Oct. 13, 1931. J. A. B. SMITH 1,826,903

TYPEWRITING MACHINE

Filed April 16, 1925 2 Sheets-Sheet 1

Fig. 1.

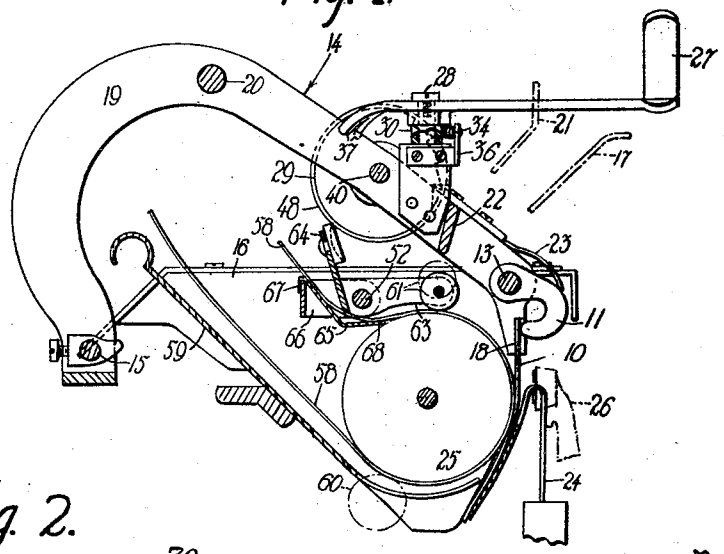


Fig. 2.

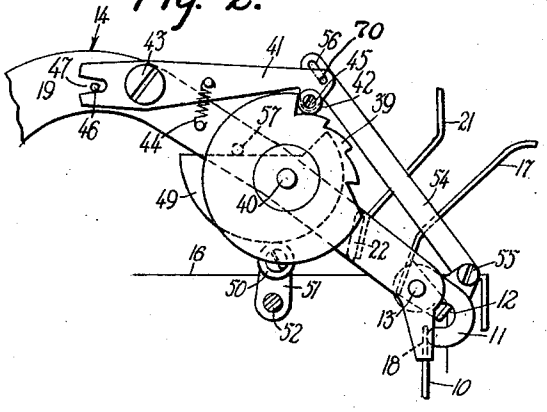


Fig. 3.

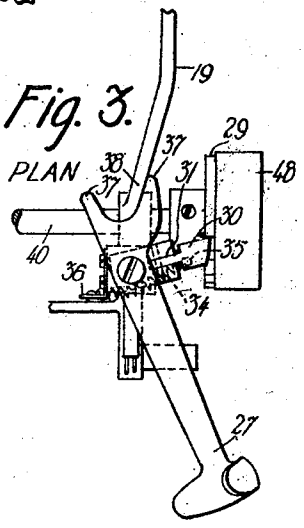
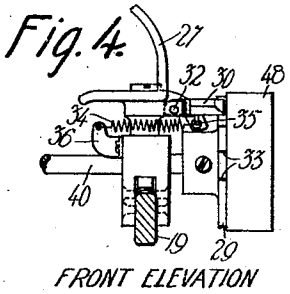
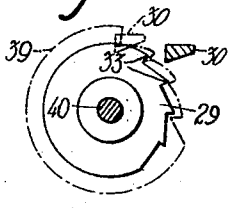


Fig. 4.



FRONT ELEVATION

Fig. 5.



