Nov. 20, 1928. 1,691,922

W. A. DOBSON

TYPEWRITING MACHINE

Filed Oct. 8, 1925

Fig. 1.

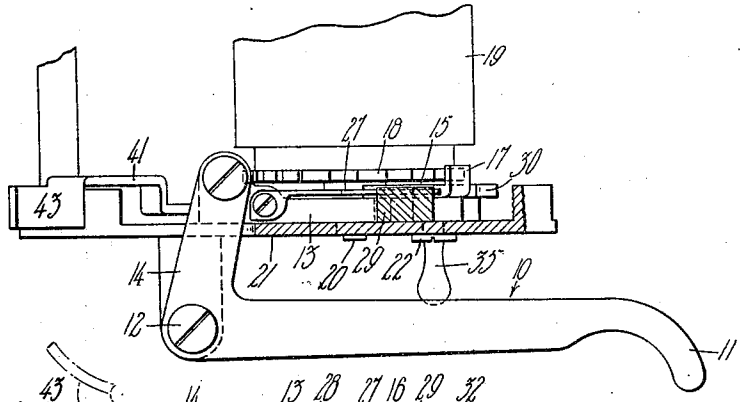


Fig. 2.

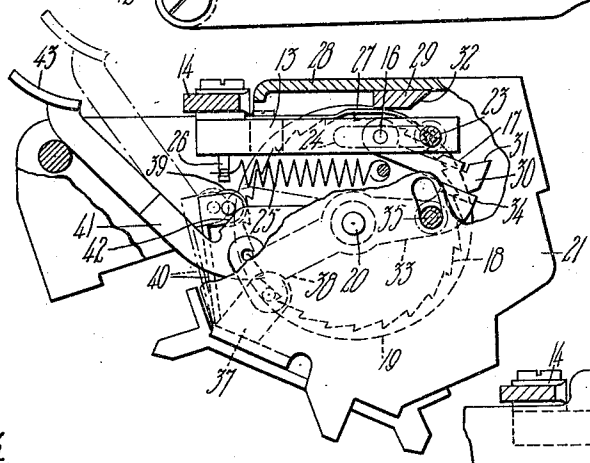


Fig. 3.

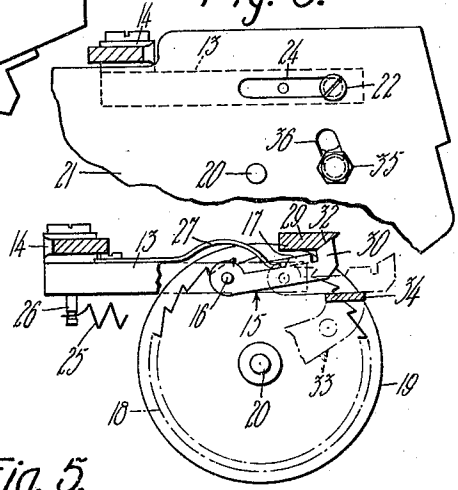


Fig. 4.

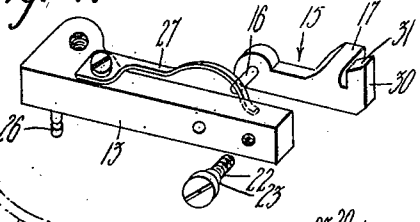


Fig. 5.

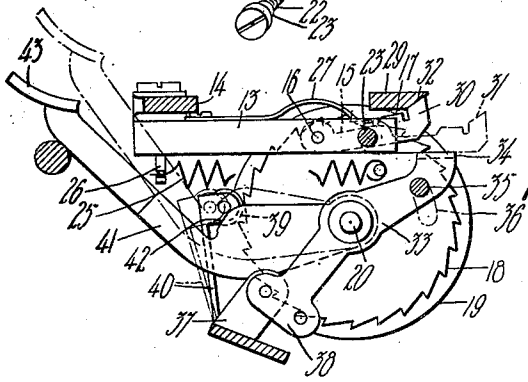


Fig. 6.

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UNITED STATES PATENT OFFICE.

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TYPEWRITING MACHINE.

Application filed October 8, 1925. Serial No. 61,191.

This invention relates to line-spacing mechanisms for typewriting machines, and has particular reference to the provision of such mechanisms, of such simple and inexpensive construction and of such lightness, compactness and durability as to be available for portable typewriters.

In the Underwood portable typewriting machine, a platen is rotatably supported by the usual end plates of a shiftable carriage, and a line-spacing wheel. A rearwardly-movable slide is operated by a carriage-return lever, and carries a pawl which drives the ratchet-wheel and platen.

