March 26, 1935. R. T. DANIEL 1,995,447

PROPELLER SHAFT BEARING AND SUPPORT FOR MODEL AIRPLANES

Original Filed June 10, 1932

Fig. 1.

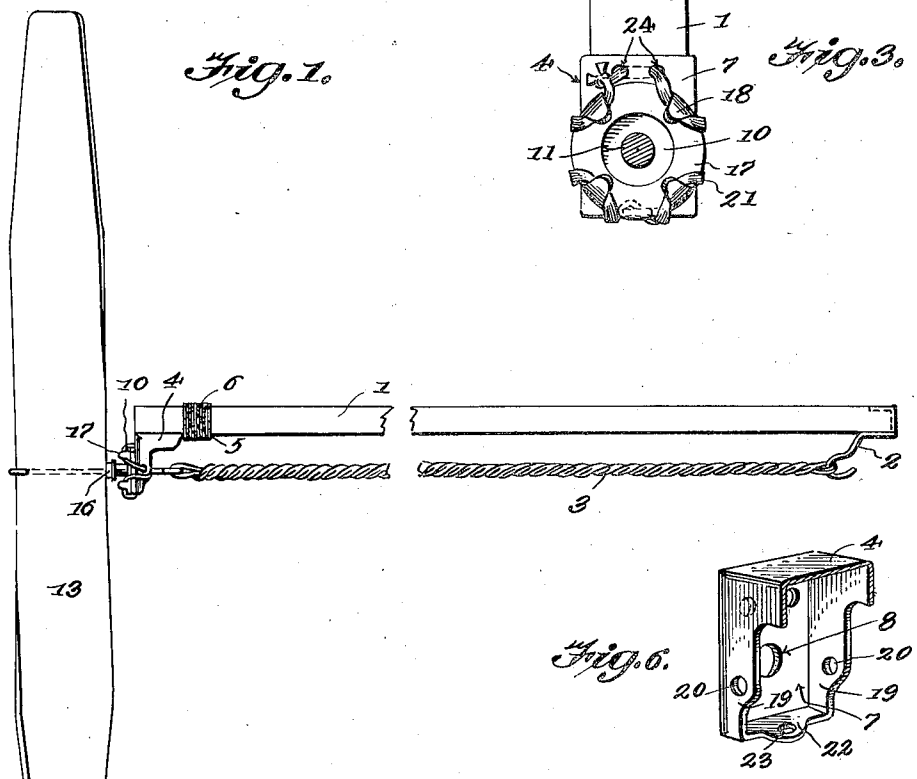


Fig. 3.

Fig. 6.

Fig. 2.

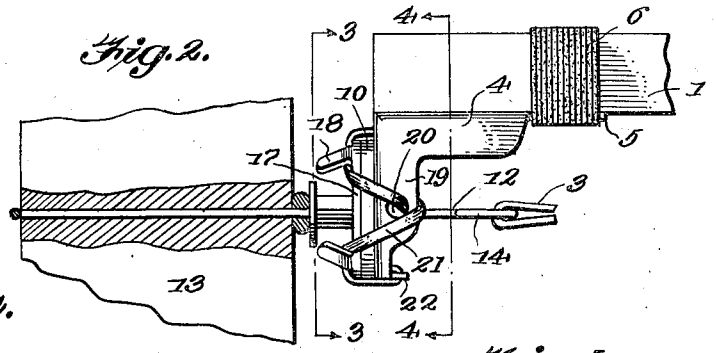


Fig. 4.

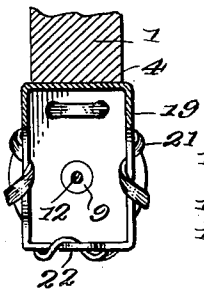
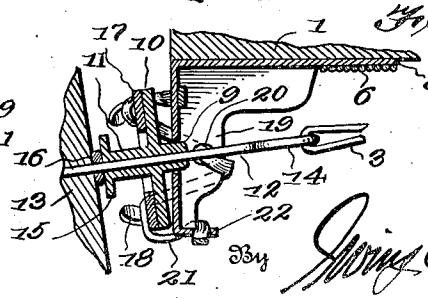


Fig. 5.



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PROPELLER SHAFT BEARING AND SUPPORT FOR MODEL AIRPLANES

Raleigh T. Daniel, Colorado Springs, Colo.

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8 Claims. (Cl. 46—50)

This invention relates to an improved propeller shaft bearing and support for model airplanes, and has for its object the production of a simple and efficient mounting for the propeller shaft which is so constructed as to permit the propeller shaft to flex the required amount should the propeller strike a foreign object.

