No. 814,144. PATENTED MAR. 6, 1906.

E. G. LATTA.

TYPE WRITING MACHINE.

APPLICATION FILED SEPT. 6, 1902.

Fig. 1.

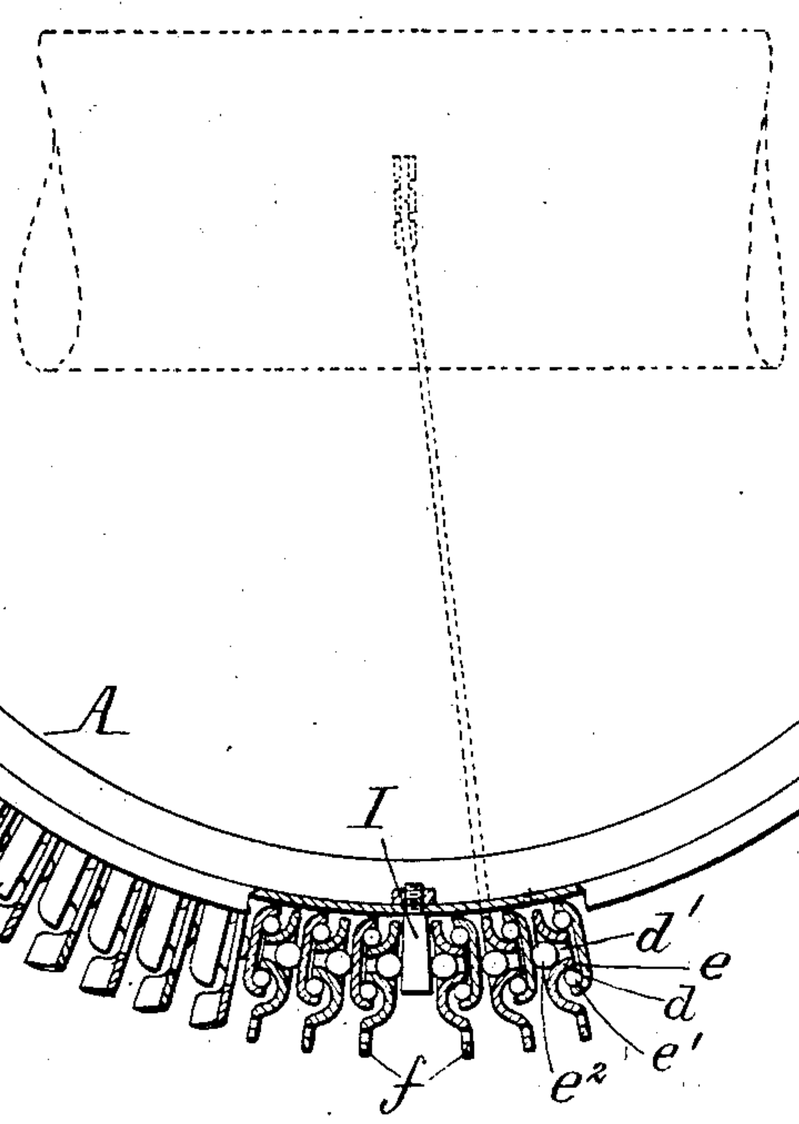


Fig. 3.

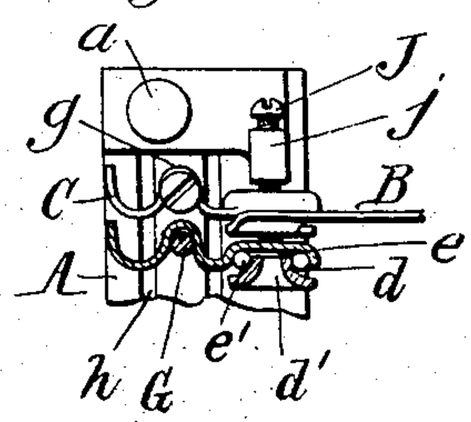


Fig. 4.

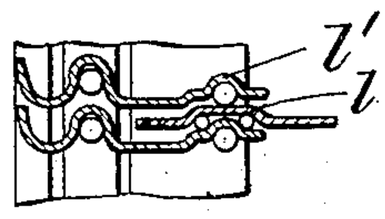


Fig. 2.

