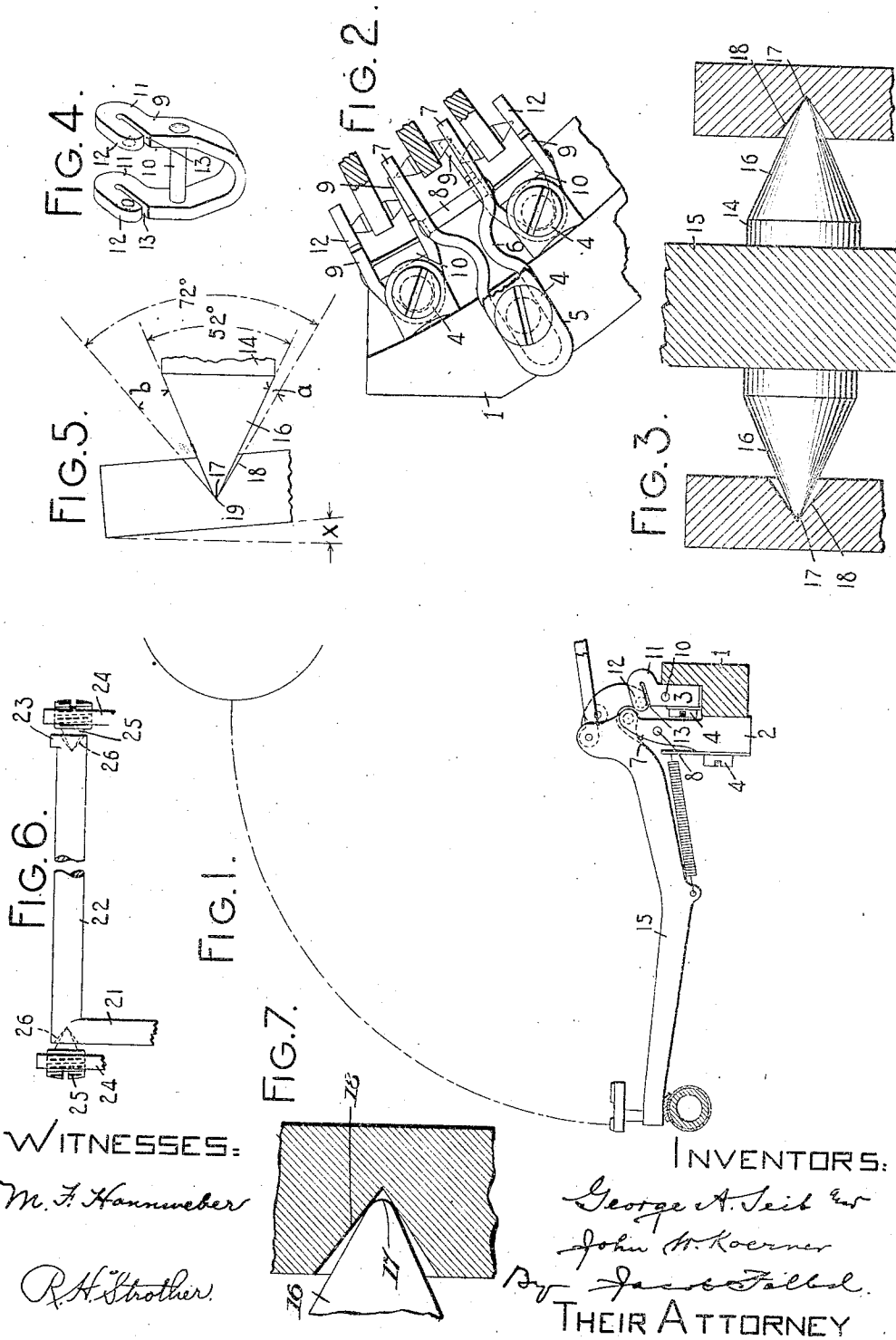


978,944.

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UNITED STATES PATENT OFFICE.

GEORGE A. SEIB AND JOHN W. KOERNER, OF SYRACUSE, NEW YORK, ASSIGNORS TO
THE MONARCH TYPEWRITER COMPANY, OF SYRACUSE, NEW YORK, A CORPORATION OF NEW YORK.

TYPE-WRITING MACHINE.

978,944.

Specification of Letters Patent.

Patented Dec. 20, 1910.

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To all whom it may concern:

Be it known that we, GEORGE A. SEIB and JOHN W. KOERNER, citizens of the United States, and residents 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.

