June 30, 1936. S. J. HAMILTON 2,045,851

PUMP

Filed Sept. 12, 1934

Fig. 1.

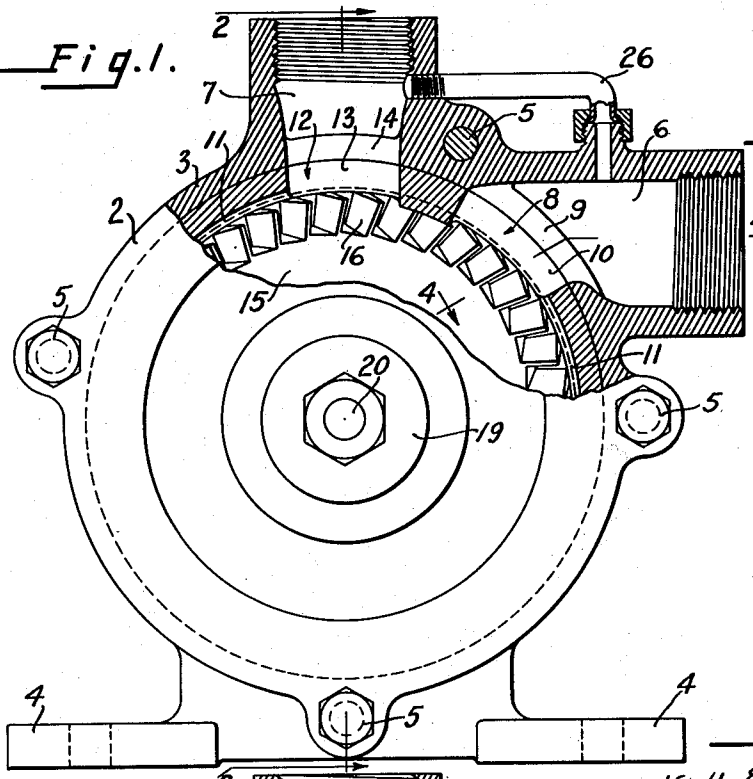


Fig. 3.

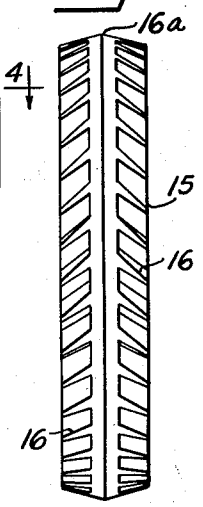


Fig. 2.

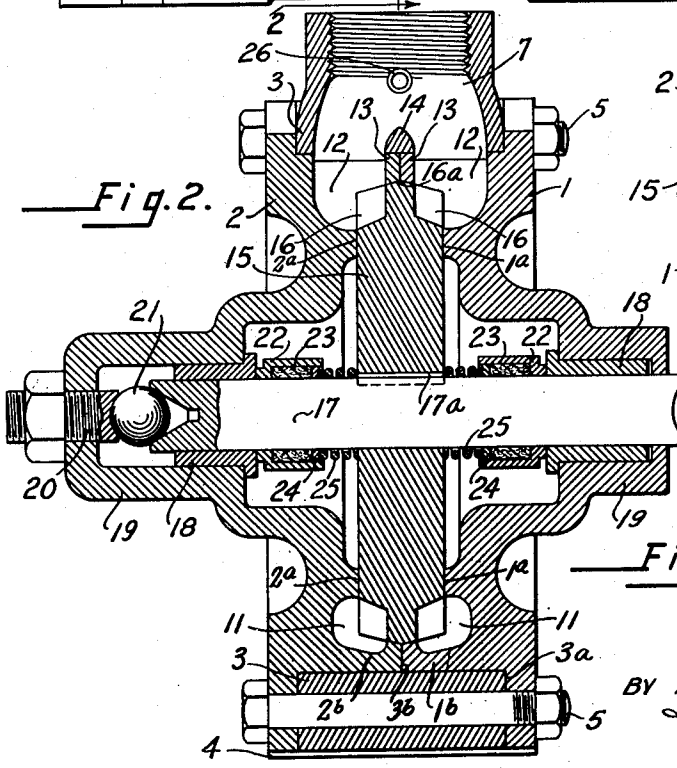


Fig. 4.

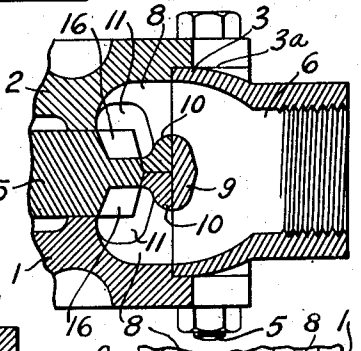
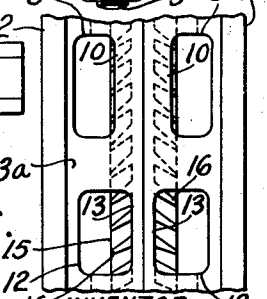


Fig. 5.



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PUMP

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Application September 12, 1934, Serial No. 743,639

1 Claim. (Cl. 103—96)

This invention relates to improvements in pumps and has for its object to provide a pump for pumping liquids, and so constructed that the air entrained in the liquid can not escape through the walls of the pump casing.

