C. E. TOMLINSON.

TYPE WRITING MACHINE.

APPLICATION FILED SEPT. 19, 1907.

952,021. Patented Mar. 15, 1910.

2 SHEETS—SHEET 1.

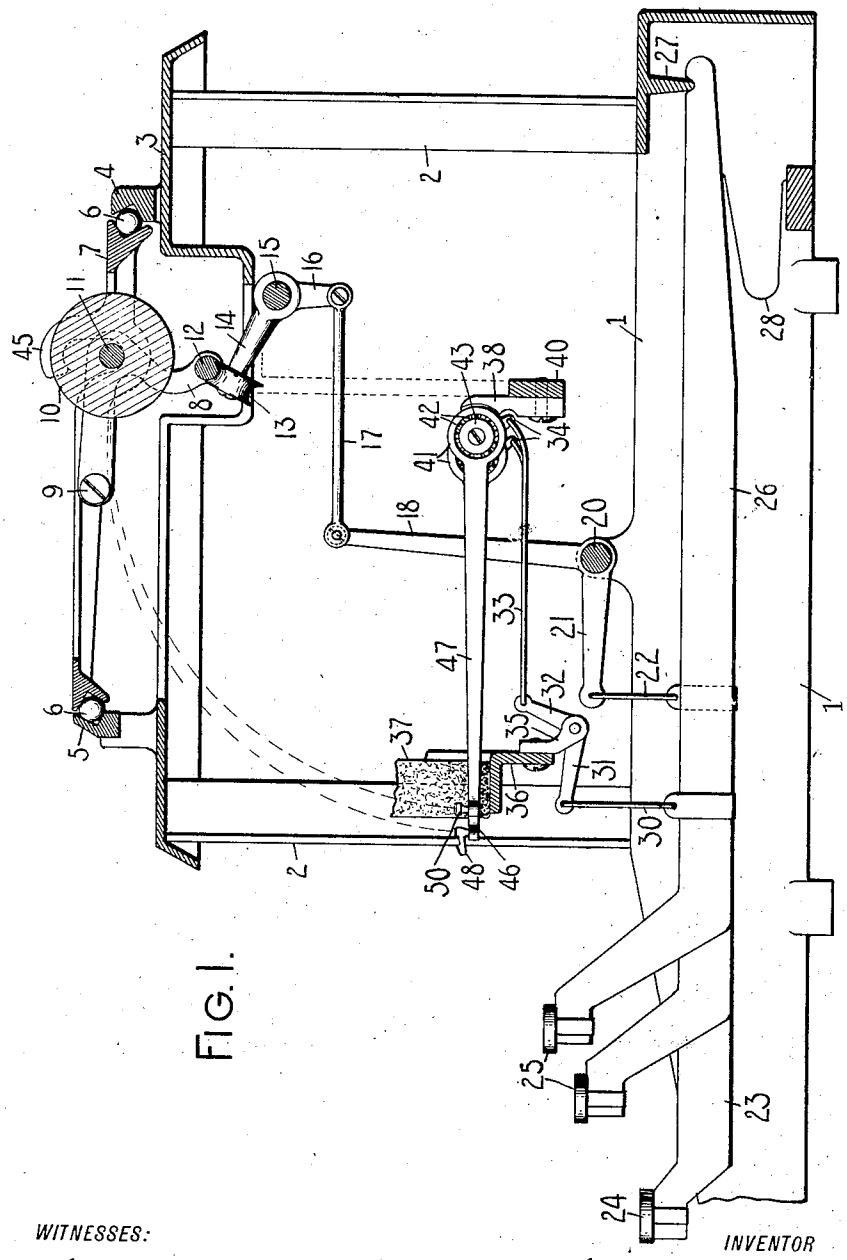

FIG. 1.

WITNESSES:

