W. S. GREGG.

PUMP.

APPLICATION FILED JULY 24, 1911.

1,038,568. Patented Sept. 17, 1912.

Fig. 1.

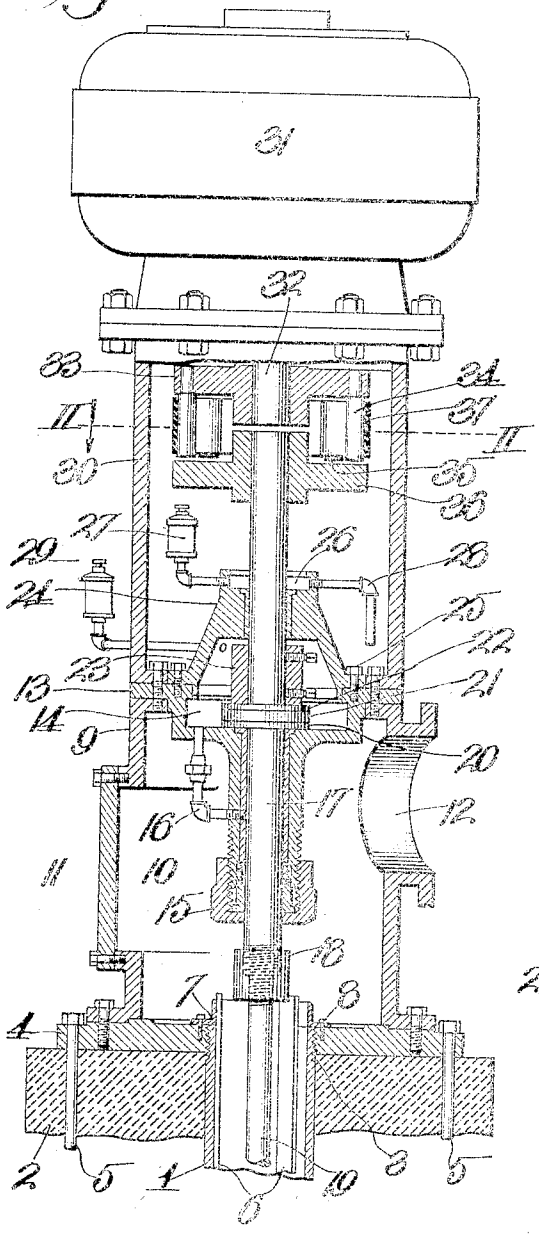


Fig. 2.

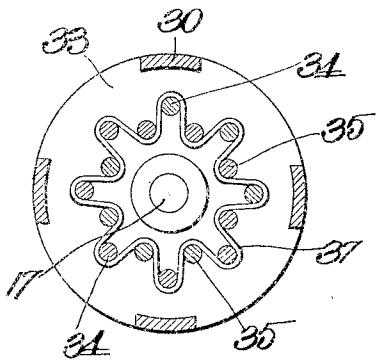
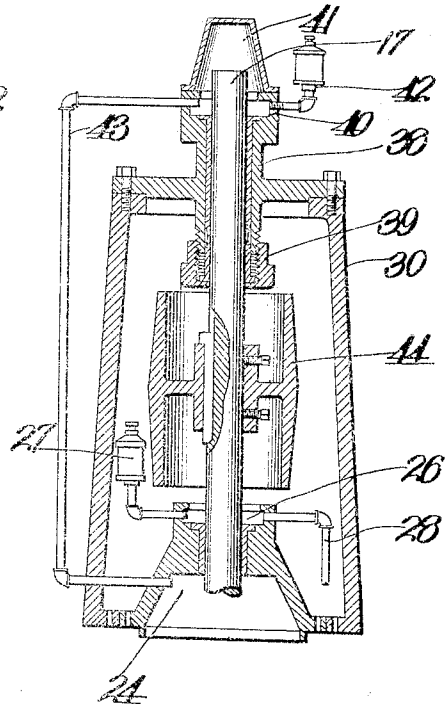


Fig. 3.