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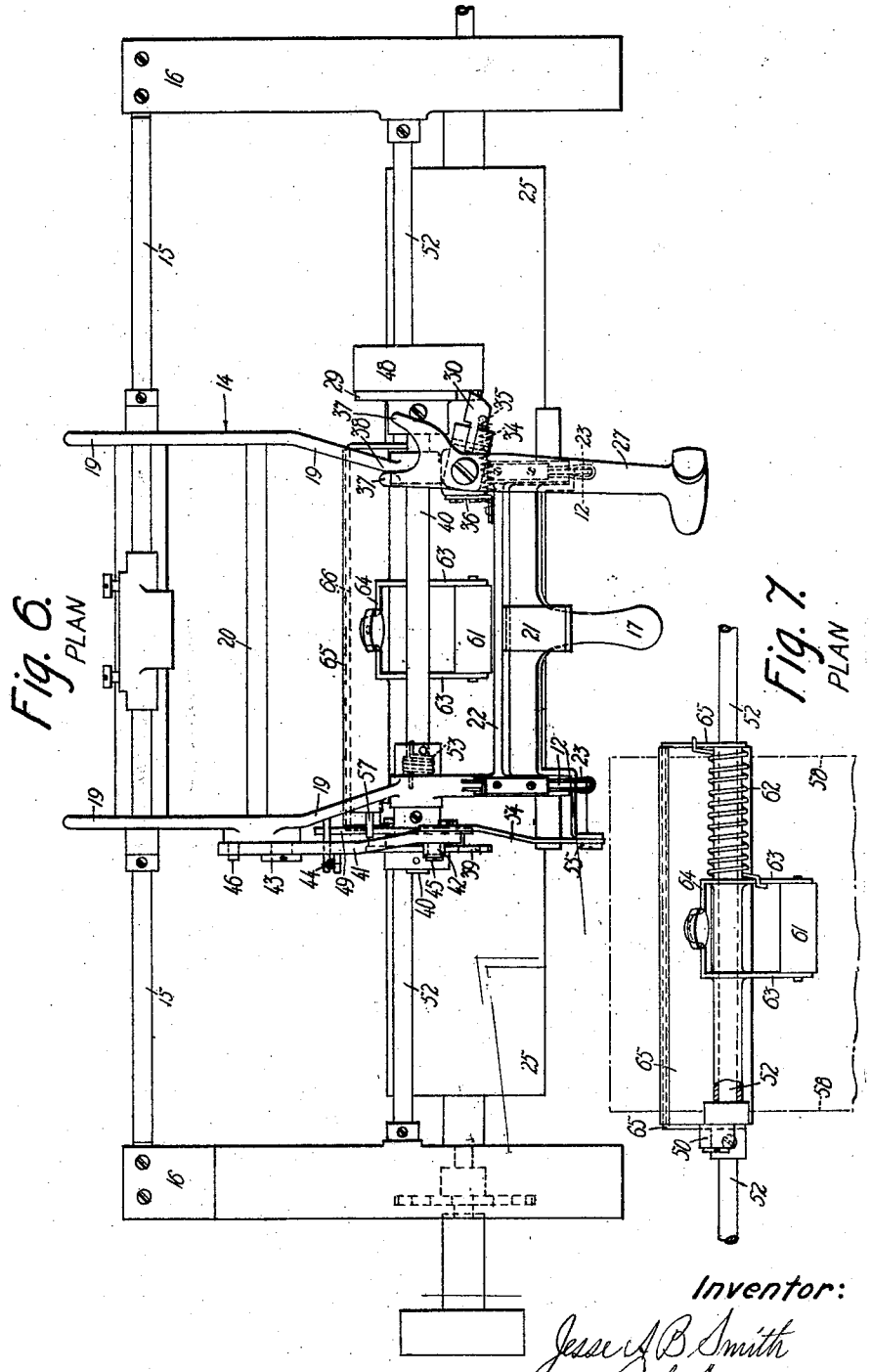


Fig. 6. PLAN

Fig. 7. PLAN

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Patented Oct. 13, 1931 1,826,903

UNITED STATES PATENT OFFICE

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TYPEWRITING MACHINE

Application filed April 16, 1925. Serial No. 23,460.

This invention relates to improvements in stencil-card writing devices for typewriting machines, and more particularly to the kind disclosed in the patent to S. Elliott, No. 1,378,771, dated May 17, 1921.

In said Elliott patent a stencil-card holding frame is pivoted at the rear upon the carriage and extends forwardly over the platen, and has clamps which grip the stencil-card at its upper edge. To permit the stencil-card to be attached to the holder, said holder is swung upwardly, and the stencil-card is then set into the holder between the clamps. The holder is then lowered to locate the stencil-card in its typing position. The line-spacing of the stencil-card is effected by a finger-wheel on the stencil-carrying frame, which may be rotated a notch by the typist after typing of each line.

The carriage then has to be returned to begin a new line of typing. The finger-wheel in said patent is placed at the right-hand end of the stencil-card holder, so that it may be rotated by the right hand, thus leaving the left hand of the operator free to return the typewriter-carriage. This, however, is an awkward and time-consuming operation. Moreover the operator may chance to return the carriage without having taken the precaution to rotate the finger-wheel, so that a second line of typing will be impressed upon the first line, thus spoiling the stencil-card.

