No. 738,234. PATENTED SEPT. 8, 1903.

C. J. PAULSON.

TYPE WRITER.

APPLICATION FILED AUG. 13, 1902.

NO MODEL.

Fig. 1.

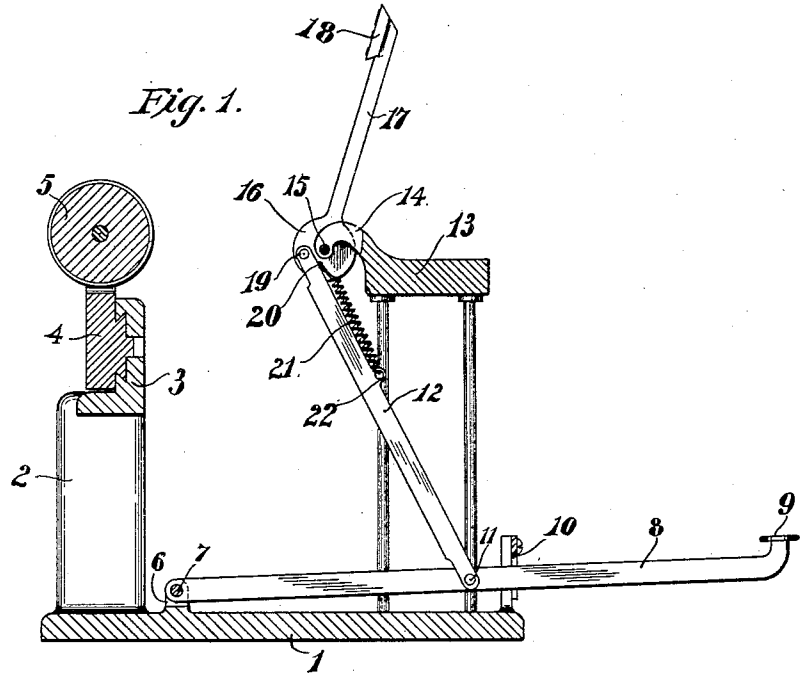


Fig. 2.

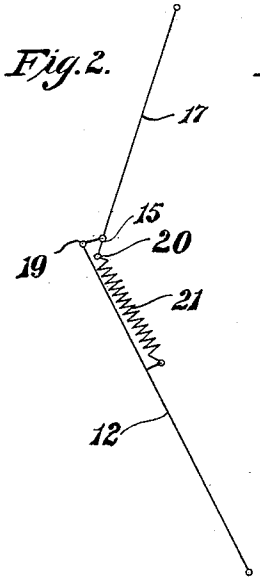


Fig. 3.

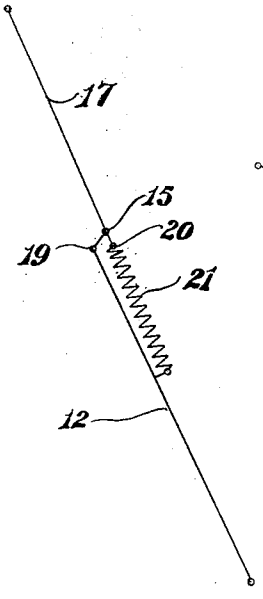
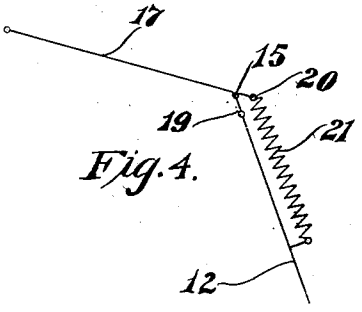


Fig. 4.



Witnesses
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No. 738,234. Patented September 8, 1903.

UNITED STATES PATENT OFFICE.

CHARLES J. PAULSON, OF BROOKLYN, NEW YORK.

TYPE-WRITER.

SPECIFICATION forming part of Letters Patent No. 738,234, dated September 8, 1903.

Application filed August 13, 1902. Serial No. 119,466. (No model.)

To all whom it may concern:

Be it known that I, CHARLES J. PAULSON, a subject of the King of Sweden and Norway, residing in Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Type-Writers, of which the following is a specification.

