

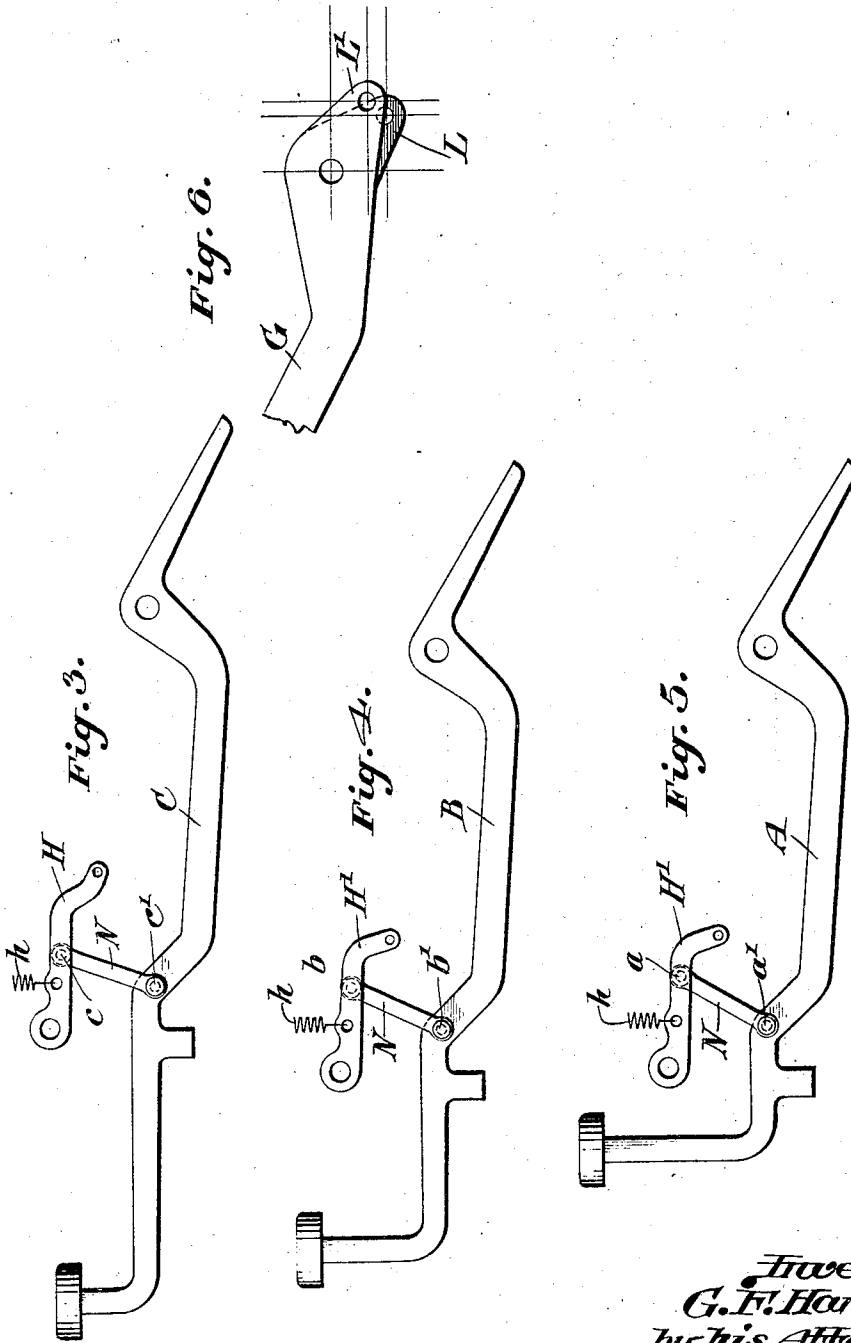
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TYPEWRITING MACHINE

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TYPEWRITING MACHINE.

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This invention relates to an improved type action which is of the general character of the type action used in the well-known Royal machine, but permits the use of flat sheet metal links of uniform length for connecting all of the key levers with the front links of the type action.

In previous constructions, the links which have connected the key levers to the front links have been made of wire, but in order that adjacent connections might not interfere, it has been necessary to make the looped ends of the links with small and sharp loops. Because of this fact it was necessary to place the holes for said links very close to the edges of the key levers and the front links.

