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TYPEWRITING MACHINE

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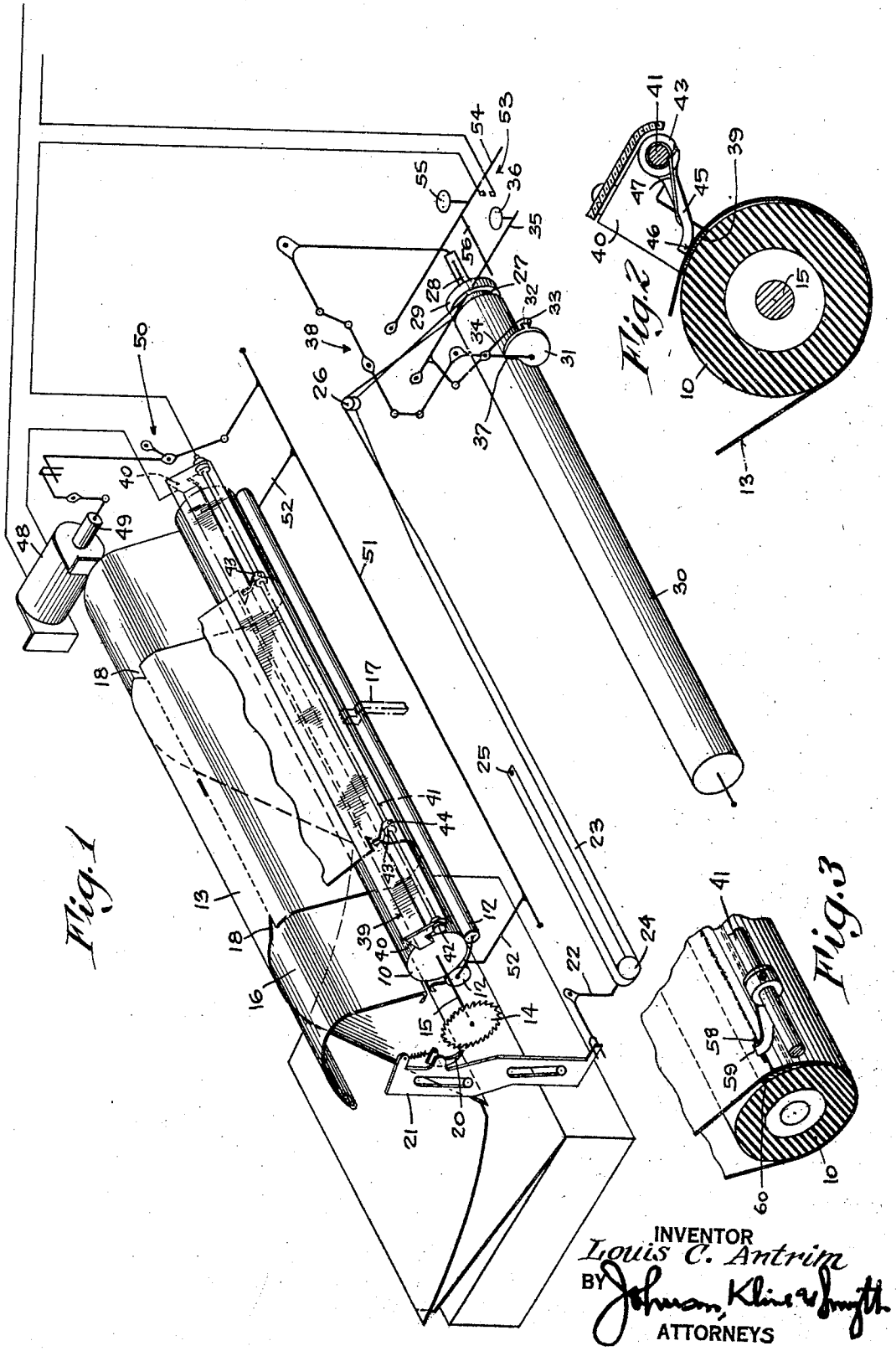


Fig. 1

Fig. 2

Fig. 3

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TYPEWRITING MACHINE

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13 Claims. (Cl. 197—133)

The present invention relates to typewriting machines, and, more particularly, to a machine which may be used with a manifolding pile comprising a plurality of superposed strips having continuous forms thereon.

