

Sept. 2, 1930.

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1,775,057

POWER OPERATED TYPEWRITER

Filed May 2, 1929

Fig. 1

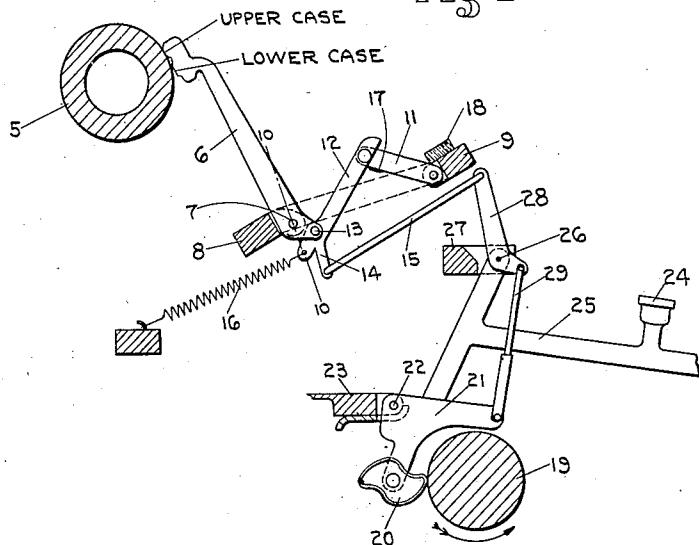
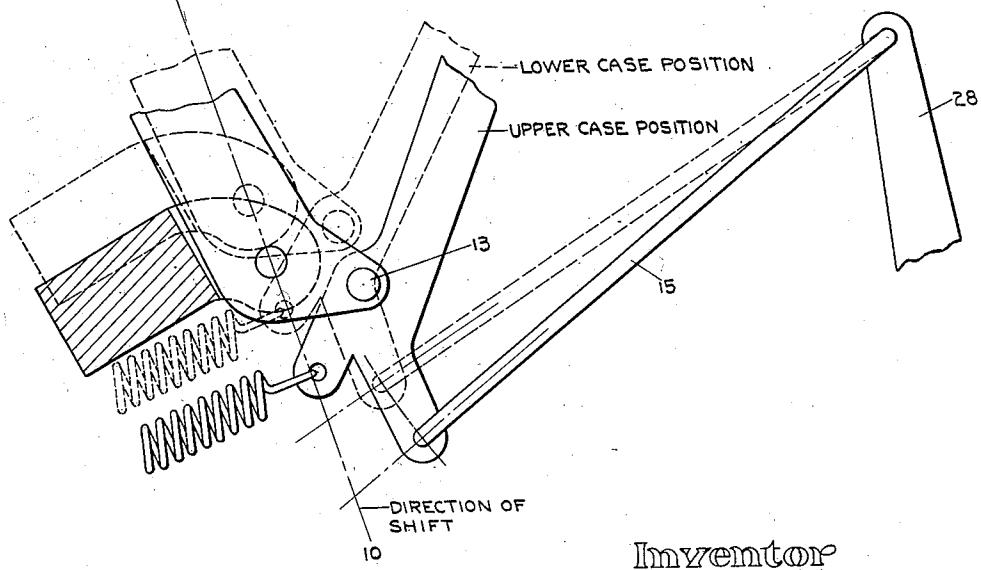


Fig. 2



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POWER-OPERATED TYPEWRITER

Application filed May 2, 1929. Serial No. 359,950.

This invention relates to typewriting machines in which the type mechanism is actuated by power mechanism, driven by a suitable source of power such as an electric motor, under the control of keys.

In machines of the kind, as in all ordinary typewriters, it is desirable that the capital or "upper-case" letters be struck with greater force than the small or "lower-case" letters, owing to the greater superficial area of the capitals. In a hand-operated machine this can be done by the operator, by striking the keys with greater force in writing capitals. In power-operated machines however, as ordinarily constructed, the force imparted to the type-bars is independent of the pressure upon the keys and is the same regardless of the position of the case-shift.

The object of the present invention is to so construct a power-actuated typewriter that the upper-case characters shall automatically be struck with greater force than the lower-case characters.