By the employment of a flat sheet metal link and the proper location of the connecting holes in the key levers and front links, it is possible to employ connecting links which are identical for all banks of the key levers and for all type actions of the machine.

In the drawings:

Figure 1 is a longitudinal section of a portion of a typewriting machine disclosing the present invention.

Figure 2 is a side view on an enlarged scale of a portion of the various type actions.

Figure 3 is a side view of a key lever of the third or next to the lowest bank.

Figure 4 is a similar view of a key lever of the second bank.

Figure 5 is a similar view of a key lever of the top bank.

Figure 6 is a fragmentary view of the difference in the form of the heels of the type bars at the center and extreme sides of the segment.

The invention is illustrated in a typewriting machine having a frame E in which is mounted a carriage F supporting a platen *f* against the front of which strikes type bars G which are pivoted in the type segment to turn about an axis *g*. A series of front links H, H' are provided and these are all pivoted upon a rod I at the front of the machine. The links H are longer than the links H' and have their rearward and downwardly turned ends of a slightly different form. The links H and H' are alternately arranged throughout the greater portion of the series of type action and the longer links H are connected

to the third and lowest bank of key levers, while the shorter links H' are connected to the top and second banks of key levers. A plurality of longer links H are placed at each extreme side of the series of type actions. All of these front links are returned to normal position by the usual returning springs *h*.

The front links are connected to the heels of their respective type bars by links K and a reference to Figure 6 will show that the center type bars have a heel L which is formed somewhat differently from the heel L' of the type bars at the sides of the series of type actions. This arrangement is shown in Patent No. 1,669,167 and is not specifically claimed herein. The purpose thereof is to assist in obtaining a uniform dip of the key levers throughout the whole series and in all four banks.

The key levers are arranged in four banks and are designated as A, B, C and D from the top to the bottom. They are all pivoted to turn about a common pivotal axis M.

The construction thus far described is or may be identical with that employed in the well known Royal machine. In previous constructions, however, the key levers and the front links have been connected as shown in the above mentioned patent or by connecting links of various lengths which have been pivoted at their ends to the front links and the key levers respectively. The prime purpose of this invention is to provide a series of connecting links N, all of which are identical in size and shape and which are pivotally connected at their ends to the key levers and the front links respectively. A uniform dip in the key levers of the various banks and a uniform action throughout the whole series of type bars from the center to the sides is obtained by varying the pivotal points of connections of the links N with the key levers and the front links. As shown in Figure 2, the links N are connected to the front links at four different points which lie in a horizontal plane but are placed at different distances from the pivotal axis of the front links. Similarly the links N are connected to the key levers of the four banks at four different points, but these points lie in the arc of a circle which is struck from the pivotal axis M of the key levers as a center

but are differently positioned in a vertical plane.

The top bank of key levers A is connected to the shorter front links H' by links N which are connected to the front links at points *a* and to the key levers at points *a'*. The point *a* is the farthest from the pivot of the front link and the point *a'* is the farthest from the lower edge of the key lever A. The second row or bank of key levers B is also connected to the short links H' by links N which are pivoted to the front links at points *b* slightly nearer to the pivotal axis of the front link and to the key lever at points *b'* slightly closer to the lower edge of said key lever.

The third row or bank of key levers C is connected to front links H by links N which are pivoted to the front links at points *c* still closer to the pivotal axis of the front link and to the key lever at points *c'* still nearer to the edge thereof. The lowest bank of key levers D is connected to front links H by links N which are pivoted to the front links at the points *d* which are the closest to the pivotal axis of the front links and to the key levers at points *d'* which are the closest to the bottom edge of the key levers.

By the above described arrangement it has been found possible to use a series of connecting links N which are uniform in size and shape and at the same time obtain a uniform dip for all of the keys of the keyboard. It may be noted that one end of the connecting link N is placed on one side of the front link while the other end engages the key lever on the opposite side thereof. This renders the construction more compact and prevents interference between any of the parts.

