Jan. 12, 1932. M. GARBELL 1,841,106

TYPEWRITER LINE SPACE MECHANISM

Filed Dec. 1, 1927 2 Sheets-Sheet 1

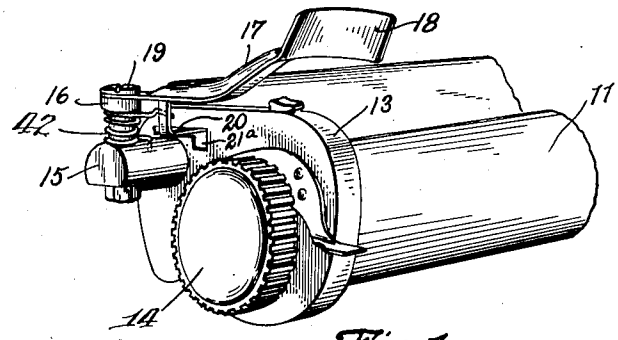


Fig. 1.

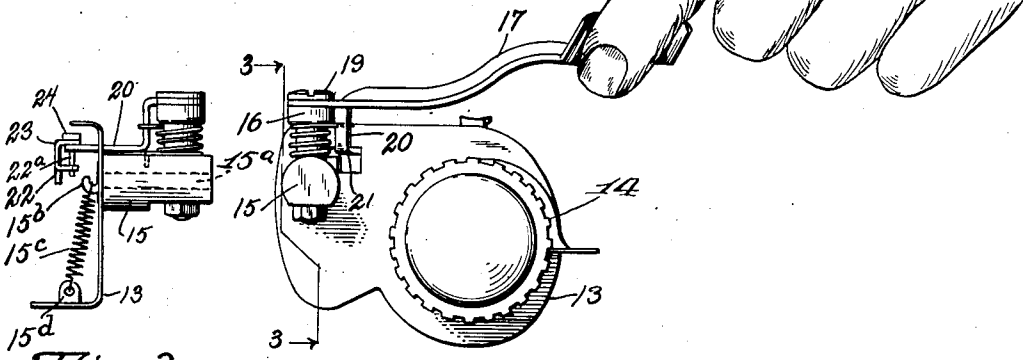


Fig. 3.

Fig. 2.

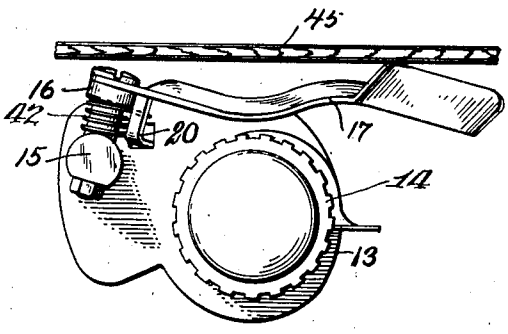


Fig. 4.

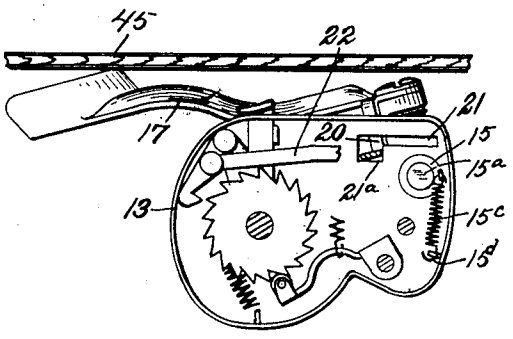


Fig. 5.

WITNESS:

INVENTOR.
Max Garbell.
BY
Jones, Addington, Ames & Seibold.
ATTORNEYS.