An object of the present invention is to avoid these difficulties, and, to this end, said stencil-card holder is stepped up the usual three steps by means of a novel frame-lever which is devised for returning the typewriter-carriage, so that awkwardness of manipulation is avoided and time is economized, and there is no chance of the operator forgetting to elevate the frame or holder. This lever has its drive stroke in carriage-return direction, and is so connected to said stencil-card frame as not only to step it up, but also to cause said stencil-card frame itself to act as a carriage-return device, at any elevation to which the frame may be raised. The single drive of the lever causes the frame to step up, and also causes the frame to force the carriage to the right to begin a new line.

In the present invention, there is combined as a unit with the stencil-carrying frame a complete train of line-spacing and carriage-returning mechanism. Said line-spacing handle is provided with a pawl to engage a line-space wheel on the shaft of the card line-spacing mechanism. Said handle is provided with two stops to engage an arm of the card-supporting frame to limit the movement of said handle in its extreme positions.

In the above-mentioned Elliott patent there is provided a detent in the form of a pawl to engage a toothed wheel on the shaft of the line-spacing mechanism to hold the card in its various line-space positions, and the card cannot be reversely fed.

One of the features of the present invention relates to means to enable the card to be reversely line-spaced at will to bring a previously typed line to the printing point by means of the finger-wheel. To this end the line-space detent is provided with a roller to engage the teeth of the ratchet-wheel, to enable the ratchet-wheel to rotate in either direction. I have also shown a deflector to keep the celluloid reserve strip from winding itself around the platen as it is fed under a pressure-roller.

Other features and advantages will hereinafter appear.

In the accompanying drawings,

Figure 1 is a cross-sectional view, in elevation, showing the device applied to the platen-frame of an Underwood typewriting machine.

Figure 2 is an end view, in elevation, of the line-spacing mechanism in its normal or released position.

Figure 3 is a plan view of the line-spacing pawl-and-ratchet arrangement.

Figure 4 is a fragmentary front view, in elevation, of the line-spacing mechanism.

Figure 5 is a detail, showing the line-space feeding mechanism.

Figure 6 is a plan view of the device, as applied to the platen-frame of an Underwood typewriting machine.

Figure 7 is a plan view of the pressure-roll and its releasing handle.

A stencil-card 10, upon which it is desired to type one or more lines of data, is inserted under jaws 11 of a clamping member 12, which is pivotally mounted upon a shaft 13 on a frame 14, rockably mounted on a cross-shaft 15 fast on the end plates 16 of the platen-frame. The clamping member 12 consists of a sheet-metal bail having a finger-piece 17 at the center thereof, and the jaws are operated by said bail. The jaws hold the card in a locating recess 18 formed in the side plates 19 of the rocking frame 14, said plates being joined together by a connecting bar 20. The finger-piece 17 co-operates with another finger-piece 21 fast to the frame by means of a cross-bar 22, which forms an integral part thereof. The finger-piece 17 is moved rearwardly to open the jaws against the tension of springs 23, while at the same time the frame may be raised to insert the card between the jaws. Then the finger-pieces are released to clamp the card, and the frame is lowered to typing position as shown in Figure 1.

To facilitate the lowering of the card there is provided a deflector-plate 24, which is designed to hug the card against the platen 25 to prevent shadowing of the types in a case-position not being imprinted upon the card. One of the type-bars, designated by the numeral 26, is shown in front of the platen which serves as a backing for the card when the types are struck to cut the stencil-card.

In order to line-space the card, so that new lines may be typed thereon, and in order that the line-spacing of the card may be done simultaneously with the return of the carriage, there is provided a lever 27 rockably mounted upon a pivot 28 fast to one of the side frames 19. The lever 27 is operatively connected to a ratchet 29 by means of a pawl 30, which is fitted into a slot 31 in the lever 27, and is pivoted on a pin 32 fast to the lever so as to engage a tooth 33 of the ratchet 29, as shown in Figure 5.

The teeth 33 of ratchet 29 may be of the same number and have the same pitch as the teeth in ratchet 39, as shown, although this is not essential, as the number of teeth in ratchet 39 may be more than those in ratchet 29. The diameters of the ratchets 29 and 39 may be the same or different. In the present case the ratchet 29 is somewhat smaller than ratchet 39, as shown in Figure 5.

It is seen, therefore, in operating the machine, that the maximum number of effective strokes of lever 27 is limited to the number of teeth in ratchet 29 with which the pawl 30 of lever 27 can engage. The number of teeth in ratchet 29 may be the same as the number of lines to be typed on the card, but this is not absolutely necessary for reasons explained hereinafter. The usual number of teeth in ratchet 29 is the same as the greatest number of lines the machine would ever be called upon to type.

