J. W. PAUL.

TYPE WRITER.

APPLICATION FILED JULY 5, 1906.

954,581.

Patented Apr. 12, 1910.

4 SHEETS—SHEET 1.

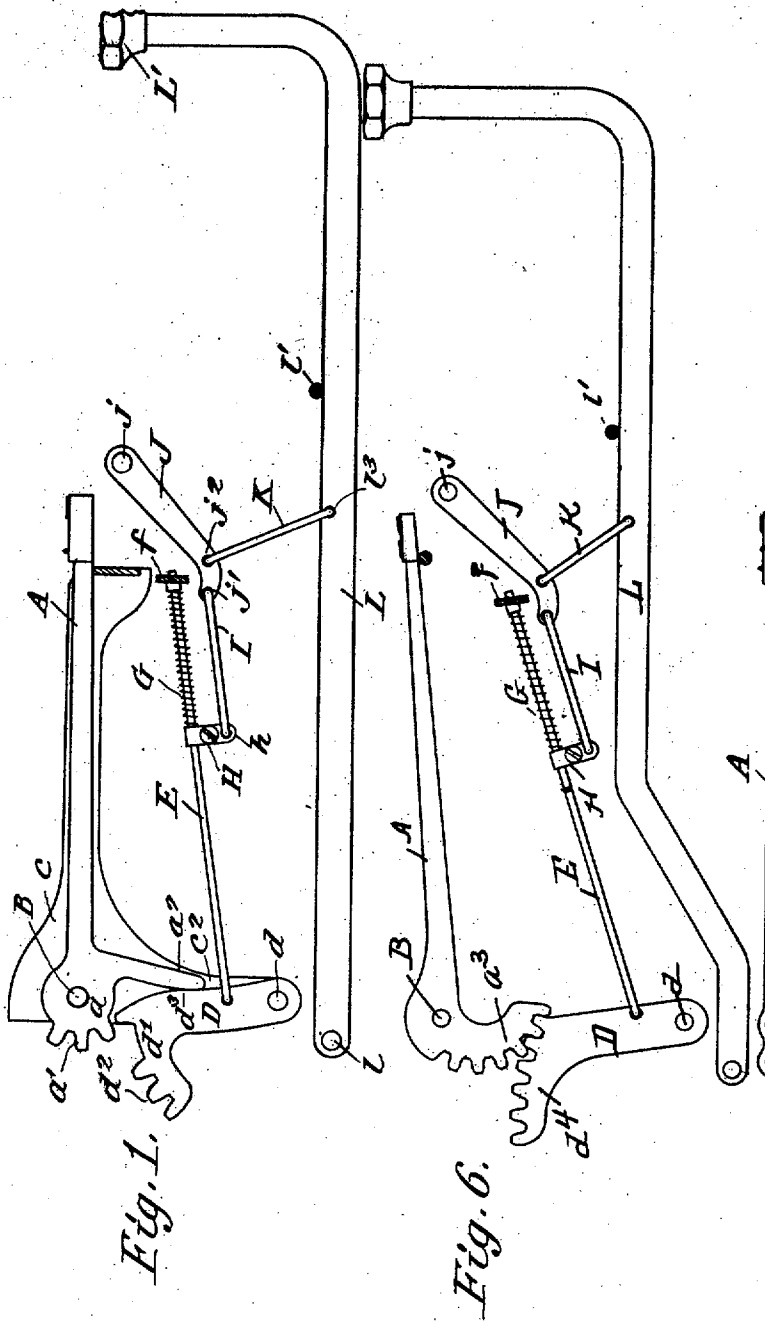

Fig. 1.

Fig. 6.