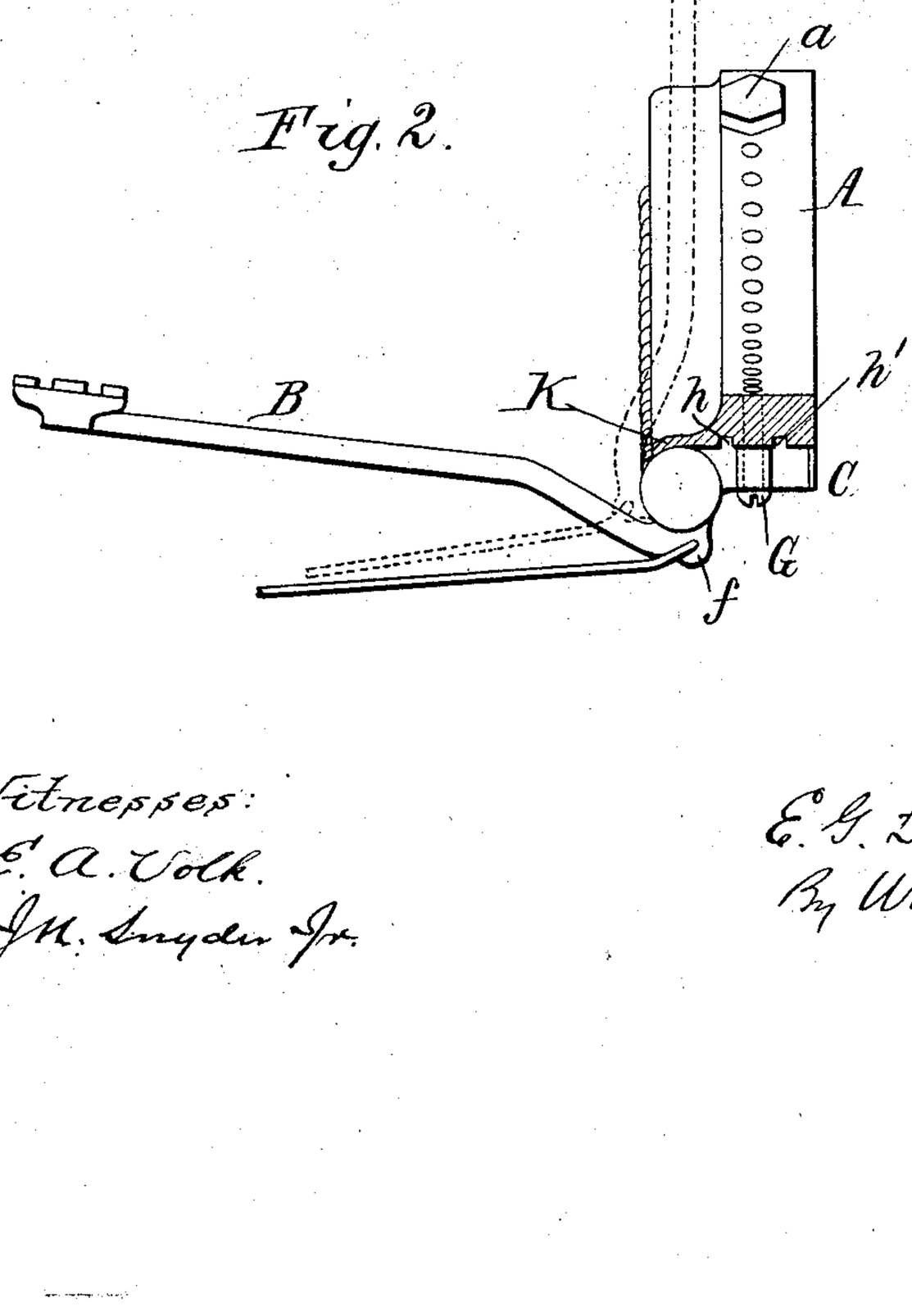
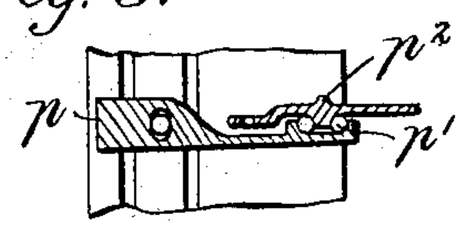


Fig. 5.



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UNITED STATES PATENT OFFICE.

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TYPE-WRITING MACHINE.

No. 814,144. Specification of Letters Patent. Patented March 6, 1906.

Application filed September 6, 1902. Serial No. 122,352.

