J. H. BARR.

TYPEWRITING MACHINE.

APPLICATION FILED SEPT. 11, 1917.

**1,332,375.**

Patented Mar. 2, 1920.

3 SHEETS—SHEET 1.

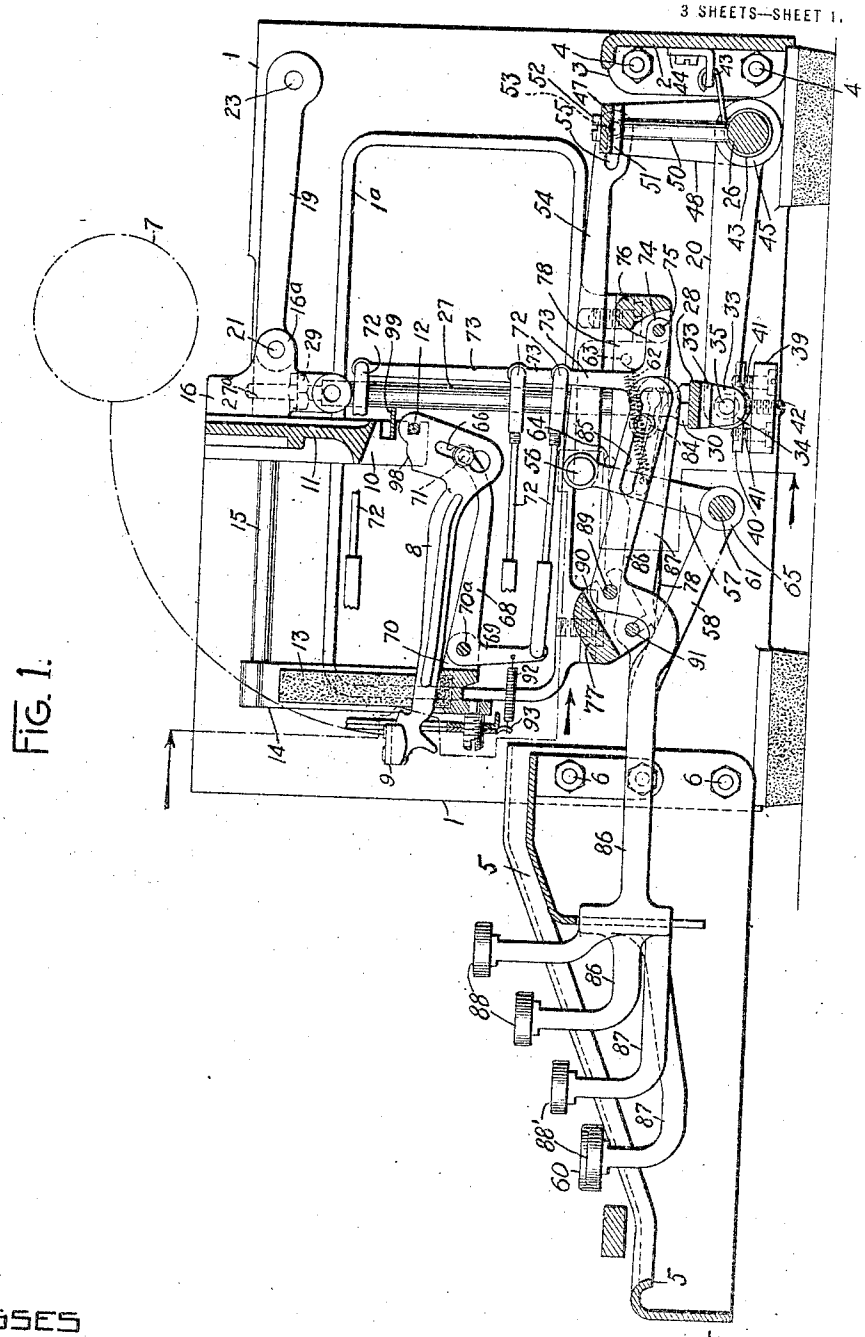


FIG. 1.