Our invention relates to type bar pivots and bearings and our main objects are to produce a tight but freely operating pivotal joint for the type bar; to provide a construction in which the pivots and bearings are held in proper working engagement under tension; to provide a self adjusting bearing, or one in which the wear is automatically compensated for; to provide a construction by which the type bar is enabled to take a true seat in its bearing even though the hanger be distorted or twisted out of true position; and also to provide a construction of pivot and bearing by which the parts may be readily oiled and by which there is provided at the pivotal point an oil cup or receptacle.

To these and other ends our invention consists in the features of construction and combinations of parts hereinafter more fully described and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a side sectional view of type bars and hangers embodying our improvements, the view also showing a type bar segment, type bar rest, platen and other parts of a typewriting machine; and particularly of the Monarch typewriting machine. Fig. 2 is a front elevation looking at the left hand upper end of the type bar segment and showing three type bar hangers and type bars, the latter being in section, and the type bars and hangers embodying our improvements. Fig. 3 is an enlarged front sectional view of a type bar, its lateral pivots and fragments of the arms of a type bar hanger. Fig. 4 is a perspective view of one of the shorter type bar hangers. Fig. 5 is a diagrammatic view of one of the hanger arms and one end of a type bar pivot. Fig. 6 is a fragmentary view of the pivotal end of a type bar of a different style. Fig. 7 is a fragmentary view in section through the axis of one of the pivotal bearings, and on an enlarged scale.

In the various views the same parts will

be found designated by the same numerals of reference.

1 designates the type bar segment of the construction embodied in the Monarch machine, 2 the longer type bar hangers and 3 the shorter type bar hangers, the hangers being secured to the segment by screws 4. The hangers 2 are similar to the longer hangers used in the Monarch machine, but the hangers 3 are differently constructed, as will presently be explained. The hangers 2 are preferably formed from a strip of sheet steel folded so as to provide the double shank portion 5, contracted neck 6 and parallel arms 7, 7'. These arms are provided with a rivet 8 headed at each end and preferably countersunk, or partially so, within depressions in the outer sides of the hanger arms. The shorter hangers 3 are also preferably made from a strip of steel and bent into general U form so as to provide parallel arms 9. Rivets 10 similar to the rivets 8 connect the arms 9. The hanger arms 9 terminate at their free ends in what we call goose necks, each of which comprises a rearwardly extending portion 11 and a forwardly extending portion 12. These portions are produced by forming the arms 9 with enlargements and slotting or cutting through the middle at 13. The purpose and effect of this construction is to provide at the bearing ends of the hanger arms, long, narrow sections having resilient properties.

The type bar pivots and the bearings for the pivots are made alike for both styles of hangers. Preferably the pivots 14 are inserted in the type bars 15, and preferably also these pivots are made of a single piece of steel passed through and secured in an opening in the type bar, so that there are projecting portions on each side of the type bar. These projecting portions are made tapering or conical, as shown at 16. The points or extremities of these tapering portions on each side of the type bar are dulled or rounded, as at 17, for a purpose which will presently appear.

The bearings for the pivots or pivotal portions 16 are formed in the hanger arms 7 of the long hangers and in the overhanging portions 12 formed integral with the hanger arms 9 of the shorter hangers. These bearings 18 are produced on or in the inner sides or faces of the hanger arms and directly opposite each other in each hanger. The said

bearings are in the nature of conical or tapering depressions circular in cross section and running to a sharp point in the body of the metal, but terminating therein without reaching to the outside of the stock. The taper of the pivot is greater, sharper or more acute than that of the bearing so that the pivots do not fit the bearings for the length of the bearings, but on the contrary only the points or rounded extremities of the pivots take bearings or seats near the bottoms of the circular depressions, as will appear more clearly by reference to Fig. 5. In this view it will also be observed that by reason of the bearing being tapered to a sharp point, while the pivot terminates in a rounded point, the pivot does not bear against the bottom of the depression, but bears against the tapering sides of said depression, and there is a small space remaining between the bottom of the bearing and the end of the pivot, which space is utilized as an oil, vaselene or other lubricant receptacle 19. By constructing the parts in this way danger of breaking the point of the pivot is obviated. If the point of the pivot were sharp and bottomed in the point of the depression it would be liable to break.

