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S. B. REDFIELD

ADJUSTABLE SUPPORT FOR STATIONARY SHAFTS

Filed June 25, 1927

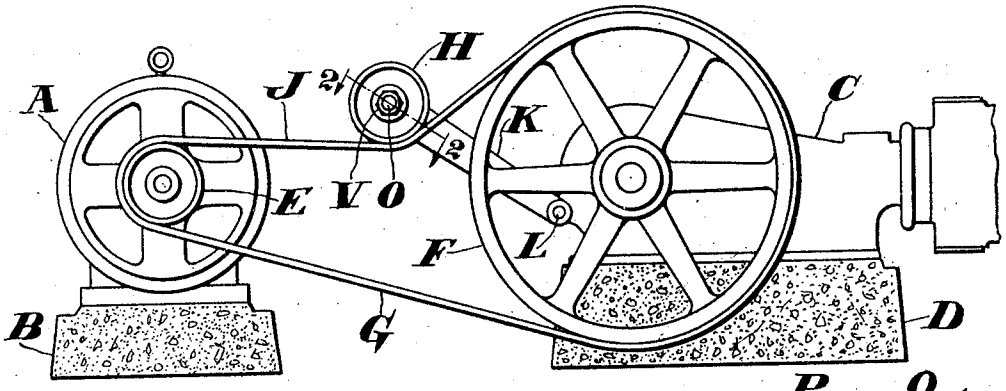


FIG.-1.

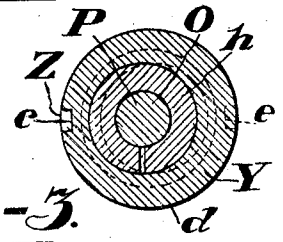


FIG.-3.

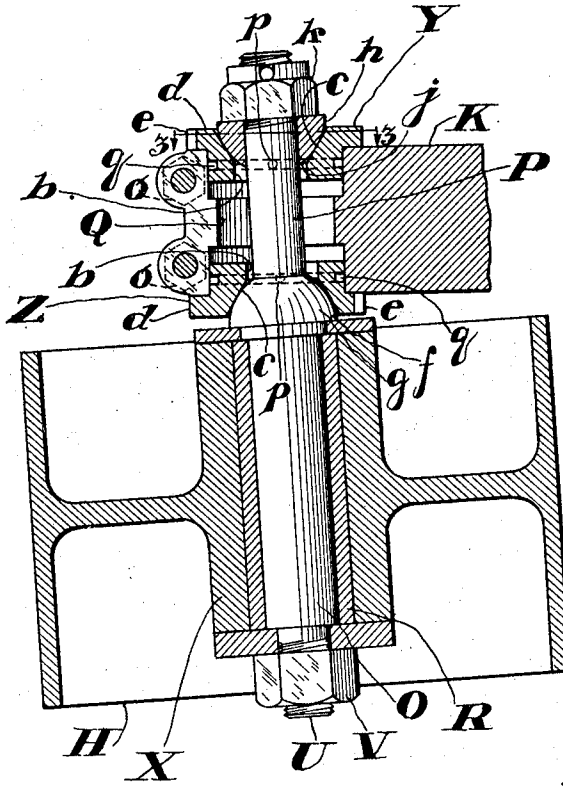


FIG.-2.

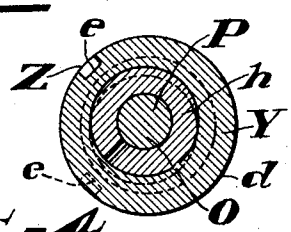


FIG.-4.

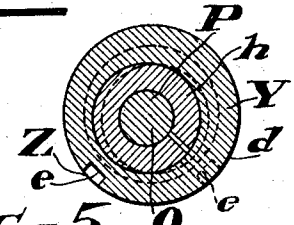


FIG.-5.

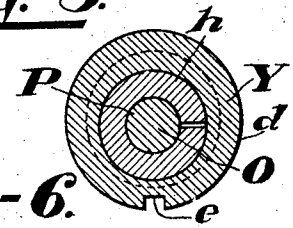


FIG.-6.

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ADJUSTABLE SUPPORT FOR STATIONARY SHAFTS.

