W. F. HELMOND.

TYPEWRITING MACHINE.

APPLICATION FILED APR. 22, 1919.

1,360,747. Patented Nov. 30, 1920.

Fig. 1.

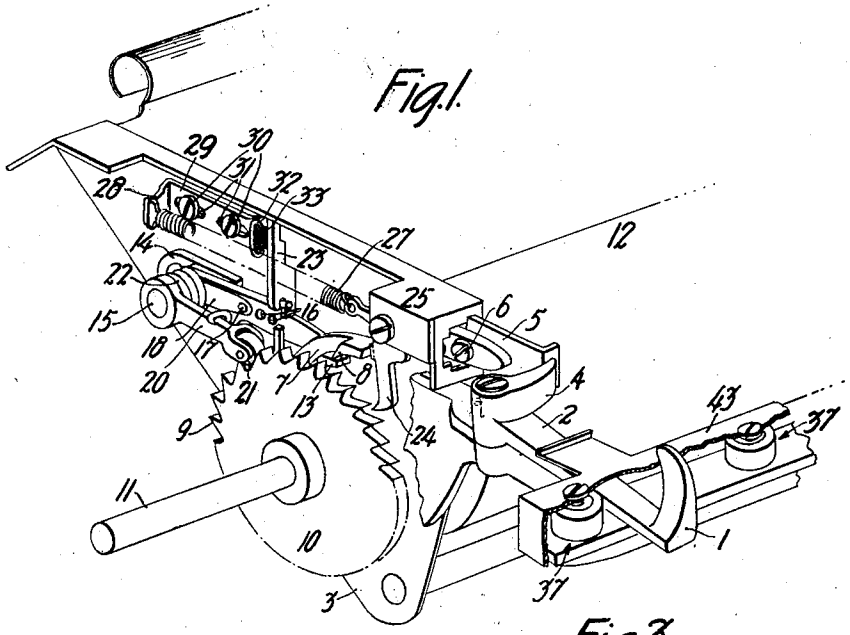


Fig. 2.

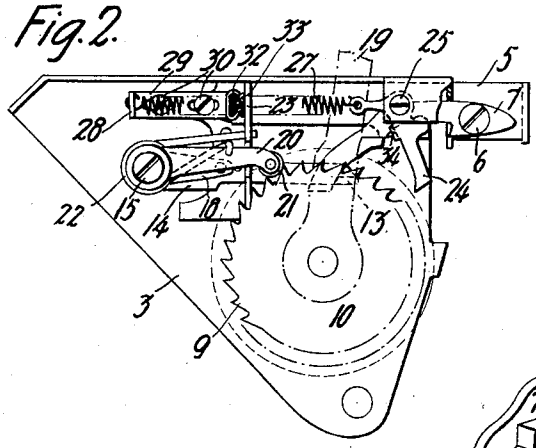


Fig. 3.

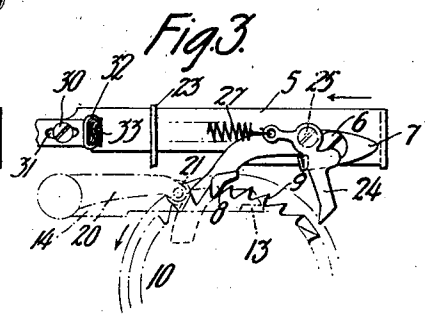


Fig. 4.

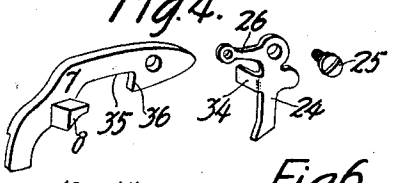


Fig. 5.

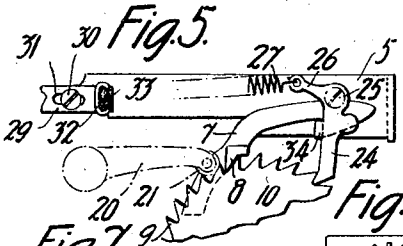


Fig. 6.

