

1,433,112.

Patented Oct. 24, 1922.

5 SHEETS—SHEET 1.

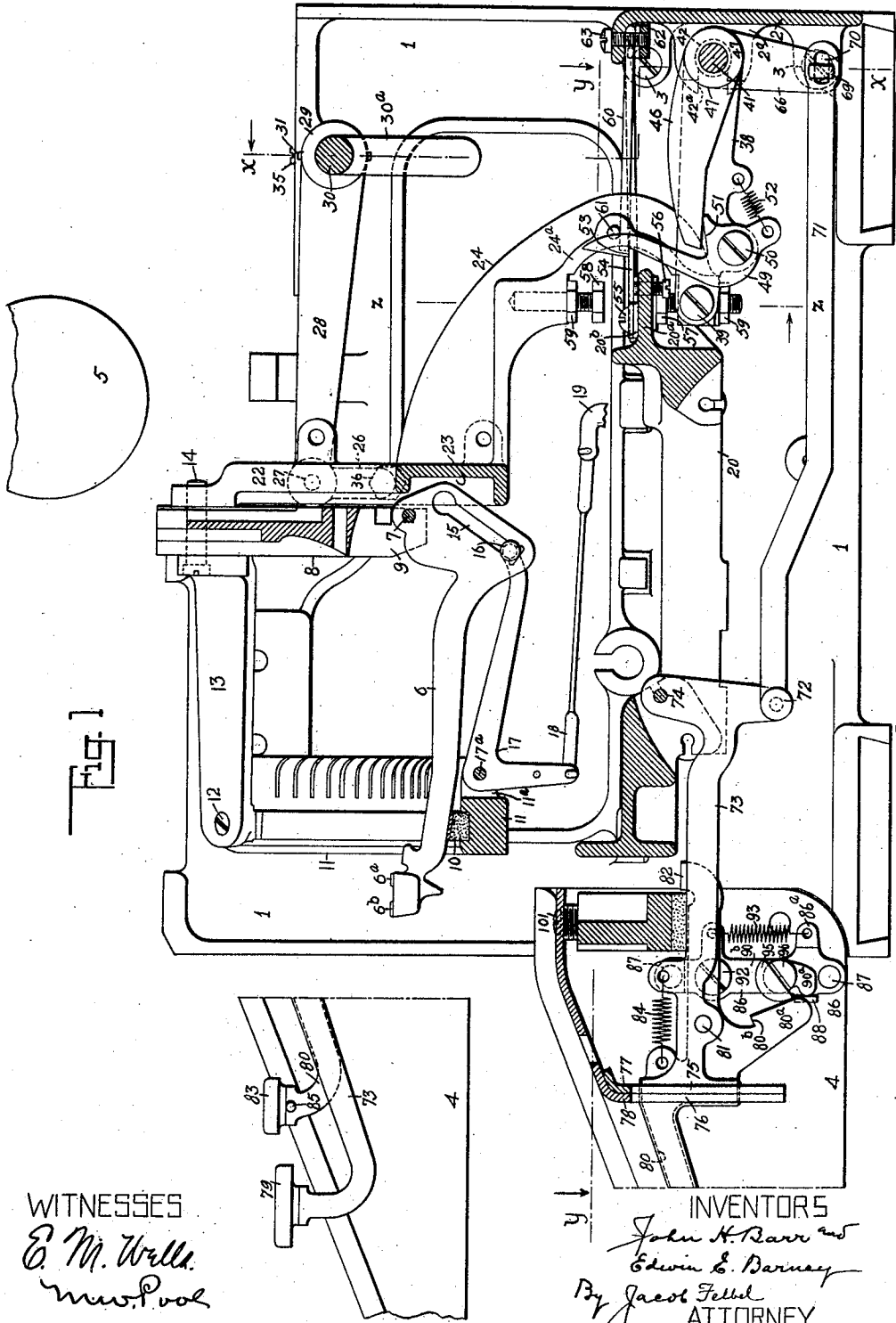


FIG. 1

WITNESSES
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TYPEWRITING MACHINE.

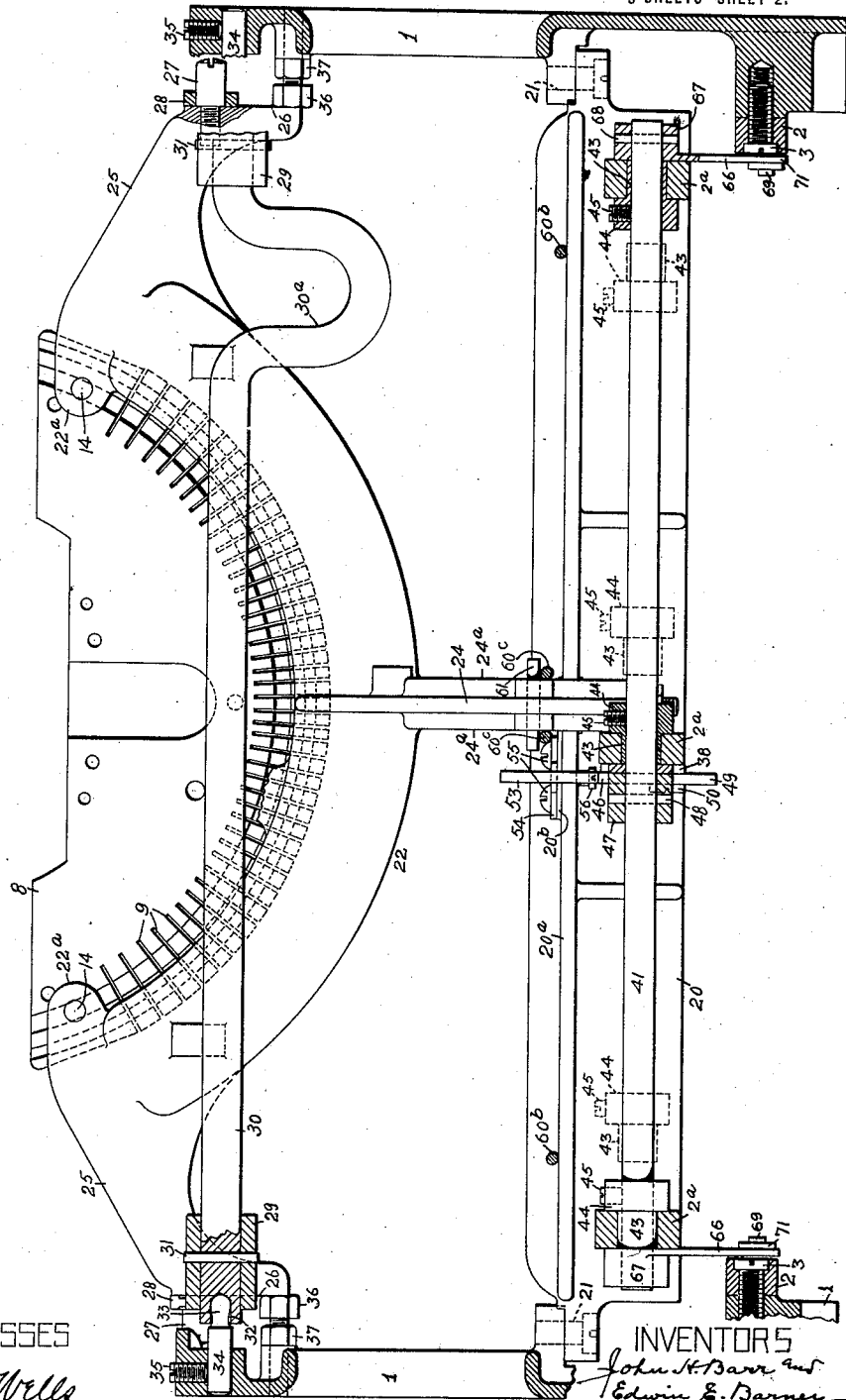
APPLICATION FILED AUG. 16, 1920.

