(No Model.)

R. W. HARDIE.

JOURNAL BEARING.

No. 331,497. Patented Dec. 1, 1885.

Fig. 1.

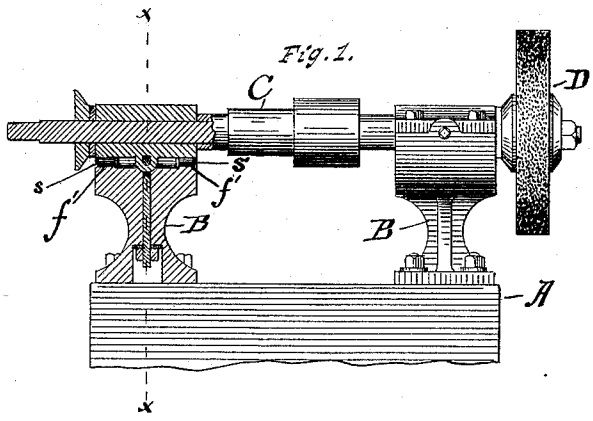


Fig. 2.

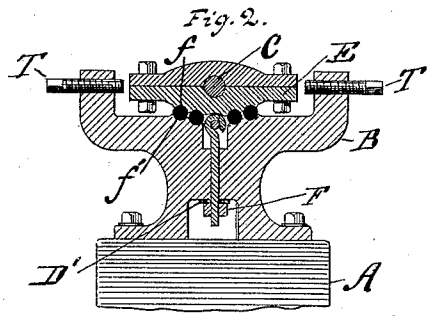


Fig. 3.

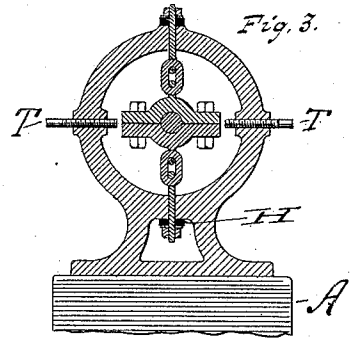


Fig. 4.

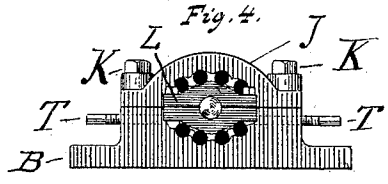


Fig. 5.

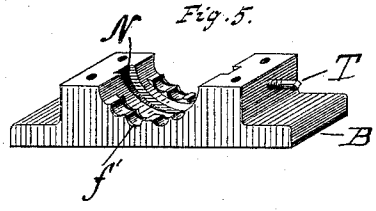


Fig. 7.



Fig. 6.

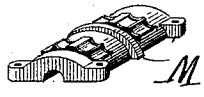


Fig. 8



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UNITED STATES PATENT OFFICE.

ROBERT W. HARDIE, OF ALBANY, NEW YORK.

JOURNAL-BEARING.

SPECIFICATION forming part of Letters Patent No. 331,497, dated December 1, 1885.

Application filed September 10, 1885. Serial No. 176,716. (No model.)

To all whom it may concern:

Be it known that I, ROBERT W. HARDIE, a citizen of the United States, residing at Albany, in the county of Albany and State of New York, have invented certain new and useful Improvements in Journal-Bearings; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to certain new and useful improvements in journal-bearings, and is applicable to line-shafting, but possesses especial value in connection with polishing and grinding machines.

The object of my invention is to relieve the shaft or journal from the severe strains caused by an irregular or unevenly-balanced wheel, and to insure an even wearing of the wheel-surface, at the same time guarding against uneven wearing of the bearing-boxes, due in machines of the ordinary type to the centrifugal force of the wheel. To this end I cushion the bearing-box in which the shaft runs in such a manner that the bearing-box and shaft may be sustained by cushions or springs of rubber or metal or like resilient material, and that similar cushions may be interposed between the sides of the journal-box and the stationary base of the machine, and in some instances between the top of the box, and a cap-piece secured to said base. The purpose of this construction is to insure a yielding motion for the shaft that shall take up and compensate for any sudden strain or shock imparted to it by pressure exerted against the polishing-wheel.

