J. H. BARR.

TYPE WRITING MACHINE.

APPLICATION FILED DEC. 30, 1910.

1,067,392.

Patented July 15, 1913.

3 SHEETS—SHEET 1.

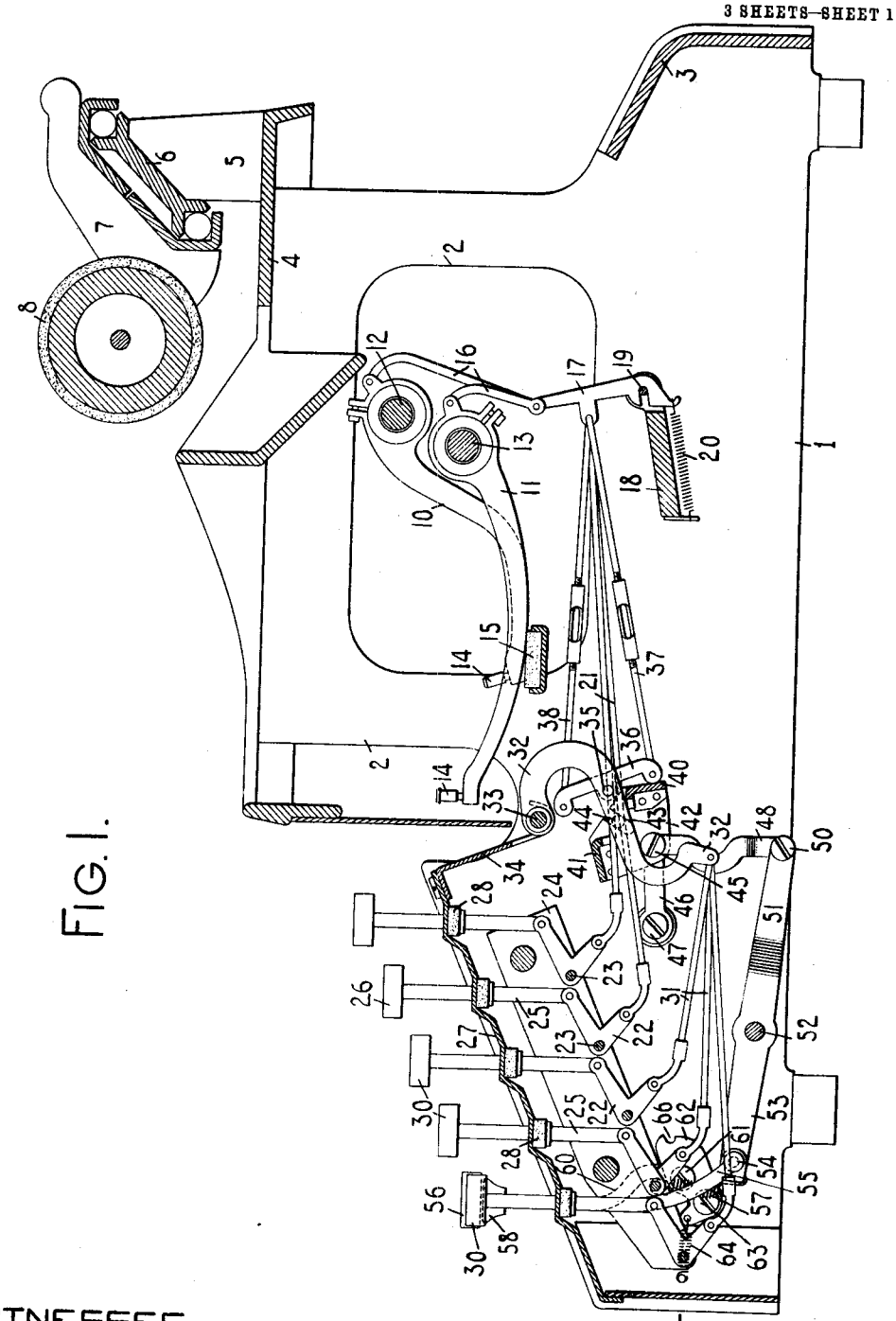


FIG. 1.

WITNESSES:

E. M. Wells

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INVENTOR:

John H. Barr

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3 SHEETS—SHEET 2.

FIG. 2.