Witnesses
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UNITED STATES PATENT OFFICE.

WALTER S. GREGG, OF KANSAS CITY, MISSOURI.

PUMP.

1,038,568. Specification of Letters Patent. Patented Sept. 17, 1912.

Application filed July 24, 1911. Serial No. 640,332.

To all whom it may concern:

Be it known that I, WALTER S. GREGG, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Pumps, of which the following is a specification.

This invention relates to pumps of that class embodying a plurality of rotary impellers for elevating a column of liquid by causing it to spirally ascend within a casing, and breaks between the impellers to interrupt the spiral progress of the liquid and thereby compel each impeller to perform its apportioned share of the work of elevating the liquid.

The object of the invention is to produce a pump head for carrying and operating the impeller-carrying shaft, capable of uninterrupted operation for long period of time without danger of overheating and at a relatively low cost.

With this general object in view the invention consists in certain novel and peculiar features of construction and organization as hereinafter described and claimed; and in order that it may be fully understood reference is to be had to the accompanying drawing; in which—

Figure 1, is a view partly in central vertical section, of the upper portion of a pump embodying my invention. Fig. 2, is a section on the line II—II of Fig. 1. Fig. 3, is a vertical section of the upper part of the pump head as equipped with a pulley for imparting rotation to the shaft of the pump.

In the said drawing where like reference characters identify corresponding parts in all the figures, 1 is the cylindrical casing of the pump extending down the required distance into the ground 2, and externally threaded at its upper end at 3 for engagement by a preferably circular base 4, the latter being anchored against rotary movement by anchor pins 5 extending downward into the ground.

Fitting within the casing is a caging 6, of any suitable type and secured to the upper end of the caging to support it properly in position is a collar 7 resting upon the upper end of the casing and base and secured to the latter preferably by cap screws 8.

Referring to the pump head, 9 indicates a cylinder mounted upon and rigidly secured to the base plate 4, and provided at one side with a hand-hole opening 10, normally closed by a plate 11, the cylinder being also provided with an exit opening 12, to which a pipe line, not shown, is adapted to be connected for conducting the liquid pumped from the well to the point desired.

13 is preferably a bronze bearing bolted upon and depending into the cylinder and provided with an oil chamber 14 at its upper end and with a stuffing box 15 at its lower end, an oil pipe 16 leading from chamber 14 to the interior of the bearing above the stuffing box for the purpose of lubricating the vertical shaft 17, journaled in said bearing, the lower end of said shaft being connected by a coupling nut 18 to the upper end of the impeller-shaft 19.

20 is the lower member of the antifriction bearing, resting upon the bottom of the oil chamber 14, around the shaft 17. 21 indicates the roller or ball-carrying member upon member 20, and 22 is the upper member of said bearing, and secured rigidly to the shaft and resting upon the ball-bearing member 22 is a collar 23, which imposes the weight of the impeller shaft upon the lower member through the interposed rollers or balls (not shown) of the bearing, in order that the shaft may turn with the least possible friction, it being understood that the chamber 14 will normally stand full of oil for the purpose of keeping the antifriction bearing properly lubricated.

24 is an arched bearing for the shaft, said bearing resting upon and being secured to bearing 13 by the bolts 25. In its upper end the bearing 24 is provided with an oil chamber 26, and to supply said chamber an oil cup 27 is connected thereto, the oil from chamber 26 lubricating the upper bearing. A drain pipe 28 leading from chamber 26 indicates to the attendant in charge when oil is dripping from it, that the shaft is being properly lubricated in the arched bearing, and for the purpose of supplying oil to chamber 14, an oil cup 29 is employed.

