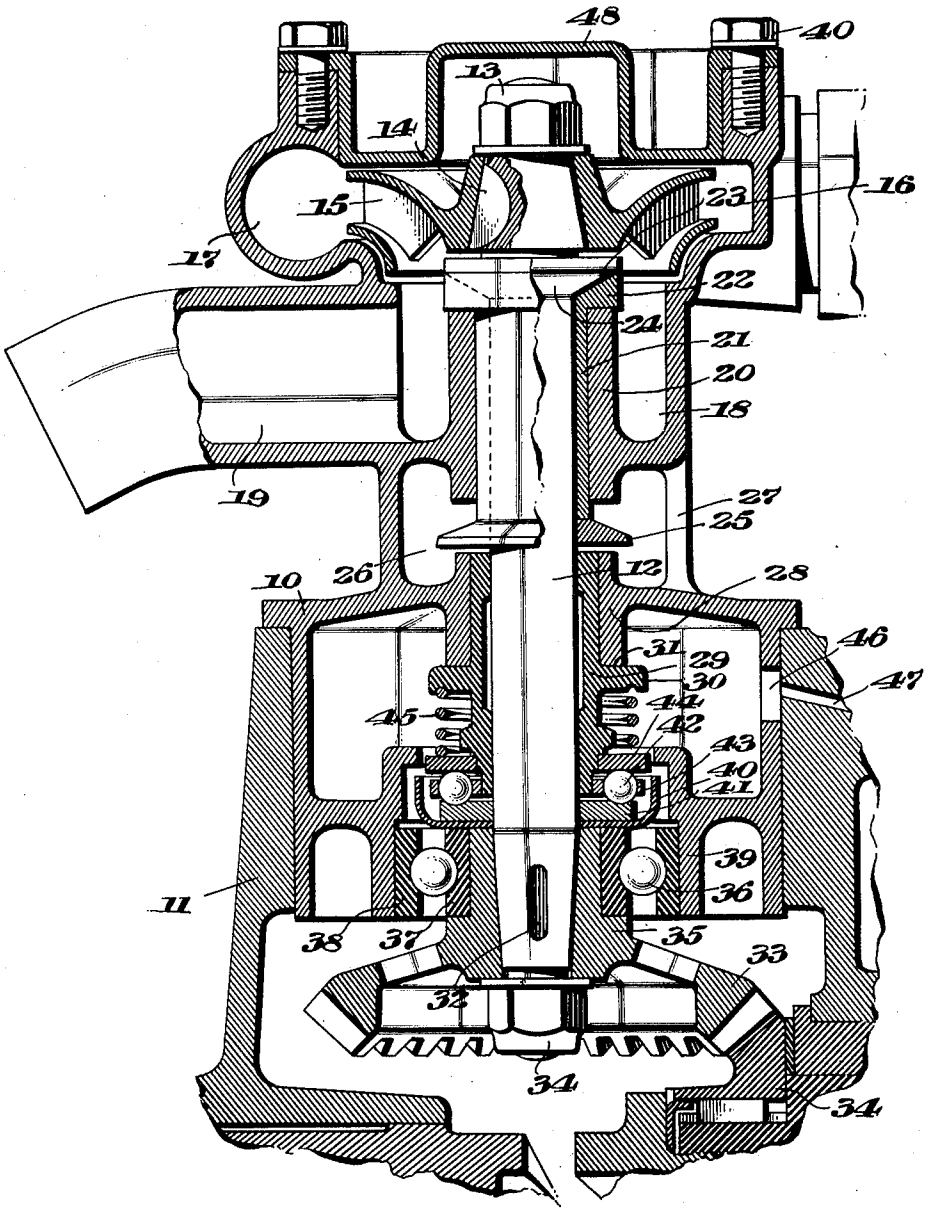
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J. G. VINCENT

PUMPING MECHANISM

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PUMPING MECHANISM.

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To all whom it may concern:

Be it known that I, JESSE G. VINCENT, a citizen of the United States, and resident of Detroit, Wayne County, State of Michigan, have invented certain new and useful Improvements in Pumping Mechanism, of which the following is a specification.

