B. W. TUCKER.

TYPE WRITING MACHINE.

APPLICATION FILED JAN. 6, 1916.

1,279,044.

Patented Sept. 17, 1918.

2 SHEETS—SHEET 1.

Fig. 1

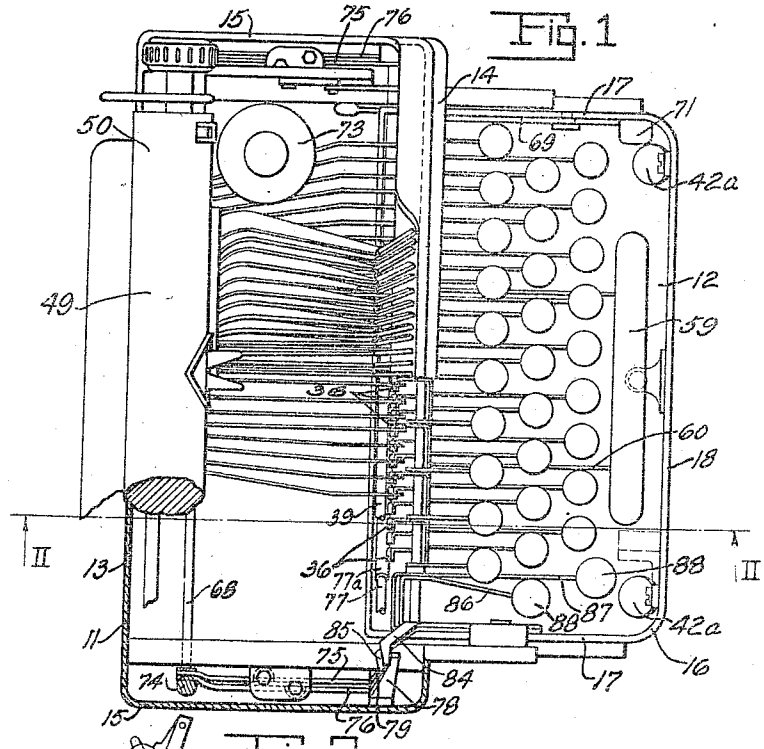


Fig. 2

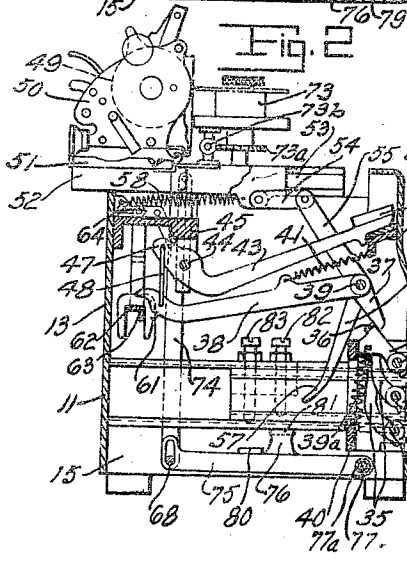


Fig. 10

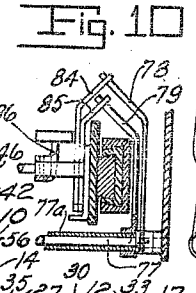
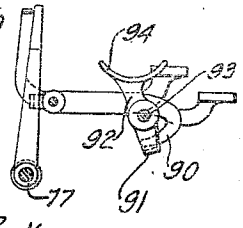


Fig. 9.



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2 SHEETS—SHEET 2.

