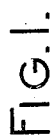


975,732.

2 SHEETS—SHEET 1.



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INVENTOR:

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WRITER COMPANY, OF SYRACUSE, NEW YORK, A CORPORATION OF NEW YORK.

TYPE-WRITING MACHINE.

975,732.

Specification of Letters Patent. Patented Nov. 15, 1910.

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To all whom it may concern:

Be it known that I, HERBERT H. STEELE, 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 type actions for typewriting machines, and the principal object of said invention is to provide a broad and efficient contact shoe to prevent undue wear.

To the above and other ends which will hereinafter appear, my invention consists in the features of construction, arrangements of parts and combinations of devices to be set forth in the following specification and particularly pointed out in the appended claims.

In the accompanying drawings, wherein like reference characters indicate corresponding parts in the different views, Figure 1 is a side elevation of one form of type action embodying my invention, the platen being shown diagrammatically in this view. Fig. 2 is a fragmentary plan view with parts in section showing a number of key levers and sub-levers constructed in accordance with my invention. Fig. 3 is an enlarged detail fragmentary front elevation showing the lower end portions of two sub-levers, the fulcrum rod therefor, and the key levers, said key levers being shown in section. Fig. 4 is an enlarged detail fragmentary perspective view showing the lower portion of one of the sub-levers. Fig. 5 is an enlarged fragmentary detail side elevation showing the lower end portion of the blank from which a sub-lever is formed.

I have shown my invention in connection with type actions such as those employed in the Monarch machine, although it should be understood that the invention may be embodied in other styles of typewriting machines.

Printing key levers 1 are provided with finger pieces 2 and with curved fulcrum treads 3 at the upper edges of the rear end portions thereof for coöperation with a fulcrum plate 4. Suitable restoring springs (not shown) are connected with the key levers to restore them to normal positions and each key lever is slotted at 5 for coöperation with a fixed rod 6 to prevent the key levers from

moving longitudinally. Each key lever has an upright sub-lever 7 pivoted thereto at 8, the lower end portion of said sub-lever being slotted at 9 for coöperation with a fixed fulcrum rod 10 which extends beneath the system of key levers and is secured at its ends to the sides of the base of the machine. The upper end of each sub-lever is pivoted at 11 to a pull link 12, the forward end of which is pivoted at 13 to a type bar 14. Each type bar is connected at 15 to one end of a restoring spring 16, the opposite end of said spring being secured to a plate 17, which plate is held in place by a screw 18 that secures the associated type bar hanger 19 to the segment 20. The forward ends of the type bars normally rest upon a support 21, the type bars themselves being segmentally arranged and adapted to strike upwardly and rearwardly against the front face of a platen 22. From an inspection of the drawings it will be seen that each of the upright sub-levers 7 is arranged on one side of its associated key lever and is pivoted thereto so as to swing in a plane indicated by the dotted line *a* in Fig. 3 and which is parallel with the plane of movement of the associated key lever, the plane of movement of the key lever or that portion thereof to which the sub-lever is connected being indicated by the dotted line *b* (Fig. 3). In Fig. 2 the left-hand one (*c*) of two central key levers is arranged on the left-hand side of its associated sub-lever and in all of the type actions to the left of this center key lever the key levers and sub-levers are arranged in a like manner, whereas the right-hand center key lever (*d*) is arranged on the right-hand side of its associated sub-lever and all of the key levers of the system to the right of the center key lever *d* are likewise arranged on the right-hand sides of their sub-levers. From an inspection of Fig. 2 it will also be observed that the key levers at the sides of the system each have a portion *e*, the plane of which is inclined to the axis of the fulcrum rod 10 and that the lower end portion of the associated sub-lever is disposed in a like manner relatively to the axis of the fulcrum rod and swings in a plane which is parallel with the plane of movement of said portion *e*, of a bent key lever. In other words, while the key levers and sub-levers at the central portion of the system swing in planes which are approximately at right angles to the axis of the ful-

crum rod 10, the key levers and the sub-levers at the sides of the system swing in planes which are at angles other than right angles to the axis of said fulcrum rod. The construction thus far described is of the same general style as that embodied in the Monarch machine.

