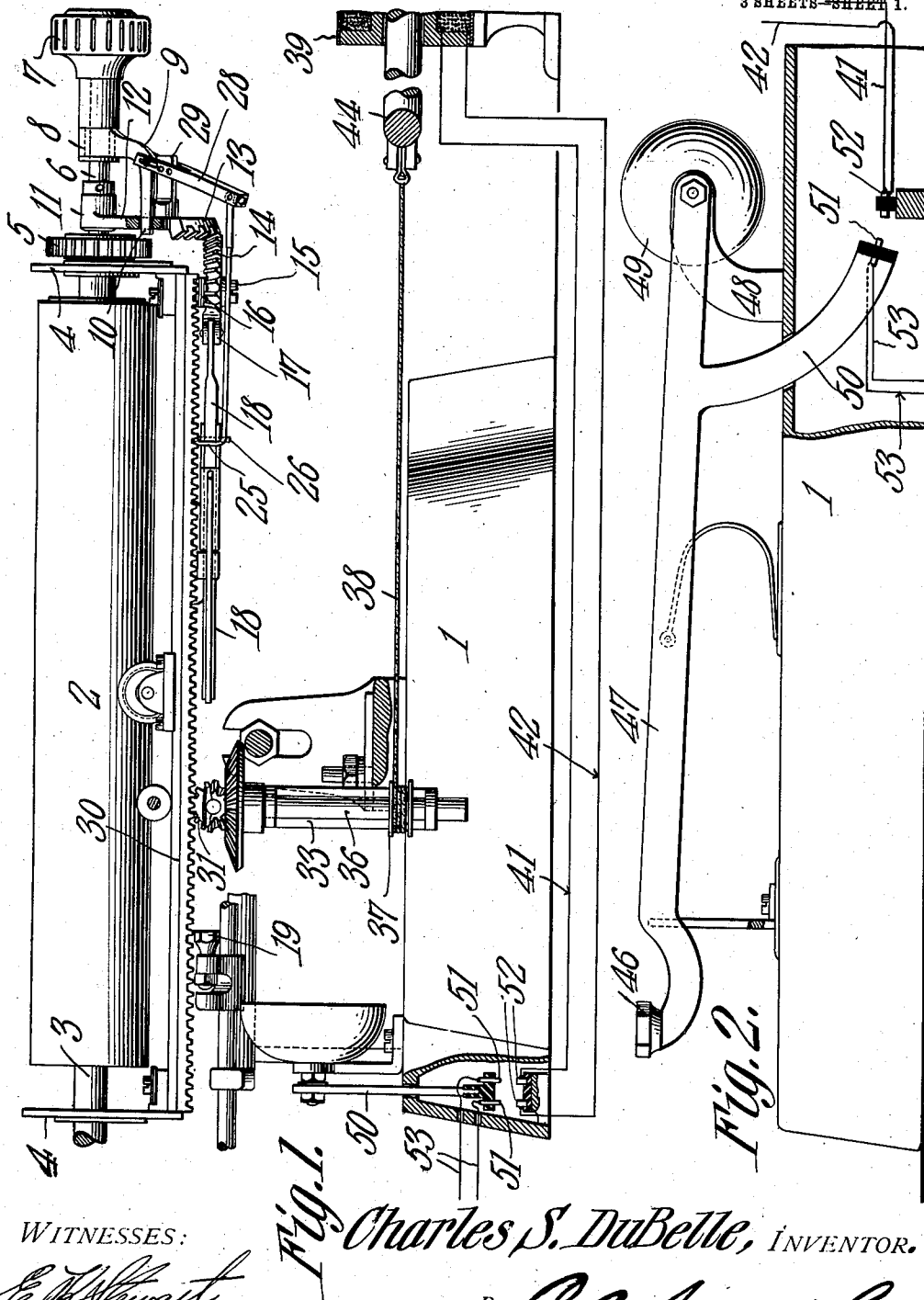


No. 873,304.

PATENTED DEC. 10, 1907.

