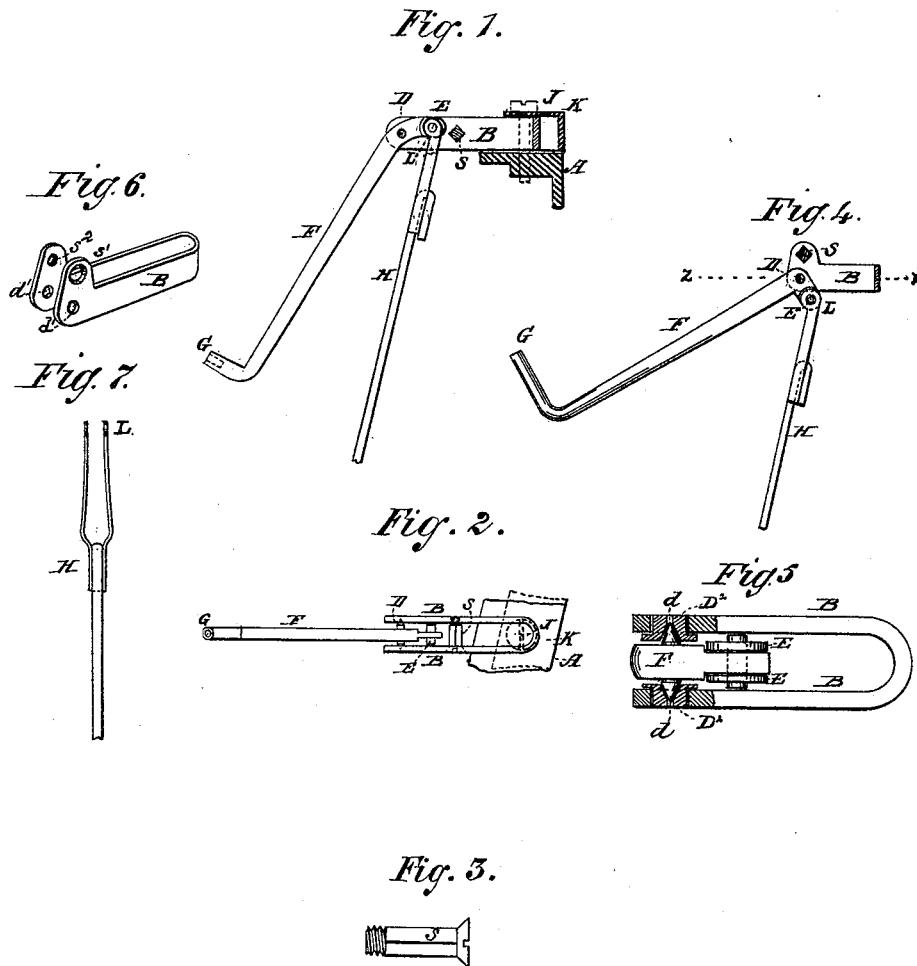


G. W. N. YOST.  
TYPE WRITING MACHINE.

No. 386,100.

Patented July 10, 1888.



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## TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 386,100, dated July 10, 1888.

Application filed August 12, 1879.

*To all whom it may concern:*

Be it known that I, GEORGE W. N. YOST, of the city, county, and State of New York, have invented a new and useful Improvement in Type-Writing Machines, of which the following is a specification.

In a type-writing machine the type bars are free or uncontrolled at one end and carry at the free end a type, and at the other end they connect with a connecting-rod, which in turn connects with a key-lever, the fulcrum being near the connection of the connecting-rod and type-bar. It is essential that the pressure of the operator's finger should readily cause the letter on the free end of the type-bars to strike a sharp blow on the paper, the type moving through a long arc while the operator's finger moves through a short arc. It is likewise essential that after the blow of the type is given and the operator's finger is removed from the key that the weight of the parts should solely by gravity carry them back into the normal position. It is also essential that alignment of the type should be at all times—that is, that the face of the type on the free end of the bar should always strike the paper fairly to give a true impression of the whole type-face.

To obtain the above essentials the journal of the type-bar must be of peculiar construction. The journal itself must also possess certain capabilities not requisite in other classes of mechanism. These are as follows: The friction between the type-bar and the hanger must be under the control of some device whereby the friction can be regulated, for upon this regulation depends the foregoing requirements. It is also essential that the hanger should be adjustable after the hanger is attached to the machine, and that in all cases the adjustment shall not alter, but preserve, the proper alignment of the type-bar. The various essentials are only such in a type-writing machine, no other classes of mechanism having such requirements.

