A. T. BROWN.

TYPE WRITING MACHINE.

APPLICATION FILED OCT. 3, 1903.

1,082,262.

Patented Dec. 23, 1913.

FIG. 1.

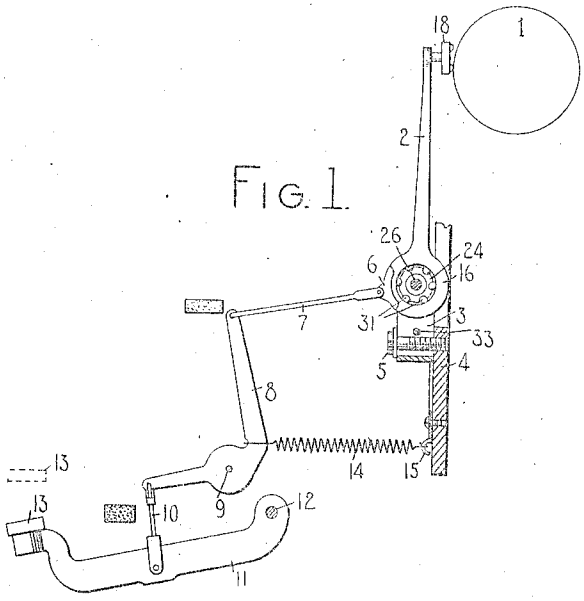


FIG. 2.

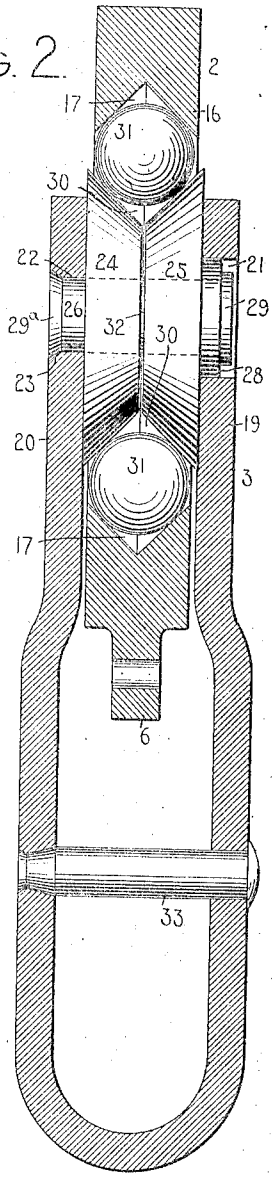


FIG. 3.

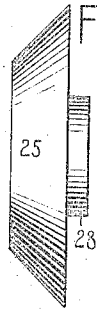
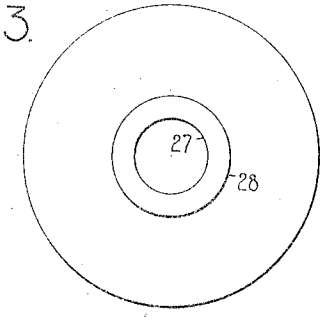


FIG. 4.



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TYPE-WRITING MACHINE.

1,082,262. Specification of Letters Patent. Patented Dec. 23, 1913.

Application filed October 3, 1903. Serial No. 175,575.

To all whom it may concern:

Be it known that I, ALEXANDER T. BROWN, a citizen of the United States, and resident of Syracuse, in the county of Onondaga and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

This invention relates to type bars and hangers for writing machines, and the main object thereof is to provide a simple and efficient ball bearing construction for the type bar and one in which the bearing may be readily adjusted in the first instance in the assembling of the parts and subsequently when wear occurs.

A further object is to provide a relatively thin ball bearing type bar construction so that a comparatively large number of type bars and hangers may be assembled within a small space, thus adapting the construction to a "front strike" or "visible" writing machine, wherein a full set of type bars must be gotten into less than half a circle.

To these and other ends which will hereinafter appear my invention consists in the various combinations of devices, features of construction and arrangements of parts, all as will be hereinafter more fully described and particularly pointed out in the appended claims.

In the accompanying drawings:—Figure 1 is a side sectional elevation of a type bar mechanism embodying my invention and also showing in end view the platen of a writing machine; Fig. 2 is an enlarged central section of a type bar and hanger embodying my improved ball bearing construction; Fig. 3 is a side elevation of one of the bearing cones; and Fig. 4 is a face view of one side thereof.

In the various views the same part will be found designated by the same numeral of reference.

1 designates the platen, 2 the type bar and 3 the type bar hanger, which is secured to a segment or support 4 by means of a binding screw 5. To a lug 6 on the type bar is pivotally connected one end of a rod 7 whose opposite end is pivoted to a bell crank lever 8, which is pivoted at 9 to a suitable portion of the framework. Another link 10 is pivotally connected at its upper end to the opposite end of said bell crank 8 and at its lower end to a key lever 11, fulcrumed at 12 to the framework and provided at its forward end with the usual key or button 13. A coiled spring 14 may be hooked at one end upon a plate 15 and at its opposite end upon the bell crank lever so as to return all of the parts to normal position after actuation.