C. S. DU BELLE.
TYPE WRITER.

APPLICATION FILED JUNE 17, 1907.



WITNESSES:

E. J. Stewart
F. J. Chapman

Charles S. DuBelle, INVENTOR.

By *C. A. Snow & Co.*
ATTORNEYS

No. 873,304.

PATENTED DEC. 10, 1907.

C. S. DU BELLE.
TYPE WRITER.

APPLICATION FILED JUNE 17, 1907.

3 SHEETS—SHEET 2.

Fig. 3.

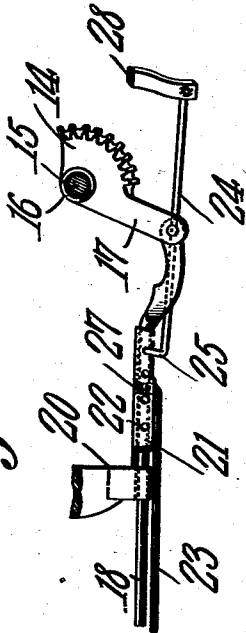
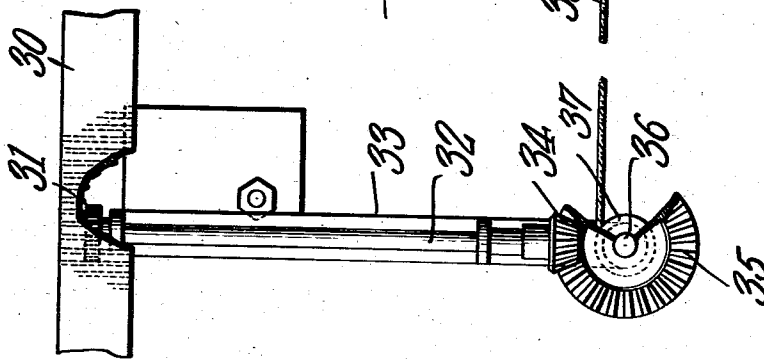
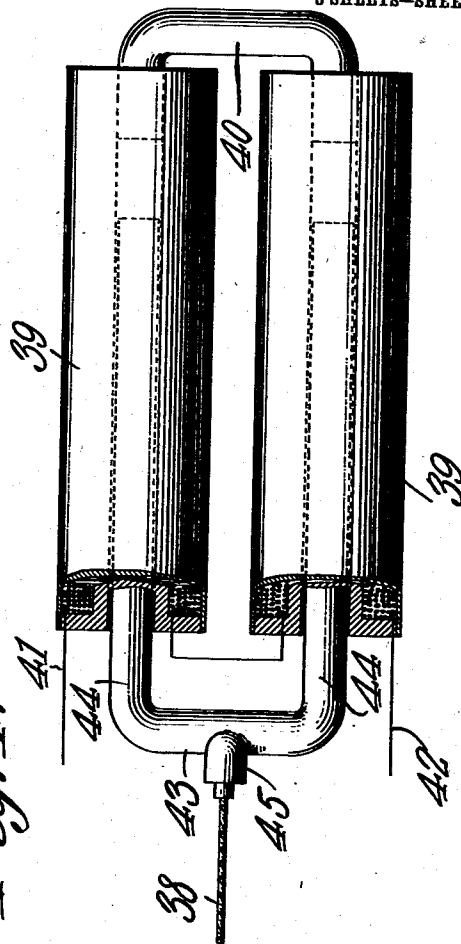


Fig. 4.



WITNESSES:

E. J. Stewart
F. J. Chapman

Charles S. DuBelle
INVENTOR.