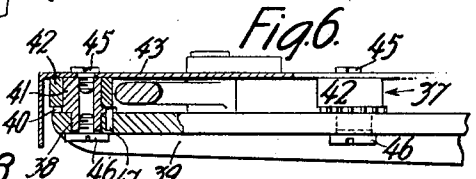


Fig. 7.

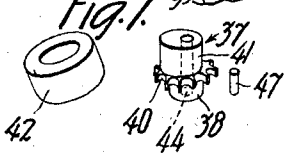
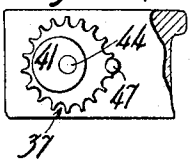


Fig. 8.



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UNITED STATES PATENT OFFICE.

WILLIAM F. HELMOND, OF HARTFORD, CONNECTICUT, ASSIGNOR TO UNDERWOOD TYPEWRITER COMPANY, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

TYPEWRITING-MACHINE.

1,360,747. Specification of Letters Patent. **Patented Nov. 30, 1920.**

Application filed April 22, 1919. Serial No. 291,895.

To all whom it may concern:

Be it known that I, WILLIAM F. HELMOND, a citizen of the United States, residing in Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Typewriting-Machines, of which the following is a specification.

This invention relates to typewriting machines, and more particularly to the line-spacing mechanism thereof, one of its objects being to provide an improved mechanism, of a simple and compact form, suitable for use with machines of existing types.

The invention is herein illustrated as applied to an Underwood typewriting machine, but is in no manner limited in its application to a machine of any particular design.

Heretofore it has been customary to have a line-space detent engage the ratchet-wheel at a point distant from that assumed by the ratchet-wheel-actuating pawl at the end of its driving stroke. As a result of such arrangement, if a ratchet wheel having a different number of teeth were substituted for that previously in use, it was found necessary to change the detent and other parts, in order to get satisfactory results. Assume, for example, that a 33-toothed ratchet was in use, and the detent was positioned at a distance of 13 teeth from the tooth of the actuating pawl. If, then, a 34-toothed ratchet of the same size were substituted for the 33-toothed ratchet, the detent would not be properly positioned for use with the substituted ratchet. Obviously, a tooth-space of the 34-toothed wheel is very little shorter than that of a 33-toothed wheel, but the position of the 13th tooth of the 34-toothed wheel would differ from that of the 13th tooth of the 33-toothed wheel by a distance equal to thirteen times the difference between the tooth-spaces on the two wheels. The amount of the discrepancy would vary with the difference in the number of teeth on the ratchet-wheels and the distance of the effective end of the detent from the tooth of the actuating pawl.

In the present construction, the aforesaid difficulty is avoided, by so mounting the line-space detent that it will engage the notch of the ratchet-wheel immediately in advance of the notch occupied by the actuating pawl at the end of its driving stroke. Moreover, by virtue of the arrangement of this detent, with reference to the ratchet-wheel, and the balanced spring used to press the detent against the ratchet-wheel, the pressure on the pivot or fulcrum of the detent is reduced, and the movement of the detent will depend more directly on the elasticity of the spring.

Provision is also made of an overthrow-pawl or stop, mounted on a fixed pivot, and normally in an ineffective position. This pawl is so related to the actuating pawl that it will be engaged thereby and moved into engagement with the ratchet-wheel at the end of the driving stroke of the actuating pawl. As a consequence of the proximity of the overthrow-pawl to and its actuation by the actuating pawl, the same overthrow-pawl is adapted for use with ratchet-wheels having different numbers of teeth.

The overthrow-stop or pawl may be normally held in ineffective position by a spring, connected thereto at one end, which also serves to return the actuating slide to normal position. To this end, the spring may be attached at its other end to a plate adjustably secured on the slide.

