

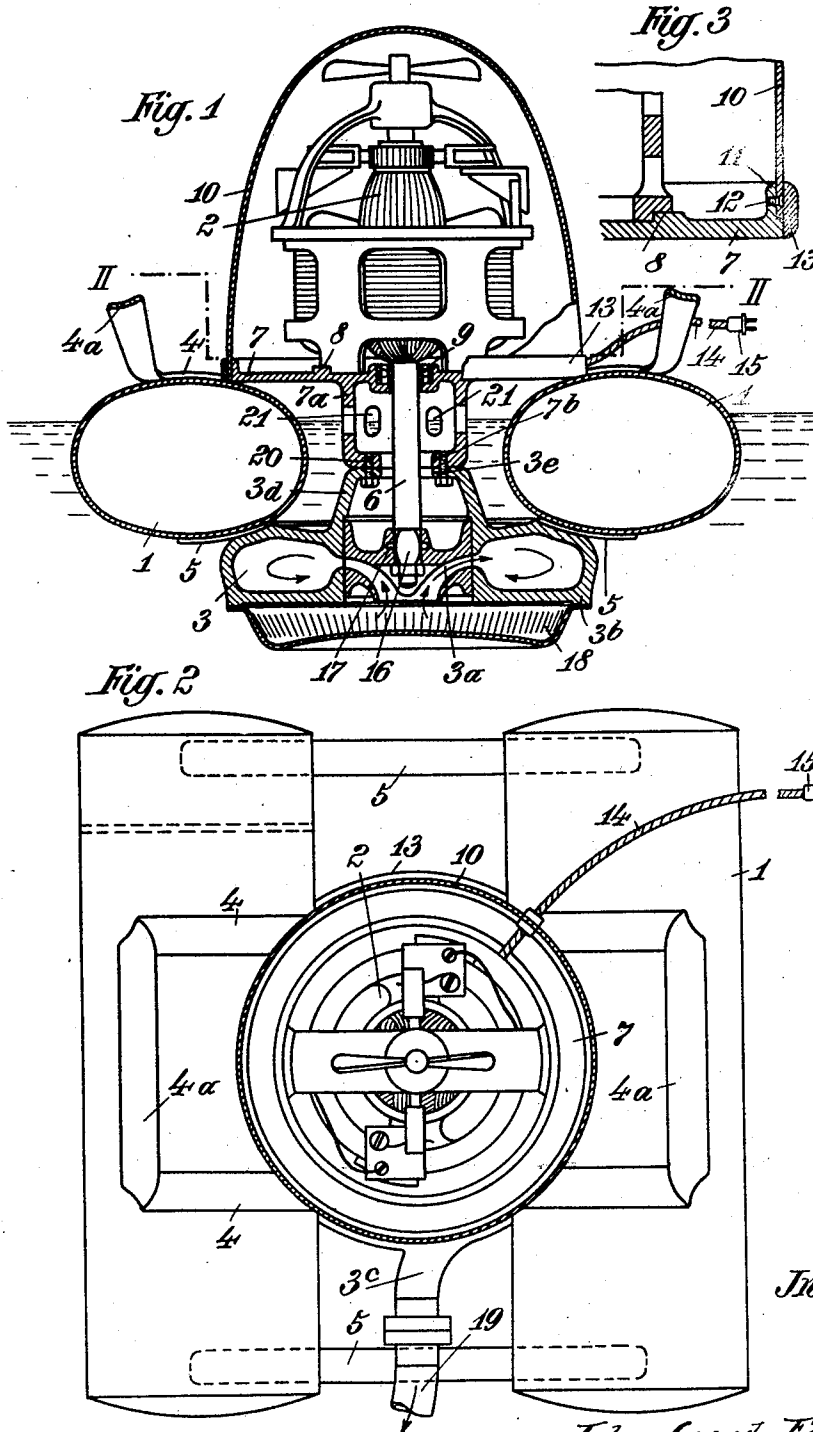
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FLOATING PUMP UNIT

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FLOATING PUMP UNIT

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4 Claims. (Cl. 103—87)

My invention relates to floating pump units, and more particularly to units which are portable and include a source of power, such as an electric motor or an internal-combustion engine, a pump operatively connected to the source of power, and a float or floats.

It is an object of my invention to provide a unit of this type which possesses a high degree of stability, in which the motor or the like is easily accessible and in which leakage of the pumped liquid from the pump into the chamber of the source of power is prevented without providing a stuffing box or other packing means at the point where the pump and the source of power are connected.

To this end, I so arrange the float that the source of power is above, and the pump is below, the level of the liquid the unit floats on.

In a preferred embodiment of my invention, I provide a circular foundation plate on a pair of floats which may be of elliptical or any other section, and mount an electric motor on the upper face of the foundation plate. Extending downwardly from the foundation plate, and upwardly from the casing of the pump, are hollow pipes which are detachably connected, surrounding the common shaft of the motor and the pump and permitting centering of the pump and the motor with respect to each other. The pipes may be of equal length, or one may be longer than the other. That pipe which extends through the level of the liquid the unit floats on, has openings in such position that they are partly above and partly below the water level.