In my copending application, Serial No. 372,100, filed December 28, 1940, now Patent No. 2,246,969, granted on June 24, 1941, there is disclosed a device for accurately controlling the feeding means of machines having mechanism for ejecting a form after a form has been written and for bringing the first line of writing of the next succeeding form by one continuous operation to proper writing position.

An object of the present invention is to avoid the necessity of employing a separate ejecting mechanism, and provide means whereby the balance of the form may be ejected after a writing operation by the same means which feed the strips line-by-line during the writing operation and to do this in such a way that after each ejecting operation the new form to be written upon is brought into a definite predetermined position controlled by physical characteristics of the advancing strips located thereon at form-length intervals.

By avoiding the necessity of using special ejecting mechanism to bring the first writing line on the form to the line of writing of the typewriter, the invention may be applied to ordinary electric typewriters, for the usual electrically operated line space feed mechanism including the platen and pressure rollers may be controlled by the physical characteristics of the forms of the pile so as to be temporarily rendered inoperative when the written form is ejected and the new form is in proper place.

Accordingly, the present invention provides means for moving the pressure rollers out of feeding engagement with the platen and writing strips after the written form has been ejected to stop the feed of the strips with the first line of writing of the next succeeding form in proper writing position. This is done in the form of the invention at present preferred by utilizing the physical characteristics appearing at form-length intervals along the strip for controlling a circuit so that a solenoid therein releases the pressure rollers when further feeding of the strips should cease.

In the specific form of this invention illustrated herein as exemplary thereof, an additional line space key is provided and so related to the usual line space key that one of these keys may be employed to actuate the line space mechanism both during writing and ejecting and the other may be used only during line-by-line feed during the writing operations.

Other features and advantages will hereinafter appear.

In the accompanying drawing:

Figure 1 is a schematic view of the machine of the present invention.

Fig. 2 is a section view showing partly in elevation the feeler mechanism.

Fig. 3 is a fragmentary showing of the feeler mechanism of another form of the invention in closed-circuit position.

As shown in the accompanying drawing, the invention is applied to a front strike typewriting machine having a cylindrical platen 10 mounted in a carriage frame, not shown, which usually is provided with feed rollers 12 adapted to press worksheets or strips 13 against the platen to cause the same to advance therewith as the platen is rotated line-by-line by line-spacing mechanism including a ratchet wheel 14 mounted on a shaft 15 carrying the platen and itself rotatably mounted in the carriage frame.

The worksheets or strips 13 are guided to the platen by a paper table 16 where they are fed around the platen by the feed rollers 12 to the line of writing where type bars such as shown at 17 strike upon the platen.

The feed rollers 12 may be manually released from feeding engagement with the platen by the operation of the usual lever and linkage mechanism provided for that purpose to permit the introduction of the strips into the machine.

In order to properly locate the strip in writing position, the present invention provides means controlled by the advancing strip for rendering the feeding mechanism inoperative to continue feed when the strip has reached proper writing position. While this may be accomplished in many ways in the preferred form of the invention feelers or detectors are provided which cooperate with control means disposed at form-length intervals on the strip 13.

In one form of the present invention now preferred, the control means are notches 18 formed, as shown in the illustrated embodiment of the invention, in the marginal portions of the strips. The notches are formed at form-length intervals and extend through the pile.

The notches, as they are located in predetermined relation with the printed forms, are adapted to cooperate with the feelers or detectors which, in the preferred form of the invention, comprise a pair of cooperating contacts

so that when the pile of strips reaches a predetermined point, which may be varied according to the length of form, an electric circuit is completed and this results in the release of the rollers 12 so that further feeding of the strips ceases.

The line-spacing mechanism which rotates the platen line-by-line to feed the strips through the machine, comprises, in addition to the ratchet wheel 14, a pawl 20 carried by a plate 21 slidably mounted on the carriage frame. The plate 21 is reciprocated vertically to cause the pawl 20 to intermittently engage with the teeth of the ratchet wheel to rotate the same and the platen line-by-line.

In the illustrated form of the invention now preferred, the plate is reciprocated by means of a bell crank lever 22 pivotally mounted to the carriage frame and moved about its pivot by a band 23 which travels about a pulley 24 carried by one arm of the bell crank lever. The one end of the band 23 is fixed as at 25, the opposite end of the band extending about a pulley 26 carried at the opposite side of the carriage frame and fixed to a disk 27 rotatably carried by a shaft 28, constantly driven while the machine is in use by some suitable power means such as an electric motor. The shaft 28 carries a second disk 29 which is keyed thereto for rotational movement with the same but which may be moved longitudinally thereof.