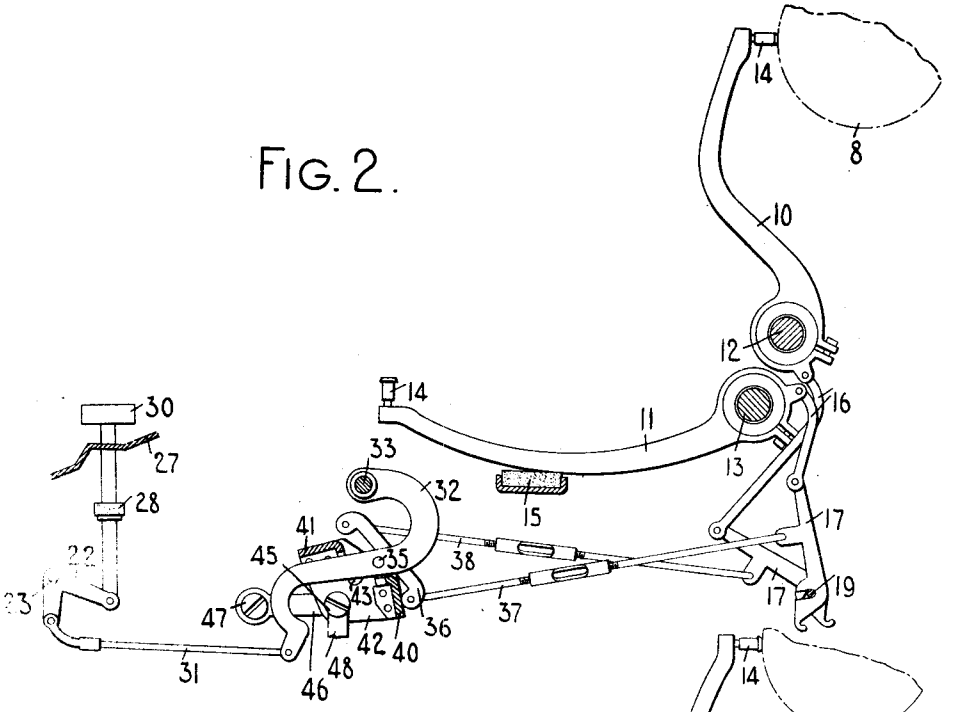
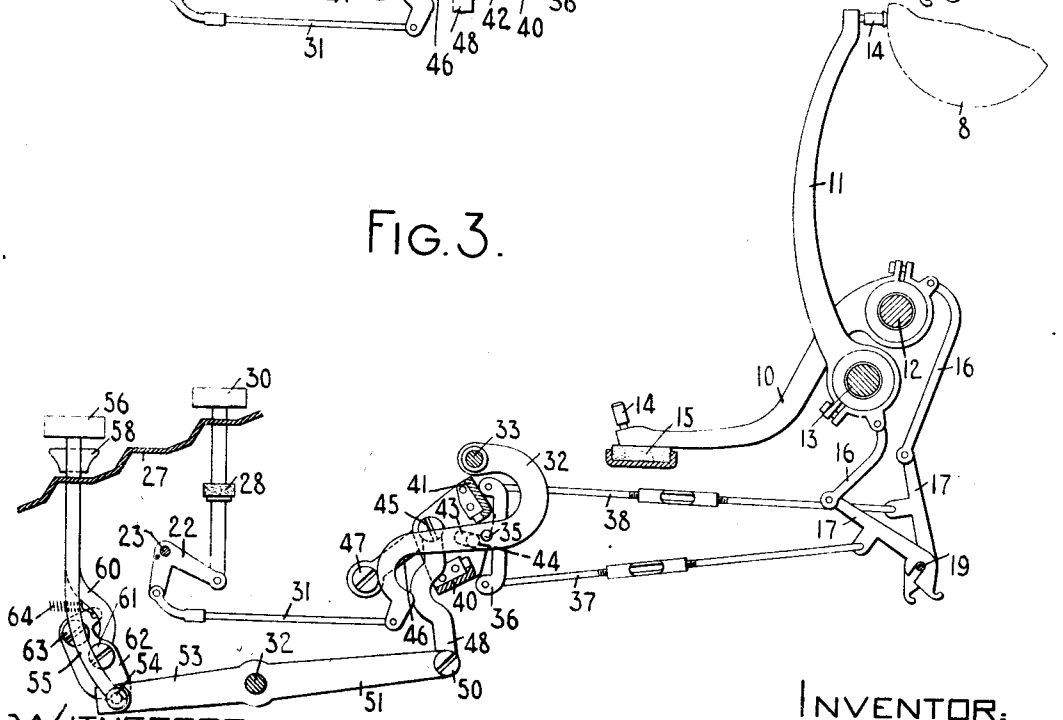


FIG. 3.



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3 SHEETS—SHEET 3.

FIG. 4.