Application filed June 25, 1927. Serial No. 201,521.

This invention relates to supports for shafts and the like, but more particularly to an adjustable support for shafts of the type commonly provided for idler pulleys in which the pulley is adapted to rotate freely on the shaft.

One object of the invention is to enable an idler pulley to be adjusted to the most suitable position with respect to the belt on which it bears, thus assuring against creeping of the belt on its pulleys.

Other objects will appear hereinafter, and to all of these ends the invention consists of the features of construction and arrangement of parts having the general mode of operation substantially as hereinafter described and claimed and illustrated in the accompanying drawings, in which

Figure 1 is a side elevation of a motor and a compressor having the invention applied thereto,

Figure 2 is a sectional plan view of the idler pulley and support taken through Figure 1 on the line 2—2 looking in the direction indicated by the arrows, and

Figures 3, 4, 5, and 6 are transverse views taken through Figure 2 on the line 3—3 looking in the direction indicated by the arrows, and illustrating a few of the positions which the shaft bushings may assume for the purpose of adjusting the position of the idler pulley with respect to the belt.

Referring to the drawings and at first more particularly to Figure 1, A designates a motor seated on a foundation B to which it may be secured in any convenient and well known manner. C is a compressor also mounted on a foundation D, and the motor A and the compressor C are provided with the usual pulleys E and F respectively on which is disposed a belt G for transmitting the power of the motor to the compressor.

As will be observed, the motor A and the compressor C are so spaced with respect to each other that only a short belt will be required and, as is customary in the case of short belt drives, an idler pulley H is disposed to bear on the slack side J of the belt G for the purpose of insuring a suitable area of contact between the belt and the pulleys. The idler pulley H in this instance is attached to an arm or bearing K preferably pivoted to the compressor C as at L so that the full weight of the idler pulley may at all times be applied to the belt.

The idler pulley H may be of any well known type and in this instance rotates freely on a shaft O having a reduced portion P which extends into a bore Q in the free end of the bearing K. Preferably, a sleeve R is pressed into the pulley H to provide a renewable bearing surface for the idler pulley. A nut V screwed on a threaded portion U of the shaft O holds the pulley H on the shaft O.

In accordance with the present invention, the bore Q in the bearing K is of considerably larger diameter than the reduced portion P of the shaft O and in the ends of the bore Q are disposed bushings Y and Z having apertures b terminating at their outer ends in flared or coniform portions c. The apertures b are in this instance located eccentrically in the bushings Y and Z so that when the bushings are rotated in the bore Q, the longitudinal axes of the apertures b will describe a circle about the longitudinal axis of the bore Q in which the bushings are disposed.

In order to limit the distance which the bushings Y and Z may extend into the bore Q, said bushings are provided with flanges d at their outer ends which bear against the sides of the bearing K and in each flange d is formed a notch e for a purpose to be described more fully hereinafter.

To the end that the shaft O may assume a position oblique to the longitudinal axis of the bore Q whenever the bushings Y and Z are rotated in said bore, the shaft O is provided with a flange f having a spherical end surface g adapted to seat in the flared portion c of the aperture in the bushing Z. On the free end of the reduced portion P of the shaft O is disposed a washer h shown in this instance as a split washer which also has a spherical end surface j to cooperate with the flared portion c of the aperture in the bushing Y.

Any suitable means may be provided for forcing the flange f of the shaft O and the washer h securely into engagement with the

bushings Y and Z. In the present instance this is accomplished by a nut *k* screwed on the end of the reduced portion P which is threaded for this purpose.

In order that the bushings Y and Z may be clamped firmly in position in the bearing K, the end of the bearing is split along a plane extending through the longitudinal axis of the bore Q, and bolts *o* disposed transversely through the end of the bearing K serve to contract the bearing firmly against the bushings Y and Z. In the present instance, additional means are provided for securing the bushings Y and Z in the bore Q. These means comprise set screws *p* screwed in the bearing K to seat in external annular grooves *q* in the bushings Y and Z.

