Feb. 5, 1929. 1,701,376

W. H. KUPPER

TYPEWRITING MACHINE

Filed April 11, 1927 2 Sheets-Sheet 1

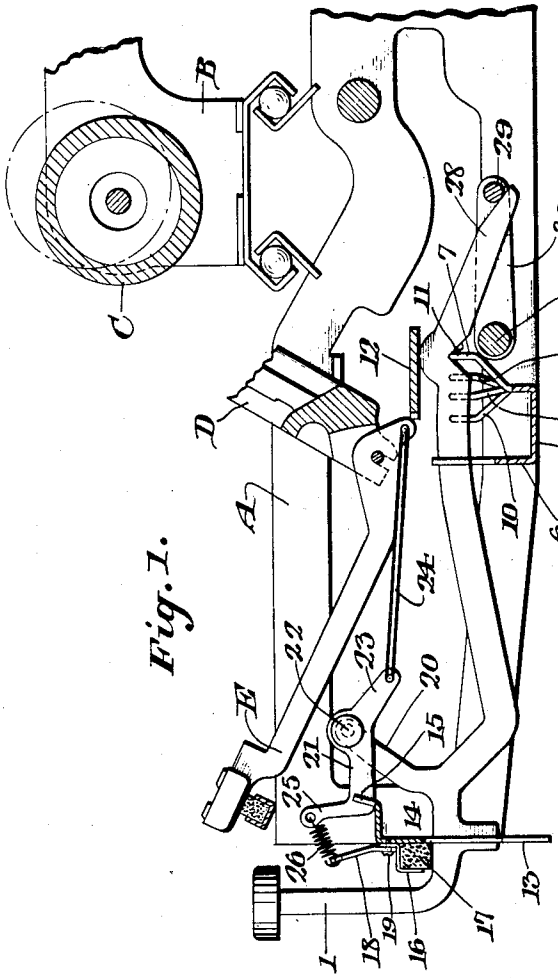


Fig. 1.

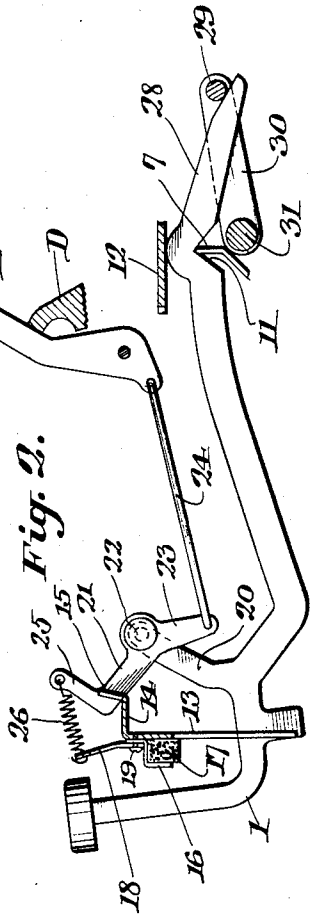


Fig. 2.

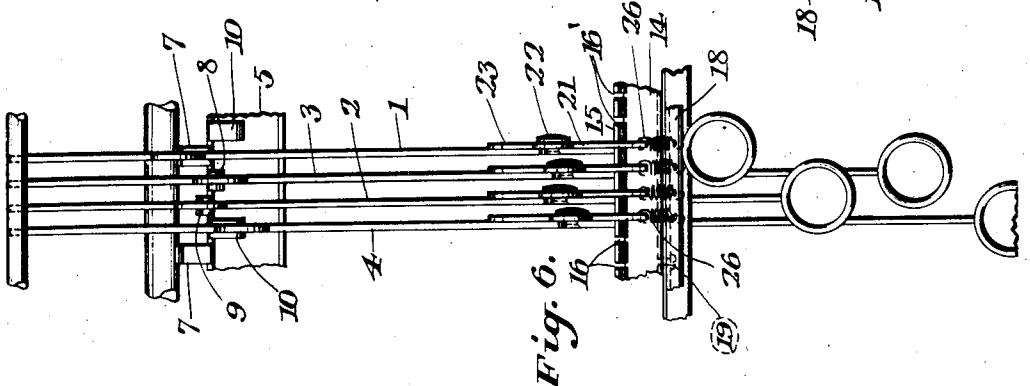


Fig. 6.

