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ROTARY PUMP

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Fig. 1.

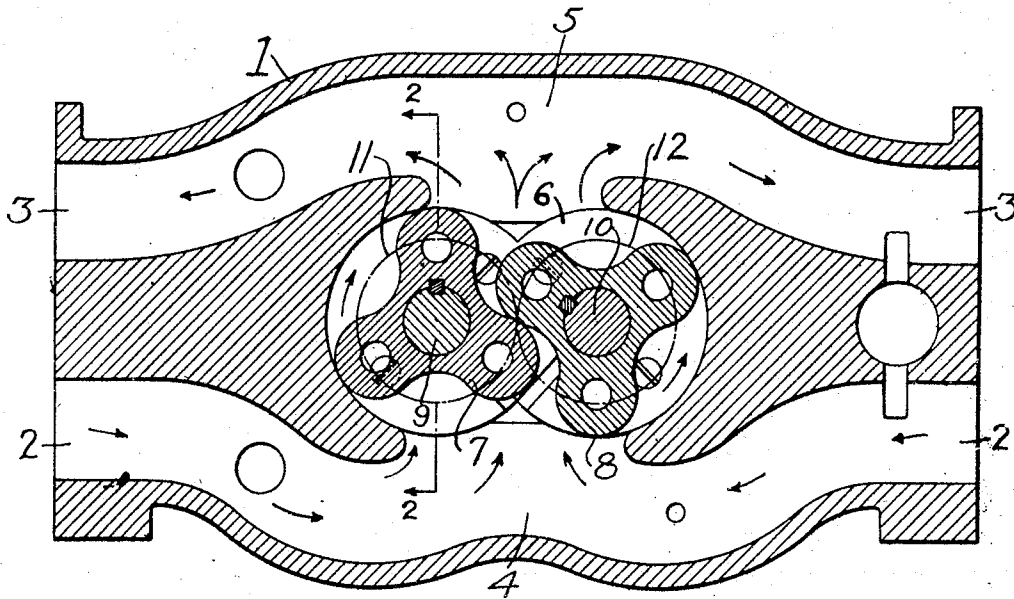
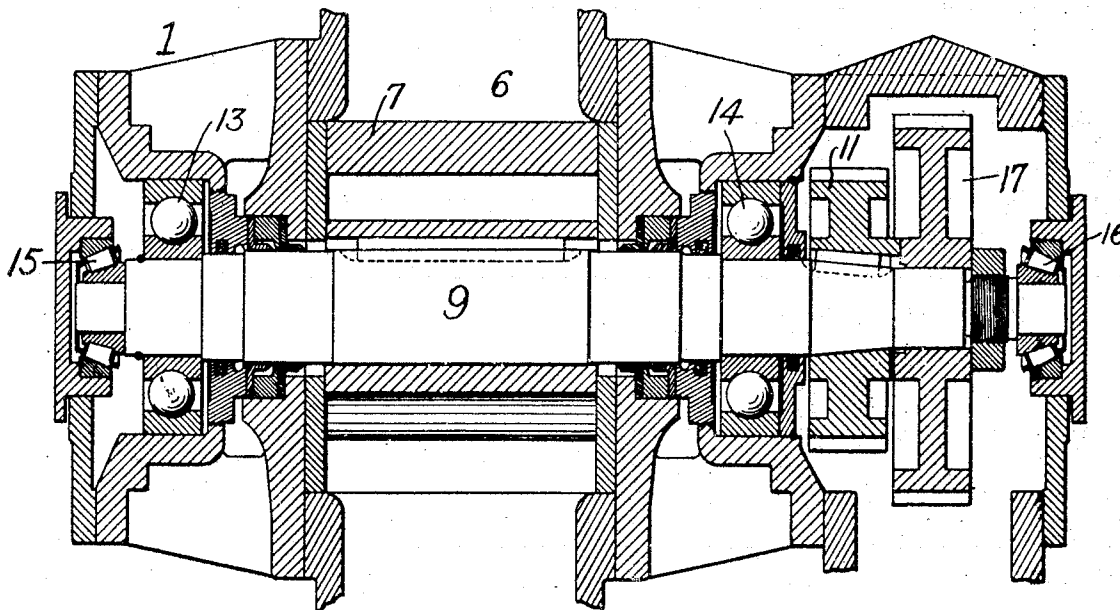


Fig. 2.



