

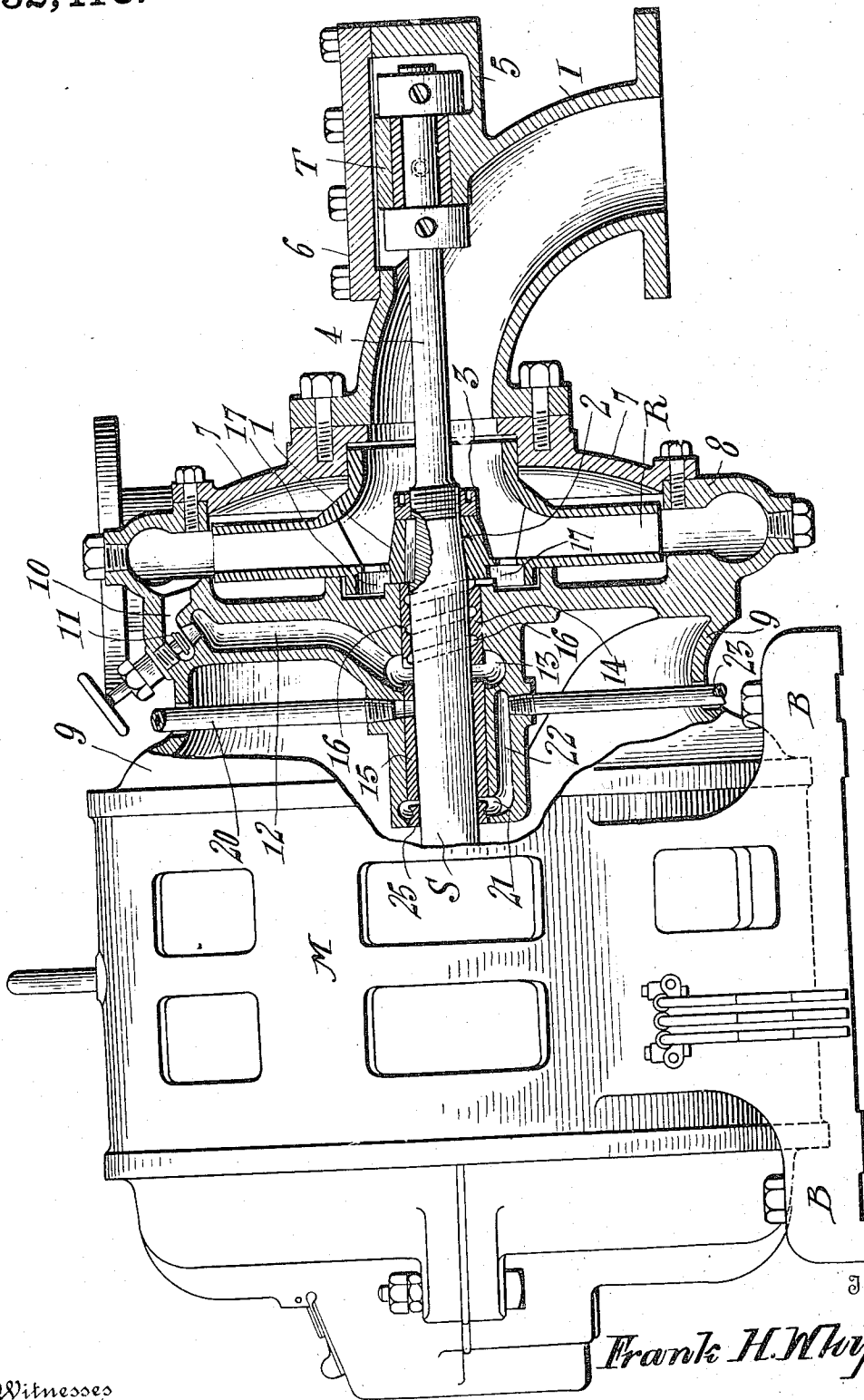
F. H. WHIPPLE.

PUMP.

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1,132,413.



