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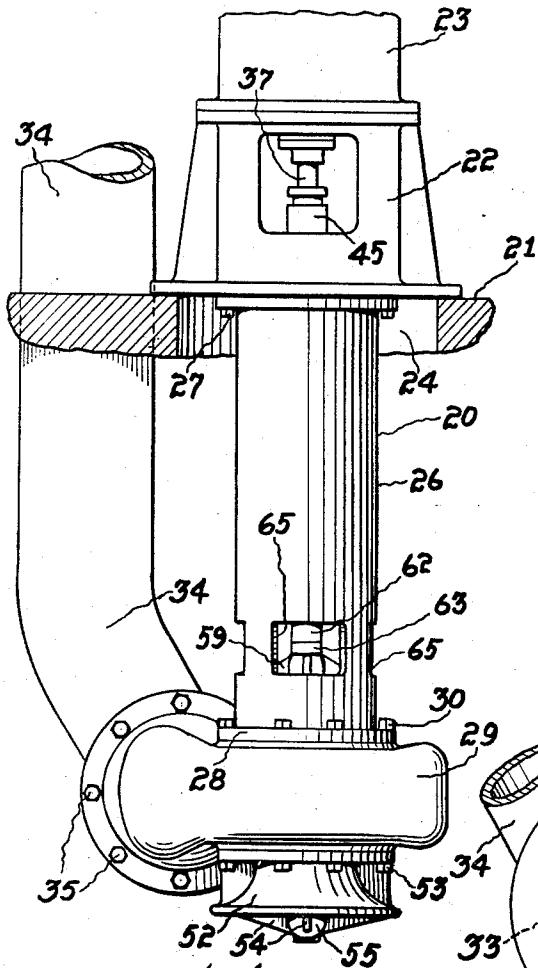


FIG. 1.

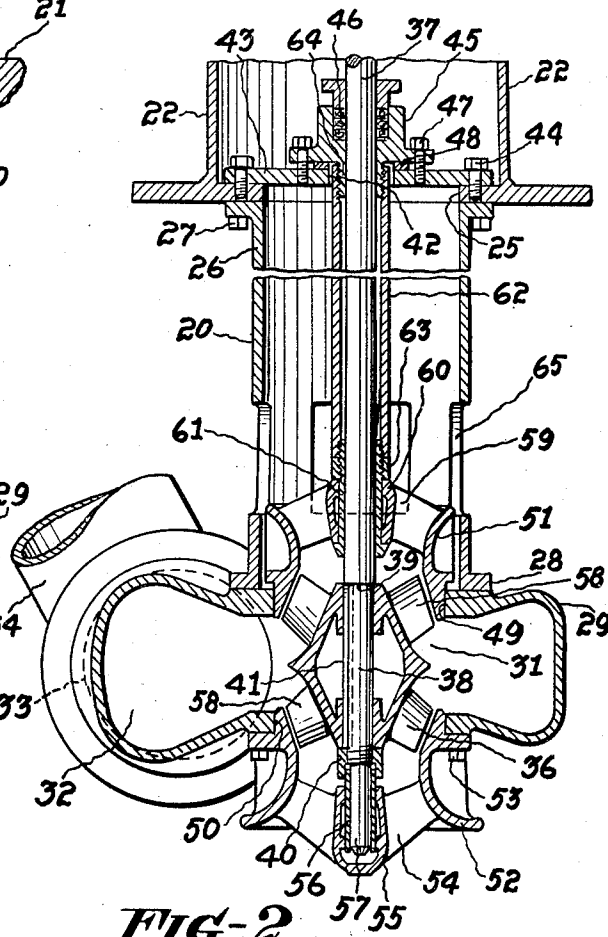


FIG. 2.

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2 Claims. (Cl. 103-104)

This invention relates to pumps, and more particularly to vertical pumps intended for permanent installation in a pit or reservoir and to be submerged in the liquid intended to be pumped.

One object of the invention is to enable the rotative parts of the pump to be conveniently removed from the pump casing for purposes of inspection and repairs.

A further object is to enable the rotative parts of the pump to be removed from the pumping mechanism without disturbing the casing parts of the pump or the conduits connected thereto.

Other objects will be in part obvious and in part pointed out hereinafter.

In the drawing accompanying this specification and in which similar reference numerals refer to similar parts,

Figure 1 is a side elevation of a pump constructed in accordance with the practice of the invention, and

Figure 2 is an elevation of the pump partly broken away.

Referring more particularly to the drawing, the pumping mechanism, designated in general by 20, is of the vertical type and is shown supported entirely by and depending from a floor 21 to which it may be secured in any well known manner.

The pumping mechanism 20 is intended more particularly for pumping fluid from a pit or reservoir (not shown). It comprises a base member 22 that rests upon the floor 21 and has mounted thereon a suitable motor only the casing 23 of which is shown.

In the floor 21 and the lower end of the base 22 are concentric openings 24 and 25, respectively, and from the base depends a tubular extension 26 that extends through the opening 24 and is secured to the lower side of the base member 22 by bolts 27. On the lower end of the extension 26 is a flange 28 that abuts an end of a pump casing 29 and is fastened thereto by bolts 30. The pump casing 29 depends from and is supported entirely by the extension 26, and its intermediate portion constitutes a pumping chamber 31 that is encircled by a volute discharge chamber 32 having a discharge port 33 opening into a discharge conduit 34 secured to the casing 29 by bolts 35 and extending upwardly through the floor 21.

