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LINE FEED FOR PAGE PRINTER

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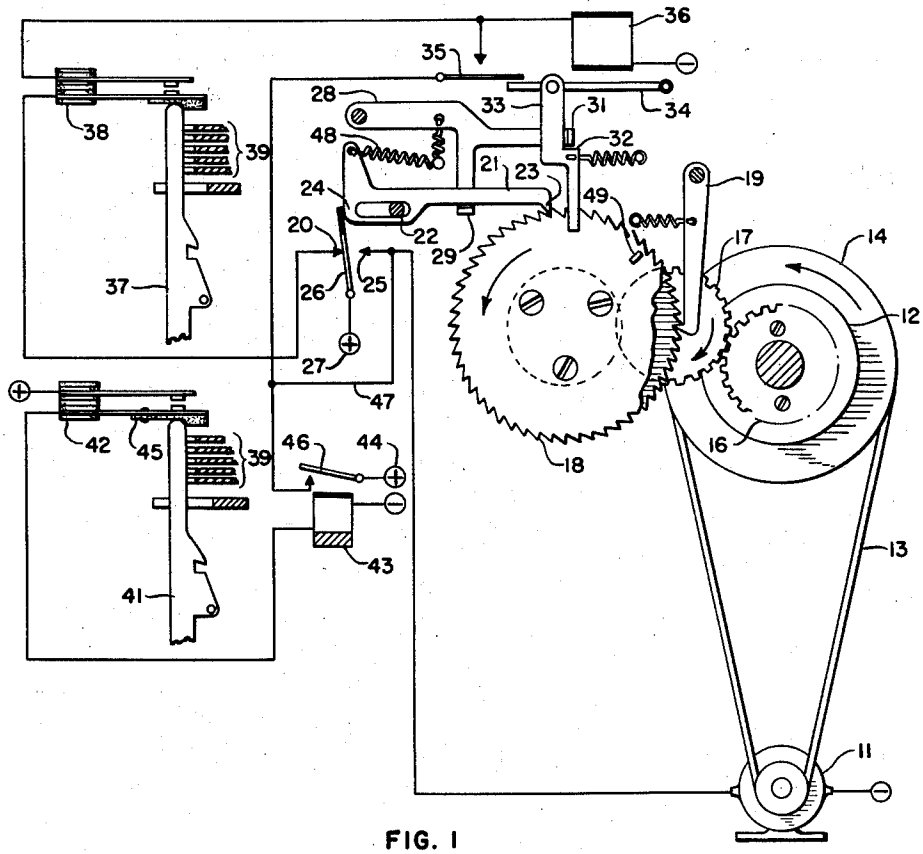


FIG. 1

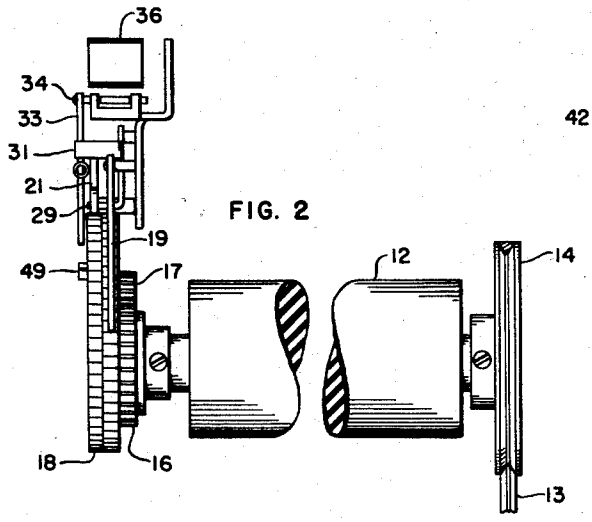


FIG. 2

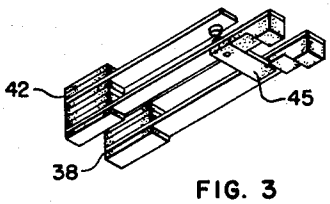


FIG. 3

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LINE FEED FOR PAGE PRINTER

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7 Claims. (Cl. 178—25)

This invention pertains to printing telegraph apparatus and more particularly to printing telegraph page printers.

The principal object of this invention is to provide a page printer with a record advancing device which is powered and operated independently of the operating motor of the apparatus.

Another object is to provide one mechanism which will serve both as a line feed device and a feed-out device without the necessity of engaging or disengaging different feeding mechanisms.

Yet another object is to provide a feed-out mechanism which operates at a very high speed.

According to the present invention there is provided a small, high speed electric motor having very low inertia for advancing the platen. The motor is controlled through a control circuit which includes an electromagnet. A program wheel is provided to be driven by the platen and cooperate with a line feed pawl to actuate the motor, or the control circuit. An armature means is associated with the electromagnet and the line feed pawl to disengage the line feed pawl from the program wheel upon the energization of the armature.

A more complete understanding of the invention may be had by the following description when read in conjunction with the drawings wherein:

Fig. 1 is a schematic representation of the present invention; and

Fig. 2 is a front elevation of the invention; and

Fig. 3 is an enlarged perspective view showing the relation of the line feed contact to the feed-out contact.

