

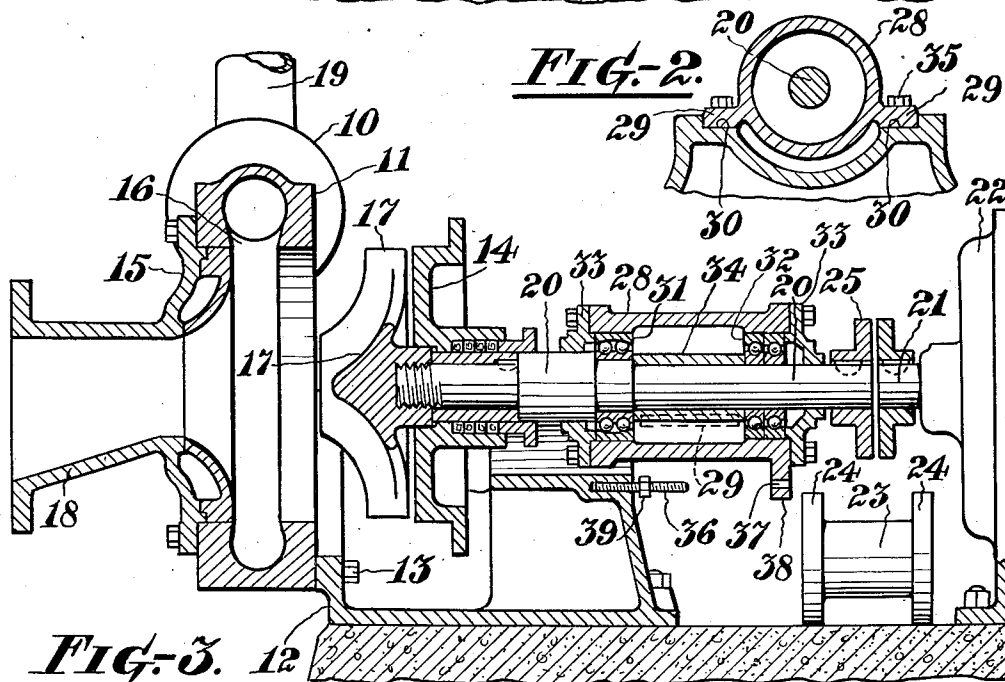
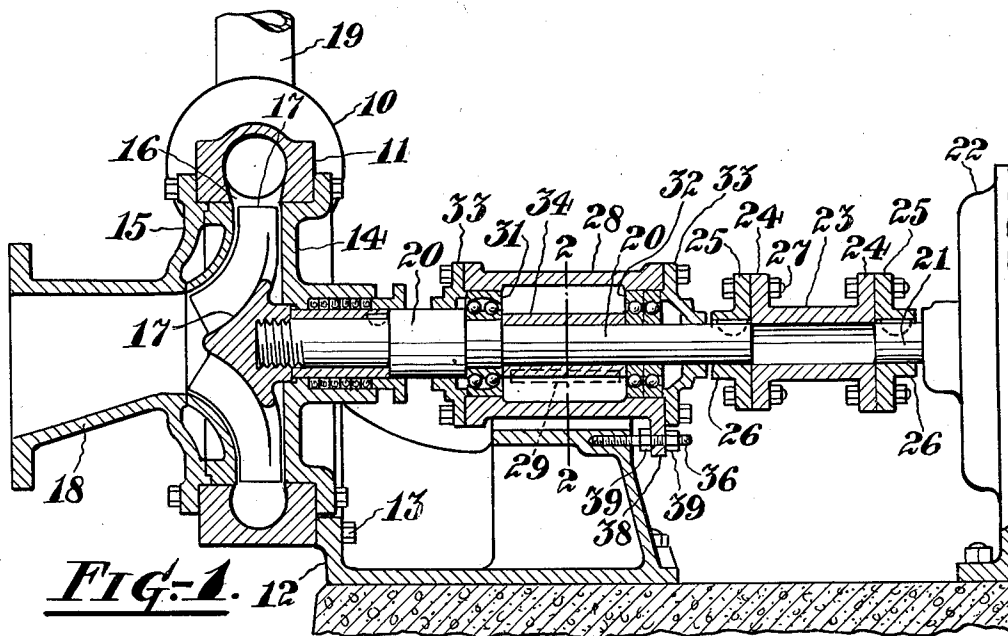
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PUMPING MECHANISM

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PUMPING MECHANISM

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1 Claim. (Cl. 103—87)

This invention relates to pumping mechanism, and more particularly to a pumping mechanism of the rotary type of which the pump is connected directly to its driving motor.

More particularly, the invention is intended for use in connection with pumping mechanisms employed for pumping liquid with entrained solids which, by their abrasive action, necessitate frequent inspection, repairs or replacement of the rotary elements of the pump.

