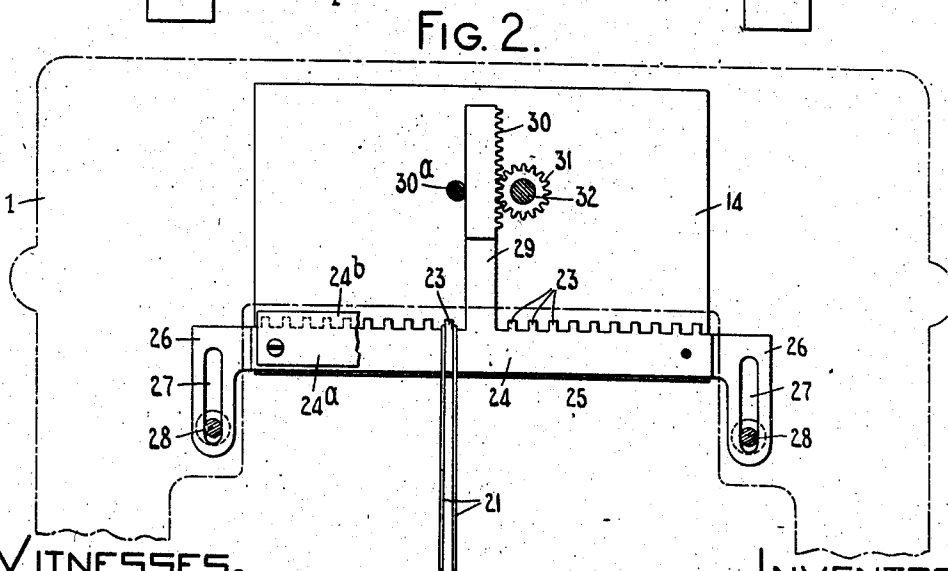
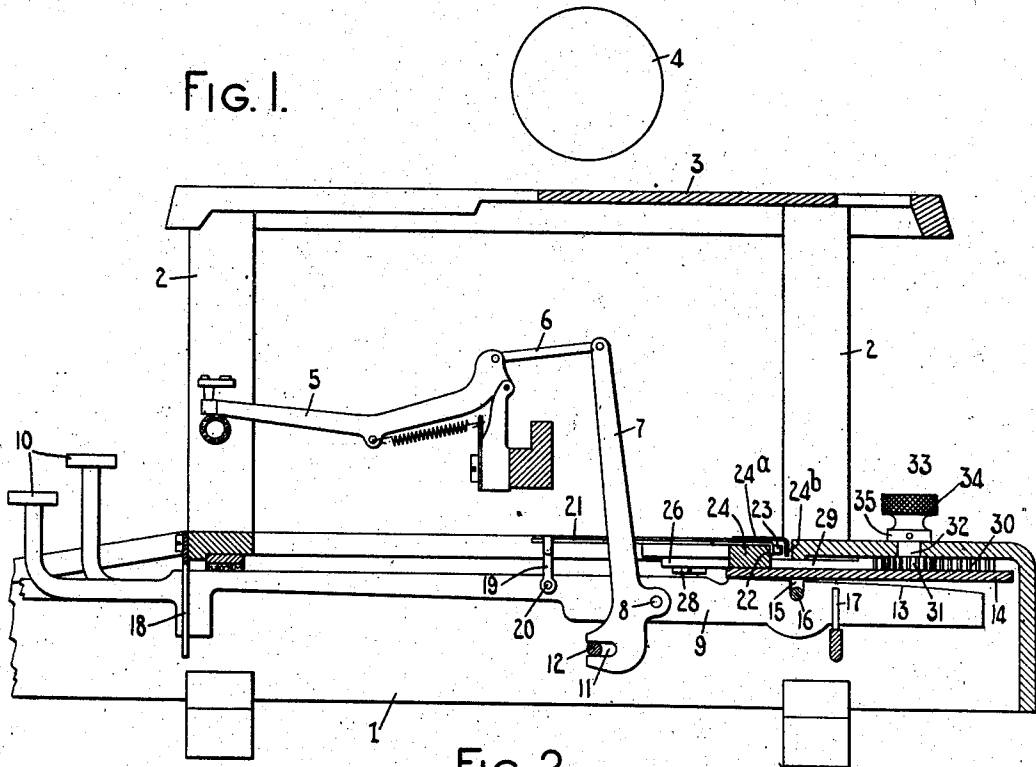


H. H. STEELE.
TYPE WRITING MACHINE.
APPLICATION FILED AUG. 17, 1912.

1,053,449.

Patented Feb. 18, 1913.



WITNESSES:

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UNITED STATES PATENT OFFICE.