The plate, adjustably secured on the slide, is also provided with a cushion or buffer, preferably of leather, adapted to engage a stop at the end of the return movement of the slide. This construction avoids noise upon stoppage of the slide in its return movement, and, by virtue of the adjusting means provided, the home or normal position of the slide may be fixed as desired.

It has also been found desirable to provide means for limiting the movement of the manually-operable lever for actuating the slide. For this purpose, provision may be made on each side of the manually-operable lever of a device comprising a cylindrical member seated in a corresponding bearing in a bar underlying the lever, a toothed wheel coaxial with, and fixedly secured to, said cylindrical portion, a second cylindrical member eccentrically fixed on said toothed wheel, and a collar of resilient material, preferably of rubber, embracing the eccentrically-mounted cylindrical member. The aforesaid device may be turned to different positions, and there held against rotation by means of a pin seated in the supporting bar, and engaging between successive teeth of the

toothed wheel. The adjusting devices may also serve as spacers between the supporting bar and a cover or trim-plate overlying the manually-operable lever.

Other features and advantages will hereinafter appear.

In the accompanying drawings,

Figure 1 is a fragmentary, perspective view, with parts broken away, of the platen-frame of an Underwood machine, with my invention applied thereto.

Fig. 2 is a side elevation of a portion of the mechanism shown in Fig. 1, showing the mechanism set for a 3-tooth movement of the platen.

Fig. 3 is a view, similar to Fig. 2, but with the parts in different positions, showing the actuating pawl near the end of its stroke and on the point of engaging with the overthrow-pawl.

Fig. 4 is a perspective view, showing the actuating pawl, the overthrow-pawl, and the screw on which the overthrow-pawl is supported, removed from the rest of the mechanism.

Fig. 5 is a side view, similar to Fig. 2, showing the position of the parts at the end of the driving stroke of the actuating pawl.

Fig. 6 is a front view, partly in section, of the line-space lever and the adjustable stops.

Fig. 7 is a view, showing, in separated relation, the elements of one of the adjusting devices.

Fig. 8 is a plan view, showing one of the adjustable stops in position, the cover-plate being removed.

In order to effect a line-space movement of a work-sheet in use, finger-piece 1, mounted on a lever 2, pivoted on the platen frame 3, is moved to the right, and the corresponding movement of lever 2 is transmitted by means of an arm 4, forming a part thereof, to a slide 5 mounted in the platen frame. Pivoted at 6 on slide 5 is an actuating pawl 7 having a tooth 8 adapted to engage teeth 9 of a ratchet-wheel 10 mounted on a shaft 11 having suitable bearings in said platen frame 3, and carrying a rotatable platen 12, which serves to support the work-sheet for engagement by the types.

The extent of movement of the ratchet-wheel 10, as a result of engagement of tooth 8 with the ratchet-teeth 9, is determined by means of a trip or shelf 13 on which the actuating pawl 7 rests. Said shelf 13 is carried by the usual slide 14 having a slotted portion embracing a pin 15, and said slide 14 is provided with the usual recesses 16 adapted to be engaged by a suitably shaped projection 17 carried by a resilient detent member 18. At its forward end slide 14 may be pivoted to a lever 19 by which the position of shelf 13 may be adjusted.

For the purpose of holding said ratchet-wheel 10 in proper line-space position, when not under the control of the actuating pawl 7, provision is made of a detent lever 20 having a yoke at its forward end in which is mounted a roll 21 adapted to engage in the notches between successive teeth of the ratchet-wheel 10. Said detent lever is mounted on said pin 15, and is spring-pressed to hold roll 21 in engagement with the ratchet-wheel by means of a spring 22 coiled around said pin 15 and having an upper arm engaging a stop 23 on the platen-frame, and a lower arm hooked over said detent lever 20. This arrangement of the spring 22 obviates unnecessary pressure or friction on pin 15, and serves to make the movement of the detent depend more directly on the elasticity of the spring than with the springs previously used. It will be seen that detent lever 20 extends along a line substantially tangential to said ratchet-wheel 10.