Fig. 3

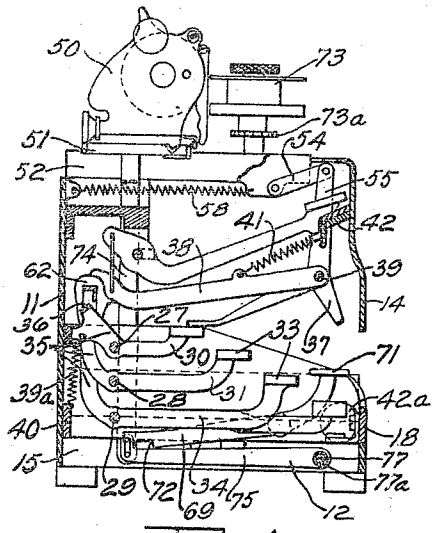


Fig. 11

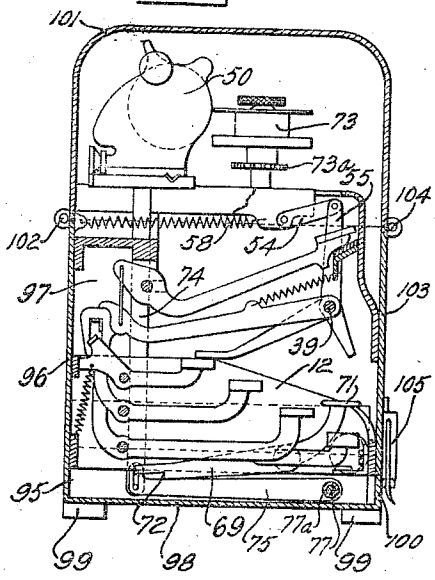


Fig. 4

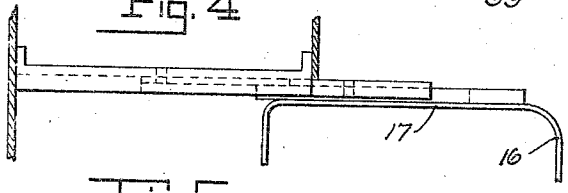


Fig. 5

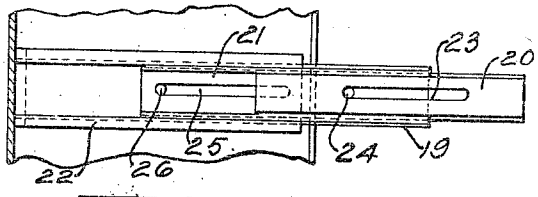


Fig. 6

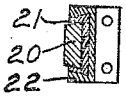


Fig. 7

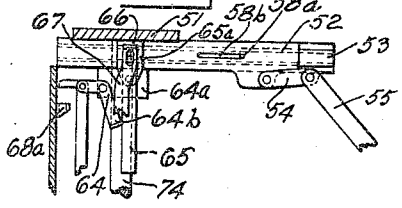
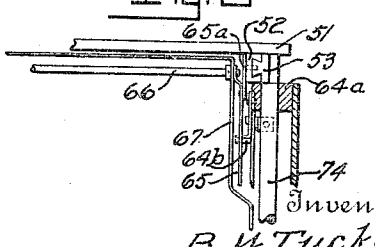


Fig. 8



Inventor

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By his Attorneys

Criswell & Criswell

UNITED STATES PATENT OFFICE.

BENJAMIN W. TUCKER, OF SOUTH ORANGE, NEW JERSEY, ASSIGNOR TO CORONA TYPEWRITER COMPANY, INC., A CORPORATION OF NEW YORK.

TYPE-WRITING MACHINE.

1,279,044. Specification of Letters Patent. Patented Sept. 17, 1918.

Application filed January 6, 1916. Serial No. 70,609.

To all whom it may concern:

Be it known that I, BENJAMIN W. TUCKER, a citizen of the United States, and a resident of South Orange, county of Essex, and State of New Jersey, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a full, clear, and exact description.

This invention relates more particularly to a front strike or other visible typewriting machine in which the cubical dimensions of the machine may be materially reduced when not in use to adapt the machine for transportation and other purposes.

One of the principal objects of the invention is to provide a typewriting machine of a small portable character in which the keyboard may be extended when in a normal operative position and which may be moved bodily and entirely inclosed within the main supporting portion of the machine so as to make the machine compact while not in use and provide a package which is substantially uniform to permit it to be conveniently carried as a part of a person's luggage in traveling or otherwise, and which, in the compact position, has the keyboard protected against injury.

Another object of the invention is to provide a writing machine which has the general appearance of a large standard bar typewriter when in use, and which may be collapsed or have parts thereof moved to a more compact position when not in use than when in a normal operative position.

Other objects of the invention are to provide simple mechanism whereby a separable operative connection may be made between the keys and the type-bars of a type-writing machine to permit the keys to be moved bodily inward when not in use and to be automatically positioned to operate the type-bars when in an open or extended position; to provide a machine in which the keyboard may be of a standard or universal character and in which the key-operated levers, the space bar and the shift levers, where more than one is used, may be moved bodily inward to be inclosed within the frame or support of the machine as a unit without any disarrangement; to provide simple means whereby a separable two-part key-operated lever connection may be made with type-bars to permit the complete separation between one part of each key-operated lever and the other part; and to provide a writing machine of simple construction which may be readily made and assembled.

A further object of the invention is to provide a machine wherein the platen carriage ribbon mechanism and escapement mechanism or either of them may be given a horizontal movement relatively to the type and simultaneously and automatically moved during the compact or extended movement of the keyboard.

A still further object of the invention is to provide simple means whereby a platen carriage may be given a compact sliding movement in a direction different from the shift and letter-spacing movements.

With these and other objects in view, the invention will be hereinafter more particularly described with reference to the accompanying drawings, which form a part of this application, and will then be pointed out in the claims at the end of the description.

In the drawings, Figure 1 is a plan view, partly broken away, of one form of machine embodying the invention.

Fig. 2 is a vertical longitudinal section of the machine taken on the line II—II of Fig. 1, the carriage and certain other parts being shown in elevation.

Fig. 3 is a view similar to Fig. 2 except that the parts have been moved to a compact position.

Fig. 4 is a fragmentary sectional plan view showing one form of the means whereby a standard or universal keyboard may be mounted to move bodily and as a unit from an extended or open position to a compact position.

Fig. 5 is a detail elevation of the telescopic sections or parts whereby the keyboard is mounted for horizontal compact movement.

Fig. 6 is a transverse section showing the dovetail connection between the several parts or slides of the keyboard member.

Fig. 7 is a fragmentary vertical elevation, partly in section, showing the means whereby the carriage and the parts for operating the escapement mechanism may be moved horizontally with the carriage in its compact movement.

Fig. 8 is a fragmentary vertical section showing in front elevation the mechanism shown in Fig. 7.

Fig. 9 is a vertical elevation, partly in section of a part of the platen shift mechanism.

Fig. 10 is a vertical section, partly in elevation of a part of the shift mechanism; and

Fig. 11 is a view showing how the machine instead of being mounted on an ordinary frame may have the mechanism thereof mounted upon an inclosing case which serves as a frame and support.

While the invention is shown as applied to a particular form of typewriting machine, it will be understood that the principle whereby the machine may be made compact may be embodied in writing machines of various kinds or constructions.