In the accompanying drawings I have illustrated my invention as applied to an emery-grinder of an ordinary type.

Figure 1 represents a side elevation and partial section of an emery-grinder to which my invention is applied. Fig. 2 represents a cross-section of the same upon the line *x x*. Fig. 3 represents a cross-section of a freely-suspended journal-bearing box provided with locking devices for holding the same firmly in position while truing the wheel. Fig. 4 represents an end elevation of a modification of my invention. Fig. 5 represents in perspective a view of the lower half of the pillow-block shown in Fig. 4. Fig. 6 represents in perspective a view of one-half of the journal-box shown in Fig. 4. Figs. 7 and 8 represent detail views of rubber cushions or springs which may be used in carrying out my invention.

Similar letters of reference indicate similar parts throughout the several views.

B B indicate pillow-blocks, which may be attached to a suitable base or table, A, as shown, or may form an integral part of said base.

C indicates the shaft of an emery grinding-machine or the like, provided at its end or at one end only with polishing or grinding wheels, as D. The shaft C revolves freely within journal-boxes located above and resting upon the pillow-blocks B B, but separated therefrom by resilient cushions, as will be hereinafter more fully set forth.

In the construction illustrated in Figs. 1 and 2 the pillow-block B is shaped upon its upper surface to correspond to the shape of the lower section of the journal-box, which has a downwardly-extending curvature. In some instances, however, I contemplate giving said lower section of the journal-box a different curvature, or even making it substantially flat, my invention consisting, broadly, in supporting the journal-boxes upon a stationary base, with cushions intermediate between the two, and in such manner as to permit of a limited or yielding movement of said boxes.

The under surface of the lower section, E, of the journal-box is provided with a series of grooves or flutes, *f'*, and the upper surface of the pillow-block with similar grooves, *f*, of opposite curvature. Between and within these fluted openings are located short cylindrical cushions of the form illustrated in Fig. 7. These cushions sustain the weight of the journal-boxes, the shaft and grinding or polishing wheels, and are prevented from slipping out of place by the ribs or flanges *s s* upon opposite ends of the pillow-block. Instead of the fluted openings or grooves, however, I may use (in connection with rubber or like resilient balls of the form shown in Fig. 8, or approximating thereto) depressions or cavities of opposite curvature to each other, and made in the pillow-blocks and journal-boxes, respectively, for receiving and retaining said balls in position. Furthermore, as a substitute for either the rubber cylinders or ball, I may em-

ploy any other kind of resilient cushion interposed between the pillow-blocks and journal-boxes, and exercising a similar function.

I do not therefore desire to be restricted to the particular construction illustrated in my drawings, although for some reason in practice I prefer it. Thus, where the lower section, E, of the journal-box is curved outwardly, and the upper surface of the pillow-block B curved inwardly to correspond thereto, the intermediate cushions perform a double function. They not only sustain the journal, but, being arranged upon a curved surface, they are enabled to take up shocks or strains exerted from the side of the shaft, as well as from its top and bottom, and in such manner that a pressure exerted upon any portion of the wheel, and through it upon the spindle, will be compensated for at a point directly opposite its point of application, thereby insuring an entirely satisfactory operation.

In Figs. 1 and 2 the journal-box is loosely connected with the pillow-block by means of an eyebolt engaging with a perforated lug or staple upon the lower surface of the box, said eyebolt passing downward through the block, and being secured at its lower end by means of a nut, F, screwed upon the end of the eyebolt, and an intervening metallic washer, D'. This construction permits of a limited motion of the journal-box on the base or pillow block, while the latter is stationary. A greater or less degree of pressure may be exerted upon the rubber springs by loosening or tightening the nut F. If greater flexibility is desired, a link may be interposed between the staple and eyebolt, so that both may connect with said link, as shown in Fig. 3.

Between the metal washer and nut and the bottom of the base a rubber washer may be interposed similar to that shown at H in Fig. 3, giving greater elasticity to the cushion-bearing.