J. B. Reeves.

R. H. Strother.

INVENTOR

Charles E. Tomlinson

BY

Jacob Falbel

ATTORNEY

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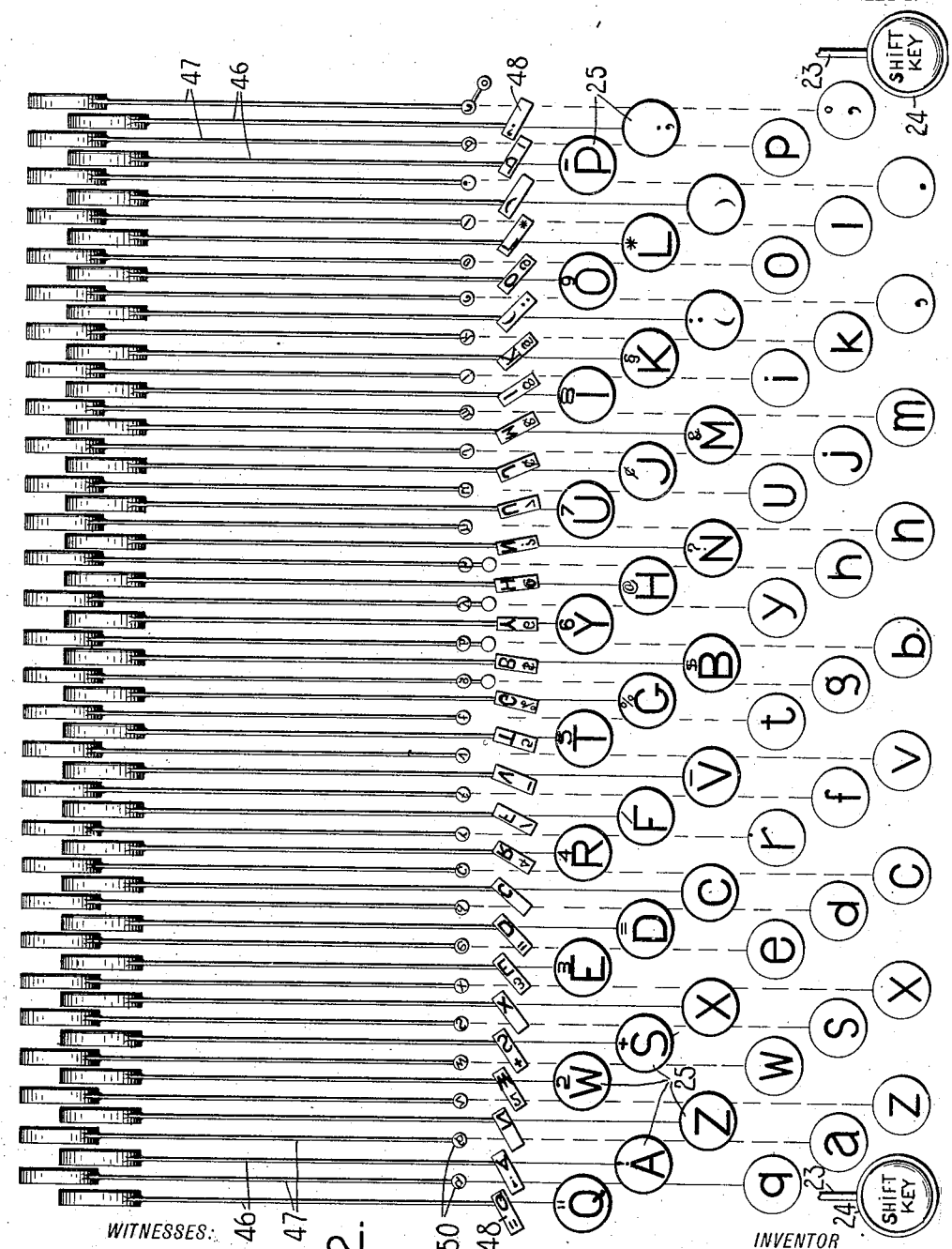

FIG. 2.

WITNESSES:

J. B. Reeves.

R. H. Strother.

INVENTOR

Charles E. Tomlinson

BY

Jacob Fabel

ATTORNEY

UNITED STATES PATENT OFFICE.

CHARLES E. TOMLINSON, OF SYRACUSE, NEW YORK, ASSIGNOR TO ALEXANDER T. BROWN, OF SYRACUSE, NEW YORK.

TYPE-WRITING MACHINE.

952,021. Specification of Letters Patent. Patented Mar. 15, 1910.

Application filed September 19, 1907. Serial No. 393,694.

To all whom it may concern:

Be it known that I, CHARLES E. TOMLINSON, 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 especially to an improved arrangement of the type bar and keyboard systems.

Although my invention is applicable to typewriting machines generally, it is designed with more especial reference to front-strike or "visible" typewriters, the objects being to combine the advantages of a full keyboard machine and a shift machine, and to make provision for the use of large types if needed and for the writing of a large number of characters.

To the above and other ends which will hereinafter appear, 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.

In the accompanying drawings, Figure 1 is a front to rear vertical sectional view of a front-strike typewriting machine having my invention embodied therein, as much only of said machine being shown as is necessary to illustrate the application of my invention to it. Fig. 2 is a diagrammatic plan view including a developed view of the type bar system and a plan view of the keyboard.