The support or frame 10 comprises a main supporting member 11 which is normally stationary, and a relatively movable keyboard member 12. The main member 11 has a rear wall 13, a front wall 14, and side walls 15 and may be made of any suitable material, as sheet metal, and may be of any suitable shape, either box-like in form or of any other desired shape. The keyboard member 12 comprises a substantially rectangular skeleton-frame-like part 16 having sides 17 connected together by a transversely extending narrow bar-like front portion 18. Connected to each side 17 is a slide 19 comprising two telescopic or movable members 20 and 21 and a fixed member 22, which latter is secured between the front wall 14 and the rear wall 13 of the main member 11 or in any other desired position. The member 20 is provided with a slot 23 in which a pin 24 projects from the slide member 21 and in said member 21 is a slot 25 in which extends a pin 26 from the normally fixed member 22. The several slide members permit outward and inward movement of the keyboard member 12 and are held together and limited in their relative movement, each member being properly guided during the extended and compact movement. The member 20 has a dovetailed connection with the member 21, as shown in Fig. 6, and the sliding member 21 has a dovetailed connection with the fixed member 22. It will be evident that the keyboard member 12 may be moved relatively to the fixed member 11 of the frame or support so that in its extended position the front bar 18 will be located some distance forward from the front wall 14 of said fixed member, and when moved to a compact position as shown in Fig. 3, the bar 18 may be made to lie substantially flush with the front wall 14 and the rest of said member 12 located entirely within the member 11, said front wall 14 being cut away to permit the compact or extended movement of said keyboard member.

On the member 11 are a plurality of supporting rods 27, 28 and 29. These rods extend transversely of the machine between the sides 17 of the keyboard frame or member 12 and are located one above the other in a substantially vertical plane. A number of key-operated levers 30 are arranged upon the rod 27, a number of key-operated levers 31 on the rod 28, and other key-operated levers 32 on the rod 29, the number of key-operated levers as well as the number of groups thereof varying usually according to whether a single case or double case shift is provided, either form being of a standard or universal character. The levers 30 to 32 each have a key 33 for operating said levers and each key-operated lever is substantially of a bell-crank form. One arm, as 34, of each lever carries one of the keys 33 and said arms 34 of the different groups are of relatively different lengths, the arm 34 of the lowest group being the longest and the keys located at a greater distance from the fulcrum rod on which the key-operated levers are supported. The arm 35 of each key-operated lever extends upwardly, and these arms have their outer ends bent at an angle as at 36 and are each adapted to engage the inner lower edge of an arm 37 of a substantially bell-crank lever 38, said arms 35 of the different groups being of different lengths to compensate for the different lengths of the arms 34 in order that a substantially uniform touch may be provided. Each lever 38 is mounted upon a transversely extending rod 39, about which said lever is adapted to move. The levers 38 and the levers 30 to 32 or either of them if made of sheet metal may be bent so as to form spaced bearings about the fulcrum rods. The levers 30 to 32 may each be held in a normal operative position by means of springs 39^a one end of each of which is attached to the lever arm 35 and the other end of each spring is passed through an aperture in the transversely extending rear bar 40 of the keyboard frame 12, while the levers 38 may be held in their normal position by means of springs 41, one end of each of which is attached to the longer arm of each lever 38 and the other end of each spring 41 held in an aperture in a transversely extending angular bar 42. The levers 38 and the key-operated levers 30 to 32 thus form substantially a two-part key-operated lever which are so mounted as to provide a complete separable connection between each arm 37 and its coöperating arm 35, there being a lever 38 for each of the levers 30, 31, and 32. The keyboard member may be supported at its outer portion when in use by feet 42^a which may be pivoted to the bar 18 to permit being moved out of the way when the keyboard is forced into the frame member 11.

When any one of the key-operated levers

30, 31 or 32 is depressed by the operator, the arm 35 of such lever will be forced forward and such forward movement will engage the downwardly extending arm 37 of its coöperating lever 38 so as to move the inner end downward when the keyboard is in the normal operative position shown in Fig. 2. If the machine is to be made compact, the keyboard member 12 may be forced inwardly which will carry all of the keys and key-operated levers 30 to 32 mounted upon the key-board member 12 bodily inward as a unit so as to place the entire keyboard or key-operated levers 30 to 32 entirely within the main member 11 in which position the keys are protected and inaccessible for operation until the keyboard member has been again extended. In the compact movement of the keyboard member and keyboard a complete separation takes place between the arms 35 and 37, while when the keyboard member is moved to an extended position the arms 35 are automatically brought into position to operate the arms 37 of the levers 38.

A number of type-bars 43 are provided, there being a type-bar for each lever 38. These type-bars 43 are pivoted at 44 to a segment or other supporting means 45 and at their outer ends are provided with type heads or blocks 46 on which are a plurality of type the number of which depend upon whether there is a double or single case shift. The type-bars each have a lug or projecting portion 47 which is connected by a link 48 to the rear end or part of each lever 38, thus when the levers 38 are operated through the keys 33 as already described, the type-bars will be pulled upon so as to force the type or types upwardly and rearward against a platen 49 mounted in a transversely movable carriage 50.