HERBERT H. STEELE, OF MARCELLUS, NEW YORK, ASSIGNOR TO THE MONARCH TYPEWRITER COMPANY, OF SYRACUSE, NEW YORK, A CORPORATION OF NEW YORK.

TYPE-WRITING MACHINE.

1,053,449.

Specification of Letters Patent.

Patented Feb. 18, 1913.

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To all whom it may concern:

Be it known that I, HERBERT H. STEELE, citizen of the United States, and resident of Marcellus, in the county of Onondaga 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 typewriting machines and more particularly to springs for returning the type actions, or parts thereof, to normal position, and to means for controlling the action of said springs so as to vary the effective force thereof as the same is applied to aid the return movement of the parts.

One of the main objects of my invention is to provide means for varying the effective force of the springs to return the parts to normal position without correspondingly modifying the force exerted by said springs initially on the parts with which they co-act.

A further object of my invention is to provide comparatively simple and efficient adjustable means for varying the effective length of each spring and thereby vary the force exerted by the spring to return the parts to normal position.

A still further object of my invention is to provide improved means whereby a variation in the touch of all of the keys of the type actions may be simultaneously effected without altering or interfering with the accelerated action of the type bars.

To the above and other ends which will hereinafter appear, my invention consists in the features of construction, arrangements of parts and combinations of devices to be set forth in the following description and particularly pointed out in the claims.

In the drawings, Figure 1 is a fragmentary vertical central fore and aft sectional view of a typewriting machine embodying my invention. Fig. 2 is a detail fragmentary plan view of a portion of the construction represented in Fig. 1.

I have shown my invention embodied, in the present instance, in a Monarch machine but have shown only so much of said machine as may be necessary to arrive at an understanding of my invention. It should

be understood, however, that the invention may be embodied in various characters of typewriting machines and that the construction may be variously modified to facilitate such embodiment.

The frame of the machine comprises a base 1, corner posts 2, and a top plate 3. The carriage (not shown) may be of the usual or any suitable character, a cylindrical platen 4, which is carried by the carriage, being diagrammatically represented in Fig. 1.

The type actions shown in the present instance are similar to those embodied in the Monarch machine, each type bar 5 striking upwardly and rearwardly against the front face of the platen. Each type bar is connected by a pull link 6 to a sub-lever 7 pivoted at 8 to a key lever 9, which key levers are substantially horizontally disposed and extend to the keyboard of the machine where they are provided with finger keys 10. The sub-levers are slotted at 11 in the usual manner for coöperation with a fixed fulcrum rod 12 which extends beneath the key levers and is fixed at its ends in the base of the machine. Each key lever is formed with a curved tread 13 adapted to bear upwardly against the bottom face of a fixed fulcrum plate 14. The key levers are slotted at 15 for the reception of a fixed rod 16 by which the key levers are prevented from creeping longitudinally along the fulcrum plate. The usual guide combs 17 and 18 are also provided for coöperation with key levers to guide them in their movements.

It will be understood that normally the forward end of the curved contact tread of each key lever bears against the fulcrum plate, and that as the associated finger key is depressed a rocking or rolling contact is effected between the curved contact tread of the key lever and the fixed fulcrum plate, thereby affording a variation in the leverage which is effective to produce an accelerated movement of the type bar in its movement toward the printing point. Each key lever has a hook-like strap 19 of the usual construction connected thereto at 20. The upper looped end of each strap receives a wire returning spring 21. These springs in the present instance are formed in pairs by

being looped at one end like a hair-pin, the looped end being bent downwardly at 22 for the reception of a lug or projection 23 on a cross bar 24 of a support or carrier 25. The looped ends of the springs are prevented from accidental displacement from the lugs 23 by a plate 24^a detachably secured in place on the carrier by screws and having a downwardly bent rear edge 24^b which extends in rear of the ends of the lugs and prevents a removal of the springs from the carrier. The body portion of this plate 24^a is arranged parallel with the cross bar 24 of the carrier and bears upon the rear end portions of the springs to prevent an accidental displacement thereof. It will thus be understood that each arm or member of the spring in itself constitutes a returning spring 21 connected with the associated type action through a strap 19. It will be understood that each spring 21 bears against the upper side of the cross bar 24 of the spring support or carrier 25, and that the springs are arranged above the key levers and extend longitudinally in the same general direction as the key levers and substantially parallel therewith. The arrangement of the forward free end of each spring 21 in the loop or strap 19 of the associated key lever is such as to afford a relative sliding adjustment of the spring in its loop, for purposes which will hereinafter more clearly appear. The carrier 25 for the returning springs in the present instance comprises the cross bar 24 provided with the rearwardly extending lugs or projections 23 and with ears 26 at the ends of the cross bar. These ears are slotted at 27, the slots extending fore and aft of the machine. Headed screws 28 are received in tapped openings in the base 1 of the machine and extend through the slots 27 of the carrier with the heads of the screws lowermost to support and guide the carrier on the base of the machine. The carrier is also provided with a rearwardly extending arm 29 provided with a rack 30 on one side edge thereof for cooperation with a pinion 31, the rack being held in mesh with the pinion by a fixed guide pin 30^a. This pinion is fixed on a spindle 32 which extends through a bearing opening in the base of the machine. The upper end of the spindle is fixedly connected to a finger piece or wheel 33 provided with a knurled portion 34 by which the finger piece and pinion may be turned. A shouldered portion 35 on the finger piece bears against the upper side of the base of the machine to provide a support for the finger piece and pinion. The pinion itself bearing against the bottom wall of that portion of the base of the machine in the spindle 32 is received, and the shoulder 35 bearing against the upper side of that portion of the base, prevent a vertical dis-