WITNESSES

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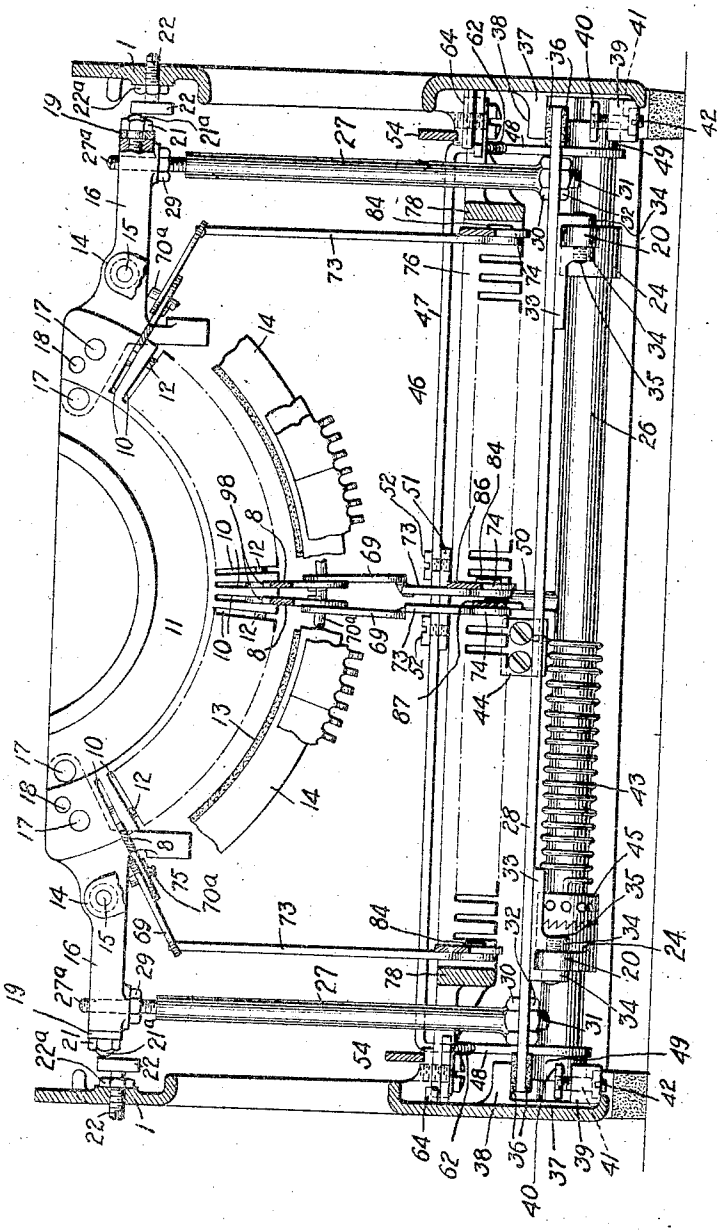


FIG. 2.

