

UNITED STATES PATENT OFFICE.

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TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 784,369, dated March 7, 1905.

Application filed November 23, 1903. Serial No. 182,309.

To all whom it may concern:

Be it known that I, OSCAR WOODWARD, a citizen of the United States, and a resident of the borough of Manhattan, city of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention relates to line-spacing mechanisms for type-writing machines whereby the platen may be rotated through regular line-space distances or may be turned through irregular or fractional line-space distances. Heretofore in such constructions where frictional mechanism has been employed to connect the line-spacing mechanism to the platen great difficulty has been encountered by reason of the ineffectiveness of the frictional mechanism to work perfectly under all conditions of use, but more particularly when the line-space lever is actuated violently or suddenly with considerable force and at which time there is a liability of failure of the platen to turn equally with the line-space ratchet-wheel, owing to the insufficient grip or frictional engagement of the connecting devices, and hence unequal line-spacing will result where it was not intended or desired.

The object of my invention is to overcome the above and other difficulties heretofore presented and to provide simple and efficient mechanism for effecting such a firm and effective engagement between the platen and the line-spacing ratchet-wheel that no matter how violently the latter may be actuated the platen shall always turn coextensively therewith, which at the same time provides such a construction that the platen may be readily disconnected from the ratchet-wheel, so as to be turned independently of the latter in either direction for the insertion of a letter, word, or line in any type-written matter or for the printing of lines at distances apart not permitted by the ratchet-wheel or for writing words and lines in blank spaces of printed forms, which require a feed movement of the platen different from that predetermined by the regular line-spacing mechanism.

To these and other ends, which will hereinafter appear, my invention consists in the features of construction, arrangements of parts, and combinations of devices to be hereinafter more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings, wherein like reference characters indicate corresponding parts in the various views, Figure 1 is a fragmentary longitudinal sectional view of the platen and its coacting mechanism. Fig. 2 is a like view of the same, the parts being viewed at right angles to their position illustrated in Fig. 1. Fig. 3 is a detail end view of the line-spacing ratchet-wheel, its engaging devices, and platen-head, the view looking in the direction of the arrow in Fig. 6. Fig. 4 is a detail perspective view of the platen-head at the right-hand end of the platen. Fig. 5 is a detail fragmentary perspective view of the so-called "actuator" and the shaft or spindle to which it is connected. Fig. 6 is a detail perspective view, partly in section, of the line-spacing ratchet-wheel and the cooperating grippers. Fig. 7 is an end view of the parts illustrated in Fig. 5, the view looking in the direction of the arrow in said last-mentioned figure.

The cylindrical platen comprises a hollow wooden core 1, which is surrounded by the usual rubber sheath 2, and a platen-head 3 is secured to the core of the platen, preferably at the right-hand end thereof, by headed screws 4, the stems of which pass through openings 5 in the flange 6 of the platen-head. The platen-head has a circumferential shoulder 7, formed on the outer face thereof, for supporting the inner bearing edge of an inwardly-projecting annular flange 8 on the line-spacing wheel 9, said wheel being adapted to revolve freely on the flange 7. A cover-plate 10 is secured in place by screws 11, which are received in threaded openings 12 in the platen-head, so as to hold the cover-plate in position where it bears against the outer face of the line-spacing ratchet-wheel and maintains it in place on the circumferential flange 7 of the platen-head. The platen-head 3 is provided