By

C. A. Snow & Co.
ATTORNEYS

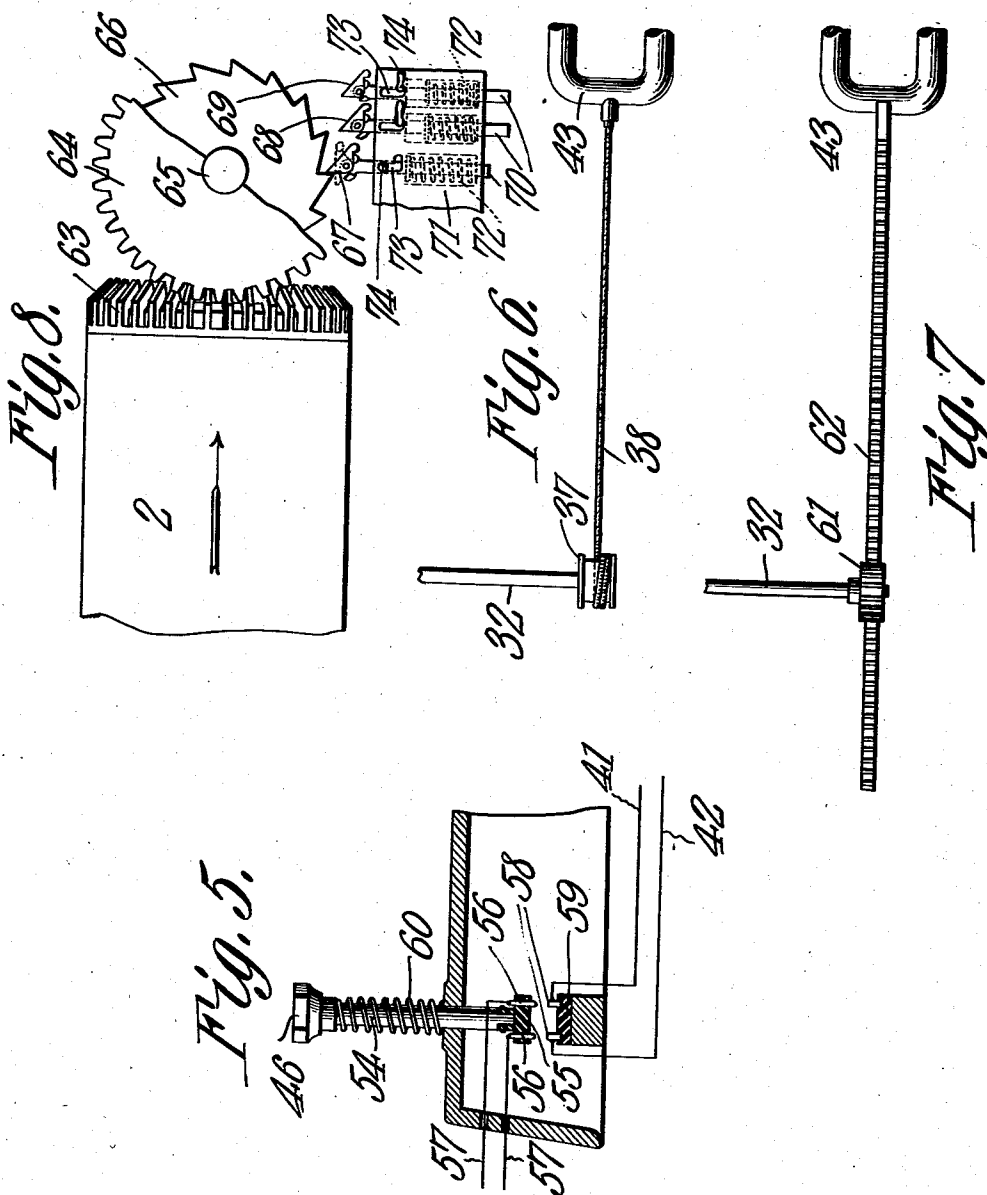
No. 873,304.

PATENTED DEC. 10, 1907.

C. S. DU BELLE.
TYPE WRITER.

APPLICATION FILED JUNE 17, 1907.

3 SHEETS—SHEET 3.



WITNESSES:

E. J. Stewart
F. J. Chapman

Charles S. DuBelle,

INVENTOR.

By

C. A. Snow & Co.

ATTORNEYS

UNITED STATES PATENT OFFICE.

CHARLES SUMNER DU BELLE, OF WILLIAMSPORT, PENNSYLVANIA.