WITNESSES

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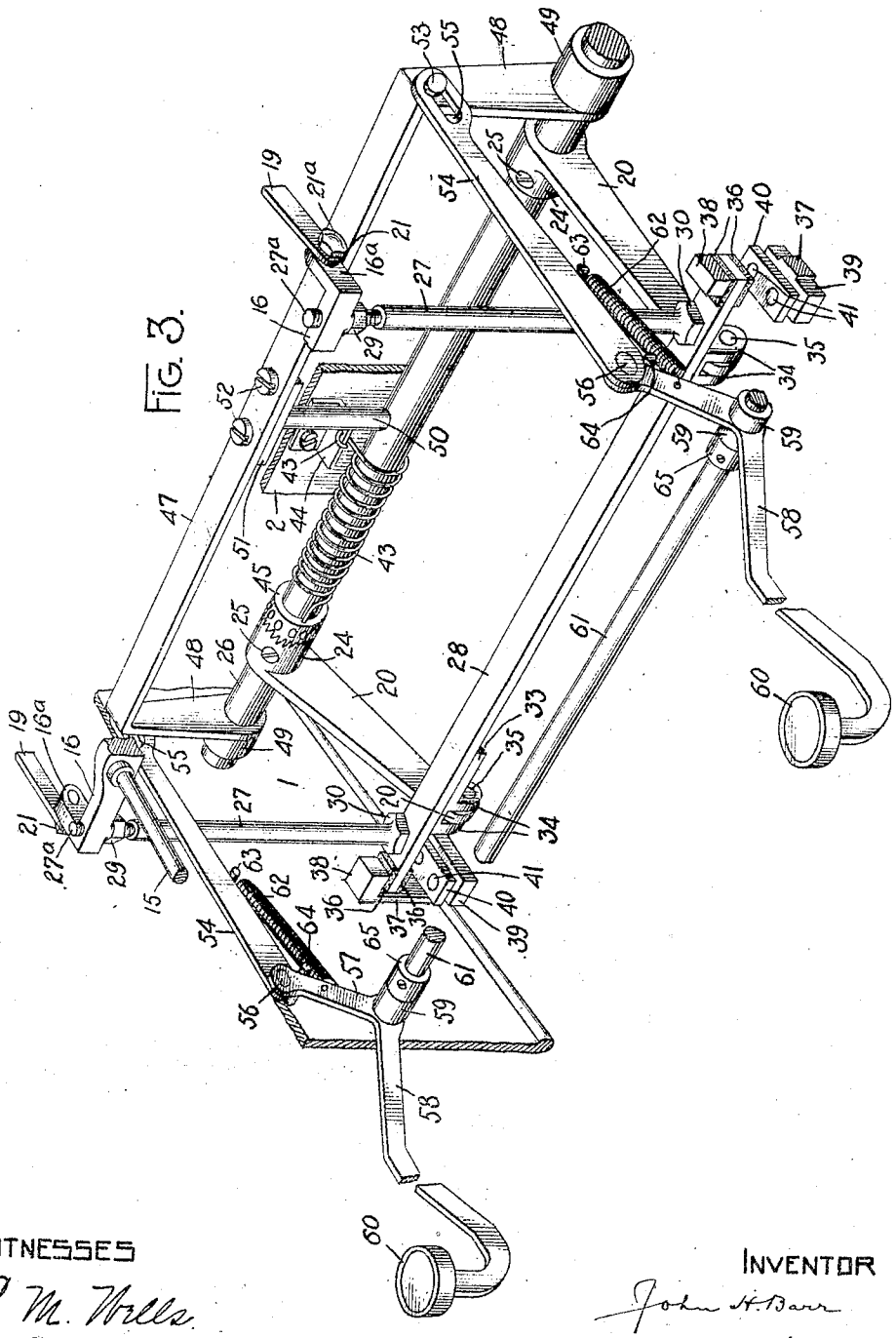
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3 SHEETS—SHEET 3.

FIG. 3.



WITNESSES

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# UNITED STATES PATENT OFFICE.

JOHN H. BARR, OF NEW YORK, N. Y., ASSIGNOR TO REMINGTON TYPEWRITER COMPANY, OF ILION, NEW YORK, A CORPORATION OF NEW YORK.

## TYPEWRITING-MACHINE.

1,332,375. Specification of Letters Patent. **Patented Mar. 2, 1920.**

Original application filed March 31, 1917, Serial No. 158,913. Divided and this application filed September 11, 1917. Serial No. 190,696.

*To all whom it may concern:*

Be it known that I, JOHN H. BARR, citizen of the United States, and 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 Typewriting-Machines, of which the following is a specification.

My present invention relates to case shifting devices for typewriting machines. Its principal object is to provide new and improved devices of the character specified.

To the above and other ends which will hereinafter appear, my invention consists in the features of construction, combinations of devices, and arrangements of parts hereinafter described and particularly pointed out in the claims.

This application is a division of my prior application Serial No. 158,913, filed March 31, 1917, now Patent No. 1,311,675, dated July 29, 1919.

