No. 649,747. Patented May 15, 1900.

H. E. PAYNE.

TYPE WRITING MACHINE.

(Application filed Aug. 18, 1898.)

(No Model.)

Fig. 1.

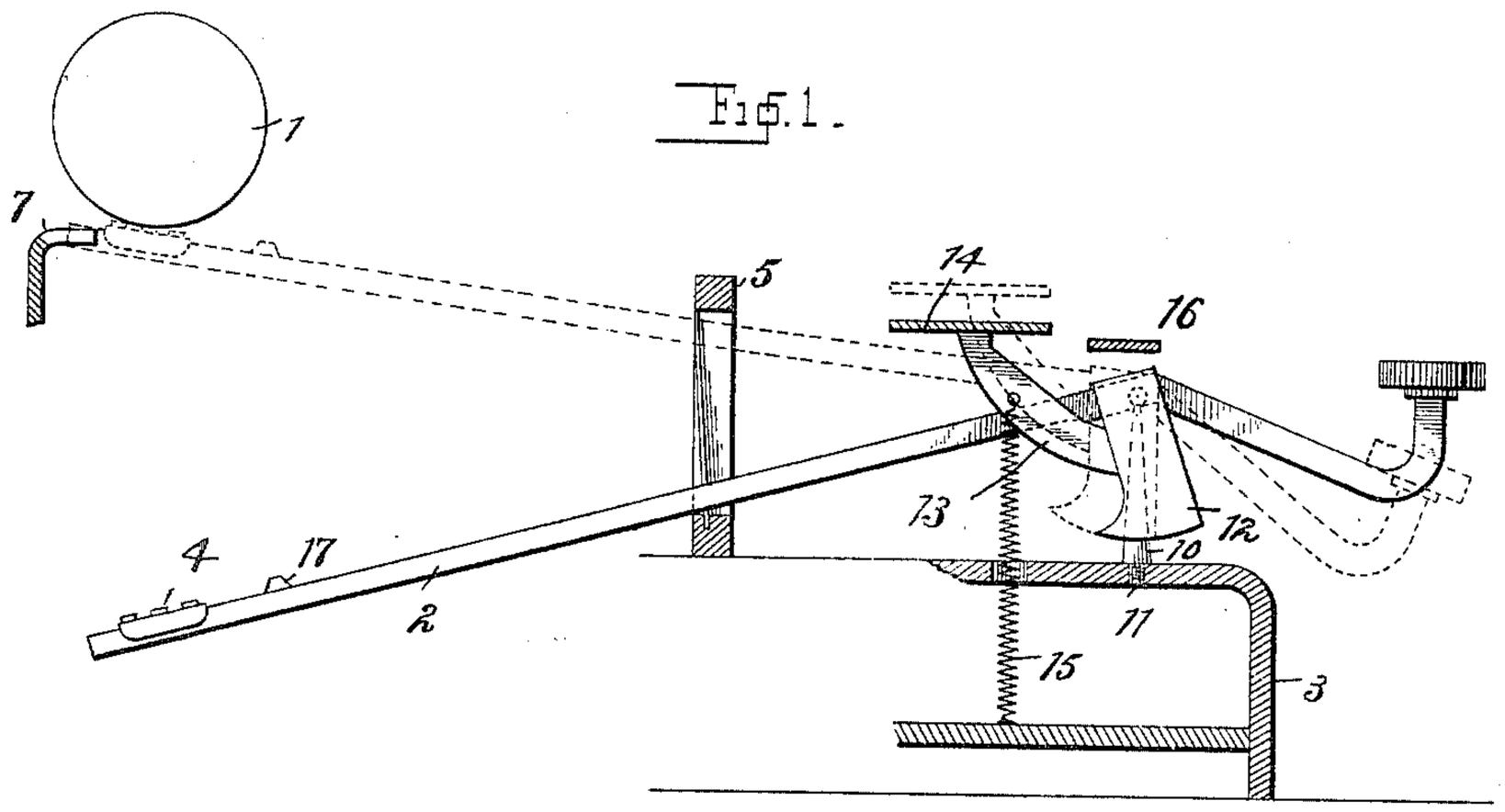


Fig. 2.

