conductor 44. The opposite terminal of the solenoid winding being connected to the ground through a battery or other source of potential not shown.

The core 45 of the solenoid 43 has, at its upper end, a hooked end or pawl tooth 46 overlying the horizontal extension 36 of the stop arm 33. Immediately beneath the lower end 47 of the solenoid core is a pair of contacts 48 and 49, disposed so as to be closed by the downward movement of the core when the solenoid is energized. The contacts 48 and 49 complete a locking circuit for the solenoid, from the ground 50, through a conductor 51, a second pair of normally closed contacts 52 and 53, and conductors 54 and 44.

If it is desired to repeat any signal combination, the key lever controlling such signal combination is first depressed to set up the signal combination through the contacts 22 and 23 and the contact lever 18, and to cause one set of signals to be transmitted in the usual manner. The selector bars 11 are not immediately returned to their original position after the signal combination is transmitted but remain set until moved to a new position by the depression of another key

lever. This permits the signal combination, previously set up, to be repeated by depressing the switch control lever 39 to close the circuit of the solenoid 43, whereupon its core 45 moves downwardly and through the hooked end 46, rocks the stop arm 33 away from the clutch. The circuit through the solenoid is locked up by the closing of contacts 48 and 49, so that the stop arm is held out of engagement with the clutch, thus enabling the cam shaft to rotate continuously to repeat the signal combination previously set up, once each revolution, until the shaft is brought to a stop by a timing device, which controls the number of signal combinations which may be repeated.

If for the specific use of a particular key board transmitter, it is desired in each instance to transmit the same repeat signal, such as a tape feed signal, the contacts 41 and 42 may be disposed immediately beneath the key lever controlling this signal combination, in which case the signal combination will be set-up and automatically repeated a number of times by the depression of a single key lever.

The timing device for automatically discontinuing the transmission of the repeating signal is controlled by the cam shaft 26 so that it operates after a predetermined number of message and repeat signal combinations have been transmitted.

Mounted on the cam shaft 26 is a single tooth worm wheel 55 in the form of a split disk, meshing with a large gear 56, so that each revolution of the cam shaft in transmitting a single signal combination causes the gear 56 to rotate through the space of one tooth. The gear 56 is pivotally mounted on a bracket 57 secured to the frame of the machine. Fixed to the shaft 58 of the gear 56 is a small pinion 59, mating with a gear sector 60. The sector 60 is pivoted at 61 on the vertical arm 62 of a bell crank lever 63, which in turn is pivoted at 64 to the bracket 57.

The horizontal arm 65 of the lever 63 is normally retained in its lower position by a spring 66 and is joined, at its outer end, to the core 67 of a solenoid 68, the winding of which is connected from a source of current, not shown, to the ground through a conductor 69 and a pair of normally open contacts 70 and 71.

The gear sector 60 rotates between a lower limit, determined by a stop pin 72, on the arm 62 of the bell crank lever and an upper limit determined by the position of the contacts 70 and 71. With each revolution of the cam shaft 26 the sector moves upwardly, a definite distance in a counter clockwise direction, and after a predetermined number of revolutions of the cam shaft, a pin 73 on the sector engages the contact arm 71 and closes the circuit through the solenoid 68. This causes the core 67 of the solenoid to

move upward and thereby rock the bell crank lever about its pivot, thus moving the vertical arm 62 to the left so as to disengage the sector 60 from its pinion 59. As soon as this occurs the retractile spring 74, connected to the sector and to a stationary arm 75, returns the sector to its initial position against the stop pin 72 at the same time opening the circuit to the solenoid and thus permitting the spring 66 to return the bell crank lever to its original position to cause the re-engagement of the sector 60 and pinion 59.

The arm 65 in its upward movement engages with the extended end 76 of the contact 70 and opens the contacts 70 and 71 thus opening the locking circuit to the clutch solenoid 43 and allowing the clutch stop arm 33 to again engage the driven ratchet of the clutch and force it out of engagement with the drawing ratchet to bring the cam shaft to a stop. The arm 65 is guided in a slot 77 formed in an extension 78 of the bracket 57.

If, for instance, it is desired to produce, at the printing unit, order coupons of a uniform size, the order is first transmitted, each character thereof caused the timing sector to be moved upwardly towards the contacts 70 and 71. At the completion of the message or order the tape feed repeating key is actuated to start the successive transmission of the tape feed signals, which continues, one for each revolution of the cam shaft, until the sector engages the contact 71 and closes the circuit to the solenoid 43 to automatically discontinue the tape feed signals.