with an outwardly-extending nipple 13, that has a central bore extending therethrough. This nipple projects through a central opening in the cover-plate 10 and is received within a bearing 14 of a suitable platen-frame. The platen-head likewise has an inwardly-extending body portion 15, which is seated within the core of the platen and has an inwardly-extending nipple 15^a, that is screw-threaded at 16 on the periphery thereof and is slotted longitudinally at 17 for purposes which will hereinafter appear. A central bore 18 in the nipple 15^a forms a continuation of the bore which extends through the nipple 13 and through the platen-head. A shaft or spindle 19 extends through the central bore 18 in the platen-head and is provided with feathers or lateral projections 20, which extend into the slots 17, so as to form a splined connection between the spindle and platen-head, thus permitting a longitudinal movement of the spindle, but preventing a relative rotary movement between the spindle and platen-head. The inner end of the spindle is provided with a fixed pin 21, that extends therethrough at substantially right angles to its length. A so-called "actuator" or "frame" 22 is preferably struck up from a single piece of sheet metal to form ears 23, that are apertured for the reception of the transverse pin 21, carried by the spindle. This frame likewise has ears 24, formed therefrom, which are apertured to receive the pivots 25 of antifriction-rollers 26. The actuator or frame is apertured centrally at 27 for the reception of the spindle 19, so that the antifriction-rollers extend on opposite sides of the spindle, and the extent of the aperture 27 in one direction permits the necessary movement of the frame or actuator on the pin 21. Stud 27^a may be seated in the sides of the frame 24 to constitute bearing-abutments that are adapted to bear against the spindle and limit the lateral movement of the frame in one direction, though it should be understood that in practice the studs 27^a may be dispensed with. The pin 21 constitutes a guide for the frame during its transverse movement on the spindle, and yet connects the frame to the spindle and maintains the proper relation between the two and assures a sliding movement of the actuator at right angles to the spindle. The spindle 19 has a collar 28 secured thereto in any suitable manner, and the periphery of this collar is threaded to receive one end of a coiled spring 29, that surrounds the spindle and is connected under tension at its opposite end to the threaded nipple 15^a of the platen-head. It will thus be understood that the tension of the spring 29 is exerted to force the spindle 19 longitudinally toward the right-hand end of the platen.

The platen-head 3 has oppositely-disposed recesses 30 formed therein, and seated within these recesses are engaging grippers 31, which

in the present instance comprise lever-arms 32, which extend longitudinally of the platen and are beveled in opposite directions on the inner faces thereof, as indicated at 33, for cooperation with the antifriction-rollers on the actuating device 22. Each of the levers 32 has a transverse recess or slot 34, so as to provide jaws 35 and 36, that extend on opposite sides of the inwardly-extending annular flange 8, formed on the line-spacing ratchet-wheel. It having been explained that the levers 32 are seated in the slots or recesses 30 of the platen-head and that the platen-head is secured to the platen, it will be understood that the platen and the levers are thus fixed to be rotated together. The spring 29 causes the actuating device 22 to exert an outward wedging pressure on the inclined or beveled portions 33 of the grippers, and thus causes each pair of jaws 35 and 36 to so tightly bind or grip the flange 8 on opposite sides that any rotation of the wheel 9 and the jaws independently of each other is prevented. The feathers 20 in the slot 17 of the platen-head lock together the spindle 19, the finger-wheel 38, secured thereto, and the platen, so that these parts cannot rotate independently of each other. When it is desired to turn the platen independently of the ratchet-wheel for fractional line-spacing, the operator presses the finger-wheel 18 inwardly against the tension of the spring 29, which moves the actuator-rollers from holding contact with the bevels 33 and relieves the inner ends of the levers 32 from the pressure of the actuating device 22. The jaws 35 and 36 then release the flange 8 and permit a rotation of the platen to any desired extent independently of the line-spacing wheel, which at this time is maintained fixed by the pressure of a detent 39 thereon. Thus when inward endwise pressure is exerted on the finger-wheel 38 it may be rotated, carrying with it the shaft or spindle 19, the platen-head 3, and the platen. When the fractional line-spacing has been effected, the endwise pressure on the finger-wheel is released, and the spring 29 causes the actuating device 22 instantly to exert its pressure on the levers 32 and the jaws to bite the flange 8, effectually bringing about an automatic locking of the parts, so that the finger-wheel, line-spacing wheel, and the platen will all rotate together.

It will be observed that the levers 32 are not fixedly pivoted, but lie loosely in the slots or channels 30, and that the actuating device 22, being mounted to move or slide freely at direct right angles and relatively to the shaft or spindle 19, exerts no more pressure on one gripper than on the other, but causes the grippers to exert pressure in opposition to each other and without any material lateral strain on the spindle 19, which would cause it to bind in its bearings; that the pressure applied by the spring is exerted equally on both levers and is applied on opposite faces of the flange