The preferred form of the invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a front to rear vertical sectional view of a typewriting machine embodying my invention, parts of the machine being omitted.

Fig. 2 is a transverse vertical sectional view, taken on planes indicated by the broken dotted line $x$ $x$ in Fig. 1 and looking rearwardly.

Fig. 3 is a perspective view of my invention.

The main frame of the machine comprises side plates 1 and a rear plate 2 provided with ears 3, the side plates and rear plate being secured in fixed relationship by screws 4. A supplemental U-shaped plate 5 for protecting the keyboard is secured to the side plates 1 by screws 6. The side plates are cut out as indicated at $1^a$. The top plates that surmount the side plates are omitted from the drawing. A platen 7, diagrammatically illustrated, is mounted on a carriage for movement back and forth across the top plate under the control of carriage feeding devices which are not herein disclosed but may be of any desired construction.

Type bars 8, each provided at the outer end of its shank with a type block 9 having two types, are disposed in an arc below the platen and are adapted to coöperate with the front face thereof. The type bars are arranged in guide slots indicated at 10 in a vertically disposed type bar support or segment 11. The type bars are pivoted on a common pivot wire 12 suitably secured to the segment 11 and near their free ends are normally supported on a rest or pad 13 supported on a segmental member 14 that is secured at its end portions to rods or bars 15 extending forward from the segment near its ends.

The type bar support or element comprising a segment proper 11 and the supplemental segment or member is mounted for vertical shifting movements, and for this purpose lateral arms or brackets 16 are secured to the segment 11 in any suitable manner, as by screws 17 and dowels 18. The supporting and guiding means for the segment comprise two pairs of parallel bars or arms 19 and 20, both pairs substantially horizontally disposed, the pair 19 being arranged above the pair 20. The arms 19 are spaced apart at each side of the machine and their forward end portions are pivotally connected with the segment extensions 16. The extensions 16 terminate in rearwardly extending parallel ears $16^a$ which receive shoulder screws 21 that pass loosely through the arms 19. Each shoulder screw has a hexagonal head terminating in a rounded top $21^a$. The tops $21^a$ coöperate with the heads of screws 22 that are threaded into the side plates 1 and project inward therefrom, said screws being held in adjusted positions by means of jamming nuts $22^a$. The heads of the screws 22 have no nicks, the nicks being preferably in the ends of the shanks. The screws 21 and 22 coöperate to prevent lateral vibration or displacement of the segment. The rear ends of the arms 19 have fixed pivots 23 projecting inward from the sides of the plates 1. The lower pair of arms 20 are arranged within the base near the sides thereof, their rear end portions being provided with hubs 24, which are secured by pins or set screws 25 to a rock shaft 26 which has bearings fixed on the plates 1. The forward ends of the arms 20 are pivotally connected to a frame or supplemental portion of the segment 11, which frame is adjustably connected to said segment and carries stops for limiting the up and down movements thereof. Said frame comprises