Though various forms of joints between moving parts were known before my invention, a mechanic would not have known which showed even the nearest approximation to the desired structure without long and tedious experiments, for in a type-writer new conditions presented themselves and the old machines

did not involve the difficulties to be met and overcome in a type-writing machine. In the patent granted to C. L. Sholes, No. 207,557, dated August 27, 1878, a type-bar is described having conical bearings which are journaled in hangers having spring-jaws also provided with cone-shaped journals. It was thought that by such a construction a bearing would be obtained which would be even and regular in its action, the spring-jaw taking up the wear of the journals arising from the use of the machine. The spring jaws of the hangers of the Sholes' machine may be properly adjusted before the hangers are screwed upon the machine; but as soon as the hangers are screwed to the top plate of the machine the spring action of the jaws is altered, and the mere putting together of the machine destroys the adjustment. Thus the act of putting in the attaching-screws for the hangers destroys the adjustment previously made.

I am aware of the patent to Millard Loucks, No. 126,220, and the patent of Dixon and Sampson, No. 106,339. In both of these patents is shown a divided or forked connecting-rod or pitman, conical journals, and an adjusting device; but in neither is shown a hanger arranged and adapted to be secured to the stationary part of a type-writer, and a type-bar held in the hanger and arranged to fall by gravity with the requisite speed, and at the same time be responsive to the touch of the operator upon a key, the requisite freedom of action being obtained, while the alignment of the type was at all times assured. In neither of these cases was a hanger used, or was there a bar like a type bar free at one end used, or was there any necessity for preserving alignment, as the necessities of the mechanisms were entirely different.

My invention consists in using a hanger the jaws of which are to be flexible, and I have found that by controlling this action by an adjusting device—such as a screw located between the arms of the hanger and in the neighborhood of the journal—such hangers can have their arms adjusted properly, so as to make the bearing of the type-bar act in the desired way, even before the hangers are screwed to the top plate of the machine, and this adjustment will not be altered by screw-

ing the hanger to the top plate, while at the same time after the machine is put together the journals, after wear takes place, may be adjusted without destroying the alignment of the types and without removing the hangers.

The adjusting means are to be a screw or the like, which can be adjusted by the operator without other tools than a screw-driver or a pin or a wrench.

In the accompanying drawings, in which similar letters of reference indicate like parts, Figure 1 is a vertical elevation of a type-bar and a sectional elevation of a hanger and adjusting-screw. Fig. 2 is a plan of the same. Fig. 3 is an enlarged view of the adjusting-screw. Fig. 4 is a sectional elevation of a type-bar and hanger, showing another form of construction. Fig. 5 is a section, on a large scale, through the hanger on a line, *z z*, Fig. 4, showing the details of the bushings and conical journal-bearings. Fig. 6 is a perspective view of a hanger shown in Fig. 4, with the bearing-steps and adjusting screw removed. Fig. 7 is a front elevation of a connecting-rod, showing the ears by which it is attached to the short end of the type-bar.

In the drawings, A represents the top plate of a type-writing machine, to which is fastened one of my improved hangers, B, by the screw J and washer K. There may be a separate washer for each hanger, or a continuous one extending over a series of hangers. Each hanger is made, preferably, of a strip of metal bent in the shape of the letter U, its sides or forks being parallel.

F is a type-bar having a socket, G, in one end for the reception of the shank of a type, and at its other end a stud, E, to the projecting ends of which, by the ears L, is attached the rod H, which communicates the motion of the key-lever (not shown in the drawings) to the type-bar. A short distance from the stud E is the axis of vibration of the type-bar. At this point a short shaft or journal having conical ends is rigidly fastened in and transversely to the body of the type-bar.

Horizontally in the inner end of each fork of the hanger B is formed a conical journal-bearing of the same taper as the ends of the type-bar journal, in which bearing the type-bar journal is supported. Instead of forming the conical bearings in the body of the forks of the hanger it is preferable to drill a straight hole through both forks after the hanger is made U-shaped, as it is shown at *d' d'* in Fig. 6. These holes are made large enough to receive cylindrical bushings D<sup>2</sup> D<sup>2</sup>, Fig. 5, which fit so closely that when pressed in from the inner sides of the forks they are held in place without any set-screws or similar fastenings.

