

(No Model.)

T. A. RICHARDS.
JOURNAL BEARING.

No. 494,594.

Patented Apr. 4, 1893.

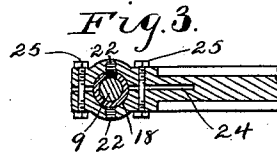
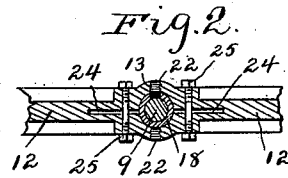
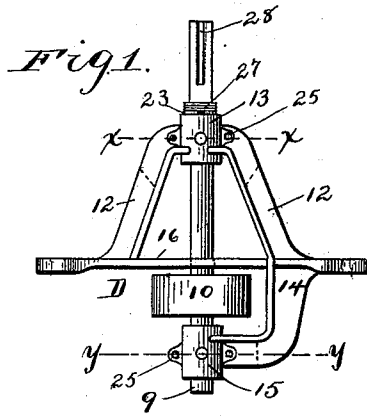


Fig. 4.

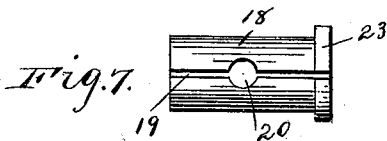
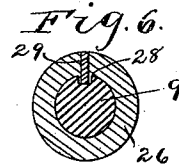
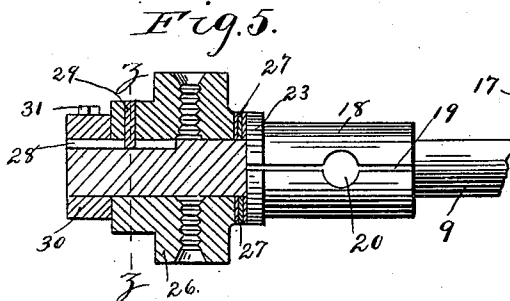
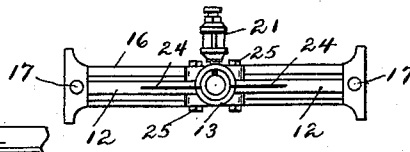
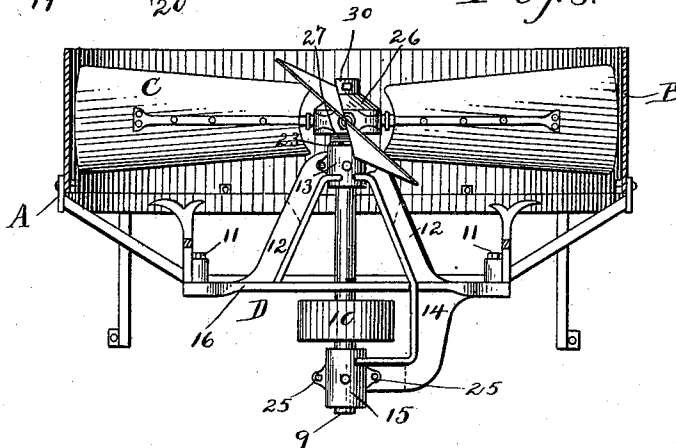


Fig. 8.



Witnesses:-

W. E. Bowen,
Benj. Miller.

Inventor:-

Theron A. Richards,
By J. E. Bowen
Attorney.

UNITED STATES PATENT OFFICE.

THERON A. RICHARDS, OF BROOKLYN, NEW YORK.

JOURNAL-BEARING.

SPECIFICATION forming part of Letters Patent No. 494,594, dated April 4, 1893.

Application filed December 31, 1890. Serial No. 376,396. (No model.)

To all whom it may concern:

Be it known that I, THERON A. RICHARDS, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Journal-Bearings, of which the following is a specification.

My invention relates to journal-bearings designed particularly for use in connection with ventilating apparatus such as fans for cooling buildings, for drying purposes, and for removing dust, gases, &c., from apartments devoted to manufacturing purposes, as well as from exhibition rooms and public halls.

The object of my invention is to devise a bracket for supporting the bearings of the driven-shaft, said bracket also carrying the belt-pulley, and which by its construction shall be readily attachable to a fan-frame or the like, and also capable of being reversed so as to render it equally well adapted for receiving the driving belt from either side of the fan-frame, or other structure.

Further objects are to improve the journal-bearings of the driven-shaft and to render their Babbitt-boxes easily and quickly renewable; to secure the hub of the fan-wheel to the driven-shaft loosely in order that it may have a lateral movement thereon while prevented from turning on the shaft, thereby transferring the thrust of the hub from the shaft to the bearing, thus preventing the shaft from being laterally crowded.

The invention is hereinafter described and its novel features are specified in the claims at the end of this specification.