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TYPEWRITER LINE SPACE MECHANISM

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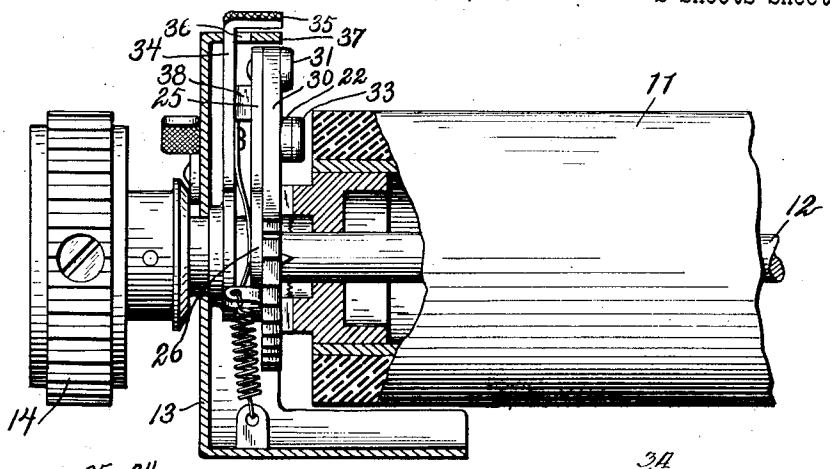


Fig. 6.

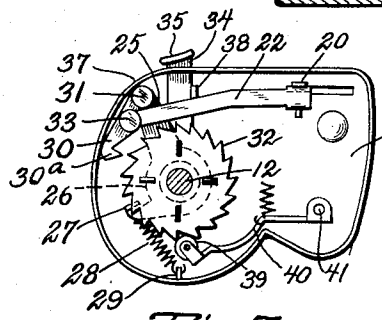


Fig. 7.

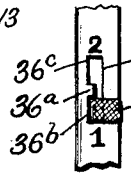


Fig. 8.a

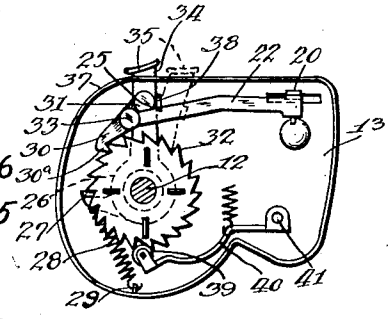


Fig. 8.

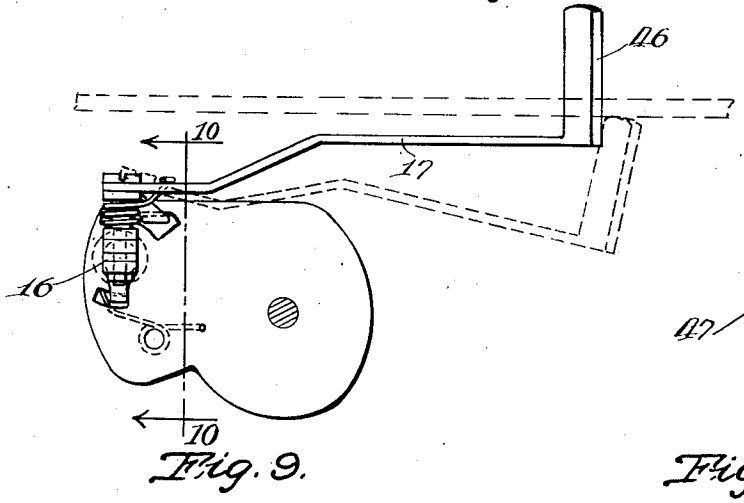


Fig. 9.

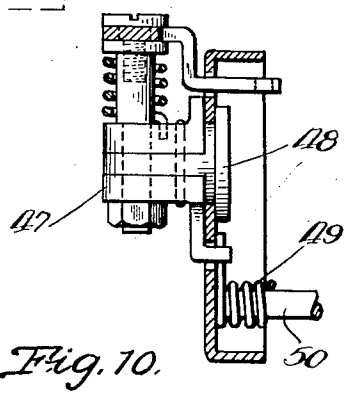


Fig. 10.

WITNESS:

INVENTOR.

Max Garbell.

BY

Jones, Addington, Ames & Seibold.

ATTORNEYS.

Dan S. Magnuson.

Patented Jan. 12, 1932 1,841,106

UNITED STATES PATENT OFFICE

MAX GARBELL, OF CHICAGO, ILLINOIS, ASSIGNOR TO VICTOR ADDING MACHINE COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS

TYPEWRITER LINE SPACE MECHANISM

Application filed December 1, 1927. Serial No. 236,920.

My invention relates to typewriters and it has particular relation to line spacing mechanism for use in typewriting machines.