The detailed construction of the typewriting machine may be of any suitable sort but for the purpose of illustration I have shown in Fig. 1 a front-strike typewriter, the main frame of which comprises a base 1, from which rise posts 2 supporting a top plate 3. Grooved rails 4 and 5 supported by the top plate coöperate with anti-friction balls 6 to support a rectangular carriage truck 7 to the end bars of which a platen frame 8 is pivoted at 9. The platen 10 has a shaft 11 that is journaled in the frame 8. Said frame comprises a transverse bar 12 beneath the platen, which bar is engaged by a roller 13 comprising part of a case-shift means for shifting the platen up and down. The roller 13 is journaled on the free end of an arm 14 projecting from a rock shaft 15 which is pivoted at its ends in the stationary framework of the machine. Near one end said rock shaft has depending therefrom an arm 16 which is connected by a link 17 with an upright arm 18 projecting from a rock shaft 20 which is pivoted at its ends in the base 1. Said shaft 20 has projecting forward therefrom near either end an arm 21 which is connected by a link 22 with a shift key lever 23 having a shift key 24 mounted on its forward end in the keyboard of the machine. The printing keys 25 are mounted on the forward ends of key levers 26, which at their rear ends are pivoted on a cross bar or rib 27 forming part of the base 1 of the machine and each of said key levers is provided with a restoring spring 28. Each of the key levers 26 is connected by a link 30 with an arm 31 of a bell crank sub-lever, which sub-lever has also an arm 32 which is connected by a link 33 with a lug 34 projecting from the heel of one of the type bars. The sub-levers 31, 32 are pivoted in hangers 35 secured to a segment 36 mounted in the stationary framework of the machine and having on its upper face a pad or type rest 37. The type bars are shown pivoted to individual hangers 38 mounted on a type bar segment 40 and each of said type bars has at its rear end an eye 41 which is connected by a ball bearing 42 to a boss 43 projecting from one face of the corresponding hanger 38. The construction is such that when any of the keys 25 is struck the corresponding type bar will be thrown to the printing point, its type striking against the front face of the platen 11; and if one of the shift keys 24 be depressed the platen will be elevated, turning about the pivots 9 until the shaft 11 of said platen is arrested by a hook-like arm 45 of the truck 7 or by a suitable stop carried thereby.

The parts thus briefly described are not of my invention and they are shown here merely for the purpose of illustrating or exemplifying the application of my invention to a typewriting machine.

By my invention, different type bars are provided with different numbers of types, and said invention carried out in a variety of ways, the precise number of types on each type bar depending on the style of the machine. As shown in the present instance, some of the type bars have two types each,

and other type bars have only one type each. The type bars are arranged in two sets, those of one set being designated in the drawings by reference numeral 46 and those of the other set by reference numeral 47, the type bars of one set alternating with those of the other. The type bars 46 when in normal position, extend farther toward the front of the machine than the type bars 47 and each of said type bars 46 has mounted on its free end a type block 48 having two types thereon, and when one of these type bars is operated the inner type will strike the platen if said platen is in normal position, and the outer type will strike the platen if said platen is in shifted position. The type blocks 48 near the ends of the segment are flared as is always the case in type blocks of this character and the extent of this flare or cross setting of the type blocks varies progressively from nothing at all at the center of the segment to a maximum at each end of the segment, all as is usual in front strike machines having a case shift.

Each of the type bars 47 has mounted thereon a type block 50 and in most instances there is but one type on each of these type bars, this type being farther toward the rear of the machine than the type blocks 48. The type blocks 50 may be caused to assume a position in rear of the type blocks 48 in any one of a variety of ways, but as shown in the present instance the type bars 46 and 47 are of substantially the same length but the pivots of the type bars 47 are set farther back or toward the rear of the machine than those of the type bars 46.