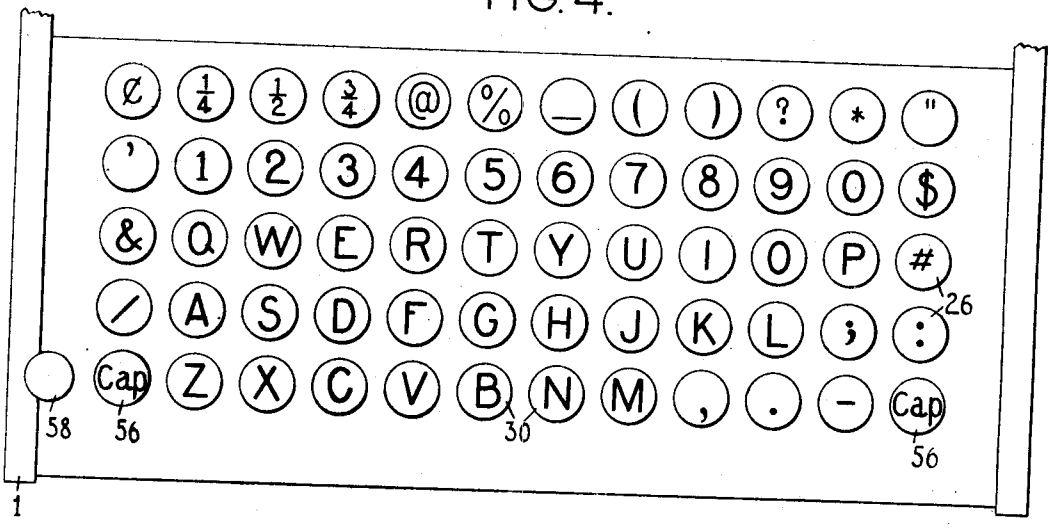
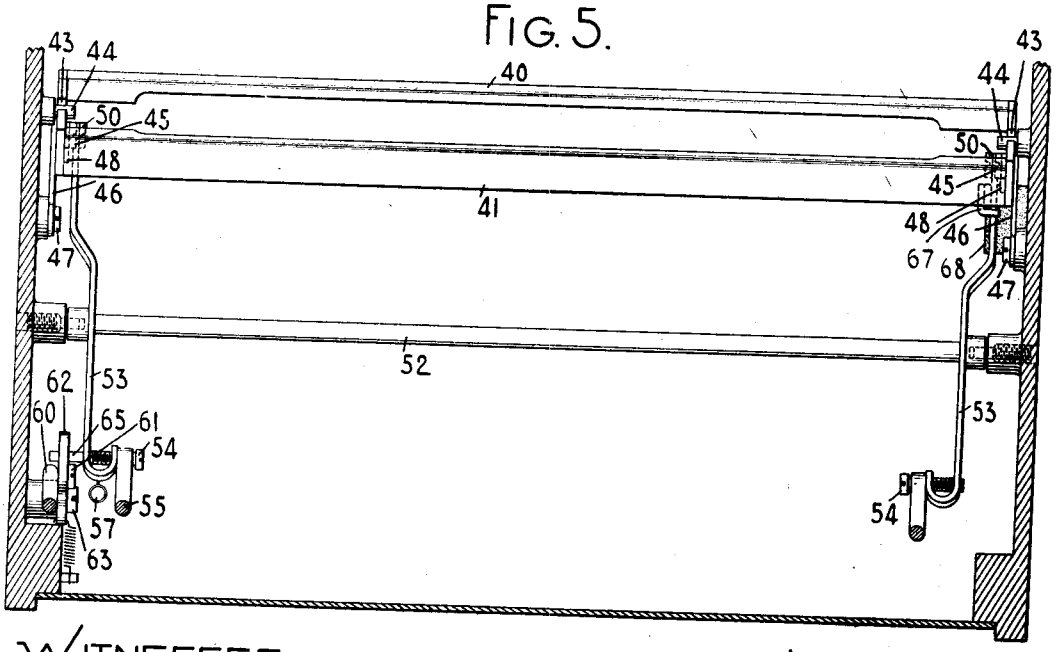


FIG. 5.

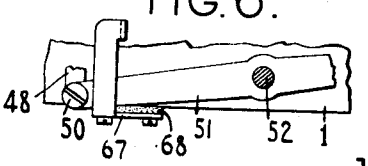


WITNESSES:

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FIG. 6.



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By Jacob Tabel

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UNITED STATES PATENT OFFICE.

JOHN H. BARR, OF SYRACUSE, NEW YORK, ASSIGNOR TO THE SMITH PREMIER TYPEWRITER COMPANY, OF SYRACUSE, NEW YORK, A CORPORATION OF NEW YORK.

TYPE-WRITING MACHINE.

1,067,392. Specification of Letters Patent. Patented July 15, 1913.

Application filed December 30, 1910. Serial No. 600,115.

To all whom it may concern:

Be it known that I, JOHN H. BARR, a citizen of the United States, and resident of Syracuse, in the county of Onondaga and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention relates to typewriting machines and more particularly to an improved type and key action for such machines.

Typewriters as heretofore constructed have been of two general classes commonly known as full keyboard and shift machines. In the full keyboard machine there is a separate key for each character to be printed, whereas in the shift machines each key prints two or more characters determined by case shift mechanism.

