Dec. 18, 1923. 1,478,123

S. N. HURT

PIVOT BEARING

Filed Dec. 10, 1919

Fig. 1.

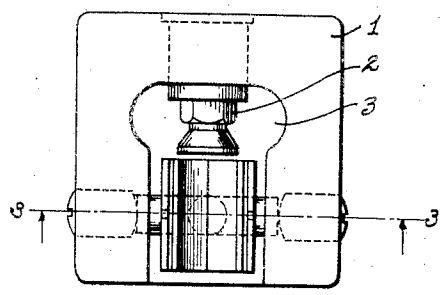


Fig. 4.

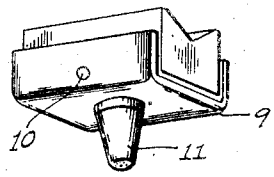


Fig. 2.

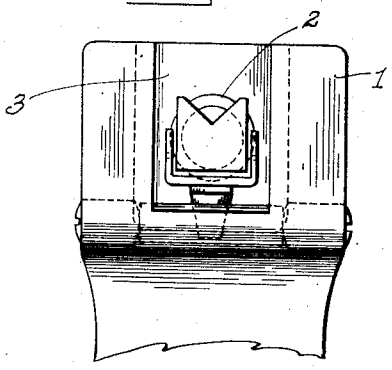


Fig. 3.

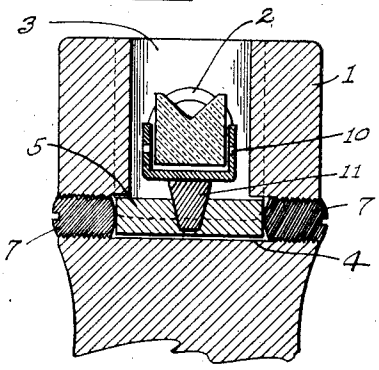


Fig. 5.

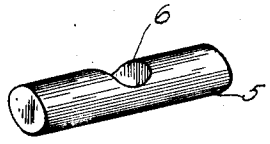
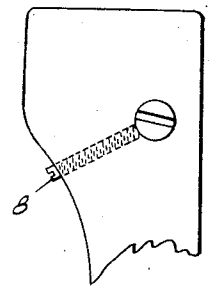


Fig. 6.



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Patented Dec. 18, 1923. 1,478,123

UNITED STATES PATENT OFFICE.

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PIVOT BEARING.

Application filed December 10, 1919. Serial No. 343,916.

To all whom it may concern:

Be it known that I, SAMUEL N. HURT, a citizen of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have invented certain new and useful Improvements in Pivot Bearings, of which the following is a specification.

This invention relates to pivot bearings, and more particularly to the mountings of agate or jewel bearings such as are used in sensitive weighing scales and in horological and other scientific instruments. Such bearings are commonly provided with V-shaped grooves adapted to receive knife-edge pivots of hardened steel or other suitable material, and in order that the rocking movement of the pivot on the bearing may be frictionless, it is necessary that the lines formed respectively by the edge of the pivot and the bottom of the groove be substantially coincident. One of the objects of this invention is to provide means for automatically aligning the knife edges and V-grooves of such pivots and bearings.

Another object of the invention is to so construct the device that the agate or jewel bearings may be accurately positioned in their supporting frames and adjusted to bring other parts of the machine into proper relation.

Owing to the brittle character of bearings of this type it has been found preferable to secure them to the metal of the instrument by setting them in cement, the common practice being to cement them in sockets formed directly in the frame or other part to which they are secured. This necessitates handling the entire frame several times during the setting of each bearing, and since the cement setting must be given time to cure, it also necessitates maintaining a larger stock of the metal frame parts than would otherwise be necessary. Another object of the invention is to provide a structure in which the bearings are mounted in small clips which are readily attachable to the frame by means which insures proper alignment of the bearing grooves, whereby the cementing and curing can be finished while detached from the larger scale parts.

Other objects and advantages will be apparent from the following description, in which reference is had to the accompanying drawings illustrating a preferred embodiment of my invention and wherein similar reference numerals designate similar parts throughout the several views.

In the drawing:—

Figure 1 is a plan view of a part of a scale frame provided with a bearing mounting embodying my invention;

Figure 2 is a fragmentary side elevation of the same.

Figure 3 is a fragmentary vertical section taken substantially on the line 3—3 of Figure 1;

Figure 4 is a view in perspective of an agate bearing and carrying clip removed from the frame;

Figure 5 is a perspective view of a rock shaft forming an element of my invention; and

Figure 6 is a front elevation on a reduced scale of a fragment of the machine frame shown in Figure 2.

I have, for the purpose of illustration, shown my invention as applied to the base horn or fulcrum stand 1 of a weighing scale, but it is to be understood that the showing is merely exemplatory and that I contemplate the use of the invention wherever applicable.