As shown in the present instance there are twenty-nine of the type bars 46 and a like number of the type bars 47 and there are fifty-eight printing keys 25. As here shown these printing keys are arranged in six transverse rows and the rows of keys considered in a fore and aft direction are oblique, this oblique arrangement being due to the use of the key levers 26 and to the particular arrangement shown. If, however, some other form of connection between the keys and the type bars were adopted said keys might be arranged differently in rows extending directly fore and aft of the machine. It will of course be understood that those keys 25 which are connected with type bars having two types thereon are each adapted to print either of two characters, depending on whether or not the shift key is operated; whereas those keys 25 that are connected with type bars having only one type thereon are each adapted to print only one character. In the particular instance shown in the drawing, the fifty-eight keys are adapted to print eighty-five characters; but five of the type blocks 48 are shown with only one character and the four middle type bars 47 are shown adapted to carry two types each, so that ninety-four characters could be put into the machine, if desired, by merely filling out the blank spaces in the type blocks already provided and without adding any additional mechanical parts. The characters on the type blocks and on the corresponding keys may be arranged in whatever way best suits the operator. For example, all of the letters of the alphabet might be placed on those key levers that carry two types each, so that the same key would always be struck to write a given letter and the shift key would be used in case it was desired to write a capital. In such an arrangement the characters other than letters, or most of them at least, would be put on those type bars which carry only one type each. This might be the arrangement best suited to some operators accustomed to using a shift machine, such for example, as the Remington. I prefer, however, to have the capital letters and the small letters on separate type bars and separate keys so that the shift key is never used in writing letters but only in the writing of characters other than the letters of the alphabet. As shown in the present instance, all of those keys in the three back rows are connected with the type bars 46 having the double type blocks, and the capital letters are printed by these type bars and keys, whereas the small letters are arranged in the three forward rows of keys and their types are on the type bars 47. Most of the three rear rows of keys carry in addition to a capital letter some other character, such as a numeral or a punctuation point or other character that it may be useful to have in the machine. The keyboard arrangement shown in the drawing is approximately that of the Smith Premier No. 2 typewriter.

I prefer to mount the type blocks, as shown in the drawing, so that the inner type stands directly over the end of the type bar, the outer type projecting toward the front of the machine in the cases of those type bars near the middle of the segment or toward one side in the cases of those type bars near the ends of the segment. I prefer this arrangement partly because the letters are used very much more frequently than the other characters and a better imprint is provided when the types are not off-set from the bars. It will be seen therefore that by this arrangement the most frequently used types are arranged directly over the type bars, thus avoiding blurring of the printing by the twisting or "cranking" of the type bars.

By having a double type block only on every other type bar and by having the alternate type bars extending not so far toward the front of the machine, there is ample room

for the double type blocks 48, even at the ends of the segment, and even if, as shown in the present instance, the capital letters on these type blocks be made unusually large. As most of the type bars 47 have only one type on each bar, there is plenty of room for these type bars and types between the type bars 46. In the case of those type bars 47 that lie near the middle of the segment, however, two types may be mounted on each type bar, if desired, because in this part of the segment there is no flaring to the type blocks and there is consequently ample room for the two types. I have shown provision for an additional type on each of the four type bars 47 near the middle of the segment. As the type bar 47 at the extreme right-hand end of the segment has nothing in the way to prevent, I have shown two types mounted on this type bar.

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

1. In a front strike typewriting machine, a type bar system having a full complement of types and comprising a series of type bars arranged in two sets, the type bars of one set extending farther toward the front of the machine when in normal position than those in the other set, and type bars of one set each having two types mounted thereon and type bars of the other set each having only one type mounted thereon.

2. In a front strike typewriting machine, a type bar system having a full complement of types and comprising a series of type bars arranged in a plurality of sets, certain of said type bars when in normal position extending farther toward the front of the machine than other of said type bars, and certain of said type bars each carrying two types and other of said type bars each carrying only one type.

3. In a typewriting machine, a type bar system comprising segmentally arranged type bars each carrying two types and segmentally arranged type bars each carrying only one type, the two sorts of type bars alternating with each other.

4. In a typewriting machine, a type bar system having a full complement of types and comprising a series of segmentally arranged type bars of substantially the same length pivoted in staggered arrangement, some of said type bars each having two types thereon and other of said type bars each having only one type thereon.

5. In a typewriting machine, the combination of a series of segmentally arranged type bars having a full complement of types, and a series of keys for operating said type bars, said type bars being arranged in two sets, certain type bars of one set each having provision for a plurality of types and certain type bars of the other set each having provision for only a single type, and those keys near the back of the keyboard being connected with one set of type bars and those keys near the front of the keyboard being connected with the other set of type bars.

6. In a typewriting machine, the combination of a keyboard having a series of printing keys, some of said keys each having more characters thereon than other of said keys, and printing devices controlled by said keys for printing said characters, said printing devices including types, and the printing mechanism controlled by each key having the same number of types controlled thereby as there are characters on that key.

