

Oct. 13, 1959

E. W. HEWITT

2,908,370

SPROCKET FEED PAPER SYNCHRONIZER

Filed Aug. 15, 1956

2 Sheets-Sheet 1

FIG. 1.

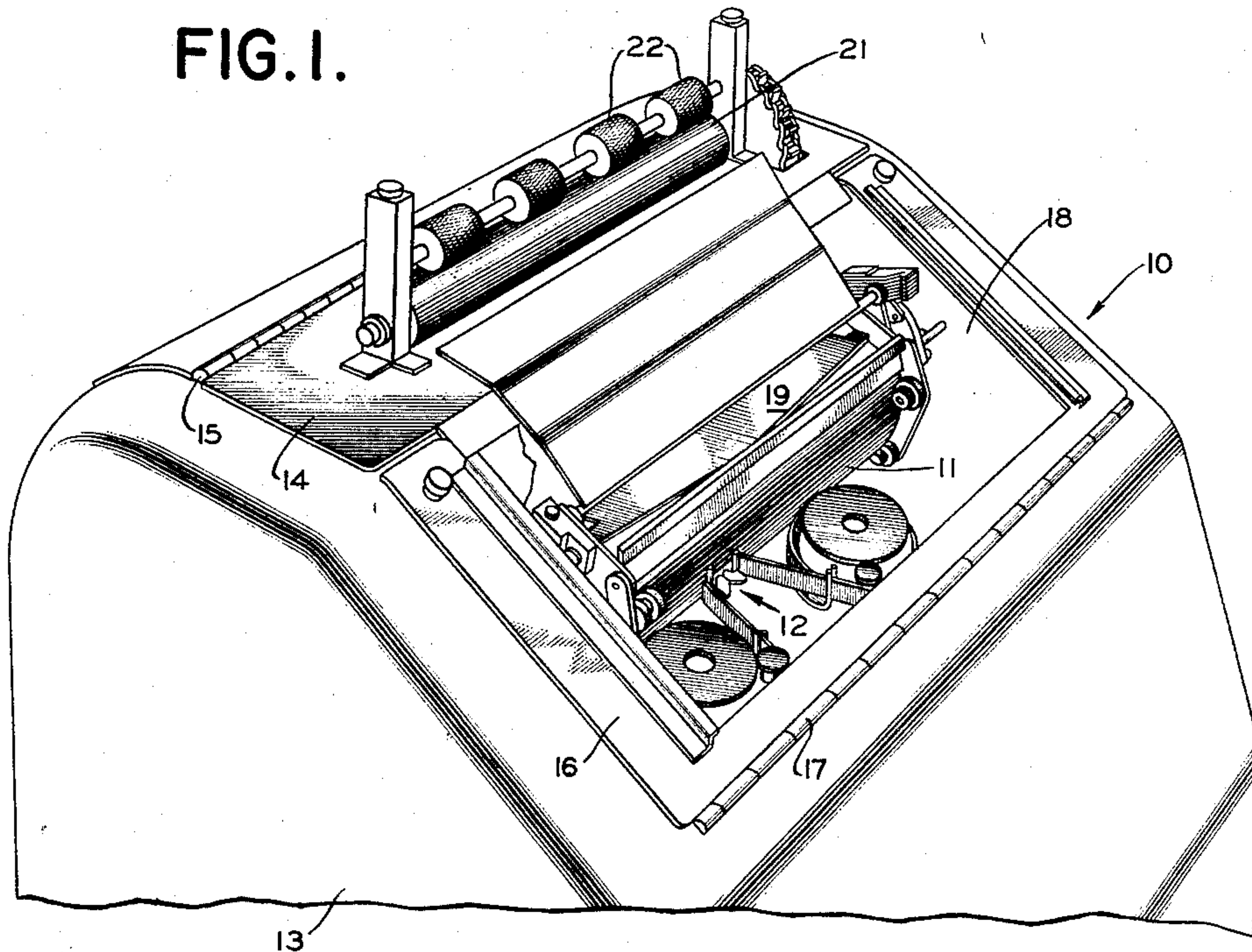
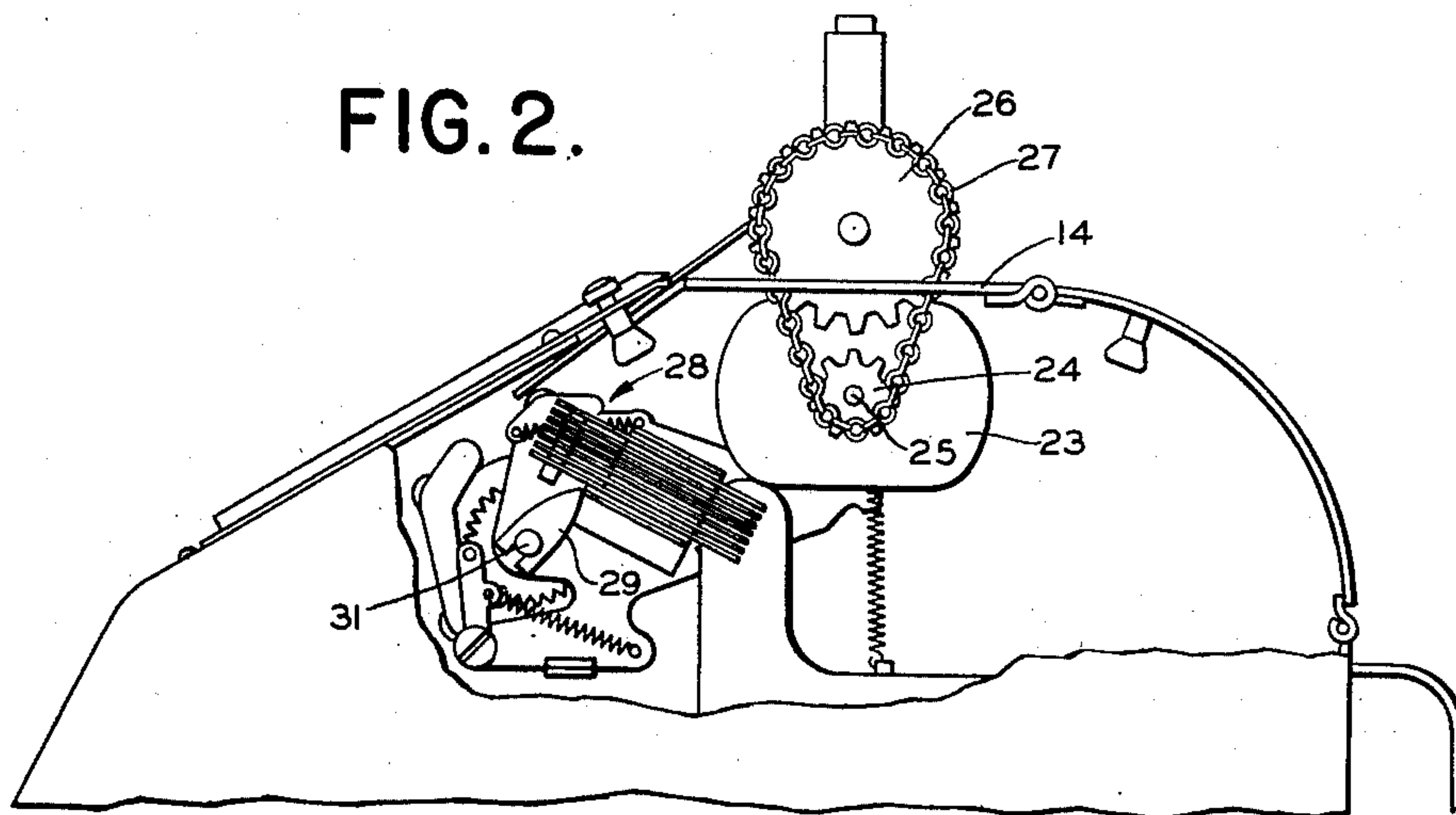