It is one of the objects of the present invention to provide a machine having the advantages of both of these classes of typewriters without the disadvantages of either. I provide a machine in which those keys that print the letters of the alphabet each control two types, one for the small letter and the other for the capital, and preferably all the other keys print only one character each. By this arrangement the keyboard is made much smaller than is necessary in the full keyboard machine and at the same time each key represents only one letter or other character, thus avoiding all confusion as to when to operate the shift key. In my machine the shift key is preferably never used, except to write capital letters. Moreover, I have provided a case shift mechanism of such a sort that when it is operated to cause the alphabet keys to print capitals it has no effect on the remaining keys. For example, the key to print a semi-colon always prints a semi-colon whether the shift key is operated or not. I provide a shift lock so that the case shift mechanism can be locked in its operated position. When this mechanism is so locked the alphabet keys always print capitals and the remaining keys are left undisturbed, printing the same characters as when the case shift mechanism is not operated. When the shift-lock key is depressed, therefore, the machine can be run without any further thought or operation of the case shift mechanism.

My invention also includes case-shift mechanism novel in principle and in construction.

I preferably employ a full set of type bars, one for each character to be printed. The alphabet keys are each connected to two type bars and the case shift mechanism determines which of said two type bars shall be operated. Each of the remaining keys is connected to only one type bar.

To the above and other ends which will appear hereinafter, my invention consists in certain features of construction and combinations and arrangements of parts all of which will be fully set forth herein and particularly pointed out in the claims.

My invention as to many of its features is applicable or adaptable to typewriting machines generally. For the purpose of illustration it is here shown applied to a machine which in many respects is identical with the Smith Premier No. 10 typewriter, and said machine may be identical with that typewriter in all respects, except as hereinafter explained.

In the accompanying drawings, Figure 1 is a front to rear vertical sectional view of a typewriter having my invention embodied therein. Figs. 2 and 3 are fragmentary views of some of the same parts but with a printing key in depressed position: in Fig. 2 the case shift mechanism is in normal position, whereas in Fig. 3 it is in the shifted position to print a capital letter. Fig. 4 is a top plan view of the keyboard. Fig. 5 is a horizontal section, with the printing keys and their connections removed to show the case shift mechanism. Fig. 6 is a detail.

The main frame of the machine comprises two side plates 1, each having a front and back post 2. Said side plates are connected together at the rear by a cross bar or plate 3 and said side plates support a top plate 4. From said top plate rise standards 5 which support the stationary rail 6 of a carriage 7 having a platen 8 mounted thereon. The machine comprises a series of front strike type bars arranged in two sets, one set of shorter type bars 10 and another set of longer type bars 11, said sets of type bars being mounted respectively on segments 12 and 13, the latter of greater radius than the former. Each of said type bars at its forward end carries a single type 14 and said type bars normally rest against a pad 15. Each of the type bars has pivoted to the heel

thereof a link 16 that comes up behind the type bar and extends radially therefrom and each of said links is pivoted to one of a series of radially disposed sub-levers 17 which sub-levers are pivoted in a segment 18 having a pivot wire 19. Each of the sub-levers 17 is controlled by a restoring spring 20.

Those type bars which are connected singly to their respective keys, have their sub-levers 17 operated by links 21 extending forward therefrom and pivoted at their forward ends to bell-crank key levers 22 which key levers are pivoted on cross wires 23 supported in a frame 24. The bell-cranks 22 are operated by the stems 25 of printing keys 26, said stems passing through suitable holes in a keyboard plate 27 and provided with stop pads 28. The construction is such that when one of the keys 26 is depressed its link 21 draws the sub-lever 17 toward the front of the machine and operates the type bar.

The arrangement of the type bars and the actuating mechanism of said type bars as far as has been described, are all substantially like the construction shown, described and claimed in my prior application No. 262,395, filed May 26, 1905. It will be understood that as shown in the present instance and preferably, the keys 26 print other characters than the letters of the alphabet. The alphabet keys 30 are mounted on stems 25 and connect with bell-cranks 22 in the same manner as the keys 26. Each of said bell-cranks however has pivoted thereto a link 31 shorter than the links 21 and each at its rear end is connected to the lower end of a lever 32 pivoted on a cross rod 33 which extends across the machine back of the keyboard. In the present instance where it is only the alphabet keys that are connected to two type bars each, there are twenty-six of these levers 32 distributed at suitable intervals along the rod 33. Said rod is partly supported near its middle by a bracket 34 which extends down from the key-board plate 27. Each of the levers 32 has pivoted thereto at 35, the middle of a two-armed lever 36 which two-armed lever normally stands in an approximately up and down position, shown in Fig. 1. The lower end of each of the levers 36 has pivoted thereto a link 37 which at its rear end is connected with one of the sub-levers 17 and the upper arm of each lever 36 has pivoted thereto a link 38 which is connected with another of said sub-levers. It will thus be seen that each key 30 is connected through the link 31 and levers 32 and 36 with two type bars. Preferably, each key is connected with one of the short type bars 10, and with one of the long bars 11, and the small letters are printed by short type bars and the capitals by long type bars. As the long and short type bars alternate in the system, each of the levers 36 is preferably connected with two adjacent type bars and therefore with two adjacent sub-levers 17.