By these means a perfect pressure balance is obtained and the motor shaft extends freely from the motor to the pump, without any stuffing box or other packing means, and leakage of water or other liquid from the pump into the motor chamber is absolutely prevented.

In the accompanying drawing, a unit having an electric motor and a centrifugal pump, with a pair of floats arranged as described, is illustrated by way of example.

In the drawing,

Fig. 1 is an axial section of the unit,

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

Fig. 3 is a detail, drawn to a larger scale.

Referring now to the drawing, 1, 1 are a pair of floats, here shown with elliptical section (obviously they may have any other section, as found suitable), 2 is an electric motor, and 3 is the pump. By way of example, I have shown an electric motor and a centrifugal pump, but it is

understood that I may provide any source of power, for instance an internal-combustion engine, and any type of pump, for instance a gear or reciprocating pump, instead of the mechanisms illustrated.

The floats are connected by stays 4 on their upper, and stays 5 on their lower faces, and the upper stays 4 are equipped with handles 4a to facilitate the carrying of the unit.

Mounted on the floats, 1, 1 is a foundation plate 7 for the motor 2 whose shaft 6 extends downwardly through a ball bearing 9 in the plate 7. 8 is a rim on the upper face of plate 7 for centering the motor 2. 10 is a cover which is placed on the motor, 11 is a flange on the plate 7 to which the lower edge of the cover is secured by screws 12, Fig. 3, and 13 is a ring of rubber or the like which closes the joint. 14 is a cable for supplying current to the motor 2 which is taken through the flange 11 by a watertight sleeve, and 15 is a plug contact at the outer end of the cable. The surface of cover 10 is so large that the heat of the motor is effectively dispersed.

The motor shaft 6 extends through the extension members 7a and 3d which are integral, respectively, with the plate 7 and the casing 3b of a centrifugal pump 3. The pipe members have inwardly projecting flanges 7b and 3e, respectively, which are interconnected by screws 20. The inside diameter of the flanges is larger than the outside diameter of the motor shaft 6 and the member 7a has openings 21 therein.

The floats 1, 1 partly project into the space between the plate 7 and the casing 3b, with the plate bearing on the floats from above, and the casing engaging the floats from below. The pitch of the floats and the overall width of the unit are reduced by this arrangement.

The pump is here shown as a centrifugal pump, with the impeller 3a on a spherical seat 16 at the lower end of the motor shaft 6. The seat 16 permits the impeller to rock, so that the impeller adapts itself to any irregularities of manufacture or assembling. 17 are pins operatively connecting the seat 16 and the impeller. 18 is a slotted shield or screen which protects the inlet of the pump. 3c and 19, Fig. 2, is the delivery duct of the pump which is arranged between the floats 1, 1.

There is an annular clearance between the flanges 7b and 3e and the shaft 6 which permits free flow in the members 7a and 3d. The openings 21 are so positioned that they are partly above and partly below the liquid level when the unit floats. This prevents creeping up of the

liquid from the clearance between the impeller 3a and its casing 3b into the motor chamber. At the same time, the air in the motor cover 10 which becomes heated and expands as the motor operates, is free to escape into the ambient air through bearing 9 and openings 21, while, conversely, when the motor is not running the air in the cover cools down, and air enters through 21 and 9.

- 10 As mentioned, it is not necessary that the members 7a and 3d should be of equal length, but one of them may be longer than the other, and it makes no difference which is the longer. However, that member which extends through
15 the liquid level, must have the openings 21 therein.

It will appear that the motor shaft 6 extends freely through the members 7a and 3d, and stuffing boxes or other packing means are dispensed
20 with and unnecessary.

I claim:

1. A floating pump unit comprising a source of power, a pump operatively connected to said source, a float connected to said unit and so arranged that said source is above, and said pump
25 is below, the level of the liquid on which the unit floats, and an extension member surrounding the operative connection of said source and said pump, said member having holes therein which
30 extend partly above and partly below the level of the liquid.

2. A floating pump unit comprising a source of power, a foundation plate on which said source is mounted, a pump, a shaft connecting said
35 source and said pump, a pump casing, pipes connected to said plate and said casing and sur-

rounding said shaft, extension members provided around the shaft and extending below the level of the liquid on which said unit floats and having holes therein extending partly above and partly below said level, means for detachably connecting said members, and a float connected to said unit and so arranged that said source is above, and said pump is below, the said liquid level.

3. A floating pump unit comprising a source of power a foundation plate on which said source is mounted, a pump, a shaft connecting said source to said pump, a cowl surrounding said source of power, a bearing for said shaft which permits the flow of air therethrough, a pump casing, extension members connected to said plate and said casing and surrounding said shaft and said bearing, said members extending through the level of the liquid on which said unit floats and having holes therein extending partly above and partly below said level, means for detachably connecting said pipes, and a float connected to said unit and so arranged that said source is above, and said pump is below, the said liquid level.

4. A floating pump unit comprising a source of power, a cover surrounding said source, a pump operatively connected to said source, a float connected to said unit and so arranged that said source is above, and said pump is below, the level of the liquid the unit floats on, and means intermediate said source and said pump for keeping liquid away from said cover while permitting the flow of ambient air to and from its interior.

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