FIG. 2.



INVENTOR.
E. W. HEWITT

BY *E. R. Hyde Jr.*

ATTORNEY

Oct. 13, 1959

E. W. HEWITT

2,908,370

SPROCKET FEED PAPER SYNCHRONIZER

Filed Aug. 15, 1956

2 Sheets-Sheet 2

FIG. 3.

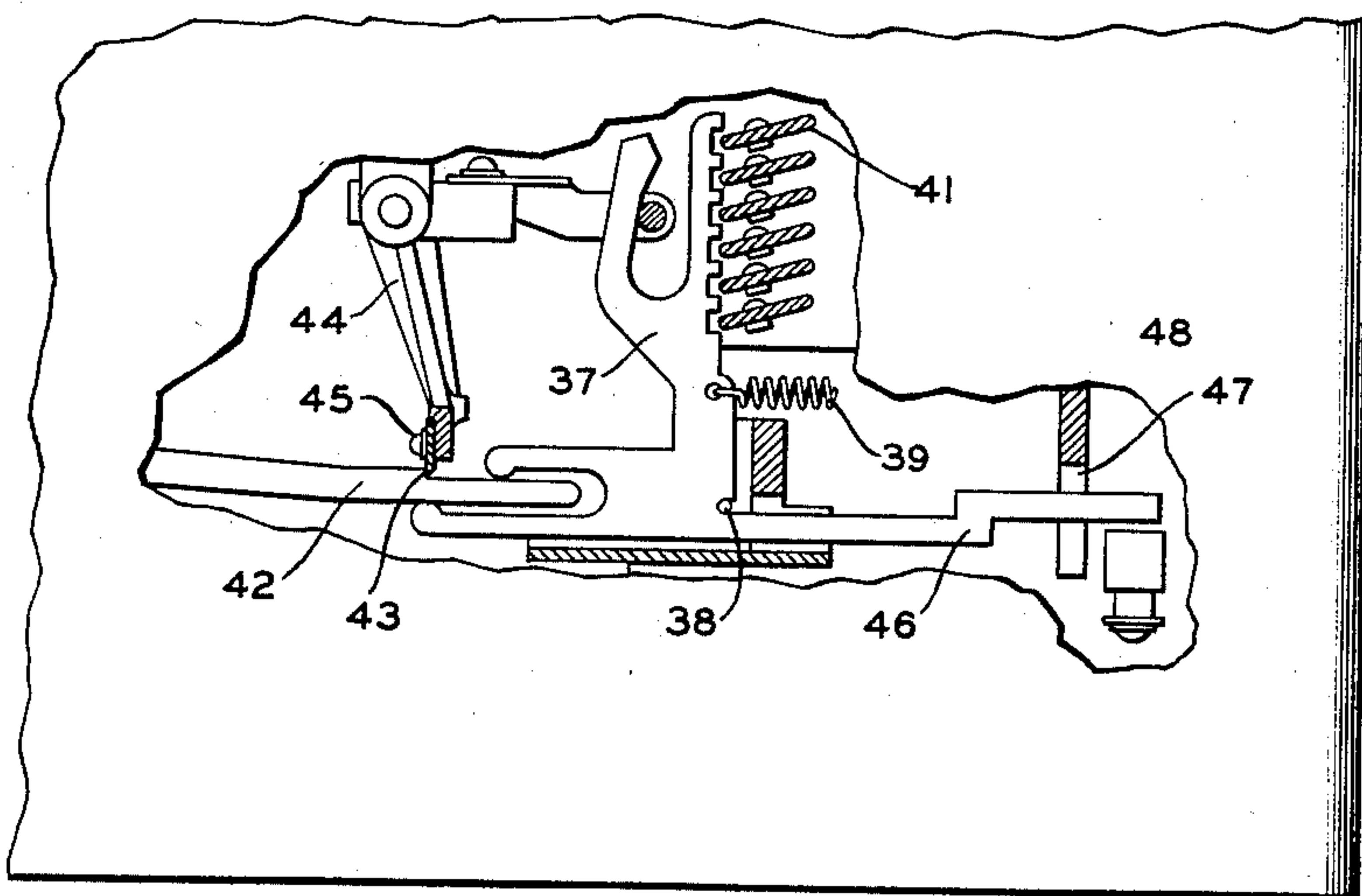


FIG. 4.