I do not wish to be limited to the means shown in Figs. 1 and 2 for securing the bearing-box in place, as, instead of such arrangement, rubber or like resilient cushions may be placed above the bearing-box in addition to those below, as shown more particularly in Fig. 4. In this instance the upper half of the bearing-box may be made the duplicate of the lower one, and the box may be held in place by the cap-piece J, attached to the pillow-block by means of the adjusting screw-bolts K K. The inner surface of the upper half of the pillow-block is similar to the inner surface of the lower half thereof, as shown in Fig. 5, and between said cap-piece and the upper portion, L, of the journal-box the cushions are similarly disposed. Both sections of the journal-box may be provided with a flange or rim, M, designed to fit within a similar groove, N, in the pillow-block and its cap-piece J, thereby preventing the journal-bearing from slipping lengthwise from said pillow-block. The adjusting-screws K K permit any desired amount of pressure to be obtained upon the resilient cushion, and as the pressure exerted by turning set-screw is in a vertical plane the bearing-box will be drawn down and its pressure upon the cushions made even and uniform throughout, while at the same time those springs which are at the side of the box will afford a yielding cushion for such side when any pressure is brought against the side of the wheel or the shaft sustains any sudden strain or shock.

In the drawings I have shown two forms of loose-jointed connection for uniting the journal-box with the base—to wit, the staple and eyebolt and the annular rim and corresponding groove. Any other form of loose-jointed connection for the same purpose, however, I contemplate using in some instances in place of the forms described and shown.

The number or position of the flutes or grooves for retaining the rubber springs or cushions is not essential to the generic character of my invention. They may be, as shown, arranged in two series—one on each side of the base and box—or they may be carried entirely across the face of the base and bearing-box. The kind of resilient material may also be varied, and in some instances I propose to use a flat metal spring or spiral metal spring in place of the rubber spring shown.

It is often desirable to true up a wheel after considerable use, and for this purpose I have placed at each side of the journal-box a set-screw, T T, passing through the pillow-block, and which, when screwed inwardly, will bear against the sides of said box and hold the same fixed during the truing-up operation.

This part of my invention is applicable also as a means of locking any journal-box which is capable of limited movement on its base by means of resilient connection—as, for instance, in the form of machine illustrated in Fig. 3, and already covered in Letters Patent heretofore granted to me. I desire, therefore, to be understood as claiming, broadly, this means for locking in position movable journal-boxes.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A journal-bearing consisting of a sustaining base-block, a bearing-box, and resilient cushions so placed between said base-block and bearing-box that a spindle revolving in said box will adjust itself to a constant center, substantially as shown and described.

2. A journal-bearing consisting of a sustaining-base, a bearing-box loosely connected with said base, and supported upon resilient cushions placed between said base and box in such a manner that a pressure exerted upon any part of the spindle revolving in said box will be compensated for at a point directly opposite its point of application, substantially as shown and described.

3. A journal-bearing consisting of a sustaining-base, a bearing-box capable of a limited motion with respect to said base by means of yielding cushions, and set-screws at opposite

sides of said base adapted to hold said box tightly in position, substantially as shown and described.

4. A journal-bearing consisting of a sustaining-base, a bearing-box, a loose jointed connection between said base and box, and yielding cushions interposed between said base and box, substantially as shown and described.

5. A journal-bearing consisting of a pillow-block, a bearing-box loosely connected with said block, and resilient cushions intermediate between said box and block, substantially as shown and described.

6. A journal-bearing consisting of a sustaining-base, a bearing-box, resilient cushions between said base and box, and a tightening-eyebolt, substantially as shown and described.

7. A journal-bearing consisting of a sustaining-base, a bearing-box, resilient cushions intermediate between said box and base, and a resilient cushion beneath said base connected with the tightening-eyebolt, substantially as shown and described.

8. A journal-bearing consisting of a pillow-block, a bearing-box, resilient cushions between said block and box, and a cap extending over the bearing-box and adjustably secured to the pillow-block, whereby the tension of the box on the cushion may be regulated, substantially as shown and described.

9. A journal-bearing consisting of a pillow-block, a cap for said block, a bearing-box whose outer surface is provided with a rim adapted to fit within an annular groove upon the inner surface of the pillow-block, and resilient connections between the box and block, substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

ROBERT W. HARDIE.

Witnesses:
GILBERT W. MINOR,
MYER NUSSBAUM.