It will be obvious that the present construction presents marked advantages in the manufacture and assembling of the machines since all of the actions may be assembled separately before they are mounted in the machine. It is also a marked advantage to be able to manufacture the connecting links of a single uniform size. Moreover, a flat link pivoted to the key lever and the front link as shown in this case is found to be superior in operation to the old form of wire link which is hooked at its ends into the respective parts. Minor changes may be made in the precise construction and a principal may be employed in type actions of a somewhat different character 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. A series of type actions each of which comprises a key lever, a front link connected to a type bar, and a connecting link pivoted to the key lever and the front link, the connecting links of the entire series being of the

same length but connected to different points of the front links and key levers for each bank of key levers.

2. A series of type actions each of which comprises a key lever, a front link pivoted at its front end and connected to a type bar, and a connecting link pivoted to the key lever and the front link, the connecting links of the entire series being of the same length but connected to the front links at points different in distance from the pivotal axis of the front links.

3. A series of type actions each of which comprises a key lever, a front link connected to a type bar, and a connecting link pivoted to the key lever and the front link, the connecting links of the entire series being of the same length but connected to the front links at points which differ in distance from the pivotal axis of the front links for each bank of key levers.

4. A series of type actions each of which comprises a key lever, a front link connected to a type bar, and a connecting link pivoted to the key lever and the front link, the connecting links of the entire series being of the same length but connected to the key levers at different vertical points.

5. A series of type actions each of which comprises a key lever, a front link connected to a type bar, and a connecting link pivoted to the key lever and the front link, the connecting links of the entire series being of the same length but connected to the key levers at different vertical points for each bank of key levers, said points being the same distance from the pivotal axis of the key levers.

6. A series of type actions each of which comprises a key lever, a front link connected to a type bar, and a connecting link pivoted to the key lever and the front link, the connecting links of the entire series being of the same length but connected to the front links at points which vary in distance from the pivotal axis of the front links for each bank of key levers, and to the key levers at different vertical points for each bank of key levers.

7. A series of type actions each of which comprises a key lever, a front link connected to a type bar, and a connecting link pivoted to the key lever and the front link, the connecting links of the entire series being of the same length but connected to the front links at points which lie in a horizontal line but vary in distance from the pivotal axis of the front links for each bank of key levers, and to the key levers at points at the same distance from the pivotal axis of the key levers but at different points from the edge of the key levers.

8. A series of type actions each of which comprises a key lever, a front link connected to a type bar, and a connecting link pivoted to the key lever and the front link, the con-

necting links of the entire series being of the same length but connected to the front links at points progressively nearer the pivotal axis of the front links for key levers of the top to bottom rows respectively.

9. A series of type actions each of which comprises a key lever, a front link connected to a type bar, and a connecting link pivoted to the key lever and the front link, the connecting links of the entire series being of the same length but connected to the key levers at points progressively nearer the lower edge of the key levers from the top to the bottom rows respectively.

10. A series of type actions each of which comprises a key lever, a front link connected to a type bar, and a connecting link pivoted to the key lever and the front link the connecting links of the entire series being of the same length but connected to the front links at points progressively nearer the pivotal axis of the front links and to the key levers at points progressively nearer the lower edge of the key levers from the top to the bottom rows respectively.

11. A series of type actions each of which comprises a key lever, a front link connected to a type bar, said front links being alternately long and short, and a connecting link pivoted to the key lever and the front link, the connecting links of the entire series

being of the same length and the links for the top and second banks of key levers being connected to the short front links and key levers at different points of each for each bank, and the links for the third and lower banks of key levers being connected to the long front links and key levers at different points of each for each bank.

12. A series of type actions each of which comprises a key lever, a front link connected to a type bar, said front links being alternately long and short, and a connecting link pivoted to the key lever and the front link, the connecting links of the entire series being of the same length and the links for the top and second banks of key levers being connected to the short front links and key levers at different points of each bank, and the links for the third and lower banks of key levers being connected to the long front links and key levers at different points of each for each bank, the points of attachment to the front links progressively approaching the pivotal axis of the front links, and the points of attachment to the key levers progressively approaching the lower edge of the key levers.

In testimony whereof, I have hereunto subscribed my name.

GEORGE F. HANDLEY.