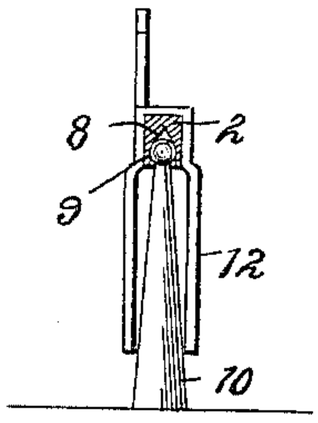


Fig. 3.

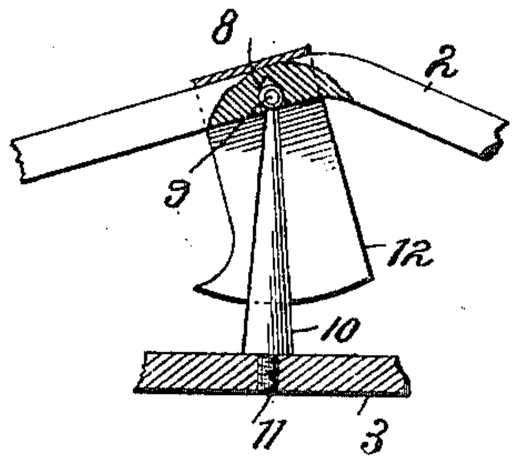
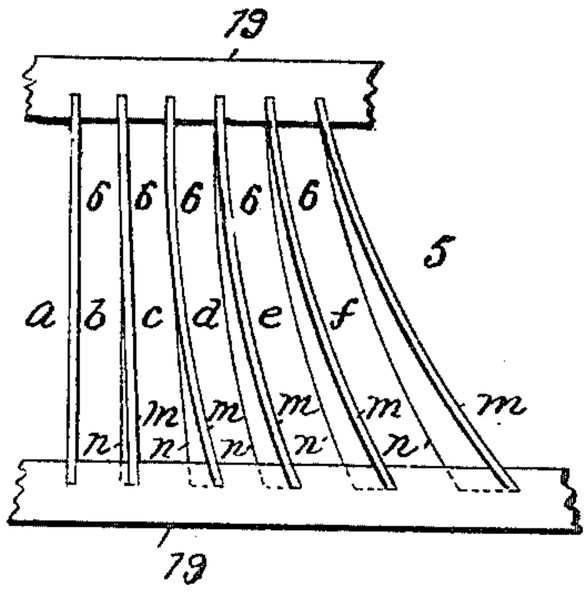


Fig. 4.



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HALBERT E. PAYNE, OF NEW YORK, N. Y.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 649,747, dated May 15, 1900.

Application filed August 18, 1898. Serial No. 688,848. (No model.)

To all whom it may concern:

Be it known that I, HALBERT E. PAYNE, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My present invention relates particularly to the kind of type-writing machine shown in the United States Letters Patent No. 565,171, granted August 4, 1896, to myself as assignee of Newman R. Marshman and Lee S. Burridge. In that machine, which is of the type-bar class, the type-bars are arranged substantially horizontal, with their type ends adjacent to the platen or impression-surface, and means intermediate of the types and the keys are provided for fulcruming and guiding the bars. In such a machine it is essential that the bars be so pivoted as to be capable of a free lateral and vertical movement about the fulcrum-point for the purpose of allowing the type to follow freely its individual guide in traveling to and from the impression-point. It is also essential that the parallelism of the type be preserved, and therefore that the bar be prevented from rotation or even vibration on its longitudinal axis. Otherwise the type will not give an even impression.

It is obviously desirable to limit or prevent lateral vibration of the type-bars in their individual paths, for the more definite the path of the individual type-bar is made the closer can the bars be made to operate without interference and the smaller can the whole keyboard and, indeed, the whole machine be made. In my aforesaid Letters Patent the detail of the mechanism for fulcruming or pivoting the type-bars is illustrated in a general way only, and the purpose of the present specification is to show and describe the best way now known to me of carrying out this portion of the invention.