placement of the pinion and finger wheel but enable these parts to be readily turned to transmit movement to the rack 30, and to the carrier 25 with which the rack is connected.

It will be seen that a turning of the finger wheel 33 is effective to produce a rectilinear horizontal movement of the carrier 25 fore and aft of the machine and to simultaneously produce a corresponding bodily movement or adjustment of all of the returning springs 21, the adjustment of the springs being in the direction of the length thereof, and in the direction of the length of the key levers. It will also be noted that during this adjustment of the springs the free end portions thereof slide through the loops of the straps 19 so that the anchored ends of the springs are brought nearer to or farther from the straps 19, depending on the adjustment of the finger piece 33. The effect of this adjustment is to simultaneously vary the effective lengths of all of the springs so that when said springs are flexed during the operation of the type actions greater or less force will be exerted thereby, depending on the adjustment of the finger piece 33 and the effective length of the springs determined by such adjustment. It will be noted, however, that the movement of the returning springs during the adjustment thereof with the carrier 24 does not alter the relations of the springs in their parallel positions with reference to the key levers. In other words, the bodily adjustment of the springs in the manner described does not flex or relax the springs and therefore does not vary, or vary to any appreciable extent, the force exerted by the springs initially on the key levers, notwithstanding the variation brought about in the effective lengths of the springs and a corresponding variation in the force exerted by the springs during the actuation of the type actions.

It will be understood that the construction and relations of the parts are such that there is no tendency to displace the carrier 25 from the position to which it may be adjusted and, on the other hand, the force exerted by the springs has a tendency to maintain the carrier in the position to which it is adjusted.

It will be seen that each spring 21, except at its anchored end, is a substantially straight wire spring, the force of which is exerted upwardly on the associated key lever to return it and the parts connected therewith to the normal position and to maintain the curved tread of the key lever against the fulcrum plate with which it cooperates. It will also be observed that the variation in the effective length of each spring in no manner alters or modifies the accelerated action of the type bars, such

action remaining the same under all adjustments of the returning springs, thus enabling an easy start of the type actions to be effected whether the resistance offered to the depression of the key be high or low under the various adjustments of the returning springs. Moreover, the position of the finger piece 33 outside of the frame of the machine, where it is readily accessible to the operator, enables the returning springs to be easily adjusted. The construction as a whole is simple and efficient and readily lends itself to embodiment in existing forms of typewriting machines such as the Monarch machine, for example, without modifying, or materially modifying, the structural features of said machines as they now exist.

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

1. In a typewriting machine, the combination of a key actuated member, a returning spring therefor, and means for varying at will the effective length of said spring, said means comprising a support for one end of the spring, means for operatively connecting the opposite end of said spring to said key actuated member, and adjustable means for varying the distance between said support and said connecting means for the opposite end of the spring.

2. In a typewriting machine, the combination of a series of key actuated members, a series of returning springs therefor, and means for simultaneously varying the effective length of all of said springs.

3. In a typewriting machine, the combination of a key actuated member, a returning spring therefor, and means for varying the point of connection between said spring and key actuated member.

4. In a typewriting machine, the combination of a key actuated member, a returning spring therefor, and hand actuated adjusting means for increasing or decreasing the distance between the point of connection of the spring with said key actuated member and the support for the spring.

5. In a typewriting machine, the combination of a key actuated member, a returning spring connected therewith, and means for effecting a bodily substantially rectilinear adjustment of said spring to vary the effective length thereof.

6. In a typewriting machine, the combination of a series of key actuated members, a series of returning springs therefor, means for operatively connecting the springs with said member so as to afford a bodily adjustment of the springs relatively thereto at the point of connection of the springs, a common support for all of said springs, and means for effecting a bodily adjustment of said support.