In the accompanying drawings which form a part of this description, and wherein like features are indicated by like letters and figures of reference in the several views, Figure 1 is a plan view of my reversible bracket and its shaft. Fig. 2 is a sectional view through line *xx* of Fig. 1. Fig. 3 is a sectional view through line *yy* of that end of the bracket (Fig. 1) which supports the main bearing. Fig. 4 is an elevation of the opposite end of said bracket with the thrust-rings removed. Fig. 5 is a longitudinal sectional view of the driven-shaft, partly in elevation, with a fan-hub secured thereon, this view also showing the split Babbitt-box and thrust-

rings in position on the shaft. Fig. 6 is a cross-section through the line *zz* of Fig. 5. Fig. 7 is an elevation of one of the Babbitt-boxes. Fig. 8 is a top plan view of a ventilating apparatus comprising a supporting-frame, a wheel-rim and a fan (the wheel-rim being in section), with my bracket embodying my bearings, &c., mounted on the supporting-frame.

Referring to Fig. 8, A indicates the supporting-frame, B the wheel-rim and C the fan of the ventilating apparatus. This apparatus is made the subject of another application for patent and is therefore not claimed herein. It is illustrated in order to show the manner of utilizing my improvements which form the subject of the present application.

The bracket is indicated by D and it has mounted therein the driven-shaft 9 carrying the fixed pulley 10. In Fig. 8 the bracket D is shown attached to the supporting-frame of the ventilating apparatus by screws 11. In this position it is adapted to support the bearings of the driven shaft without said bearings coming in direct contact with the fan-frame. The alignment of the driven-shaft is thus never disturbed by movements or distortions of the fan-frame, or other structure upon which the bracket may be mounted.

The bracket D comprises arms 12 supporting at their extremities the secondary bearing 13 of the driven-shaft 9, and arm 14 carrying at its end the main bearing 15 of said shaft. As any lateral thrust imparted by the shaft 9 to bearings 13 and 15 will be transferred to the bolts passing through the bolt holes in the ends of cross piece 16 with a tendency to loosen the bolts as well as to cause vibration of the structure to which said bolts are attached, it is important to reduce as far as practicable the aggregate leverage under which such thrust is so transferred without reducing the distance between said bearings, upon which distance depends in a large measure the steadiness and uniformity of the running of shaft 9 and its pulley 10 and the uniform wearing of the Babbitt boxes in the bearings. The bearings mentioned are preferably formed integral with the arms 12 and 14, and are thus shown in the drawings. These several arms project from the cross-piece 16 in the ends of which the holes 17 which re-

ceive the attaching screws 11 are made. The secondary bearing 13—made preferably integral with the arms 12—is formed in the process of casting with a slit extending through it on a horizontal plane, such slit also entering the arms to about the points indicated by dotted lines Figs. 1 and 8, and also indicated by the sectional view Fig. 2. This bearing, 13, is bored and provided with a Babbitt-box 18, such as is shown in Fig. 7. The Babbitt-box is cast with a longitudinal slit 19 to permit it to contract so as to enable the wear to be taken up as hereinafter explained, and also with a hole 20 to receive the oil-cup 21 as shown in Fig. 4. The oil-cup 21 is set into hole 22 of the bearing and extends into the hole 20 made in the Babbitt-box 18 in the line of the slit 19, in which position it serves to prevent the Babbitt-box from turning in the bearing. The Babbitt-box 18 is also cast with a head 23 against which the thrust-rings, presently referred to, bear. The slit in the arms 12 of the bracket is indicated at 24, and this slit is provided so that when the Babbitt-box 18 becomes worn the wear may be taken up (since the box is likewise slit longitudinally) by means of the adjusting screws 25, and thus proper relation between the driven-shaft 9 and the Babbitt-box is maintained. The split Babbitt-boxes 18 are cast of a uniform size and are therefore interchangeable, so that when one becomes so far worn as to be unserviceable, a perfect box may be substituted for it with the saving of trouble and delay incident to the method now practiced of providing bearings with Babbitt-boxes, which method consists in cutting out the old box and molding a new one in its place, a tedious and troublesome proceeding. It will be noticed that an oil-cup hole 22 is provided on both surfaces of the bearings 13 and 15 so that an oil-cup may be applied to said bearings whether the open side of the bracket be on the right or left hand. The Babbitt-box 18 is of course adjustable so as to bring its hole 20 coincident with holes 22 in the bearing 13 (or 15). The main shaft-bearing 15 of the bracket is the same in construction as the secondary bearing 13 above described, except that the detachable Babbitt-box 18 will not be provided with the head 23 when applied to main bearing 15, as the box in this connection is not subjected to any of the thrusts of the hub.

The driven-shaft 9 is a part of the bracket D and has mounted thereon the pulley 10 as shown. The front end of bracket D is provided as stated with but one arm, 14, which supports the main bearing 15, the opposite side of the bracket at the front being unobstructed. The arm 14 is also split in the direction of its depth, as is also its bearing, as indicated in Fig. 3, and both bearings 13 and 15 are provided with adjusting screws 25.

