March 3, 1931. R. T. DANIEL 1,795,165

FLEXIBLE PROPELLER SHAFT COUPLING FOR TOY AEROPLANES

Filed July 29, 1929

Fig. 1.

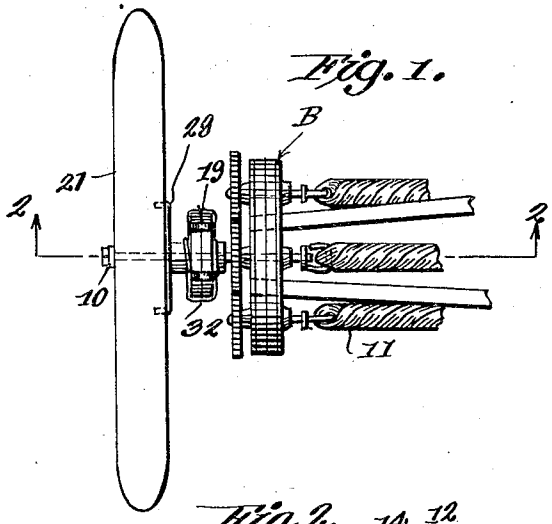


Fig. 2.

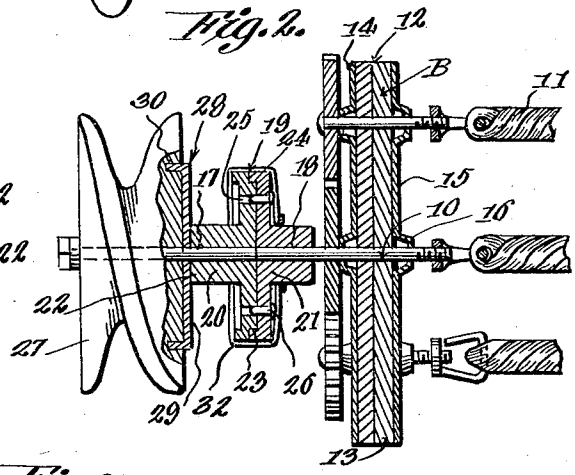


Fig. 6.

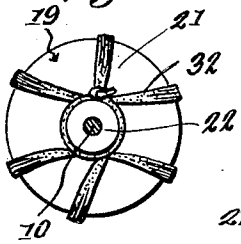


Fig. 3.

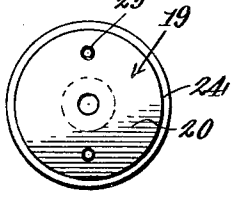


Fig. 4.

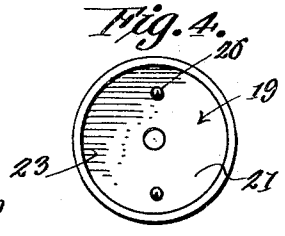
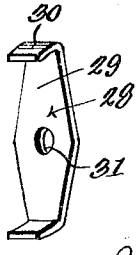


Fig. 5.



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UNITED STATES PATENT OFFICE

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FLEXIBLE-PROPELLER-SHAFT COUPLING FOR TOY AEROPLANES

Application filed July 29, 1929. Serial No. 382,015.

This invention appertains to toy aeroplanes and more particularly to the propeller shaft thereof.

In order to have a true running and efficient propeller, it is necessary that the propeller shaft be journaled in a solid stationary bearing. However, it frequently occurs with all types of models, that during the operation of flight, the propeller will strike against some solid object. Thus, the propeller shaft is sprung or bent, after which it is almost impossible to true it up again. This mishap may occur with the same shaft a sufficient number of times to cause the shaft to finally snap off. No model, no matter how well constructed, is immune to such an accident to its propeller and shaft.

It is therefore a prime object of this invention to provide a novel means for constructing the propeller shaft, whereby the shaft is permitted to flex or give when the propeller strikes an object, thereby effectively preventing injury to the propeller shaft and insuring the proper flight of the toy aeroplane at all times.

Another important object of my invention is the provision of novel means for forming a flexible coupling in the propeller shaft of a toy aeroplane, the coupling being of such a construction as to permit the easy assembling thereof.

A further object of my invention is to provide an improved flexible propeller shaft for aeroplanes of the above character, which will be durable and efficient in use, one that will be simple and easy to manufacture, and one which can be incorporated with a toy aeroplane at a very low cost.

With these and other objects in view, the invention consists in the novel construction, arrangement and formation of parts, as will be hereinafter more specifically described, claimed, and illustrated in the accompanying drawing, in which drawing:

Figure 1 is a fragmentary side elevation of a toy aeroplane showing the improved coupling incorporated in the propeller shaft thereof;

Figure 2 is a fragmentary longitudinal section taken on the line 2—2 of Figure 1 illustrating the construction of the coupling;

Figure 3 is a rear elevation of one of the members of the flexible coupling;

Figure 4 is a front elevation of the companion coupling member;

Figure 5 is a detail perspective view of the attaching bracket for connecting the propeller with one of the coupling members or sections, and

Figure 6 is a detail view with the propeller shaft in section illustrating the resilient means employed for connecting the shaft sections together.