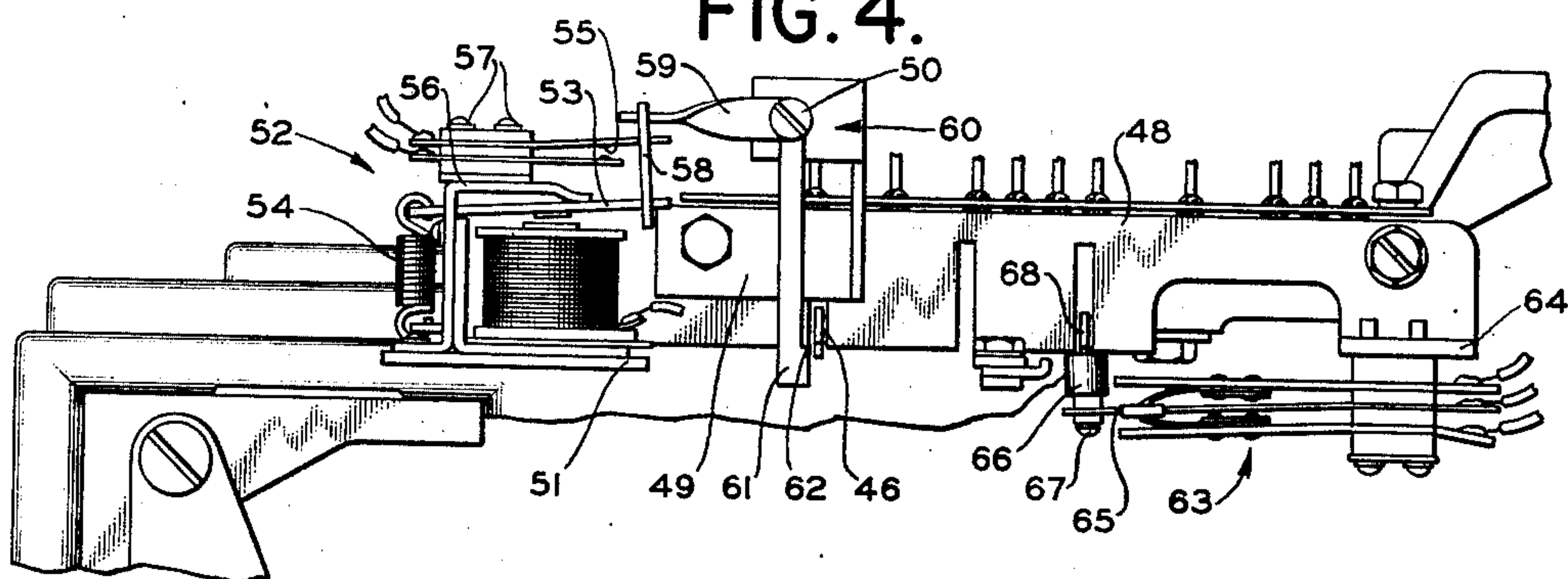
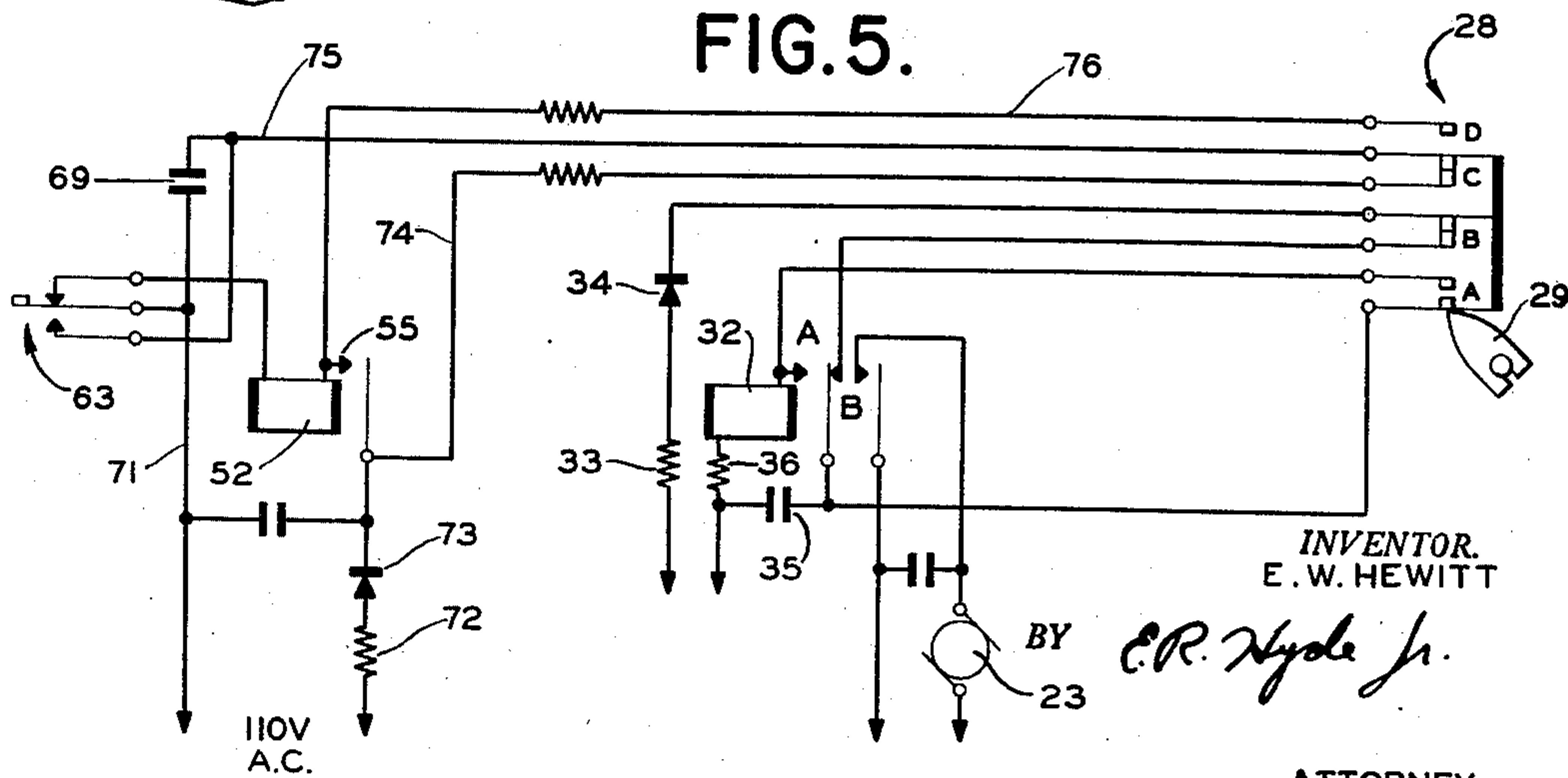