Referring now to the drawings, a high speed, low inertia motor **11** is positioned to drive the platen **12** through the belt or chain **13** and the wheel **14**. The platen **12** has means associated with it such as the gears **16** and **17** for driving the ratchet or program wheel **18** as it is advanced by the motor **11**. A check pawl **19** is urged against the ratchet to prevent any clockwise rotation thereof. A line feed pawl **21** is slidably mounted on a pin **22** suitably positioned in the frame. The pointed extremity **23** of the pawl **21** is normally engaged with the ratchet **18** while the butt end **24** is in contact with the transfer contact **26** which is connected with the source of energy **27**. A disengaging lever **28** is positioned with its lower extension **29** positioned beneath the line feed pawl and its upper extension **31** associated with the shoulder **32** of the armature extension **33**. The armature extension **33** is fastened to the armature **34** which is positioned to be attracted by the energization of the electromagnet **36**.

A line feed lever **37** is in camming relationship with the line feed contact **38** so that when the code bars **39** are aligned to select lever **37** in the manner well known in the art, the contact **38** is closed to apply energy to the magnet **36** from the energy source **27**. The feed-out lever **41** is similarly associated with the feed-out contact **42**. Closing of the feed-out contact applies positive battery to the slow release relay **43**. Energization of the relay **43** establishes a circuit from a source of energy **44** through the make contact **46** and the conductor **47** to

the motor **11**. A contact **35** is positioned to be closed by the actuation of the armature **34** to establish a holding circuit from the source of energy **44** to the electromagnet **36**.

Referring now to Fig. 1, which depicts the present invention in its normal printing position with the line feed pawl **21** being urged to the left by the ratchet **18** to hold the transfer contact **26** in engagement with the control circuit so that the circuit is conditioned for energizing the magnet **36** upon the closing of the line feed contact **38**. When the line feed signal is received in the printer, the code bars **39** are so aligned as to allow the line feed lever **37** to be rotated clockwise and cam the line feed contact **38** closed. Closing of the line feed contact **38** completes the control circuit from positive battery **27** through contacts **26** and **38**, and through the magnet **36** to negative battery to energize the electromagnet **36**. Energization of the magnet **36** causes the armature **34** and the armature extension **33** to be moved upward, which movement causes the lifting interponent **28** to be rotated counterclockwise about its pivot and move the tip **23** of the line feed pawl **21** out of engagement with the ratchet, thereby allowing the line feed pawl **21** to be moved to the right by its spring **48**. The spring contact **26**, being normally biased toward the contact **25**, is permitted to be engaged with the contact **25**, by the movement of the line feed pawl **21**, to energize the motor **11** from the source of energy **27** to thereby advance the platen. It is apparent from the foregoing description that the energization of the magnet **36** is only momentary, since the reaction of the armature causes the contact **26** to move away from the control circuit to the motor circuit. As soon as the magnet **36** is energized it will close contact **35**, but magnet **36** will not be locked operated because contact **26** will move away from contact **20** and contact **35** will open before contact **26** engages contact **25**. When positive battery is removed from the magnet **36**, the armature **34** and its extension **33** return to their unoperated position so that the pawl **21** is allowed to engage the ratchet **18** at a position, governed by the length of the slot in the pawl **21**, from which it will require a predetermined movement of the platen **12** and thereby the ratchet **18** to move the pawl **21** to the left to move the contact leaf **26** from the contact **25** to contact **20**. Movement of the contact leaf **26** from the contact **25** will stop the motor **11** and condition the control circuit for future operation. It is, of course, understood that the rotation of the line feed lever **37** is of relatively short duration so that contact **38** is open before the pawl **21** is moved to the left by the rotation of the platen **12**.

The line feed contact **38** and the feed-out contact **42** are arranged in any suitable manner such as that shown in Fig. 3 so that while the line feed contact **38** may be closed independent of the feed-out contact **42**, closing of contact **42** will simultaneously close the line-feed contact **38**.

When the feed-out signal is received in the printer, the feed-out lever **41** is moved clockwise in the usual manner of selection to close the contacts **42** and **38**. Closing of the contact **38** energizes the electromagnet **36** and disengages the line feed pawl **21** from the ratchet **18** as set forth above. Momentary closing of the contact **42** causes the delay relay **43** to be energized thus completing a temporary holding circuit from positive battery **44** through the contact **35** and the magnet **36**. The slow release relay **43** holds the make contact **46** operated during the time required to move the contact **26** from point **20** of the control circuit to point **25** of the motor circuit. When the transfer is completed, the relay **43** releases and the magnet **36** gets locking battery from the energy source **27** through the conductor **47** and the contact **35**. Since the magnet is held energized, the line feed pawl is held

out of engagement with the ratchet 18 so the platen is continuously advanced by the motor. A projection or lug 49 is placed at a predetermined point on the ratchet so that when the platen 12 and thereby the ratchet 18 has been advanced to a predetermined point, the lug 49 will engage the armature extension 33 and cause it to be rotated in a clockwise direction (Fig. 1). Rotation of the extension 33 moves the shoulder 32 out of contact with the projection 31 of the lifting lever 28 to allow the lever 28 to be rotated clockwise so that the pawl 21 is once more engaged with the ratchet 18. The ratchet 18 moves the pawl 21 as set forth above to shut off the motor after a predetermined amount of platen advance.