The adjacent faces of the disks 27 and 29 form a friction clutch so that when the friction face of the disk 29 is moved into engagement with the friction face of the disk 27 the latter will rotate with the disk 29.

A roller 30 fixed to the shaft 28 is used in the present invention to actuate the line-spacing mechanism. To this end, a cam 31 is pivotally mounted adjacent the peripheral surface of the roller 30 and carries a lug 32 which normally is engaged by a dog 33 carried by a link 34. The link 34 is connected through a suitable linkage mechanism with a bar 35 which carries a manual depressible key 36 such as the usual line space key.

Depression of the key 36 through the bar 35 and associated linkage mechanism will move the dog 33 out of engagement with the lug 32 to free the cam for rotation. When released, the cam, through a suitable spring provided for that purpose, is pivotally moved into engagement with the roller 30 and will be driven with the roller. Rotation of the cam through an eccentric 37 and a suitable linkage mechanism such as shown at 38 will intermittently move the disk 29 into engagement with the disk 27 to intermittently drive the latter disk and wind the band 23 thereon. The band 23, as it is intermittently taken up by the disk 27, will rock the bell crank 22 to reciprocate the slide 21 to cause the pawl 20 carried thereby to drive the ratchet wheel 14.

It will now be seen that, as long as the key 36 is depressed, the line-spacing mechanism will intermittently operate the platen to advance the strips 13 line-by-line around the same.

To bring about the desired control of the strips through the notches 18, an elongate plate 39 of conducting material is insulatedly supported by the carriage frame to overlie the platen as shown in Fig. 1. The plate 39 preferably is pivotally mounted to the carriage so that it may be swung back away from the platen if desired.

The plate is formed with a pair of upturned flanges 40 supporting a rod 41 which is insulated from the same by suitable insulating bushings 42. Suitably mounted on the rod are a pair of contact carriers 43 which may be adjusted along the rod transversely of the path of movement of the strips and locked in adjusted position by means of set screws 44. Each contact carrier has a dependent feeler and detector contact 45 pivotally mounted thereon and having a contact face 46 extending in the direction of the movement of the advancing strips. A spring 47, secured to the carrier and engaging the contact 45, normally urges it against the strips so that it will be normally held in engagement with the same as the strips are advanced.

The conducting plate 39 and contacts 45 are included in an electric circuit to control the feeding means and are connected one to each side of a source of current so that a gap exists between the two when the detector contacts rest on the continuous strips.

When a pair of notches 18 pass under the detector contacts 45, the latter will be urged into engagement with the channel, the plate 39 to close the gap in the circuit. The face 46 of each contact 45 is of a sufficient length to maintain engagement with the plate for a period sufficient to enable the control to function before the notches will have passed out of position underlying the contacts 45.

The control may be effected through a solenoid 48 connected into the control circuit. The armature 49 of the solenoid is connected through a suitable linkage mechanism such as shown at 50 to a rod or rock bar 51 rotatably mounted on the machine. The rod carries a pair of arms 52 which support the feed rollers 12 and hold the same in engagement with the platen 10. The solenoid 48, when energized, will draw the armature 49 into the core thereof and through the linkage mechanism 50 rotate the rod 51 and urge the arms 52 downward to move the pressure rollers 12 away from the platen 10 to stop the feed of the strips.

So long as the contacts 45 engage the conducting plate 39, the pressure rollers 12 will be held out of engagement with the platen and the same may be operated idly without advancing the strips.

To cause the strips to again advance, pressure may be applied to the strips so that they frictionally engage the platen in any suitable way. This may be accomplished by the operator pressing her fingers against the strips on the platen to advance the same a distance sufficient to move the notches out of position underlying the contacts 45, although in the preferred form of the present invention, the rollers 12 are automatically caused to again engage the platen after the ejecting period. For this purpose, the control circuit is provided with a monitor switch 53 which must be closed before the notching of the advancing strips can effect the control. Various means may be employed to close this switch but preferably the same is moved to closed-circuit position and held in that position by the ejecting period feed control means of the present invention which may comprise a pivotally mounted bar 54 carrying a manually engageable key 55. A lever 56 carried by the bar 54 overlies the bar 35 and depression of the key 55 will also depress the bar 35, which, as has been previously explained, actuates the feed mechanism to cause the platen to advance line-by-line as long as the bar 35 is depressed.