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5 SHEETS—SHEET 2.

FIG. 2



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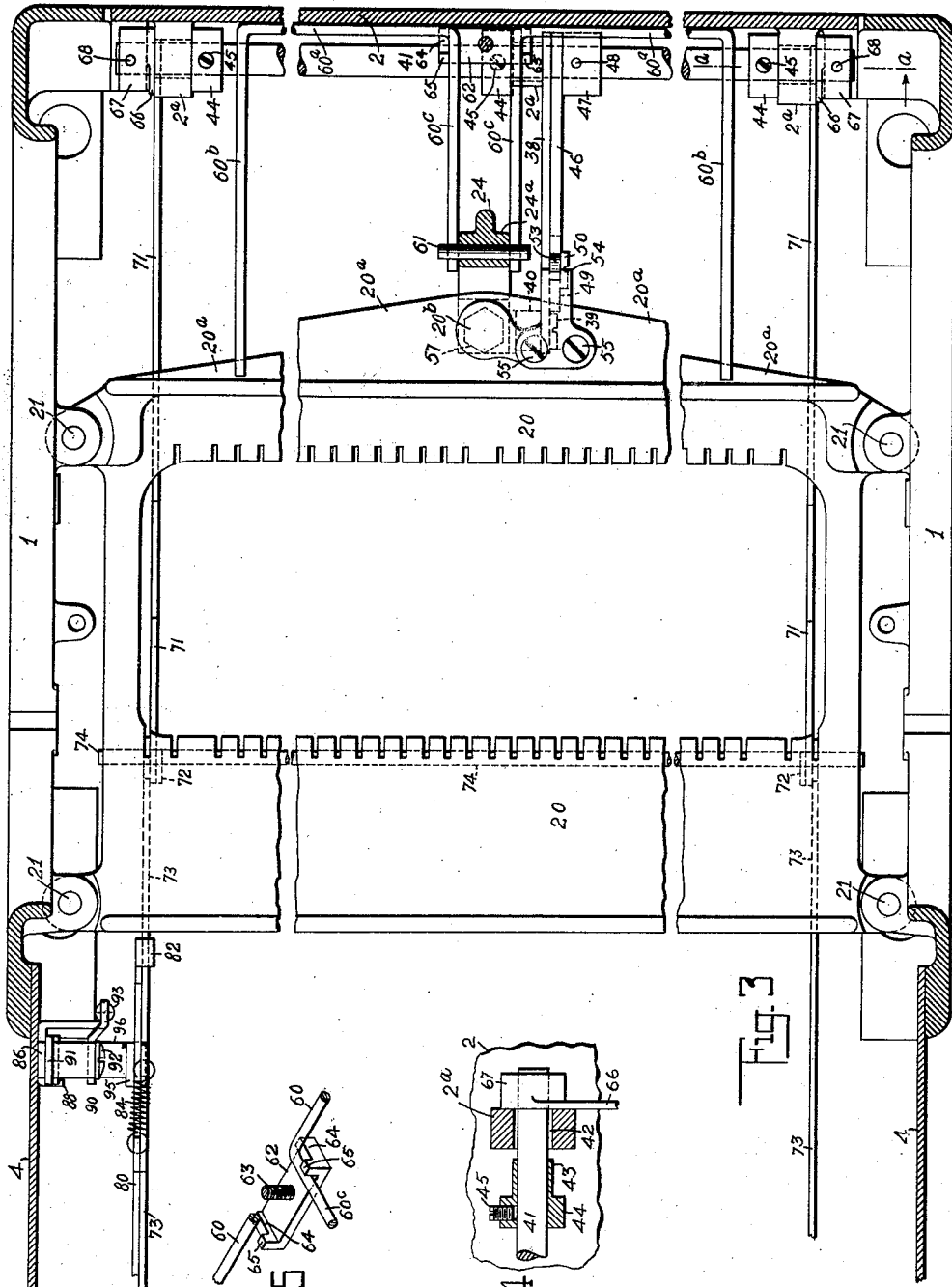
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 TYPEWRITING MACHINE.
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5 SHEETS—SHEET 3.



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5 SHEETS—SHEET 4.

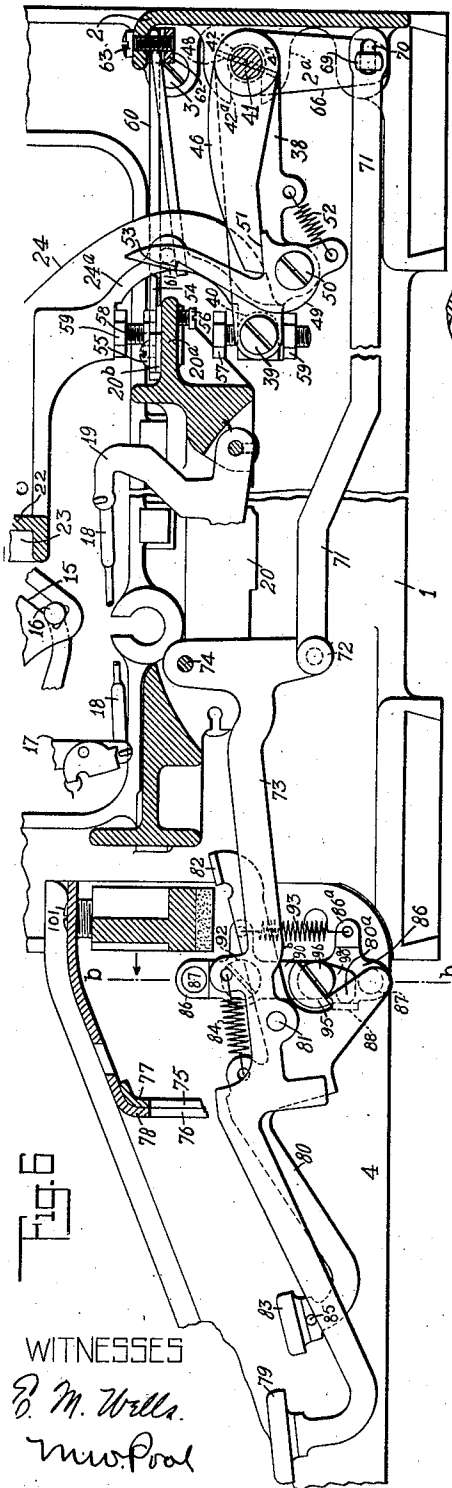


Fig. 6

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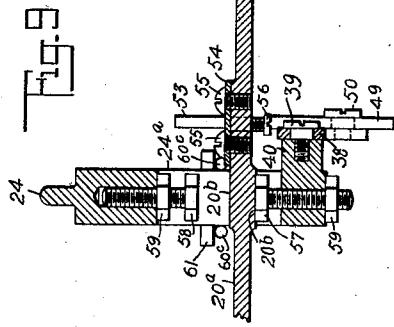
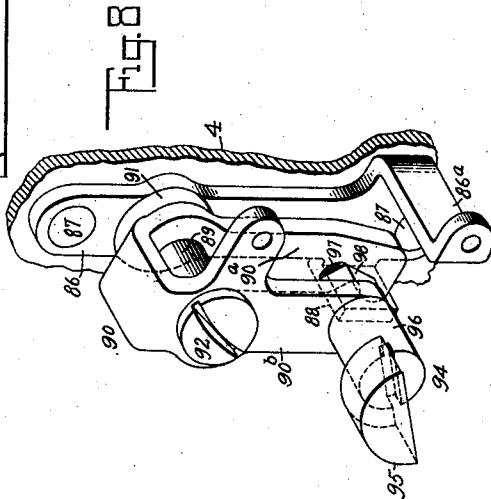