To all whom it may concern:

Be it known that I, EMMIT G. LATTA, a citizen of the United States, and a resident of Friendship, in the county of Allegany and State of New York, have invented new and useful Improvements in Type-Writing Machines, of which the following is a specification.

This invention relates to improvements in type-writing machines, and more particularly to antifriction-bearings for the type-bars.

One object of the invention is to provide antifriction-bearings of exceedingly simple and compact form which can be produced at the minimum cost.

Another object of the invention is the provision of simple means whereby the bearings can be adjusted individually or in a group and can be individually disconnected from the supporting segment or frame.

A further object of the invention is to so construct the supporting-segment that it will protect the bearings from dust and dirt.

In the accompanying drawings, Figure 1 is a front elevation, partly in section, of a type-bar segment provided with type-bars and bearings embodying the invention, a portion only of the bars and bearings being shown. Fig. 2 is a transverse section through the segment, showing one type-bar and its bearing-hanger in elevation. Fig. 3 is a fragmentary bottom plan view showing two adjacent hangers and one type-bar. Figs. 4 and 5 are sectional views showing modified forms of the type-bars and hangers.

Like letters of reference refer to like parts in the several figures.

In Figs. 1, 2, and 3 of the drawings the parts are shown as arranged for a front-strike machine; but the invention is also applicable to machines in which the printing-point is either above or below the platen. Also any number of the type-bars and bearings may be employed, and they may be arranged in more than one row, and the form of the type-head on the bar may be varied to suit different machines.

A represents the type-bar support or segment, which, as usual, is curved concentric with the printing-point and is secured in any approved manner to the type-writer frame (not shown)—for instance, by bolts *a* at the opposite ends of the segment.

B represents the type-bars, and C the bearing-hangers therefor, which are secured to the outer or under face of the segment. In the form shown in Figs 1 to 3 of the drawings these parts are constructed and arranged as follows: The type-bars are similar, and each is provided at its inner end with a circular bearing enlargement which is provided on one side with a central projection or cone *d* and on the opposite side with a central depression or socket *d'*. Each hanger is provided with a circular bearing-head, which is cupped or provided with a circular cavity *e* on one side. The bearing enlargements on the type-bars are arranged between the hangers with their cones projecting into the cups of the hangers to form annular raceways for circular rows of balls *e'*. e^2 represents a retaining-ball which is confined in the socket in the bearing enlargement of each type-bar and bears against the face of the adjacent hanger-head. The circular row of balls *e'* are held in a plane intersecting the printing-point, and the type end of the type-bar is inclined, so that the type-head swings in the plane of its circular row of balls. The crank portion *f* of the type-bar, to which the operating-link is connected, is also preferably offset to bring it in the plane of the circular row of balls, and thus avoid cross strain on the bearing. The retaining-ball seats itself in the socket in the type-bar enlargement and simply bears at one point on the next hanger-head, which point is in the axis of the bearing. The retaining-ball does not, therefore, appreciably obstruct the free movement of the type-bar. The surface of the head of the hanger on which the retaining-ball for each type-bar bears is preferably parallel with the plane of the circular row of balls for said type-bar to cause the retaining-ball to work on a surface perpendicular to the axis of the bearing. The type-bars and hangers are made from sheet-metal blanks which have the bearing portions pressed or bent to form the cups and cones for the circular row of balls and the socket for the retaining-ball. The hangers are provided with rearwardly-projecting securing-shanks, which are attached to the segment by screws G, which pass through loops *g*, formed on the hanger-shanks. The loops are sufficiently larger than the diameter of the attaching-screws to allow the hangers to be shifted longitudi-

nally on the segment to adjust the bearings and take up wear therein when the screws are loosened without causing the disengagement of the screw-heads from the shanks. In order to prevent the hangers from turning about their securing-screws or moving transversely of the segment, the latter is provided in its outer face with longitudinal grooves *h*, in which engage lugs or projections *h'*, formed on each hanger on opposite sides of the loop. The lugs and grooves prevent the hanger-loops from spreading and add to the rigidity of the attachment, but do not prevent the longitudinal adjustment of the hangers on the segment when the screws are loosened. As shown in Fig. 1, the hangers or bearings on opposite sides of the center of the segment face in opposite directions, so that the two center or innermost type-bars are adjacent to each other or between the two center hangers.

I represents a center stop, which is secured in any suitable manner to or formed on the center of the segment. The stop projects outwardly from the segment between the retaining-balls for the innermost type-bars and serves as the abutment or bearing for said balls. The opposite faces of the stop are preferably parallel with the adjacent rows of bearing-balls, so that the retaining-balls bear on the stop in the axes of the bearings.