Much trouble has been experienced in the past with overthrow of the ratchet-wheel as a result of quick movements of the line-space lever. To guard against such action, provision is made in the present construction of an overthrow-pawl or stop 24 pivotally mounted on the platen-frame by means of a screw 25. Said overthrow-pawl is provided with an arm 26 out of alinement with the main portion of said pawl, and to this arm is attached a spring 27, by means of which the overthrow-pawl is normally held in ineffective position. At the other end of said spring 27 it is connected to an ear 28 projecting from a plate 29 adjustably secured to slide 5 by means of screws 30 extending through slots 31 in plate 29. It will be seen that spring 27 serves to restore slide 5 and consequently lever 2 to normal position, and to normally hold overthrow-pawl 24 in ineffective position. At its forward end, plate 29 is provided with a holder 32, in which is supported a cushion or buffer 33 of suitable resilient material, preferably leather, which is adapted to engage with stop 23 on the platen-frame. It will be seen that unnecessary noise is avoided by the use of said cushion, and that as a result of the adjustable mounting of plate 29 on slide 5, the forward normal position of said slide may be determined.

Overthrow-pawl 24 is also provided with an offset lug or ear 34, normally lying in a recess 35 in the lower edge of actuating pawl 7. At one end of said recess 35 is a shoulder 36, which, upon driving movement of the actuating pawl 7, will engage lug 34 when the actuating pawl approaches the forward end of its driving movement and move overthrow-pawl 24 into the position shown in Fig. 5. This structure is also adapted for use with ratchet-wheels of different numbers of teeth due to the location of the overthrow-pawl in proximity to the

actuating pawl, and also to the fact that the overthrow-pawl is thrown into effective position at the end of the driving stroke of actuating pawl 7.

In order to obtain movement of lever 2 in accordance with that of the other parts, provision is made of adjustable stop devices located on opposite sides of said lever. These devices are designated generally by 37, and each comprises a cylindrical portion 38 bearing in a suitable opening in bar 39, a toothed wheel 40 fixedly secured to portion 38 and lying on the upper surface of bar 39, said parts 38 and 40 being coaxial, and a cylindrical member 41 fixed in eccentric position on wheel 40. Mounted on cylindrical members 41 are collars 42 of resilient material, preferably rubber, with which said lever 2 engages. Members 38, 40 and 41 may be formed integrally, or separately and secured together in any suitable manner. Members 40 and 41 may also serve as spacers for the cover or trim-plate 43. In order to secure the parts in assembled position, the adjusting devices are provided with threaded openings 44 coaxial with the toothed wheels 40, and headed screws 45 and 46 engaging in said openings 44. In order to adjust devices 37, screws 45 and 46 are removed and devices 37 turned to the desired position where they will be held against rotation by means of pins 47 set in sockets in bar 39 and projecting between adjacent teeth of wheels 40. The function of collars 42 is to avoid unnecessary noise in operation.

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 typewriter, in combination, a platen-carriage, a platen rotatably mounted therein, a ratchet-wheel connected to said platen, an actuating pawl to engage said ratchet-wheel and thereby line-space said platen, an adjustable controlling element, movably mounted on said carriage, to determine the effective length of stroke of said actuating pawl, a detent to engage said ratchet-wheel and thereby hold said platen in any line-space position, said detent having its engaging element so positioned, relatively to said pawl, as to enter a tooth-space adjacent that occupied by said pawl at the end of a line-spacing-stroke, a balanced spring to yieldingly hold said detent in effective position, and a single bearing-member projecting from said carriage, and serving as a guide for said pawl-controlling element, a retainer for said spring, and a pivot for said detent.