The platen carriage 50 may be of any suitable construction. As shown, it is substantially the same as embodied in the Corona portable typewriter, and is adapted to travel transversely of the machine on a carriage bed 51. The carriage bed 51 is held upon bars 52. There are two bars 52 located on opposite sides of the machine, and said bars are slidably held to other bars 53. The bars 53 are also arranged in pairs and may be slidably connected to the bars 52 by suitable dovetailed tongue and groove connections or in any other desired way. The bars 52 on which the bed 51 is mounted and which are located on opposite sides of the machine are connected by links 54 to levers 55. The levers 55 are mounted on the transversely extending rod 39 and their lower arms 56 extend at an angle and are each provided with a foot portion 57. The arms 56 are each adapted to be engaged by the keyboard frame 16 of the member 12 as the same is moved inwardly and in doing so will rock the arms 56 and cause the feet 57 to ride upon the upper edge of the sides of said keyboard member as shown in Fig. 3. This movement of the levers 55 will cause the links 54 to move the side bars 52 relatively to the bars 53, thus carrying the bed and carriage and whatever parts are mounted on said bars 52 from an overhanging position as shown in Fig. 2 forwardly to the position shown in Fig. 3 wherein the carriage is located directly over the main or fixed member 11 of the supporting frame. When the keyboard frame is extended the carriage is forced rearward by means of one or more springs 58 one end of each of which is attached to the rear wall of the support or fixed member and the other end to one of the bars 52, though instead of the springs 58 the carriage may be connected to be moved positively rearwardly as well as forwardly with the compact and extended movements of the keyboard. The carriage and keyboard are thus moved bodily as a unit simultaneously in opposite directions to a compact position when the keyboard frame member is moved to such position, and when the keyboard is extended the carriage is also moved and automatically to its operative position in overhanging relation at the rear of the main fixed member 11. A pin 58^a, Fig. 7, may project from each of the bar members 53 of the carriage support, and said pins are adapted to enter slots 58^b to limit the relative movements of the members 52 and 53 if desired.

A space bar 59 is provided as a part of the keyboard and this space bar is carried by the space levers 60. The space levers 60 are mounted upon one of the fulcrum rods 27 to 29, preferably the lower one, and has upwardly extending arms which engage the arms of levers 61 mounted upon the rod 39. These levers 61 are similar to the levers 38, except at their inner ends said levers 61 have slotted ends 62 which are adapted to fit over and form a guide for a universal bar 63. The universal bar 63 extends transversely of the machine and has upwardly extending parts which are connected to bell-crank levers 64. These bell-crank levers are located at opposite sides of the machine and are pivotally held to fixed brackets 64^a located near the rear corners of the machine. The levers 64 have downwardly extending arms 64^b and these arms are adapted to engage the lower portion of levers 65 and form a break joint connection therewith, said levers 65 being pivoted to brackets 65^a secured to the movable carriage supporting bars 52. To the upper ends of the levers 65 is held a transversely extending rod 66 and this rod 66 is adapted to extend through slots in a rocking frame 67. This rocking frame 67 is substantially the same as in the Corona typewriter and that dis-

closed in the patent to Otto Petermann No. 1,121,040, dated December 15, 1914, and is adapted to operate the escapement dogs and other parts, as the ribbon mechanism. The escapement mechanism is not shown and may be of any desired form. The rocking frame 67 is pivotally held to the transversely extending rod 68 so as to rock back and forth with the movement of the universal bar, there being a spring or other means not shown if desired whereby the rocking frame may be restored to its normal position. As the levers 55 are operated to move the carriage and bars 52 transversely of the machine, the rocking frame 67 will be permitted to rock on the transversely extending rod 68 by reason of the slots in said rocking frame and by reason of the mounting between the levers 65 and bell-crank levers 64 said levers 65 will move away from the bell-crank levers 64 during the compact movement, but when the carriage is moved to its normal operative position the levers 65 will be again brought into engagement with the levers 64 in position to be operated by said latter levers. The levers 64 at one end may be extended beyond the universal bar and adapted when separated from the levers 65 to have said ends engage stops 68[a] on the rear wall of the frame to prevent the universal bar by its weight from dropping too far or becoming disengaged from the space levers.

The keyboard member 12 with all the parts mounted to move therewith may be locked in its extended operative position. As one means, a latch or member 69 is pivotally held at 70 in the keyboard frame portion 16. This latch 69 has a key 71 at one end thereof and at the other end is provided with a notch 72 which is adapted, when the keyboard is in its normal operative position, to engage a part of the front wall 14 of the main member as shown best in Fig. 2. By depressing the key 71 the latch 69 will have its notched end removed from the front wall of the member 11 at which time the keyboard frame member 12 may be forced inwardly within the main member 11.

Any suitable means may be provided as ribbon mechanism, both for vibrating the ribbon to permit visible writing and for moving the ribbon lengthwise across the printing point. As one means ribbon spools 73 are located on each side of the machine and are supported by the movable bars 52 of the carriage support. These spools may be rotated by gears 73[a] and worms 73[b], the latter being operated through the rocking frame 67, the ribbon vibrating mechanism, not shown, being also operated by the rocking frame 67 or otherwise, to move the ribbon to and from the printing point or to permit the same to remain inactive in substantially the same manner as disclosed in the patent to Otto Petermann No. 1,121,044, dated December 15, 1914.