This invention relates to hydrocarbon motors, and more particularly to pumping mechanism for circulating water or other cooling medium for hydrocarbon motors.

The object of the invention is to provide a pump and driving connection therefor, that will be simple in construction, may be easily manufactured and will be efficient in operation.

Another object of the invention is to provide pumping mechanism having means for preventing leakage of the fluid during the operation of the pump, and more particularly when the pump is idle.

Another object of the invention is to provide means for taking up the thrust of the driving connections for the water pump of the hydrocarbon motor.

Further objects will appear as the description proceeds, and from the accompanying drawing in which there is illustrated in vertical section one embodiment of the pumping mechanism constructed in accordance with my invention.

The pump casing 10 is mounted, in this instance, upon a portion 11 of the crank shaft casing of the motor, the casing 10 extending downwardly into the casing 11 as shown. In the present instance the pump shaft 12 is mounted vertically, the upper end of the shaft having a conical seat, on which is secured, by means of the nut 13 and key 14, a pump 15. The upper end of the pump casing 10 is provided with an annular opening 16, in which the impeller is located, this opening leading into a spiral conduit 17 of the usual construction on this type of pump, the conduit 17 forming the discharge conduit for the pump. The casing 10 is also provided below the opening 16 with a fluid receiving chamber 18, this chamber receiving the cooling water or other cooling medium through an inlet pipe 19. The inner wall of the chamber 18 is annular in shape as indicated at 20, and this wall receives and houses a bushing 21, the latter having a laterally extending flange 22 at its upper end. The upper surface of the flange 22 is conical in form as indicated at 23, and this surface forms a seat for a corresponding conical flange 24, formed on the pump shaft 12 below the conical portion of said shaft.

The lower end of the bushing 21 contacts with a throw off ring 25, this member being tightly fitted on the shaft 10 to prevent relative movement of the ring on the shaft. The casing 10 has formed therein, below the chamber 18, an annular chamber 26, which is adapted to receive any water or other fluid which leaks down between the bushing and the annular wall 20, and this chamber is provided with an opening 27 through which the fluid may escape. The fluid passing downwardly in the manner indicated engages the throw off ring 25, and is discharged by this ring into the chamber 26 and escapes through the opening 27.

The casing 10 is provided below the chamber 26 with an annular bearing portion 28, this bearing portion receiving and forming a housing for a bushing 29. The bushing 29 has formed thereon or secured thereto a laterally extending flange 30 adapted to engage the lower end 31 of the bearing portion 28 of the casing 10. The lower end of the shaft 12 has secured thereto by means of a key 32, a bevel gear 33, this gear being also secured by nut 34, carried by the lower end of the shaft. The gear 33 meshes with the bevel gear 34, carried by the crank shaft of the motor, and these gears constitute the driving means for the shaft. The hub of the gear 34, as indicated at 35, is extended upwardly and is mounted in a ball bearing 36 having an inner ball race 37 and an outer ball race 38, the latter being positioned in a bearing portion 39, formed in the casing 10. It should be noted that the ball race 38 is loosely mounted in the bearing portion 39, whereby the ball race may move longitudinally in the portion 39.

In order to take up the thrust, caused by the gearing connection 33, 34, a thrust bearing is provided intermediate the flange 30, formed on the bushing and the annular ball