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To all whom it may concern:

Be it known that I, FRANK H. WHIPPLE, a citizen of the United States, residing at Visalia, in the county of Tulare and State of California, have invented certain new and useful Improvements in Pumps; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to pumps, and more especially to those which act on a rotary or centrifugal principle; and the objects of the same are to produce a pump whose casing supplements or replaces one end of an electric motor casing and contains a bearing for the tip of the motor shaft.

Another object is to provide means for mounting the pump head or runner directly on the motor shaft so that the two units become one in effect and are supported by a single base.

Still another object is to provide the pump casing with means for automatically feeding water to a water seal which surrounds the bearing of the shaft, so that no air may leak through the pump; and with a drain so that no water may pass into the motor.

These various objects are carried out by constructing the device in the manner hereinafter more fully described and claimed, and as shown in the drawing hereto attached whereon the motor casing is illustrated in side elevation and the parts of the pump and its casing in central vertical section.

In the drawings the letter M designates broadly an electric motor of any ordinary construction and having its own base B and shaft S. I do not wish to be limited in the construction of this motor, but rather I would prefer to employ one of the types commonly used for the purposes hereinafter set forth, and remove one face plate of its casing—in the present case that toward the right in the drawings. The letter R designates the runner or head of an ordinary centrifugal pump whose construction also is immaterial excepting that I prefer it shall be of that type commonly employed in connection with such a motor, and it may be of the open-runner or closed-runner type; and the letter I designates its suction elbow or inlet. The Whipple centrifugal pump will answer. The letter T designates broadly a thrust bearing whose details of construction

are not important. On this understanding the gist of the invention is as follows:

The pump runner by preference has a hub 1 adapted to be removably engaged with the shaft S of the motor in any suitable way as by tapering the latter at the point 2 and forcing the hub thereon by a nut 3 as shown. The shaft may be reduced and extended as at 4 through this nut and across the inlet elbow or nozzle I, and its remote end I prefer to mount in a thrust bearing T. This bearing is disposed within a casing 5 carried by the elbow, and the top 6 of this casing is rendered removable so that access to its interior may be had. Water flowing through the elbow I has access to this thrust bearing and keeps the same constantly cooled. The elbow is by preference bolted to a face plate 7, and the latter removably attached to the rim 8 of the pump casing as usual; but what might be called the rear side of the rim is shaped as at 9 to form the face plate of the motor casing and is secured to the rim of this casing in any suitable manner. Therefore the two casings become one in effect, and the pump is carried by the base B of the motor so that the pump does not need to have any support of its own. The disposition of the runner upon the motor shaft avoids the necessity that the pump shall have a shaft of its own, and therefore the use of a coupling between the motor shaft and the pump shaft is also avoided. This not only simplifies matters and reduces expense, but it avoids the necessity for two bases, economizes room, and reduces the possibility of vibration and noise. Yet access to the interior of the pump is permitted by removing the elbow, and if the entire runner is to be withdrawn, the face plate 7 can be taken off as will be clear.

At a suitable point within the annular channel in the rim 8 the pump casing is provided with a passage 10 controlled by a valve such as indicated at 11, the passage being extended thence inward toward the shaft as at 12 and communicating with an annular channel 13 which is interposed between the two parts 14 and 15 of the bearing in which the shaft S turns, or possibly between the two bushings or babbitts forming parts of said bearings. Centrifugal force drives water into the channel within the rim, and some of it flows out the passage 10, under the valve 11, and through the passage 12 to the channel 13, in which lat-

ter it forms a water seal and prevents air from being sucked in through the bearing 14 and driven through said bearing 15 toward the motor. For carrying the water within the channel 13 back to the center of the runner R, the bearing 14 may be provided with a spiral groove 16, and the inner end of this groove communicates with an annular space 17 around the hub as shown in the drawings. Therefore there is a constant circulation of water from the channel within the rim through the passage to the channel 13 around the bearing, and from the latter back to the center of the runner, and while the water is passing through this course it cools the bearings and keeps them clean. If the pump should be throwing too much sand I would prefer to close the valve 11, at least temporarily.