FIG. 5.



1

2,908,370

SPROCKET FEED PAPER SYNCHRONIZER

Ernest W. Hewitt, Stamford, Conn., assignor to The Western Union Telegraph Company, New York, N.Y., a corporation of New York

Application August 15, 1956, Serial No. 604,192

7 Claims. (Cl. 197—133)

The present invention relates to telegraph printing apparatus and more particularly to means for selectively controlling the line feed of a teleprinter.

The standard type teleprinter in commercial use feeds a continuous strip of message paper over a platen where the received messages are imprinted line by line. The paper is then fed through a slot or opening in the top of the machine. One type of paper strip in common use is provided with a series of feed holes along each edge that are gripped by feed sprockets to cause intermittent feeding of the strip. To facilitate the cutting of the individual message sheets, the strip is provided with a series of longitudinally spaced transverse weakened severance lines. Thus, as the strip passes through the slot in the top of the teleprinter, it may be conveniently severed along the transverse weakened lines. When this machine is connected for transmission, it is necessary for the sending operator to know the position of the message blanks in the receiving machine. At the commencement of transmission of a particular message, a receiving message blank must be in its home or initial position. It has been found that the width of a message, that is the distance between the transverse weakened lines, is equivalent to 22 line feeds. Thus if a message is less than 22 lines, a complete blank at the receiver will not be used and it is necessary then for the sending station to transmit a number of extra line feed signals to make up the difference to 22 in order to bring the next blank into initial position for the subsequent message. If too many extra line feed signals are transmitted, the next blank will be overstepped past its initial or home position. It is to this general problem that the invention is directed.

It is therefore an object of this invention to provide means whereby the message paper at a receiving teleprinter is in the initial position at the commencement of message transmission from a sending station.

Another object of the present invention is to provide an improved control means for the line feed mechanism of a teleprinter.

Another object of this invention is to provide means whereby the sending operator can determine the position of the receiving message blanks.

Another object of the present invention is to provide mechanism of simple construction for selectively blocking the line feed of a receiving teleprinter.

In accordance with these and other objects, the present invention contemplates a periodically operating relay or magnet which blocks the line feed mechanism so that line feed signals subsequent to the one that places a message blank in the initial position are ineffective. Thus after a particular message has been transmitted that partially fills a recording blank the sending station need only transmit a number of line feeds so that the total line feeds equal or are more than 22. After the 22nd line feed, the relay or magnet at the receiver is actuated and subsequent line feeds will not actuate the line feed mechanism. At this point the next recording

2

blank in the strip of message paper at the recorder is in the initial or home position. The operator at the sending station will then transmit a carriage return or other predetermined signal to release the line feed blocking relay at the recorder.

The invention will be more fully understood from the following description of a specific embodiment thereof taken with the drawings in which:

Fig. 1 is a perspective view of the upper part of a teleprinter which has been modified with an automatic severing device;

Fig. 2 is an elevation of the right side of the machine of Fig. 3 with part of the casing broken away;

Fig. 3 is a side view of the teleprinter of Fig. 1 with part of the casing broken away to show parts of the operating mechanism thereof;

Fig. 4 is a front view of the lower portion of the teleprinter with the cover broken away to show the line feed mechanism of the present invention; and

Fig. 5 is a schematic diagram of the control circuits of the present invention.

Referring now to the drawings and more particularly to Fig. 1, numeral 10 indicates generally a teleprinter of the type shown in U.S. Patent Nos. 1,904,164 of Morton and 2,273,081 of Zenner. The operation and construction of the teleprinter are well known to those skilled in the art and reference may be had to the above patents for the details of construction of this machine. For present purposes it need only be pointed out that a continuous strip of message paper is fed over a platen 11 where the message characters are printed. A printing mechanism (not shown but generally indicated by numeral 12) includes type bars that are selectively operated by received pulses from the distant transmitter. The printing mechanism travels from left to right to print the characters as it travels. The message paper is stationary as the printing mechanism travels across the paper and at the end of a line the printing mechanism reverts to the left side of the machine and the message paper is advanced one line.