two vertical rods or bars 27 and a connecting cross bar 28. The rods 27 are arranged at the sides of the segment 11. The upper end portion of each rod is reduced and screw threaded, as indicated at 27a. The threaded portions engage in threaded openings in the extensions 16 and below such extensions carry locking nuts 29. The lower ends of the rods 27 are formed with hexagonal heads 30 and below these heads terminate in reduced threaded portions 31 on which are nuts 32. The cross bar 28 is confined between the hexagonal heads 30 and the nuts 32 which serve as clamps to make the frame comprising the rods 27 and the cross bar 28 rigid. By loosening the nuts 32 the rods 27 may be rotated on their axes by a spanner or other tool applied to the hexagonal heads 30, the nuts 29 of course being also loosened to permit of such rotation. As a result of such rotation the frame 27, 28 and the segment 11 may be relatively adjusted, and after such adjustment may be rigidly held or set in fixed relationship by tightening or jamming the nuts 29. After thus adjusting or re-adjusting the frame and segment, the nuts 32 of course should be tightened. Brackets 33 are secured to the under face of the cross bar 28 in any suitable way, as by spot-welding, each bracket comprising a pair of downwardly extending ears 34 between which is loosely arranged the forward end of one of the arms 20. Cross pins 35 secured in the ears 34 pivotally connect the arms 20 with the cross bar 28 and consequently with the type bar segment. The end portions of the cross bar 28 project outward beyond the rods 27 and are provided with pads 36 of fiber or the like at their top and bottom faces. These pads constitute stop devices, each pad coöperating with a stationary stop device. The stationary stop devices are constituted by brackets 37 cast as a part of or otherwise suitably secured to the side plates 1, and each bracket comprises an inwardly extending lug or stop proper 38 and a lower inwardly extending lug 39. The lug 39 is broader than the lug 38 and provides a support for an adjustable stop plate proper 40 which is connected to its support 39 by three screws, the two outer screws 41 being headed and passing upward loosely through the support 39, screwing into threaded openings in the stop plate 40. The middle screw 42 is threaded through the support 39 and abuts against the lower face of the stop plate 40, holding it in its uppermost position as determined by adjustments of the side screws 41. The upper pad 36 on each side of the stop bar coöperates with a lug 38 to limit upward movement of the frame 27—28 and segment 11 while the under pads 36 coöperate with the stop plate 40 to limit downward movements of said parts. Normally the segment is maintained in its upper position by spring devices, said spring devices comprising a wire spring 43 coiled around the rock shaft 26 at its left-hand side. The inner end of said spring is hooked into an angular bracket 44 screwed to the rear of the frame plate 2, thus providing a stationary anchorage for the spring. The left-hand end portion of the spring is secured in a collar 45 loosely mounted on the shaft 26. The outer end portion of said collar is provided with ratchet teeth which engage with corresponding ratchet teeth formed on the inner face of the left-hand hub 24. The collar is provided with holes to receive a tool by which it may be rotated to provide for varying the tension of the spring 43. After adjustment the spring serves to maintain the collar set by engagement of the two sets of ratchet teeth. The spring 43, acting through the arms 20, normally overcomes the force of gravity and maintains the type bar segment and the frame depending therefrom in upper position with the top stop pads 36 engaged with the lugs 38. In this position the inner or lower case types on the type blocks 9 are adapted for printing.

In order to shift or depress the segment for printing with the outer or upper case types, key operated devices are provided, said devices operating on the shaft 26 to rock it and swing or move the arms 20 and connected parts downward. The key operated devices comprise a bail or member 46 having a body or cross portion 47 and two downwardly bent parallel arms 48 provided with hubs 49 which bear loosely on the rock shaft 26 outside the crank arms 20. A central upstanding rod or arm 50, fixed to the rock shaft 26, is provided with a T-head 51 to which the bail 46 is secured by screws 52 passing downward through the cross portion 47. The construction is such that the central portion of the bail is fixed to the central portion of the rock shaft, the end portions or arms 48 of the bail bearing loosely on the rock shaft. Lateral headed pins 53 extending outward from the upper end portions of said arms are engaged loosely by the rear ends of horizontally disposed links 54, said links being provided with slots indicated at 55 which receive the pins 53. The forward ends of said links are pivotally connected at 56 with the upwardly extending arms 57 of shift key levers, which further comprise forwardly extending arms 58 and hub portions 59, said arms 58 terminating in shift keys 60. The hub portions 59 bear rotatably on a transverse pivot rod 61 secured at its ends in the side plates 1. Draw springs 62, anchored at their rear ends to stationary pins 63 and at their forward ends hooked into the arms 57, restore the trains of key operated devices comprising the parts 54, 57 and 58 to