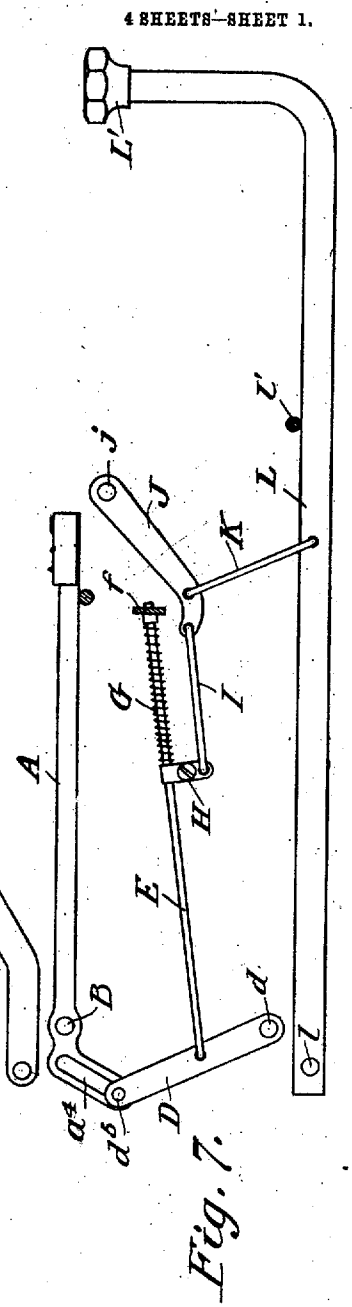

Fig. 7.

Witnesses

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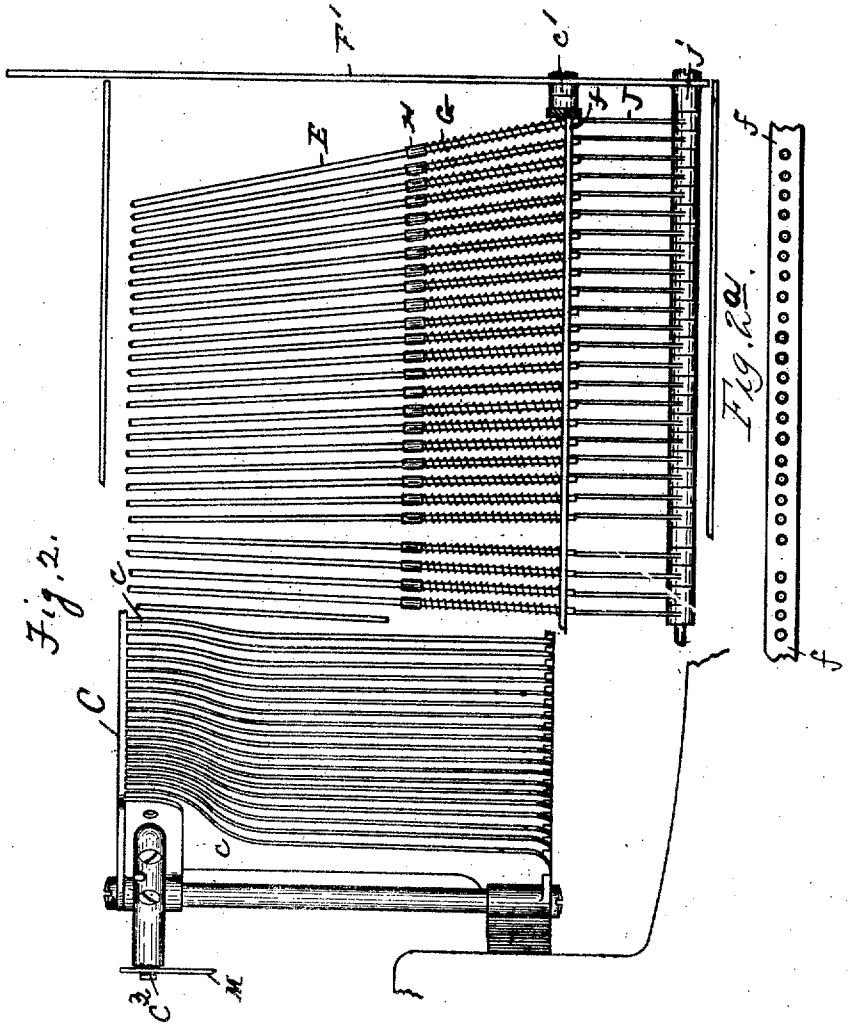