2. In a typewriting machine, the combination with a platen-carriage and a platen rotatably mounted therein, of a ratchet-wheel operatively connected with said platen, an actuating pawl movably mounted on said carriage and capable of engaging said ratchet-wheel to line-space said platen, an overthrow-pawl movably mounted on said carriage, and means normally holding said overthrow-pawl in an ineffective position clear of said ratchet-wheel, said overthrow-pawl having a part lying in the path of movement of a part of said actuating pawl and by which it may be moved into effective position at the end of the stroke of said actuating pawl, the engaging relation between said overthrow-pawl and said ratchet-wheel being such that the former constitutes a positive stop for the latter when in its effective relation.

3. In a typewriting machine, the combination with a revoluble platen, of a ratchet-wheel connected therewith, a ratchet-wheel-actuating pawl, a slide on which said pawl is pivoted, an overthrow-stop mounted on a fixed pivot, an arm attached to said stop, but out of alinement therewith, and a spring, connecting said slide and said arm, urging said slide to forward position and said stop to ineffective position.

4. In a typewriting machine, the combination with a revoluble platen, of a line-space ratchet-wheel therefor, a ratchet-wheel-actuating pawl having a shoulder facing in the direction of its driving movement, an overthrow stop mounted on a fixed pivot and normally held in ineffective position, a lug on said stop to be engaged by said shoulder to effect movement of said stop to effective position, said stop also serving to limit the advance movement of said actuating pawl, and a line-space detent positioned to engage the notch of the ratchet-wheel immediately in advance of the notch occupied by the actuating pawl at the limit of its driving stroke.

5. In a typewriting machine, the combination with a revoluble platen and a line-space ratchet-wheel connected therewith, of means for controlling the movement of said ratchet-wheel including an actuating member, a ratchet-wheel-actuating pawl pivoted on said actuating member and provided with a shoulder facing in the direction of the actuating movement, and a pivoted overthrow-pawl adapted to be engaged by said shoulder at the end of the actuating stroke to be swung into engagement with said ratchet-wheel to hold said ratchet-wheel and actuating pawl against advance movement.

6. In a typewriting machine, in combination, a letter-spacing carriage, a platen-carriage shiftably mounted therein, a platen rotatably mounted in said platen-carriage, means for line-spacing said platen comprising an actuating member movably mounted in said platen-carriage, an operating lever for said actuating member, said lever being

movably mounted in said letter-spacing carriage, means for adjusting the normal position of said actuating member, and means for effecting a compensating adjustment of the normal position of said operating lever.

7. In a typewriting machine, the combination with a revoluble platen, of line-spacing means therefor including a manually-operable lever, and adjustable means for limiting the movement of said lever comprising a member rotatable in a bearing in a fixed support, a disk fixed to said member and having openings arranged along the circumference of a circle, and a pin set in a socket in said fixed support and extending into one of said openings.

8. In a typewriting machine, the combination with a platen, of line-space mechanism therefor including a slide, a manually-operable lever for actuating said slide, and means for limiting the movement of said lever including a cylindrical member having a bearing in a fixed support, a toothed-wheel fixedly connected with said cylindrical member, a pin held in position in said support to project between adjacent teeth of said toothed-wheel and hold the same against rotation, a second cylindrical member eccentrically secured to said toothed-wheel, and a collar of resilient material mounted on said eccentrically-mounted member.

9. In a typewriting machine, the combination with a platen, of line-spacing means therefor including a line-space lever and adjustable means to determine the limits of its movement in both directions, comprising at each end of the path of said lever a member comprising a cylindrical journal portion mounted in a suitable bearing, a gear-wheel coaxial with said journal portion, a cylindrical portion eccentric with respect to said journal portion and connected therewith, and means to engage between the teeth of said gear-wheel and prevent rotation thereof, and thereby lock said eccentric portion in adjusted position to be engaged by said lever.

10. In a typewriting machine, the combination with a revoluble platen, of an actuating pawl, a slide for actuating the same, a manually-operable lever for actuating said slide, a spring for returning said slide to normal position, a member comprising an ear to which said spring is connected at one end, a holder, and a cushion of resilient material in said holder, means whereby said member may be secured in adjusted position on said slide, and a stop to be engaged by said cushion on the return movement of said slide.