normal or lower case position after a downward shifting operation and tend to maintain the lever arms 57 engaged with stop pins 64 that project laterally inward from the side plates 1. The construction is such that the keys 60 are independent of each other, the loose or lost motion connection 53, 55 permitting the bail 46 and rock shaft 26 to be rocked by depressing one of the keys 60 without affecting the other key and the parts controlled thereby. The keys 60 are spaced apart, being arranged at opposite sides of the printing keyboard and the angular levers 57, 58 may be kept in proper position on the pivot rod 61 by means of fixed collars 65 which loosely confine the hubs 59 between said collars and the adjacent side plates 1. It will be observed that as a result of the described construction the pull, transmitted to either link 54 actuated by the associate shift key 60, is further transmitted through the pin 53, bail 46 and arm 50 to the middle portion of the rock shaft 26, so that the torsion to which such rock shaft is subjected does not produce unequal motion of the two links or arms 20. Also it will be observed that the shift frame is provided with stop devices comprising the parts 36 and 37 which are independent of the stop devices 64 of the actuating mechanism controlled by the keys 60; also that after the extent of shifting movement of the segment 11 and its depending frame 27, 28 has been determined by the relative adjustment of the stops 38 and 40, the position for location of the segment 11 may be independently varied or set through adjusting the relationship between said segment and its frame 27, 28, as has been described. During the up and down shifting movements of the segment the rounded tops $21^a$ of the heads of the screws 21 coöperate with the heads of the adjustable screws 22 to assist in guiding the segment, preventing undue sidewise movement or vibration. The screws 22 are so adjusted in respect to the screws 21 that the free up and down shift of the segment is not impeded but any undue side movement is prevented. The heads of the screws 22 are of such diameter that in both lower and upper case positions the rounded tops $21^a$ are contiguous to said heads so that at all times the segment is guided and controlled in respect to lateral vibration. It will be further understood that a lock of any suitable description may as usual be provided in connection with one of the shift key levers to hold the segment depressed in upper case position.

The type bars hitherto described are provided each with a train of key controlled actuating devices. Each train coöperates with a cam slot 66 in the associate type bars and comprises a bell crank having a long arm 68 and a short arm 69. The bell cranks are mounted in slots indicated at 70, formed in the member 14, said bell cranks having a common segmental pivot wire $70^a$ mounted on said member 14. The long arm 68 of each bell crank is provided with a headed pin 71 which engages in the slot 66 of the associate type bar and operates the latter. The shorter arms 69 of the bell cranks are connected by links 72 with the upstanding arms 73 of another set of bell cranks which comprise also arms 74, said bell cranks being pivoted on a pivot wire 75 supported on a frame that is detachably mounted in the base of the machine and comprises rear and front bars 76 and 77 and connecting end bars 78. Each bell crank 73, 74 is provided with a headed pin 84 that engages in the cam slot, indicated at 85, formed in the rear end portion of the key lever. There are two kinds of key levers 86 and 87, differing somewhat in shape, each key lever 86 being provided with a printing key lever 88 and being pivoted on a fulcrum rod 89 common to all of the key levers 88. Guide slots 90 in the bar 77 receive the key levers 86 and 87. The key levers 87 have keys 88′ and are pivoted on a common pivot wire 91. Draw springs 92, connected to the lever arms 69 and anchored to stationary hooks 93, assist to restore the type bars after actuation.

The type bars and their actuating mechanism need not be more fully described herein since they are primarily the subject-matter of my prior application aforesaid and are claimed in said application and not in the present one.

It will be understood that when one of the key levers is depressed the bell crank 73, 74 that is directly connected to it is rocked, this motion being transmitted through the pull links 72 to the connected bell crank 68, 69, said bell crank operating through its pin 71 on its cam slot 66 to swing the connected type bar upward and rearward to print against the platen. Preferably the type bars are provided with shoulders 98 that, toward the latter part of the type bar movement, coöperate with a universal bar 99 that is comprised in the carriage feeding mechanism, the universal bar being mounted to shift with the segment 11. When said segment is in the upper position, in which position it prints lower case, the inner types on the type bars will print as has been stated. When, however, one of the shift keys 60 has been operated, the type bar segment will be lowered or depressed, as has been explained, so that if one of the printing keys be actuated, the outer type on the connected type bar will be caused to print. The levers 73, 74 do not participate in case shifting movements and when such shifts take place the links 72 swing about their pivotal points of connection with said levers as centers.