Witnesses

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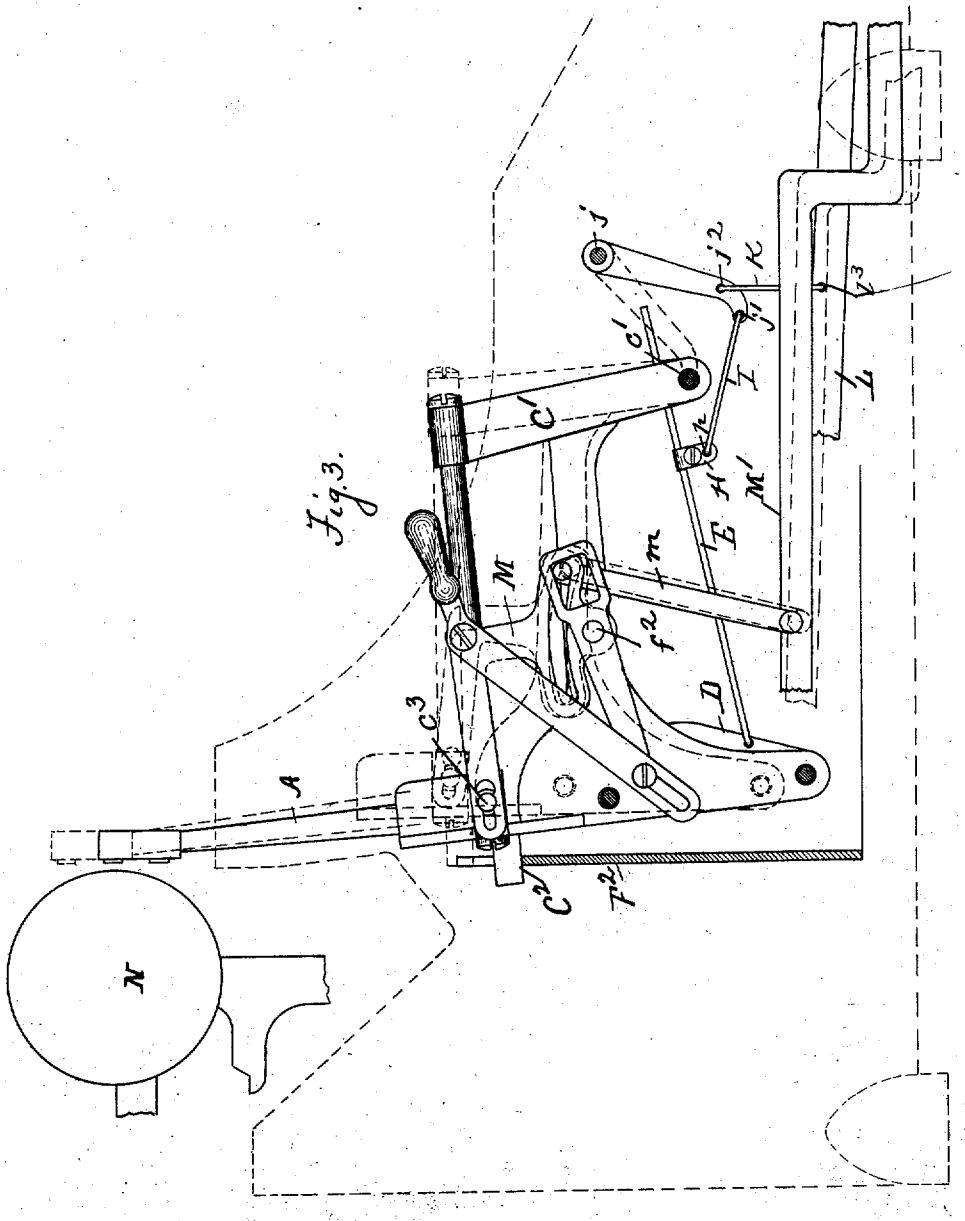

Fig. 3.

Witnesses
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4 SHEETS—SHEET 4.

Fig. 4.