While a preferred form of the invention has been disclosed and described herein, it is obvious that changes may be made in the details without departing from the spirit or scope of this invention.

What is claimed is:

1. In a telegraph printer, a rotatable platen, a platen driving motor for imparting rotation to said platen, an electromagnetically controlled line feed mechanism for controlling said motor comprising an escapement facility, a first selectable means effective when selected to cause said mechanism to effect the rotation of said platen a predetermined invariable amount, and a second selectable means cooperating with said first selectable means and effective when selected to cause said mechanism to effect the rotation of said platen variable amounts.

2. In a device for advancing a record through a telegraph printer in incremental steps, a rotatable platen, a motor for rotating said platen, a power source, a transfer contact biased to connect said power source to said motor to energize said motor, a normally open control circuit including an electromagnet, means actuated by the rotation of said platen for moving said transfer contact to break the connection between the motor and power source and to make a connection between said power source and said control circuit, an armature actuated by said electromagnet for rendering said contact moving means effective, and means selectively actuated by the printer to close said control circuit.

3. In a telegraph printer, a record advancing means comprising a rotatable platen, a power source, an electric motor for rotating said platen, a control circuit including an electromagnet, selectively actuated means in said printer for closing said control circuit to energize said electromagnet, means actuated by said electromagnet when said electromagnet is energized for supplying power from said source to said motor, said last mentioned means including an element movable to open the circuit from the power source to said motor when the magnet is de-energized, means actuated by the rotation of said platen for moving said element to position to open said motor circuit, and means actuated by the energization of said magnet for causing said element to de-energize the control circuit.

4. In a telegraph printer having a rotatable platen and a program wheel adapted to be rotated by the rotation of said platen, a form feed-out mechanism comprising a motor for rotating said platen, a power source, switch means biased to connect the power source to said motor, a control circuit, switch control means normally engaged by said program wheel for holding said switch means in position to connect the power source to the control circuit and to disconnect the power source from the motor, an electromagnet in said control circuit, an armature actuated by said magnet for disengaging said switch control means from said program wheel, signal controlled means selectively actuated by the printer for closing said control circuit to energize said magnet for a predetermined length of time, a holding circuit for holding said magnet energized to maintain the circuit from the power source to the motor closed, means controlled by the rotation of the platen to a predetermined point for rendering said holding circuit ineffective, and a signal controlled means for energizing said holding circuit.

5. In a telegraph recorder having a rotatable platen and a program wheel driven thereby, a circuit including a motor for rotating said platen, a power circuit having a transfer contact therein which is biased to connect power to said motor, a first normally open control circuit which includes an electromagnet, escapement means for engagement with said program wheel to move said transfer contact to open the power circuit to said motor and to close the power circuit to said control circuit, armature means actuated by said magnet to move said escapement means out of engagement with said program wheel, whereby said transfer contact is allowed to close the power circuit to said motor, a second normally open control circuit for supplying power to said motor, means actuated by the operation of said magnet for connecting said second control circuit to said magnet, signal selected means for simultaneously closing said first and second control circuits, and means actuated by the advance of said program wheel to a predetermined point for nullifying the effect of said armature means on said escapement means.

6. Apparatus for advancing a record through a telegraph printer comprising a motor, a platen arranged to be driven by said motor, a power source, a first normally open contact arranged to be selected and closed by said printer, an electromagnet connected to be supplied with energizing power upon the closure of said first contact, a transfer contact connected to said power source and normally positioned to supply power from said source to said first contact, a second contact associated with said transfer contact and connected to said motor, said transfer contact being biased to disconnect power at said source from said first contact and to connect it to said second contact, a pawl normally restraining said platen against rotation and arranged to be driven to a position to move said transfer contact to normal position when the motor drives the platen, and means actuated by said electromagnet for tripping said pawl out of restraining relation with the platen thereby to energize said motor.

7. Apparatus for advancing a record through a telegraph printer comprising a motor, a platen arranged to be driven by said motor, a power source, a first normally open contact arranged to be selected and closed by said printer, an electromagnet connected to be supplied with energizing power upon the closure of said first contact, a transfer contact connected to said power source and normally positioned to supply power from said source to said first contact, a second contact associated with said transfer contact and connected to said motor, said transfer contact being biased to disconnect power at said source from said first contact and to connect it to said second contact, a pawl arranged to be driven to a position to move said transfer contact to normal position when the motor drives the platen, means actuated by said electromagnet for tripping said pawl out of restraining relation with the platen thereby to energize said motor, a third normally open contact arranged to be selected and closed by the printer, means actuated by the closure of said third contact for supplying power to said motor, and means actuated by said last-mentioned means for holding said electromagnet operated for a predetermined interval of time.

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