INVENTOR
W. H. Kupper
BY
Boardman Wright
ATTORNEY

Feb. 5, 1929. 1,701,376

W. H. KUPPER

TYPEWRITING MACHINE

Filed April 11, 1927 2 Sheets-Sheet 2

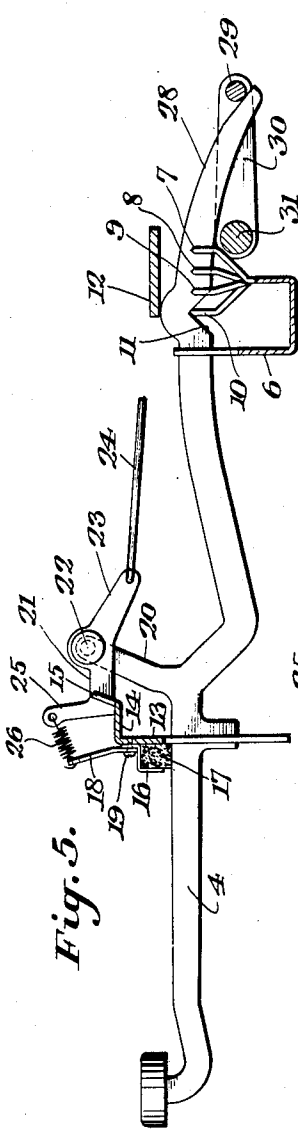


Fig. 5.

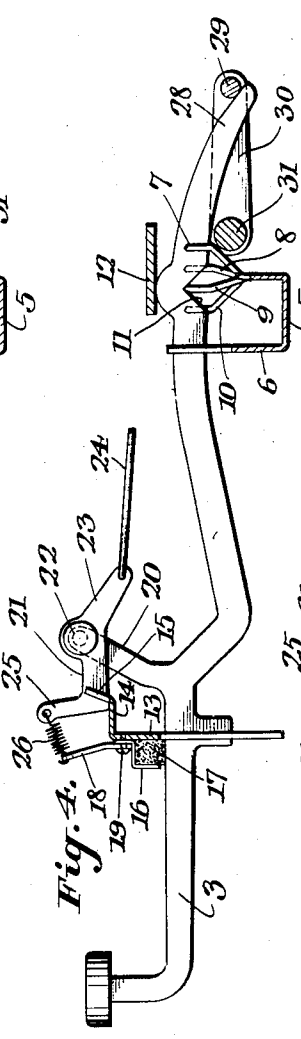


Fig. 4.

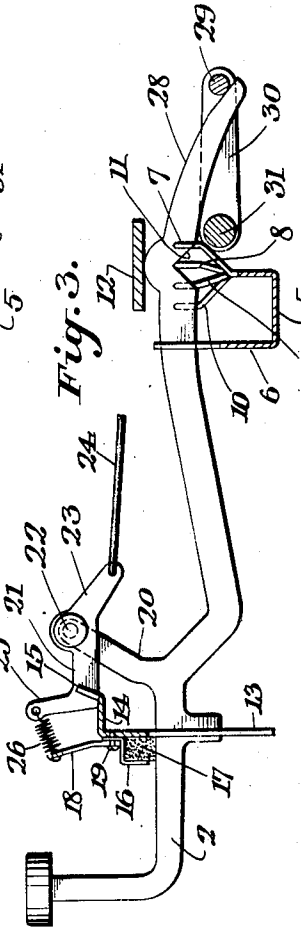


Fig. 3.

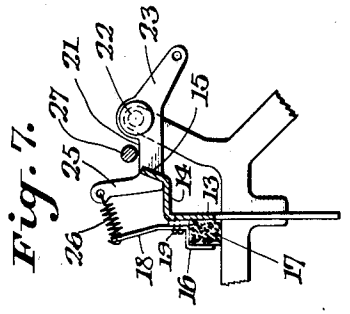


Fig. 7.