A feature of the invention is the provision of guiding means for the slide, which includes a bearing-member carried by the slide and disposed within a rearwardly-extending slot in the adjacent end plate of the carriage. The length of the slot is such as to limit the movement of the slide.

Another feature is the provision of a regulator, which preferably includes an arm pivoted upon the platen-shaft, and having adjacent its extremity a shelf which supports the pivoted pawl, said arm being adjustable so as to direct the pawl to engagement with different teeth of the ratchet-wheel. A finger-piece is carried by the regulator and extends through the end plate of the carriage, whereby adjustments may be easily made, and a suitable detent is provided for holding the regulator in its adjusted positions.

A releasable roller-detent may engage the teeth of the ratchet-wheel to justify the platen. A releasing cam is operated by a finger-piece. Another feature of the invention is the provision of means whereby the roller-detent will be automatically thrown into engagement with the ratchet-wheel when the line-space lever is operated, so that in the event that the operator should neglect to return the detent to its normal position upon reaching the end of a line, the proper line-spacing may be insured.

Other features and advantages will hereinafter appear.

In the accompanying drawings,

Figure 1 is a fragmentary top plan view of a typewriting machine embodying the invention, certain portions thereof being broken away and shown in section.

Figure 2 is an end elevation thereof, with parts broken away and shown in section, and illustrating the regulator in position for double spacing.

Figure 3 is a fragmentary end elevation, showing clearly the guiding means for the line-space slide.

Figure 4 is a detail perspective view of the line-space slide and its cooperating pawl.

Figure 5 is a transverse sectional view, taken just inside of the end plate, and illustrating the parts in adjustment for single-space operation.

Figure 6 is a fragmentary view similar to Figure 5, and illustrating more clearly the means for maintaining engagement of the pawl with the ratchet-wheel.

A line-space lever 10, having a suitable finger-engaging portion 11, may be swung rightwardly about its pivot 12, to operate a line-space slide 13, attached to an arm 14 of the line-space lever. The line-space slide 13 carries a pawl 15, pivoted at 16 to the slide, and having a suitable offset tooth 17 for engaging the teeth of a ratchet-wheel 18. The ratchet-wheel 18 is mounted with a platen 19 for rotation on a shaft 20, which is journaled in the usual pair of end plates 21 of a shiftable platen-frame, only one of the end plates being shown in the drawings. In order to guide the line-space slide 13 in its movement, a shouldered stud or screw 22 extends from the slide 13 and has a bearing-portion 23 which is disposed in a rearwardly-extending slot 24 of the adjacent end plate, the proportions of said slot being such as to properly limit the movement of the slide. A spring 25, having one of its ends anchored to the end plate 21, and its other end secured to a depending post 26 of the slide 13, tends to hold the slide and its associated parts in normal position, as illustrated in Figure 2.

In order that the pawl 15 will always maintain proper engagement with the ratchet-wheel 18, the slide 13 carries a spring 27, having a curved end, as best shown in Figure 4, which presses the pawl 15 downwardly about its pivot 16. A top flange 28 of the end plate 21 supports an abutment 29, against which the spring 27 is pressed as the line-space lever 10 is operated. In this manner, the pressure of the spring 27 against the pawl is positively maintained at the beginning of the line-space stroke, thereby overcoming any tendency of

the platen to overthrow. As the rearward limit of movement of the slide 13 is reached, the spring 27 becomes disengaged from its contact with the abutment 29, and, at this point, an overthrow-lock 30, integral with the pawl 15, and having an angular upper surface 31, engages with the angular surface 32 of the abutment 29, whereby rotation of the platen and ratchet will be effectively arrested at the end of the line-space stroke.

In order to vary the line-spacing of the platen, I provide a regulator which may preferably include an arm 33, pivoted upon the platen-shaft 20, and having adjacent its extremity a table 34, which supports the pawl 15, limiting its downward movement about the pivot 16. A suitable finger-piece 35 may be operated to adjust the arm 33, said finger-piece extending through an arcuate slot 36 in the end plate 21. A yieldable detent 37 engages an oppositely-disposed arm 38 of the regulator to hold it in adjusted positions for either single or double line-spacing. When the table 34 is in its lowest position, as shown in Figure 2, the platen will be double spaced by actuation of the lever 10; and, when the table 34 is in its upper position, as shown in Figures 5 and 6, single spacing may be obtained.