It will be seen that both type bars are constantly connected with the key and that if either one of these two type bars be held by any means against operation and the key be depressed, the other type bar will be operated. For example, if the operator placed his finger over the type of the longer type bar 11 and struck the key, the shorter type bar would be thrown to the printing point; and if he held down the shorter type bar the longer one would be thrown to the printing point. It will also be observed that in this operation the operated one of the links 37, 38 has a leverage of about two to one on the point 35, at which the lever 32 is connected with the lever 36. To compensate for this the link 31 is connected with the lever 32 at a distance from the rod 33 about twice as great as the distance of the point 35 from said rod. By this means the leverage of one of the keys 30 on the operated type bar is approximately the same as that of one of the keys 26 on its type bar.

The case shift mechanism consists of means for blocking one or the other of the two type bars that is connected with each of the keys 30. This blocking can be conveniently done at the lever 36 and I prefer to block this particular part. To this end two cross bars 40 and 41 are mounted at their ends on angled end plates 42 each of which has a slot 43 therein which slot embraces a pin 44 projecting inward from the side plate 1 of the main frame. Each of the plates 42 is pivoted at 45 to a link 46 which in turn is pivoted at 47 to the side plate 1. Two links 48 are pivoted at their upper ends on the pivots 45 and at their lower ends they are pivoted at 50 to arms 51 which are secured one at either side of the machine to a rock shaft 52. The parts normally stand in the position shown in Fig. 1 but by rocking the shaft 52 the arms 51 are raised to the position shown in Fig. 3, thus moving upward and tilting the frame comprising the end plates 42 and the cross bars 40 and 41. The motion of this frame is guided by the links 46 and by the pin-and-slot connections 43, 44, the construction being such that as the frame moves upward it is rocked from the position shown in Fig. 1 to that shown in Fig. 3. When the parts are in the Fig. 1 position the bar 40 stands in front of the lower ends of all of the levers 36 and prevents said lever ends from moving toward the front of the machine but leaves the upper ends of said levers free to move. The result is that if a key 30 is depressed the upper end of the lever 36 moves toward the front of the ma-

chine, operating the short type bar 10 as shown in Fig. 2. When the parts are in the position shown in Fig. 3, the upper ends of all of the levers 36 are blocked and the operation of the key 30 causes the lower end of the lever 36 to move toward the front of the machine, thus operating the long type bar 11.

It will be noted in Fig. 1 that when the shift mechanism is in its normal position the pressure of the lever 36 against the plate 40 is substantially lengthwise of the link 46 so that said pressure has practically no tendency to move said link about its pivot and, therefore, little or no tendency to rock the shaft 52 and the parts connected therewith. It will also be noted that a line drawn through the center of the pin 44 and at right angles to the slot 43 will pass pretty nearly through the point of contact between the lever 36 and one of the bars 40, 41, so that the pressure of this lever against the plate has practically no tendency to rock the frame about the pin 54. In Fig. 3 similar mathematical relations will be seen to obtain: that is to say, the pressure of the lever 36 against the bar 41 is substantially lengthwise of the link 46 and the point of contact is approximately in the normal line through the pin 44. It will also be observed that the shifting motion of the frame bar 40 or 41, is in a direction opposed to that in which the blocked part (in this case the end of the lever 36) moves. That is to say, the lever 36 when operated, moves toward the front of the machine, and the blocking bars when shifted, move toward the rear. The result is that if a key 30 be started down before the shift key has completed its stroke, the end of the lever 36 will begin to move, but will be pushed back to normal position by the bar. It is not essential, therefore, that the shifting operation be completed before beginning to depress a key 30. Preferably the ends of the levers 36 are rounded toward the front of the machine as shown in order to pivot nicely on the bars 40 and 41.

The shift mechanism may be operated in various ways but I prefer to extend the lever arms 51 toward the front of the machine forming lever arms 53 each of which has pivoted thereto at 54 the lower end of the stem 55 of a shift key 56. The parts are normally held in the position shown in Fig. 1 by means of a restoring spring 57, (Figs. 1 and 5) which spring is connected at its lower end with one of the arms 53 and at its upper end with a stationary part, but when either of the shift keys 56 is depressed the case shift mechanism is moved to position to block the upper ends of the levers 36.