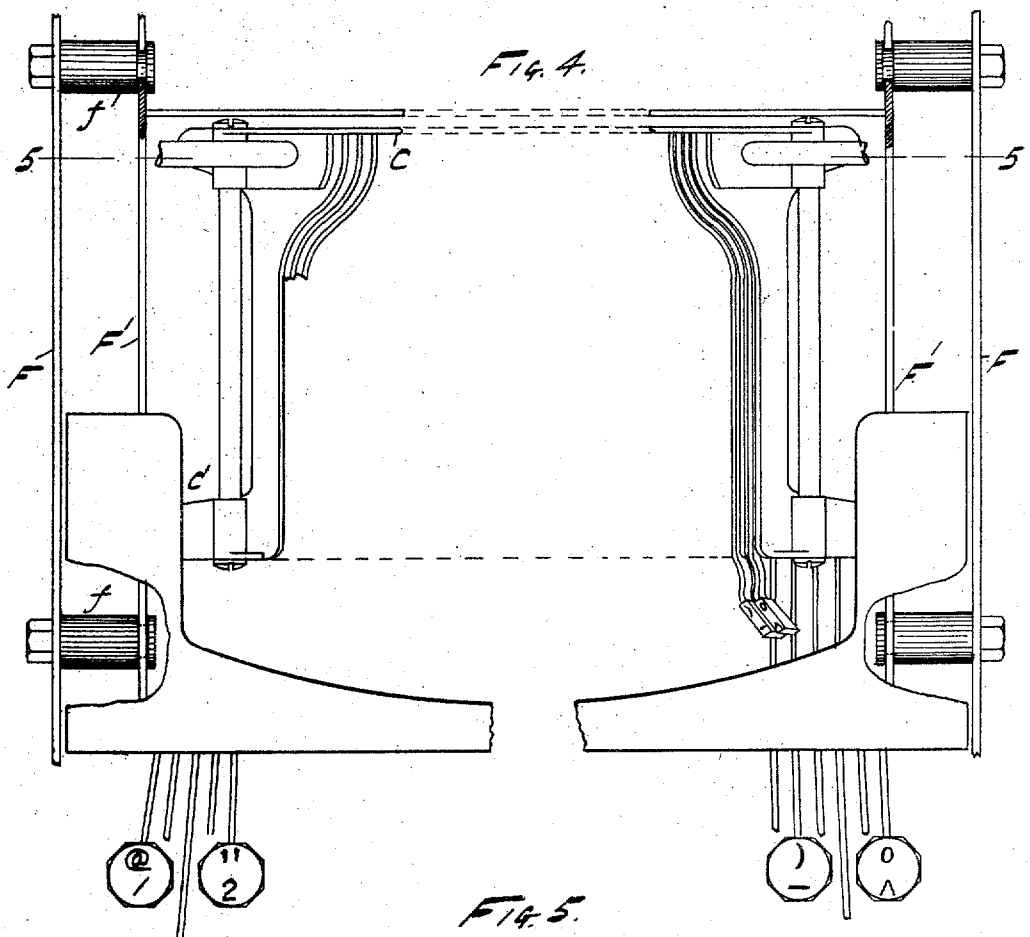
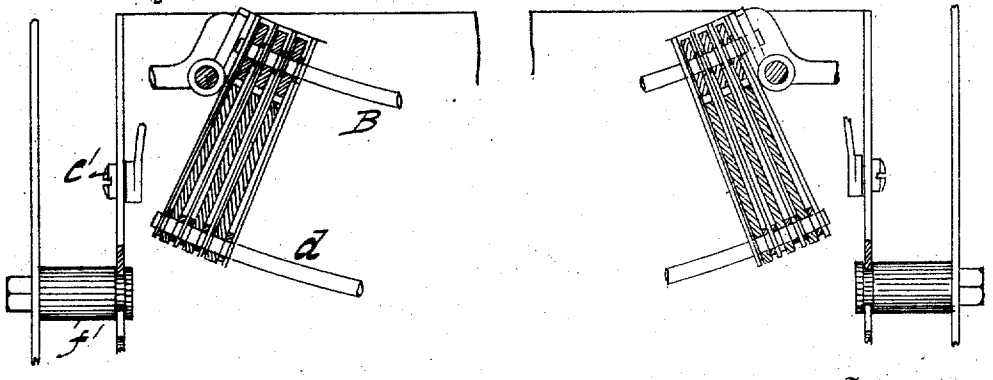


Fig. 5.



Witnesses

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UNITED STATES PATENT OFFICE.

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TYPE-WRITER.

954,581. Specification of Letters Patent. Patented Apr. 12, 1910.

Application filed July 5, 1906. Serial No. 324,903.

To all whom it may concern:

Be it known that I, JOHN W. PAUL, a citizen of the United States, residing at Kittanning, in the county of Armstrong and State of Pennsylvania, have invented new and useful Improvements in Type-Writers, of which the following is a specification.

This invention relates to typewriters and consists in certain improvements in the construction thereof as will be hereinafter fully described and pointed out in the claims.

More particularly the invention relates to improvements in the type bar action and the parts immediately connected therewith.

