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BLADE WHEEL PROPELLER

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Fig. 1

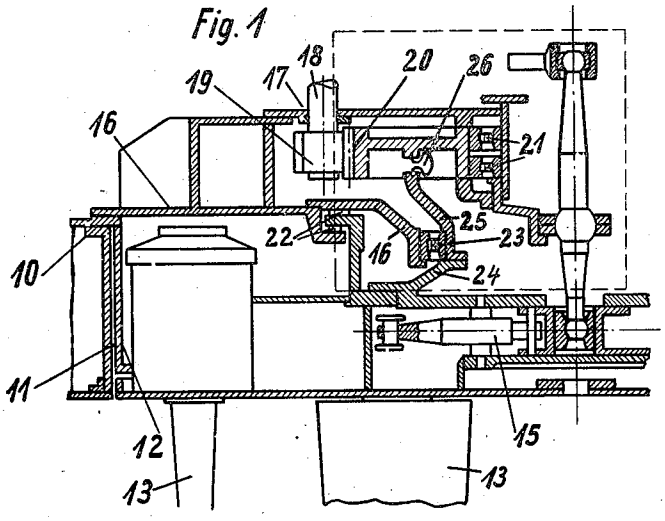


Fig. 2

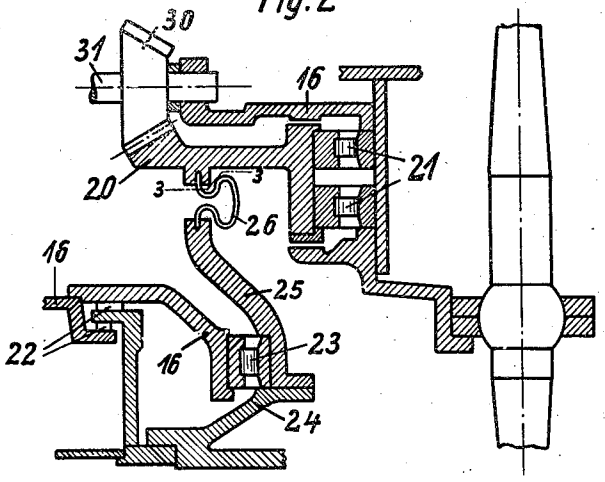
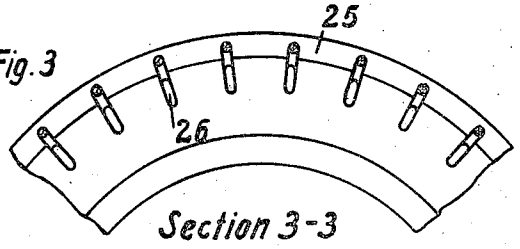


Fig. 3



Section 3-3

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BLADE WHEEL PROPELLER

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2 Claims. (Cl. 170—150)

This invention relates to blade wheel propellers in which the rotary members are actuated by means of toothed wheels or gears from a moving shaft. In the use of blade wheel propellers of this kind it has been found that the shocks to which the blades are subjected during their rotation in the water are transmitted to a relatively rigid connection of driving main gear and driving pinion. Also, the swinging movement of the blades causes reactions which are transmitted to the relatively rigid driving mechanism. Such actions bring about a rapid wear of the transmission gearing which is already under heavy load, and in some cases due to sudden shocks a breaking of the intermeshing teeth.

The object of the invention is to overcome the objections just pointed out and to provide an elastic connection between the wheel body and the driving gears whereby sudden shocks may be taken up and the swinging movement of the blades also compensated for.

For this purpose, the invention consists of a blade wheel propeller having a rotor and a driving gearwheel, each forming a coupling member, and an elastic, entirely metal coupling disposed between the coupling members.

The invention will be more fully described hereinafter and an embodiment thereof shown in the drawing, and the invention will be finally pointed out in the claims.

In the accompanying drawing:

Figure 1 is a vertical section of a part of a blade wheel propeller embodying this invention;

Figure 2 is a similar section of enlarged size with only part of the members shown in Figure 1; and

Figure 3 is a sectional plan view taken on the line 3—3 of Figure 2 of the elastic connection between driving gearwheel and the blade wheel propeller rotor.

Similar characters of reference indicate corresponding parts throughout the various views.