In order to lock the case shift mechanism in shifted position I provide a shift-lock key 58, Figs. 1, 3 and 4. This key has a stem 60, the lower end of which is pivoted at 61 to a small cam-plate or lever 62 which is pivoted at 63 to one of the side plates 1. A returning spring 64 normally holds the plate 62 and the key 58 in their upper positions shown in Fig. 1 but these parts can be depressed to the position shown in Fig. 3 by operating the key 58. The lower part of the plate 62 is formed as a sort of cam which acts on the projecting end 65, Fig. 5, of the pivot screw 54 and depresses the case shift frame when the key 58 is operated. Said plate 62 has a notch 66 formed in its lower end, into which notch the pin 65 catches when the key is depressed, thus locking the parts in their operated position as shown in Fig. 3. By striking either one of the two shift keys 56 the frame can be forced down so as to bring the pin 65 out of the notch 66 whereupon the spring 64 will restore the lock to normal position and when the key 56 is released the whole case shift mechanism will return to normal position.

It will be noted that the levers 32 are curved into a sort of S-shape and that they extend through the long slot between the two bars 40 and 41. This construction is not absolutely essential but it is a convenient way of organizing these parts and it gives the desired action of the lever. It will also be noted in Fig. 1 that some of the links 21 pass through this same slot. It will be noted in Fig. 4 that there are five rows of keys with twelve keys in each row except the bottom row which has only ten printing keys. There are thus fifty-eight keys which print eighty-four characters. It will be noted that the alphabet keys 30 are all in the first three rows from the bottom although, as there are only twenty-six of these keys, a number of the character keys 26 are also in these three rows. The two top rows consist entirely of character keys each connected with only a single type bar and it is the links 21 connected with these two rows of keys that pass through the slot. Some of the other links 21 pass below the bar 40.

It will of course be understood that various changes can be made in the details of construction and arrangement without departing from my invention.

In Fig. 6 I have shown a stop device for arresting the shift frame in each of its two positions. This stop device, as shown, consists of a sheet metal bracket 67 secured to one of the side plates 1 and bent so as to have one part beneath and another above one of the lever arms 51. The part against which this arm normally rests, is shown provided with a cushioning pad 68. It will be noted that when one of the bars 40 and

41 is in operative position, the linkage which controls it is about in a sort of dead-center position, so that no extreme accuracy is necessary in positioning the lever arm 51. Indeed, the bars 40 and 41 themselves do not require to be set with any great accuracy, as their only function is to block the operation of one of the two type bars connected with the operated key.

In some typewriters heretofore constructed or proposed in which one key is used to operate more than one type bar, the shift from one type bar to another has been by disconnecting the key from the first bar and then connecting it with the other. In all such devices, the shift must be effected before the operation of the printing key is begun, and the mechanism will not work properly if the operator is a little slow in depressing the shift key. This has been a serious fault with the prior mechanisms referred to. In my construction a plurality of independent printing elements or type bars have constantly maintained or permanent connection with a single key and means are provided for selecting one of said type bars without disconnecting the other or others. The shift is effected by changing the motion of part of the connections, in the present instance, the floating links or levers 36, without disconnecting any of the type bars. Said levers are provided with double fulcrums, and they swing sometimes about one fulcrum and sometimes about the other, thus shifting the application of the power from one type bar to another. If the shift key be depressed while a printing key is in a partially depressed position, the type bar which had begun to move will have its travel reversed and will be forced back to normal position while the other type bar will move to printing position, the two bars passing each other in opposite directions during the depression of the key. It will of course be understood that the means for accomplishing these results can be varied considerably from the precise mechanism described, without departing from my invention. It will also be understood that my novel case shift mechanism is applicable to machines in which all of the printing keys are connected with a plurality of type bars each.

From what has been said it will be perceived that I have provided two different sorts of type actions in one of which one type bar only is connected to each key, and in the other of which two type bars are connected to each key, and that the type bars of one of these kinds of type action are interspersed with those of the other kind. The letter keys extend in three rows nearly across the keyboard and the character keys extend in two rows entirely across the keyboard so that in the type bar segments some of the type bars belong to one set or sort of type action and some to the other and that the two sorts are intermingled the one with the other. The blocking means, however, are so designed so as to affect only those type actions in which two type bars are connected to the key.

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

1. In a typewriting machine, the combination of a series of two-armed levers, type bars connected with said levers, one type bar for each arm of each lever, means for operating said levers, a tilting frame arranged in front of said levers and movable to two positions in one of which it blocks one end of each of the levers and in the other of which it blocks the other ends of said levers.

2. In a typewriting machine, the combination of stationary framework, a number of keys, a number of type bars, means connecting each key with two of said type bars, means for blocking the connections of one or the other of said type bars and leaving the other free to be operated by its key, and means for shifting said blocking means, said blocking means comprising a frame having pin and slot connection with the stationary framework, and two links pivoted to said frame and to said framework.