I have found that this can be accomplished very simply, in the case of a machine of the basket-shift type, by a relative position of parts such that the changes in angular position of a link connecting the type mechanism with the power mechanism, which changes are caused by the case-shifting movement of the type basket, result in the transmission of more force or power through this link in one case position than in the other.

In the accompanying drawings Fig. 1 is a partly sectional side elevation of typewriter mechanism embodying the present invention, the figure showing a single type bar, together with the mechanism immediately associated therewith. Fig. 2 is an enlarged detail from Fig. 1.

The invention is illustrated as embodied in a typewriter having the usual platen roller 5, and type bars 6. The type bars, of which only one is shown, are mounted on the usual pivot rod 7, supported by a type basket indicated by rear and front members 8 and 9. The type basket is shown only diagrammatically, the rigid connection of the forward and rear members being indicated by dotted lines connecting them, in Fig. 1.

The illustrated machine is of the basket-shift type, the normal or lower-case position being that in which the type basket is elevated, and the upper-case position being reached by depressing the type basket. The means for shifting the type basket and for guiding its movements are not shown, as they may be of any well known or suitable form, but the direction of the case-shifting movement is indicated by the dot-and-dash line 10—10.

The type bar 6 is actuated through the medium of a toggle mechanism comprising a link 11 and a lever 12, which are pivotally connected together. The forward end of the toggle link 11 is pivoted on the basket member 9, while the toggle lever 12 is connected with the type bar, by means of a pivot 13. The toggle lever has a depending short arm 14, to which is connected a link 15 by which the toggle mechanism is actuated.

A spring 16, attached to the rear end of the toggle lever, tends to draw it rearwardly, in a direction to straighten the toggle, and this movement is limited by the engagement of the forward end of the toggle lever with a lateral lug 17 on the toggle link. In this normal position of the parts the toggle is substantially straight, and the type bar is swung forwardly into position to rest upon a cushion 18 on the basket member 9. This type bar mechanism is similar to that disclosed in my application filed February 11, 1928, Serial No. 253,727, and is therefore not claimed herein, but it is illustrated as it lends itself particularly well to an embodiment of the present invention.

The power mechanism, for moving the link 15 to actuate the type-bar mechanism, may be of various forms known to the prior art, but is preferably of the type illustrated in United States Letters Patent No. 1,688,364 granted to me October 23, 1928. As its details are of no consequence in the present connection, only its principal elements are shown. It comprises a power roller 19, which is rotated constantly in the direction indicated by an arrow in Fig. 1, by means of any suitable source of power. Cooperating with this roller is a cam 20, mounted on a cam lever 21.

which is pivoted, at 22, on a stationary frame member 23 of the machine. The cam is normally disengaged from the roller, but its operation is controlled by a key 24, mounted upon a key lever 25 which is pivoted, at 26, on a stationary frame member 27. The arrangement is such that when the key is depressed the cam is caused to engage the power roller and make substantially a half rotation in 10 rolling contact therewith, thus causing the cam lever to be swung through an angle determined by the height of the cam lobe. The lever is then free to return to its original position, with the cam arrested in position to be 15 out of engagement with the roller. The details of the mechanism by which this result is accomplished may be similar to those disclosed in the said patent.

The cam lever 21 is connected, by a link 29, 20 with a bell-crank lever 28, which is pivoted at 26, and the upper arm of this lever is attached to the link 15. Consequently, when the cam mechanism operates the bell-crank lever is swung in the direction to pull upon 25 the link 15, thus bending and shortening the toggle mechanism and swinging the type bar into engagement with the platen. This operation of the parts is illustrated in Fig. 1, 30 which shows them in the position of extreme movement of the cam lever.