Fig. 9

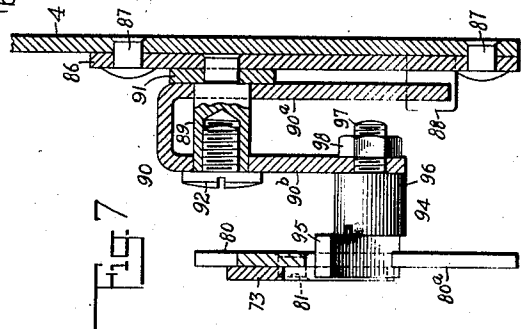


Fig. 7

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5 SHEETS—SHEET 5.

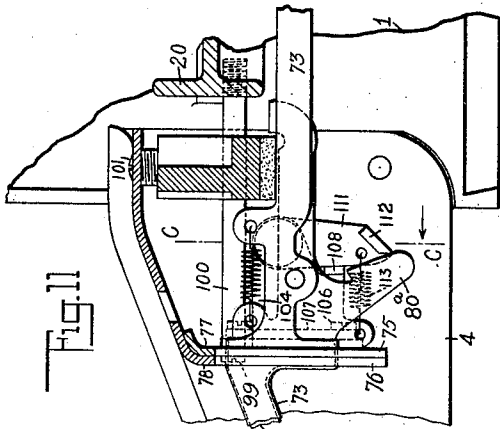


Fig. 11

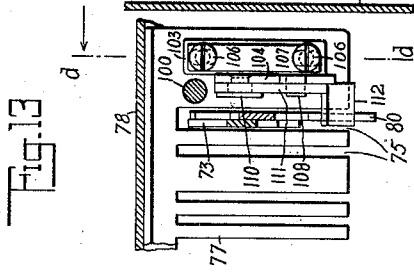


Fig. 13

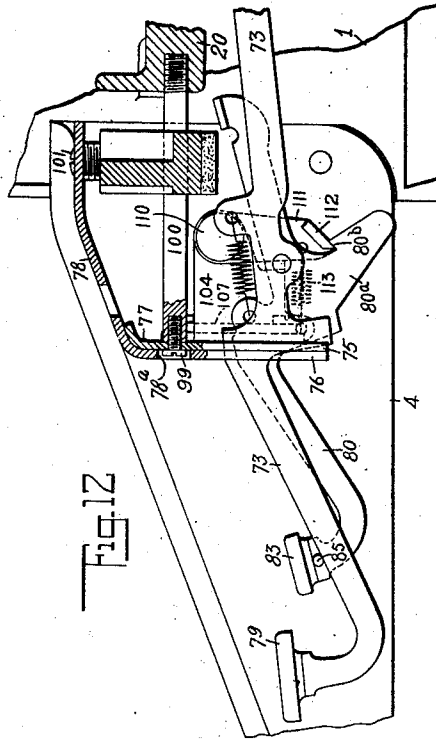


Fig. 12

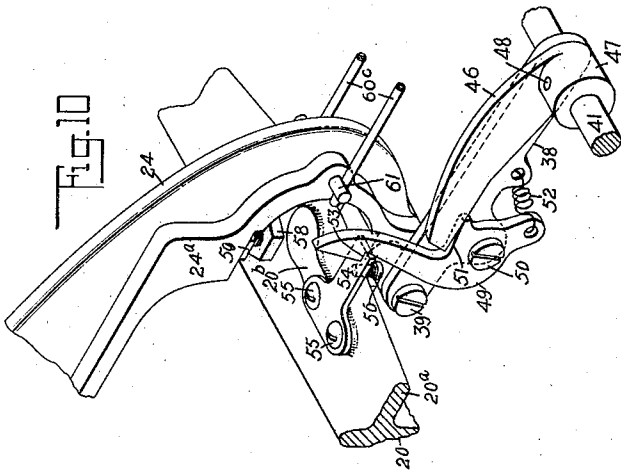


Fig. 10

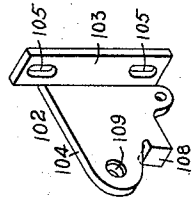


Fig. 15

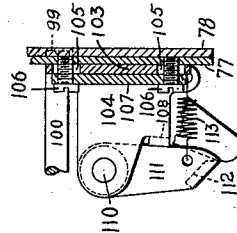


Fig. 14

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 Jacob Felbel

UNITED STATES PATENT OFFICE.

JOHN H. BARR, OF NEW YORK, N. Y., AND EDWIN E. BARNEY, OF NEWARK, NEW JERSEY, ASSIGNORS TO REMINGTON TYPEWRITER COMPANY, OF ILION, NEW YORK, A CORPORATION OF NEW YORK.

TYPEWRITING MACHINE.

Application filed August 16, 1920. Serial No. 403,780.

To all whom it may concern:

Be it known that we, JOHN H. BARR and EDWIN E. BARNEY, citizens of the United States, and residents, respectively, of the city, county and State of New York, and Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Typewriting Machines, of which the following is a specification.

Our present invention relates to case shifting devices for typewriting machines, and its principal object is to provide new and improved devices of the character specified. In the form shown in the drawings our invention is adapted to shift the type bar system but it is to be understood that the invention is applicable to devices for otherwise effecting the case shift.

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

In the accompanying drawings which illustrate the preferred form of our invention,

Figure 1 is a front to rear vertical sectional view of a typewriting machine embodying said invention, parts of said machine being omitted and parts broken away and the front or keyboard portion at the left of the figure being transposed above and somewhat to the right of its usual position.

Figure 2 is a vertical sectional view taken on planes indicated by the dotted line *x x* in Figure 1 and looking forward.

Figure 3 is a horizontal sectional view taken on a plane indicated by the dotted line *y y* in Figure 1 and looking downward.

Figure 4 is a detail sectional view taken on a plane indicated by the dotted line *a a* in Figure 3 and looking in the direction of the arrow at said line.

Figure 5 is a fragmentary perspective view of a detail.

Figure 6 is a fragmentary vertical sectional view corresponding to Figure 1 but showing the parts as they are related when the type bar system is shifted.

Figure 7 is an enlarged vertical sectional view taken on a plane indicated by the

dotted line *b b* in Figure 6 and looking forward in the direction of the arrow at said line, said figure illustrating certain of the shift key lock devices.

Figure 8 is an enlarged perspective view of certain of the shift key lock devices.

Figure 9 is a vertical sectional view taken on a plane indicated by the dotted line *z z* in Figure 1 and looking rearward in the direction of the arrow at said line.

Figure 10 is a fragmentary perspective view of the locking devices for the shiftable type bar support or segment.

Figure 11 is a fragmentary vertical sectional view illustrating a modified construction of the shift key locking mechanism.

Figure 12 is a vertical sectional view corresponding to Figure 11 but illustrating the locking mechanism when in effective position or when the type bar support is shifted.

Figure 13 is a transverse vertical sectional view taken on a plane indicated by the dotted line *c c* in Figure 11 and looking forward in the direction of the arrow at said line.

