April 1, 1930. F. G. BROWN 1,752,366

PUMP

Filed June 18, 1928

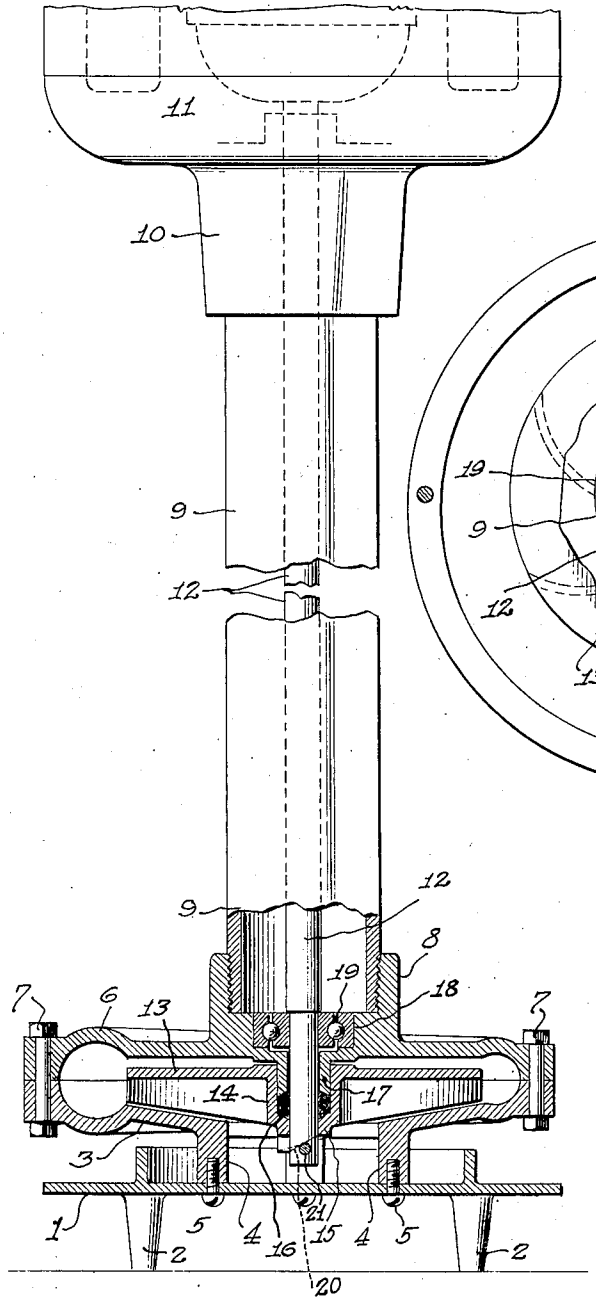
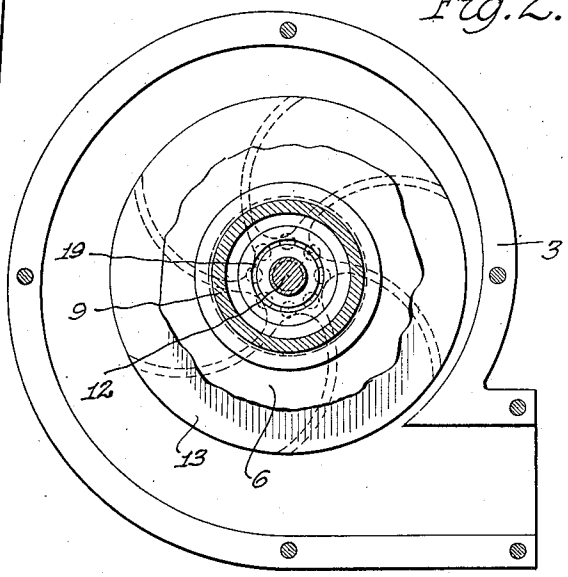


Fig. 1.

Fig. 2.



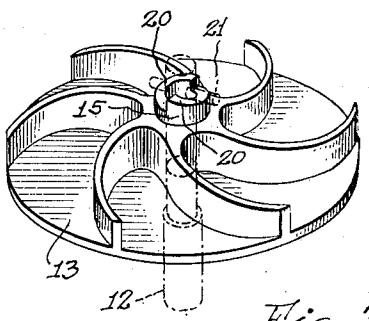


Fig. 3.

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UNITED STATES PATENT OFFICE

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PUMP

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The present invention pertains to a novel pump designed particularly for drainage purposes but also capable of service for the general purposes of elevating water and other liquids.