The platen carriage, as well as the parts supported by the bars 52 and 53 are adapted to be shifted vertically, though instead of a platen shift a type segment shift may be employed without affecting the principle by which the machine may be made compact. As shown, the carriage and the direct support therefor as well as parts mounted thereon are vertically shiftable. The carriage supporting bars 53 are held upon posts 74 which are suitably guided in the brackets 64[a] at the rear portions of the machine frame and at their lower ends these posts are connected by the transversely extending rod 68. Levers or arms 75 and 76 extend from the fore part of the machine rearwardly, there being two levers on each side of the machine. As the machine is shown with a double case shift, each type block of each type-bar may have three type, one for the upper case, one for the lower case, and the other for figures or other characters, though only one case shift may be employed if desired, the number of keys and type-bars being changed accordingly. The outer arms 76 are secured to a transversely extending rod or shaft 77 and the inner arms to a sleeve 77[a] arranged around the shaft and both sets of arms are operatively connected to move the rod 68 and posts 74. An arm 78 extends upwardly from the shaft 77, and an arm 79 extends upwardly from the sleeve 77[a] so that by operating one arm, as the arm 78, one movement is given to the platen carriage and support vertically, and by moving the other arm 79 a different throw to the support and platen carriage is given, there being a spring, not shown, if desired tending normally to force the carriage and its support downwardly. On one pair of arms, as 75, are stops 80 while on the pair of arms 76 are stops 81. The stops 81 are adapted to engage fixed stops or screws 82 on a part of the keyboard slides at opposite sides of the machine, while the stops 80 are adapted to engage stops or screws 83 also located on the keyboard slides. These stops are adapted to limit the movement of the arms, and as said stops are of relatively different lengths, as are also the stops 80 and 81, different throws are given to the platen carriage during the movements of the arms 78 and 79. The arms 78 and 79 are adapted to be engaged by arms 84 and 85 respectively, one arm, as 84, extending upwardly from and operated by a shift lever 87, while the other arm 85 is operated by a shift lever 86, each of which is provided with a key 88 by which the lever may be depressed. The shift levers 86 and 87 are substantially U-shaped in form, and are rotatably held upon the support rod 28 of the key-levers 31, and

each shift lever has a forwardly extending portion 89. The shift levers 86 and 87 are independently movable and each forwardly extending portion 89 of said levers may have a hook portion 90 which is adapted to be engaged by the inturned end 91 of a pivotally held lock lever 92, said lock lever being pivoted upon a stud 93 and having a finger portion 94 by which said lever may be moved on its pivot. If either one of the levers is depressed, it may be locked in such depressed position by means of the lever 92 engaging either or both hooks 90, and if it is desired to lock both shift levers against movement the lever 92 is moved so that the end 91 may engage under the hooks 90, thus preventing movement of both of said levers.

In Fig. 11, the construction of the mechanism is the same as already described, but instead of the frame or support being independent of a carrying case the mechanism is supported directly by an inclosing case which forms a frame or supporting means for the different mechanisms and may be of any suitable construction. The main member 95 of the case or support has a rear wall 96, side walls 97, a base 98 on which may be rubber feet 99, and a short front wall 100 over the upper edge of which the keyboard member 12 is adapted to move. A cap, top or cover 101 may be hinged at 102 to the main member 95 and is adapted to swing backwardly when the machine is in use. The cover 101 has a front member 103 which is hinged at 104 to the lower edge of the front wall of said cover. This member 103 is adapted to form a closure for the front of the case when the machine is in a compact condition and is adapted to be moved out of the way with the cover 101. One or more clasps 105 of any suitable form may be provided to hold the cover 101 and member 103 in a closed position, there being a handle, not shown, if desired for carrying purposes.

It will be evident from the foregoing that the keyboard and keyboard frame with all of the parts mounted thereon may slide horizontally so as to move all of the keys within the main frame member to make the machine compact and to protect the keys against injury; that the keyboard member of the frame when forced rearward will move the carriage and its supporting bars forward as well as those parts mounted to move with the carriage; that the principle whereby compactness is secured does not prevent the proper operation of the various mechanisms by the keys, such as the escapement mechanism, the ribbon mechanism, and such other parts as coöperate therewith; that the general form or construction of a standard type-bar machine is maintained when the machine is in its normal operative condition; that the compact principle is such that the frame may be of any suitable construction; that the frame may be made so as to be placed as a permanent part in a carrying case or the said carrying case may be so constructed as to entirely inclose all of the parts of the machine and form the frame itself instead of using a separate carrying case; and that said machine is simple in construction, effective in use, and inexpensive to manufacture.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:—

1. In a typewriting machine, the combination of a main frame part, type bars supported on said main frame part, a platen carriage, a support for said carriage slidably mounted on said main frame part and movable forwardly from a rearwardly extended normal operative position to a more compact inoperative position above said main frame part, and a keyboard movable rearwardly relatively to said main frame from a normal extended operative position to a more compact inoperative position.

2. In a typewriting machine, the combination of a main frame part, type bars supported on said main frame part, a platen carriage, a support for said carriage slidably mounted on said main frame part and movable forwardly from a rearwardly extended normal operative position to a more compact inoperative position above said main frame part, a keyboard frame part slidably held to said main frame part and movable rearwardly within the same while upright from a normal extended operative position to a more compact inoperative position within said main frame part, and key-operated levers mounted on said keyboard frame part to move therewith adapted to actuate the type-bars when said keyboard frame part is in its normal extended operative position.

3. In a typewriting machine, the combination of a main frame part, a platen carriage, a support for said carriage, connections between said support and the main frame part whereby said support may be moved to shift the carriage from a normal rearwardly extended operative position forwardly to a more compact inoperative position above the main frame part, a keyboard, a keyboard support, and connections between said keyboard support and the main frame whereby said keyboard may be shifted from a normal extended operative position rearwardly to a more compact inoperative position within the main frame part.

4. In a typewriting machine, the combination of a main frame part, upwardly and rearwardly movable type bars, a type segment supported on said main frame part in fixed relation therewith, a keyboard slidably supported on the main frame to move from a forwardly extended operative position

rearwardly to a more compact inoperative position within the main frame below the type-bars, and operating connections between the keyboard and type-bars.