TYPE-WRITER.

No. 873,304.

Specification of Letters Patent.

Patented Dec. 10, 1907.

Application filed June 17, 1907. Serial No. 379,511.

To all whom it may concern:

Be it known that I, CHARLES S. DU BELLE, a citizen of the United States, residing at Williamsport, in the county of Lycoming and State of Pennsylvania, have invented a new and useful Improvement in Type-Writers, of which the following is a specification.

This invention has reference to improvements in typewriters, and its object is to provide an automatic means for returning the carriage to its initial position after completing a line or a portion of a line, and also to cause the feed of the carriage to present the paper for the next succeeding line.

The invention consists essentially in an electrically operated means for moving the carriage in a direction to return it to the beginning of a line after having completed an entire line or a part thereof, which electric means may be under the control of a suitably located key on the keyboard.

In addition to the returning mechanism, the invention comprises means for rotatively moving the platen to feed the paper the requisite distance for the imprinting of a new line.

More specifically considered, the invention comprises the employment of a solenoid for the actuating means to return the carriage to its initial position, and the solenoid may be under the control of an electric switch to be closed on the depression of a suitably located key on the keyboard, or a push-button, or, in fact, any suitable structure adapted to the purpose.

In its broader aspects the invention comprises a means for rotating the platen, which means is constructed with direct reference to the particular commercial form of typewriter on which the invention is to be used. With reference to this part of the invention, it may be stated that the carriage-return mechanism is of practically no value without combining therewith the automatic means for rotatively actuating the carriage to feed the paper for the next succeeding line.

The invention will be best understood by reference to the following description taken in connection with the accompanying drawings forming part of this specification, in which,

Figure 1 is a rear view, partly in section, of so much of a commercial form of typewriter as is necessary for the understanding of the

present invention, with said invention applied thereto; Fig. 2 is a side elevation, partly in section, of one form of key-operated switch mechanism which may be used in connection with the invention; Fig. 3 is a detail view of a portion of the line spacing mechanism; Fig. 4 is a plan view, partly in section, of the means for returning the carriage to its initial position; Fig. 5 is a detail view of a form of electric controlling mechanism somewhat different from that shown in Fig. 2; Figs. 6 and 7 are diagrammatic views showing different forms of carriage shifting attachments; and Fig. 8 is a detail view, partially diagrammatic, showing another form of line spacing mechanism from that shown in Figs. 1 and 3.

Referring to the drawings, there is shown the base 1 and platen 2 of a known commercial form of typewriter. The arbor 3 of the platen is journaled in suitable portions 4 of the carriage, which latter structure is not shown since a showing of this part is unnecessary for the understanding of the invention. Upon the arbor 3, beyond one end of the platen, there is mounted a toothed wheel 5 constituting the ratchet wheel for controlling the movements of the platen and commonly employed upon this type of machine.

Upon an extension 6 of the arbor there is mounted a platen-manipulating hand wheel 7, also common to this type of machine and provided for the purpose of rotating the platen by hand. This hand wheel 7 is also movable longitudinally upon the extension 6 and engages a collar 8, also slidable upon the extension 6, which collar 8 carries an angle arm 9 terminating in a tooth 10 movable into and out of engagement with the ratchet wheel 5.

Between the collar 8 and the ratchet wheel 5 there is mounted another collar 11, rotatable upon but not movable longitudinally with reference to the extension 6 of the platen arbor. This collar 11 has a radial arm 12 through which the tooth 10 extends, there being a suitable perforation for this purpose, and at the outer end the arm 12 is formed into an arc-shaped, beveled gear segment 13 in mesh with another gear segment 14 mounted for rotation upon a stud 15 fast on the carriage carrying the platen. The gear segment 14 is under the control of a spring 16 surrounding the stud 15, and this segment is also provided with a bifurcated arm 17 receiving one end of a rod 18 extend-

ing under the carriage in the direction of its length. In the path of the free end of the rod 18 is a stop 19 with which this rod engages when the carriage is moved toward its
5 initial position.