A roller-detent 39 normally engages the teeth of the ratchet 18 to insure proper line-spaced position of the platen, said roller-detent being supported upon a resilient arm 40, adjacent the detent 37. A lever 41, having a cam-surface 42, engages the pivotal support of the roller-detent 39, as best shown in Figures 2 and 5, whereby the detent may be released from engagement with the ratchet-wheel 18, to facilitate fractional line-spacing. A suitable finger-gripping portion 43 is provided on the upper extremity of the lever 41, and may be drawn forwardly to the position shown in dot-and-dash lines in the drawings. In the event that the operator should release the detent 39 from engagement with the ratchet-wheel, subsequent operation of the line-space lever 10 will automatically return the detent 39 to its normal position by virtue of the fact that the lever 41 is disposed in the path of movement of the line-space slide 13. This feature will be more clearly understood from a study of Figure 5 of the drawings, wherein the interference between the line-space slide 13 and the lever 41 is clearly illustrated.

It will be seen that to solve the problem of compactness of the line-space lever with its pawl and to secure efficiency, the lever has a long arm which extends forwardly and backwardly alongside of the end of the carriage and close thereto, with a short arm extending in from said lever through the end of the carriage, this short arm 14 swinging backwardly when the long arm-lever or the line-space lever returns the carriage. This backward swing of the lever 14 is communicated to the line-spacing pawl 17 by an improved train, since it would be impracticable to mount said pawl directly upon the arm 14 without sacrificing some of the work that the pawl 17 must do. In order to secure efficiency and compactness it is mounted upon a slide 13 which is guided by the end frame 21 of the carriage, and which lies against the inner surface of the end plate 21 of the carriage, and is pivotally connected at its rear end to the arm 14, and is guided at its front end by its stud-screw 22 in the slot 24 in the end of the carriage. The pawl 17 is mounted on this slide between the slide and line-space wheel 18. The line-space wheel 18 is pocketed just inside of the end 21 of the carriage-frame, that is, just inside of the flanged or overhanging portion of said end, while the lever 11 lies outside of the said end 21 only far enough to allow play of the lever. The distance from wheel 18 to the lever 11 is very small, and answers the requirement of compactness in this kind of machine, while the lever 11 turns freely when operated.

This provision allows for the beveled stop 29 to be fixed upon the inner wall of the frame 21 within the overhang or flange, without making the machine any larger, said stop 29 overhangs the slide 13 and juts into the path of the stop-tooth 30 on the pawl, which lies close alongside the slide 13, see Figure 1. Compactness is further maintained by arranging the line-space regulator 33 in the form of a lever loosely pivoted for compactness on a boss on the platen-end, through which extends the platen-axle 20, said regulator 33 pocketed under the slide 13, so as not to add anything whatsoever to the length of the carriage, and having a finger-piece 35 projecting out through a slot 36 in the end of the carriage and falling short of the lever 11, so as not to increase the exterior length of the carriage; this line-space lever 33 formed with a lip 34 projecting under the pawl 30, and also below the slide 13. Thus the parts 13 and 33 lie one above another in the same plane and within the shell or pocket 21 which constitutes the end of the carriage. Also under the slide 13, and therefore not occupying any room and not extending the carriage, is the detent-release lever 41, 43, which is also provided on the boss on the platen-frame end. If all of the parts 13, 15, 33, 34 and 41, etc., were to be removed from the machine, the carriage could be no shorter. While the lever 11 lies outside of the carriage-frame, still the whole length of the carriage, including said lever, is much shorter than is customary.

The use of a very wide sheet of paper is permitted, extending, in fact, far enough to almost touch the inner edge of this end 21 of the platen-frame, without fouling the mechanism. Moreover all the moving parts,

owing to the compactness of arrangement, are made short and light and efficient.

The pawl 15, which normally lies outside of the teeth of the ratchet-wheel 18, is carried positively into mesh with the teeth of the ratchet-wheel at the operation of the line-space lever 11. Spring 27 normally is under pressure at its free end, being fastened at its rear end to the slide. The free front end of the spring 27 normally stands under the lug 29, and is pressed down thereby, so as to force the pawl 15 downwardly. Hence, at the operation of the lever 11, the slide 13 and the spring 27 and the pawl 15 move rearwardly substantially as a unit, and the spring forces the pawl to enter a notch in the toothed wheel 18, and to rotate the wheel. The position of the spring at the end of its platen-rotating stroke is seen at Figure 6. The bulge in the spring 27 is to enable it to be carried down by the lug 29, which is at a high elevation. The bulge simply carries the spring up far enough to reach said lug 29. It makes little difference whether the spring 27 is or is not pressed down at the Figure 6 position, because the work of rotating the platen has been finished.