A skeleton standard 30, is secured as shown or in any other suitable manner, upon bearing 13, as a support for an electric or equivalent motor 31, the shaft 32 of the motor being alined with and terminating at its lower end just above the upper end of shaft 17, and secured rigidly on said shaft 32 is a disk 33, provided with a plurality of depending pins 34, arranged in staggered relation to similar pins 35, projecting upward from a similar disk 36 se-

cured upon the upper end of shaft 17, and engaging said pins is a belt 37, which as the motor is started acts as a shock absorber or cushion, that is to say, it yields slightly under the circular movement of the pins 34 so as to impose a gradually increasing pressure on pins 35 and which almost instantly become sufficient to impart rotation to the shafts 17 and 19, it being also noted that when the circuit not shown, is broken, this shock absorber or cushion effects the arrest of the shaft 32 without injurious shock or jar.

In Fig. 3, which illustrates the belt-driven type of pump head, the skeleton standard 30 is surmounted by a bearing 38, for the upper extremity of shaft 17, which in this instance is preferably of greater length than in the construction shown by Fig. 1, and said bearing is provided at its lower end with a stuffing box 39 and at its upper end with an oil chamber 40, covered by a cap 41, an oil cup 42 being connected to supply oil to chamber 40, and from such chamber surplus oil will pass through pipe 43 to the interior of the arch cap 24, for supplying oil to chamber 14, shown only in Fig. 1, the shaft 17 being equipped within said skeleton standard with a belt wheel 44 adapted to be driven by a belt, not shown. The operation of shaft 17 through the instrumentality of the motor or the belt wheel effects rapid rotation of shaft 19, and the impellers carried thereby.

The liquid elevated rises within the casing to the exit opening 12, through which it is discharged, the parts being so proportioned that as long as the pump is in operation the cylinder will be kept full of water and thereby utilized to keep the bearing 13 cool and thus insure for the same a maximum period of service.

From the foregoing it will be apparent that I have produced a pump embodying the features of advantage enumerated as desirable and while I have illustrated and described the preferred embodiment of the invention I wish it to be understood that I reserve the right to make all changes properly falling within the spirit and scope of the appended claims.

I claim:—

1. In a pump, a hollow vertical head having a discharge opening 12, a bearing resting upon and depending into the head and provided with a chamber 14 at its upper end and a stuffing box 15 at its lower end, and an oil pipe 16, establishing communication between chamber 14 and the interior of the bearing above the stuffing box; a skeleton standard bolted upon the upper end of the bearing; an arched bearing 24 bolted down upon the first-named bearing and inclosed by the standard and provided with a chamber in its upper end; an oil supply pipe extending through the lower part of the arched bearing to discharge into the chamber in the top of the first-named bearing, an oil supply pipe to discharge into the chamber at the top of the arched bearing; a drain-pipe leading from said last-named chamber; a vertical shaft extending through and journaled in said bearings; and anti-friction bearing around said shaft and resting on the underlying bearing to minimize friction between the latter and the shaft.

2. In a pump, a hollow vertical head having a discharge opening 12, a bearing resting upon and depending into the head and provided with a chamber 14 at its upper end and a stuffing box 15 at its lower end and an oil pipe 16 establishing communication between chamber 14 and the interior of the bearing above the stuffing box; a skeleton standard bolted upon the upper end of the bearing; an arched bearing 24 bolted down upon the first-named bearing and inclosed by the standard, and provided with a chamber in its upper end; an oil supply pipe extending through the lower part of the arched bearing to discharge into the chamber in the top of the first-named bearing; an oil-supply pipe to discharge into the chamber at the top of the arched bearing; a drain-pipe leading from said last-named chamber; a vertical shaft extending through and journaled in said bearings; an anti-friction bearing around said shaft and resting on the underlying bearing to minimize friction between the latter and the shaft; a motor supported on the standard; and a shock-absorbing connection to transmit power from the motor to the shaft.

In testimony whereof I affix my signature in presence of two witnesses.

WALTER S. GREGG.

Witnesses:
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