Figure 14 is a vertical sectional view taken on a plane indicated by the dotted line *d d* in Figure 13 and looking in the direction of the arrow at said line.

Figure 15 is a perspective view of a detail of the modified shift key locking mechanism.

As appears from Figs. 1, 2 and 3, the main frame of the machine comprises side frames or plates 1 preferably formed with openings and connected at the rear by a cross plate 2, the frame members being secured together by screws 3. A U-shaped frame member 4 is connected to the front portions of the side plates 1 and encloses the keyboard. Above the main frame is arranged a platen 5, diagrammatically illustrated, said platen being mounted on a carriage, not shown, which is adapted for movement back and forth from side to side of the machine under the control of devices including suitable escapement mechanism.

Co-operative with the front face of the platen are type bars 6 pivoted on a common fulcrum wire 7 that is mounted on a segmental support 8, each type bar being provided with two types, a lower case type 6^a and an upper case type 6^b. The type bars

are arranged in radial slots 9 formed in said support and normally are horizontally disposed, their free end portions resting on a pad 10 mounted on a segmental rest 11. The end portions of this rest are secured by screws 12 to the forward ends of arms 13 extending horizontally forward from the segment or support 8 near its ends. The arms 13 and segment 8 are connected together by screws 14. The rear portions of the type bars 6 are provided each with a slot 15 with which co-operates a headed pin 16 fixed to the rear end of the longer horizontal arm of a bell crank 17 pivoted on a fulcrum wire 17^a common to all of the bell cranks, said fulcrum wire being mounted on the segment 11. The rear portion of said segment is formed with guide slots 11^a in which the bell cranks 17 are arranged. The shorter arm of each bell crank has connected to it the forward end of a link 18, the rear end of said link being pivotally connected to an arm of a lever 19 fulcrumed on a rectangular frame member 20 that is horizontally arranged within the base of the machine and is detachably secured thereto by screws 21. The sub-frame or member 20 is provided with a rearwardly extending lip or ledge portion 20^a. The full train of type bar actuating devices is not disclosed herein nor is the type bar action or system claimed per se since it forms no part of the present invention. The type bar segment 8 is secured to a supporting frame or bracket member, designated as a whole by the reference numeral 22, by means of the screws 14. The bracket member is vertically arranged behind the type bar segment and the screws 14 pass through the segment into ears 22^a projecting inward from the bracket near its top. The bracket as a whole is curved to conform to the curve of the segment, its front being formed with a channel 23 housing the rear end portions of the type bars. Centrally the bracket is provided with a rearwardly and downwardly curving arm 24 and at its sides said bracket is formed with outwardly extending lugs 25 having plain vertical outer faces 26. Pivotally connected by shoulder screws 27 to the outer faces of the lugs 25 are horizontally disposed and rearwardly extending arms or links 28, these arms bearing on the shouldered portions of the screws 27 which are screwed into the lugs 25. The arms 28 at their rear end portions are provided with collars 29 which fit over the end portions of a rock shaft 30, the collars being pinned thereto by pins 31. The rock shaft 30 extends from side to side of the machine at its upper rear portion, and at the right-hand side, viewed from the rear as in Fig. 2, is formed with a depressed portion 30^a to accommodate mechanism, not shown, including the spring drum shaft. At

its ends the rock shaft 30 is formed with depressions indicated at 32 which receive rounded end portions 33 of pivot pins 34 projecting horizontally inward from the side plates 1, said pins being accommodated in holes in the side plates and being adjustably secured to the side plates by downwardly extending set screws 35. The construction in effect provides a rock shaft 30 and crank arms 28 near the ends thereof to support and guide the shiftable element comprising the bracket 22, the type bar segment 8 and the rest 11. This element is further guided by the heads of adjustable screws 36 which are secured in the side frames 1 and project inward therefrom, being adjustably locked to said side frames by locking nuts 37. The tops of the heads or inner faces of said screws 36 are adapted to co-operate with the plain faces 26 of the bracket 22 and are so adjusted that while they do not generate friction that would interfere with the shifting movements of said bracket, they so co-operate with the faces 26 as to prevent undue side shake or vibration of the shiftable member.

The guiding and controlling of the shiftable member is further assisted by devices comprising a link or arm 38 which, as will be understood from Figs. 1, 2, 3, 9 and 10, is centrally arranged at the base of the machine, said link extending horizontally fore and aft of the machine and its forward end being pivotally connected by a shoulder screw 39 to the curved arm 24, the lower end of said arm being provided with a rightwardly extending projection or boss 40 which receives said shoulder screw. The rear end portion of the arm or link 38 is perforated to fit loosely over a rock shaft 41, said rock shaft being supported from lugs 2^a which project forward from the inner face of the frame plate 2. These lugs are formed with perforations 42, said perforations having open mouths 42^a at their forward sides, contracted so that the distance across these mouth portions is slightly less than the diameter of the perforations. The perforations 42 accommodate bushings or bearing members 43 provided with collar portions 44 which receive set screws 45 by which the bushings may be held in fixed relationship with the rock shaft 41 which passes through them and over which they fit. The bushings take a bearing engagement in the perforations 42 and are of greater diameter than the mouths 42^a so that when they are engaged in the bearing openings 42 (as in Figs. 2 and 3) the rock shaft 41 cannot be displaced forward through the mouths 42^a. However, by loosening the set screws 45 the bushings 43 may be released and slid along the shaft 41 out of engagement with their bearings, permitting the rock shaft to be removed by being drawn

forward through the open mouths 42^a of said bearings, the rock shaft being of lesser diameter than these mouths. The withdrawn position of the bushings is shown in Fig. 4 and in dotted lines in Fig. 2. There are three lugs 2^a, one near each side of the machine and one centrally arranged between them and three corresponding bushings, so that the construction provides a stable support for the rock shaft, while at the same time permitting its convenient withdrawal and replacement. As stated, the link 38 bears loosely on the rock shaft 41, said link being contiguous to the central lug 2^a and being disposed at the right of said lug. The link 38 is loosely confined between the central lug 2^a and a crank arm or operating arm 46, this crank arm being provided with a hub 47 which fits over the rock shaft 41 and is pinned thereto by a pin 48. The crank arm extends forward from the rock shaft and its free end is adapted to co-operate with a latch or locking member comprised in a mechanism which is adapted automatically to maintain the shiftable type bar element locked in its normal position. Said latch, indicated by the numeral 49, is pivoted on a shoulder screw 50 which is supported on the link 38, the latch being in the same vertical plane with the crank arm 46, so that the free end of said crank arm may bear on a bearing face 51 with which the latch is provided above its pivot 50. Below said pivot the tail portion of the latch is perforated to receive the hooked end of a coiled spring 52, the opposite end of said spring being anchored to the link or latch support 38, the tendency of said spring being constantly to swing the upper arm of said latch forward. Said upper arm terminates in a hook portion having a horizontally disposed plain or engaging face 53. This face is adapted normally to overlie the rearwardly extending end portion of a T-shaped latch plate 54 secured by screws 55 to a thickened portion or boss 20^b of the ledge 20^a of the frame plate 20. Normally the latch 49 overlies and engages with the plate 54, as clearly shown in Figs. 1 and 10, its forward movement being limited by contact with the end of said plate. At this time the shiftable type bar support is in its lower case position so that the inner or lower case types on the type bars may co-operate with the printing face of the platen 5. Adjustment of the latch plate 54 is afforded by a screw 56 which is threaded upward through the ledge 20^a and engages the under face of the plate 54 behind the securing screws 55. By loosening these screws and advancing upward the screw 56, the engaging or rear end of the plate 54 may be raised or lifted. Likewise said plate may be depressed by lowering the engaging end of the screw 56 and correspondingly tightening

the securing screws 55. The screw 56 passes through the ledge 20^a in rear of the thickened portion 20^b so that the upper end of the engaging portion of the screw 56 is clear of the ledge, as shown in Fig. 1.