8 and at opposite sides of the center of the line-spacing ratchet-wheel; that substantially none of the pressure applied laterally of the grippers is exerted against the platen shaft or spindle 9 or against any fixed pivots, so that essentially the full force of the spring is transmitted to the gripping-point and is not materially curtailed by the friction or binding of the parts; that the movements of the finger-wheel endwise of the platen without undue effort are effective to disconnect and connect the line-spacing wheel and platen, and that the grippers bind at opposite sides of the flange 8 and endwise of the platen, so as to effect a powerful frictional engagement between the parts, thus avoiding any liability of any slip between the platen and the ratchet-wheel when the line-space lever is moved violently. It will likewise be observed that the space between the jaws 35 and 36 of each lever is of just sufficient width to receive the flange 8 and to afford a releasing movement of the jaws relatively thereto when the pressure of the actuating device 22 is removed from the grippers 32 and that the construction enables the employment of long gripper-levers and that it requires but a very slight outward movement of the free ends of the levers to cause the jaws to efficiently bind against the flange to lock the parts together.

It will be further observed that the construction is such that there is no independent rotation or lost motion between the finger-wheel and platen and that the gripping is instantly and automatically effected when the hand of the operator is removed from the finger-wheel and without specially moving or adjusting a part after each fractional line-spacing movement and that the right-hand finger wheel of the platen is effective to both release the platen and to rotate it when released or when locked to the line-spacing ratchet-wheel.

The occasional rotation of the platen for fractional line-spacing changes the relation between the platen and the line-spacing ratchet-wheel, so that the impact of the types is not always on certain given lines as determined by the teeth of the wheel, and the wear is consequently distributed over the entire surface of the platen.

It will be understood that the loosely-arranged or unpivoted levers or grippers are mounted in a manner such that they not only grip the line-spacing ratchet-wheel, but also fulcrum thereon and receive directly the full essential force of the spring that causes them to connect the line-spacing wheel to the platen.

The construction which affords a sliding movement of the actuator 22 at right angles to and independently of the spindle constitutes an important feature of my present invention, and from certain aspects of the invention any suitable gripping devices may be employed to cooperate with the actuator.

Certain principles of invention herein

shown and described are not claimed because they are broadly claimed in my companion application, filed December 30, 1902, Serial No. 137,132.

What I claim as new, and desire to secure by Letters Patent, is--

1. In a type-writing machine, the combination of a line-spacing wheel, a platen adapted to rotate with or independently of said line-spacing wheel, means for connecting the platen and line-spacing wheel to rotate together, controlling means comprising an actuator that is adapted to move longitudinally and transversely of the platen, said actuator carrying rollers that cooperate with said connecting means.

2. In a type-writing machine, the combination of a line-spacing wheel, a platen adapted to rotate with or independently of said line-spacing wheel, a spindle that is movable longitudinally of the platen and is connected to turn the same, a frame that is carried by said spindle and is freely movable in a direction at substantially right angles thereto, rollers carried by said frame, arms between which said frame is adapted to move, and against which said rollers bear, and grippers controlled by said arms.

3. In a type-writing machine, the combination of a line-spacing wheel, a platen adapted to rotate with or independently of said line-spacing wheel, a spindle, a guide-pin that projects from said spindle at substantially right angles thereto, an actuator mounted to move transversely of the spindle on said guide-pin, and clamping devices controlled by said actuator.

4. In a type-writing machine, the combination of a line-spacing wheel, a platen adapted to rotate with or independently of said line-spacing wheel, a spindle, a spring for moving said spindle in one direction, a guide-pin that projects from said spindle at substantially right angles thereto, an actuator mounted to move transversely of the spindle on said guide-pin, arms between which said actuator extends and clamping devices actuated by said arms.

5. In a type-writing machine, the combination of a line-spacing wheel, a platen adapted to rotate with or independently of said wheel, a spindle that is adapted to move longitudinally of said platen, a platen-head, a spring that surrounds said spindle and is connected at one end to the spindle and is directly connected at its opposite end to the platen-head, and engaging means controlled by said spindle, said engaging means being adapted to operatively connect the platen and line-spacing wheel.

6. In a type-writing machine, the combination of a line-spacing wheel, a platen-head on which said wheel is adapted to turn, a platen adapted to turn with or independently of said line-spacing wheel, a movable spindle, a coiled

spring surrounding said spindle and connected thereto at one end, a threaded nipple on the platen-head to which the other end of said spring is connected, and engaging means controlled by said spindle, said engaging means being adapted to operatively connect the platen and line-spacing wheel.