The invention is illustrated in the accompanying drawings as follows:—

Figure 1 shows a side elevation of the type bar action. Fig. 2, a plan view of the type basket and parts of the type bar action, part of the basket being broken away to better show construction. Fig. 2^a shows a front view of the guide *f*, through which the rod E extends. Fig. 3 is a side elevation of the basket, part of the frame being in section to show the method of hanging the basket. Fig. 4, a plan of the basket showing additional parts. Fig. 5, a section on the line 5—5 in Fig. 4. Figs. 6, and 7 show side elevations of alternative constructions of type bar actions.

A marks the type bar; B, the pivot for the same. The type bars are mounted in the type basket C which forms a segment and all the type bars strike to a common center or printing point on the platen N. The type bars are mounted between the guide plates *c* and the pivot B is formed by a curved rod, a single rod forming a pivot for all the type bars. The type basket is pivoted at *c'* and the stop C^2 of the type basket normally rests on the cross piece F^2. When however the basket is shifted it is lifted from this point of support as shown in Fig. 3. The guide plates *c* have the extensions c^2 and arranged between these extensions are the rock levers D, one for each type bar. These rock levers are pivotally mounted on the rod *d*, a single rod forming the pivot for the rock levers in the same manner as the rod B forms the pivot for the type bars.

In the preferred construction the heel of the type bar A is provided with a variable gear *a* and the rock lever is provided with the variable gear *d'*. This variable gear is so constructed that with the initial movement of the rock lever, the smaller gear d^3 of the variable gear acts upon the larger gear a^2 on the type bar, and as the movement progresses the larger gear d^2 of the rock lever D is brought into mesh with the smaller gear *a'* of the type bar, thus there is a marked acceleration of the type bar as the rock lever D actuates it. Not only is this acceleration made possible by the rock lever D but in as much as it is carried between the guide plates c^2 and has a pivot the axis of which is parallel to the pivot of the type bar on which each lever acts, the type bar is relieved of all side strain, so that it may be more easily kept in alinement.

I prefer to actuate the rock lever D by means of the rod E which is pivotally connected to the rock lever D. In the preferred construction also, the rod E has its front end slidingly mounted in the cross piece *f* which is secured to the auxiliary frame F'. The cross piece *f* is provided with a series of perforations for this purpose, the perforations being in line so that the front ends of the rods are brought into horizontal alinement. In either instance the manner of mounting the front end relieves the part to which the rear end is connected of some of the strains incident to actuating the rod. It also provides a more convenient method for mounting the type bar springs G. These are in the form of a coil mounted directly around the rod E and are located between the guide plate *f* and the clamp H, which is secured to the rod in the rear of the guide plate *f*.

The rod E is preferably actuated by mechanism operating as a reverse toggle, that is a toggle operating upon the flexing of the links rather than by the straightening of the toggle, and, as shown, comprises the link I which is hooked in the perforation *h* in the clamp H and the perforation *j'* in the rock lever J. All the rock levers J are mounted on a rod *j*. A link K is hooked into a perforation j^2 in the lever J and the perforation l^3 in the key lever L. This reverse toggle mechanism as well as the variable gear is arranged to effect acceleration in the movement of the type bar. The key lever L is pivoted at *l* and has its upward movement limited by the stop *l'*. It is provided with the finger piece L'.

As before stated, the basket is pivoted at *c'* and this pivot *c'* is in line with the normal position of the pivot formed between

the link I and lever J so that as the basket is shifted there is no movement of the key levers. A bell crank lever M is connected with the basket by means of the pin c^3. It is mounted on the pin f^2, the pin f^2 being secured to the frame. A link m connects the bell crank lever with the shift lever M'. Upon the depression of the shift lever, the bell crank lever will be actuated to raise the basket to the position shown in dotted lines in Fig. 3. A reversing mechanism is shown in the drawings but as this forms no part of the present invention it is not further described.

The auxiliary frame is mounted in the main frame F in any desired manner. As shown, it is secured to the main frame by means of the lugs f'.

In the alternative construction shown in Fig. 6, the variable gear instead of being of two distinct sizes forms segments a^3 and d^4 of elliptical gears. Otherwise the parts operate in the manner shown in the preferred construction.

In the alternative construction shown in Fig. 7, the heel of the type bar is provided with a cam slot a^4. The rock lever D is provided with the pin d^5 for operating this cam slot. As the rock lever swings, the arm of the lever formed by the heel of the type bar is shortened so as to effect acceleration of the type bars.