The device thus far described is of known construction, being found in a certain commercial form of typewriter, and is used for causing the shift of the platen when the carriage is moved by hand to its initial position
10 as well as for determining the width of the margin.

Utilizing the structure thus far described, I render the rotation of the platen for advancing the paper entirely automatic on the return of the carriage to its initial position by means which I will now proceed to describe.

It may be noted that the rod 18 is curved near its point of connection to the arm 17
20 and also that near its free end it passes through a bracket 20 which serves to support this rod. Surrounding the rod 18 between the curved portion and the bracket 20 is a sleeve 21 provided with a number of perforations 22, and this sleeve carries another
25 rod 23 parallel with the rod 18. This sleeve has fast to it one end of a link 24, which end is bent into an eye 25 with one member 26 passing through one of the perforations 22 and through a longitudinal slot 27 formed in
30 the rod 18 adjacent to its curved end. This holds the sleeve 21 from rotation upon the rod 18 and at the same time permits the rod 18 to move longitudinally through the sleeve
35 21. The other end of the link 24 is connected to a lever 28 pivotally connected to a post 29 fast on the radial arm 12 close to the slot through which the tooth 10 extends. The lever 28 is of the first order, and the end
40 remote from its connection with the link 24 is pivotally connected to the arm 9, so that when the lever 28 is moved about its pivot the tooth 10 will be moved into or out of engagement with the teeth of the ratchet
45 wheel 5.

Now, in the form of typewriter shown in Fig. 1 means are provided whereby the relative positions of the gear segments 13 and 14 are adjusted to cause the rod 18 to have a
50 certain fixed position in accordance with the adjustment of these gear segments, thus determining the extent of rotation given to the platen and so providing for the spacing between the lines. Since this structure, in
55 itself, forms no part of the present invention and is of known form, it is not illustrated in the drawings. Now, since this means for determining the spacing between the lines causes a rotative movement of the arm 9 and
60 sleeve 8 as well as the arm 12 and sleeve 11 about the arbor extension 6 as an axis, the stud 29 and the lever 28 will participate in this rotative movement, but the lever 28 is not thereby moved about its pivot although
65 the rod 18 is moved longitudinally with refer-

ence to the rod 23. Therefore, the rod 23 will under some circumstances project quite a distance from the rod 18. Now, the purpose of the rod 23 is that it should be engaged
70 by the stop 19 so as to move the lever 28 about its pivot and so force the tooth 10 between the teeth of the ratchet 5. Thus, when the rod 18 comes into contact with the stop 19, whether immediately after the engagement of the rod 23 therewith or after the
75 rod 23 has been moved to its full extent, the rod 18 will cause the partial rotation of the gear segment 14 and a corresponding rotation of the gear segment 13 and the consequent rotation of the platen 2 because the
80 rod 23 has caused the tooth 10 to engage the ratchet 5 which is fast upon the platen 2 and the said ratchet and platen must therefore participate in the rotative movement of the arm 12 under the impulse of the segment 14
85 and rod 18. It will be seen that the tooth 10 is by this mechanism always brought into engagement with the ratchet 5 before the line spacing mechanism can come into action, whether said line spacing mechanism be
90 set for one or more spaces. It will also be seen that this spacing mechanism is entirely automatic and does not depend upon the volition of the operator.

Still considering the type of machine
95 shown in the drawings, it is customary to return the carriage to its initial position by moving the same longitudinally under the impulse of the hand of the operator applied to the hand wheel 7. In order that this return movement may be made automatic,
100 there is fast on the carriage a rack bar 30 which is engaged by a pinion 31 fast on one end of a shaft 32 journaled in a suitable frame 33 fast on the base of the typewriter.
105 At the other end of the shaft 32 there is provided a bevel pinion 34 engaged by a bevel gear wheel 35 on the upper end of an upright shaft 36, also suitably journaled in the frame 33 and carrying near its lower end a band
110 wheel 37 upon which is wound a band or cord 38, through which latter power may be applied to cause the rotation of the shaft 36 on the unwinding of the band or cord from the wheel or drum 37. The rotation of the shaft
115 36 in the proper direction will transmit motion through the gear wheel 35 and pinion 34 to the other shaft 32, and this will impart motion through the pinion 31 and rack 30, and thus move the carriage in the proper direction
120 to carry it to its initial position ready to print a line. Now, in the particular machine under consideration the carriage has a forward and back shift to each side of the normal or neutral position; consequently, the
125 rack is made sufficiently wide to always engage with the pinion 31 whatever may be the shifted position of the carriage.