After the lever 27 has moved the necessary number of strokes and has raised the card to its uppermost position for line-spacing, its further movements become ineffective to raise the card up any higher, as the pawl 30 on the lever 27 has no more teeth on the ratchet 29 to engage with. The lever 27 would, however, in such event, still be useful to move the carriage. When the pressure upon the lever 27 is released, the same is returned to its normal position shown in Figure 6 by means of a spring 34, which actuates both the pawl and the lever. In order that the spring may be effective to resiliently hold the pawl in engagement with the ratchet and at the same time to return the lever, the spring has one end mounted on a stud 35 fast to the pawl, and the other end is secured to the side plate by means of a piece 36 fast thereto. For the purpose of limiting the swing of the line-spacing lever, and in order that it may be possible to return the carriage by the action of the lever, the same is provided at the rear thereof with a fork having two prongs 37, which strike the side plate at 38, as shown in Figures 1 and 3.

The line-spacing of the card is effected in a manner similar to that shown and described in said patent to Elliott. There is provided a retaining ratchet or detent wheel 39, having a single set of teeth, fast to a shaft 40, which is rotatably journaled in the frame 14, and carries at the end the feeding ratchet 29. Co-operating with the ratchet 39, there is provided a retaining pawl 41 pivotally mounted at 43 on one of the side plates 19. The retaining pawl is held in engagement with the ratchet by means of a spring 44, and, in order to permit back-feeding of the ratchet 39, to thus lower the card one or more spaces, the pawl is provided with a roller 42 engaging with the ratchet. Said roller is rotatably mounted on a stud 45 fast to the pawl 41, which is limited in its swing by a stop or pin 46 engaging with a slot 47 in said pawl. When the pawl 41 is stopped by either side of the slot 47 bearing against the pin 46, the pin 70 in pawl 41 is at one end or the other of the slot 56. When the pin 70 is at the lower end of the slot 56, the detent-roller 42 is located at the bottom of the tooth on ratchet 39, and when the pin 70 is at the upper end of the slot 56, the detent-roller 42 has risen to a position high enough to permit the entire ratchet 39 to be freely rotated under it if there were no stop to prevent such excess movement. The last part on ratchet 39 to engage the roller, as the frame is raised, is formed with an inclined surface extending from the bottom of the previous tooth to the periphery of the ratchet 39, so that the inclined surface cannot act as a stop-member

against the roller 42 after the card has been raised to the last line of typing.

If the shaft 40 were to be rotated in the direction of, and beyond, the line-spacing position during adjustment by the rotation of the finger-wheel 48, then the detent-roller 42 would ride up on the inclined surface until the cam 49 came against the stop-pin 57, so that no strain could be exerted thereby on the detent-roller 42. In this manner the card may be either raised by means of the line-spacing lever 27 or back-spaced by means of the finger-wheel 48, which may form an integral part of the ratchet 29.

The free end of the frame 14 is raised in a manner illustrated in the patent to Elliott, in which the cam 49 fast to the shaft 40 cooperates with a roller 50 borne by the platen-frame of the machine. Said roller is rotatably mounted on a supporting piece 51 fast to a cross-shaft 52 on the platen-frame. Due to the peculiar outline of the cam 49 when the same is rotated, the frame is raised an amount equivalent to the width of one space between the lines of typing upon the card.

In the Elliott patent there is shown mechanism whereby the frame 14 is automatically restored to its normal position corresponding to the first line of typing upon the stencil-card. Said mechanism comprises a spring 53 wound around the shaft 40, which is tensioned or loaded during the line-feeding operation. In order to restore the ratchet 29, there is provided a one-way connection between the finger-piece 17 and the pawl 41, shown in the form of a link 54 connected to the jaws 11 at 55, and to the pawl by means of the pin-and-slot arrangement 56. In this manner, when the jaws are opened the link 54 is forced upwardly to move the roller 42 away from the ratchet, thus permitting the shaft 40 to rotate backwardly to its normal position shown in Figure 2, in which the cam 49 is arrested in its backward rotation by the pin 57 fast to the side plate.

From the above it will be seen that two manually-operable means are provided for raising the frame 14 for line-spacing, namely, the finger-wheel 48 and the lever 27. This arrangement permits the wheel 48 to be used as a preadjusting device to set the machine for the number of lines to be typed on the card. This feature of the invention does away with the necessity for employing a ratchet having a plurality of different groups of segmental teeth, each group having a different number of teeth to be used according to the number of lines to be typed, as employed by Elliott. In this invention ratchet 39 need be supplied with only one group of teeth, the number of teeth being at least as great as the greatest number of lines the machine will be called upon to type. In operating the machine to type a less number of lines than the number of teeth in ratchet 29, finger-wheel 48 is rotated the number of steps necessary to leave the desired number of steps for the work in hand. The lever 27 is then operated to line-space the cards and return the frame to line-starting position for the balance of steps, after which it becomes automatically ineffective for line-spacing, as described.