Since the bell-crank lever 28 is pivoted on a stationary frame member, the position of the pivotal connection between the link 15 and this lever is always the same in any given 35 position of the cam mechanism. The position of the pivotal point of the rear end of the link, however, is changed in consequence of the case-shifting movement of the type basket. The object of the present invention 40 is accomplished by so designing the mechanism, as to its dimensions and the relative locations of the various pivotal points, that this change has the result of causing a more powerful stroke to be imparted to the type bar when the type basket is in its depressed 45 or upper-case position. As shown particularly in Fig. 2, the angle between the line 10-10 and the length of the link 15 is acute, in both the upper-case and the lower-case 50 positions. This figure shows the parts in the position reached by them at the extreme throw of the cam mechanism, and the parts are shown, in full lines, as in their upper-case position, while the dotted lines show them as in the lower-case position. It will 55 be apparent that in the upper-case position the angle between the line 10-10 and the link 15 is more acute than in the lower-case position, and that in consequence, the movement of the bell-crank lever 28 to a given 60 point results in a positive bending movement of the toggle mechanism through a greater angle. If, therefore, the arrangement is such that in the upper-case position the type bar 65 will be moved positively into engagement

with the platen, a shorter positive movement will be imparted to the type bar in the lower-case position, so that the stroke will be completed only through the momentum of the parts, against the opposition of the spring 70 16, and thus the impact of the type will be less powerful. Assuming that the type bar, both in upper-case and lower-case position, normally rests upon the cushion 18, the arrangement may be such that in upper-case 75 position the cam 20, when idle, has only the necessary minimum clearance from the power roller 19, this position of the cam being determined by its positive interconnection with the type-bar mechanism. Under these 80 conditions the cam will have its full or maximum effective operation. When the parts are shifted to lower-case position the change in the location of the rear pivotal point of the link 15 will cause a slight forward movement 85 of the upper arm of the bell-crank lever 28, with the result of moving the cam away slightly from the power roller, so that when the cam is thereafter thrown into operation it will impart a swing of less amplitude to 90 the cam lever, and hence to the type-bar mechanism.

The invention claimed is:

1. A power-operated typewriting machine comprising a shiftable type basket, a type-bar mechanism carried thereby, a relatively stationary key-controlled power unit, and a link connecting the power unit with the type-bar mechanism; characterized by the fact that the pivotal points of the link are, in both 100 case-shift positions, in lines lying, with respect to the direction of the case shift, in acute angles at the same side of a right-angle position, so that in a given position of the power unit the pivotal connection of the link 105 with the type-bar mechanism is more advanced in one case-shift position than in the other-case-shift position.

2. A power-operated typewriting machine comprising a shiftable type basket, a type-bar carried by the type basket, a toggle mechanism, for actuating the type bar, also carried by the type basket, a relatively stationary key-controlled power unit, and a pull-rod pivoted to and connecting the power unit and the toggle mechanism; characterized by the fact that the pivotal points of the pull-rod are, in both case-shift positions of the type basket, in lines lying, with respect to the direction of the case shift, in acute angles at 110 the same side of a right angle, with the more acute angle corresponding to the upper-case position of the type basket.

3. A power-operated typewriting machine comprising a shiftable type basket, a type bar carried by the type basket, a relatively stationary key-controlled power unit, and means, connecting the power unit with the type bar, comprising a link of which one end 115 is swung about the pivotal point of the other 120

end in consequence of a shifting movement of the type basket, the link being arranged, with respect to the line of shift, so that it forms, with said line, a substantially more acute angle in one case position than the other.

4. A power operated typewriting machine comprising a shiftable type basket, a platen, a type bar carried by the type basket, a key controlled lever pivoted on a fixed part for actuating the type bar into engagement with the platen, and a link operatively connecting said key controlled lever and the type bar, the arrangement being such that the shifting movement of the type basket so changes the direction of the application of power to the type bar that it is impelled with greater force in one shift position than in the other.

5. A power operated typewriting machine comprising a shiftable type basket, a platen, a type bar carried by the type basket, a key controlled lever pivoted on a fixed part for actuating the type bar into engagement with the platen, a link operatively connecting said key controlled lever and the type bar, a power driven roller, a cam normally free from said roller but movable into rolling engagement therewith, and a link operatively connecting said cam with said key controlled lever, the arrangement being such that the shifting movement of the type basket to upper case position moves said cam to advance the point at which it engages the driven roller.

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