

Jan. 14, 1930.

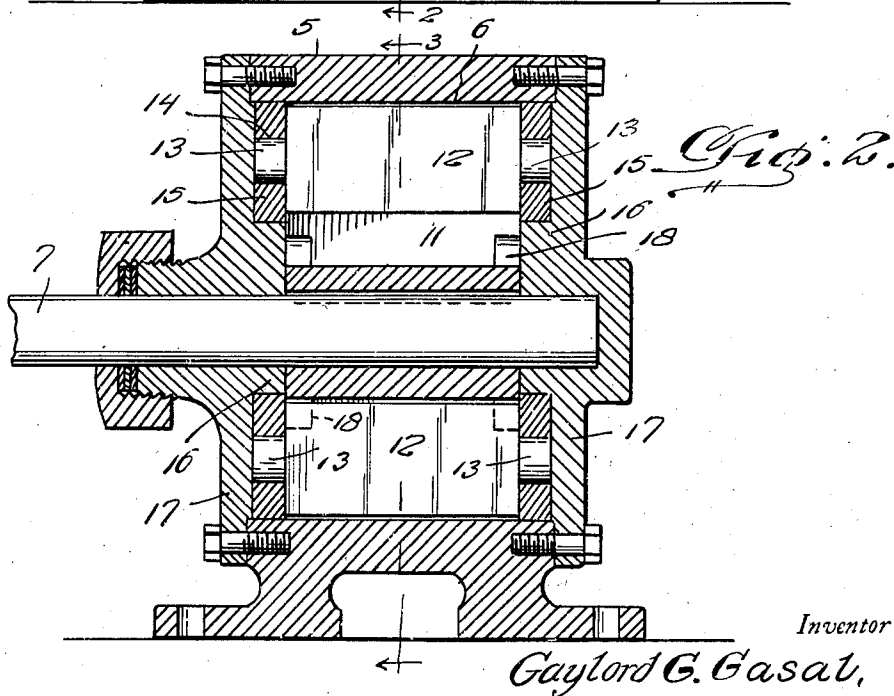
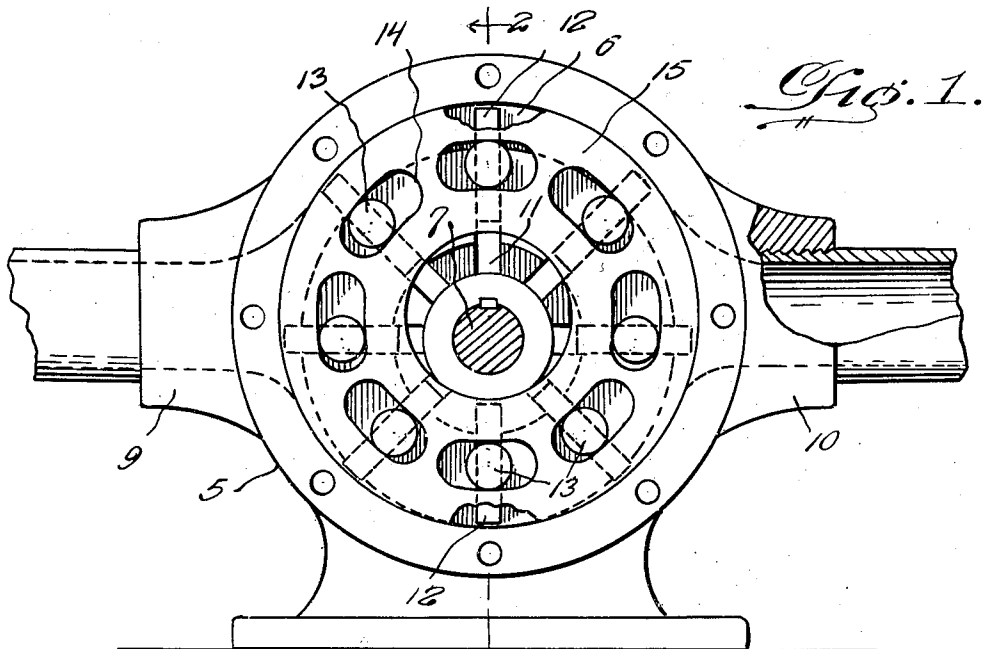
G. G. GASAL