7. In a typewriting machine, the combination of a key actuated lever, a returning

spring operatively connected thereto and arranged substantially parallel with that portion of the lever to which the spring is connected, and means for effecting a substantially rectilinear adjustment of said spring lengthwise thereof.

8. In a typewriting machine, the combination of a series of key actuated levers, a series of returning springs, means for operatively connecting the springs with said levers so as to afford an adjustment of the springs relatively to said levers in the general direction of the length thereof, said springs being arranged substantially parallel with those portions of said levers with which the springs are connected, a common support for all of said springs, and means for effecting a substantially rectilinear adjustment of said support.

9. In a typewriting machine, the combination of a key actuated member, a returning spring therefor, a connection between said spring and member, which connection remains constant relatively to the member but affords a variation in the position of the spring relatively to said member at the point where the spring co-acts with said connection, and adjustable means for effecting a bodily movement of said spring to effect said adjustment of the spring.

10. In a typewriting machine, the combination of a series of key actuated members, a series of returning springs therefor, connections between said springs and members, which connections remain constant relatively to the members but afford a variation in the position of the springs relatively to said members, a common carrier for all of said springs, and means for effecting a bodily adjustment of said carrier and springs.

11. In a typewriting machine, the combination of a series of key actuated members, a series of returning springs therefor, a common support for said springs, said support being mounted for sliding adjustment, a rack connected with said support, a pinion meshing with said rack, and a finger piece for turning said pinion.

12. In a typewriting machine, the combination of a series of key actuated levers; a series of returning springs therefor, said springs being arranged substantially parallel with said levers; and means for simultaneously varying the effective length of all of said springs, said means comprising a bodily movable carrier common to all of said springs for effecting a bodily adjustment of the springs in the direction of their length, and means for effecting a bodily adjustment of said carrier.

13. In a typewriting machine, the combination of a series of key actuated levers; a series of returning springs therefor, said

springs being arranged substantially parallel with said levers; and means for simultaneously varying the effective length of all of said springs, said means comprising a
 5 5 bodily movable carrier common to all of said springs for effecting a bodily adjustment of the springs in the direction of their length, a rack connected with said carrier, a pinion meshing with said rack, and a finger piece
 10 10 arranged outside of the frame of the machine where it is readily accessible to the operator, said finger piece being connected with said pinion to control it and thus effect a bodily adjustment of the carrier and a
 15 15 lengthwise bodily adjustment of the springs.

14. In a typewriting machine, the combination of a key actuated lever, a returning spring connected therewith, an adjustable support for said spring, a rack connected
 20 20 with said support, a pinion meshing with said rack, and a finger piece connected with said pinion, said finger piece being located outside the frame of the machine for ready manipulation to adjust said support.

15. In a typewriting machine, the combination of a key actuated member, a returning spring therefor, and means for varying the effective force exerted by said spring to
 30 30 return said member to normal position without correspondingly altering the force exerted initially by said spring on said member.

16. In a typewriting machine, the combination of a type bar, actuating means therefor including means for effecting an acceleration of the type bar in its movement to
 35 35 the printing position, a returning spring for said type bar, and means for varying the effective force exerted by said spring to return said member to normal position without
 40 40 correspondingly altering the force exerted initially by said spring on said mem-

ber and without affecting the acceleration of the type bar.

17. In a typewriting machine, the combination of a type bar, a key actuated lever
 45 45 operatively connected therewith, a fulcrum plate on which the key actuated lever has a rocking movement to effect an acceleration of the type bar as the latter moves toward the printing position, a returning spring
 50 50 operatively connected to said key lever, and means for varying the effective force exerted by said spring to return said lever to normal position without correspondingly altering the force exerted initially by said
 55 55 spring on the lever and without modifying the acceleration of the type bar effected by the rocking action of the key lever on the fulcrum plate.

18. In a typewriting machine, the combination of a series of type bars, a series of
 60 60 key actuated levers operatively connected therewith, a fulcrum plate on which the key actuated levers have a rocking motion to effect an acceleration of the type bars as
 65 65 they move toward the printing position, returning springs for said levers and which exert a force to maintain the levers against the fulcrum plate, said springs extending longitudinally in the same general direction
 70 70 as said levers, and means for effecting a simultaneous bodily adjustment of said springs in the direction of their length to vary the effective force of said springs.

Signed at Syracuse, in the county of
 Onondaga and State of New York, this 15th
 day of August, A. D. 1912.

HERBERT H. STEELE.

Witnesses:

H. BARRY,

BESSIE G. KETTELL.