While I will hereinafter describe my improved line spacing mechanism as peculiarly adapted for use in connection with a portable typewriter and for this reason point out the manner in which the finger-engagable line spacing lever may be utilized in a portable typewriter, it is to be understood that the elements of my mechanism are not confined to such use but may be employed in typewriters of standard size if desired. However, I wish to emphasize that the line spacing mechanism proposed by me is adapted for use with a line spacing lever in such manner that said lever may be collapsed into a minimum volume occupying space when required.

My invention will be better understood by reference to the accompanying drawings, in which I have shown as much of a typewriting machine as is necessary to illustrate a complete reduction to practice so far as the operating portions of a line spacing entity are concerned.

In the drawings:

Figure 1 is a fragmentary, perspective view of the left-hand end of a platen together with the spacing mechanism, whereby the material being written on is advanced line-by-line through the rotation of said platen;

Fig. 2 is an elevational view of the platen-supporting frame and the line spacing lever mounted thereupon;

Fig. 3 is an elevational, sectional view taken on line 3—3 of Fig. 2;

Fig. 4 is a view similar to Fig. 2 but showing the line spacing lever in collapsed position;

Fig. 5 is a view of the elements shown in Fig. 4, taken from the other side of the end frame;

Fig. 6 is an elevational view of the operating elements of the line spacing mechanism, said view being taken from the front of the machine and being partially sectioned to show said operating elements;

Fig. 7 is an elevational view of the inside of the left-hand platen-supporting end frame showing the line spacing elements in inoperative position;

Fig. 8 is a view similar to Fig. 7 showing the elements after the line spacing lever has been moved to effect a rotation of the paper-supporting platen, the full line position of a stop member being that utilized when a spacing of one line is desired, while the dotted lines show the position of said stop when two lines or a double space is needed;

Fig. 8—*a* is a top plan view of a portion of the device showing the means for setting the line space stop for either single or double spacing;

Fig. 9 is an elevational end view of a modified form of a line spacing lever, the full line position being that utilized when the cover of the machine is off, and the dotted line showing being the position of the line spacing lever, or associated elements, when the cover is on; and

Fig. 10 is an elevational, sectional view taken on the line 10—10 of Fig. 9.

Referring now in detail to the drawings, I will first describe the operative elements of the line spacing mechanism without reference to the manner in which the line spacing lever may be mounted for collapsing. A paper supporting platen 11 is carried on a shaft 12, which latter is mounted in end frames, the left-hand end frame being shown at 13. These end frames are mounted on the typewriter carriage in any desired manner. A knurled knob 14 is utilized to turn the platen 11 any number of desired spaces, this knob being connected to the platen in a particular manner to permit of the platen being freed from the normal line spacing mechanism to provide for variable line spacing. The mechanism for variable line spac-

ing will not be further described in this application because the same forms the subject matter of my copending application Serial No. 259,233, filed March 5, 1928.

A mounting stud 15 is secured to the end frame 13 and carries a lug 16 to the top of which latter is pivotally secured a line spacing lever 17 provided with a finger-engageable end portion 18. In this connection, it will be noted that the lever 17 and the engageable portion 18 are of peculiar and novel configuration, whereby the finger is permitted to engage the lever in a normal manner as the hand in its easiest position is swept transversely of the machine (see Fig. 2). The peculiar configuration of the lever is such that a low assembly of the elements is permitted. Because of the said low compact assembly, I do not find it necessary in all cases to make the spacing lever collapsible to accommodate the cover of an enclosing case, such as is usually provided for covering and carying a portable typewriter.

As shown in Figs. 1 and 2, the lever 17, by reason of its peculiar shape fits down very closely to the top of the machine, thereby permitting the line spacing elements to be so compactly contained in a minimum volume that the enclosing cover is substantially no higher or larger than if the said lever were collapsed.

The lever 17 is pivotally secured to the top of the lug 16 by a screw 19, so that movement of the part 18 by the finger causes an oscillatory movement of the lever 17 in a horizontal plane and about the point of pivotal connection to the member 16. Extending in a bell-crank manner from the end of lever 17 at its pivotal point is an arm 20 which is dropped downwardly as shown and passes through an elongated slot 21 in the end frame 13. An arm or pull rod 22 has a right-angled portion 23 thereof secured to the inner end of arm 20 by a screw 24, said arm 22 extending substantially parallel to the inner face of the end frame 13. This particular connection permits the vertical movement of arm 20 with respect to arm 22, to allow depression of the spacing lever 17, as hereafter described. If, however, it is not necessary to depress said lever, the arm 20 may be connected directly to the end of arm 22 without the interposition of the collar slide.