It will now be seen that the key 36 may be used to control the feeding means of the typewriting machine during the writing period and the key 55 to control the feeding means during the ejecting period for movement of the notches into position

underlying the contacts 45 will not effect a control of the feeding means if the strip has been advanced by operation of the key 36.

However, the key 55 may be used as the usual line spacing key during the writing operation and thereafter held down to continuously operate the platen and advance the strips line-by-line until the contacts 45 ride into the notches 18. The key 36 in this operation of the machine is used merely as a starter for resuming the advance of the strips. The resumption of feed of the strips a distance sufficient to move the notches out of position underlying the contacts will break the control circuit and the key 55 may then again be used to operate the platen through both the writing and ejecting periods.

It will be seen that the operation of the typewriter of the present invention is as follows: The contact carriers 43 are first adjusted transversely of the continuous strips to insure that the contacts 45 lie in the path of movement of the notches. The operator, during the writing period, may advance the strips through the machine line-by-line by momentarily depressing the key 36 which, as has been explained, will drive the platen line-by-line. After the writing operation is completed, the operator can, by holding key 55 depressed, advance the strips line-by-line until the form written upon is ejected from the machine and the notches of the next succeeding form have been advanced to the position in which they underlie the contacts 45 of the control mechanism. The key 55, as long as it is held down, will hold the switch 53 closed thereby initiating the control circuit which will be completed by the contacts 45 riding into the notches to engage the plate 39. The completion of the circuit energizes the solenoid which through the linkage mechanism 50 and the bar 51 releases the rollers 12 from feeding pressure.

As soon as the key 55 has been released, the switch 53 will automatically move to an open-circuit position thereby deenergizing the solenoid 50, whereupon the rollers 12 again are caused to engage the platen. The strips can now be fed through the machine line-by-line either by operating the platen during the writing period by the key 36 and thereafter by the key 55 or by using the key 36 to operate the platen to feed the strips a distance sufficient to move the notches out of position underlying the contacts 45 and continuing the feed of the strips during the writing as well as the ejecting period by use of the key 55.

Other physical characteristics of the pile occurring at form-length intervals may be employed to effect the control of the feed of the pile, if it is not desired to employ the notches 18.

While any constantly recurring physical characteristics of the pile may be employed to effect control of the feed, there is shown in Fig. 3 means which may be utilized to render the feeding mechanism, which may be of the type described with regard to Figs. 1 and 2, ineffective. The control is also of the same construction as previously described, for, in this form of the invention, when the physical alteration in the strip such as the staple 58, which secures the strips together at form-length intervals and holds the same in registration, passes under the detector contact 59, it will bridge the gap between the same and a conducting plate 60, such as the plate 39, illustrated in Figs. 1 and 2. The engagement of the contact 59 with the staple 58 completes a control circuit such as shown in Fig. 1 to bring about a release of the pressure rollers from feeding engagement.

When the strips so stapled together are fed frictionally, creeping occurs between the several strips, but the amount of creeping resulting from the feeding of one form length is imperceptible and not objectionable. With the strips stapled together, this creep is accumulated in advance of the next staple, and when the pressure rollers are released to interrupt the ejection of the strips, the strips are relieved of frictional engagement with each other, with the result that the strips themselves shift relatively and come into registration as defined by the next staple.

Variations and modifications may be made within the scope of this invention and portions of the improvements may be used without others.

I claim:

1. In a typewriter machine of the type described, means for line-by-line feeding through the machine a continuous strip having control means disposed at form-length intervals; means for controlling said feeding means for advancing said strip at line space intervals during a writing operation and at repeated line space intervals for ejecting the remainder of the written form after the writing operation; means including detector means adapted to cooperate with said control means of the strip for rendering said feed control means inoperative to continue to control the advancement of the strips when a written form has been ejected and the next successive form is in proper writing position; and means separate from said first-named control means for controlling said feeding means to advance said strip at line space intervals a distance sufficient to move the control means of said strip out of cooperative relationship with said detector means thereby rendering said first-named control again operative.

2. In a typewriting machine of the type described, means for feeding line-by-line a continuous strip having physical characteristics thereon at form-length intervals; means for operating said feeding means for line spacing during a writing operation; means for operating said feeding means for ejecting at line space intervals the remainder of a written form from the machine after a writing operation; and means under the joint control of said ejecting period feed-operating means and said physical characteristics of the strip for rendering the feeding means inoperative to feed the strip when a form has been ejected from the machine and the next successive form of the strip is located in proper writing position, said feeding means being rendered operative upon disuse of said ejecting period feed-operating means and said first-named feed-operating means being effective to resume the advance of the strip for the next writing operation.