Referring to the accompanying drawings, which form a part of this specification, Figure 1 is a sectional elevation of such parts of a type-writing machine as are necessary to an understanding of my invention. Fig. 2 is an elevation of a fulcrum-post with cross-section view of a type-bar thereon. Fig. 3 is a similar view taken in a direction at right angles to Fig. 2. Fig. 4 is a face view of part of the guide-plate.

1 may represent any form of impression-surface—as, for example, an ordinary rotating and longitudinally-moving platen—while 2 is a type-bar of the class shown in my aforesaid Letters Patent, and 3 is any part of the stationary frame of the type-writing machine. The fulcra of the bars 2 are in this form of machine arranged with their tops or bearings in a plane with the printing-point, and the bars are horizontal, or nearly so, with their ends bearing the types 4 located adjacent to and either under or above the platen. They are here shown under the platen. While showing my invention applied, as it is by preference, to the plan or style of machine shown in said Letters Patent, in which the type-bar and key are rigidly connected, it will be obvious from the succeeding description and claims that the invention is not necessarily limited to machines of that class. The type ends of the several bars are disposed within a comparatively-small space, and the key ends are arranged and spaced substantially as in the standard keyboard, the bars being of such length and so bent horizontally as to enable this disposition to be made. The exact arrangement of the keyboard and the shape of the several type-bars are not illustrated here, not being substantially different in the present invention from the arrangement and shape illustrated in my aforesaid Letters Patent. The bars are here shown with keys directly upon their forward ends; but it is obvious that the bars may instead be operated by keys through the medium of any usual or preferred connecting devices.

To cause the type ends to move from their normal position to the impression-point through the proper path, a guide plate or comb 5 is provided with guide-slots 6, which, as shown in Fig. 6, are so shaped as to give the type ends while moving toward the platen such lateral motion as may be necessary while the types are approaching the impression-point until they are nearly in contact with the platen. The latter part of the movement is, however, directly vertical to the impression-surface, and exact accuracy of alinement is obtained by a guide 7 adjacent to the platen.

Preferably the guide-grooves of comb 5 are made by forming said comb of a series of flat steel strips or wires *a b c d*, &c., fixed at top and bottom in a frame 19. By laying these strips flat or twisting them more or less, as shown in Fig. 4, the shape of the guide-grooves can be accurately made to accord with the movement necessary for their corresponding type-bars. In said figure the central strip *a* is set in edgewise without twisting. The figure only shows the adjacent strips *b f*, which lie on one side of strip *a*. It will be seen that they are necessarily given more and more twist, so that their forward edges *m* are successively at a greater angle to the vertical; but the rear edge *n* of each is parallel to the forward edge *m* of the next preceding strip, so that between the several pairs of edges *m n* parallel-sided paths 6 of successively-greater divergence from the vertical are provided. Furthermore, in a guide-comb made made up of wires or strips the working edges are smooth and comparatively frictionless. Therefore the comb can be placed farther toward the type and away from the fulcra of the type-bars without unduly increasing the friction. It is advantageous to set the comb as near the type as possible. Any inaccuracies of the comb-slots or looseness of the type-bars therein will be exaggerated at the printing-point in proportion to the nearness of the comb to the fulcra.

Each type-bar has at 8 (see Fig. 2) a seat for the ball or rounded head 9 on one of a series of vertical posts or fulcra 10, which are fastened at 11 to a fixed part of the frame of the machine. Fastened to the individual type-bars (adjacent to their fulcra 10) are a series of saddle-shaped guides 12 of width enough from front to rear to insure their engagement with the sides of the posts 10 in all positions of the type-bars. The posts 10 are tapered, so that the lower edges only of the saddles 12 will bear thereon, thus securing the least possible vibration or rotating movement of the type-bar with the greatest looseness of fit of the saddles on the posts, for it will be apparent that with the point of bearing of the saddle edges on the posts so far below the heads 9 a very considerable looseness between the posts and the lower edges of the saddles will permit but a very slight rotating movement of the type-bars. This is an important element in lessening the cost of the machine without impairing its accuracy of operation. The said lower edges of the saddles are curved, as shown in Fig. 3, in lines substantially concentric with the heads 9, so as to prevent vertical sliding motion between the members 12 and 10 when the type-bar is operated. The lower edges of the saddle embracing the posts can, as shown in Fig. 5, be readily set so as to closely embrace the post, and thus prevent loose motion of the type-bar and also prevent any vibrating or tilting of it on its longitudinal axis.