In order to provide comparatively broad wearing surfaces for the sub-levers and for other reasons which will presently appear, I form each of the sub-levers 7 with contact or wearing flanges or shoes 23. These contact shoes are preferably formed integral with their sub-levers from a blank such as that shown in Fig. 5 and are struck up from said blank and bent on the dotted lines 24 (Fig. 5) so as to project laterally from one face of the sub-lever at substantially right angles to the plane of the sub-lever, to provide flat parallel contact faces 25 which are oppositely disposed and which form upper and lower walls of the slot or recess 9 and coöperate with the fulcrum rod on opposite sides thereof. From an inspection of Fig. 3 it will be seen that each shoe 23 presents a contact or wearing face 25 which is considerably broader than the thickness of the metal from which the sub-lever is formed, thus obviating undue wear of the sub-lever and fulcrum rod at the point where the sub-lever fulcrums and slides on the rod 10. It will also be seen that said contact shoes on each sub-lever extend beneath its associated key lever so as to cut the plane of movement thereof, or in short extend through and beyond the plane in which the associated key lever is situated, thus obviating any cranking action between the key lever and sub-lever, if there should be anything tending to cause a cranking action. The flange 23 is itself broader than the thickness of the metal of the lever, but this is not absolutely essential, though very desirable. The flange 23 however broad adds to the length of the bearing, part of which is comprised by the thickness of the metal of the lever. The bearing shoe as a whole may be said to comprise the metal in the plane of the lever and the laterally extending flange 23 also. As shown in the present instance, the shoes 23 in the right-hand half of the system are bent out toward the right and those in the left-hand half of the system toward the left.

By presenting the flat lateral contact faces 25 for coöperation with the fulcrum rod, I am enabled to provide a longer line of contact between each shoe and the fulcrum rod 10. This is true even of those levers which are oblique to the fulcrum rod.

It may in some cases be found sufficient to provide only an upper contact shoe 23 on each of the sub-levers, inasmuch as most of the wear takes place at the upper wall of the slot 9 and the upper side of the fulcrum rod, but I prefer in practice to employ both

contact shoes on each sub-lever. Further, this is an advantage in manufacture since the milling operation of the contact faces 25 can be performed with a greater degree of accuracy when two contact shoes 23 are employed on each sub-lever.

It may be found desirable in some instances to extend the contact shoe in a direction the opposite of that shown, or away from the key lever in order to oppose or overcome any cranking action which may be produced at the opposite side of the sub-lever.

From the foregoing description it will be understood that I have provided simple, durable and efficient bearings without increasing the thickness of the metal of which the parts are formed. To increase the thickness of the parts would result in correspondingly increasing their weight and said parts would occupy more space in the machine than is required for the thinner parts now employed; in fact, to provide bearings as broad as those here shown by increasing the thickness of the sub-levers would not be practicable, as said sub-levers would then occupy more space than could be allotted to them in the machine.

Various changes may be made without departing from the spirit and scope of my invention.

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

1. In a typewriting machine, the combination of a sub-lever having a slot therein and a part that has a bearing in said slot, said sub-lever having a flange along said slot to increase the width of the bearing surface.

2. In a type action, a key operated lever having an elongated slot therein and a pair of separate oppositely disposed bearing shoes forming walls of said slot and coöperative with the fulcrum of said lever and broader than the lever is thick.

3. In a type action, a slotted sheet metal key operated lever having a pair of oppositely disposed bearing shoes formed integral therewith, said shoes having flat wearing faces which are broader than the thickness of the metal from which said lever is formed and which coöperate with the fulcrum of said lever.

4. In a typewriting machine, the combination of a slotted sheet metal key operated lever having a pair of oppositely disposed separate bearing shoes formed integral therewith and extending at right angles to the plane of said lever, said shoes having parallel contact faces which are broader than the thickness of the metal of which said lever is formed, and a fulcrum rod against which said contact faces bear.

5. In a typewriting machine, the combination of a fulcrum rod, and a plurality of key actuated levers fulcrumed on said rod and

the planes of which are differently disposed with reference to said fulcrum rod, each of said levers having a bearing shoe which extends at substantially right angles to the plane of its lever and which is broader than the lever is thick and has a contact face that coöperates with said fulcrum rod.

6. In a typewriting machine, the combination of a fulcrum rod, a key actuated lever fulcrumed on said rod, the plane of said lever being disposed relatively to said fulcrum rod at an angle other than a right angle, and oppositely disposed bearing shoes carried by said lever, the wearing faces of said shoes being parallel and broader than the thickness of said lever.

7. A type action comprising a key lever, a sheet metal sub-lever pivoted to and actuated by said key lever, a fulcrum rod for said sub-lever, and a bearing shoe formed integral with said sub-lever and coöperative with said fulcrum rod, the said shoe having a wearing face which is wider than the thickness of the metal from which said lever is formed.