A pivotally mounted arm 25 has an enlarged circular portion 26 journalled about the shaft 12 and carries a lug 27 which is constantly urged downwardly and to the left around the shaft 12 by a spring 28, which latter is attached at 29 to the inner and bottom edge of the end frame 13.

A pawl 30 is pivotally mounted at 31 on the upper end of the arm 25, said pawl having a gear-engaging tooth 30*a* which is adapted to engage in the teeth of, and move, a gear 32, which latter is fastened to the shaft 12 of the platen 11. The arm 22 is secured to the pawl arm 30 at 33, it being noted that said point 33 is below the point 31 at which the arm 30 is connected to the pivoted rotatable arm 25.

A stop member 34, having a knurled finger engageable portion 35 extending through a slot 36 in the upper edge 37 of the end frame 13, is also journalled about the shaft 12. Said member 34 is slightly resilient to permit its movement from one end of the slot 36 to the other end thereof, it being noted that said slot 36 has a small partition or barrier 36*a* midway thereof, so that the member 34 may be positioned either in the space 36*b*, designated as "1" or in the portion 36*c*, designated as "2". The operator of the machine may, therefore, fix the finger piece 34 in either the space 36*b* or the space 36*c* and thereby obtain a proper line spacing of the paper when the lever 17 is operated, as will now be described.

The member 34 carries a stop lug 38 which extends at right-angles therefrom and stands in the path of the arm 25 as the same is moved to the right under the influence of the line spacing lever (see Figs. 7 and 8). A roller 39 is mounted on the end of a spring member 40 and bears against the inter-dental spaces of the gear 32 to insure an accurate and positive tooth-by-tooth movement of said gear 32. The member 40 is mounted at 41 on the inner face of the end frame 13.

Assume now that it is desired to space the platen step-by-step one space at a time. The member 34 carrying the stop lug 38 is set in position "1" as shown in Fig. 8—*a*. The lever 17 is moved to the right by pressure of the finger thereby rotating the same around the point 19 and causing the inner end of arm 20 to move to the right (see Figs. 7 and 8). This causes the arm 22 to likewise move to the right and pull the pawl-arm 30 around its pivotal connection 31 so that the tooth 30*a* engages one of the gear teeth of wheel 32. This particular movement is quite advantageous in that the pawl and platen-rotating gear wheel are positively engaged prior to a positive movement of the platen being initiated.

After the arm 30 has moved around its point of connection 31 to bring the tooth 30*a* into engagement with one of the teeth on the wheel 32, a further movement of said arm 22 swings the arm 25 around its journalled connection and carries said arm rearwardly until the stop 38 is encountered. The rotary movement of the platen is then positively stopped, whereafter a release of the finger from the lever 17 permits the spring 28 to pull the arm 25 in a counter-clockwise direction until the upper arm thereof contacts with the edge 37 of the frame 13.

A spring 42 is so mounted on the lug 16 that the lever 17 is constantly urged into nor-

mal retracted position or to the left. When, therefore, said lever 17 is released the spring 42 restores it to normal position, and in so doing moves the arm 20 to the left (Figs. 7 and 8), and causes the pawl-arm 30,—which is actuated by said arm 22,—to be further swung about its pivotal connection to withdraw the tooth 30*a* from the teeth of the wheel 32.

It will be noted that the angular movement of the platen 11 is predetermined by the number of teeth which the finger 30 takes as it is moved under the influence of arm 22 and the lever 17. The number of teeth taken by said pawl 30*a* is determined by the distance which said arm 25 may move until the stop 38 is encountered. Therefore, by setting said stop 38 at predetermined positions, the angular movement of the platen 11 may be varied to space the material being written upon any predetermined number of spaces.

In the form of my invention here illustrated, I have shown a mechanism for moving the platen either one or two line spaces, but do not wish to be limited to that construction, since the mechanism described may be adapted for more or less spaces according to the needs of the operator.