It is also an object of this invention to provide a turbine pump composed of a casing having side members surrounded by a sealing ring which cooperates with the side members in the formation of an inlet and an outlet for the casing.

It is also an object of this invention to provide a pump consisting of a casing having a pair of contiguous side members and a surrounding sealing ring with a rotor therein having impeller teeth by which a fluid may be caused to flow from an inlet to an outlet in a plurality of streams.

These and other advantages will appear from the following description taken in connection with the drawing.

Referring to the drawing:

Figure 1 is a side elevation of the pump with the parts thereof adjacent to the inlet and the outlet broken away.

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

Figure 3 is a view showing the pump rotor.

Figure 4 is a section on line 4—4 of Figure 1.

Figure 5 shows the relation of the inlet and the outlet to each other and to the rotor.

The pump as a whole is composed of two essential parts, a casing and a rotor mounted for rotation within the casing. The casing is composed of two contiguous sides 1 and 2 having annular internal ridges 1*a* and 2*a* and annular peripheral flanges 1*b* and 2*b*. These side members in the present illustration are substantially circular, with their adjacent faces contiguous and their peripheries surrounded by a sealing ring 3, which is seated within a groove 3*a* formed in the peripheries of the sides. This ring in conjunction with the sides forms a casing that is substantially fluid-proof. No air that is entrained in the liquid can pass out between the sides of the casing because the sides are contiguous and fit closely together except at the inlet and the outlet, and the joint 3*b* formed by the two sides fitting together is sealed by this ring.

The casing is supported by means of feet 4 which extend laterally from the sealing ring. The sealing ring has formed thereon an inlet projection 6 and an outlet projection 7. The inlet projection 6 extends substantially tangentially from the casing while the outlet 7 extends substantially radially to one part of the periphery of the casing.

The sides have formed therein inlets 8 separated from each other by means of a rib 9 formed on the ring and by means of parts 10 formed on the sides (Figure 4). Extending from the inlets 8 to the outlets 12 are channels or passageways 11 (Figures 1 and 2). These channels or passageways are more or less annular and extend substantially around the sides of the casing from the inlet to the outlet. Each channel has an outlet 12 separated from each other by parts 13 of the sides and a rib 14 which is a part of the ring (Figure 2).

Within the casing and rotatably mounted therein is a rotor 15 in the form of a disc, which has on its periphery sets of teeth or fins 16. In the present instance there are two sets of these teeth or fins separated by means of a partition 16*a*. This partition, together with the rotor, serves to separate the two passageways or channels 11, thereby forming two distinct and separate passageways whereby fluid may pass from the inlet to the outlet due to the operation of the rotor.

The rotor is supported for rotation on a shaft 17 (Figure 2) to which it is suitably splined by means of spline 17*a*. This shaft is supported adjacent each end by bearings 18. These bearings are supported in cylindrical projections 19 formed on the sides. In the end of one of these projections is a screw 20 adapted to support between it and one end of the shaft a thrust ball 21.

Adjacent each bearing and around the shaft 17 is a sleeve 22, one end of which closely engages the shaft while the main body of the sleeve is slightly spaced from the shaft and provides a space for a packing 23, held therein by means of a ring 24 and a spring 25 between the ring and the side of the rotor. Suitable operating means for the shaft and rotor is attached to the end of the shaft remote from the thrust ball 21.

The teeth or fins are formed on each side and on the periphery of the rotor. These teeth project laterally from the central plane of the rotor at an acute angle to a plane perpendicular to the axis of rotation of the rotor (Figure 3). These teeth are also arranged at an acute angle to the diameter of the disc (Figure 1). The periphery of the rotor slopes laterally toward the axis of rotation from a plane passing through the center of the disc or rotor and perpendicular to its axis of rotation (Figure 2).

In the operation of the pump the rotor is caused to rotate so that the fluid is taken in at the inlet and discharged at the outlet. Because of the

close fit between the sides and the sealing ring the entrained air in the fluid, which is usually water, cannot escape but is discharged from the pump with the fluid or water.

I desire to comprehend within my invention such modifications as may be embraced within my claim and the scope of my invention. For instance, a by-pass 26 for diverting a portion of the flow may be provided.

Having thus fully described my invention, what is claimed as new and desired to be secured by Letters Patent, is:

In a pump, a casing comprising a pair of sides with contiguous axial flanges forming a peripheral channel and a sealing ring in said channel cooperating therewith to form an air seal, each of said sides having a pair of inwardly directed ridges thereon, a shaft mounted in said casing, a rotor on said shaft having a rib on its peripheral surface in sealing engagement with two of said inwardly directed ridges and its side faces in sealing engagement with the other inwardly directed ridges to form a plurality of pumping channels, said rotor having a plurality of buckets on the periphery thereof at each side of said rib, said sealing ring having ports forming a common inlet and a common outlet for said pumping channels, said sealing ring surrounding said casing and having a rib extending across said ports, the rib on said sealing ring cooperating with the two of said inwardly directed ridges having sealing engagement with the rib on said rotor to direct the fluid into the pumping channels and to seal said pumping channels apart from one another.

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