This invention relates to type-writing machines, and especially to that class in which a series of key-levers operates a series of type-bars by means of connecting-rods and in which the printing shall be visible to the operator during the process of writing. It is well known in certain type-writing machines of this class to employ a returning-spring for the purpose of pulling back to its position of rest the type-bar after the key-lever has been released, so that the type-bar cannot rebound and collide with the next following type-bar. In some cases this returning-spring was connected to the type-bar and to a suitable lug of the frame of the machine. In other cases it was connected to the type-bar and to the connecting-rod.

The object of the present invention is to arrange this returning-spring in such a way so as to make it much more efficient than in any one of the connections heretofore known; and the invention consists of this new arrangement and connection, which is hereinafter fully described and specified, and particularly set forth in the appended claims.

The accompanying drawings illustrate the invention in its application to a visible-writing type-writing machine, although the same is not limited to this class of machines and may be used in connection with any other suitable type-bar machine.

Figure 1 of the drawings is a side elevation, partially in section, of this new improvement. Figs. 2, 3, and 4 are diagrammatic views of successive positions of the operative parts of the arrangement.

1 in Fig. 1 is the base-plate of the machine and is provided with the standards 2, carrying the guideway 3 for the carriage 4 of the printing-platen 5. Lugs 6 of the base-plate 1 form bearings for the pivot-rod 7 of a series of key-levers 8, each having a finger-piece 9. A serrated bar 10 on the front part of the base-plate 1 limits the upward motion of the key-levers 8. Each key-lever is provided with a pin 11 for movably connecting thereto a connecting-rod 12.

The top plate 13 of the machine has a series of bearing-lugs 14, one for each type-bar, and a corresponding number of axle-pins 15, which form pivots for the type-bars 17. Each type-bar has a hub portion 16 and type characters 18. To the hub 16 is movably connected at 19 the connecting-rod 12 and at 20 a spiral spring 21, the other end of which spring is held by a lug 22 of the connecting-rod 12. The several connections of connecting-rod 12, spring 21, and type-bar 17 are not intended to be limited to the connection shown, and simple rigidly-connected levers may be used instead of the hub 16, as indicated in the diagram, Figs. 2, 3, and 4.

The essence of the invention consists now in an arrangement in which the pin 15 is, in fact, the pivot for three rigidly-connected levers. One lever is represented by the type-bar 17, the second lever by a line connecting the points 15 and 19, and the third lever by a line connecting the points 15 and 20. The advantages of this arrangement will more fully appear by setting forth the operation of the device. In depressing the key-lever 8 the connecting-rod 12 will act upon the type-bar at the beginning of the stroke with its greatest effective leverage, because in its initial position the line or lever 15 19 is substantially at right angles to the direction of movement of the connecting-rod 12, as clearly illustrated in Fig. 2. At the end of the stroke this system is substantially at a dead-point, as in Fig. 4. The consequence will be that the type end of the type-bar receives a great momentum during the first part of its motion which will tend to produce a most effective impression of the type upon the paper held on the platen, while the decrease in effective leverage during the stroke until it reaches a substantially dead-point at the end of the stroke will tend to prevent any unnecessary strain on the type-bar striking the paper and any danger of breaking the type-bar.

The operation of the spring 21, which returns the type-bar to its initial position, is just the reverse from that of the connecting-rod. At the beginning of the stroke the effective leverage 15 20 of the spring is very small.

It reaches its dead-point during the stroke when the axis of the coiled spring is substantially parallel to the connecting-rod, as in Fig. 3, and increases again toward the end of the stroke, as in Fig. 4. The tension of the spring of course increases gradually to the end. During the return movement of the type-bar under the action of the spring the latter will operate with greatest effective leverage at the beginning of the return movement, will again pass its dead-point at about one-half of it, and reach a relatively small effective leverage at the end of the return movement. The result will be that the type-bar is removed instantly from the paper held on the platen; but the speed of its return movement is gradually decreased, so that at the end of the return movement the effective leverage and the tension of the spring is just large enough to prevent the rebounding of the type-bar from its rest.

That which is claimed as new and useful, and desired to be secured by Letters Patent, is—

1. The combination with a fulcrumed type-bar of a platen, a stop determining the rest position of the type-bar, and a returning-spring whose line of effort passes between the platen and the fulcrum of the type-bar when the latter is adjacent to its position of rest and between said stop and the fulcrum of the type-bar when the latter is adjacent to its printing position.