Referring to Fig. 8, I have shown in dotted lines the position of the member 34 and the stop 38 when it is desired to space the platen two lines by a single movement of the lever 17. In order to accomplish the same, the finger piece 35 is moved slightly to the right (see Fig. 8—*a*) and pushed backwardly into space 36*c*, at which time the member 34 will stand in the position in dotted lines in Fig. 8. Now when the lever 17 is moved, the arm 25 will be permitted to swing through twice the distance as was heretofore explained which will result in the tooth 30*a* moving the wheel 32 through an angular distance of two line spaces.

As I have before indicated, the line spacing elements heretofore described and combined, are peculiarly susceptible to association with a line space lever which may be collapsed if desired. While, as I have indicated, my particular lever does not require collapsing in order to fulfill the requirements of minimum volume occupying space, nevertheless, the combination of elements is such that the lever may be mounted for collapsing if desired.

Referring to Figs. 4 and 5, I have illustrated the manner in which the above described combination may be constructed to permit such collapsing. It is only necessary to provide a rotary mounting for the stud 15, the same being accomplished by making said stud 15 of hollow cylindrical formation and slipping it over a pin 15*a* protruding from the outside of the frame 13. The cylindrical member 15 is provided with a lug 15*b* on the right side thereof and extending from the inside of the end frame 13, so that a spring 15*c* secured at 15*d* will restore the member 15 to a position in which the lug 16 is vertical should said member 15 be rotarily moved away from said latter position and then released.

As shown in Fig. 5, the slot 21 is made deeper at the end 21*a* to allow the inner lower portion of the arm 20 to move downwardly when the lever 17 and the member 16 are rotated about the pin 15*a*. In Fig. 3, I have illustrated the manner in which the arm 22 may be secured to the inner end of the arm 20 to permit of this movement. As shown in this figure, the right-hand end of the arm 22 is of U-shape formation comprising a yoke in which is supported a pin or rod 22*a*, the end of arm 20 being mounted on said pin 22*a* so that as said arm 20 is moved downwardly, it slides along said pin 22*a* to provide for the collapsing of lever 17.

Assuming that the latter embodiment of my invention is employed as shown in Figs. 4 and 5, the placing of a cover 45 over the machine may move the lever 17 downwardly to collapse the same. Upon the removal of said cover 45, the spring 15*c* rotates the cylindrical hollow member 15 to a predetermined position so that the line spacing lever mounting stud 16 is in vertical position.

As before indicated, it is not necessary to provide such U-shaped connection nor said cut-out end of the slot 21 if the lever 17 is not to be depressed.

In Figs. 9 and 10 I have illustrated another form of line spacing lever constructed in accordance with my invention and which is adaptable to operate with the spacing elements heretofore described and is collapsible if desired. The elements of this modified form are very much the same as those heretofore described, with the difference that the lever 17 is provided with a vertical extending finger piece 46. The lever 17 in this latter form is pivotally mounted on the stud 16 and is returned to normal position by a spring as was described in the first illustrated embodiment of my invention. The said stud 16 is securely mounted on a composite member 47 which is journalled in the end frame 13 and which has lug 48 extending therefrom through said frame, to which latter is attached a restoring spring 49 which is secured to a member 50 also mounted in the frame 13.

While I have described but two embodiments of my invention, it is to be understood that the elements, particularly with respect to the line spacing combination herein described, are adaptable for use in typewriting machines of different kinds without involving a departure from the spirit of my invention, and I desire, therefore, that my said invention be limited only by the scope of the appended claims and the prior art.

I claim:

1. In a typewriting machine, a platen, and line spacing mechanism including a line-space lever, a pull rod attached to the latter, said lever comprising one arm of a bell crank the other arm of which is attached to said pull rod, a pivotally mounted pawl-supporting arm, a pawl pivotally mounted upon the latter and connected to said pull rod, and a connection between said pull arm and said bell crank arm whereby relative vertical movement therebetween occurs upon depression of said lever.