In order to actuate the band or cord 38, I have provided an electric means best shown
130

in Fig. 4. This electric means comprises a pair of solenoid coils 39—39 connected together at one end by a yoke 40 and they may be otherwise supported to preserve their parallelism. These solenoids are connected up in suitable order and their terminals are connected to conductors 41 and 42 to be hereinafter referred to. Adapted to these solenoids is a core comprised of a U-shaped frame 43, the legs 44 of which enter the solenoid coils 39. At the center of the frame 43 is formed a boss 45 to which the cord or band 38 is secured. When the solenoid coils are not energized the core frame 43 is, of course, freely movable with relation to these coils. Consequently, when the typewriter carriage is moved in the act of printing a line the cord 38 is wound upon the drum 37 and the core legs 44 are withdrawn from the coils 39 but not to a sufficient extent to withdraw them entirely therefrom. When, however, the solenoid coils are energized, the core legs are drawn into the coils and the cord 38 is unwound from the drum 37 and, acting through the gearing, causes the return of the carriage to its initial position as has already been described.

Now, in order that the operator may readily cause the energization of the coils 39 there may be provided a suitable key 46 on the keyboard upon the end of a key lever 47 having its other end pivoted, if desired, upon the bracket 48 carrying the bell 49, or this key lever may be supported in any other suitable manner. The key lever 47 is provided with an arm 50 which may extend through the base 1 of the machine to the interior thereof and there be provided with an insulated contact 51 movable into engagement with another insulated contact 52 fast in the base of the machine and connected to one of the conductors coming from the solenoids, say the conductor 41. Connected to the contact 51 is a conductor 53 which may lead to a suitable source of current, which latter may also be connected to the other conductor 42 leading to the solenoid coils. This source of current may be a local battery, or, by means of a suitable cord and plug, connection may be made through a socket to the street mains.

Instead of the key 46 being fast upon the key lever 47, it may be fast upon a stem 54 carrying at its lower end an insulated block 55 having two contacts 56 forming the terminals of conductors 57 leading to the source of electrical energy. In the path of the contacts 56 there are other contacts 58 fast on an insulated block 59 supported in the base of the machine and forming the terminals of the conductors 41 and 42 leading from the solenoid coils 39. This key 46 is maintained in a normally elevated position with the terminals 56 and 58 out of contact by means of a suitable helical spring 60 surrounding the stem 54.

In Figs. 6 and 7 are shown other means of transmitting motion from the solenoid core to the shaft 32. In Fig. 6 the cord 38 is attached to the drum 37 mounted directly upon the shaft 32, thus doing away with the bevel gearing, while in Fig. 7 there is a pinion 61 fast on the end of the shaft 32, and this pinion is engaged by a rack 62 fast on the solenoid core 43.

It will be understood, of course, that instead of the twin solenoid coils a single coil may be used, but I prefer to use two coils.

It will be understood that with regard to the structure so far described the invention is not limited to the exact construction shown, and various changes may be made so long as the principle of the invention is adhered to.

While I have described the line spacing mechanism with reference to the particular type of machine shown in Fig. 1, the said spacing mechanism may be modified to suit different types of machines. For instance, in Fig. 8 there is shown a type of machine where the platen 2 has one end provided with a gear wheel 63 engaged by another gear wheel 64, upon the arbor 65 of which, or, if desired, fast to one face thereof, is a ratchet disk 66. In the path of the ratchet disk are three stops 67, 68 and 69. Each of these stops is formed on the end of a stem moving longitudinally in a suitable casing 71 and urged to the projected position by an inclosed spring 72. A bayonet slot 73 in the casing is provided for the passage of a manipulating handle 74, so that the stop 67, 68 or 69, as the case may be, may be held in the retracted position out of the path of the teeth of the ratchet disk 66 or may be released to the action of the spring 72 and carried into the path of these teeth.