1,743,539

ROTARY PUMP

Filed April 23, 1928

2 Sheets-Sheet 1



Inventor

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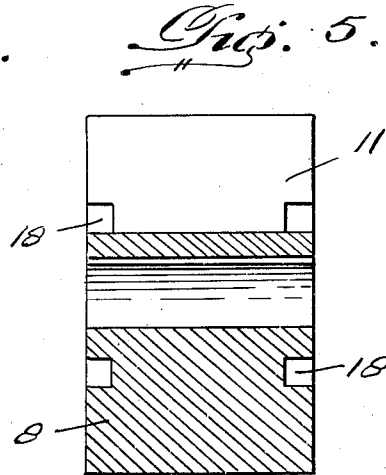
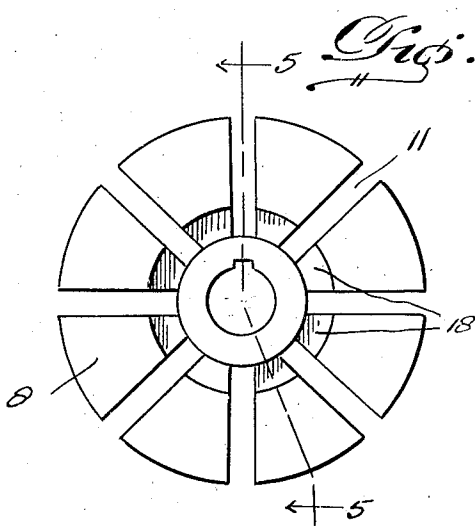
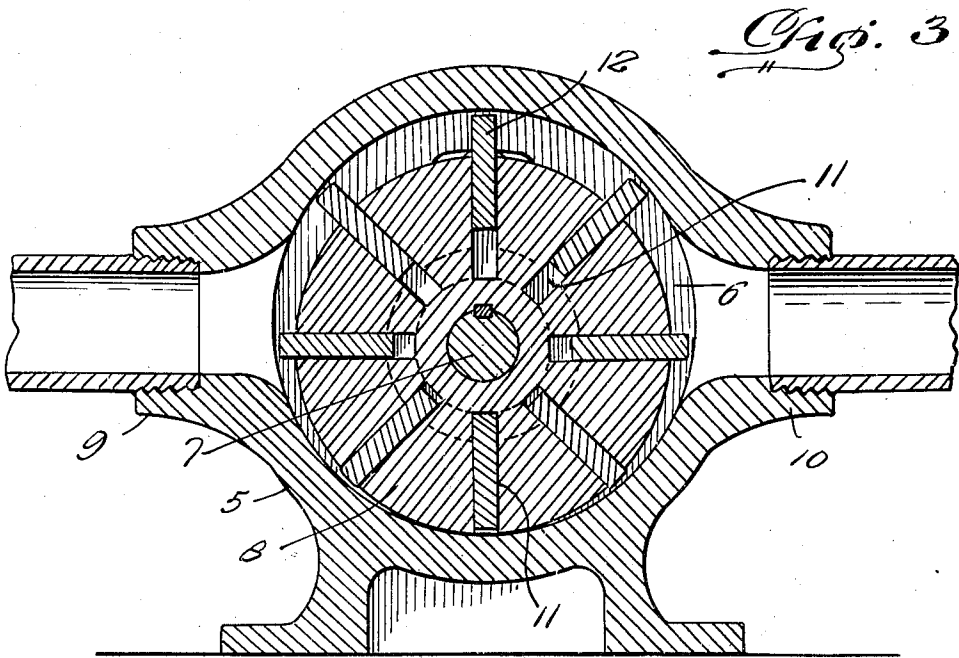
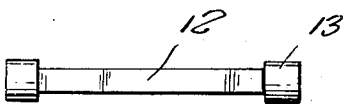


Fig. 6.



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UNITED STATES PATENT OFFICE

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ROTARY PUMP

Application filed April 23, 1928. Serial No. 272,245.

My invention relates to rotary pumps or motors of that type which embodies a casing or shell having a cylindrical chamber in which is operative a driving rotor carrying radial blades or vanes having a defined orbital movement with a resultant reciprocation of the blades or vanes in the guide slots formed in the rotor.

In the conventional forms of such type of rotary pump, the outer edges of the blades have frictional contact with the inner cylindrical surface of the casing chamber, or pintles on the inner edges of the vanes travel in tracks or follow the surfaces of cams, causing tremendous friction, producing rapid wear, and taking excessive power. Also, in such conventional forms of rotary pump, the blades project materially beyond the periphery of the rotor when they approach a given position, with the result that the resistance of the fluid on the exposed portions of the blades rock or cant the latter and cause them to bind across the edges of their guideways with undue friction.

The primary object of the present invention is to improve the construction of rotary pumps of the above type, so that the above mentioned friction with its resulting wear is practically eliminated.