This invention constitutes a line-spacing unit manufactured separately from the remainder of the carriage. All parts 14, 13, 15, 33, 40, 41, 37, 25, 34, 35, etc., are assembled in final positions upon the plate 21, thus forming a complete manufactured unit. This unit can then be placed in position upon the carriage, the hole in the plate sliding upon the end 20 of the platen-axle, and the hole at the left-hand end of the plate 21 fitting upon the cylindrical rear bar which forms a part of the carriage-frame, and is seen at Figures 1 and 2. This plate 21 may be detached from the machine and examined and cleaned and repaired as a unit, and then replaced as a unit upon the carriage. Portable typewriters are dropped on the floor, are thrown about by the baggageman, they are roughly handled by children and by amateur operators, and they are constantly in need of repair and replacement of parts. The combining of all these things into the form of a unit is an element that is of substantial importance in making a portable typewriting machine business successful.

The requirements of a portable machine are compactness, cheapness, lightness, acessibility, simplicity and durability. The dished part of the carriage-frame forms a pocket-housing for a compactly arranged line-spacing mechanism. The handle swings in a plane close above the top of the side-plate. All form one unit. It will be noted that the whole pawl-actuating mechanism is compactly and accessibly arranged at the top portion of the side-plate. This also gives, according to another feature, good opportunity for co-operation between the line-space lever and a detent-release lever which is usually located at the rear, with suitable shape of the elements; the operating stroke of the line-spacing slide-bar will directly throw the detent-release lever backward to restore the detent to operative position upon the line-space wheel, in case the operator neglected to individually restore the detent-roller after positioning a work-sheet.

The top arrangement of the pawl-actuating mechanism also gives opportunity for compactly housing the above-mentioned variable line-spacing member (without additional space), the handle of which may be easily located and conveniently operated in upward and downward movement.

The pawl-actuating mechanism is compact, simple and mechanically well equalized, to minimize stresses and operating forces to be applied.

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 rotatable platen, of a line-space wheel rotatable therewith, means to actuate the line-space wheel to line-space the platen, a detent engaging the line-space wheel to prevent overthrow, and means to disengage the detent, said disengaging means being automatically releasable upon actuation of the line-spacing means.

2. In a typewriting machine, the combination with a rotatable platen, of a line-space wheel rotatable therewith, means to actuate the line-space wheel to line-space the platen, a detent engaging the line-space wheel to prevent overthrow, and means to disengage the detent, said disengaging means being disposed in the path of movement of and operable by the line-space actuating means.

3. In a typewriting machine, the combination with a rotatable platen, of a line-space wheel rotatable therewith, a carriage-return lever, a driving connection between the carriage-return lever and the line-space wheel, means normally engaging the line-space wheel to prevent overthrow of the platen, and means to disengage the last-mentioned means, said disengaging means being releasable by actuation of the carriage-return lever.

4. In a typewriting machine, the combination with a rotatable platen, of a ratchet-wheel rotatable therewith, a line-spacing lever, a driving connection between the line-spacing lever and the ratchet-wheel, a yieldable detent engaging the ratchet-wheel to prevent overthrow of the platen, and detent-releasing means disposed in the path of movement of the line-spacing lever.

5. In a typewriting machine, the combinatin with a rotatable platen and a carriage therefor, of a line-space ratchet rotatable with the platen, a line-space lever pivoted on

the carriage, a slide movable transversely of the platen-axis and positively connected to the line-space lever, a pawl pivoted on the slide to engage and ride upwardly on the rotating ratchet, and means mounted on the carriage above the slide and co-operative with the upward movement of the pawl to effect a wedging movement of the pawl to prevent overthrow of the platen.

6. In a typewriting machine, the combination with a rotatable platen and a carriage therefor, of a line-space ratchet rotatable with the platen, a line-space lever pivoted on the carriage, means including a pawl for transmitting motion from the line-space lever to the ratchet, yieldable means for pressing the pawl into engagement with the ratchet, and an abutment engaging the yieldable means and flexing the same against the pawl at the beginning of the line-space stroke.

7. In a typewriting machine, the combination with a rotatable platen and a carriage therefor, of a line-space ratchet rotatable with the platen, a line-space lever pivoted on the carriage, means including a pawl for transmitting motion from the line-space lever to the ratchet, yieldable means for pressing the pawl into engagement with the ratchet, and an abutment to limit the line-space movement of the pawl, said abutment engaging the yieldable means to increase its pressure on the pawl at the forward limit of movement.