Referring to the drawings in detail, wherein similar reference characters designate corresponding parts throughout the several views, the numeral 10 generally indicates a propeller shaft of a toy aeroplane B, the construction of which forms the subject matter of another application for patent filed by me of an even date herewith.

The propeller shaft 10 is driven from any preferred type of spring or rubber motor and can be driven from my novel rubber band motor partially shown in the drawings and indicated by the reference character 11, the motor forming the subject matter of another application for patent filed by me of even date hereof.

The aeroplane B embodies a front stationary nose plate or bulkhead 12 which in the present instance includes a laminated wood disk 13 having secured to its opposite faces aluminum disks 14 and 15. These disks are provided with bearings 16 for receiving the propeller shaft 10, which extends axially through the front nose plate or bulkhead 12. The propeller shaft 10, in accordance with my invention, includes an outer section 17 and an inner section 18, and these sections are connected by my novel shaft coupling 19.

The shaft coupling 19 includes a pair of companion disk shaped members 20 and 21 each of which includes oppositely extending hub portions 22 which are keyed, soldered or otherwise secured to their respective shaft sections 17 and 18. The forward face of the coupling section 21 is provided with a circular recess 23 which receives the circular boss

24 formed on the front coupling section 20. The section 20 is provided with inwardly directed openings 25 on opposite sides of the propeller shaft section 17 and these openings are adapted to receive pins 26 soldered or otherwise secured to the coupling section 21. The pins 26 engaging the walls of the openings 25 set up a driving connection between the shaft sections 17 and 18. The forward end of the shaft section 17 receives the propeller 27 which may be formed of wood or metal, just as desired. A suitable clip 28 is employed for connecting the propeller to the hub 22 of the coupling section 20 and this clip includes a diametrically extending body portion 29 having laterally extending lugs 30 which are embedded in and secured to the propeller 27. The central portion of the plate 29 is provided with an opening 31 for receiving the propeller shaft section 17 and this plate 29 can be soldered or otherwise secured to the hub 22.

I preferably connect the coupling sections 20 and 21 together by resilient or elastic means and as shown in the drawings, a rubber band is employed for this purpose. This rubber band, indicated by the reference character 32, is secured to the hub 22 of the section 21 and is then wrapped around the coupling sections 20 and 21 and finally secured to the hub 22 of the section 20.

It is obvious from this construction that when the aeroplane is in flight, and the propeller strikes an object, the shaft is permitted to give or flex due to the coupling sections 20 and 21 and the resilient connection thereof. Thus, no harm will result to the propeller shaft from this cause and the rubber band can be readily replaced when the same wears out.

From the foregoing description, it can be seen that I have provided a novel means for effectively protecting the shaft of a toy aeroplane against injury incident to the propeller striking an object while the aeroplane is in flight.

Changes in details may be made without departing from the spirit or the scope of this invention, but:

What I claim as new is:

1. In a toy aeroplane, a propeller shaft including a pair of sections, a coupling for connecting said sections together including a pair of companion disks secured respectively to the shaft sections, one of the disks having a circular recess and the other a circular boss fitted in said recess provided with openings arranged on opposite sides of the propeller shaft, pins carried by the other coupling section received in said opening, a propeller on one of the shaft sections, means for securing the propeller to the adjacent coupling section, and a rubber band connecting the coupling sections together.

2. In a toy aeroplane, a propeller shaft including a pair of sections, a disk carried by each section normally having mutual uniform contact with each other throughout their adjacent faces, and releasable means for normally holding said disks in contacting relation.

3. In a toy aeroplane, a propeller shaft including a pair of sections, a disk carried by each section normally having mutual uniform contact with each other throughout their adjacent faces, and yieldable means for normally holding said disks in contacting relation.

4. In a toy aeroplane, a propeller shaft including a pair of sections, a disk carried by each section normally having mutual uniform contact with each other throughout their adjacent faces, and elastic means passing around and over said disks for yieldably and normally holding said disks in contacting relation.

5. In a toy aeroplane, a propeller shaft including a pair of sections, a disk carried by each section normally having mutual uniform contact with each other throughout their adjacent faces, the adjacent faces of said disks interfitting and means for yieldably and normally holding said disks in contacting relation.

6. In a toy aeroplane, a propeller shaft including a pair of sections, a disk carried by each section, each disk provided with an irregular contacting surface and adapted to interfit, and means for yieldably holding the interfitting faces of said disks in mutual uniform contact with each other throughout their adjacent faces.

In testimony whereof I affix my signature.

RALEIGH T. DANIEL.