3. In a typewriting machine, the combination of two type bars, a floating lever, two links one pivoted to each end of said lever and each of said links connected with one of said type bars, a lever pivoted on a fixed pivot and having the middle of said floating lever pivoted directly thereto, a key for operating said lever, and a frame shiftable into juxtaposition to one end or the other of said floating lever to block one end or the other of said lever and thus cause either one or the other of the type bars to be operated by a depression of said key.

4. In a typewriting machine, the combination of a series of type bars, a series of keys less in number than said type bars, angled key levers, means connecting some of said levers with said type bars, one type bar for each lever, and means connecting other of said levers each with two type bars, the last recited means including a series of floating levers, each connected at each of its ends with one of said type bars, a series of sub-levers each having the middle of one of said floating levers pivoted thereto and each connected with one of said angled key levers, the lever arms of said sub-lever being so related that the point on said sub-lever at which it is connected with said key lever moves approximately twice as far as the point at which said floating lever is pivoted, whereby the two sorts of keys have substantially the same extent of depression.

5. In a typewriting machine, the combination of a series of printing keys and key

levers, links operated by said key levers, a series of type bars greater in number than said printing keys, connections from some of said links to some of said type bars, one type bar for each link, sub-levers operated by the remaining links, floating levers operated by said sub-levers and each of said floating levers having two type bars connected therewith, one at each end thereof and each of said floating levers connected at its middle with a sub-lever, and means for blocking either end of each of said floating levers, the lever arms of said sub-levers being so related as to give upon a key depression approximately the same extent of motion to the unblocked end of the floating lever as is imparted to said link, whereby all of the keys have substantially the same extent of dip.

6. In a typewriting machine and in case shift mechanism, the combination of a series of type bars, a series of floating levers, each connected with two of said type bars, one type bar being connected with each end of each lever, a series of keys, key operated means for operating said floating levers, and means for blocking one end or the other of each of said floating levers, said blocking means comprising two bars connected together at their ends and having sliding pivotal connection with the stationary framework, and two links connected with said frame and arranged to be substantially on the dead center in either shifted position of said frame.

7. In a typewriting machine, the combination of a series of type bars, a series of keys less in number than said type bars, a series of floating levers, key connections for operating said floating levers, connections from each of said floating levers to two of said type bars, one connection at each end of each lever, and shiftable blocking means for said floating levers, said blocking means comprising two bars, one for each series of lever-ends and shiftable alternately into operative position, some of said connections passing between said bars.

8. In a typewriting machine, the combination of a series of type bars, a series of keys less in number than said type bars, connections from some of said keys to said type bars, one type bar for each key, and connections from the remaining keys to said type bars, two type bars for each key, the last recited connections including floating levers each connected with a key and each connected with two type bars one at each end of said lever, means for blocking one end of each of said levers, said means including two bars shiftable alternatively into operative position, one for each series of lever-ends, the connections from the first recited keys to the type bars passing between said blocking bars.

9. In a typewriting machine, the combination of a series of type bars, a series of keys less in number than said type bars, a series of floating levers each connected with two of said type bars, one type bar at each end of each lever, connections from said keys to the middles of said floating levers, and case shift mechanism including two bars, one for blocking one series of lever-ends and the other for blocking the other series of lever-ends, and means for moving said bars alternatively into operative position, said means including means for moving one of said bars toward and from the corresponding series of lever-ends in a direction approximating the direction in which said lever-ends move when operated, whereby if a printing key is depressed before the shift key or simultaneously with it and one of said floating levers has begun to operate, said bar will restore the end of said lever to initial position and the other bar will leave the other end of said lever free to be operated.

10. In a typewriting machine, the combination of a series of type bars, a series of keys less in number than said type bars, a series of floating levers each connected with two of said type bars, one type bar at each end of each lever, connections from said keys to the middles of said levers, and case shift mechanism including two bars, one for blocking one series of lever-ends and the other for blocking the other series of lever-ends, rigid connections between said bars, said bars and connections constituting a frame, and means for imparting to said frame a motion including a turning motion such that when one of said bars approaches or recedes from the corresponding series of lever-ends it moves in a direction approximating that in which said lever-ends move when operated, whereby if a printing key is depressed before the shift key or simultaneously with it and one of said floating levers has begun to operate, said bar will restore the end of said lever to initial position and the other bar will leave the other end of said lever free to be operated.

11. In a typewriting machine, the combination of a series of type bars, a series of keys less in number than said type bars, a series of floating levers each connected with two of said type bars, one type bar at each end of each lever, connections from said keys to the middles of said levers, case shift mechanism including two bars, one for blocking one series of lever-ends and the other for blocking the other series of lever-ends, rigid connections between said bars, said bars and connections constituting a frame, and means for imparting to said frame a motion including a turning motion such that when one of said bars approaches or recedes from the corresponding series of lever-ends it moves in a direction approxi-

mating that in which said lever-ends move when operated, whereby if a printing key is depressed before the shift key or simultaneously with it and one of said floating levers has begun to operate, said bar will restore the end of said lever to initial position and the other bar will leave the other end of said lever free to be operated, and guiding means for said frame arranged to come substantially to a dead center position so as to resist the pressure of the lever-ends against the one of said bars in use.