It will be observed that by my present invention the shiftable element or segment is shiftable downward and upward and is controlled and guided by means comprising two pairs of parallel pivoted arms, the lower pair being arranged in the base of the machine and being secured to the rock shaft and also being pivotally connected at their forward ends with a supplemental vertically movable or rising and falling frame which is adjustably secured to the type bar segment proper and extends downward therefrom, being provided with stop devices which coöperate with stationary stop devices; that said rock shaft is operated by independent shift keys which are arranged at opposite sides of the keyboard, said shift keys being connected to links which in turn are loosely connected with parallel rocking arms comprised in a bail or fore and aft rocking frame mounted on said rock shaft; that the connection between the rock shaft and the shift keys comprises three arms, a central arm as 50 and two end arms as 48, the central arm being fixed to the rock shaft and the two end arms loose thereon, connections, as the cross bar 47, being provided for connecting the three arms; that there are provided sets of stops for the type bar support and other sets of stops for the shift keys and connected devices for moving said support; and that when the type bar segment is shifted the bell crank levers 68, 69 shift therewith and that at this time the links 72 swing about their rear pivotal connections with the stationary bell cranks 73, 74 which, together with the key levers, remain motionless during the shifting operations.

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

1. In a front strike typewriting machine, the combination of a platen, type bars, a support therefor, a frame rigid with said support and adjustably connected thereto, said frame comprising a cross bar extending from side to side of the machine within the base, and means for controlling and guiding said support comprising two pairs of parallel pivoted arms, one pair arranged above the other, one pair of said arms being connected to said support near its outer ends and the other pair being spaced apart within the base of the machine and connected directly to said cross bar near its ends.

2. In a front strike typewriting machine, the combination of a platen, type bars, a support therefor, a U-shaped frame adjustably connected to said support and depending therefrom, and means for shiftably controlling said support, said means comprising two pairs of parallel arms, one pair connected with the upper part of said support and extending rearward therefrom and having stationary pivotal centers, and the other pair of arms arranged in the base of the machine and pivotally connected directly to the cross bar of said frame near the sides of the base and extending to a stationary pivotal center.

3. In a front strike typewriting machine, the combination with a platen, type bars, a vertical type bar segment, a frame rigid with said segment and extending downward within the base of the machine, means for affording adjustment between said frame and said segment, stops for said frame, a pair of parallel arms having stationary pivots and connected with said segment, a second pair of parallel arms connected directly with the lower portion of said frame, said second pair of arms being spaced apart so that they are located near the sides of the base of the machine, a rock shaft on which said second pair of arms are fixed and key controlled means for rocking said shaft.

4. In a typewriting machine, the combination of a platen, a type bar support, and key operated means for effecting a relative shifting movement between said support and said platen, said means comprising a rock shaft, a central arm fixed thereto, two end arms loosely connected to said rock shaft, and means for connecting said central arm with said end arms.

5. In a typewriting machine, the combination of a platen, type bars, a support for said type bars, and means for controlling said support, said means comprising a rock shaft, a bail having parallel arms loosely surrounding said rock shaft near its ends, a central arm fixed to said rock shaft and to said bail, independent shift keys at opposite sides of the keyboard, and connections between each of said keys and one of said parallel arms.

6. In a typewriting machine, the combination of a platen, type bars, a support for said type bars, and means for controlling said support, said means comprising a rock shaft, a bail having parallel arms loosely surrounding said rock shaft near its ends, a central arm fixed to said rock shaft and to said bail, shift key levers spaced apart, and links connecting said shift key levers with said parallel arms.

7. In a typewriting machine, the combination of a platen, type bars, a support for said type bars, and means for controlling said support, said means comprising a rock shaft, a bail having parallel arms loosely surrounding said rock shaft near its ends, a central arm fixed to said rock shaft and to said bail, shift key levers, links pivotally connected to said shift key levers and having loose connections with said parallel arms, stops for said levers, and springs normally maintaining said key levers in engagement with said stops.