The means shown for adjusting or crowding the bearings together consists of two adjusting-screws J, one located at each end of the segment. The adjusting-screws work in screw-threaded holes in brackets or lugs *j*, secured to or formed on the segment, and abut at their inner ends centrally against the circular heads of the outer hangers. In assembling the bearings each hanger, together with its type-bar, circular row of balls, and retaining-ball, is placed on the segment and loosely secured by turning its attaching-screw nearly home. After all of the hangers on one side of the center stop have been thus loosely secured in place the adjusting-screw J on that side of the segment is turned until all of the bearings on that side of the segment are forced into proper adjustment, and then the screws for the several hangers are tightened up to firmly secure the hangers in their adjusted positions. The bearings on the other side of the center stop are similarly assembled and adjusted. If one or more of the bearings wear loose at any time, the attaching-screws for the hangers can be loosened and the wear taken up by the adjusting-screws in the manner described for adjusting the bearings. If preferred, the hanger-screws may be tightened only enough to hold the hangers against looseness on the segment and the adjusting-screws turned to force them along the segment to take up any wear that may take place. In either case the several bearings on one side of the center stop are simultaneously adjusted and the looseness from wear automatically distributed among the hangers. The arrangement is such that the hangers or any one of them can be removed and replaced without disturbing other parts of the machine or the other hangers.

The segment (see Fig. 2) is provided on its front side with a flange K, which overhangs or covers the bearings and prevents dust or dirt from falling into the bearings. The flange is preferably curved downwardly over the upper sides of the bearings, as shown. The type-bars are curved downwardly or suitably cut away at their inner ends to permit them to move to the printing position without striking the cover-flange on the segment.

Instead of providing the center stop and arranging the bearings as described on opposite sides thereof the stop can be omitted and all of the bearings adjusted by forcing them with one adjusting-screw against the other adjusting-screw or other stop or by turning both adjusting-screws to crowd the bearings between them. The center stop, however, is preferable, as it retains the type-bars on each side of it in substantially the same position instead of permitting more bars to be grouped on one side of the stop than on the other, as is liable to be the case after repeated adjustments without the center stop. Moreover, where the adjustment is made from both ends of the segment the movement of individual hangers is only about half as much as it would be if the hangers were all moved one way. Thus the necessary movement for taking up the wear after long usage is afforded with narrower shanks for the hangers and more hangers and type-bars can be mounted on a segment of given length.

Ball-bearing hangers and type-bars have been devised heretofore; but they have been made by machining from forgings or solid stock and were expensive, and the bearings for the several type-bars had to be individually adjusted, or where a common adjusting means has been employed the adjusting device has been passed through central openings in the type-bars and hangers. These openings are objectionable, because they necessitate larger bearings or ball-races.

While the type-bars and hangers formed as above described are deemed preferable at the present time, they may be formed in various other ways to accomplish the desired results. For instance, they may be constructed as shown in Figs. 4 and 5. The form of the invention shown in Fig. 4 is substantially the same as that described except that the ball-cup *l* is formed in the type-bar and the cone *l'* on the hanger. Fig. 5 shows the hanger *p* formed with the cup and the type-bar having on one side a cone entering said cup to form a raceway for the balls *p'*

and on the other side a center retaining pivot or projection p^2 instead of the retaining-ball shown in Fig. 1. Both the hanger and type-bar shown in this form are made from forgings or solid stock.

In all of the forms shown the center retaining bearing or device for transmitting the pressure from one hanger to the next is provided and there is no adjusting means passing through the bearings. From the different forms of the invention shown it is obvious that the manner of mounting and adjusting the hangers and type-bars is applicable to type-bars and hangers whether either or both are made of forgings or from sheet metal and that the forms of the bearing portions of the hangers and type-bars may be widely varied and still be within the scope of this invention.

I claim as my invention—

1. A series of vibrating type-bars and supporting-hangers therefor arranged in pairs, a row of balls inclosed between the type-bar and hanger of each pair, and a lateral connection in the axial line about which the type-bar swings between the type-bar supported by one hanger and the hanger that supports its neighboring type-bar, substantially as set forth.

2. A series of vibrating type-bars, and intermediate supporting-hangers, an interposed circular row of balls acting to pivotally connect each bar and one hanger, and a pointed lateral extension arranged in the exact axial line and having an end bearing between the type-bar supported on one hanger, and the hanger for the next adjoining type-bar of the series, substantially as set forth.