The total number of printing and spacing signals transmitted between each successive operation of the timing device and consequently the length of the coupon produced at the printing unit may be varied by changing the distance the sector 60 must rotate before engaging the contact 70. This is readily accomplished by loosening the screw 79 by which the contact unit is mounted on the bracket 57, and raising or lowering the contacts by means of the handle 80.

It will be understood that the timing device may be used independently of the signal repeating mechanism, for a variety of purposes, such as, operating a counting device to determine the total number of signals transmitted, indicating the end of a line or for tabulating when used in connection with a page printing unit, etc.

In Figure 6 I have shown a counting mechanism 81 having the operating lever 82 thereof connected by a link 83 to the arm 65 of the bell crank lever 63, so as to be operated at the completion of each cycle of operation of the transmitter, to count, for instance, the number of orders or coupons transmitted.

While I have described but a single embodiment of my invention it is to be understood that it may take other forms and that many changes may be made therein without

departing from the invention. Therefore, I do not desire to be limited to the exact detail shown and described except in accordance with the appending claims.

What is claimed is:

1. In a key-board telegraph transmitter, means for transmitting a variable number of intelligence signal combinations, means for automatically repeating a definite signal combination a variable number of times and means having a definite cycle of operation for rendering the total number of intelligence and repeated signals constant for each cycle of operation.

2. In a key-board telegraph transmitter, means for transmitting a variable number of signal combinations means for automatically repeating a definite signal combination a variable number of times and means having a definite cycle of operation for rendering the total number of intelligence and repeated signals constant for each cycle of operation, said means being adjustable to vary to the number of signal combinations transmitted during each cycle of operation.

3. In a key-board telegraph transmitter, selecting means for setting up a definite signal combination, and means for automatically repeating said signal combination a number of times.

4. In a key-board telegraph transmitter, means for transmitting intelligence signals, means for automatically transmitting a succession of paper feed signals and means for automatically discontinuing the transmission of the paper feed signals after a predetermined total number of intelligence and paper feed signals have been transmitted.

5. In a key-board telegraph transmitter, means for setting up a desired signal combination, means for automatically repeating said signal combination and means controlled by the number of signal combinations transmitted for automatically discontinuing the transmission of said repeated signal combinations.

6. In a key-board telegraph transmitter, means for setting up a desired signal combination, means for automatically repeating said signal combination and a timing device operated by the transmission of said signal combinations for automatically discontinuing the repetition of said signal combination after a predetermined number thereof have been transmitted.

7. In a key-board telegraph transmitter, means for transmitting intelligence signal combinations, means for automatically repeating a definite signal combination, a timing device having a predetermined cycle of operation for discontinuing the transmission of the repeated signal combination, said timing device being controlled by each intelligence and repeated signal combination transmitted whereby the total number of intelligence

70

75

80

85

90

95

100

105

110

115

120

125

130

gence and repeated signal combinations will be the same for each cycle of operation.

8. In a key-board telegraph transmitter, a rotary element, means associated therewith for transmitting a single signal combination during each revolution thereof, and means driven by said rotary element operating after a predetermined number of revolutions thereof for modifying the operation of the transmitting apparatus.

9. In a key-board telegraph transmitter, a rotary element, means associated therewith for transmitting a single signal combination during each revolution thereof, means for stopping said rotary element after each revolution, and means for rendering said stopping means ineffective whereby a succession of signal combinations will be automatically transmitted.

10. In a key-board telegraph transmitter, a rotary element, means associated therewith for transmitting a single signal combination during each revolution thereof, means for stopping said rotary element after each revolution thereof, and key-lever controlled means for rendering said stopping means inoperative to permit a succession of signal combinations to be repeated.

11. In a key-board telegraph transmitter, a rotary element, means associated therewith for transmitting a single signal combination during each revolution thereof, means for stopping said rotary element after each revolution thereof, key-lever controlled means for rendering said stopping means inoperative to permit a succession of signal combinations to be repeated, and means operating after a predetermined number of revolutions of said rotary element for restoring the operation of the stop member to discontinue the transmission of said repeated signals.

12. In a key-board telegraph transmitter, a "stop-start" transmitting device, means for rendering said "stop-start" device inoperative to permit a succession of signals to be automatically repeated, and means operating after a predetermined number of said signals have been transmitted for again rendering said "stop-start" mechanism operative, to discontinue the transmission of said repeated signals.

13. In a key-board telegraph transmitter, a rotary element, means associated therewith for transmitting a single signal combination during each revolution thereof, a timing device having a movement between predetermined limits, means for moving said device a definite distance during each revolution of said rotary element, and means for automatically returning said timing device to its initial position after it has reached the limit of its movement.