Referring to the drawing, and more particularly to Figure 1, a ship's hull 10 is shown with the usual opening 11 wherein seats the casing 12 of a known blade wheel propeller in the well-known manner. This blade wheel propeller has a plurality of blades 13 which are suitably actuated in oscillatory or swinging movement during their rotation. The mechanism for such swinging movement is generally indicated by 15, and a detailed description thereof is not entered into, as no novelty is claimed therein, and such mechanism is of known construction.

Upon the ship's hull 10 and above the opening 11, the blade wheel propeller casing 16 has an opening 17 through which the driving shaft 18 passes and extends into the casing of the propeller. The lower end of the driving shaft 18 is provided with a pinion gear 19, which in turn meshes with a driving gear 20 which is provided at its hub with a ball bearing 21 of known construction. A part of the casing 16 of the propeller is provided with a bearing 22, and another part is provided with a bearing 23. These bearings are direct pressure and thrust bearings. The part 16 is stationary, and cooperating with the bearings 22 and 23 is a rotor portion 24 of the blade wheel propeller, which rotor portion 24 extends upwardly as indicated by 25 towards the main driving gear 20. Between the main driving gear 20 and the upwardly extending rotor member 25, coupling springs, made entirely of metal and indicated by 26, are provided. A plurality of such springs 26 are circumferentially arranged so as to act as a mechanical connection between the rotating main driving gear 20 and the rotor portion 25, to be driven thereby. These coupling members are of elastic metal and are so arranged as to transmit the power from the main drive gear to the rotor portion 25, yet allow for a certain amount of elastic movement between the parts 25 and 20. Thereby, any shocks to which the propeller may be subjected are taken up by these elastic coupling members, and also any swinging movements of the blades are compensated by the elastic characteristic of these coupling members.

By the arrangement described, the wheel body and also the gearing are journaled in the ship's body without being disconnected from each other. Any vibrations or swinging movements and shocks of the wheel body are immediately taken up by the ship's body, whereas, the elastic coupling does not conduct any shocks or vibrations upon the gearing, so that the teeth of the gearing while in actuation are not injured or damaged or subjected to unnecessary wear.

In Figure 2, only part of the mechanism shown in Figure 1 is shown. Instead of a driving pinion 19, a driving gear 30, arranged on a horizontal axle 31, supported in the housing 16 is shown.

The lower side of the gearwheel 20 is provided with a plurality of circumferentially disposed spaced openings, and likewise, the upper side of the rotor 25. Preferably, these openings are in registration with each other. The torsionally elastic coupling springs 26 are generally U-shaped with inwardly bent portions and out-

wardly extending legs. The ends of the legs fit into the openings, either tightly or loosely. There is one spring for each pair of oppositely disposed openings. Thus, the coupling member formed by the gearwheel **20**, and the coupling member formed of the rotor **25**, are connected with each other by a plurality of circumferentially disposed spaced springs, as shown in Figure 3, having torsional elastic characteristics.

I have shown an embodiment of my invention, but it is clear that this is capable of variation and modification without departing from the spirit of the invention, and I, therefore, do not wish to be limited to the precise details of constructions set forth, but desire to avail myself of such variations, modifications and adaptations as come within the scope of the appended claims.

What is claimed is:

1. A blade wheel propeller assembly, comprising a blade wheel propeller, a coupling member therefor, a driving mechanism for said blade wheel propeller, another coupling member attached to and forming part of said mechanism, and an elastic coupling disposed between said coupling members, said elastic coupling being a plurality of circumferentially disposed generally C-shaped springs bridging the coupling members, and each spring having one end in one coupling member and the other end in the other coupling member.

2. In a blade wheel propeller assembly including a main driving member, a circular rotor driven by said member, a plurality of oscillable blades substantially parallel with each other having vertical axes, circumferentially placed around the center of the circular rotor and adapted to act upon a fluid, the combination of two independent upper and lower annular parts of said circular rotor, one for the blades and one for the driving member, and circumferentially disposed torsionally elastic members, placed between the upper and lower parts of said rotor and adapted to transmit torque from the upper part to the lower part of the rotor, whereby torsional vibration shocks resulting from the action of the medium upon the blades are being prevented from being transmitted to the driving member.

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