7. In a typewriting machine, the combination of a keyboard comprising a series of keys, those keys near the back of the keyboard bearing the capital letters and characters other than letters and those keys near the front of the keyboard bearing the small letters, means controlled by some of said keys to print only one character each, and means controlled by other of said keys to print a plurality of characters each.

8. In a typewriting machine, the combination of printing mechanism, case shift mechanism including a case shift key, and a keyboard having printing keys, certain of which are each adapted to print either one of a plurality of characters depending on whether or not said shift key is operated, and other of which keys are not adapted for use in conjunction with said shift key, all of said printing keys being adapted to actuate said printing mechanism simultaneously with the operation of said keys.

9. In a typewriting machine, the combination of printing instrumentalities, a case shift device, and a series of keys, certain of said keys being adapted for use in conjunction with said case shift device and certain of said keys not being adapted for use in conjunction with said case shift device and all of said keys being adapted to actuate said printing instrumentalities simultaneously with the operation of said keys.

10. In a typewriting machine, the combination of a series of type bars divided into a plurality of sets, the type bars of the different sets having different numbers of type thereon, printing keys for actuating said type bars, and case shift mechanism for use in conjunction with certain only of said type bars and keys, all of said keys being adapted to actuate said type bars simultaneously with the operation of said keys.

11. In a front-strike typewriting machine, the combination of a plurality of sets of type bars, the type bars of one set extending farther toward the front of the machine than those of another set or sets and each carrying a larger number of types than those of the other set or sets, printing keys for actuating said type bars, and suitable case shift

mechanism, all of said keys being adapted to actuate said type bars simultaneously with the operation of said keys.

12. In a front-strike typewriting machine, the combination of two sets of type bars, the type bars of one set alternating with those of the other set, the type bars of one set extending farther toward the front of the machine than those of the other set, the type bars of the set that extend farther toward the front having provision for two types on each bar and some of the type bars of the other set having provision for only one type on each bar but certain of the type bars of the latter set having provision for two types each.

13. In a visible writing machine, a type bar system having a full complement of types and comprising a series of segmentally disposed pivoted type bars arranged in two sets, type bars of one set each having a plurality of types mounted thereon and some at least of the type bars of the other set each having only one type mounted thereon.

14. In a visible writing machine, a type bar system having a full complement of types and comprising a series of segmentally disposed pivoted type bars arranged in two sets with the free ends thereof in parallel planes, type bars of one set each having a plurality of types mounted thereon and some at least of the type bars of the other set each having only one type mounted thereon.

15. In a visible writing machine, the combination with type bars having a full complement of types, of printing keys, certain of said keys having a plurality of indices thereon and certain of said keys having only a single index or character thereon, the keys each having a plurality of indices thereon being each connected with a type bar having a plurality of types thereon and the keys each having only a single character thereon being connected each with a type bar having only a single type thereon, and case shifting mechanism.

16. In a visible writing machine, the combination of two sets of pivoted segmentally arranged type bars of substantially uniform length, the pivots of the type bars of the two sets being arranged in parallel planes, type bars of one set each carrying a plurality of types and type bars of the other set each carrying only a single type, keys for the different type bars, and case shifting mechanism, the type bars of the two sets having a full complement of types.

17. In a typewriting machine, the combination of a plurality of individually operable type bars having a full complement of types, certain of said type bars each having a plurality of types and certain of said type bars each having only a single type, and means for rendering any type on any bar operative to print.

18. In a typewriting machine, the combination of a set of segmentally arranged type bars, certain type bars of said set having each a plurality of types on a bar and a second set of segmentally arranged type bars, certain type bars of said set having each only a single type on a bar, the type bars of the second set being arranged between the type bars of the first mentioned set.

19. In a typewriting machine, the combination of a series of segmentally arranged type bars, certain of said type bars having each a plurality of types on a bar, and other of said type bars having each only a single type on a bar, the type bars having a single type being arranged between the type bars having two types and having their type blocks in a plane parallel to the plane in which the type blocks having two types thereon are situated.

20. In a typewriting machine, the combination of a segment, a set of segmentally arranged type bars mounted on said segment, and a second set of segmentally arranged type bars mounted on said segment, the type bars of the two sets being of substantially uniform length, the type blocks of the second set being arranged between the type bars of the first mentioned set and nearer the segment than are the type blocks of the first mentioned set, certain type bars of the first set having two types each and certain type bars of the second set having each one type only.

Signed at Syracuse, in the county of Onondaga, and State of New York, this 31 day of August A. D. 1907.

CHARLES E. TOMLINSON.

Witnesses:
C. C. SCHOENECK,
J. A. PROSS.