14. In a key-board telegraph transmitter, having key-levers corresponding to the characters to be transmitted, a rotary element,

means for transmitting a single signal combination during each revolution thereof, a stop member engaging said rotary element for limiting the rotation of said element to a single revolution upon each actuation of a character key-lever, means controlled by a key-lever for moving and holding said stop member out of engagement with said rotary element to permit a succession of similar signal combinations to be transmitted, and a timing device for causing re-engagement of said member with said rotary element after a predetermined total number of character and repeated signal combinations have been transmitted.

15. In a key-board telegraph transmitter having a rotary signal transmitting element, means for transmitting a single signal combination during each revolution thereof, and a timing device for determining the number of signal combinations transmitted comprising a contact member operable between predetermined limits, a gear for driving said rotary element engaging with said gear whereby said contact member is moved between its limits by a predetermined number of revolutions of said rotary element, a circuit controlled by said contact member in one limit of its movement, and means in said circuit operating to return said contact member to its other limit of movement.

16. In a key-board telegraph transmitter having a plurality of key-levers, a rotary transmitting element, a stop member engaging said rotary element to prevent rotation thereof, means operable by depression of a key-lever to actuate said stop member to permit said rotary element to make a single revolution, and a separate means operable upon a depression of a definite key-lever to permit the rotary element to revolve continuously.

17. In a key-board telegraph transmitter having a plurality of key-levers, a rotary transmitting element, a stop member engaging said rotary element to prevent rotation thereof, means operable by depression of a key-lever to actuate said stop member to permit said rotary element to make a single revolution, a separate means operable upon a depression of a definite key lever to permit the rotary element to revolve continuously, and means for automatically discontinuing the rotation of said element after a predetermined number of signal combinations have been transmitted.

18. In a key-board telegraph transmitter having a plurality of intelligence key-levers and a paper feed key-lever, a rotary shaft, signal transmitting means operated thereby, a stop member for said shaft, means operable upon actuation of an intelligence key-lever to permit said shaft to make a single revolution for transmitting the selected signal, a

solenoid for releasing said stop member, means for energizing said solenoid on actuation of paper feed key-lever to permit said shaft to rotate continuously for transmitting
 5 a succession of paper feed signal combinations and a timing device for automatically de-energizing said solenoid to discontinue the transmission of said signal combination after a predetermined total number of in-
 10 telligence and paper feed signal combinations have been transmitted.

19. In a key-board telegraph transmitter having a plurality of intelligence key-levers and a paper feed key-lever, a rotary shaft,
 15 signal transmitting means operated thereby, a stop member for said shaft, means operable upon actuation of an intelligence key-lever to permit said shaft to make a single revolution for transmitting the selected sig-
 20 nal, a solenoid for releasing said stop arm, means for energizing said solenoid on actuation of paper feed key-lever to permit said shaft to rotate continuously, means for estab-
 25 lishing a locking circuit for said solenoid upon energization thereof, and a timing device operable after the transmission of a pre-determined number of intelligence and paper feed signals to open said locking circuit.

20. In a key-board telegraph transmitter
 30 having a rotary signal transmitting element, a timing device having a cycle of operation dependent upon the number of revolutions of said rotary element, said timing device comprising a contact member moving between
 35 predetermined limits, a driving member operated by said rotary element engaging said contact member to move the same, a solenoid, a circuit therefor, a contact in said
 40 circuit disposed so as to be closed by said contact member in one limit of its movement, means operated by said solenoid when the
 45 contact member reaches the limit of this movement for disengaging the contact member from its driving member and returning the contact member to its other limit of move-
 ment to permit the cycle of operation to be repeated.

21. In a key-board telegraph transmitter
 50 having a rotary signal transmitting element, a timing device having a cycle of operation dependent upon the number of revolutions of said rotary element, said timing device comprising a pivoted toothed sector moving
 55 between predetermined limits, a gear meshing with said sector, a worm secured to said rotary element engaging said gear, a pivoted lever for supporting said sector, a solenoid having a core connected to said lever, a cir-
 60 cuit for said solenoid, and a contact in said circuit closed by said sector in one limit of its movement, for energizing said solenoid to rock the lever and thereby disengage the sector from the gear, and a spring for re-
 65 turning the sector to its other limit of move-

ment, to permit the cycle of operation to be repeated.

22. In a key-board telegraph transmitter, means for transmitting individual intelligence signal combinations, means for auto-
 70 matically transmitting a succession of paper feed signal combinations, a timing device operable between predetermined limits for controlling the total number of intelligence and paper feed signal combinations trans-
 75 mitted, said device moving towards its limit of movement during the transmission of intelligence signal combinations and completing its movement during the automatic trans-
 mission of the paper feed signals.

In testimony whereof I affix my signature.
 JAMES W. LONG.

85

90

95

100

105

110

115

120

125

130