Now, let it be assumed that the extreme movement of the carriage carrying the platen 2 is such as to carry the ratchet disk 66 to the dotted line position shown in Fig. 8. And let it be further supposed that the stop 69 is projected into operative relation, that is, into the path of the ratchet disk 66. When the carriage is returned to its initial position a tooth on the ratchet disk 66 is engaged by the stop 69 just before it reaches its initial position and the disk 66 is actuated around its axis for a distance equal to the length of the tooth. This will cause the rotation of the platen to feed the paper one space. If the stop 68 is also projected it will engage the disk 66 before it is engaged by the stop 69, and, consequently, the disk 66 will be actuated a distance equal to the length of two teeth, while if the stop 67 is projected it will also engage the disk before it is engaged by the stop 68, but the corresponding time dis-

tance in advance thereof, and the stops will rotate the disk 66 a distance of three teeth. The operator can therefore adjust the machine for line spacing as desired.

- 5 It may be observed that exact proportions are not shown in the drawings, and, therefore, I am not limited to any particular proportion of the parts, since different machines will require different arrangements according to the type of operation.

10 The structure of Fig. 8 is not intended to be an exact representation of the structure to be used but is only indicative, since each separate type of machine will require some modification in order to adapt the line spacing mechanism to the particular structure employed in that machine.

I claim:—

1. In a typewriter, automatic means for 20 returning the typewriter carriage to its initial position, and a line spacing mechanism operated by the movement of the carriage toward its initial position comprising intermeshing gears for rotating the platen, means 25 for actuating said gears, a stop in the path of said gear-operating means, and means for connecting the gear members to the platen also operated by engagement with said stop.

2. In a typewriter, automatic means for 30 returning the typewriter carriage to its initial position, and a line spacing mechanism operated by the movement of the carriage toward its initial position comprising intermeshing gears for rotating the platen, means 35 for actuating said gears, a stop in the path of said gear-operating means, and means for connecting the platen and gear members comprising a tooth for connecting one of the gear members to the platen, a lever controlling said tooth, and a sliding member connected to said lever and arranged to be engaged by said stop.

3. In a typewriter, automatic means for 45 returning the typewriter carriage to its initial position, and a line spacing mechanism operated by the movement of the carriage

toward its initial position comprising means for rotating the platen, a stop in the path of said means, and means for connecting the platen and operating means therefor comprising a tooth, a lever controlling said tooth, 50 and a sliding member connected to said lever and arranged to be engaged by said stop.

4. In a typewriter, an automatic means for 55 returning the typewriter carriage to its initial position, and a line spacing mechanism operated by the movement of the carriage toward its initial position comprising intermeshing gears for rotating the platen, a sliding rod connected to the gears, a stop in the path of the rod, a sliding member carried 60 by said rod and provided with means coacting with said stop, a lever carried by one of the gears, a tooth connected to said lever and movable thereby to connect the said gear to the platen, and connections between the lever and the sliding member.

5. In a typewriter, means for returning a typewriter carriage to its initial position 70 ready for the imprinting of a line, comprising a solenoid, electric circuit terminals controlled from the keyboard of the typewriter, a charged electric circuit including said circuit terminals and the solenoid, connections 75 between the solenoid and the typewriter carriage for moving the latter to its initial position when the solenoid is energized, and line spacing mechanism for the platen comprising an adjustable line spacing means operated to rotate the platen on the return 80 movement of the carriage, and means operated by the carriage on its return movement toward its initial position for locking the line spacing means to the platen.

85 In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

CHARLES SUMNER DU BELLE.

Witnesses:

F. H. SIMMONS,
A. H. BLOOMFIELD.