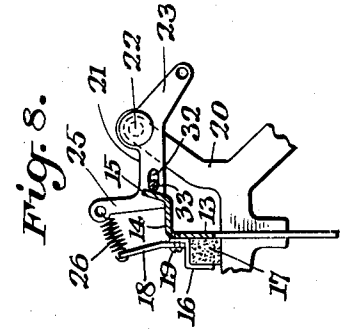


Fig. 8.

INVENTOR
W. H. Kupper
BY
Baldwin & Wright
ATTORNEYS

Patented Feb. 5, 1929. 1,701,376

UNITED STATES PATENT OFFICE.

WILLIAM H. KUPPER, OF HARTFORD, CONNECTICUT, ASSIGNOR TO ROYAL TYPEWRITER COMPANY, INC., OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

TYPEWRITING MACHINE.

Application filed April 11, 1927. Serial No. 182,814.

This invention relates to a type action for use in typewriting or similar machines which is in many respects similar to the flexing action at present embodied in the well known Royal machines. In such actions, however, the front links which form a part of the intermediate connection between the key levers and the type bars are pivoted at their front ends to a fixed part and it has been necessary either to provide some form of sliding connection between the rigid arm on the key lever and the front link or to provide an intermediate link between the key lever and the front link which is pivoted to both.

One of the features of the present invention relates to the provision of front links in a type action of this character which are pivoted to upward projections from the key levers by means of rivets. Those front links are not positively connected to the frame at all but are guided at their front ends in a comb guide. This permits the downward movement of the link rendered necessary by the type action and provides for the necessary sliding movement.

In the usual machine having four banks of key levers which are of different lengths, it is necessary to provide different fulcrum points as a part of the means for obtaining a uniform key depression and a further feature of the invention resides in the provision of a single sheet metal member which acts as a slotted comb guide for the key levers and also affords the different fulcrum points.

Other detail features of the invention will be apparent from the following description and will be set forth in the appended claims.

In the drawings:

Figure 1 is a side elevation of a part of a typewriting machine with parts in section showing a key lever of the upper bank and the type action connected thereto.

Figure 2 is a similar view with the key in depressed position.

Figure 3 is a side elevation of one of the keys of the second or next to highest bank with its associated parts.

Figure 4 is a similar view of the third or next to lowest key lever.

Figure 5 is a similar view of the lowest bank of key levers.

Figure 6 is a top plan view of four key levers, one of each bank and associated parts, the type bars being removed.

Figure 7 is a fragmentary view of a portion of the action showing a retaining bar for the front links.

Figure 8 is a similar view showing a modification.

The invention is illustrated as applied to the usual Royal portable typewriter, but may be applied to other types of machines so that this illustration is not to be regarded as in any way limiting the invention. There is shown a part of the main frame A, a carriage B supporting a platen C, and a type bar segment D having type bars E pivoted therein in the usual manner.

The key levers are arranged in four banks 1, 2, 3 and 4, the highest or rear bank being shown in Figures 1 and 2. For the purpose of providing fulcrum and guiding means for the key levers there is provided a channel shaped member 5 which extends from side to side of the machine and is supported by the frame thereof. The front vertical wall 6 of this channel member is slotted to form a comb guide for the key levers. The rear wall of the channel member 5 is divided by slits into fingers which are bent so that they lie in four transverse lines as clearly shown in the drawings. The rear finger 7 affords a fulcrum for the key levers 1 of the highest bank of keys. The next front finger 8 affords fulcrum for the key lever of the second bank. The finger 9 living in front of the finger 8 affords a fulcrum for the third bank of key levers and similarly the finger 10 affords a fulcrum for the lowest bank of key levers. The key levers of each bank are provided at the proper points with an inverted V-shaped notch 11 which engages the proper fulcrum. In this manner a single sheet metal member is provided which has the dual purpose of affording the necessary fulcrums for the various banks of key levers and also provides a comb guide for the key levers. A plate 12 extends from side to side of the machine and overlies the various key levers at a point above the fulcrum thereof so as to prevent accidental displacement.