What I claim as new is:—

1. In a typewriter, the combination of a platen; a type bar arranged for a front strike on said platen; means for actuating the type bar; a sliding rod for actuating said means; said rod being slidingly mounted at the front and pivotally connected with said means at the rear and horizontally arranged; a guide for said sliding rod arranged below the normal position of said bar; a finger piece; and means actuated by the finger piece for actuating said sliding rod.

2. In a typewriter, the combination of a platen; a type bar arranged for a front strike on said platen; means for actuating said type bar, said means being arranged to accelerate the movement of the type bar as it progresses toward the platen; a sliding rod for actuating said means, said rod being slidingly mounted at the front and pivotally connected with said means at the rear and horizontally arranged; a guide for said sliding rod arranged below the normal position of said bar; a finger piece; and means actuated by the finger piece for actuating said sliding rod.

3. In a typewriter, the combination of a platen; a type bar arranged for a front strike on said platen; a sliding rod for actuating said type bar, said rod being slidingly mounted at the front and pivotally mounted at the rear and horizontally arranged; means for conveying the movement of said rod to said type bar; a guide supporting said sliding rod at the front, the guide being arranged below the normal position of said type bar; a finger piece; and means connected to said finger piece and acting on said sliding rod between its pivotal support at the rear, and the guide at the front in all positions of the rod for conveying the movement of the finger piece to the rod.

4. In a typewriter, the combination of a platen; a type basket arranged to permit a mounting of type bars for a "front strike" on said platen; a plurality of type bars mounted in said basket; sliding rods horizontally arranged for actuating said type bars; means for conveying the movement of said rod to said type bar; guides for the front ends of said rods, said guides holding the front ends of said rods in a horizontal plane; finger pieces; and means actuated by the finger pieces for actuating said rods.

5. In a typewriter, the combination of a platen; a type bar arranged for a "front strike" on said platen; a sliding rod for actuating said type bar; means for conveying the movement of said sliding rod to said type bar; a spring mounted on said sliding rod for returning the type bar; a finger piece; and means actuated by the finger piece for actuating said rod.

6. In a typewriter, the combination of a platen; a type bar arranged for a "front strike" on said platen; a sliding rod for actuating said type bar; means for conveying the movement of said sliding rod to said type bar; a guide for said sliding rod arranged below the normal position of said type bar; a finger piece; means actuated by the finger piece for actuating said sliding rod; and a spring for returning the type bar arranged on said rod and abutting against said guide.

7. In a typewriter, the combination of the platen; a series of pivoted type bars arranged for a "front strike" on said platen; a plurality of rocking levers having axes parallel to the axes of the pivots of the type bars and arranged to actuate said type bars; rods horizontally arranged and pivotally connected to said rocking levers; and means acting through said rods for actuating said rocking levers.

8. In a typewriter, the combination of the platen; a pivoted type bar arranged for a "front strike" on said platen; a rocking lever having its axis parallel to the axis of the pivot of the type bar and arranged to actuate said type bar; a rod pivotally connected to said rocking lever and having its front end slidingly mounted; and means acting through said rod for actuating said rocking lever.

9. In a typewriter, the combination of the platen; a series of pivoted type bars

arranged for a "front strike" on said platen; a plurality of rocking levers having axes parallel to the axes of the pivots of the type bars and arranged to actuate said type bars; rods pivotally connected to said rocking levers, the front ends of said rods being slidingly mounted; guides for the front of said rods arranged to hold said rods in alinement; and means acting through said rods for actuating said rock levers.

10. In a typewriter, the combination of a platen; a pivoted type bar arranged for a "front strike" on said platen; a rocking lever for actuating said type bar; a rod pivotally connected with said rocking lever and having its front end slidingly mounted; and mechanisms comprising devices operating as a reverse toggle for actuating said rod.

11. In a typewriter, the combination of a platen; type bars arranged for a "front strike" on said platen; a basket for said type bars; a pivotal connection for said basket; rock levers for actuating said type bars; rods pivotally connected to said rock levers and having their front ends slidingly mounted and in line; and mechanisms comprising devices operating as reverse toggles for actuating said rods.

12. In a typewriter, the combination of a platen; type bars arranged for a "front strike" on said platen; a basket for said type bars; a pivotal connection for said basket; rock levers for actuating said type bars; rods pivotally connected to said rock levers and having their front ends slidingly mounted and in line; and mechanisms comprising devices operating as reverse toggles for actuating said rods, the joints of said reverse toggles being normally in line and coincident with the pivotal connection of the basket.