2. The combination with a fulcrumed type-bar, an operating-lever and a connecting-link, of a platen, a stop determining the rest position of the type-bar and a returning-spring one of whose ends is attached to said link and whose line of effort passes between the platen and the fulcrum of the type-bar when the latter is adjacent to its position of rest and between said stop and the fulcrum of the type-bar when the latter is adjacent to its printing position.

3. The combination with a fulcrumed type-bar, an operating-lever below said type-bar and a link connecting the two, of a returning-spring attached to said link and to a part of the type-bar below its fulcrum, the line of effort of said spring being shifted from one side of the fulcrum of the type-bar to the other during the swinging movement of the type-bar.

4. The combination with a fulcrumed type-bar, an operating-lever below said type-bar and a link connecting the two, of a returning-spring attached to said link and to a part of the type-bar between the fulcrum of the type-bar and the point of pivotal connection of the link therewith, the line of effort of said spring being shifted from one side of the fulcrum of the type-bar to the other during the swinging movement of the type-bar.

5. The combination with a fulcrumed type-bar provided with a hub portion, an operating-lever below said type-bar and a link connecting the two, of a returning-spring attached to said link and to a portion of the type-bar between the fulcrum of the type-bar and the point of pivotal connection of the link therewith, the line of effort of said spring being shifted from one side of the fulcrum of the type-bar to the other during the swinging movement of the type-bar.

6. The combination with a fulcrumed type-bar and an operating-link pivoted to the type-bar and whose line of effort approaches the fulcrum of the type-bar during the printing movement thereof, of a returning-spring whose line of effort is shifted from one side of the fulcrum of the type-bar to the other during the forward and backward movements of the type-bar.

7. The combination with a fulcrumed type-bar and an operating-link pivoted to the type-bar and whose line of effort approaches the fulcrum of the type-bar during the printing movement thereof, of a platen, a stop determining the rest position of the type-bar, and a returning-spring whose line of effort passes between the platen and the fulcrum of the type-bar when the latter is adjacent to its position of rest and between said stop and the fulcrum of the type-bar when the latter is adjacent to its printing position.

8. The combination with a fulcrumed type-bar, an operating-link pivoted to the type-bar and whose line of effort approaches the fulcrum of the type-bar during the printing movement thereof, and an operating-lever, of a platen, a stop determining the rest position of the type-bar and a returning-spring one of whose ends is attached to said link and whose line of effort passes between the platen and the fulcrum of the type-bar when the latter is adjacent to its position of rest and between said stop and the fulcrum of the type-bar when the latter is adjacent to its printing position.

9. The combination with a fulcrumed type-bar, an operating-link pivoted to the type-bar and whose line of effort approaches the fulcrum of the type-bar during the printing movement thereof, and an operating-lever below said type-bar, of a returning-spring attached to said link and to a part of the type-bar below its fulcrum, the line of effort of said spring being shifted from one side of the fulcrum of the type-bar to the other during the swinging movement of the type-bar.

10. The combination with a fulcrumed type-bar, an operating-link pivoted to the type-bar and whose line of effort approaches the fulcrum of the type-bar during the printing movement thereof, and an operating-lever below said type-bar, of a returning-spring attached to said link and to a part of the type-bar between the fulcrum of the type-bar and the point of pivotal connection of the operating-link with the type-bar, the line of effort of said spring being shifted from one side of the fulcrum of the type-bar to the other during the swinging movement of the type-bar.

11. The combination with a fulcrumed type-

bar provided with a hub portion, an operating-link pivoted to said hub portion and whose line of effort approaches the fulcrum of the type-bar during the printing movement thereof, and an operating-lever below said type-bar, of a returning-spring attached to said link and to a portion of the type-bar hub between the fulcrum and the point of pivotal connection of the link therewith, the line of effort of said spring being shifted from one side of the fulcrum of the type-bar to the other during the swinging movement of the type-bar.

In testimony whereof I have hereunto set my hand, in the presence of two subscribing witnesses, this 31st day of July, 1902.

CHARLES J. PAULSON.

In presence of—

RALPH JULIAN SACHERS,

FRED. J. DOLE.