It is obviously inadvisable to frequently derange either the driving motor or the head of the pump associated with the intake connection, since to do so involves the laborious and tedious operation of accurately realigning all the parts. As heretofore constructed and arranged, the pump impeller could be serviced only by shifting either the motor or the inlet connection and consequently disturbing the original order of the various elements constituting the pumping mechanism.

It is accordingly an object of the invention to enable the pump impeller to be removed from the pump casing without disaligning any of the elements of a train connecting the pump impeller with the driving motor.

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 longitudinal sectional elevation of a pumping mechanism having the invention applied thereto,

Figure 2 is a transverse view taken through Figure 1 on the line 2—2, and

Figure 3 is a view similar to Figure 1 showing the impeller removed from the pump casing.

Referring more particularly to the drawing, 10 designates, in general, a pump of the centrifugal type comprising the usual casing 11 which is secured to the side of a base plate 12 by bolts 13.

Closures are provided for the ends of the casing 11 in the form of heads 14 and 15 which, together with the casing 11, define a pumping chamber 16 for the accommodation of an impeller 17 whereby liquid flowing to the pumping chamber 16 through an inlet connection 18, carried by the head 15, is pumped through a discharge pipe 19 to a desired destination.

The impeller 17 may, as shown, be of the single, open type and is mounted on the extremity of a shaft 20, extending through the head 14,

in axial alignment with the shaft 21 of a motor 22 whereby the impeller 17 is driven.

In accordance with the practice of the invention the adjacent ends of the shafts 20 and 21 are spaced in such manner that the rotary elements of the pump may be shifted endwise in the direction of the motor a sufficient distance to permit the impeller 17 to be completely withdrawn from the casing 11 upon removal of the head 14. A connection is provided between the shafts 20 and 21 in the form of a spacer 23 having, at its ends, flanges 24 which seat against flanges 25 of sleeves 26 keyed on the ends of the shafts 20 and 21. Bolts 27, extended through the flanges 24 and 25, serve to secure the spacer 23 to the sleeves 26.

Disposed about the shaft 20 is a casing 28, preferably of cylindrical shape, having lateral flanges 29 which seat upon flat horizontal surfaces 30 of the base plate 12. The casing 28 serves as a container and support for anti-friction bearings 31 and 32 disposed about the shaft 20. The bearings 31 and 32 are retained in the casing 28 by caps 33 bolted to the ends of the casing and seating against the outermost races of the bearings 31 and 32. The bearings 31 and 32 are held in suitably spaced relation with respect to each other by a sleeve 34 disposed about the shaft 20 and seating against the innermost races of the bearings.

Any suitable means, such as bolts 35 extending through the flanges 29 and engaging the base plate 12, may be provided for securing the casing 28 to the base plate. In order to further assure the correct position of the casing 28 and, therefore, of the frictionless bearings 31 and 32 with respect to the shaft, a bolt 36 is threaded into the base plate 12 and extends through an aperture 37 in a lug 38 of the casing 28. Nuts 39 threaded on the bolt 36 act against the opposed surfaces of the lug 38 for shifting the casing 28 and the bearings 31 and 32 to the correct position with the respect to the shaft 20.

In practice, whenever it is intended to remove the impeller 17 from the casing 11 the spacer 23 may be removed from the adjacent extremities of the shafts 20 and 21. Upon freeing the head 14 from the casing 11 and removing the bolts 35 and the outermost nut 39 the impeller 17, together with the shaft 20 and the casing 28 and its contents, may be moved endwise in the direction of the motor 22.

By suitably proportioning the spacer 23 the distance which the rotary elements of the pump may be moved will be sufficient to permit com-

plete withdrawal of the impeller 17 from the casing 11. Free access may then be had to the impeller for the required attention.

As will be readily understood, the casing 28 will at all times remain seated upon at least a portion of the flat surfaces 30 so that no matter what position the rotor may occupy it will at all times remain in coaxial relationship with the pump casing and the motor. This is particularly desirable for the reason that after the parts are again in serviceable condition they may be quickly restored to the correct positions with respect to the parts wherewith they are associated.

After the rotor has been replaced the casing 28 is again secured to the base plate and the spacer 23 inserted between the shafts 20 and 21

and secured in position for transmitting the movement of the motor to the impeller.

I claim:

In combination, a pump having a rotor, a motor for driving the rotor and having a shaft, a spacer interposed between and connecting the shaft and the rotor and being removable to enable withdrawal of the rotor from the pump in the direction of the motor, a support member, and a bearing for the rotor supported by the support member to maintain the rotor in coaxial alignment with the pump in all positions of the rotor and being slidable out of its normal bearing position relatively to the support member to permit withdrawal of the rotor.

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