Another object of this invention is the production of a simple and efficient elastic anchorage and mounting for the propeller shaft of a model airplane which will flexibly support the propeller shaft in such a manner as to permit the bearing to provide a universal flexing action in the event the propeller should strike an object.

A still further object of this invention is the production of a simple and efficient bearing and mounting of a propeller shaft for a model airplane which consists of a minimum number of parts, which may be manufactured cheaply, and which is efficient in operation.

With these and other objects in view, this invention consists in certain novel constructions, combinations and arrangements of parts as will be hereinafter more specifically described and claimed.

In the drawing:—

Figure 1 is a side elevation of a motor stick showing the propeller bearing and motor band associated therewith, the motor stick being adapted to be supported upon a model airplane in any suitable or desired manner as is the custom of the trade;

Figure 2 is an enlarged side elevation of the bearing and hanger associated with a portion of the motor stick, a portion of the propeller being shown in section;

Figure 3 is a section taken on line 3—3 of Figure 2;

Figure 4 is a section taken on line 4—4 of Figure 2;

Figure 5 is a longitudinal sectional view through the hanger and flexible bearing; and

Figure 6 is a detail perspective view partly in section of the hanger member used in connection with the present device.

By referring to the drawing, it will be seen that 1 designates a conventional motor stick which carries at one end of the motor band the supporting hook 2 for engaging one end of the motor band 3. Secured to the forward end of the motor stick 1 and preferably to the underface thereof, is a sheet metal hanger member 4 formed of a light metallic structure and having a rearwardly extending connecting finger 5, the hanger member 4 being adapted to be glued to the underface of the motor stick 1, and then wound or wrapped by means of the winding threads 6. It should be understood, however, that the hanger member 4 may be secured to the forward end of the motor stick 1 in any convenient or desired manner common to the trade, without departing from the spirit of the invention. This hanger member 4 is provided with a front plate 7, which front plate is provided with a comparatively centrally located bearing receiving aperture 8 which is only of sufficient size to permit the bushing 9 of the bearing plate 10 to pass therethrough, and properly flex to provide a universally flexing joint.

The bearing plate 10 is provided with the rearwardly extending bushing 9 and a forwardly extending bushing 11 through which extends the comparatively short propeller shaft 12 which propeller shaft 12 supports at its forward end the usual propeller 13 and is provided at its rear end with a motor band engaging hook 14, as shown. This propeller shaft 12 is only of sufficient length to permit of a proper connection with the motor band 3, and is sufficiently short to allow a maximum swinging movement of the shaft without contact with the bottom face of the motor stick 1. The bushing 11 is preferably provided with an annular flange 15 for contact with the bearing bead 16. The bearing plate 10 is preferably circular in shape and is adapted to normally snugly fit against the front face of the front plate 7, as is shown in Figure 2, to constitute a sturdy and efficient propeller shaft supporting member.

An anchorage plate or ring 17 is mounted to fit flat upon the front face of the bearing plate 10, the bushing 11 projecting through the ring or anchorage plate, as clearly shown in the drawing. This anchorage plate 17 is provided with a plurality of outwardly projecting and inturned tongues 18 formed preferably upon the periphery of the anchorage plate or ring 17, these tongues 18 extending toward the propeller and away from the hanger 4. An elastic band 21 of any suitable or desired structure is passed under and around these tongues 18 as shown in the drawing, and the hanger member 4 is provided upon the side flanges 19 thereof with apertures 20 through which the elastic band 21 is threaded. The hanger member 4 is provided with a flange 22 at the bottom thereof having an aperture 23 formed therein, and a plurality of apertures 24 are formed in the front plate 7 of the hanger near the top thereof, as shown clearly in Figures 3 and 6 of the drawing. In carrying out the proper elastic anchoring of the bearing and anchorage plate, the elastic band 21 is threaded through the apertures 24 and then under one of the tongues 18, the band then extending through one of the apertures 20, and then under the next adjoining tongue 18, then through the lower aperture 23, and then under the next adjoining tongue 18, and then through the opposite side aperture 20 and finally under the remaining tongue 18 when the ends of the elastic band may be secured together, thereby

providing an efficient elastic anchorage for the anchorage plate and bearing plate whereby the bearing plate may be normally held flat against the front face of the front plate 7, as shown in Figure 2, to normally support the propeller shaft 12 in proper alignment. Should, however, the propeller come in contact with a foreign object, the bearing so constructed and designed as above set forth, will permit of a proper and immediate flexing of the required amount to prevent injury to the propeller, the elastic anchorage providing a bearing which will be in the nature of an elastic universal joint permitting the flexing of the bearing at any angle.