13. In a typewriter, the combination of a platen; type bars arranged for a "front strike" on said platen; a basket for said type bars; a pivotal connection for said basket; rock levers for actuating said type bars; rods pivotally connected to said rock levers and having their front ends slidingly mounted and in line; mechanisms comprising devices operating as reverse toggles for actuating said rods, links secured intermediate of the ends of the devices operating as reverse toggles, and connecting said devices with key levers; and said key levers.

14. In a typewriter, the combination of the type bar A; the pivot B on which said type bar is mounted; a rock lever for actuating said type bar; the pivot D for said rock lever, said pivot D having its axis parallel to the axis of the pivot B; the rod E pivotally connected to the rock lever D; the guide *f* in which the front end of the rod E is slidingly mounted; the clamp H arranged on the rod E; the spring G mounted between the clamp H and the guide *f*; devices operating as a reverse toggle, comprising the swinging lever J, and the link I connecting said lever with the clamp H; the link K extending from the lever J to a key lever; and the key lever.

15. In a typewriter, the combination of a platen; a type bar arranged for a "front strike" on said platen, the heel of said type bar having the variable gear formed in two distinct radii a^2 and a'; the rock lever D for actuating said type bar and having a variable gear formed in two distinct diameters d^3 and d^2 for acting with the gears a^2 and a' respectively; and means for actuating the rocking lever.

16. In a typewriter, the combination of the platen; a type bar arranged for a "front strike" on said platen; a rocking lever for actuating said type bar, said type bar and rocking lever being provided with a variable gear through which said rocking lever actuates said type bar; and mechanism for actuating said rocking lever comprising devices operating as a reverse toggle.

17. In a typewriter, the combination of a platen; a type bar arranged for a "front strike" on said platen, the heel of said type bar having the variable gear formed in two distinct radii a^2 and a'; the rock lever D for actuating said type bar and having a variable gear formed in two distinct radii d^3 and d^2 for acting with the gears a^2 and a' respectively; a rod pivotally connected with said rocking lever and having its front end slidingly mounted; and means for actuating said rod.

18. In a typewriter, the combination of a platen; a type bar arranged for a "front strike" on said platen; a rocking lever for actuating said type bar, said type bar and rocking lever being provided with a variable gear through which said rocking lever actuates said type bar; and mechanism comprising devices operating as a reverse toggle for actuating said rod.

19. In a typewriter, the combination of the type bar A with a variable gear having two distinct radii a^2 and a'; the pivot B for said type bar; the rocking lever D provided with the variable gear having two distinct radii d^3 and d^2 for acting upon the gears a^2 and a' to actuate the type bar; the pivot *d* for the lever D having its axis parallel to the axis of the pivot B; the rod E pivotally connected to the rock lever; the guide *f* in which the front end of the rod E is slidingly mounted; the clamp H on the rod E; the spring G mounted between the clamp H and guide *f*; the swinging lever J; the link I connecting said lever J with the clamp H; the key lever L; and the link K connecting the key lever with the swinging lever J.

20. In a typewriter, the combination of a

platen; a type bar arranged for a "front strike" on said platen; a sliding rod for actuating said type bar; a guide through which the front ends of said rods slide; mechanism connected to said rod at the rear of said guide for actuating said rod; and a spring arranged on the rod between said point of connection and said guide.

21. In a typewriter, the combination of a platen; a series of type bars arranged for a "front strike" on said platen; a basket in which said type bars are mounted; a pivot for said basket; a series of sliding rods for actuating said type bars, the front ends of said rods being arranged in alinement; and mechanisms comprising devices operating as reverse toggles for operating said rods.

22. In a typewriter, the combination of a platen; a series of type bars arranged for a "front strike" on said platen; a basket having a series of guide plates for said type bars and between which said type bars are pivoted; extensions on said guide plates; and rock levers pivoted between said extensions operatively connected with and arranged to actuate said type bars.

23. In a typewriter, the combination of a platen; a series of type bars arranged for a "front strike" on said platen; a basket having a series of guide plates for said type bars and between which said type bars are pivoted; extensions on said guide plates; and rock levers pivoted between said extensions operatively connected with and arranged to actuate said type bars, said rock levers and type bars being provided with gears through which the actions of the rocking levers are communicated to the type bars.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JOHN W. PAUL.

Witnesses:
H. C. LORD,
CLARK M. COLE.