5. In a typewriting machine, the combination of a main frame part, upwardly and rearwardly movable type bars, a type segment supported on said main frame part in fixed relation therewith, a keyboard slidably supported on the main frame to move from a forwardly extended operative position rearwardly to a more compact inoperative position within the main frame below the type bars, and separable relatively slidable means forming operating connections between the keys of the beyboard and the type bars when the keyboard is in its extended position.

6. In a typewriting machine, the combination of a relatively stationary frame part, a platen carriage, a support for said carriage, connections between said support and said stationary frame part, whereby the carriage may be moved from a normal rearwardly extended operative position forwardly to a more compact position above said frame part, a keyboard, a support for said keyboard, connections between said keyboard support and said frame part whereby the keyboard may be moved from a normal extended operative position rearwardly to a more compact position within said frame part, and means for causing said carriage support and said keyboard support to move toward and from their compact positions simultaneously.

7. In a typewriting machine, the combination of a relatively stationary frame part, a platen carriage, a support for said carriage slidably held to said stationary frame part to adapt the carriage to be moved from a normal operative position to a more compact inoperative position, a keyboard, a keyboard support slidably connected with said stationary frame part to adapt the keyboard to be moved from a normal operative position to a more compact inoperative position, and means for causing said keyboard support and carriage support to move simultaneously to and from compact position.

8. In a typewriting machine, the combination of a frame, a platen carriage, a movable support for the platen carriage, a keyboard, a movable support for the keyboard, and means for simultaneously moving said supports to shift the carriage and keyboard relatively to the frame from their normal operative positions to more compact inoperative positions.

9. In a typewriting machine, the combination of a support, a platen, a keyboard, and means for simultaneously moving said platen and keyboard from their normal extended operative positions to more compact inoperative positions relatively to said support.

10. In a typewriting machine, the combination of a relatively stationary support, a platen carriage, a keyboard, and means whereby said carriage and keyboard may be shifted from normal extended operative positions to more compact inoperative positions relatively to said support.

11. In a typewriting machine, the combination of a relatively stationary support, a platen carriage, a keyboard, and means whereby said carriage and keyboard may be shifted while maintained in an upright position from their normal operative positions to inoperative positions in more compact relation with said support.

12. In a typewriting machine, the combination of a relatively stationary support, a platen carriage, a keyboard, and means whereby said carriage and keyboard may be shifted simultaneously while upright from their normal operative positions to more compact inoperative positions.

13. In a typewriting machine, the combination of a relatively stationary support, type bars mounted on said support, a platen, a keyboard, and means whereby said carriage and keyboard may be shifted relatively to the type bars to make the machine more compact when not in use.

14. In a typewriting machine, the combination of a relatively stationary support, type bars mounted on said support, a platen, a keyboard, and means whereby said carriage and keyboard may be shifted relatively to the type bars to place said platen and keyboard in close relation with each other and with the type bars when the machine is not in use.

15. In a typewriting machine, the combination of a relatively stationary frame part, a platen carriage supported thereon and movable from a normal operative position to a more compact position, a keyboard held to said frame part and movable from a normal operative position to a more compact position, and means controlled by the movement of the keyboard for automatically moving the carriage to and from compact position.

16. In a typewriting machine, the combination of a relatively stationary frame part, a platen carriage, a support for the platen carriage slidably held to said frame part, a keyboard support slidably held to said frame part, keys mounted on said keyboard support, and means actuated by the movement of the keyboard support to and from a compact inoperative position for simultaneously sliding the carriage support to and from a compact inoperative position.

17. In a typewriting machine, the combination with the type bars, of a key action for operating the type bars embodying key-operated levers shiftable from normal extended

operative positions to more compact inoperative positions in close relation with the type bars, a platen, and means controlled by the movement of the key-operated levers toward and from compact position for shifting the platen relatively to the type bars and key levers to move the platen toward and from a compact inoperative position in close relation with the type bars.

18. In a typewriting machine, the combination of type bars, key levers adapted to operate said type bars, a platen, and means whereby said platen and key levers may be shifted from their normal extended positions in coöperative relation with the type bars to inoperative positions in closer relation with the type bars.

19. In a typewriting machine, the combination of printing instrumentalities, keys for actuating said printing instrumentalities, a platen, and means whereby said keys and platen may be simultaneously shifted in opposite directions relatively to the printing instrumentalities to place said keys and platen in close relation with the printing instrumentalities when the machine is not in use.

20. In a typewriting machine, the combination of a support, printing instrumentalities mounted on said support, a platen, key levers, operating connections for actuating the printing instrumentalities through the key levers, means whereby the key levers may be moved bodily relatively to said printing instrumentalities from their normal operative positions into more compact relation with the printing instrumentalities, means operable by the movement of the key levers to compact position for positively moving the platen from its normal position in coöperative relation with the printing instrumentalities to an abnormal inoperative position in more compact relation with said printing instrumentalities, and means tending to normally move the platen into coöperative relation with the printing instrumentalities.

21. In a typewriting machine, the combination of a main frame part, type bars supported on said main frame part, a platen carriage, a support for said carriage slidably held to said main frame part and movable forwardly from a normal rearwardly extended operative position to a more compact position above the main frame part, means for normally forcing said support toward its rearwardly extended position, a keyboard, a keyboard support slidably held to the main frame part and movable from a normal forwardly extended position to a more compact position within said main frame part, and means operable by the rearward movement of said keyboard support for forcing the carriage support forwardly to its compact position.