In other words, a feature and advantage of the present improvement is to provide improved means for the effective bearing or supporting of the blades or vanes at all positions thereof, so as to hold the blades or vanes at all times a proper distance from the inner cylindrical surface of the casing chamber, thereby enabling them to run freely with respect to the rotor, relieving them of all frictional contact against the peripheral surface of the casing chamber, and consequently materially reducing the wear.

The invention consists in the novel form, combination and arrangement of parts hereinafter more fully described, shown in the accompanying drawings and claimed.

In the drawings:

Figure 1 is a side elevational view, with one end cover removed, of a rotary pump embodying the present invention.

Figure 2 is a transverse section on line 2—2 of Figure 1.

Figure 3 is a longitudinal section on line 3—3 of Figure 2.

Figure 4 is a side elevational view of the rotor.

Figure 5 is a transverse section on line 5—5 of Figure 4; and

Figure 6 is an edge plan view of one of the blades or vanes.

Referring more in detail to the drawings, 5 indicates a shell or casing which forms a cylindrical chamber 6 through which extends an eccentrically mounted shaft 7 on which is secured a rotor 8 having a diameter less than that of the chamber 6 and located eccentrically in the latter with its lower side running close to the contiguous portion of the cylindrical inner wall of the shell 5 and leaving a material space between the top of the same and the upper portion of the inner surface of the chamber 6. One side of the shell is provided with a connection 9, and the opposite side is provided with a connection 10, such connections being selectively capable of use as inlet and outlet connections and extending laterally from the peripheral wall of the shell 5.

The rotor 8 is provided with a plurality of radial guide slots or recesses 11 extending from end to end in the rotor. In each guide slot 11 is slidably mounted a flat blade or vane 12, which, when it is retracted, approaches the inner end of its guide slot, and as the rotor rotates, the blade moves outwardly to driving position, forming a movable wall extending between the upper portion of the rotor 8 and the opposite spaced upper surface of the chamber 6.

It is desirable to prevent the blades 12 from having frictional contact with the inner

cylindrical surface of the chamber 6 and, at the same time, to prevent their binding on the transverse shoulders formed by the outer ends of the walls of the guide slots 11, and this is accomplished by the provision of means effective to carry the blades as they pass the top portion of the inner cylindrical surface of chamber 6 during the operation of the pump. in the shell adjacent the opposite ends of the rotor, said rings being formed with circumferentially arranged arcuate slots, and pintles on the ends of the blades operable within the respective registering slots in the runner rings, the peripheral outer edges of the runner rings having engagement with the inner peripheral wall of the shell. 70

In testimony whereof I affix my signature.

GAYLORD G. GASAL. 75

10 A preferred form of such means consists in the provision of blades 12 of such length that the major inner portions thereof are within the guide slots 11 when the blades are in their position of maximum projection as shown at the top of Figure 3, and the provision of pintles 13 on the ends of the blades 12 adjacent their outer edges, or materially outwardly of their inner edges, fitting in arcuate elongated openings 14 provided in runner rings 15, which rings are mounted at opposite ends of the rotor on cylindrical bearings 16 provided concentric with the chamber 6 on the inner faces of end covers 17 for the shell 5, and have their peripheral edges engaging the inner cylindrical surface of the shell 5. 80

The rings 15 are driven by the blades or vanes 12, the openings 14 being of sufficient length to allow the blades to pass the two centers. The openings 14 are so arranged and the pintles 13 are so fitted therein that the vanes are held at all times at proper distance from the surface of the chamber 6 to relieve them of all frictional contact with such surface. A further natural result is that the rings 15 and pintles 13 determine the orbital movement and position of the several blades or vanes in the operation of the pump. 85

In order to relieve pressure behind the several blades or vanes, the inner ends of the guide slots 11 are serially connected by means of arcuate slots 18 provided in the opposite ends of the rotor 8 concentric with and adjacent the axis of the latter. 90

45 Minor changes may be made without departing from the spirit and scope of the invention as claimed. 95

I claim:

50 In a rotary pump, a shell, a rotor eccentrically mounted therein, said rotor including a solid body formed with a central bore, and spaced radial slots that extend inwardly from the periphery of the body to a point adjacent said bore, the body being formed with circumferentially extending spaced arcuate slots in the opposite ends of the same, said arcuate slots being disposed concentric with and adjacent the bore of the body and affording communication between the radial slots at the inner ends thereof, blades slidably arranged in the radial slots, and means to prevent the blades from having frictional contact with the inner cylindrical wall of the shell where the liquid passes through the pump comprising runner rings mounted for rotation with- 110 115 120 125