12. In a typewriting machine, the combination of a series of front-strike type bars, a series of keys less in number than said type bars, connections from one of said keys to two adjacent type bars, said connections including a floating lever connected at each of its ends with a type bar and at its middle with said key, and means for blocking one end or the other of said lever.

13. In a typewriting machine, the combination of a key, two type bars, a floating lever operated by said key, connections from said type bars to the two ends of said floating lever, and means for blocking the ends of said lever alternatively, said blocking means including a frame having two blocking surfaces in different planes, means for controlling said frame, said means including links and pin-and-slot connections between the said frame and the stationary framework of the machine, and a case shift key for shifting said frame.

14. In a typewriting machine, the combination of a series of front strike type bars arranged in two sets pivoted in different arcs, and the type bars of one set alternating in the basket with those of the other set, two sets of sub-levers connected with said two sets of type bars, keys, means whereby a key when operated can operate a sub-lever of one of said sets, and means shiftable to cause said key to operate a sub-lever of the other set, said shiftable means including means for transferring the action of said key from one of said sub-levers to the other during the operation of the key.

15. In a typewriting machine, the combination of a series of front-strike type bars arranged in two sets, links and sub-levers extending radially from the several type bars, links extending from said sub-levers toward the front of the machine, printing keys, means whereby one of said keys when operated operates one of said forwardly extending links, and means shiftable to cause said key when operated to operate another one of said links.

16. In a typewriting machine, the combination of a series of front-strike type bars arranged in two sets, links and sub-levers extending radially from the several type bars, links extending from said sub-levers toward the front of the machine, printing keys, means whereby one of said keys when operated operates one of said forwardly extending links, and key actuated means shiftable to enable said key when operated to reverse the operation of a type bar if started before the shift key is completely operated.

17. In a typewriting machine, the combination of a series of front-strike type bars arranged in two sets, links and sub-levers extending radially from the several type bars, links extending from said sub-levers toward the front of the machine, an actuator permanently connected with two of said links, a printing key connected with said actuator, and shiftable means whereby said key, in one position of said means, will operate one of said forwardly extending links, and in another position of said shiftable means said key will operate the other of said links.

18. In a typewriting machine, the combination of a series of front-strike type bars arranged in two sets, links and sub-levers extending radially from the several type bars, a series of key operated actuators each connected with two of said sub-levers, a series of keys each of which is connected to one actuator and a pair of sub-levers, and shiftable means coöperative with said series of actuators to cause each actuator to act differently at different times so as to operate one or the other of said sub-levers.

19. In a typewriting machine, the combination of a series of front-strike type bars arranged in two sets, links and sub-levers extending radially from the several type bars, a key operated rocking actuator controlling two sub-levers, and means for causing said actuator to rock in one way to actuate one of said sub-levers and to rock in another way to actuate the other of said sub levers as desired.

20. In a typewriting machine, the combination of a unitary keyboard comprising printing keys for numerals, punctuation marks and other signs and for letters; a unitary printing mechanism operated by said keys, said printing mechanism including type bars carrying types for printing capital letters, type bars carrying types for printing small letters and type bars carrying types for printing other characters; connections from each of said character keys other than the letter keys to appropriate type bars, each key being connected with one type bar only; connections from each of said letter keys to one of said capital letter type bars and also to one of said small letter type bars, the last mentioned connections including floating levers and changeable means for varying the fulcrums of said levers to cause each of said keys to operate one or the other of said two type bars as desired, and means connecting the keys to the floating levers, said connecting means

including levers so designed as to give to each of the letter keys substantially the same leverage on either one of the two type bars with which said letter key is connected as one of the character keys has on the single type bar with which it is connected.

21. In a typewriting machine for printing small letters, capital letters, numerals, punctuation marks and other signs, the combination of a set of type bars carrying types for printing capital letters, a set of type bars carrying types for printing small letters, letter printing keys each connected with one type bar of each of said sets, case shift mechanism, a set of type bars for printing other characters, and keys for operating the last mentioned type bars, the latter being interspersed among the type bars of the other sets, and said case shift mechanism including means for selectively blocking the action of those type bars connected two to a key and said blocking means being inoperative on those type actions in which one type bar only is connected to each key.

Signed at Syracuse, in the county of Onondaga, and State of New York, this 23rd day of December, A. D. 1910.

JOHN H. BARR.

Witnesses:
E. E. CORY,
I. L. MARTIN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."