In practice we prefer to so form the depressions in the hanger arms as that the bearings have considerable more divergence than the pivots, and in carrying out our invention we have provided for a difference of 20° in divergence between these two members. As shown in the drawings, the bearing depressions in the hangers and the tapering ends of the pivots have the form of cones, and each of said depressions has between two opposite elements of the cone an angle of about 72° , whereas the opposing elements of the pivot are formed on an angle of about 52° , as indicated at Fig. 5. We prefer to make the rounded ends of the pivots in the manner shown in the drawings; that is to say, with the curved or spherical surface at the extreme end of the pivot constituting a smooth continuation of the conical surface. When the hanger arms are in parallelism and the pivots are at right angles to the hanger arms there would then be a space of 10° on each side of the pivot between it and the adjacent wall of the hanger.

At Fig. 3 it will be observed that the pivot is arranged centrally to the bearing or depression, and while this is the proper relation that the pivot should have to the bearings in the hanger, nevertheless if this true relationship should be disturbed either in the manufacturing, assembling or alining, any slight deflection at the bearing faces of the hanger will not be detrimental to the action of the type bar.

Fig. 5 shows a pivot connecting with the bearing faces of a hanger wall that has been twisted a distance equal to x . This distur-

tion will not diminish the tension at the bearing faces and will not throw the type bar out of its true path. The effect of the twist is to diminish the space a and proportionately increase the space b , but the point of the pivot still maintains a proper seat and is operative and the type will not be thrown out of alinement. This is the main object of providing the clearance of 10° all the way around the conical faces of the pivot.

The type bars are preferably inserted in the hangers by springing apart slightly the hanger arms so that the pivots on each side of the type bars may enter the depressions in the arms. The rivets are then set so as to produce the required tension in the arms and a tension that will permit the bar to drop freely of its own weight. When the parts are thus assembled the free ends of the hanger arms will have a tension toward each other and endwise of the type bar pivots and will press against the rounded ends of the pivots on opposite sides of the bar, and this tension is sufficient to enable the hanger arms to take up automatically any wear that may occur between the ends of the pivots and their seats or bearings. In the long hangers 2 the hanger arms are of sufficient length to provide the requisite elasticity without special or unusual construction, though it has been found desirable to have a slight separation between the inwardly bent sections constituting the neck portion 6 of the hanger. Inasmuch as the ordinary short hanger does not possess the desired amount of resiliency we have devised the special construction of short hanger heretofore described, and which by reason of its looping back or goose neck form gives, in effect, hanger arms of greater length, though the distance measured directly between the pivot point and the rivet is the same as in the ordinary short hanger. Still, so far as one feature of our invention is concerned, the short hangers may be otherwise made, as for example, the arms may be thinner or more elastic beyond the rivet point without embodying the goose neck construction, and as far as the long hangers are concerned they may be otherwise constructed also, it being immaterial, broadly considered, how the desired resiliency or tension is obtained. Of course it will be understood that in some styles of machines it may be unnecessary to have more than one form of hanger and that of uniform size.

The bearing surfaces are hardened to increase their durability. It will be noted that the pivots of the type bars contact with the bearings 18 only at or near the extreme ends of said pivots at which points said pivots are of very small diameter. It results from this construction that the contacting surfaces are very close to the axis of rotation of the

type bar and that when the type bar is operated the motion of the pivot at its bearing points is very slight and the wear is thus reduced to a minimum.

5 The principle of our type bar bearing is applicable to those constructions in which the pointed pivot is mounted on the hanger arm and the co-acting bearing depression is in the type bar. Such a construction is shown in Fig. 6 which represents the pivot end of a type bar such as is used in the Smith Premier machine, for example. In said figure, 21 represents the type bearing arm of the type bar; 22, the axle of said type bar; 23, the actuating arm that is connected by a link with the key lever; and 24, the hanger arms. Pivot points 25 are threaded through the hanger arms and engage bearing depressions 26 in the ends of the axle 22. The pivot points 25 and the bearing depressions 26 are tapered as in the other form of our invention, and as before the taper of the points 25 is greater or sharper than that of the depressions 26 and the extreme end of each of the pivot points 25 is slightly rounded as before. The hanger arms 24 are so constructed as to afford the necessary resilience. The pivot points 25 may be adjusted toward and from each other and it is contemplated that this adjustment shall be such as to place the hanger arms under suitable tension toward each other.

Various other changes may be made in the details of construction and arrangement without departing from our invention.

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

1. In a typewriting machine, the combination of a type bar, a pivotal support therefor having a fixed pivotal axis, the pivot bearing comprising a tapered pivot and a tapered depression against the tapered sides of which said tapered pivot bears and only close to said pivotal axis, the taper of said pivot being sharper than the taper of said depression and the point of the pivot terminating short of the bottom of the tapered depression; and resilient means for pressing said pivot and depression together lengthwise of said axis.