The teleprinter is enclosed in a casing 13 which has a cover plate 14 hinged thereto as at 15. A U-shaped frame 16 is also hinged to the casing at 17. The frame mounts a transparent window 18 so that the operation of the machine may be conveniently viewed. The teleprinter herein shown is equipped with a severing device which automatically severs each message blank after it passes through the machine. This severing mechanism is disclosed in detail in applicant's copending application Serial No. 505,667, filed May 3, 1955, and reference may be had thereto for a detailed description thereof. For the purposes of the present invention it need only be pointed out that the severing mechanism includes a stationary blade 19 mounted above the platen 11. Two sets of tension rollers 21 and 22 are securely mounted to the cover plate 14 at the top of the teleprinter. Since the width of each message blank, that is the distance between transverse severance lines is equivalent to 22 line feeds, the severing blade 19 and rollers 21, 22 are so located that the distance from the edge of the severing blade to the point of tangency of the rollers is equal to 22 line feeds.

As a message is received and the paper is stepped line by line, it is guided to the tension rollers 21, 22. After 22 line feeds, the leading edge of the paper has reached the tension rollers which thereupon rotate to tension the paper across the stationary blade 19.

A restraining force is provided by means of the sprocket feed mechanism so that the message blank will be severed by the stationary blade. At this time the next message blank is in its initial or home position to

receive the next message from the transmitter. Power is supplied to the tension rollers by means of a motor 23 mounted on the underside of cover plate 14. A sprocket 24 is secured to the motor shaft 25 and is aligned with a sprocket 26 mounted on an extension of the shaft of roller 21. A link chain such as 27 encircles the sprockets so that energization of the motor causes rotation of the severing rollers. The direction of rotation of the motor shaft 25 is such that the lower severing roller 21 rotates in a counterclockwise direction as seen in Fig. 1. The plurality of upper severing rollers 22 being in frictional contact with roller 21 will rotate in clockwise direction so that a message sheet will be ejected rearwardly. Operation of motor 23 is controlled by switch contacts 28 which are secured in place by a bracket fastened to the side frame of the teleprinter. Cam 29 is fastened to an extension of the platen shaft 31 to close switch 28 with each complete rotation of the platen. Since the circumference of the platen in a standard teleprinter is equal to 22 line feeds, when the platen completes one revolution the message sheet is advanced a distance of one message blank and cam 29, being secured to the platen shaft has made one revolution to close the contacts of switch 28. The motor control circuit is shown in Fig. 5. Motor 23 is connected in series with the source of power and the normally open B contacts of a relay 32. Also connected to the power source is the series combination of resistor 33, rectifier 34, normally closed B contacts of switch 28, break contacts B of relay 32 and capacitor 35. The rectifier provides a D.C. current which maintains capacitor 35 in a normally charged condition. Coil 32 in series with normally open A contacts of switch 28 is connected across the charged capacitor. With coil 32 normally deenergized, its break contact A completes the charging path for capacitor 35. As the leading edge of the strip reaches the tension rollers, cam 29 actuates switch 28. The A contacts of the switch close to connect relay coil 32 across charged capacitor 35. The relay thereupon energizes to close its B contacts to operate motor 23. The A contact of relay 32 will transfer to the make position and serve as a locking circuit for this relay. The time constant of capacitor 35 and resistor 36 will determine the energization period of relay 32 and hence the period of time that motor 23 operates the tension rollers. The B contacts of switch 28 open the charging circuit of capacitor 35 so that after the capacitor discharges across coil 32 it remains discharged until the next line feed advances cam 29 to permit switch 28 to return to the normal position.

Referring now to Fig. 3 there is shown part of the teleprinted line feed mechanism. This includes a function lever 37 pivotally mounted on a function lever shaft 38 secured to the side frames of the machine. A function lever spring 39 is secured to the one arm of the function lever and anchored at the other end to the machine. This spring serves to continually urge the function lever in a clockwise direction as seen in Fig. 3. The upper arm of the function lever is bifurcated and has code notches cut in the outer edges of one of the arms in the usual manner.