The object of making the bracket D with one of its sides open at its front, is to enable it to be attached, to the fan-frame for example, with the open side either on the right or left-

hand—rendered possible by the easy reversibility of the bracket, due to the simple manner in which it is adapted to be secured in place—thereby permitting the attachment of the belt to the pulley 10 from any direction. This is important as it renders the bracket D much more serviceable than it would otherwise be. The bracket D when mounted on the fan-frame supports the bearings of the driven-shaft from any direct contact with said frame, thus insuring perfect alignment of said shaft, which experience has shown it is impossible to secure when the shaft-bearings are supported directly on the fan-frames.

Before placing hub 26 on the driven-shaft 9, I slip on said shaft the rings 27—preferably three—which bear against the head 23 of the Babbitt-box 18, thus furnishing four bearing surfaces. This constitutes what I term the thrust-bearing.

To relieve the driven-shaft 9 from the bad effects of the thrust of the hub 26 in the revolution of the fan, said hub instead of being fixed fast to the shaft is arranged thereon so that it may have a slight lateral play—or exert pressure on the rings 27. This I provide for by making a longitudinal groove 28 in the outer end of the shaft and securing a feather 29 in the hub in such manner that it will cooperate with groove 28 so as to permit the hub to move laterally against the thrust-bearing while preventing said hub from turning on the shaft. By this arrangement it is plain that the fan-hub will exert its thrust against the head 23 of the Babbitt-box 18 of the secondary bearing of the driven-shaft and not in such a manner as to crowd the shaft laterally. In cases in which the shaft 9 is driven directly by the engine, the arrangement just described prevents the revolving wheel from crowding said shaft toward or against the cylinders of the engine. The hub is held on the shaft 9 by means of a collar 30 secured by screws 31. The rings 27 of the thrust-bearing also assist in lubricating the bearing.

The herein described bracket D which is adapted to support the shaft-bearings free from any direct contact with the fan frames, much increases the value of a ventilating fan as it insures the perfect alignment of the driven-shaft regardless of disturbances in the frames—and also renders the apparatus available for use in places where, without the bracket, it could not conveniently be employed.

The means described for relieving the driven-shaft from the thrust of the hub not only prevents injury to the parts usually affected by such thrust but causes the apparatus to run more smoothly and with less friction.

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

1. A bracket for ventilating apparatus and the like, comprising a cross-piece, as 16, provided with holes at each of its ends for receiving the attaching bolts or screws, and

arms projecting from the front and rear of said cross-piece and carrying journal bearings, one of which journal bearings is located forward of and the other in the rear of said cross-piece, substantially as set forth.

2. A bracket for ventilating apparatus and the like, provided with arms terminating in journal bearings or boxes fitted with contractible linings, the said journal bearings divided horizontally, as described, and adjusting screws serving to take up the wear of said contractible linings, substantially as set forth.

3. A bracket for driven shafts the arms whereof are split horizontally at their outer ends which terminate in horizontally divided journal boxes or bearings, in combination with contractible metallic bearings, substantially as set forth.

4. A reversible bracket for driven shafts comprising an attaching member or cross-piece, as 16, provided at its ends with screw or bolt holes, a journal bearing supported in the rear of said attaching member by a pair of arms projecting from said attaching member, and a second journal bearing supported in front of said attaching member by a single projecting arm, substantially as and for the purpose set forth.

5. A bracket for driven shafts comprising a cross-piece or attaching member, as 16, provided at its ends with bolt or screw holes, and arms 12 and 14 projecting from said attaching member and terminating in journal bearings or boxes, one of said bearings located in front and the other in the rear of said cross-piece or attaching member, in combination with shaft 9 having mounted thereon pulley 10, substantially as set forth.

6. A bracket for driven shafts provided with arms 12 and 14 terminating in journal

bearings or boxes 13 and 15, in combination with shaft 9, a metal bearing arranged in said box 13 and provided with a head, as 23, and rings 27 encircling shaft 9 and co-operating with the head of said lining, substantially as set forth.

7. The combination with a bracket for ventilating apparatus provided with a journal box fitted with a contractible metallic bearing provided with a head as 23, and a driven shaft resting in said bearing and provided at its end with a groove, as 28, of a hub mounted on said driven shaft and provided with a feather cooperating with the groove in the shaft, substantially as and for the purpose set forth.

8. A bracket for driven shafts provided with a contractible journal box having an oil-cup hole through its top and bottom surfaces, in combination with a contractible metal lining removably fitted within the bore of said box and having an oil-cup hole in its surface adapted to co-operate with either of the oil-cup holes in the journal box, thus rendering the bracket reversible, substantially as set forth.

9. As a new article of manufacture, a metal box or lining for journal bearings or boxes of uniform diameter throughout its length and cast with a thrust collar or head at one end, and provided with a longitudinal slit its entire length and with an oil-cup hole, substantially as set forth.

Signed at New York, in the county of New York and State of New York, this 16th day of December, A. D. 1889.

THERON A. RICHARDS.

Witnesses:

T. H. PALMER,
J. E. M. BOWEN.