From the foregoing description, it will be seen that a very simple and efficient flexible mounting for the propeller shaft has been produced which will be cheap in structure and which will possess a minimum weight as is necessarily required in a device of this particular character.

It has long been recognized in this particular line of invention that the provision of a flexible mounting for the propeller is very essential. Since a model airplane flies without pilot control, it is liable to, and in nearly every flight the model airplane will, strike its propeller against some object and may even nose over while moving along the ground. Hence, it is essentially important that the shaft be so mounted as to permit the same to flex.

It is well recognized that in the usual shaft hanger, the horizontal propeller thrust line is maintained only by reason of the rubber band motor which is attached to the shaft thereof, and that during operation the line of thrust will be continually changing since the rubber unit when unwinding will not do so with perfect smoothness. This will cause a yanking of the shaft in view of the fact that the horizontal alignment of the shaft is dependent upon the motor and the thrust line will be continually changing, and cause the propeller to revolve in an eccentric circle. The propeller efficiency is in this manner cut down and often undesirable vibration is set up throughout the plane.

In my invention, however, I have provided for the propeller shaft a solid bearing prepared of turned brass which is normally held against the face of the hanger by means of the rubber band anchorage 21 illustrated and described above, and in this way the shaft is, under ordinary conditions, held in straight alignment and if some dearranging force is applied to the propeller, such for instance, as the striking of the propeller against a foreign object, the elastic anchorage immediately allows the propeller to flex the required amount and thus prevent injury.

With this structure described, I provide a smooth and true running propeller which, with a proper design and selection of material, will also prove a very light bearing arrangement. The relative short propeller shaft will also, as stated above, permit of a maximum swinging action without fear of the propeller shaft coming in contact with the motor stick. The provision of the solid turned bearing will greatly enhance the value of the device in maintaining the propeller in its true and proper position.

It should be understood that certain detail changes in the mechanical structure may be employed without departing from the spirit of the invention, so long as these changes fall within the scope of the appended claims.

Having described the invention, what is claimed as new:—

1. A bearing for a model airplane shaft comprising a hanger, said hanger having a plurality of apertures formed therein, a bearing plate mounted upon said hanger and normally lying snugly thereon for supporting a propeller shaft, an anchorage ring carried by said bearing plate, said ring having ears formed thereon, and an elastic band threaded through said apertures in said hanger and extending over said ears for flexibly supporting said bearing plate in proper alignment with respect to said hanger.

2. A bearing for a model airplane shaft comprising a hanger, said hanger having a plurality of apertures formed therein, a bearing plate mounted upon said hanger and normally lying snugly thereon for supporting a propeller shaft, an anchorage ring carried by said bearing plate, said ring having ears formed thereon, and an elastic band threaded through said apertures in said hanger and extending over said ears for flexibly supporting said bearing plate in proper alignment with respect to said hanger, said ears being formed upon the periphery of said anchorage ring and being forwardly extended and inwardly inclined.

3. In combination with a motor stick, of a bearing for a model airplane shaft comprising a hanger member embodying a right-angular structure provided with an elongated finger for facilitating the securing of the hanger member to said motor stick, said hanger member comprising a front plate and side and end flanges, said front plate having an aperture extending substantially centrally therethrough, a bearing having an extended bushing seated in said aperture, said front plate and flanges having apertures formed therein, an anchorage ring carried by said bearing and having projecting tongues and a flexible band passing through said last mentioned apertures and engaging said tongues for flexibly supporting said bearing in engagement with said hanger.

4. In a model airplane, a propeller shaft, a support for said propeller shaft, a motor for said propeller shaft, and elastic anchorage means for anchoring said shaft support against rotation and permitting said support to flex, said elastic anchorage means being independent of said motor.

5. In a model airplane, a propeller shaft, a bearing, a support for said bearing, a motor for said shaft, and means for resiliently anchoring said bearing upon said support for normally maintaining the thrust line of the propeller uniform relative to said support irrespective of the operation of the motor.

6. In a model airplane, a propeller shaft, a bearing for said propeller shaft, a support for said bearing an elastic motor for driving said propeller shaft, and elastic means for resiliently anchoring said bearing upon said support independent of said elastic motor.

7. A mounting for a model airplane propeller comprising a support, a propeller shaft, a bearing for said propeller shaft, and resilient means directly engaging said bearing and resiliently holding said bearing in engagement with said support.

8. A mounting for a model airplane propeller comprising a support, a propeller shaft, a bearing for said propeller shaft, and an elastic band directly engaging said bearing and resiliently holding said bearing in engagement with said support.

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