11. In a typewriting machine, the combination with a revoluble platen, of platen-actuating means including a slide, a manually-operable lever for actuating said slide, means including a spring to return said slide and consequently said lever to normal position, means, including a cushion of resilient material adjustably mounted on said slide and a fixed stop, to determine the forward limit of movement of said slide, and means for limiting the movement of said lever comprising eccentrically-mounted cylindrical stop members and means to hold the same in adjusted position.

12. In a typewriting machine, in combination, a platen, a carriage in which said platen is mounted, a ratchet-wheel operatively connected to said platen, a line-spacing pawl therefor, an actuating member for said pawl movably mounted in said carriage, an overthrow-stop movably mounted in said carriage, and a spring connecting said stop and actuating member, and tending to move each to and hold it in its normal ineffective position.

13. In a typewriting machine, in combination, a platen, a carriage in which said platen is mounted, a ratchet-wheel operatively connected to said platen, a line-spacing pawl therefor, an actuating member for said pawl movably mounted in said carriage, an overthrow-stop movably mounted in said carriage, a spring connecting said stop and actuating member, and tending to move each to and hold it in its normal ineffective position, and a part controlled in its movements by said actuating member to engage said stop at the end of a line-spacing stroke of said pawl to move said stop to its effective position.

14. In a typewriting machine, in combination, a platen, a carriage in which said platen is mounted, a ratchet-wheel operatively connected to said platen, a line-spacing pawl therefor, an actuating member for said pawl movably mounted in said carriage, an overthrow-stop movably mounted in said carriage, a spring connecting said stop and actuating member, and tending to move each to and hold it in its normal ineffective position, and a part carried by said pawl to engage said stop at the end of a line-spacing stroke thereof, to move said stop to its effective position, the engaging parts of said pawl and stop being so related as to cause each to be held in close engagement with said ratchet-wheel, at the completion of a line-spacing rotation of said platen.

15. In a typewriting machine, in combination, a platen-carriage, a platen rotatably mounted therein, and line-spacing mechanism therefor comprising a ratchet-wheel connected to said platen, an actuating member movably mounted in said carriage, a line-space pawl pivoted to said actuating member and provided with a shoulder facing in the direction of actuating movement,

and an overthrow-pawl, movably mounted in said carriage, having a part to be engaged by said shoulder and by which it may be moved into effective relation at the end of a stroke of said line-space pawl to prevent further movement of said ratchet-wheel and platen.

16. In a typewriting machine, in combination, a carriage, a platen rotatably mounted therein, line-spacing means therefor comprising an operating member movably mounted in said carriage, and an adjustable stop for limiting the movement of said operating member, said stop comprising a member rotatably mounted in said carriage, a toothed portion concentric with its axis, a stop portion eccentric therewith, and a pin settable in an opening in said carriage to engage between any two teeth of said toothed portion and maintain said movement-limiting stop in an adjusted position.

17. In a typewriter, in combination, a platen-carriage, a platen rotatably mounted therein, a ratchet-wheel connected to said platen, an actuating pawl to engage said ratchet-wheel and thereby line-space said platen, an adjustable controlling element, movably mounted on said carriage, to determine the effective length of stroke of said actuating pawl, a detent to engage said ratchet-wheel and thereby hold said platen in any line-space position, said detent having its engaging element so positioned, relatively to said pawl, as to enter a tooth-space adjacent that occupied by said pawl at the end of a line-spacing stroke, a balanced spring to yieldingly hold said detent in effective position, and a single bearing-member projecting from said carriage, and serving as a guide for said pawl-controlling element, a retainer for said spring, and a pivot for said detent, said spring comprising a coiled portion surrounding said retainer, and two end-portions extending outwardly therefrom in the same general direction as said pawl, said end-portions being connected at closely-neighboring points with said detent and said carriage, respectively.

WILLIAM F. HELMOND.

Witnesses:
J. J. BASKERVILLE,
WILLIAM P. SMITH.