In order to protect the platen of the machine when the stencil is cut with the bare type, and to facilitate the cutting, there is provided a backing in the form of a strip 58 of comparatively hard material having a supply at the rear of the platen. The backing is inserted around the platen, down a rear table 59 under the platen to co-operate with feed-rolls 60, and up in front of the platen past the printing point and back under a pressure-roll 61. The pressure-roll is rockably mounted upon the shaft 52 and is held bearing upon the backing strip by the pressure of a spring 62. Sometimes it is necessary to correct the bulging of the backing strip, and to this end the roller-supporting bail 63 is provided with an upwardly-extending finger-piece 64, through which the roll may be swung away from the platen.

To prevent the backing strip from winding itself around the platen when the same is rotated to line-spice the same, and to present a fresh portion thereof to the printing field, there is provided a plate or deflector 65 mounted upon a support or bail-piece 66, the opposite arms of which form side-edge guides for the strip 58. The plate is fast to the bail-piece at 67 and extends downwardly and forwardly to a point closely adjacent the platen, or to bear upon the platen at 68. In this manner the leading edge 69 of the strip is prevented from following the curvature of the platen and is led to the outside, as shown in Fig. 1.

It will be noted that the cylindrical platen is stationary and presents a stationary stenciling area to the stencil-cutting types; that the backing strip is carried by the platen; that the platen is never rotated during a stenciling period except to remove a type-mutilated area of the backing strip and present a new area for the types to cut against; that a stenciling area on the backing strip will withstand a succession of stencil-cutting operations before it becomes defective to properly cut the cards; and that the stencil-feeding mechanism is all mounted upon the card-carrying frame.

Variations may be resorted to within the scope of the invention, and portions of the improvements may be used without others.

Having thus described my invention, I claim:

1. In a typewriting machine, the combination with a platen, a carriage therefor and types, of an overhead displaceable frame mountable upon the carriage, means for raising the frame step by step to line-

space a stencil carried thereby, said means including a support attached to the frame, a lever swingable on said support, stops carried by the lever and coacting with the frame to control the stroke of the lever, a ratchet-wheel, a pawl for engaging the ratchet-wheel upon swinging said lever, and a spring associated with said pawl and the support for returning the lever to normal position and for causing said pawl to press against the teeth of said ratchet-wheel in all frame-operation positions of said lever.

2. In a typewriting machine, the combination with a platen, a carriage therefor and types, of an overhead displaceable frame mountable upon the carriage, means for raising the frame step by step to line-space a stencil carried thereby, said means including a support attached to the frame, a lever swingable on said support, stops carried by the lever and coacting with the frame to control the stroke of the lever, a ratchet-wheel, a pawl for engaging the ratchet-wheel upon swinging said lever, and a spring associated with said pawl and the support for returning the lever to normal position and for causing said pawl to press against the teeth of said ratchet-wheel in all frame-operating positions of said lever, said lever including a forked end, the tines of the fork constituting stops which engage the frame to determine the normal and the active positions of said lever.

3. In a typewriting machine, the combination with a platen, a carriage therefor and types, of an overhead displaceable frame mountable upon the carriage, means for raising the frame step by step to line-space a stencil carried thereby, said means including a support attached to the frame, a lever swingable on said support, stops carried by the lever and coacting with the frame to control the stroke of the lever, a ratchet-wheel, a pawl for engaging the ratchet-wheel upon which swinging said lever, and a spring associated with said pawl and the support for returning the lever to normal position and for causing said pawl to press against the teeth of said ratchet-wheel in all frame-operating positions of said lever, said lever including a forked end, the tines of the fork constituting stops which engage the frame to determine the normal and the active positions of said lever, said spring being effective to return said lever to said normal position with one of the tines of the fork against the frame.