As is well known, one difficulty incident to the installation of machinery, such as where a machine is intended to be driven by a separate prime mover, is that of so aligning the machines that the axes of the pulleys of the prime mover and the machine intended to be actuated thereby will be substantially parallel to each other. While satisfactory results may, of course, be obtained, the time required and the consequent expense of so aligning the machine adds greatly to the cost of installation. Even when the utmost care is exercised in placing the machines, it frequently happens that the shafts on which the pulleys are disposed are slightly oblique with respect to each other and, during the operation of the machines, the belt will tend to creep on the pulleys, thus at times rendering it difficult to maintain the belt on the pulleys. The present invention aims to eliminate these shortcomings and, due to the adjustable feature herein described, will enable the idler pulley H to be adjusted to the most suitable position with respect to the position of the belt. The idler pulley H may be adjusted to any angle or combination of angles within the range of the means provided.

In order to obtain a full and clear understanding of how these adjustments may be brought about, reference may be had to Figures 3 to 6 inclusive, in which Figure 3 illustrates the position of the bushings Y and Z whenever it is desired to deflect the shaft O in a horizontal plane without inclining it in a vertical direction. This may be readily accomplished by unscrewing both the bolts *o* and the set screws *p* so that the bushings will be freely rotatable. The bushing Y may then be rotated in one direction for a distance of 90° as shown in Figure 2, this being the maximum distance which the aperture *b* in the bushing may be moved from the longitudinal axis of the bore, and the bushing Z may be rotated in an opposite direction a similar distance. In this way the shaft O may be inclined from the longitudinal axis of the bore Q so that whenever the belt G tends to incline from the desired direction, the pulley H may be readily adjusted to suit this condition.

Whenever it is desired to effect a vertical adjustment of the shaft O, the bushings Y and Z may be adjusted as illustrated in Figure 4. In this instance the bushing Y is rotated so that its slot *e* is located above the horizontal and the bushing Z is rotated a similar distance in the opposite direction. By adjusting the bushings to these positions, the shaft will be tilted in a vertical direction without deflecting it in a horizontal plane.

In Figure 5 is illustrated another position to which the shaft O may be inclined in a horizontal direction. In this figure both the bushings Y and Z are rotated in opposite directions so that the slots *e* in said bushings will lie an equal distance from the vertical central plane.

In the position of the bushings Y and Z as illustrated in Figure 6, the slots *e* in both bushings will lie in the same longitudinal plane. This may be the position of the bushings whenever conditions permit the shaft to lie parallel with the longitudinal axis of the bore Q in the bearing K.

From the foregoing, it will be observed that the slots *e* in the bushings Y and Z serve as indices for seating the bushings with respect to a given point, as for instance, the slot in the bearing K, or any other convenient point. Preferably, the bushings are at all times moved an equal distance in opposite directions from the indicator. However a certain adjustment of the shaft O may be obtained by permitting one bushing, either Y or Z, to remain stationary in the bore Q and rotate the other bushing only. It will be readily seen that a lesser inclination of the shaft O will be obtained by only manipulating one bushing than would be the case if both bushings were manipulated as previously described.

After the shaft O has been adjusted to the desired position, the bolts *o* and the set screws *p* may be screwed tightly in position to hold the bushing firmly in the bearing K. Thereafter the nut *k* may be screwed on the reduced portion P of the shaft O to force the spherical surface *g* of the flange *f* firmly against the bushing Z and also the washer *h* tightly against the bushing Y. By applying the necessary pressure to the nut *k*, the washer *h* will be caused to exert a clamping effect on the reduced portion P of the shaft O to assist in holding the said shaft rigidly in position.

I claim:

In combination, a split bearing having a bore therethrough, a shaft extending with one end into the bore, a flange on the shaft having a spherical end surface, a washer on the shaft having a spherical end surface, said washer being split to enable it to be clamped tightly on the shaft, bushings in the bore having ec-

centrically disposed apertures to receive the shaft, the outer ends of the apertures being flared to cooperate with the spherical surfaces of the flanges and the washer, said bushings being adapted to be rotated in opposite directions for tilting the shaft with respect to the longitudinal axis of the bore, bolts clamping the bearing on the bushings, and a nut on the shaft bearing against the washer to clamp said washer to the shaft and to hold the flange and washer in engagement with the bushings.

In testimony whereof I have signed this specification.

SNOWDEN B. REDFIELD.