22. In a typewriting machine, the combination of a main frame part, upwardly and rearwardly movable type bars mounted on said main frame part, a platen carriage, a carriage support, connections between said carriage support and main frame part whereby said support may be moved to shift the carriage while upright from a rearwardly extended position in coöperative relation with the type bars to a more compact position above and out of coöperative relation with the type bars, resilient means for normally moving said support to its rearwardly extended position, key levers, operating connections between the key levers and type bars, a movable support for the key levers, connections between said key lever support and the main frame part whereby said support may be moved rearwardly while upright from its normal forwardly extended position to a more compact position beneath the type bars, and means actuated by moving said key lever support rearwardly for forcing the carriage support forwardly.

23. In a typewriting machine, the combination of a support having a plurality of relatively movable members having an extended position when the machine is in use and movable to a compact position when the machine is not in use, type bars mounted on one of said members, key-operated levers arranged in groups to support keys in banks and mounted on another of said members so as to move bodily therewith and to maintain their relative arrangement on said member in all positions of said member, a separable operating connection between each type bar and its associated key-operated lever adapted to permit the key-operated levers to move free of said operating connections during the compacting movement of the support members and to be automatically positioned for operation of the type bars when the support members are extended, a platen carriage, and means whereby the platen carriage will be moved to a compact position when the key-operated levers are moved to compact position.

24. In a typewriting machine, the combination of a main frame part, type bars mounted on said main frame part, case shift means mounted on said main frame part, a universal bar mounted on said main frame part, a horizontally slidable keyboard frame part slidably held to the main frame part to move from a normal forwardly extended position to a compact position with said main frame part, a standard keyboard, including printing-key levers and a space bar and shift levers, mounted on said keyboard frame part and movable as a unit therewith, separable operating connections between each printing-key lever and its associated

type bar, separable operating connections between the shift levers and the case shift means on the main frame part, and a separable operating connection between the space bar and universal bar.

25. In a typewriting machine, the combination of a support, a universal keyboard, a platen carriage, and means for simultaneously moving the key board and platen carriage in opposite directions to make the machine compact when not in use.

26. In a typewriting machine, the combination of a support, a universal keyboard, a platen carriage, and means for simultaneously moving the key board and carriage in opposite directions while upright to place the carriage above the keyboard and reduce the length of the machine from front to rear when not in use.

27. In a typewriting machine, the combination of a support, a platen, a keyboard, and means for moving the platen and keyboard horizontally in opposite directions to make the machine more compact when not in use.

28. In a typewriting machine, the combination of a support, a platen carriage slidably held to said support to adapt the carriage to be moved forwardly, type, and key-operated levers operatively connected to the type and slidable as a unit rearwardly from a normal operative position in front of said support to a more compact position.

29. In a typewriting machine, the combination of a support, a platen carriage mounted thereon, type bars mounted on said support and movable upwardly and rearwardly toward the printing point, and a slidable standard keyboard mounted to move bodily as a unit from a normal position at the front of said support to a more compact position below the plane of the type bars, the printing keys of said keyboard having separable operating connections with their associated type bars.

30. In a typewriting machine, the combination of a support having a relatively stationary member and a horizontally slidable member, a platen carriage supported on the main member, type bars mounted on the main member, pivoted key-operated levers mounted on the horizontally slidable member and arranged in groups on pivots having a fixed relation with each other, and separable operating connections between the type bars and their associated key-operated levers.

31. In a typewriting machine, the combination of a support comprising a relatively stationary member and a horizontally slidable member, a platen carriage, type bars supported on the main member, key-operated levers mounted on the horizontally slidable member and arranged in groups forming a standard keyboard, and operating connections between the type bars and their associated key levers, said groups of levers being movable bodily in unison with each other and with said slidable member and having their same relative positions always maintained when said slidable member is moved to collapse and extend the machine.

32. In a typewriting machine, the combination of a support comprising a relatively stationary member and a horizontally slidable member, a platen carriage, type bars supported on the stationary member, keys mounted on the horizontally slidable member, and a separable operating connection between each type bar and its associated key embodying relatively slidable levers.

33. In a typewriting machine, the combination of a support comprising a relatively stationary member and a horizontally slidable member, a platen carriage, type bars supported on the stationary member, key levers mounted upon the horizontally slidable member, and a set of levers mounted on the main member positively connected at their rear ends with the type bars and having separable connections at their forward ends with the key levers.

34. In a typewriting machine, the combination of a support comprising a relatively stationary member and a horizontally slidable member adapted to move into the main member from an extended position to a compact position, keys arranged in groups and mounted upon said slidable member to move bodily therewith, said groups of keys having their relative arrangement maintained in both the extended and compact positions thereof, and printing instrumentalities operatively connected to the keys.

35. In a typewriting machine, the combination of a platen carriage, a support, type bars mounted on the support on pivots having a fixed relation with said support, key levers mounted in groups on pivots having a fixed relation with each other, and means whereby the groups of kev levers may operate the type bars and be moved as a unit to a compact inoperative position below the type bars.

36. In a typewriting machine, the combination of a platen carriage, a support along which said carriage travels, type bars located below and in front of the carriage, keys mounted below and in front of the type bars and adapted to operate the type bars, and means whereby the carriage may be moved forwardly over the type bars and the keys moved rearwardly under the type bars.