4. In a typewriting machine, the combination with a platen, a carriage therefor and types, of an overhead displaceable frame mountable upon the carriage, a support mounted on said displaceable frame, a stud carried by said support, a line-spacing lever pivotally received on said stud, said lever carrying a pair of stops co-operating with the frame to determine the throw of said line-spacing lever in both directions, one of said stops enabling said lever to employ said frame as a means for returning the carriage a cam rotatably associated with the frame and coacting with a stationary portion of the machine to lift the frame, a ratchet-wheel operatively connected to said cam, a pawl swingably mounted on said line-spacing lever and engageable with said ratchet-wheel, and a spring having one end thereof connected to the pawl and the other end thereof secured to said support, said spring being normally effective to withdraw said pawl from the ratchet-wheel and cause one of said stops to engage the frame, said spring being also effective to press the pawl into engagement with the ratchet-teeth in all operating positions of the line-spacing lever.

5. In a typewriting machine, the combination with a platen and types, of means for guiding a strip of backing material inserted around the platen to protect the latter from the type-blows, said means including a stationary support at the top of the platen, and a pressure-roll for holding the strip against the platen, and a deflector carried by said support for receiving the strip after passing beyond the pressure-roll, said deflector including a lip-portion closely adjacent the platen and a body-portion extending rearwardly from the lip and then upwardly, said support also carrying side-edge guides for said strip.

6. In a typewriting machine, the combination with a platen and types, of means for guiding a strip of backing material inserted around the platen to protect the latter from the type-blows, said means including a stationary support at the top of the platen, a pressure-roll for holding the strip against the platen, a deflector carried by said support for receiving the strip after passing beyond the pressure roll, said deflector including a lip-portion closely adjacent the platen and a body-portion extending rearwardly from the lip and then upwardly, said support also carrying side-edge guides for said strip, and a deflector-plate at the front of the platen for holding a stencil against said strip.

7. In a front-strike typewriting machine having a carriage and a platen thereon, and also having a frame mounted on said carriage to swing up and down thereon, said frame having means for raising and lowering a stencil-card at the front of the platen, the combination of a line-spacing train mounted on said frame to swing up therewith step by step at the line-feeding operation of the stencil-card, said line-spacing train including a forwardly-extending lever whose driving stroke is in the direction of the return of the carriage, a frame-elevating pawl pivoted on said lever and engaging said train, said lever being capable of both line-spacing the card and employing said frame as a means for returning

the carriage to begin a new line of typing at all elevations of said frame, detent-means for elevations of said frame, detent-means for holding the frame at its different line-spacing elevations, means for releasing the detent independently of said line-spacing train, and permitting said frame to drop, and automatic means independent of said detent-means for disengaging said pawl from the train, and thereby making the throw of the lever ineffective after the last line has been typed.

8. In a typewriting machine, the combination of a carriage, a platen thereon, a stencil-card-holding device including a frame swingably mounted upon said carriage for presenting a pendent stencil-card to typing position at the front of the platen, and line-spacing mechanism for raising said swingable frame step by step to line-space the stencil-card and including a line-spacing train having a combined carriage-return and line-space lever, the drive stroke of said lever being in the direction of the carriage-return, said lever having a fixed extent of displacement by engaging said swingable frame, to enable the lever to employ said frame to drive the carriage back to the beginning of a new line, said lever having means for stepping said swingable frame upwardly on returning the carriage to begin a new line of typing, means for limiting the number of successive stepping operations of said lever, and means independent of said lever for controlling the drop of said frame to original position for typing the first line upon the next card.

9. In a card-typing machine, the combination with a carriage, a platen mounted thereon, and typing members, of a movable frame supported by the carriage and having a clamp to hold a card, means to raise the card vertically in steps to line-space the same with reference to the typing line of the machine, said means including a rotatable cam mounted on a shaft, a fixed support mounted on the carriage for the cam to bear against, a toothed segment also on the shaft, a manually-operable lever engaging said segment to rotate the same and effective to raise the card for line-spacing in the machine, said lever having a working stroke in carriage-returning direction, means to enable said lever to return the carriage at any elevation of said frame, means to automatically disconnect the lever from said segment after fully raising the frame, and means independent of said lever to restore the parts to their initial positions.

10. In a front-strike typewriting machine, the combination with a carriage, a platen thereon, and a frame supported by said carriage to rise and fall thereon, said frame having means for holding a stencil-card and raising and lowering the same at the front of the platen, of a line-spacing train capable of lifting the frame step by step for line-feeding the stencil-card, said line-spacing train including a forwardly-extending lever having its drive stroke in carriage-returning direction and effective by manual operation to line-space said card and also effective to concomitantly return the carriage to its initial position at any elevation of said frame, to begin a new line of typing, a detent for holding the frame in successive line-spaced elevations, and means independent of said detent for limiting the gross extent to which said frame can be elevated by successive operations of said lever.

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