Assisting to maintain the type bar support in its case positions are stop devices comprising headed screws 57 and 58 which are supported on the arm 24 and are adapted to co-operate with the ledge 20^a which serves as a stationary frame stop or arresting device. The arm 24 is provided at its sides with flanges or thickened portions 24^a which serve to strengthen the arm and also afford sufficient stock for threading in the stop screws 57 and 58. The lower portion of the arm 24 is so shaped as loosely to embrace the ledge 20^a, the screws 57 and 58 being arranged respectively below and above said ledge so that their heads may contact there with at the thickened portion 20^b. The screw 57 is threaded down through the lower end of the arm 24 so that the screw head may contact with the under face of said ledge when the type bar support is in its lower case position, this in the present instance being when the type bar support is in its raised or uppermost position. The stop screw 58 is threaded upward into the arm 24 so that the head of said screw may contact with the upper face of the ledge to arrest the type bar support or segment when it is depressed to bring the upper case types 6^b into position for use. This upper case position is illustrated in Fig. 6. Adjustability of the segment stops or screws 57 and 58 is of course essential and in order to maintain the screw stops fixed in adjusted position, they are provided with locking nuts 59 which co-operate with contiguous portions of the arm 24 to lock the screw stops after they have been properly set.

In order to restore the shiftable type bar element from its lowermost (or upper case) position to its upper (or lower case) position, spring mechanism is provided which is best illustrated in Figs. 1, 2, 3 and 5. Said spring mechanism comprises preferably two U-shaped spring members of round stock designated as 60. These are horizontally disposed and their connecting or cross portions 60^a are contiguous to the frame plate 2, the ends of their outer arms 60^b overlying the stationary ledge 20^a. The inner arms 60^c of said spring members extend forward in parallelism and terminate at opposite sides of the arm 24, their ends underlying a cross pin 61 extending through said arm. At the bends formed between the arms 60^c and the parts 60^a of the spring members they are supported on a bracket or plate 62 which is arranged below the forwardly curved top portion of the cross plate 2 and is loosely secured thereto by a headed screw 63 passing downward through said

top portion. The bracket 62 has side ledges or lips 64 terminating forwardly in somewhat higher extensions 65. The spring members overlies and rest on the side ledges or walls 64, and the inner arms 60^c extend forward inside of said walls and contiguous to the extensions 65 with the inner faces of which the spring arms are adapted to contact. The construction is such that while the spring members 60 are supported on the bracket 62, and are held against sidewise displacement by the parts 65 of said bracket, nevertheless the free action of the spring arms is not impeded by the bracket. When the type bar element is shifted downward the spring arms 60^c are flexed, subjecting the cross portions 60^a to torsion, and when the shifted element is released the flexed spring arms operate to return it or restore it to its uppermost position with the stop screw 57 in contact with the under face of the stationary stop 20^b. During this back and forth shifting movement the latch 49 will be automatically actuated, as will hereinafter appear.

Key actuated devices are provided for operating the case shift mechanism, said devices comprising, as best appears from Figs. 1, 2, 3 and 6, crank arms 66 secured to opposite end portions of the rock shaft 41, each crank arm 66 having a hub or collar portion 67 which is secured by a pin 68 to the rock shaft 41 outside the end bearings 2^a. These crank arms may act in co-operation with the end bearings 2^a to prevent endwise displacement of the rock shaft 41. The crank arms depend from the rock shaft and each is provided with a laterally projecting pin or rivet 69 having a rectangular head. Each pin 69 passes through a slotway 70 formed in the rear end of a forwardly extending link 71. In assembling, the head of the pin is horizontally disposed and passes through the slot readily, and thereafter the pin is turned and set so as to bring the head crosswise of the slot, the construction preventing disconnection of the link 71 from its associate crank arm 66. The forward end of each link is pivotally connected at 72 with an angular lever 73 fulcrumed on a rod 74 mounted upon the detachable sub-frame 20, each lever 73 being guided in a guide slot in said frame. The forward portion of each of said levers 73 passes through slots 75 and 76 formed respectively in two parts 77 and 78 of a comb plate or slotted guide member, the mounting of which will be more particularly described in connection with the modification illustrated in Figs. 11-15. Each shift key lever 73 terminates forwardly in an up-turned stem which is provided with a shift key or button 79, the two shift keys being arranged one at each of the key-board. The shift keys are operated independently of each other, the pin and slot connection 69, 70 affording lost motion so that the actuation of one of the shift keys will not affect the other or the train of devices associated with said other down to and including the associate link 71, said link remaining motionless while the crank arm 66 associated with it is free to swing rearward under the actuation of the other shift key. If found desirable each shift key and its train of devices including the key lever 73 and link 71 may be provided with suitable restoring springs. The right-hand shift key is adapted to shift the type bar system temporarily, as when it is desired to print a capital at the beginning of a sentence, while the left-hand shift key is adapted to be operated when more or less continuous upper case printing is to be done and to that end is associated with shift key locking devices next to be described.

Said shift key locking devices comprise a locking lever 80, best illustrated in Figs. 1, 3 and 6. The lever 80 is pivoted at 81 to the outside of the left-hand shift lever 73, the rear arm of said lever 80 terminating in a lip 82 and its forward arm terminating in a key 83. The lip 82 overlies the upper edge of the lever 73 and acts as a stop, being normally maintained in contact with the lever 73 by a coiled spring 84 which is connected at one end to the lever 73 and at the opposite end to the forward arm of the lever 80 above its pivot. The locking lever 80 is adapted when depressed by the key 83 to swing on its fulcrum 81 against the pull of the spring 84, this independent movement of the lever 80 being limited by a stop pin 85 which is adapted to contact with the upper edge of the lever 73, as shown in Fig. 6. After such contact further pressure on the key 83 will actuate both the lever 80 and the lever 73. Below its pivot the lever 80 is provided with a hook or latch portion 80^a having a face 80^b which is adapted for co-operation with a relatively stationary device, one form of which is illustrated in Figs. 1 and 6-8. Said device comprises a plate 86 secured by rivets 87 to the inner face of the left-hand side frame 1. At its lower end the plate 86 is provided with an inwardly turned stop lip 88 and near its upper end said plate carries an inwardly extending shouldered rivet or pivot pin 89 on which is pivotally supported a co-operating latch member designated as a whole by the numeral 90. Said member is U-shaped in cross section, having parallel sides 90^a and 90^b, and it is spaced away from the plate 86 by a washer 91 surrounding the shank of the pin 89. The member 90 is prevented from accidental detachment from said pin 89 by a headed screw 92 threaded into the outer end of the pin 89. The side 90^a of the member 90 adjacent the washer