The head or collar on the inner end of each bushing comes to a bearing on the inner side of the fork, and prevents the body of the bushing projecting beyond the outer side of the fork. The bushings are thus held in the forks of the hanger, and practically made an integral part thereof. Before the bushings are

pressed into position a conical bearing is formed in each of the same taper as the ends of the type-bar journal, and then they are case-hardened or tempered so as to present a hard surface of contact to the type-bar journal. When placed in the hanger, the bearings will be exactly opposite each other and in line.

As near to the type journal-bearings as will permit the requisite motion of the type-bar are corresponding holes in each fork S' S<sup>2</sup>, fitted to receive an intermediate transverse connection, preferably in the form of the adjusting-screw S. This screw may be placed between the type-bar bearings and the point of attachment of the hanger to the top plate, as shown in Figs. 1 and 2; or it may be directly above the type-bar bearings, as shown in Figs. 4 and 6. In its latter position it can be placed nearer the type-bar journal-bearings and can be more readily reached for the purpose of adjustment, as hereinafter described. One of these holes, S', is tapered to receive the conical head of the screw S, which is made like the head of an ordinary wood-screw, and the other, S<sup>2</sup>, has a thread cut in it, forming a nut in which the thread of the screw S fits. The screw S, when inserted and turned by a screw-driver applied to the slot in its head, draws the two forks of the hanger together. As in their normal position the forks of the hanger are spread slightly apart, so as not to bring the bearings in close contact with the type-bar journal, it is always necessary to tighten the screw S to properly support the type-bar journal. As this screw is thus always under tension, it has no tendency to work loose.

The elasticity of the metal of which the hanger is made permits its forks to be sprung apart sufficiently to place the type-bar journal D in the bearings D<sup>2</sup>; or, if rigid forks are desired, a joint may be made in the hanger at the point of union of the two forks. In the former construction, when the type-bar journal has been inserted and the forks resume their normal position, no pressure is exerted upon the type-bar journal, and consequently it has free endwise play. The type-bar journal D, having been placed in its bearings, the tightening of the screw S causes the bearings to come in contact with the ends of the journal, and the type-bar will thus be prevented from any lateral movement, but will be free to vibrate about its axis. As the conical bearings or the ends of the type-bar journal become worn by use, a lost motion will be occasioned and the type-bar will not move accurately in one plane. To obviate this it is only necessary to tighten the screw S, which, as has been shown, causes the forks of the hanger to approach each other and brings the bearings in closer contact with the ends of the type-bar journal. To facilitate this adjustment without the inconvenience of removing each hanger from the top plate, the body of the screw S is made square, so that a forked wrench may be applied to it.

By the improvement herein described the

type-bar is limited to movement in a plane at right angles to the axis of its journal, so that its types will invariably strike at the desired point. Defects in alignment, which constitute

5 a serious objection to this class of type-writing machines, may by this improvement be almost entirely obviated; or, if in the course of time they are occasioned as a result of wear, they may be readily corrected by the use of the adjust-  
10 ing screw. Hangers provided with adjusting-screws, as described, may be placed side by side on the plate of a machine with but little space between them. This is very desirable in the construction of a compact type-writing  
15 machine. The bushings set in the forks of the hanger enable the use of a hanger of a thin horizontal section, and secure long accurately-formed hardened bearings, which retain oil and are unaffected by rust or dirt.

20 What I claim as new, and desire to secure by Letters Patent, is—

1. In a type-writing machine, the combination of a type-bar provided with lateral conical journals, a connecting-rod for actuating  
25 said type-bar, a bifurcated hanger having flexible arms provided with conical bearings for the journals of the type-bar, and an intermediate transverse connection uniting said flexible arms and adapted to adjust and set their free

ends, whereby lateral movement of the jour- 30 nals of the type-bar may be prevented and the alignment of the printing be always preserved, substantially as set forth.

2. In a type-writing machine, the combination of a top plate or support, a type-bar pro- 35 vided with lateral conical journals, a connecting-rod for actuating said type-bar, a bifurcated hanger secured to the top plate or support and having flexible arms provided with conical bearings for the journals of the type-bar, 40 one of said arms having a threaded perforation and the other a countersink perforation, and a transverse countersink-screw engaging said perforations and having its body portion between the arms of the hanger constructed 45 for engagement by a suitable tool to effect its rotation, whereby any projection of the ends of the screw is avoided, (thus enabling the hangers to be set close together,) and whereby any screw of the series employed may be turned to 50 adjust the arms without removing the hanger from its position upon the top plate or support, substantially as set forth.

GEORGE W. N. YOST.

Witnesses:

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