7. In a type-writing machine, the combination of a platen, a line-spacing ratchet-wheel, a flange on said wheel, clamping-jaws that are adapted to bear on opposite sides or faces of said flange, a spindle, and a frame carrying antifriction-rollers for controlling said clamping-jaws, said frame being carried by said spindle.

8. In a type-writing machine, the combination of a platen, a line-spacing ratchet-wheel, a flange on said wheel, clamping-jaws that are adapted to bear on opposite sides or faces of said flange, a spindle, a frame, one of said two last-mentioned parts carrying a guide-pin that extends at substantially right angles to the length of the spindle to afford a lateral movement of the frame, and means for affording an actuation of said jaws through said frame.

9. In a type-writing machine, the combination of a platen, a platen-head secured thereto and which has a channel therein, a lever seated in said channel so that the lever is connected to turn with the platen and may receive a movement independent thereof, a line-spacing wheel having an annular flange which is seated in a groove in said lever, an actuating device, and a finger-wheel operatively connected to said actuating device to afford a transverse movement of the free end of said lever to effect an engagement or disengagement between the lever and said flange, said actuating device comprising a frame carrying antifriction-rollers that cooperate with said levers.

10. In a type-writing machine, the combination of a platen, a platen-head secured thereto and which has a channel therein, a lever seated in said channel so that the lever is connected to turn with the platen and may receive a movement independent thereof, a line-spacing wheel having an annular flange which is seated in a groove in said lever, an actuating device, a finger-wheel operatively connected to said actuating device to afford a transverse movement of the free end of said lever to effect an engagement or disengagement between the lever and said flange, said actuating device comprising a frame carrying antifriction-rollers that cooperate with said levers, and a hand-operated spindle carrying said frame and with relation to which the frame is adapted to receive a movement at substantially right angles to the length of the spindle.

11. In a type-writing machine, the combination of a platen, a shaft, a line-spacing ratchet-wheel, a plurality of engaging devices that rotate with the platen and which are adapted to engage said line-spacing wheel, and an actuating device that is supported by said shaft and is

adapted to receive a movement independently and laterally thereof and to bear upon said engaging devices to afford an actuation thereof, whereby the pressure is equally exerted upon said engaging devices, said actuating device comprising a frame carrying antifriction-rollers that bear against said engaging devices.

12. In a type-writing machine, the combination of a platen, a line-spacing ratchet-wheel, a plurality of levers that extend longitudinally of the platen and each of which is provided with means adapted to engage the line-spacing ratchet-wheel or be disengaged therefrom, a longitudinally-movable shaft that is connected to rotate with the platen, an actuating device carried by said shaft and movable independently thereof in directions transverse thereto and adapted to bear or press on said levers, a spring exerting its tension on the shaft and effective to normally maintain the engaging devices locked to the line-spacing wheel, and a finger-wheel connected to said shaft and effective to turn the platen and to move the shaft longitudinally against the tension of its spring in order to release the engaging devices from the line-spacing wheel, said actuating device comprising a frame carrying antifriction-rollers that bear against the levers, and a pin that extends transversely of the shaft for guiding the frame in its transverse movement.

13. In a type-writing machine, the combination of a platen, a line-space ratchet-wheel provided with a flange, levers with gripping-jaws operating on the flange of the ratchet-wheel, a spring-pressed shaft, a frame carrying antifriction-rollers, which frame is loosely carried by said shaft and the rollers on which cooperate with the levers to cause the jaws to bite and hold the flange, and a finger-wheel adapted to thrust the shaft against the tension of its spring and to rotate the platen independently of the ratchet-wheel when the jaws release the flange thereof.

14. In a type-writing machine, the combination of a platen, a line-spacing ratchet-wheel having a flange, a platen-head carrying levers that extend longitudinally of the platen and are provided with lateral jaws for engaging said flange, and means for automatically spreading said levers and causing the jaws to simultaneously and uniformly grip the flange, said spreading means comprising a hand-operated spring-restored spindle and a frame carrying antifriction-rollers which bear against said levers, said frame having a movement transversely and independently of said spindle.