terminates at its lower end in a forwardly extending nose which normally is maintained in engagement with the stop lip 88 by a coiled spring 93, one end of which is 5 connected to a lug projecting rearward from the side 90^b of the member 90, the other end of said spring being anchored to a lug 86^a on the plate 86. Secured to the lower end of the side 90^b is a member 94 comprising a 10 semi-circular engaging device proper 95, a body or head 96 being provided with a nick for a screw driver, and a shank or threaded portion 97 which is threaded through the side 90^b. A clamping nut 98 at the opposite 15 wall of the side 90^b clamps the member 94 in adjusted relationship to the member 90. It will be observed that the pivoted member 90 is in effect spring mounted, the spring 93 normally maintaining the latching device 95 20 in contact with the stop 88 and contiguous to the lower end portion of the hook 80^a as in Fig. 1. When the key 83 is depressed it will swing the lever 80 on its pivot 81 which initially will remain stationary, with the 25 result that the member 90 will be swung on its pivot 89 against the spring 93. This movement will continue until, as a result of the actuation of the key 83, the lever 80 and the lever 73 will be swung downward far 30 enough to bring the locking face 80^b past the straight inclined face of the detent or latch part 95, which will then be swung or snapped forward by the spring 93 until the two parts interlock as in Fig. 6, the result 35 being that the shift key mechanism will be locked down and the parts controlled thereby correspondingly locked in abnormal or upper case position. The forward swing of the member 90 will be limited by the stop 40 88, and the parts are arranged so that a subsequent depression of the left-hand key 79 will release the lever 80 and allow its hook portion 80^a to be swung forward by the 45 spring 84 clear of the detent part 95. Referring specifically to the main or case shifting operation, it will be understood that the depression of either shift key 79 will swing the associate lever 73 on its pivot, 50 forcing the link 71 rearward and causing it through action on the pin 69 to swing the associate crank arm 66 rearward, rocking the shaft 41. As said shaft is rocked the crank arm 46 will be swung downward and its forward end acting on the contact face 55 51 will swing the latch 49 on its pivotal center 50. It will be observed from Fig. 1 that normally the crank arm 46 contacts only with the rear end portion of the contact surface 51 somewhat behind and above 60 the pivotal center of the latch 49, the faces of the two parts being at an angle. Consequently the initial swinging movement of the latch under the action of crank arm 46 will be independent of the supporting link 38 65 which will remain stationary until the crank arm 46 contacts fully with the contact face 51 substantially through its length, the spring 52 being stretched as a result of this turning movement of the latch. This initial swinging movement of the latch will carry 70 its hooked upper end 53 rearward and clear of the plate 54 with which it normally engages. After the latch 49 has been swung on its center out of locking engagement with the plate 54, and the crank arm 46 is fully 75 engaged with the contact surface 51 of said latch, further downward movement of said crank arm will be transmitted from the latch 49 to the upper side of the pivot 50 and thence to the link 38, with the result that 80 said link will be swung downward. Downward movement of the link will be transmitted to the curved arm 24 and thence to the frame or bracket member 22 and type bar segment 8, which together with the type 85 bars 6 and their rest 11, will move downward until arrested by contact of the stop 58 with the stationary stop surface 20^b, as shown in Fig. 6. The downward or case shifting movement of the type bars will be 90 participated in by the bell cranks 17 and the forward portions of the links 18. These links will swing about their pivotal connections with the levers 19 as centers, which 95 levers 19 being mounted on the stationary frame 20 will not participate in the case shifting movement. The links 18 when in lower case position are angularly disposed each to a horizontal line passing through their pivotal point of connection with the 100 associate lever 19, the links inclining forward and upward from such line. As a result of the case shifting movement the links will be swung downward to a corresponding position below said line. When the shift 105 key is released the type bar system and its support will be re-shifted back to normal position, being arrested by engagement of the screw stop 57 with the under surface of the thickened or stop portion of the ledge 110 20^a. When the type bar system and its support are arrested by contact of the stops as described, the link 38 will also be arrested, but upward movement of the crank arm 46 will continue, thus releasing the latch 49 115 which will be free to swing forward under the pull of its spring 52 until it automatically reengages with the plate 54, as shown in Fig. 1. In this position it will be understood that the shiftable type bar mechanism 120 and its support will be held positively against movement or vibration. The latch 49, by reason of the engagement of its hook 53 with the plate 54, will normally lock the shiftable frame or member against downward 125 movement, while the stop screw 57 will prevent its upward movement. In other words, the latch 49 and the stop device 57 co-operate with opposite sides of the stationary stop to hold the shift member or 130

frame positively against vibration, which might result in the blurring of the type imprint or in causing it to print out of alignment.

5 In Figs. 11-15 is illustrated a modified construction of shift key locking mechanism, which instead of having one of the co-operative locking elements mounted on the side frame of the machine, provides instead a mounting on the detachable sub-
10 frame 20, the advantage being that when the frame part or sub-frame 20 is detached, and with it the shift key levers and associate devices that are mounted on it, the co-operative locking element will likewise be detached. In other words, a unit construction is provided. Referring first to Figs. 11 and 12, it will be observed that the comb plate 77 is secured by screws 99 to the forward ends of horizontally disposed rods 100, said rods at their rear ends being threaded into the detachable frame 20. The comb or cover plate 78 which fits over the comb plate 77 is detachably secured in place by screws
20 101. The screws 99 are accessible through holes 78^a in the cover plate 78. Fixed to the rear face of the comb plate 77 near its left-hand end is an angular bracket member 102 shown detached in Fig. 15. This member comprises a slotted portion 103 and an angularly disposed rearwardly extending portion 104. The portion 103 is provided with elongated slots 105 affording passage for screws 106 that secure the bracket to the
30 comb plate 77. Interposed between the portion 103 and the screws is a rectangular washer 107. The portion 104 of the bracket is provided with a stop lip 108 and a perforation 109 which accommodates a shouldered and headed rivet or pivot pin 110. This pivot pin provides a pivotal support for a co-operating detent or latching device 111 terminating at its lower end in an inwardly turned lip 112, which is adapted to co-operate with the hooked end portion or latch 80^a of the shift lock lever 80. A coiled spring 113 having one end connected to the device 111 and the other end anchored to the bracket 102, tends constantly to swing
50 the device 111 forward about its pivot and maintains the front edge of the lip 112 normally engaged with the rear face of the hook portion 80^a. The construction is such that when the locking key 83 is depressed from normal position the portion 80^a will act against the device 111, swinging it rearwardly against its spring 113 until the face 80^a has swung downward far enough to clear the latch, which will then snap forward to the Fig. 12 position, interlocking the parts. The forward swing of the device 111 under the pull of its spring 113 is limited by the stop 108, the construction and arrangement being such that when it is desired to release
60 the parts a depression of the key 79 will

allow the hook 80^a to swing clear of the lip 112, said hook being thereafter drawn forward to clear said lip by the spring 84.

Aside from the case shifting mechanism, such illustrated parts as are novel are not
70 claimed herein as they constitute no part of the present invention.

Various changes besides those described may be made without departing from the invention. 75

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

1. In a typewriting machine, the combination of a platen element, a type bar element, a stationary part, a shift key, and a train of
80 devices between said key and one of said elements for shifting the same, said devices including a lock co-operating with said stationary part to normally prevent shifting movement of the shiftable element, said key
85 first unlocking said lock while the shiftable element remains motionless and said lock thereafter transmitting case shifting movements from said key to said shiftable element. 90

2. In a typewriting machine, the combination of a platen, a type bar segment, a lock normally locking said segment against a fixed part of the machine against shifting
95 movement, a shift key, and connections from said shift key to said segment and also to said lock, the operation of said shift key being effective first to unlock said lock without moving said segment and thereafter to actuate said lock itself to shift said segment. 100

3. In a typewriting machine, the combination of an element shiftable to change case, devices for supporting and guiding said element including a link, a spring latch mounted on said link and normally preventing
105 case shifting movement, and key operated means effective first to release said latch and thereafter through said latch to actuate said link to cause a shifting of said element. 110

4. In case shifting mechanism for typewriting machines, the combination of a shiftable element, a shift key, and a train of case shifting devices controlled by said
115 key and including a motion-transmitting latch mounted independently of said key and which normally operates to lock the shiftable element against shifting movement, it being necessary first to unlock said latch in order to position it for motion transmission, the shiftable element remaining motionless
120 during such unlocking.