The fulcrum stand 1 is shown as provided with an adjustable thrust bearing 2 of the type illustrated in detail in U. S. Patent No. 1,294,450, to Hapgood, February 18, 1919. Since my invention does not reside in the thrust bearing per se, I will not particularly describe it. As shown, the bearing to which my invention is applied is located in a recess 3 in the upper part of the fulcrum stand. One wall of this recess forms a convenient mounting for the thrust bearing 2, and when the bearing is so located the recess may be covered and the bearing and mounting of my invention thus protected and kept clean. It is to be understood, however, that my improved bearing mounting may be applied to frame members differently formed.

The stand 1 is provided with a horizontal bore 4, the upper side of which opens into the recess 3, and lying within the bore 4 is a cylindrical rocking member 5 having a ta-

pered transverse opening 6 substantially midway between its ends. The opposite ends of the bore 4 are threaded to receive adjusting screws 7. By loosening one of the screws 7 and tightening the other the rocking member 5 may be moved longitudinally in the bore 4. The ends of the screws 7 which contact the member 5 are crowned so that they may engage the member 5 with sufficient snugness to prevent longitudinal movement without preventing rocking movement thereof. After the member 5 has been properly positioned the adjusting screws 7 may be locked in place by turning up set screws 8 (see Figure 6).

The agate bearing is mounted in a channel-shaped metallic clip 9 which preferably substantially conforms in shape to the lower part of the agate and has one or more perforations 10 in its walls. In mounting the agate, suitable cement is applied to the clip or to the agate and the agate is then placed into position. The openings 10 act as vents to permit the escape of air and the extrusion of surplus cement, and the cement which remains in the perforations when the agate is set assists in anchoring it in place. By the use of a suitable fixture a large number of agates may be set in clips at the same time and the height of the bottom of the V-grooves determined with great nicety.

Projecting rigidly from the bottom of the clip 9 is a frusto-conical pin 11. The pin 11 is adapted to be rotatively received in the opening 6 of the rocking member 5. When the pin 11 has been dropped into the opening 6 and the parts are in assembled relation, as shown in Figures 1, 2 and 3, it is apparent that the agate is capable of movement about axes perpendicular to each other and to the line formed by the bottom of the V-groove but that it is incapable of movement about any axis which is parallel to the V-groove. Supposing the agate to be used as a fulcrum bearing for a scale lever, if the fulcrum pivot be out of alignment in any direction the bearing may turn until the line at the bottom of the V-groove coincides with the line at the knife edge of the pivot. When the knife edge comes into full line engagement with the bottom of the V-groove the bearing is held rigidly in place so that no shifting of the lever is permitted. If, owing to improper machining, or for other reasons, the nose of the lever does not come into plumb relation with the part to which it is to be connected, the nose of the lever may be swung laterally by moving the pivot on one side rearwardly and the pivot on the other side forwardly, or the nose may be shifted forwardly or rearwardly by moving the pivots on both sides in the same direction, the pivots being movable by manipulation of the screws 7.

While it will be apparent that the illustrated embodiment of my invention herein disclosed is well calculated to adequately fulfill the objects primarily stated, it is to be understood that the invention is susceptible to variation, modification and change within the spirit and scope of the subjoined claims.

Having thus described my invention, I claim:

1. In a device of the class described, in combination, a frame, a connecting member rockable with respect to said frame about an axis, a second connecting member rockable about an axis perpendicular to the first said axis, and a line bearing member carried by said second connecting member, the bearing line lying perpendicular to both said axes.

2. In a device of the class described, in combination, a frame, a supporting member rotatable relatively thereto on a horizontal axis, and a bearing carried by and rotatable relatively to said supporting member on a vertical axis.

3. In a device of the class described, in combination, a frame, a member mounted in said frame to rotate on a horizontal axis, a grooved bearing, and a vertical pin rotatably connecting said member and said bearing.

4. In a device of the class described, in combination, a frame, a grooved bearing, a clip receiving said bearing, and means so connecting said clip and said frame as to permit relative pivotal movement thereof about axes perpendicular to each other and to said groove and to hold said clip and frame against relative pivotal movement about an axis parallel to said groove.

5. In a device of the class described, in combination, a frame, a bearing, a clip receiving said bearing, a pin projecting downwardly from said clip, a rocking member journaled in said frame, said pin being swiveled in said rocking member.

6. In a device of the class described, in combination, a bearing, a clip receiving said bearing, a pin projecting downwardly from said bearing, a frame having a horizontal bore therein, and a cylindrical member lying in said bore, said pin being swivelly connected to said cylindrical member.

7. In a device of the class described, in combination, a frame having a horizontal bore therein, a cylindrical member lying in said bore and revoluble therein, means for adjusting said member longitudinally of said bore, and a bearing swiveled to said member on a vertical axis.

8. In a device of the class described, in combination, a frame having a horizontal bore therein, a cylindrical member in said bore, adjusting screws threaded in said bore and bearing against the ends of said cylindrical member, said cylindrical member

having an upwardly flaring opening therein, a tapered pin in said opening, and a bearing clip secured on said pin.

9. In a device of the class described, in combination, a frame having a horizontal bore therein, a cylindrical member in said bore, adjusting screws threaded in said bore and bearing against the ends of said cylindrical member, and a bearing clip rotatably mounted on said cylindrical member.

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