The pumping chamber 31 contains an impeller 36 of the double suction type that is mounted upon a vertical shaft 37 extending

through the extension 26 and the base member 22 for connection with the shaft of the driving motor. The impeller 36 is mounted upon a portion 38 of reduced diameter of the shaft.

Its upper end seats against a shoulder 39 on the shaft and is held thereagainst by a nut 40 threaded on the portion 38 and acting against the lower end of the impeller. A suitable key 41 imbedded in the hub of the impeller and the shaft serves further to secure the shaft and the impeller against relative rotation.

The shaft 37 extends through an aperture 42 in a plate 43 lying in the lower portion of the base member 22 and secured fixedly thereto by bolts 44 to cover the upper end of the extension 26, and on the plate 43 is a stuffing box 45 containing sealing material 46 for effecting a seal along the surface of the shaft. The stuffing box is secured to the plate 43 by bolts 47, and a packing member 48 encircles the aperture 42 and is clamped between the plate 43 and the stuffing box 45.

In the upper and lower sides of the pump casing 29 are openings 49 and 50 to receive, respectively, suction bells 51 and 52. The suction bell 52 is secured fixedly to the casing by bolts 53 and has a plurality of radial arms 54 to support, at their inner ends, a bearing 55 of cup-shape that contains a bushing 56 to accommodate the lower end 57 of the shaft 37. Both openings 49 and 50 are preferably of the same diameter but it is desirable that the opening 49 be of somewhat larger diameter than the impeller so that the latter may pass readily through said opening.

The suction bell 51 is adjustable in the opening 49 being slidable endwise therein to provide a correct degree of clearance between the suction bell and the upper vanes 58 of the impeller. To this end the suction bell 51 is provided with the radial arms 59 that carry at their inner ends a bearing 60, and in the bearing 60 is a bushing 61 having an external flange at its lower end to overlie and engage the corresponding end of the bearing 60.

The sleeve 61 projects beyond the upper end of the bearing 60 and is threaded into the lower end of a tubular holder 62 encircling the shaft 37. Preferably, a sleeve 63 is threaded upon the bushing 61 to seat against the upper end of the bearing 60 for clamping the bushing 61 to the bearing, and the holder 62 is, in turn, seated against the upper end of the sleeve 63 to lock the said sleeve firmly in position.

The upper end of the holder 62 extends

through the aperture 42 and is threaded internally to receive an externally threaded annular stem 64 on the lower surface of the stuffing box 45 and encircling the shaft 37. The threaded connection between the holder 62 and the stem 64 is of ample length so that the holder may be readily adjusted endwise of the stem 64 for raising or lowering the suction bell 51 to provide the correct clearance between the said suction bell 51 and the impeller vanes 58.

The body portion of the suction bell 51 lies within the extension 26 and is of slightly smaller diameter than the said extension so that it may be rotated readily for effecting the said adjustments or, when required, may pass readily through the entire extension for removal from the top thereof. The upper or inlet end of said suction bell is, moreover, flared outwardly toward the wall of the extension 26 and adjacent said flared portion and in the wall of the extension 26 are suitable ports 65 for the admission of liquid into the upper end of the impeller chamber.

In practice, with the pump immersed in the liquid intended to be pumped, liquid enters the impeller chamber through both suction bells and is impelled through the conduit 34 to a desired destination. Whenever it is required to disassemble the rotative elements of the pump the motor is first removed from the base member 22. The plate 43, together with the stuffing box 45 and the suction bell 51, may then be conveniently removed from the assembly. If required, the impeller may next be withdrawn from the pump through the opening 48 and the extension. After the required repairs have been made the parts are again returned to their correct assembled positions and all the adjustments are made from the motor floor 21 and without disturbing the assembled relationship of the casing parts below the motor base or the connection between the pump casing 29 and the discharge conduit 34.

I claim:

1. In a vertical pump, a base member, an extension depending from the base member and having a port for the admission of liquid thereinto, a pump casing depending from the extension and having an impeller chamber and an opening to communicate the impeller chamber with the interior of the extension, a discharge conduit for the impeller chamber connected to the casing, a suction bell in the opening to convey liquid from the extension into the impeller chamber and being adjustable axially of the impeller chamber, an impeller in the impeller chamber of smaller diameter than the opening and the extension to enable the impeller to pass therethrough, a vertical shaft for the impeller extending through the extension and the base member, a bearing in the suction bell for the shaft, and a holder for the suction bell and the bearing adjustably connected to the base member for effecting adjustment of the suction bell axially of the impeller.

2. In a vertical pump, a base member, a tubular extension depending from the base member and having a port for the admission of fluid thereinto, a pump casing depending from the extension and having an impeller chamber and openings in the opposed sides coaxial with the support member, a discharge conduit for the impeller chamber connected to the casing, a double suction impeller in the impeller chamber of smaller diameter than the uppermost opening and the extension to enable the impeller to pass therethrough, a vertical shaft for the impeller extending through the extension and the base member, a suction bell in the lowermost opening having a bearing for the shaft, a suction bell in the uppermost opening and being adjustable axially of the impeller chamber, a bearing in the last mentioned suction bell for the shaft, and a tubular holder for the last mentioned suction bell adjustably connected to the base member.

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