2. In a typewriting machine, carriage end frames, a shaft mounted in said frames, a platen carried on said shaft, mechanism for line-spacing said platen including a pivoted lever having a finger engageable portion and bell crank portion extending into proximity to the platen end, a pull rod attached to said bell crank portion, an arm journalled about said shaft, a pawl pivotally mounted on said arm and connected to said pull rod, a circular ratchet on said platen engageable by said pawl to rotate the platen, and adjustable stop means for engaging said arm to permit the rotation of said platen a predetermined number of spaces when said lever is oscillated.

3. In a typewriting machine, carriage end frames, a shaft mounted in said frames, a platen carried on said shaft, mechanism for line-spacing said platen including a pivoted lever having a finger engageable portion and bell crank portion extending into proximity to the platen end, a pull rod attached to said bell crank portion, an arm journalled about said shaft, a pawl pivotally mounted on said arm and connected to said pull rod, a circular ratchet on said platen engageable by said pawl to rotate the platen, and adjustable stop means comprising a stop arm pivotally mounted on one of the end frames for engaging said arm to permit the rotation of said platen a predetermined number of spaces when said lever is oscillated.

4. In a typewriting machine, carriage end frames, a shaft mounted in said frames, a platen carried on said shaft, mechanism for line-spacing said platen including a pivoted lever having a finger engageable portion and bell crank portion extending into proximity to the platen end, a pull rod attached to said bell crank portion, an arm journalled about said shaft, a pawl pivotally mounted on said arm and connected to said pull rod, a circular ratchet on said platen engageable by said pawl to rotate the platen, and adjustable stop means comprising an arm pivotally mounted about said shaft and provided with means to stop said pawl-supporting arm after a predetermined rotation of said platen.

5. In a typewriting machine, carriage end frames, a shaft mounted in said frames, a platen carried on said shaft, mechanism for line-spacing said platen including a pivoted lever having a finger engageable portion and bell crank portion extending into proximity to the platen end, a pull rod attached to said bell crank portion, an arm journalled about said shaft, a pawl pivotally mounted on said arm and connected to said pull rod, a circular ratchet on said platen and engageable by said pawl to rotate the platen, and an adjustable stop arm, said stop arm extending through a portion of the end frame and said frame being provided with positioning means to permit the variable placement of said stop arm, said arm being movable transversely of the platen to occupy a selected position.

6. In a typewriting machine, a carriage end frames, a shaft mounted in said frames, a platen carried on said shaft, mechanism for line-spacing said platen including a pivoted lever having a finger engageable portion and bell crank portion extending into proximity to the platen end, a pull rod attached to said bell crank portion, an arm journalled about said shaft, a pawl pivotally mounted on said arm and connected to said pull rod, a circular ratchet on said platen and engageable by said pawl to rotate the platen, and an adjustable stop arm, said stop arm extending through a portion of the end frame and said frame being provided with a plurality of recesses in which said arm may be seated, said arm being slightly resilient to permit its placement in a selected recess to thereby stop said pawl arm and permit a predetermined spaced rotation of said platen.

7. In a typewriting machine, a platen, end frames supporting said platen, a stud projecting from one of said end frames, a lever support pivoted on said stud to swing in a vertical plane, and a line-space lever pivotally mounted on said support.

8. In a typewriting machine, a platen, end frames supporting said platen, a stud projecting from one of said end frames, a line space lever mounted on said stud and connected to said platen to line space the latter, said lever being so mounted that it is depressible, and means associated with said stud for automatically restoring said lever after either a line space movement or a depression thereof.

9. In a typewriting machine, a platen, end frames supporting said platen, a stud supported by one of said end frames, a line-space lever mounted on said stud to be swung in a horizontal line-spacing plane and in a vertical plane for depression, and a pull rod operably associating said lever and platen to rotate said platen, said attachment being such that the aforesaid depression of said lever takes place without affecting said rod.

10. In a typewriting machine, a platen, end frames supporting the same, a supporting member pivotally mounted on one end

frame, a line space lever mounted on said supporting member to have pivotal movement with respect thereto and to be depressible by pivotal movement therewith, said lever comprising a bell crank, one arm of which is finger-engageable, a pull rod attached to the other arm of said bell crank, said latter arm passing through an aperture in said end frame and being attached to said pull rod by means permitting relative vertical movement therebetween when said lever is depressed.

In witness whereof, I have hereunto subscribed my name.

MAX GARBELL.