5. In case shifting mechanism for typewriting machines, the combination of a shiftable element, means for shifting said
125 element including a shift key lever, and means including devices in said first recited means for normally holding said element positively in fixed relationship with stationary parts of the machine, said holding means
130

being mounted independently of the shift key lever and being rendered ineffective independently of and prior to the beginning of the case shifting movement.

5 6. In case shifting mechanism for typewriting machines, the combination of a platen, a segment, a shift key lever, and means operated by said lever for shifting said segment, said means including essential
10 parts which also positively prevent vibration of said segment during printing operations, which parts are rendered ineffective as vibration preventives independently of and prior to the beginning of the case shifting
15 movement of said segment.

7. In a typewriting machine, the combination of a platen, a shiftable type bar segment, a lock normally controlling said segment, a shift key, and a single train of connections between said shift key and said segment and also with said lock, said shift key being mounted independently of said lock and the operation of said shift key being effective first to unlock said lock prior to the beginning of shifting movement on said segment and afterwards to shift said segment.

8. In case shifting mechanism for typewriting machines, the combination of a shiftable segment, two stops thereon, a horizontal ledge on the frame of the machine provided with top and bottom contact surfaces for normal co-operation with the stops on the segment whereby the stops and the ledge are maintained in clamped relationship thus holding the segment against vibration, a shift key, and connections to one of said stops for moving it to release the segment.

9. In case shifting mechanism for typewriting machines, the combination of a shiftable element, a frame stop and devices on said shiftable element co-operating with said frame stop at opposite sides thereof to prevent movement of said element.

10. In case shifting mechanism for typewriting machines, the combination of a shiftable element, a frame stop and devices on said shiftable element co-operating with said frame stop at opposite sides thereof to prevent movement of said element, one of said devices being movable to permit said element to be shifted.

11. In a typewriting machine, the combination of a platen element, a type bar element, means for relatively shifting said elements, a lock for normally preventing said relative shifting movement, a key, and a single train of connections operative first to release said lock and afterwards to effect said relative shift.

12. In a typewriting machine, the combination of a platen, a shiftable type bar segment, a lock normally controlling said segment, a shift key, and a single train of connections between said shift key and said seg-

ment and also with said lock, the operation of said shift key being effective first to unlock said lock and afterwards to shift said segment.

13. In case shifting mechanism for typewriting machines, the combination of a shiftable element, stops, a spring maintaining said stops in contactive engagement, a spring latch normally preventing disengagement of said stops, and a train of devices for shifting said shiftable element, said latch being a necessary element in said train.

14. In case shifting mechanism for typewriting machines, the combination of a shiftable element, stops, a spring maintaining said stops in contactive engagement, a spring latch normally preventing disengagement of said stops, a key effective to release said latch and operate the case shift, and a train of devices for shifting said shiftable element, said latch being a necessary element in said train.

15. In a typewriting machine, the combination of an element shiftable to change case, supporting and guiding devices for said element comprising a link, a spring latch mounted on said link and normally preventing case shifting movement, and a key operated means effective to release said latch and actuate said link to effect the case shift.

16. In a typewriting machine, the combination of an element shiftable to change case, supporting and guiding devices for said element comprising a link, a latch pivoted on said link and normally preventing case shifting movement, a spring for said latch, a crank arm coaxial with said link, and key operated means to swing said crank arm to release said latch and through said latch to actuate said link to effect the case shifting movement.

17. In a typewriting machine, the combination of an element shiftable to change case, a train of key actuated case shifting devices, a latch pivotally mounted on one of the parts in said train, and a stationary part with which said latch normally engages.

18. In a typewriting machine, the combination of an element shiftable to change case, a train of key actuated case shifting devices, a latch pivotally mounted on one of the parts in said train, and a stationary part with which said latch normally engages, said train also comprising a part for disengaging said latch from said stationary part.

19. In a typewriting machine, the combination of an element shiftable to change case, a train of key actuated case shifting devices, a latch pivotally mounted on one of the parts in said train, and a plate adjustably mounted on a stationary part with which plate said latch normally engages.

20. In a typewriting machine, the combination of an element shiftable to change

case, a train of key actuated case shifting devices, a latch pivotally mounted on one of the parts in said train, a T-shaped latch plate with which said latch normally engages, a support for said latch plate, screws threaded into said support for securing said latch plate thereto, and a screw oppositely threaded into said support and abutting against said latch plate for varying the location of said latch plate.

21. In a typewriting machine, the combination of an element shiftable to change case, supporting and guiding devices for said element comprising a link, a vertically arranged latch pivoted on said link and provided at its upper end with a hook, a stationary latch plate with which said hook normally engages, a spring connected to the tail of said latch and constantly tending to maintain said hook engaged with said plate, and a key actuated crank arm effective on said latch to overcome said spring and disengage said hook from said latch, said crank arm being thereafter effective through said latch on said link to swing the same to shift said shiftable element.

22. In a typewriting machine, the combination of an element shiftable to change case, case shifting devices comprising a horizontally disposed link or arm, an upright latch pivoted on said link and provided at its upper end with a hook and also provided above its pivot with a contact face, a stationary plate with which said hook engages, a spring connected to the tail of said latch for maintaining such engagement, and a crank arm operative on the contact face of said latch to turn it on its pivot and thereafter to exert pressure against said pivot to move said link.

23. In a typewriting machine, the combination of a shiftable element, a supporting device between said element and the frame of the machine, a shift key, connections to said element from said shift key, two parallel spring arms connected to said element and both adapted to be flexed when said element is shifted in one direction, said spring arms restoring said element to normal position after the shift, and a detachable plate common to both springs and provided with devices for preventing displacement of said springs.

24. In a typewriting machine, the combination of a shiftable element, a shift key, connections to said element from said shift key, and two U-shaped springs having a common support and parallel arms adapted to be flexed when said shiftable element is shifted, the cross portion of each spring being subjected to torsion as a result of the shifting movement.

25. In a typewriting machine, the combination of a shiftable element, a shift key, connections to said element from said shift

key, two U-shaped springs having parallel arms adapted to be flexed when said shiftable element is shifted, the cross portion of each spring being subjected to torsion as a result of the shifting movement, and a common support for said springs comprising a plate secured by a screw to the frame of the machine and provided with projections which assist to prevent displacement of said U-shaped springs.

26. In a typewriting machine, the combination of a shiftable type bar segment, a bracket on which said segment is mounted, said bracket being provided with a depending arm, U-shaped springs having arms arranged in parallelism at opposite sides of said depending arm and co-operating with projections on said depending arm, and means for shifting said segment and bracket, said parallel spring arms being subjected to flexure during the shift and the cross portions of said U-shaped springs being subjected to torsion.

27. In a typewriting machine, the combination of a shiftable element, a rock shaft, a pair of crank arms connected to said element and fixed to opposite end portions of said rock shaft, a second rock shaft connected to said segment, a shift key connected to said second rock shaft, stationary bearings for said second rock shaft and displaceable bushings between said second rock shaft and said bearings.