The type bar 2 comprises the usual shank and also an eye 16 formed or provided interiorly with a ball bearing groove or circular ball chamber 17 which may be V-shaped or rounded in cross section. At the free end of the type bar may be provided a socket to receive the stem of a type block 18 which may be provided with one or more types, two being shown.

The type bar hanger preferably comprises a U-shaped plate-like device having parallel arms or jaws 19 and 20. The jaw 19 is formed or provided transversely with a cylindrical hole 21 and the jaw 20 with a like hole 22 but having an outwardly flaring seat 23 at its outer side or portion.

Between the jaws of the hanger are arranged two rings, cones, plates or tapering bearings 24 and 25, and these cones, rings or plates are supported upon a cross pin or rivet 26, which passes transversely through perforations 27 in said cones and enters the holes 21 and 22 in the arms of the hanger. The cone 24 is plain while the cone 25 is provided with a circular boss or bearing 28 on its outer side surrounding the perforation 27. The outer diameter of this boss or bearing is of a size to fit the cylindrical hole 21 in the arm or jaw 19 of the hanger.

The cross pin or rivet 26 is riveted or headed at one end as at 29, and the inner side of the same bears against the outer face of the boss 28, but preferably said head does not fit the outermost portion of the hole 21 in the hanger jaw, being purposely made of less diameter than the same. The opposite end of the cross pin fits the cylindrical hole 22 in the hanger arm 20, and when in position its beveled extremity 29^a fits or seats in the flaring or tapering recess 23 of said hole, as shown clearly in Fig. 2. Where the cross-pin passes through the perforations in the cone or plate it is cylindrical. The cones are so placed upon the cross-pin that they form together a V or analogous bearing 30 opposite to and corresponding with the bearing 17 in the type bar. Between these bearings or raceways thus formed is a set of circularly arranged anti-friction balls 31 which travel upon the bear-

ing 30 formed by the adjacent and oppositely disposed cones. The type bar is supported upon this set of balls and travels therewith and thereon when by the key actuated mechanism it is swung to the printing point and when it is returned to normal position.

In assembling the parts initially the cones 24 and 25 are kept slightly separated by the balls 31, as indicated by the space 32 between said cones in Fig. 2, and in consequence the cones may be subsequently adjusted one relatively to the other in parallel planes when wear takes place in the balls or in the bearings and it becomes necessary to take up the shake or lost motion in the joint or bearing.

When the parts are assembled the cone or disk 25 having the boss 28 is capable of a slight movement on the pin or rivet 26 toward the opposite cone or disk 24, so as to enable the bearing to be properly adjusted in the first instance. The projection of the boss 28 into the hole or bearing 21 in the side arm 19 of the hanger enables this adjustment to be made without losing the support of said disk within said arm and when the pin or rivet is inserted said boss forms a support for this end of the pin or rivet. Since the boss 28 fits snugly within the hole 21 in the hanger arm and the rivet end passes through said boss, said end is thereby as firmly supported as the opposite end of the rivet and hence neither the rivet nor the cones or plates can work longitudinally of the hanger or get out of true position. The cone or plate 25 is adjusted to a position relatively to the anti-friction balls and the bearing in the type bar by riveting or upsetting the end 29 of the pin 26 against the outer face of the boss 28, the cone or plate being moved thereby bodily along the pin toward the opposite cone 24 until the required adjustment of the cone 25 against the balls has been effected. When wear occurs from usage this adjustable plate or cone 25 may be caused to take up such wear by a further tapping of the head 29 of the rivet.

From the foregoing and from the drawings, it will be seen that my construction embodies an anti-friction bearing for type bars in which the bar is pivotally mounted and wholly supported on anti-friction balls to swing entirely free from contact with the hanger; that the plane of movement of each type bar is in the median plane of the annular ball race provided by cones, disks or plates, and is in the median plane of the set of circularly arranged set of balls and thus avoids all "cranking" action of the bar on its hanger, and that a side wall of said ball race is adjustable to different planes parallel to the plane of the ball race to afford a uniform contact with all of the balls under all adjustments. It will also be seen that the oppositely beveled cones supported in the bifurcated hanger form an exteriorly grooved hub which is arranged within the eye of the type bar and that the adjustable cone or plate is separate from the body of both the type bar and the hanger; also that the pin or rivet supports the hub upon the hanger and that the adjustable plate or cone is arranged between the arms of the bifurcated hanger and is adjustable independently thereof; and also that one end of the central pin 26 is riveted to the hanger arm 20 and the other end of said pin is riveted at 29 upon or against the boss 28 of the cone 25, said boss fitting snugly in the hole 21 formed in the other arm 19 of the hanger, whereby the disks are firmly supported and are enabled to be maintained in parallelism with each other and with the parallel jaws of the hanger. The arms of the hanger are preferably secured together by a tie rod or rivet 33.