8. In a type action, a fulcrum rod, a key lever which has a portion, the plane of which extends at an angle other than a right angle to said fulcrum rod, a sub-lever pivoted to the said portion of the key lever and fulcrumed on said fulcrum rod, the plane of those portions of said sub-lever which coöperate with said key lever and the fulcrum rod extending at an angle other than a right angle to said rod, and a bearing shoe carried by said sub-lever and coöperative with said fulcrum rod, said bearing shoe having a contact face which is wider than the sub-lever is thick.

9. In a type action, the combination of a fulcrum rod, a key lever, a sheet metal sub-lever pivoted to said key lever and fulcrumed on said fulcrum rod, the plane of the sub-lever being at an angle other than a right angle to the axis of the fulcrum rod, a pair of oppositely disposed bearing shoes formed integral with said sub-lever and having parallel bearing faces which are wider than the thickness of the metal from which said sub-lever is formed and which are coöperative with and are situated on opposite sides of said fulcrum rod.

10. In a type action, a key lever, a sub-lever pivoted thereto at one side of the key lever, and a contact shoe carried by said sub-lever, the median plane of the key lever cutting said contact shoe.

11. In a type action, a key lever, a sub-lever pivoted thereto at one side of the key lever, and a contact shoe formed on said sub-lever, said shoe projecting laterally toward the plane of the key lever.

12. In a type action, a key lever, a sub-lever operatively connected thereto at one side of the key lever, a fulcrum rod for said

sub-lever, and contact shoes formed on said sub-lever and projecting laterally therefrom toward the plane of the key lever and coöperating with said fulcrum rod on opposite sides thereof.

13. In a type action, a key lever, a sheet metal sub-lever operatively connected thereto, said sub-lever having a contact shoe formed integral therewith and coöperative with the fulcrum of said sub-lever and extending from the body of the sub-lever at substantially right angles to the plane thereof and toward the plane of said key lever.

14. In a type action, a key lever, a sub-lever operatively connected thereto at one side of said key lever and having oppositely disposed contact shoes with flat parallel faces coöperating with the fulcrum of said sub-lever and broader than the lever is thick, said shoes extending toward the plane of said key lever.

15. In a type action, a key lever, a sheet metal sub-lever operatively connected to the key lever at one side thereof and having a pair of oppositely disposed contact shoes formed integral therewith, said contact shoes having contact faces which are broader than the thickness of the metal from which said sub-lever is formed and which coöperate with the fulcrum of said sub-lever and extend toward the plane of movement of said key lever.

16. In a typewriting machine, the combination of a key lever, a sheet metal sub-lever pivoted thereto at one side of the key lever and having a pair of oppositely disposed contact shoes formed integral therewith and extending at right angles to the plane of said lever, said shoes having parallel contact faces which are broader than the thickness of the metal from which said sub-lever is formed and which extend toward the plane of movement of said key lever, and a fulcrum rod against which said contact faces on the sub-lever bear.

17. In a typewriting machine, the combination of a series of key levers, a series of sub-levers, each of said sub-levers being pivoted to the associated key lever at one side thereof and having a contact shoe at the fulcrum thereof which extends outwardly from that side of the sub-lever to which the associated key lever is pivoted and the contact face of which is broader than the sub-lever is thick, and a fulcrum rod which coöperates with said contact shoes.

18. In a typewriting machine, the combination of key levers, sub-levers pivoted thereto, the sub-levers on each side of the center of the system all being pivoted on the same sides of their respective key levers, and the sub-levers on opposite sides of the center of the system being pivoted to the key levers on opposite sides thereof, contact shoes formed on said sub-levers, each con-

tact shoe projecting laterally from its sub-lever beneath the associated key lever, and a fulcrum rod with which said contact shoes cooperate.

5 19. In a typewriting machine, the combination of a system of key levers, a system of sub-levers pivoted thereto, all of said sub-levers being pivoted to their key levers at the sides thereof which are nearest the center of the system, said sub-levers having contact shoes that extend outwardly therefrom toward the sides of the system, and a fulcrum rod with which said contact shoes cooperate.

15 20. In a type action, a key actuated sheet metal lever having an elongated slot, a con-

tact wall of said slot being formed by bending the metal at right angles to the plane thereof to form a flat bearing shoe that is broader than the metal is thick.

20 21. In a type action, a key controlled sheet metal sub-lever which is slotted and has a sliding movement at the slotted portion thereof, and a bearing shoe struck up from said sub-lever and forming a contact face at said slotted portion, said shoe being wider than the thickness of metal from which said sub-lever is formed.

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Witnesses:

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