8. In a typewriting machine, the combination of a platen, type bars, a type bar segment, a frame rigid with said segment and comprising two parallel uprights and a connecting cross bar, stop devices on said frame, coöperative stationary stop devices, means for affording relative adjustment between the uprights of said frame and said segment, key operated devices for shifting said frame and said segment and having a lost motion connection with said segment, said devices comprising a key lever, and stop devices for said key lever.

9. In a front strike typewriting machine, the combination of a platen, type bars, a vertical type bar segment, a frame comprising two vertical rods or bars and a cross bar connecting the lower end portions of said rods or bars, the upper portions of said rods having adjustable screw connections with side portions of said segment, stop devices coöperative with said cross bar for limiting up and down movement of said segment, key operated shifting devices connected to said segment, and stop devices for said key operated devices.

10. In a front strike typewriting machine, the combination of a platen, type bars, a vertical type bar segment, a frame comprising two vertical rods or bars and a cross bar connecting the lower end portions of said rods or bars, the upper portions of said rods having adjustable screw connections with side portions of said segment, horizontally disposed parallel arms having stationary pivotal centers and being pivotally connected with said segment, other horizontally disposed parallel arms parallel also to the first pair and arranged below the same in the base of the machine, said other parallel arms having pivotal connections with said cross bar, a rock shaft to which said other parallel arms are fixed, and key operated devices for controlling said rock shaft.

11. In a front strike typewriting machine, the combination of a platen, type bars, a type bar segment, a frame comprising two vertical rods or bars and a cross bar connecting said rods or bars, said rods having adjustable screw connections with said segment, horizontally disposed parallel rocking arms pivotally connected with said segment, other horizontally disposed parallel arms parallel also to the first pair and arranged below the same in the base of the machine, said other parallel arms having pivotal connections with said cross bar, a key operated rock shaft to which said other pair of parallel arms are fixed, and a counterbalancing spring surrounding said rock shaft and anchored to the frame of the machine.

12. In a front strike typewriting machine, the combination of a platen, type bars, a support therefor, means for controlling and guiding said support comprising sets of parallel arms, and means for preventing sidewise movement of said support, said means comprising contact devices movable with said support and having rounded heads, and headed adjustable screws projecting inward from the sides of the frame, the heads of the screws having uninterrupted plane surfaces and providing contact devices with which said rounded heads coöperate, the ends of the shanks of said screws being provided with nicks for receiving an adjusting tool.

13. In case shifting mechanism for typewriting machines, the combination of a shiftable element, an up-and-down movable frame connected to said element, a fore-and-aft rocking bail, key actuated devices connected to said bail near its ends, and equalizing devices for transmitting the shifting movement from said bail to said shiftable element and to said frame.

14. In case shifting mechanism for typewriting machines, the combination of a shiftable element, an up-and-down movable frame connected to said element, a fore-and-aft rocking bail, key actuated devices connected to said bail near its ends, a rock shaft, arms fixed to said rock shaft near its ends and pivotally connected to said frame, and a central arm fixed to said rock shaft and rigidly connected to said bail.

15. In case shifting mechanism for typewriting machines, a shiftable element, a rock shaft having arms connected to said element, a bail loosely mounted on said rock shaft, key actuated devices connected to the ends of said bail, and a connection between said bail and said rock shaft whereby when the bail is actuated at either end its motion is transmitted substantially equally to both of said arms through said rock shaft.

16. In a typewriting machine, the combination of a type bar segment, a pair of pivoted arms pivotally connected thereto, a vertically movable frame having an adjustable connection with said segment, a second pair of pivoted arms connected to said vertically movable frame, a rock shaft on which said second pair of arms are supported, a bail loosely pivoted on said rock shaft, an arm rigidly connected to said rock shaft and to said bail, shift keys one at each side of the keyboard, and connections between said keys and the end portions of said bail.

Signed at the borough of Manhattan, city of New York, in the county of New York and State of New York, this 10th day of September, A. D. 1917.

JOHN H. BARR.

Witnesses:
CHARLES E. SMITH,
E. M. WELLS.