37. In a typewriting machine, the combination of a support comprising a relatively stationary member and a horizontally slidable member adapted to move within the stationary member from an extended posi-

tion to a more compact position, type bars mounted on the stationary member, and keys mounted upon the slidable member and movable bodily therewith as a unit, said keys being adapted to operate the type bars when said slidable member is extended and being movable with said slidable member to an inoperative position under the type bars without changing the position of the type bars.

38. In a typewriting machine, the combination of type bars, a support for said type bars, a plurality of levers arranged horizontally and each having one arm connected with a type bar and another arm extending downwardly, a plurality of key levers each having a forwardly extending arm supporting a key and an arm adapted to engage the downwardly extending arm of one of the first-mentioned levers to operate the type bars when the keys are depressed, and means whereby the key levers may be moved rearwardly relatively to said first-mentioned levers to more compact positions below the type bars and out of coöperative relation with said first-mentioned levers.

39. In a typewriting machine, the combination of a type bar support, type bars mounted thereon, a set of levers each having one arm positively connected with one of the type bars and a free arm, key-operated bell-crank levers pivotally supported in groups and each having a key-supporting arm and an arm adapted to engage the free arm of one of said first-mentioned levers to operate the type bars when the keys are depressed, and a support for the pivots of said key-operated bell-crank levers whereby said levers may be moved rearwardly into compact relation with the type bars and out of coöperative relation with the first-mentioned levers.

40. In a typewriting machine, the combination of a type bar support, type bars mounted on said support, a pair of coöperating bell-crank levers for each type bar one of which levers carries a key and forms a part of a universal keyboard, and means whereby the key-carrying lever of each pair may be moved relatively to its coöperating lever from a normal operative position to a more compact position.

41. In a typewriting machine, the combination of a main frame part, a keyboard frame part held to the main frame part to move horizontally within the same to reduce the length of the machine from front to rear, type bars mounted on the main frame part, key-operated levers mounted on the keyboard frame part and adapted to operate the type bars when in their normal extended operative positions, a releasable latch adapted to hold the keyboard frame part in its normal extended position, and feet held at the outer portion of the keyboard frame part to support the same when said frame part is extended.

42. In a typewriting machine, the combination of a main frame part, a keyboard frame part, tongue and groove connections between said frame parts whereby the keyboard frame part is slidable rearwardly within the main frame part to reduce the length of the machine from front to rear, type bars mounted on the main frame part, key levers mounted on the keyboard frame part and operatively connected to actuate the type bars when the keyboard frame part is in its normal extended position, and a releasable latch adapted to hold the keyboard frame part in its extended position.

43. In a typewriting machine, the combination of a main frame part, a keyboard frame part, tongue and groove connections between said frame parts whereby the keyboard frame part is slidable rearwardly within the main frame part to reduce the length of the machine from front to rear, type bars mounted on the main frame part, key levers mounted on the keyboard frame part and operatively connected to actuate the type bars when the keyboard frame part is in its normal extended position, and a key-operated latch lever mounted on the keyboard frame part and adapted to engage an abutment on the main frame part to hold the keyboard frame part in its extended position.

44. In a typewriting machine, the combination of a main frame part, a keyboard frame part, tongue and groove connections between said frame parts whereby the keyboard frame part is slidable rearwardly within the main frame part to reduce the length of the machine from front to rear, type bars mounted on the main frame part, key levers mounted on the keyboard frame part and operatively connected to actuate the type bars when the keyboard frame part is in its normal extended position, and feet pivotally held to the keyboard frame part adjacent its outer end adapted to support the same when extended and to fold upwardly within said keyboard frame part to move therewith within the main frame part.

45. In a typewriting machine, the combination of a frame, bars mounted upon said frame and movable substantially horizontally forwardly and rearwardly, a platen carriage supported on said bars and movable transversely of said bars and frame, a lever, a link connecting the lever with said bars, a movable keyboard frame part, a keyboard supported thereon, and means whereby the lever may be operated by moving said keyboard frame part to move the bars and carriage forwardly to a compact position.

46. In a typewriting machine, the combi-

nation of a support, bars mounted on said support to move forwardly and rearwardly substantially horizontally thereon, a platen carriage mounted on said bars and movable transversely thereof for letter spacing, a lever operatively connected with said bars, a bodily movable keyboard, and means whereby said lever may be automatically operated to move the bars and carriage forwardly and rearwardly when the keyboard is moved.

47. In a typewriting machine, the combination of a support, bars mounted upon said support and movable forwardly and rearwardly thereon, a platen carriage movable forwardly and rearwardly with said bars and having a letter spacing movement transversely of said bars, a bodily shiftable keyboard, and means whereby said bars may be automatically operated to move the bars and the platen carriage forwardly and rearwardly when the keyboard is shifted.

48. In a typewriting machine, the combination of a support, a pair of bars slidably mounted upon said support to move horizontally forwardly and rearwardly thereon, a platen carriage supported on said bars to move therewith and having a letter-feed movement transversely of said bars, levers, links connecting the levers with said bars, a keyboard, a forwardly and rearwardly slidable keyboard frame held to said support, and means whereby the levers may be automatically operated to slide the bars and carriage forwardly when the keyboard frame is moved rearwardly.

49. In a typewriting machine, the combination of a support, a platen and printing instrumentalities mounted on said support, a keyboard having keys adapted to operate the printing instrumentalities, and means comprising a pair of slides, each having two movable members and a fixed member adapted to telescope, whereby the keyboard may be moved from an extended operative position to a compact inoperative position.

This specification signed this 4th day of January A. D. 1916.

BENJAMIN W. TUCKER.