In pumps of this character which are usually placed in sumps, cesspools, furnace pits, elevator shaft pits and the like, there has been considerable difficulty in keeping the liquid away from the bearing at the lower end of the shaft. The principal object of this invention is to provide a satisfactory gland that will effectively prevent access of water to the bearing and upper parts of the assembly. In the accomplishment of this object, the device is so constructed that a compressible packing between the shaft and the rotor constitutes a seal between the water chamber and the bearing. The impeller or rotor is normally loose on the shaft, and a cam connection between the shaft and the impeller compresses the packing until the impeller can no longer be displaced, after which the impeller turns with the shaft.

The invention is fully disclosed by way of example in the following description and in the accompanying drawing, in which—

Figure 1 is an elevation of the device partly in section;

Fig. 2 is a plan sectional view; and

Fig. 3 is a detail perspective view inverted.

Reference to these views will now be made by use of like characters which are employed to designate corresponding parts throughout.

The assembly is built upon a base 1 having a series of legs 2 and thereby adapted to be positioned in or near the sump or other region to be drained. Upon the base is mounted a pump casing comprising a lower section 3 having downwardly extending lugs 4 secured to the base by screws 5, and an upper section 6 fixed to the lower section by bolts 7. The upper section has an upwardly extending boss 8 into which is threaded the lower end of a shaft tubing 9. On the upper end of the tubing is mounted a suitable housing 10 containing an electric motor 11.

A shaft 12 extends from the motor axially through the tubing and into the center of the pump casing. Within the casing is disposed an impeller or rotor 13 having a hub 14 concentric with the shaft and considerably larger than the same. The lower part of the hub is restricted at 15 and closely surrounds the same but is loose with respect thereto. In the bottom of the hub is placed a quantity of compressible material 16 and this is engaged by a boss 17 extending downwardly from the upper section 6 into the hub 14. In the top of the section 6 is a central recess 18 containing a double race ball bearing 19 for the lower end of the shaft 12.

The restricted part of the hub is extended downwardly and outwardly of the impeller and is given the form of two oppositely inclined faces 20 as shown more clearly in the inverted detail of Figure 3. A pin 21 passed through the lower end of the shaft 12 lies across these faces. This arrangement constitutes a cam connection which causes the rotor to be lifted when the shaft 12 begins to turn. The packing material 14 is thus compressed to its limit, after which the pin can no longer raise the cam and therefore carries it bodily to impart rotative movement to the impeller. It will thus be seen that the packing material being compressed as closely as possible effectively prevents access of water to the bearing 19.

Although a specific embodiment of the invention has been illustrated and described, it will be understood that various alterations in the details of construction may be made without departing from the scope of the invention as indicated by the appended claims.

What I claim is:—

1. In combination, a rotary shaft, a rotor loosely mounted thereon, a compressible packing surrounding said shaft at said rotor, and a cam connection between said shaft and rotor adapted to shift the latter on rotation of the shaft and thereby compress the packing.

2. In combination, a rotary shaft, a rotor loosely mounted thereon, a compressible packing surrounding said shaft at said rotor, a cam formed on said rotor around the outer end thereof, and a pin carried by said shaft in engagement with said cam and adapted

to lift the rotor whereby to compress the packing.

3. In combination, a rotary shaft, a rotor having a hub receiving said shaft, said hub having a restricted portion loosely surrounding the shaft, a casing enclosing said rotor, a boss extending from said casing into the hub and surrounding the shaft, a compressible packing between said restricted portion and said hub, and a cam connection between said shaft and rotor adapted to shift the latter on rotation of the shaft and thereby compress the packing.

4. In combination, a rotary shaft, a rotor having a hub receiving said shaft, said hub having a restricted portion loosely surrounding the shaft, a casing enclosing said rotor, a boss extending from said casing into the hub and surrounding the shaft, a compressible packing between said restricted portion and said hub, a cam formed on said rotor around the outer end thereof, and a pin carried by said shaft in engagement with said cam and adapted to lift the rotor whereby to compress the packing.

5. In combination, a rotory shaft, a rotor loosely mounted thereon, a compressible packing surrounding said shaft at said rotor, oppositely inclined members formed on said rotor about the center thereof, and a pin carried by said shaft in engagement with said members and adapted to lift the rotor whereby to compress said packing.

6. In combination, a rotary shaft, a rotor having a hub receiving said shaft, said hub having a restricted portion loosely surrounding the shaft, a casing enclosing said rotor, a boss extending from said casing into the hub and surrounding the shaft, a compressible packing between said restricted portion and said hub, oppositely inclined members formed on said rotor about the center thereof, and a pin carried by said shaft in engagement with said members and adapted to lift the rotor whereby to compress said packing.

7. In combination, a pump casing, a rotary shaft extending therein, a rotor loosely mounted thereon, a compressible packing surrounding said shaft at said rotor, a cam connection between said shaft and rotor adapted to shift the latter on rotation of the shaft and thereby compress the packing, and a bearing between said shaft and casing above said packing.

In testimony whereof I affix my signature.

FRANK G. BROWN.