Selector vanes 41 are controlled by received pulses to assume selected positions. With each cycle the function lever is released to rotate in a clockwise direction to permit the code notches to engage the vanes 41. If a line feed signal has been received, the vanes 41 will be in a predetermined position to mesh with the coded notches in the line feed function lever 37. In this case the function lever is permitted to rotate clockwise. The lower horizontal arm of the function lever is also bifurcated to receive a push bar 42 which is notched as at 43. A function bail 44 supports a function bail blade 45 which is positioned to engage notch 43 when the push bar is raised by the clockwise rotation of the function lever. In this manner a line feed signal will cause the

push bar to be engaged by the function bail blade and a line feed operation is effected in the usual manner as disclosed in the above cited Morton and Zenner patents. In the present invention the function lever 37 has an extension arm 46 which extends forwardly of the machine and passes through a slot 47 in bracket 48. The purpose of the extension arm 46 will now be described.

Referring now to Fig. 4, which shows a front view of the teleprinter, there is a bracket 48 to which a relay mounting bracket 49 is secured. Bracket 49 includes a horizontal shelf 51 which supports a relay generally indicated by numeral 52. Relay 52 has an armature 53 to which one end of tension spring 54 is secured. The other end of the spring is anchored to bracket 51 and serves to pivot armature 53 upwardly to the position shown in Fig. 4. A pair of contacts 55 is mounted on an upstanding bracket 56 by means of screws 57. The upper contact arm passes through a link 58 which is secured to the end of armature 53. Bracket 49 also serves to support an L-shaped lever 60 having a horizontal arm 59 and a vertical arm 61. Lever 60 is pivotally mounted to the bracket 49 by means of screw 50. The outer end of arm 59 passes through an opening or slot in the upper end of link 58. Arm 61 has a lateral extension 62 at the lower end thereof which is adapted to cooperate with the line feed function lever extension 46. It is seen then that energization of solenoid 52 will result in the armature 53 being pulled downwardly thereby closing contacts 55 and pivoting lever 60 in a counterclockwise direction, so that the extension 62 of lever arm 61 will assume a position underneath function lever extension 46.

A set of carriage return contacts 63 is mounted to a horizontal shelf 64 of bracket 48. The center tongue 65 of contact 63 has a vertical member 66 secured to the upper surface thereof by means of a screw 67. The location of the member 66 is such that it is positioned directly underneath the carriage return function lever 68. In this manner when a carriage return signal is received to pivot the carriage return function lever the transfer contacts 63 are actuated. Lever 68 may be the standard carriage return function lever found on teleprinter machines or it may be an added function lever that responds to the carriage return signal.

The control circuit for relay 52 will now be described with reference to Fig. 5. A capacitor 69 is connected to one side of an A.C. supply by wire 71. The other side of the supply may be traced through a resistor 72, rectifier 73, wire 74, the normally closed C contacts of switch 28 and wire 75 to the other side of capacitor 69. Thus, a D.C. source is normally applied to charge the capacitor.

After a message blank has passed the teleprinter platen, that is after 22 line feeds, cam 29 will actuate switch 28 to open the C contacts and close the D contacts thereof. When this occurs relay 52 is connected across the charged capacitor 69. This circuit may be traced from one side of the capacitor through the break contacts of switch 63, relay 52, wire 76, the D contacts of switch 28 (now closed), wire 75 to the other side of the capacitor. Thus relay 52 will energize to pivot lever 60 in a counterclockwise direction so that the projection 62 assumes a position underneath the extension 46 of the line feed function lever 46. In this condition subsequent line feeds from the transmitter will be ineffective since function lever 37 will not be free to pivot and lift push bar 42. When relay 52 energizes it closes contacts 55 which complete a locking circuit for the relay coil. It is seen then that after a message blank has passed through the teleprinter and has been severed, the subsequent message blank will remain in its initial or home position despite the reception of further line feed signals. At this point in the operation the sending station will transmit a carriage return signal to cause the carriage return function lever 68 to pivot in the usual manner. This will cause

5

actuation of switch 63 which thereupon deenergizes the relay 52 thereby unlocking the line feed mechanism. The make contacts of switch 53 serve to shunt capacitor 69 to dissipate any charge that may remain thereon.

Though the present invention has been disclosed with reference to a specific embodiment thereof, it should be understood that this is not to be considered as limiting the appended claims.