Attached to each saddle 12 is a finger 13, adapted to operate a universal bar 14, connected with the step-by-step escapement, and a spring 15, connecting the finger 13 with a part of the fixed frame, that returns the type-bar to normal position and holds the seat 8 firmly on the head 9. These parts, however, are only shown for the purpose of illustration and may be varied at will. An inking-ribbon, ink-roller, or other means of inking the type or the impression may be employed.

When an impression is to be made, the key is depressed from the position shown in full lines to that shown in dotted lines and the type-bar turns upon the head 9 both vertically and horizontally into contact with the platen. This motion is permitted by the open saddle 12, which, however, completely prevents any motion of the type-bar around its longitudinal axis and any loose motion of the type-bar upon its fulcrum. The seats 8 are sufficiently deep to insure the retention of the type-bars upon the posts by the springs 15 under all ordinary circumstances. To prevent accidental displacement—as, for example, during shipment of a machine—a bar or plate 16 may be extended over the type-bars in such position as not to interfere with the printing of the bars. To enable the removal of one or more type-bars, it is only necessary to first remove the bar or plate 16 and then detach the spring or springs of the type-bar or type-bars to be taken out.

The tops of the posts may be pointed instead of having rounded heads 9, and the bars may be fulcrumed upon said points, if desired, and in the broader sense of my invention other forms of pivots may be adopted which will have the effect of enabling the bars to have a lateral and vertical motion—that is to say, motion vertical to the impression-surface—without motion around the longitudinal axis of the bars.

In this class of machine the close parallelism of the type-bars may cause in rapid writing the striking of one bar upon the other. To prevent injury to the type, which would result if such blows were taken by the type, I form or provide upon the bars, at 17 or at other suitable point adjacent to the type and either on top of or underneath the bars, or both on top and underneath, a projection or lug which will take the blow and prevent the type-faces from ever coming in contact with the under side of an adjacent type-bar.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. In a type-writing machine, the combination of a platen or impression-surface, a series of type-bars, means for guiding the same to and from the impression-surface and stationary fulcra for said type-bars and means for engaging the type-bars with said fulcra and permitting free rotary and vertical motion thereon but preventing lateral motion of the type-bars at their fulcra, substantially as set forth.

2. In a type-writing machine, the combination of a platen or impression-surface, a series of key-bearing type-bars, means for guiding the same to and from the impression-surface, stationary fulcra for said type-bars and means for engaging the type-bars with said fulcra and permitting free rotary and vertical motion thereon but preventing lateral motion of the type-bars at their fulcra, substantially as set forth.

3. In a type-writing machine, the combination of a series of type-bars, a series of posts or fulcra therefor, and a series of saddle-shaped guides carried by said type-bars and engaging said posts all arranged and adapted to operate, substantially as set forth.

4. In a type-writing machine, the combination of a series of type-bars and a series of posts or fulcra therefor, a series of saddle-shaped guides and a rigid guide-comb all arranged and adapted to operate, substantially as set forth.

5. In a type-writing machine, the combination of a series of type-bars having fulcrum-seats, a series of posts or fulcra having rounded heads engaging in said seats and a series of saddle-shaped guides attached to the type-bars and embracing the said posts, substantially as set forth.

6. In a type-writing machine, the combination of a series of type-bars, a series of tapered fulcrum-posts and a series of saddle-shaped guides affixed to said bars and embracing said posts, substantially as set forth.

7. In a type-writing machine, the combination of a series of type-bars, a series of fulcra therefor, means for preventing rotation of the type-bars on their longitudinal axes or lateral motion on their fulcra, means for guiding the individual type-bars and a guide for the type ends of the several type-bars, substantially as set forth.

8. In a type-writing machine, the combination of a series of fulcra, a series of type-bars loosely supported thereon, springs for retaining the type-bars on their fulcra, and a removable bar, common to all the type-bars, for preventing accidental displacement of said bars, substantially as set forth.

9. In a type-writing machine, the guide-comb consisting of a frame, and a series of strips or wires twisted with successive front and rear edges parallel, substantially as set forth.

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