For lubricating purposes oil may be admitted through a pipe 20 to one portion of the bearing or its babbitt at 15. At the inner end of this portion I also preferably form an annular channel 21 which communicates through a passage 22 with an exhaust pipe 23, and this channel catches any oil or water which may pass through the inner section of the bearing, and therefore prevents it from being driven or drawn into the motor. This detail protects the coils of the latter, and I find it of advantage. Around the shaft S and at a point to be projected into the channel 21 when the front casing is applied to the motor casing, I preferably secure a collar 25 as shown; and when these parts are assembled this collar will stand well within the casing of the motor. The parts are otherwise of any preferred construction, and the materials and proportions are obviously not important.

What is claimed as new is:

1. The combination with a rotary motor having an extended shaft; of a centrifugal pump whose runner is mounted on said shaft and whose casing has a two-part bearing for the shaft, an annular channel formed around the latter intermediate the parts of the bearing, and a passage-way leading from its rim to said channel, the walls of said passage-way being formed integrally with said casing.

2. The combination with a rotary motor having an extended shaft; of a centrifugal pump whose runner is mounted on said shaft and whose casing includes a two-part bearing for the shaft, an annular channel formed around the latter intermediate the parts of the bearing, and a passage-way leading from its rim to said channel, the walls of said passage-way being formed integrally with said casing and a valve controlling said passage.

3. The combination with a rotary motor having an extended shaft; of a centrifugal pump whose runner is mounted on said

shaft and whose casing includes a two-part bearing for the shaft, an annular channel formed around the latter intermediate the parts of the bearing, a passage-way extending upwardly from said annular channel to a point contiguous to the rim of said casing, one end of said passage communicating with said annular channel, the other with the pump chamber, the walls of said passage being formed integrally with said casing, and a valve controlling said passage.

4. The combination with a rotary motor having an extended shaft, a field ring, and one face plate for the latter; of a centrifugal pump having its runner mounted on said shaft and one side of its casing connected to the open side of said field ring and constituting the other face plate for the latter, said casing including an integrally formed two-part bearing for the shaft of said motor, an annular channel formed around said shaft intermediate the parts of said bearing, a passage-way extending through the casing and having one end communicating with said annular channel and the other end with the runner space of the casing contiguous to the rim of the latter, the walls of said passage-way being integrally formed with said casing, and a valve for controlling said passage.

5. The combination with a rotary motor having an extended shaft, a field ring for the motor and one face plate for said field ring; of a centrifugal pump having its runner mounted upon said shaft and one side of its casing outwardly flared and connected to said field ring and constituting the other face plate thereof, said casing including an integrally formed two-part bearing, the latter having an annular channel formed intermediate the parts thereof and communicating with the inner end of a spiral groove formed in the inner surface of one part of said bearing, a passage-way extending from said annular channel to a point contiguous to the rim of said casing, the walls of said passage-way being formed integrally with said casing, and a valve controlling said passage-way.

6. The combination with a rotary motor having an extended shaft, a field ring for the motor and one face plate for said field ring; of a centrifugal pump having its runner mounted upon said shaft and one side of its casing outwardly flared and connected to said field ring and constituting the other face plate thereof, said casing including an integrally formed two-part bearing, the latter having an annular channel formed intermediate the parts thereof and communicating with the inner end of a spiral groove formed in the inner surface of one part of said bearing, said casing also having an internal channel communicating with the outer end of said groove, a passage-way extending

from said annular channel to a point contiguous to the rim of said casing, the walls of said passage-way being formed integrally with said casing, and a valve for controlling said passage-way.

5 7. The combination with a rotary motor having an extended shaft, a field ring and one face plate for the latter; of a centrifugal pump having its runner mounted on said shaft and one side of its casing outwardly flared and connected with said field ring whereby to constitute the other face plate thereof, said casing including a two-part bearing, the latter being formed with an
10 annular channel intermediate the parts there-
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of; a passage-way extending from said annular channel to the rim of said casing, means to control said passage-way, a suction elbow carried by said casing, a bearing integrally formed in said elbow to receive the free end of said shaft and a casing for said bearing substantially as and for the purpose set forth.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

FRANK H. WHIPPLE.

Witnesses:

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