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ROTARY PUMP

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This invention relates primarily to improvements in rotary pumps of the type employing geared, cooperating rotors. The principal object of the invention is to provide a novel mounting for the rotors resulting in increased efficiency in the pump and eliminating to a large extent destructive distortions of the rotor shafts.

More specifically, the principal object of the invention is to provide a novel mounting for rotor shafts more or less positively retaining the rotors in parallel alignment and largely eliminating distortion or flexing of the shafts.

In the attached drawings:

Figure 1 is a transverse section through a pump of the class to which the present invention primarily relates, and

Fig. 2 is a section on the line 2—2, Fig. 1.

With reference to the drawings, the pump as illustrated comprises a casing 1 having intake ports 2, 2 and discharge ports 3, 3, these ports connecting respectively with intake and discharge channels, 4 and 5 respectively. Intermediate the channels 4 and 5 is a chamber 6 in which are mounted cooperating rotors 7 and 8. These rotors are mounted respectively on shafts 9 and 10 which are geared together by gears 11 and 12, and are journaled in the pump casing, as hereinafter described. The shaft 9 also carries a gear 17 through which power is applied to the shaft to drive the rotors. The operation of this type of pump is well understood in the art, and in the drawings I have indicated by means of arrows the flow in and through the pump casing from the intake to the discharge ports.

By reason of the high rate of speed at which the rotors of this type of pump are operated and by reason further of the relatively high pressures set up in the casing and between the two rotors, there has been a tendency for the shafts to bend or flex in operation, with the result that true parallel alignment of the shafts is destroyed and the efficiency of the pump correspondingly adversely affected.

It is the object of the present invention to overcome these defects and thereby to pro-

vide a pump having relatively high efficiency in operation.

Referring to Fig. 2, showing a longitudinal section through one of the shafts, it will be noted that the shaft is supported upon two main bearings 13 and 14 in the pump frame or casing. These bearings are placed as close to the ends of the rotor as is consistent with adequate packing of the casing ports through which the shaft 9 extends. In addition to the bearings 13 and 14, I provide at the ends of the shaft additional bearings 15 and 16, preferably of the thrust type, and which function not only to fix the axis of the shaft but also prevent axial movement of the shaft in the main bearings. It will be understood that for any flexure of the shaft adjacent the ends of the rotor there is normally a corresponding movement of the shaft extremities, and accordingly by placing the bearings 15 and 16 at the ends of the shaft I largely overcome the tendency of the shaft to flex in operation, as previously described. I thereby not only obtain a considerable increase in operating efficiency, due to the more positive maintenance of the rotors in true parallel alignment, but also effectively prevent fatigue and eventual rupture of the shaft.

I claim:

1. A liquid rotary pump comprising a casing, coaxing rotors in said casing, shafts for said rotors extending through the casing at both ends, a plurality of bearings for each shaft extremity, said bearings being spaced apart, with one bearing of each set located in sufficiently close proximity to the rotor to prevent local flexure in the intermediate rotor-carrying portions of the shafts, and said bearings cooperating to maintain all portions of the respective shafts in substantial alignment.

2. A liquid rotary pump comprising a casing, coaxing rotors in said casing, shafts for said rotors extending through the casing at both ends of the rotors, packing means for the joints between the casing and the shafts, and a plurality of bearings for each projecting shaft extremity outwardly of said packing means, the bearings of each set being

spaced apart, with one bearing of each set located in sufficiently close proximity to the ends of the rotor to prevent local flexure in the intermediate or rotor-carrying portions of the shafts, and said bearings cooperating to maintain all portions of the respective shafts in substantial alignment.

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