bearing 36, 37, 38. There is mounted on the shaft 10, above the hub 35 of the gear 33 and above the annular ball bearing, a cage 40, which is cup shaped, and extends upwardly surrounding a collar 41, also mounted on shaft 12 and a ball bearing 42, which is carried by a ball race 43. The balls 42 of the ball bearing seat on the collar 41 and also on a collar 44, and there is positioned intermediate the flange 30 of the bushing 29 and the collar 44, a coil spring 45. Since the flange 30 is prevented from upward movement by its engagement with the lower surface 31 of the bearing portion 28 of the casing 10, the spring 45 will press downwardly against the collar 44, and this downward thrust will be communicated through the collar 44, ball bearing 42, collar 41, hub 35 and ball bearing 36, 37, 38 to the shaft 12, thereby counteracting the upward thrust given to this shaft through the gearing connection 33 and 34. This downward thrust of the spring 45, being communicated to the shaft 12 in the manner described, also forces the flange 24, formed on the shaft into engagement with the flange 22, formed on the bushing 21, thereby maintaining these members in close contact or engagement with each other, and preventing the leakage of any water or other fluid from the chamber 18 between these surfaces and downwardly between the shaft and the bushing. When the pump is operated, the direction of flow of the fluid will, of course, be upwardly in the chamber 18 and outwardly, and in view of this motion of the fluid, there is only a slight tendency of the fluid to leak between the surfaces 22 and 24. When the pump is idle, however, there is no motion of the fluid, and these surfaces 22 and 24 tend to separate and permit the passage of fluid between them, and this tendency is counteracted by spring 45 in the manner described.

The casing 10 is provided, as shown at 46, with a lateral opening, through which oil is received from a passage 47, formed in a portion of the crank shaft casing, this passage being connected in any suitable manner with the oil circulating system of the motor. A cover 48 is secured, as by bolts 49, to the upper end of the casing, thereby enclosing the annular chamber 16 and spiral conduit 17, which form the impeller cage.

From the above description, it will be seen that a simple and practical construction of pumping mechanism has been provided, and, moreover, a construction having means for effectively preventing the leakage of the fluid being operated upon. Means has also been provided for coacting with the pump shaft, and the cooperating elements, for taking up the end thrust of this shaft, caused by the driving gearing.

While I have, in the above specification, described one specific embodiment of my invention, it should be understood that the invention is capable of modification and that changes in the construction and in the arrangement of the cooperating parts may be made without departing from the spirit or scope of the invention as expressed in the following claims.

Having described my invention what I claim and desire to secure by Letters Patent is:

1. In combination, a pump casing having a fluid receiving chamber, said chamber having an inner wall forming a bearing, a bushing mounted in said bearing, a shaft mounted in said bushing, and means for maintaining said shaft and bushing in close engagement with each other to prevent the leakage of fluid from said chamber between said shaft and bushing.

2. In combination, a pump casing having a fluid receiving chamber, said chamber having an inner annularly formed wall, a bushing mounted in said annular wall, a shaft mounted in said bushing, and resiliently actuated means for maintaining said shaft and bushing in close engagement with each other to prevent the leakage of fluid from said chamber between said shaft and bushing.

3. In combination, a pump casing having a fluid receiving chamber, said chamber having an annular wall, a bushing mounted in said annular wall, a shaft mounted in said bushing, and means including a resiliently actuated thrust bearing for said shaft for maintaining said shaft and bushing in close engagement with each other to prevent leakage of fluid from said chamber between said shaft and bushing.

4. In combination, a pump casing having a fluid receiving chamber, said chamber having an inner annular wall, a bushing mounted in said wall and having laterally extending flange, a shaft mounted in said bushing and having a lateral flange engaging a flange on said bushing, and resiliently actuated means for maintaining said flanges in close contact with each other to prevent the leakage of fluid therebetween.

5. In combination, a pump casing having an impeller cage at one end thereof and an annular chamber intermediate the ends thereof, a pump shaft mounted in said casing, an impeller carried by said shaft and positioned in said impeller cage and a throw off ring secured to said shaft and positioned in said chamber for discharging fluid which has leaked downwardly on the shaft.

6. In combination, a pump casing, a pump shaft rotatably mounted therein, a bushing carried by said casing and surrounding said shaft, said bushing having a laterally extending flange, a ball thrust bearing for

said shaft and a spring surrounding said bushing and engaging the flange thereon and said ball thrust bearing.

7. In combination, a pump casing, an annular ball bearing mounted therein, a pump shaft mounted in said ball bearing, a thrust bearing for said shaft disposed above said ball bearing, and resiliently actuating means for forcing downwardly on said thrust bearing, said means coacting with said annular ball bearing.

In testimony whereof I affix my signature.

JESSE G. VINCENT.