28. In a typewriting machine, the combination of a shiftable element, a rock shaft, a pair of crank arms connected to said element and fixed to opposite end portions of said rock shaft, a second rock shaft connected to said segment, a shift key connected to said second rock shaft, open mouthed bearings for said rock shaft, bushings detachably fixed to said second rock shaft and engaging in said open mouthed bearings, the bushings being of greater diameter than the width of the mouths of said bearings and the second rock shaft being of lesser diameter than the mouths of said bearings.

29. In a typewriting machine, the combination of an element shiftable to change case, controlling devices for said element including a shaft, bearing lugs for said shaft in the base of the machine, each bearing lug being circularly perforated, the perforations being provided with mouths less in width than the diameter of the perforations, and bushings slidably mounted on said shaft, said bushings having a bearing fit in said perforations.

30. In a typewriting machine, the combination of an element shiftable to change case, controlling devices for said element including a shaft, bearing lugs in the base of the machine for said shaft, each bearing lug being circularly perforated, the perforations being provided with mouths less in

width than the diameter of the perforations, and bushings surrounding said shaft and bearing in the perforations in said lugs, said bushings having collar portions which receive set screws whereby the bushings are detachably fixed to said shaft.

31. In a typewriting machine, the combination of an element shiftable to change case, controlling devices for said element including a shaft, stationary perforated bearing lugs for said shaft, the perforations having narrow mouths, and bushings surrounding said shaft and bearing in said perforations, said bushings having collar portions which receive set screws whereby the bushings are detachably fixed to said shaft, said shaft being of lesser diameter than the mouths of the perforations and the bushings being of greater diameter than said mouths so that normally they prevent withdrawal of said shaft from said lugs, the shaft, however, being free to be withdrawn sidewise therethrough when the bushings are freed and slid along the shaft out of the perforations.

32. In a typewriting machine, the combination of a shiftable element, a rock shaft, a pair of crank arms fixed to opposite end portions of said rock shaft and pivotally connected to said shiftable element, a second rock shaft parallel to the first, a crank arm fixed centrally to the second rock shaft, connections between said central crank arm and said shiftable element, a second pair of crank arms fixed to opposite end portions of said second rock shaft, and key connections to said second pair of crank arms.

33. In a typewriting machine, the combination of a shiftable segment, two rock shafts, a pair of crank arms fixed to opposite end portions of one of said rock shafts and pivotally connected to said shiftable segment, a crank arm fixed centrally to the other of said rock shafts, connections between said central crank arm and said shiftable segment, a second pair of crank arms fixed to opposite end portions of said last named rock shaft, key connections to said second pair of crank arms, and stops on the frame of the machine co-operative with said shiftable segment to prevent lateral vibration thereof.

34. In a typewriting machine, the combination of a shiftable element comprising an upright type bar segment, an upright bracket member to which said segment is detachably secured, said bracket being provided with a central arm extending downward and rearward, and a type bar rest supported from said bracket member; stop devices mounted on said arm; stationary stop devices with which said first recited stop devices co-operate; a shift key; and connections to said element.

35. In a typewriting machine, the combi-

nation of a shiftable element, two parallel rock shafts, two crank arms fixed to opposite end portions of one of said rock shafts and pivotally connected to said shiftable element, a crank arm fixed centrally to the other of said rock shafts, connections between said central crank arm and said shiftable element, a second pair of crank arms fixed to opposite end portions of said last named rock shaft, key connections to said second pair of crank arms, and restoring spring mechanism for said shiftable element, said shiftable element comprising an upright segment, an upright bracket member to which said segment is detachably secured, said bracket being provided with a central, downwardly extending arm with which said spring mechanism co-operates, and a type bar rest supported from said bracket member.

36. In a typewriting machine, the combination of a shiftable element, two parallel rock shafts, two crank arms fixed to opposite end portions of one of said rock shafts and pivotally connected to said shiftable element, a crank arm fixed centrally to the other of said rock shafts, connections between said central crank arm and said shiftable element, a second pair of crank arms fixed to opposite end portions of said last named rock shaft, and key connections to said second pair of crank arms, each of said key connections having a lost motion connection with its associate crank arm.

37. In a typewriting machine, the combination of a shiftable element, two parallel rock shafts, two crank arms fixed to opposite end portions of one of said rock shafts and pivotally connected to said shiftable element, a crank arm fixed centrally to the other of said rock shafts, connections between said central crank arm and said shiftable element, a second pair of crank arms fixed to opposite end portions of said last named rock shaft, and key connections to said second pair of crank arms, said key connections comprising links having lost motion connection with their associate crank arms and levers each pivotally connected with one of said links and provided with a shift key.

38. In a typewriting machine, the combination of a shiftable element, two shift key levers, connections between each of said levers and said shiftable element, and key locking devices for one of said shift levers effective to hold it in operative position, said key locking devices comprising a locking lever pivoted on said associate shift lever and provided with a hook, and a spring mounted detent device co-operative with said hook.

39. In a typewriting machine, the combination of a shiftable element, two shift key levers, connections between each of said

levers and said shiftable element, and key locking devices associated with one of said shift levers and effective to hold it in operative position, said key locking devices comprising a locking lever pivoted on the associate shift lever, a stop on one end of said locking lever and a key on the opposite end of said locking lever, a spring connecting said locking lever with the associate shift lever, a hook on said locking lever, and a spring pressed engaging device for engaging said hook.

40. In a typewriting machine, the combination of a shiftable element, a shift key lever, connections between an arm of said lever and said shiftable element, a comb plate detachably mounted on the frame of the machine and provided with a guide slot for said shift lever, a locking lever pivoted on the shift lever and provided with a hook, a stop and a key, a spring connecting said locking lever with the associate shift lever, and a spring pressed detent for said hook, said detent being mounted on said comb plate.

41. In a typewriting machine, the combination of an element shiftable to change case, shift key levers, connections between said levers and said element, a sub-frame detachably mounted on the main frame of the machine on which said shift levers are pivoted, a guide comb with which said levers co-operate, said guide comb being detachably secured to said sub-frame, key locking devices associated with one of said shift levers, said key locking devices comprising a locking lever pivoted to the associate shift lever and a detent device co-operative with said locking lever, said detent device being mounted on said comb plate.

42. In a typewriting machine, the combination of an element shiftable to change case, shift key levers, connections between

said levers and said element, a sub-frame detachably mounted on the main frame of the machine, said shift levers being pivoted on said sub-frame, a guide comb with which said levers co-operate, arms secured to said sub-frame and projecting forward therefrom, screws for attaching said guide comb to said arms, a locking lever pivoted to one of said shift levers and provided with a hook, a spring pressed detent with which said hook co-operates, and a bracket on which said detent is pivoted, said bracket being detachably secured to said guide comb.

43. In a typewriting machine, the combination of an element shiftable to change case, shift key levers, connections between said levers and said element, a sub-frame detachably mounted on the main frame, said shift levers being pivoted on said sub-frame, a comb plate by which said levers are guided, said comb plate being detachably secured to said sub-frame, key locking devices comprising a locking lever pivoted to one of said shift levers, an angular bracket, screws for adjustably securing said bracket to said comb plate, a depending arm pivoted to said bracket, a spring anchored to said bracket and connected to said arm, a stop on said bracket against which said arm is normally maintained by said spring, and an engaging device upon said arm adapted to co-operate with said locking lever.

Signed at the borough of Manhattan, city of New York, in the county of New York and State of New York, this 12th day of August, A. D. 1920.

JOHN H. BARR.
EDWIN E. BARNEY.

Witnesses:

CHARLES E. SMITH,
E. M. WELLS.