2. In a typewriting machine, the combination of a type bar, a pivotal support therefor having a fixed pivotal axis, the pivot bearing comprising a conical pivot having a small rounded end the rounded surface of which is a smooth continuation of the conical surface, and a tapered depression against the tapering sides of which the rounded end of said conical pivot bears, the taper of said pivot being sharper than the taper of said depression; and resilient means for pressing said pivot and depression together lengthwise of said axis.

3. In a typewriting machine, the combination of a type bar, a pivotal support therefor

having a fixed pivotal axis, the pivotal support comprising a tapered pivot having a small rounded end and a tapered depression against the tapering sides of which said rounded end bears, the taper of said pivot being sharper than the taper of said depression; and resilient means for pressing said pivot and depression together lengthwise of said axis.

4. In a typewriting machine, the combination of a type bar bearing comprising a tapered pivot having its end rounded, and a tapered depression against the tapering sides of which the rounded end of said tapered pivot bears, the taper of said pivot being sharper than the taper of said depression; and resilient means for pressing said tapered pivot and said tapered bearing depression together endwise.

5. In a typewriting machine, the combination of a resilient hanger arm, a type bar, and a pivotal connection between said hanger arm and type bar, said pivotal connection comprising a tapered pivot having a rounded end, and a tapered depression against the tapering sides of which the rounded end of said tapered pivot bears, the taper of said pivot being sharper than the taper of said depression and said resilient hanger arm being under tension to press said tapered pivot and said bearing depression together endwise.

6. In a typewriting machine, the combination of a type bar, a pair of resilient hanger arms, and a pivotal connection between said type bar and said hanger arms comprising tapered pivots and tapered bearings, the taper of each of said pivots being sharper than the taper of the bearing, the end of each pivot engaging the tapering sides only of its bearing, the point of each pivot terminating short of the bottom of the tapered depression, and said resilient hanger arms being under tension to press said tapered pivots and said bearings together endwise.

7. In a typewriting machine, the combination of a pair of resilient hanger arms, a type bar mounted between said hanger arms, and a pivotal connection between said type bar and said hanger arms comprising tapered pivots on said type bar and tapered bearing depressions in said hanger arms, the taper of each of said pivots being sharper than that of the co-acting depression, the end of each pivot engaging the tapering sides only of its bearing, the point of each pivot terminating short of the bottom of the tapered depression, and said resilient hanger arms being under tension toward each other.

8. In a typewriting machine, the combination of a type bar, a two-armed hanger for said type bar, and a pivotal connection between said type bar and hanger comprising a tapered pivot on each side of said type bar and a tapered bearing depression in each of

- the arms of said hanger, the taper of each of said pivots being sharper than the taper of the depression, the point of each pivot terminating short of the bottom of the tapered depression, and said pivot bearing against the tapering sides only of said depression, and means joining the arms of said hanger for putting said hanger arms under tension toward each other.
- 10 9. In a typewriting machine, a type bar hanger arm made in goose-neck form to increase the resilience of said hanger arm.
- 15 10. In a typewriting machine, the combination of a type bar, a hanger arm made in goose-neck form to increase its resilience, and means for putting said hanger arm under tension.
- 20 11. In a typewriting machine, a U-shaped hanger having its arms made in goose-neck form for the purpose set forth.
- 25 12. In a typewriting machine, the combination with a type bar and its pivot, of a U-shaped hanger in the arms of which said pivot bears, and means for placing said hanger arms under tension, said hanger arms being of goose-neck form to increase their resilience.
- 30 13. In a typewriting machine, the combination with a type bar and its pivot, of a U-shaped hanger in the arms of which said pivot bears, and means for placing said

hanger arms under tension toward each other, each of said hanger arms having a cut-out 13, for the purpose set forth.

14. In a typewriting machine, the combination with a type bar and its pivot, of a U-shaped hanger having a connecting device, as a rivet, between the arms thereof and having said type bar pivot bearing in said arms, said arms being cut or split between said connecting device and said pivot so that the actual length of each of said arms beyond said connecting device is materially greater than the direct distance from said connecting device to the end of said arm, for the purpose set forth.

15. In a typewriting machine, the combination of resilient hanger arms having circular tapering depressions, and a type bar having pivots which bear only near their ends and against the sides only of said depressions, and each pivot terminating short of the bottom of the tapered depression.

Signed at Syracuse, in the county of Onondaga and State of New York, this 11th day of June A. D. 1907.

GEORGE A. SEIB.
JOHN W. KOERNER.

Witnesses:

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JOHN H. HAMEL.