3. In a typewriting machine of the type described, means for feeding a continuous strip having a succession of printed forms thereon through the machine; means for controlling the feeding means for advancing said strip as line after line is written and for continuously ejecting line-by-line the remainder of the written form after a writing period; means actuated by movement of a portion of a succeeding form of the advancing continuous strip under the control of said last-named means to a predetermined position relative to said machine for rendering said feeding means inoperative whereby the advance of the strip is stopped when the remaining portion of the written form has been ejected from the ma-

chine and the first line of writing on the next succeeding form is in proper writing position; and means for controlling said feeding means to advance the strip after the ejecting period a distance sufficient to move the controlling portion of the succeeding form out of said predetermined position.

4. In a typewriting machine of the type described, means for feeding a continuous strip having a succession of printed forms thereon through the machine; means for operating the feeding means for advancing said strip as line after line is written; means for operating said feeding means to continuously feed the strip line-by-line to eject the remaining portion of the written form from the machine; and means rendered operative by a succeeding form of the advancing strip for controlling the feeding means during the ejecting period to stop the advance of the strip when the first line of writing on the next succeeding form is in proper writing position, said feeding means being rendered operative upon disuse of said ejecting period feed-operating means, the first-mentioned feed-operating means being effective to again advance the strip for the next writing period.

5. In a typewriting machine of the type described, means for feeding a continuous strip having control means at form-length intervals through the machine; means for operating said feeding means for advancing said strip line-by-line during a writing operation and for line-by-line ejecting the remainder of the written form after a writing period; means for stopping the feed of said strip when the next successive form is in proper writing position, said means comprising a circuit including contacts cooperating with the control means of the advancing strip for rendering said feed means inoperative; and means for operating said feeding means to advance the strip after the ejecting period a distance sufficient to move the control means of said strip out of engagement with said contacts to render said first-named feed-operating means again operative.

6. In a typewriting machine of the type described, means for feeding line-by-line a continuous strip having control means at form-length intervals through the machine; means for operating said feeding means during a writing period; means for operating said feeding means for line-by-line ejecting the form after a writing period; and means for stopping the feeding means at the end of the ejecting period when the next successive form is in proper writing position, said means comprising means actuated by said ejecting period feed-operating means for preparing a control circuit and means cooperating with the control means of said strip for completing the circuit to render the feeding means inoperative, the feeding means being rendered operative by disuse of said ejecting period feed-operating means and the writing period feed-operating means being effective to again advance the strip for the next writing period.

7. In a typewriting machine of the type described, means for feeding a continuous strip having control means at form-length intervals; means for operating said feeding means for advancing said strip line-by-line during a writing operation and for ejecting the remainder of a written form line-by-line after the writing operation; means initiated by operation of said last-named means and including means cooperative with the control means of said strip for rendering said feed-operating means inoperative to further control the feed of the strip when the remainder of the written form has been ejected and the first line of writing of the next succeeding form is in proper writing position; and means, separate from said first-named operating means, for operating said feeding means to resume the advance of said strip.

8. In a typewriting machine of the type described, means for feeding a continuous strip having a succession of printed forms thereon through the machine, each form having a control means therein; means for operating the feeding means for advancing the strip line-by-line during a writing period; means for operating the feeding means for ejecting at line space intervals the remainder of the written form; an electro-responsive means adapted when energized to render the feeding means inoperative after the strip has been fed under the control of said last-named operating means a distance sufficient to eject the remainder of the written form and bring the first line of writing of the next successive form to proper writing position; and a circuit for said electroresponsive means having two gaps therein, one of said gaps being closed by operation of said ejecting period feed-operating means, the other of said gaps being closed when the control means of the next successive form has been fed to a predetermined position relative to the machine thereby completing said circuit and energizing said electroresponsive means.

9. In a typewriting machine of the type described, a platen; movably mounted pressure rollers cooperating with said platen to feed through the machine a continuous strip having apertures therein at form-length intervals; means for rotating said platen line-by-line; means for controlling said platen-rotating means during a writing operation; actuator means for operating said last-named means to effect rotation of said platen after the writing operation for ejecting at line-space intervals the remainder of the written form; a circuit including a normally open switch and a plurality of relatively movable contacts normally spaced apart by said strip, said switch being closed by operation of said actuator means for ejecting the remainder of the written form, ejection of the remainder of the written form advancing the apertures in the next succeeding form to a predetermined position relative to said machine wherein said contacts engage each other through said apertures to energize said circuit; an electroresponsive means connected into said circuit and energized therewith; and means controlled by the energization of said electroresponsive means for moving the pressure rollers out of feeding engagement with said platen to stop the advance of said strip with the next succeeding form in proper writing position.