At the front of the machine there is provided a vertical plate which is slotted at 13 to form a comb guide for the front part of the key levers and this plate has a rearwardly extending horizontal portion 14 terminating in an upward portion 15 which is slotted for a purpose hereinafter set forth. A metal plate 16 has a portion spaced from the vertical plate and retains a buffer 17 which serves

to limit the upward movement of the key levers. Another plate 18 extends upward and has a function hereinafter set forth. It may be noted that the plates 16 and 18 are attached to the vertical plate by screws 19 and the vertical plate is fastened to the frame of the machine in any desired manner. Each key lever has a rigid projection 20 which extends upward and slightly to the rear. There is provided a series of front links 21 and one of these is pivoted by a rivet 22 to the upward projection 20 of the key lever. Each front link has a portion 23 which extends rearwardly and downward from the pivot point and is connected by the usual link 24 to the heel of the type bar. The extreme front portion of each link has an upwardly extending part 25 provided with an eye to which is attached one end of a spring 26, the other end of which is hooked into a similar eye in the plate 18. When all the type actions are assembled and placed in the machine a rod 27 shown in Figure 7 may be positioned above the body of the front links 21 in order to prevent accidental displacement.

It will be noted that the front link 21 is connected to the upward projection of the key lever and has no positive connection whatever with the frame of the machine. When the parts are moved from the normal position shown in Figure 1 to the operative position of Figure 2, by a depression of the key lever, the front link which is guided by the slotted portion 15 of the front plate will rock about its engagement with the edge of this plate as about a pivot, being held against the same by the tension of the spring 26 and it will also slide somewhat on the comb plate. The spring 26 is the returning spring for the entire type action and when the key is released will return all parts to normal position. It will be noted that the front links 21 are similar in shape but that the link which is carried by a key lever 1 of the highest bank has a pivot point 22 farthest to the rear. The link 21 which is connected to a lever 2 of the second bank has the pivot point 22 slightly further forward. In similar manner pivot points 22 of the links which are connected to the key levers 3 and 4 are each located slightly in advance of the preceding pivot connection. Since the links 24 which connect the front links 21 to the type bars are of uniform length it necessarily follows that the distance from the pivot 22 to the point of connection of the link 24 increases slightly from the top row to the bottom. By means of the variations in the fulcrums of the key levers and the variation in the position of the pivot point 22, a uniform depression is obtained for all of the keys of the key board.

Each key lever has a rearward extension 28 which is downturned and engages beneath a rod 29 carried by arms 30 which are in turn fast to a rod 31 carried by the frame of the machine. This frame which comprises the rods 29 and 31 and the connecting arms 30 is a universal bar frame and the movement thereof will be transmitted to the escapement mechanism and ribbon mechanism in any desired manner. The arrangement of the various fulcrum points above specified enables a uniform depression of the key levers to impart a uniform movement to the universal bar for all keys of the key board.

A modified form of construction is shown in Figure 8 in which the rod 27 of Figure 7 is omitted and each front link is provided with an elongated slot 32 through which slots passes a rod 33 supported at its ends in the frame work. The slot 32 is so formed as to allow for the necessary pivotal and sliding movement due to the depression of the keys. In this construction the sliding movement takes place between the front links and its support instead of between the front links and the key levers as in previous constructions.

It will be obvious that this type action is simple and efficient in construction and that substantially all parts thereof may be stamped out of sheet metal, thus reducing the cost of manufacture. The principle involved may be applied to typewriting machines of different types and in constructions which may be quite widely different from that illustrated. Minor changes may be made without in any way departing from the spirit of the invention, which is to be regarded as limited only by the scope of the appended claims.

I claim as my invention:

1. In a typewriting or similar machine, a type action including a type bar, a key lever, and intermediate connections comprising a substantially horizontal front link pivoted to the key lever and supported near one end for free sliding and pivotal movement, and a link directly connected to the front link and to the type bar.