3. A sheet-metal type-bar having a printing character at one end, a circular seat or race for bearing-balls on one side of the other end, and a seat for a single ball opposite the center of the ball-race, substantially as set forth.

4. A sheet-metal type-bar hanger formed of a single strip of sheet metal having a central reverse curve forming an offset loop for a retaining-screw, substantially as set forth.

5. The combination of a support, type-bar hangers laterally adjustable on said support, a vibrating type-bar, a row of bearing-balls interposed between said type-bar and one hanger, and an independent center bearing on the axial line by which the lateral movement of one hanger is limited by the adjoining hanger, substantially as set forth.

6. The combination of a support, type-bar hangers laterally adjustable on said support, a vibrating type-bar, a row of bearing-balls interposed between said type-bar and one hanger, an independent center bearing on the axial line by which the lateral movement of one hanger is limited by the adjoining hanger, and means acting on the axial line of said hangers for adjusting the same laterally, substantially as set forth.

7. A type-bar, and hanger therefor, consisting of two parts of sheet metal, each of uniform thickness provided with depressed cups forming opposable bearing-surfaces for an interposed circular row of balls, substantially as set forth.

8. The combination of a series of vibrating type-bars, and hangers therefor arranged side by side and having opposable ball-bearing faces, a row of balls interposed between the bearing-faces of each type-bar and its hanger and working thereon, a supporting-segment for the hangers arranged wholly outside of the circular ball-seats, and a rocking contact-point between each type-bar and the hanger that supports the adjacent type-bar, substantially as set forth.

9. A group of type-bars and hangers having circular parts and arranged with a type-bar beside each hanger, and a circular row of balls between each type-bar and its hanger, each type-bar having a rocking connection with the adjacent hanger inside of the row of balls on the axial line, substantially as set forth.

10. The combination of a support, a series of vibrating type-bars, and laterally-movable hangers arranged side by side, opposable bearing-surfaces for a circular row of balls between each bar and one hanger, balls between said bearing-surfaces, and independent means for transmitting the lateral movement of one hanger along the axial line to the bar supported by the next hanger, substantially as set forth.

11. The combination of a support, a series of vibrating type-bars, a series of hangers laterally movable on said support and arranged side by side, a circular row of balls arranged in a plane between each type-bar and its hanger, and a contact-bearing between each bar and the next adjoining hanger, the said contact-bearing being on the axial line of the circular row of balls, and at the exact center thereof, substantially as set forth.

12. The combination of a support, a series of laterally-movable hangers, vibrating type-bars supported thereby, a series of center connections and contact-points limiting the lateral movement of the hangers, and attaching devices for said hangers whereby either of the hangers may be detached without disturbing the other hangers, substantially as set forth.

13. The combination with a segment, and group of laterally-movable type-bar hangers thereon, of a fixed stop arranged on the segment between the hangers to limit their movement, substantially as set forth.

14. The combination with a segment, and group of laterally-adjustable type-bars and hangers therefor, of a fixed stop arranged between the hangers on the segment, and an adjusting-screw acting to force the hangers toward the stop, substantially as set forth.

15. The combination with a segment, a series of type-bar hangers supported thereby, and vibrating type-bars, of contact-points arranged exactly on the axial line of the type-bars between the several hangers and adjacent bars, and means for forcing the several bars and hangers into contact, substantially as set forth.

16. The combination of a segment, a series of laterally-movable type-bar hangers supported thereby, a vibrating type-bar supported by each hanger and an interposed row of balls, and a central retaining-ball between each hanger and the bar supported by the next hanger of the series, substantially as set forth.

17. In a type-writing machine, the combination of a pivoted type-bar, and a dust-shield convexed transversely whereby the shield partially incloses and prevents the admission of dust to the pivot-bearing for the type-bar, said type-bar being formed to receive the dust-shield when the bar is in the printing position so that the dust-shield does not interfere with the swinging movement of the bar, substantially as set forth.

18. In a type-writing machine, the combination of a type-bar segment, and a series of type-bars having circular bearing ends projecting from the bars and pivoted on the under side of said segment, said segment having an integral flange which projects directly over and is curved downwardly and partially incloses said circular ends of the type-bars, substantially as set forth.

Witness my hand this 26th day of August, 1902.

EMMIT G. LATTA.

Witnesses:
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