10. In a typewriter of the type described, a platen; means for rotating said platen line-by-line; movably mounted pressure rollers cooperating with said platen to feed through the machine as the platen is rotated line by line a continuous strip having predetermined characteristics thereon at form-length intervals; means for operating said platen-rotating means for advancing the strip through the machine during the writing operation and for ejecting the remainder of the written form after the writing operation; control means initiated by operation of said last-named means and adapted when completed to move said pressure rollers out of engagement with said platen after the written form has been ejected

and the first line of writing of the next succeeding form has been brought to the writing position, said means including a circuit having a pair of spaced contacts therein coacting with the strip to form a gap within said circuit, the gap being closed and the control means completed upon detection by said contacts of a predetermined characteristic of said strip; and means for operating said platen-rotating means to resume the advance of said strip while said contacts are in detecting relation with said characteristic, the first-named operating means being made operative incident to resumption of movement of said strips a distance sufficient to move said contacts out of detecting relation with said characteristic.

11. In a typewriting machine of the type described, means for feeding a continuous strip having predetermined characteristics thereon at form-length intervals; means for operating said feeding means for advancing said strip line-by-line during a writing operation; means for operating said feeding means after a writing operation for ejecting the remainder of the written form at line space intervals from the machine; electroresponsive means adapted when energized to render the ejecting period feed-operating means inoperative to continue to control the feed of the strips after the written form has been ejected and the next succeeding form is in proper writing position; and a normally open circuit for energizing said electroresponsive means having a plurality of cooperating contacts therein, one pair of said contacts being normally spaced apart but moved into engagement by operation of said ejecting period feed-operating means to initiate the completion of the circuit, the other of said contacts coacting with said strip and completing said circuit upon detection thereby of a predetermined characteristic in the next succeeding form after the written form has been ejected.

12. In a typewriting machine of the type described, a platen; movably mounted pressure rollers cooperating with said platen to feed a continuous strip having apertures therein at form-length intervals; means for rotating said platen line-by-line; means for controlling said platen rotating means during the writing operation; means for controlling said platen rotating means after the writing operation for ejecting at line space intervals the remainder of the written form; a contact disposed between said platen and the strip being fed thereover; a contact engaging the upper surface of said strip and normally held out of engagement with said first-named contact by said strip; an electroresponsive device; a circuit for said electroresponsive device including a normally open switch closed by operation of said ejecting period feed control means, said contacts forming a part of said circuit; and means controlled by the energization of said electroresponsive device for moving the pressure rollers out of feeding engagement with said platen, said electroresponsive device being energized at the end of the ejecting period by the engagement between said contacts while the ejecting period feed control means is operated as a predetermined aperture of said strip is moved to a position wherein said contacts engage each other through said aperture.

13. In a typewriting machine of the type described, a platen; movably mounted pressure rollers cooperating with said platen to feed a continuous strip having apertures therein at form-length intervals; means for rotating said platen line-by-line; actuator means including a manually operable key for actuating said feeding means to advance said strip line-by-line during a writing period; a second manually operable key; means controlled by said last-named key for operating said actuator means to cause said feeding means to eject the remainder of the written form at line-space intervals from the machine; a contact disposed between said platen and the strip being fed thereover; a contact engaging the upper surface of said strip and normally held out of engagement with said first-named contact by said strip; an electroresponsive device; a circuit for said electroresponsive device including a normally open switch in said circuit, said switch being disposed adjacent said second manually operable key and closed by operation of the same; and link means interconnecting said electroresponsive device and said pressure rollers for moving the latter out of feeding engagement with said platen upon energization of said electroresponsive device, said electroresponsive device being energized at the end of the ejecting period while the second mentioned key is controlling said feeding means by the engagement between said contacts as a predetermined aperture of said strip is moved to a position wherein said contacts engage each other through said aperture, the electroresponsive means being deenergized upon release of said second key whereupon said pressure rollers return to feeding position, said actuator means being effective to control said feeding means during the next writing period.

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