2. In a typewriting or similar machine, a type action including a type bar, a key lever, and intermediate connections comprising a front link pivoted to the key lever and a comb guide which supports the link for free sliding and pivotal movement, said comb guide also having a part which acts as a guide for the key lever.

3. In a typewriting or similar machine, a type action including a type bar, a key lever, and intermediate connections comprising a front link pivoted directly to the key lever and supported near one end for free sliding and pivotal movement, and a spring connected to the front link and acting to return the whole type action to normal position.

4. In a typewriting or similar machine, a type action including a type bar, a key lever, and intermediate connections comprising a

substantially horizontal front link pivoted intermediate its ends to the key lever, a link connecting the rear end of the front link to the type bar and means upon which the front portion of the front link rests for free sliding and pivotal movement.

5. In a typewriting or similar machine, a type action including a type bar, a key lever, and intermediate connections comprising a front link pivoted intermediate its ends to the key lever, a link connecting the rear end of the front link to the type bar, and a comb in which the front portion of the front link is guided for free sliding and pivotal movement.

6. In a typewriting or similar machine, a type action including a type bar, a key lever, and intermediate connections comprising a front link pivoted intermediate its ends to the key lever, a link connecting the rear end of the front link to the type bar, a comb in which the front portion of the front link is guided for free sliding and pivotal movement, a spring anchorage carried by said comb, and a spring connected to the front link and to said anchorage and acting to return the whole type action to normal position.

7. In a typewriting or similar machine, a type action including a type bar, a key lever having an upwardly extending rigid extension, and intermediate connections comprising a front link pivoted to said extension and guided near one end for free sliding and pivotal movement, and a link directly connected to the front link and to the type bar.

8. In a typewriting or similar machine, a type action including a type bar, a key lever, and intermediate connections; and a member carried by the machine frame and having a horizontal portion, said intermediate connections comprising a front link pivoted to the key lever and resting on said horizontal portion on which it slides and pivots.

9. In a typewriting or similar machine, a type action including a type bar, a key lever, and intermediate connections; and a member carried by the machine frame and having a horizontal portion and a continuing vertical portion slotted to form a guide, said intermediate connections comprising a front link pivoted to the key lever and freely sliding and pivoting in said guide about the horizontal portion.

10. In a typewriting or similar machine, a type action including a type bar, a key lever, and intermediate connections; and a member carried by the machine frame and having a horizontal portion and a continuing vertical portion slotted to form a guide, said intermediate connections comprising a front link pivoted to the key lever and freely sliding and pivoting in said guide about the horizontal portion, said member also having a vertical slotted portion which acts as a comb guide for the key lever.

11. In a typewriting or similar machine, key levers arranged in banks, and supporting and guiding means for the same comprising a channel shaped sheet metal member the front wall of which is slotted to form a guide for the key levers and the rear wall of which is slitted and bent to form tongues lying in a plurality of transverse lines and forming fulcrums for the key levers of different banks.

12. In a typewriting or similar machine, key levers arranged in banks, supporting and guiding means for the same comprising a channel shaped sheet metal member the front wall of which is slotted to form a guide for the key levers and the rear wall of which is slitted and bent to form tongues lying in a plurality of transverse lines and forming fulcrums for the key levers of the different banks, and a notch in the under side of each key lever which rests on one of said tongues.

13. In a typewriting or similar machine, key levers arranged in banks, supporting and guiding means for the same comprising a channel shaped sheet metal member the front wall of which is slotted to form a guide for the key levers and the rear wall of which is slitted and bent to form tongues lying in a plurality of transverse lines and forming fulcrums for the key levers of the different banks, and a plate connected to the machine frame and overlying the key levers above their fulcrum points to retain the levers against accidental displacement.

14. In a typewriting or similar machine, a type action including a type bar, a key lever, intermediate connections comprising a front link pivotally connected intermediate its ends to a rigid extension from the key lever, a fulcrum for the front link upon which it rests for free sliding and pivotal movement, a link directly connected to the front link and to the type bar, and means preventing accidental displacement of said front link.

In testimony whereof, I have hereunto subscribed my name.

WILLIAM H. KUPPER.