As well understood in this art, the reverse of this construction may be made; that is to say, the part 2 may be made as or regarded as a hanger and the part 3 may be made as or regarded as a type bar, without departing from the spirit of my invention, and in the following claims I desire to cover this equivalent construction.

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

1. The combination of a type bar hanger, a type-bar, one of said type bar and type bar hanger members having an interiorly grooved eye and the other of said members being cleft or bifurcated and embracing said eye, an exteriorly grooved hub within said eye, and a series of bearing balls in the race formed by said grooves, one wall of said race being formed by an adjustable plate separate from the body of either of said members.

2. The combination of a type bar hanger, a type-bar, one of said type bar and type bar hanger members having an eye, said eye being in the median plane of the type bar, a hub within said eye, a support for securing said hub upon the other of said members, a ball-race intermediate said eye and hub, and anti-friction balls in said race, one wall of said ball race being formed by a separable plate adjustably mounted on one of said parts against the balls for holding said balls within said race and for compensating for any wear or undue looseness that may take place between the balls and the bearings therefor.

3. The combination of a type-bar hanger, a type-bar, one of said type bar and hanger members having an eye and the other of said members being cleft or bifurcated to embrace said eye, a hub arranged within said eye, a ball-race and balls intermediate said

eye and hub, and a pin or support extending between the arms of said cleft or bifurcated member and uniting said arms to said hub, a wall of said ball-race being formed by an adjustable plate, said plate being arranged between the arms of the bifurcated member.

4. The combination of a type-bar provided at its inner end with a ball chamber, balls within said chamber, bearing plates having peripheral surfaces to engage said balls, a type bar hanger having arms between which said bearing plates and said type bars are mounted, and a pin extending through the arms of said hanger and through said bearing plates.

5. The combination with a bifurcated hanger, of a type bar provided at its inner end with an eye or circular ball chamber, balls within said chamber, bearing plates for retaining said balls within the chamber, a supporting member which extends between the arm of the hanger and means for relatively adjusting said bearing plates in parallel planes along said supporting member.

6. The combination with a bifurcated hanger, of a type bar provided with a circular ball chamber, balls within said chamber, adjustable plates for said balls, a pin or stud passing transversely through said plates and one of said plates being adapted to be adjusted toward the other.

7. The combination with a type bar provided at its inner end with a ball chamber, balls within said chamber, relatively adjustable bearing plates having peripheral surfaces to engage said balls, a type bar hanger having arms between which said bearing plates and said type bar are mounted, and a pin extending through the arms of said hanger and through said bearing plates.

8. The combination with a hanger or support provided with arms, of a type bar having at its pivotal end a ball-race, anti-friction balls, a plate separate from said hanger arms for retaining said balls within said race, means extending between the hanger arms for supporting said plate and said type bar between said arms, and means for affording an adjustment of said plate along said supporting means.

9. The combination with a hanger or support provided with arms, of a type bar having at its pivotal end an interior ball race, anti-friction balls, relatively adjustable plates separate from said hanger arms for retaining said balls in position, and means for supporting said plates and type bar between said arms, said means extending from one hanger arm to the other.

10. The combination with a hanger or support provided with arms, of a type bar having at its pivotal end a ball-race, anti-friction balls, a plate for holding said balls in position within said race, and a pin whereon said plate is adjustably mounted.

11. The combination with a one-piece type bar hanger having a pair of integral arms, of a type bar journaled between said arms and having a ball bearing chamber, a supporting device extending between the hanger arms, bearing plates separate from but interposed between said hanger arms, means for affording a relative adjustment of said bearing plates in parallel planes along said supporting device, and anti-friction balls located in said ball chamber between said bearing plates.

12. The combination of a type bar provided with an annular ball-race, anti-friction balls, a plate adjustable against the balls for retaining said balls within said race and for compensating for any wear or undue looseness that may take place between the balls and the bearings therefor, a hanger, and a pin passing through said adjustable plate for supporting said type bar upon said hanger.

13. The combination of a bifurcated hanger, the opposing jaws of which are perforated, bearing plates arranged between the jaws of said hanger and one of said plates having a boss fitted within the perforation in one of said jaws and adjustable transversely of the hanger, a cross-pin passing through said plates and supported at one end in one of the jaws of the hanger and at its other end in the said boss, a type bar having an interior annular ball bearing opposing that formed by the said bearing plates, and an intermediate set of anti-friction balls.

Signed at Syracuse, in the county of Onondaga and State of New York, this 29th day of September A. D. 1903.

ALEXANDER T. BROWN.

Witnesses:

CHAS. S. CLARK,

T. A. KIDD.