8. In a typewriting machine, the combination with a rotatable platen and a carriage therefor, of a line-space ratchet rotatable with the platen, a line-space lever pivoted on the carriage, a slide movable transversely of the platen-axis and operable by the line-space lever, a pawl pivoted on the slide to engage the ratchet, a stop to limit the movement of said pawl, and a spring carried by the slide and engaging the pawl to press the pawl against the ratchet, said spring being actuated by the stop to exert a greater pressure on the pawl at the beginning of the line-space stroke.

9. In a typewriting machine, the combination with a rotatable platen and a carriage therefor, of a line-space ratchet rotatable with the platen, a line-space lever pivoted on the carriage, a slide movable transversely of the platen-axis and operable by the line-space lever, a pawl pivoted on the slide to engage the ratchet, a stop to limit the movement of said pawl, a spring carried by the slide and engaging the pawl to press the pawl against the ratchet, said spring being actuated by the stop to exert a greater pressure on the pawl at the beginning of the line-space stroke, a detent engaging the ratchet to justify the platen, and means including a cam for disengaging the detent from the ratchet, said means being releasable by operation of the line-space lever.

10. In a typewriting machine, the combination with a platen and a platen-carriage, of a line-space ratchet rotatable with the platen, a carriage-return lever, a rearwardly-movable slide mounted on the carriage and operable by the carriage-return lever, a pawl pivoted on the slide, a spring carried by the slide and pressing the pawl against the ratchet, and means to increase the pressure of the spring on the pawl near the beginning of the line-space stroke and finally to arrest the movement of the pawl at the end of the stroke.

11. In a typewriting machine, the combination with a revoluble platen and a ratchet-wheel rotatable therewith, of means for actuating the ratchet-wheel to line-space the platen, a detent normally engaging the ratchet-wheel to prevent overthrow, and a cam-lever for manually disengaging the detent to allow a free rotation of the platen, the arrangement being such that when the detent is disengaged, actuation of the line-space means will operate the cam-lever to restore said detent to engaging position.

12. In a typewriting machine having a revoluble platen and a carriage therefor, the combination with a ratchet-wheel rotatable with said platen, of a line-space lever pivoted to one end of said carriage, means, including a slide and a pawl pivoted thereto, operated by the line-space lever to actuate the ratchet-wheel, a leaf-spring mounted on said slide and bearing down upon the pawl for urging the latter against the ratchet-wheel, and an abutment mounted on the carriage above the pawl both for pressing the leaf-pring against the pawl at the beginning of the line-space movement and for limiting the travel of the pawl at the end of said movement.

13. In a portable typewriting machine, the combination of a carriage, a platen mounted thereon and having a line-space wheel, said carriage having an end, and the following train of instrumentalities all mounted on said end to form therewith a manufacturing unit, viz., a line-space handle in the form of a bell-crank, a spring-returned slide connected to the short arm of said bell-crank, a pawl driven by said slide, a spring-pressed detent to engage the line-space wheel, a releasing device for said detent, and a line-space regulator pivoted around the platen-axle between said carriage end and the line-space wheel.

14. A machine constructed according to claim 13, in which the slide lies alongside of the inner face of the carriage end, and is pivoted at its rear end to the short arm of the bell-crank, and is supported at its forward end in a slot in the end of the carriage, the pawl being pivoted upon the slide, a lug upon the carriage frame end engaging the pawl tooth to lock the platen against overthrow, and a line-space regulating lever having a lip on which the pawl normally rests out of engagement with the line-space wheel, said line-space regulating lever having a handle pro-

jecting through the platen frame end, said regulating lever occupying the space directly under the slide for compactness.

15. A machine constructed according to claim 13, in which the slide lies alongside of the inner face of the carriage end, and is pivoted at its rear end to the short arm of the bell-crank, and is supported at its forward end in a slot in the end of the carriage, the pawl being pivoted upon the slide, a lug upon the carriage frame end engaging the pawl tooth to lock the platen against overthrow, a line-space regulating lever having a lip on which the pawl normally rests out of engagement with the line-space wheel, said line-space regulating lever having a handle projecting through the platen frame end, said regulating lever occupying the space directly under the slide for compactness, and a platen-detent release also lying in the space under the slide, and having a shoulder to engage the platen-detent to release it.

16. A machine constructed according to claim 13, in which the spring normally is pressed down by a lug fixed upon the platen frame end to press upon the pawl to insure the engagement of the latter with a notch in the line-space wheel at the operation of the line-space handle.

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