15. In a type-writing machine, the combination of a line-space ratchet-wheel provided with a flange, a platen carrying within its hollow core means for normally locking it to the ratchet-wheel and comprising a platen-head secured to the platen, grippers loosely seated in sockets or channels in the platen-head and

having jaws which are adapted to engage the flange of the line-spacing ratchet-wheel, an actuating device operating on the inner ends of the levers, a shaft carrying the actuating device and provided with a spring to hold the actuating device in the operative position between the grippers, said actuating device comprising a frame carrying antifriction-rollers that bear upon the grippers, and which frame is adapted to move independently and transversely of said shaft, and means for releasing the actuating device and unlocking the jaws.

16. In a type-writing machine, the combination of a platen-head, a line-spacing wheel that is adapted to turn on said head, a platen that is adapted to turn with or independently of the line-spacing wheel, a spindle that is splined to the platen-head so as to afford a longitudinal movement of the spindle independently of the platen-head but to cause the spindle, platen-head and platen to rotate together, a nipple formed on the platen-head, a coiled spring surrounding the spindle and connected at one end thereto and at the other end to said nipple, a gripper that coöperates with the line-spacing ratchet-wheel, and an actuating device carried by the spindle and coöperating with said gripper.

17. In a type-writing machine, the combination of a platen-head, a line-spacing wheel that is adapted to turn on said head, a platen that is adapted to turn with or independently of the line-spacing wheel, a spindle that is splined to the platen-head so as to afford a longitudinal movement of the spindle independently of the platen-head but to cause the spindle, platen-head and platen to rotate together, a nipple formed on the platen-head, a coiled spring surrounding the spindle and connected at one end thereto and at the other end to said nipple, grippers that coöperate with the line-spacing ratchet-wheel, and an actuating device carried by the spindle, said actuating device comprising a frame that carries antifriction-rollers which bear against the grippers and having a movement transversely and independently of said spindle.

18. In a type-writing machine, the combination of a line-spacing wheel, a platen which is adapted to turn with or independently of said line-spacing wheel, grippers for said wheel, and controlling means for said grippers, said controlling means comprising a spindle carrying a transverse pin, a frame that is adapted to move transversely and independently of said spindle and which is apertured for the reception of said spindle and has guide-openings for coöperation with said pin.

19. In a type-writing machine, the combination of a line-spacing wheel, a platen which is adapted to turn with or independently of said line-spacing wheel, grippers for said wheel, and controlling means for said grippers, said

controlling means comprising a spindle carrying a transverse pin, a frame that is adapted to move transversely and independently of said spindle and which is apertured for the reception of said spindle and has guide-openings for coöperation with said pin, and antifriction-rollers carried by said frame and bearing against the grippers.

20. In a type-writing machine, the combination of a line-spacing wheel, a platen which is adapted to turn with or independently of said line-spacing wheel, grippers for said wheel, and controlling means for said grippers, said controlling means comprising a spindle carrying a transverse pin, an apertured frame which is struck up from a single piece of sheet metal and receives the spindle therethrough, said frame being carried by the pin and adapted to slide thereon transversely and independently of the spindle, and coöperating with said engaging devices.

21. In a type-writing machine, the combination of a line-spacing wheel, a platen which is adapted to turn with or independently of said line-spacing wheel, grippers for said wheel, and controlling means for said grippers, said controlling means comprising a spindle carrying a transverse pin, an apertured frame which is struck up from a single piece of sheet metal and receives the spindle therethrough, said frame being carried by the pin and adapted to slide thereon transversely and independently of the spindle, and antifriction-rollers carried by the frame on opposite sides of said spindle, and coöperating with said grippers.

22. In a type-writing machine, the combination of a line-spacing wheel, a platen adapted to rotate with or independently of said line-spacing wheel, grippers for connecting the line-spacing wheel and platen, a spindle, and an actuator that is moved by the spindle and moves independently thereof at right angles to the spindle and coöperates with the grippers.

23. In a type-writing machine, the combination of a line-spacing wheel, a platen adapted to rotate with or independently of, a platen-head connected to the platen and having a groove therein, a spindle that moves in the platen-head and which has a spline or feather that extends into the groove in the platen-head, grippers adapted to connect the line-spacing wheel to the platen, and an actuator carried by the spindle and coöperating with the grippers.

Signed in the borough of Manhattan, city of New York, in the county of New York and State of New York, this 20th day of November, A. D. 1903.

OSCAR WOODWARD.

Witnesses:

K. V. DONOVAN,
E. M. WELLS.