What is claimed is:

1. In a telegraph printer in which message characters are printed on a continuous strip of message paper fed in a step-by-step manner over a platen by a line feed mechanism, said message paper having equally spaced transverse severance lines defining message blanks, the combination including a stationary blade projecting into the path of strip feed and extending transversely thereacross, a plurality of normally inoperative gripping rollers longitudinally spaced from said stationary blade in the path of the strip, said rollers defining a line of contact spaced from said blade a distance substantially equal to the distance between transverse severance lines of the strip, electric motor means to operate the gripping rollers, means to disable said line feed mechanism including a relay, lever means controlled by the relay to selectively engage the line feed mechanism, periodically operable cam controlled switch means synchronized with the paper feed to be actuated when a message blank is in the initial position with a severance line located adjacent said blade, circuit means whereby actuation of the switch means energizes said motor and actuates said relay whereby said rollers operate to sever a message blank and the line feed mechanism is disabled to render subsequent line feed signals ineffective and means responsive to a predetermined signal to release said disabling means.

2. In a telegraph printer in which message characters are printed on a continuous strip of message paper fed in a step-by-step manner over a platen by a line feed mechanism including a pivotally mounted function lever, said message paper having equally spaced transverse severance lines defining message blanks, the combination including a stationary blade projecting into the path of strip feed and extending transversely thereacross, a plurality of normally inoperative gripping rollers longitudinally spaced from said stationary blade in the path of the strip, said rollers defining a line of contact spaced from said blade a distance substantially equal to the distance between transverse severance lines of the strip, electric motor means to operate the gripping rollers, means to disable said line feed mechanism including a relay, lever means controlled by the relay to selectively engage the line feed function lever to prevent pivotal movement thereof, periodically operable cam controlled switch means synchronized with the paper feed to be actuated when a message blank is in the initial position with a severance line located adjacent said blade, circuit means whereby actuation of the switch means energizes said motor and actuates said relay whereby said rollers operate to sever a message blank and the line feed mechanism is disabled to render subsequent line feed signals ineffective and means responsive to a predetermined signal to release said disabling means.

3. In a telegraph printer of the type wherein a continuous roll of message paper is stepped past a printing mechanism by a line feed mechanism responsive to received signals, the combination including means to disable said line feed mechanism, said disabling means including relay means, means responsive to a predetermined number of line feed signals to energize said relay means, means controlled by said relay means to engage said line feed mechanism whereby subsequent line feed

6

signals are ineffective to step said message paper, and means responsive to a predetermined signal to release said disabling means whereby said line feed mechanism is free to function.

4. In a telegraph printer of the type wherein a continuous roll of message paper is stepped past a printing mechanism by a line feed mechanism responsive to received signals, the combination including means to disable said line feed mechanism, said disabling means including electroresponsive means, means to selectively energize said electroresponsive means after a predetermined number of line feed operations, means controlled by said electroresponsive means to engage said line feed mechanism whereby said line feed mechanism is periodically disabled, and means responsive to a predetermined signal to release said disabling means whereby subsequent line feed signals will step the roll of message paper.

5. In a telegraph printer of the type wherein a continuous roll of message paper is stepped past a printing mechanism by a line feed mechanism responsive to received signals, the combination including means to disable said line feed mechanism, said means including a relay, lever means controlled by said relay to selectively engage the line feed mechanism, periodically operable switch means to actuate said relay after a predetermined number of line feed operations whereby said line feed mechanism is periodically disabled, and means responsive to a predetermined signal to release said disabling means whereby subsequent line feed signals will step the roll of message paper.

6. In a telegraph printer of the type wherein a continuous roll of message paper is stepped past a printing mechanism by a line feed mechanism responsive to received signals and wherein said line feed mechanism includes a pivotally mounted function lever, the combination including means to disable said line feed mechanism, said means including a relay, lever means controlled by said relay to selectively engage the line feed function lever to prevent pivotal movement thereof, periodically operable cam controlled switch means to actuate said relay after a predetermined number of line feed operations whereby said line feed mechanism is periodically disabled, and means responsive to a predetermined signal to release said disabling means whereby subsequent line feed signals will step the roll of message paper.

7. In a telegraph printer of the type wherein a continuous roll of message paper is stepped past a printing line by a line feed mechanism, said roll of message paper being longitudinally divided into a series of message blanks of equal width, said line feed mechanism being responsive to received line feed signals and including a pivotally mounted line feed function lever, the combination including means to disable said line feed mechanism, said means including a relay, lever means controlled by said relay to selectively engage the line feed function lever to prevent pivotal movement thereof, periodically operable cam controlled switch means synchronized with the paper line feed whereby said switch means is actuated when a message blank is in the initial position, circuit means connecting the switch means and relay whereby actuation of the switch means actuates said relay to disable said line feed mechanism, and means responsive to a predetermined signal to release said disabling means whereby subsequent line feed signals will step the roll of message paper.

References Cited in the file of this patent

UNITED STATES PATENTS

1,175,277	Kurowski	Mar. 14, 1916
1,520,478	More	Dec. 23, 1924