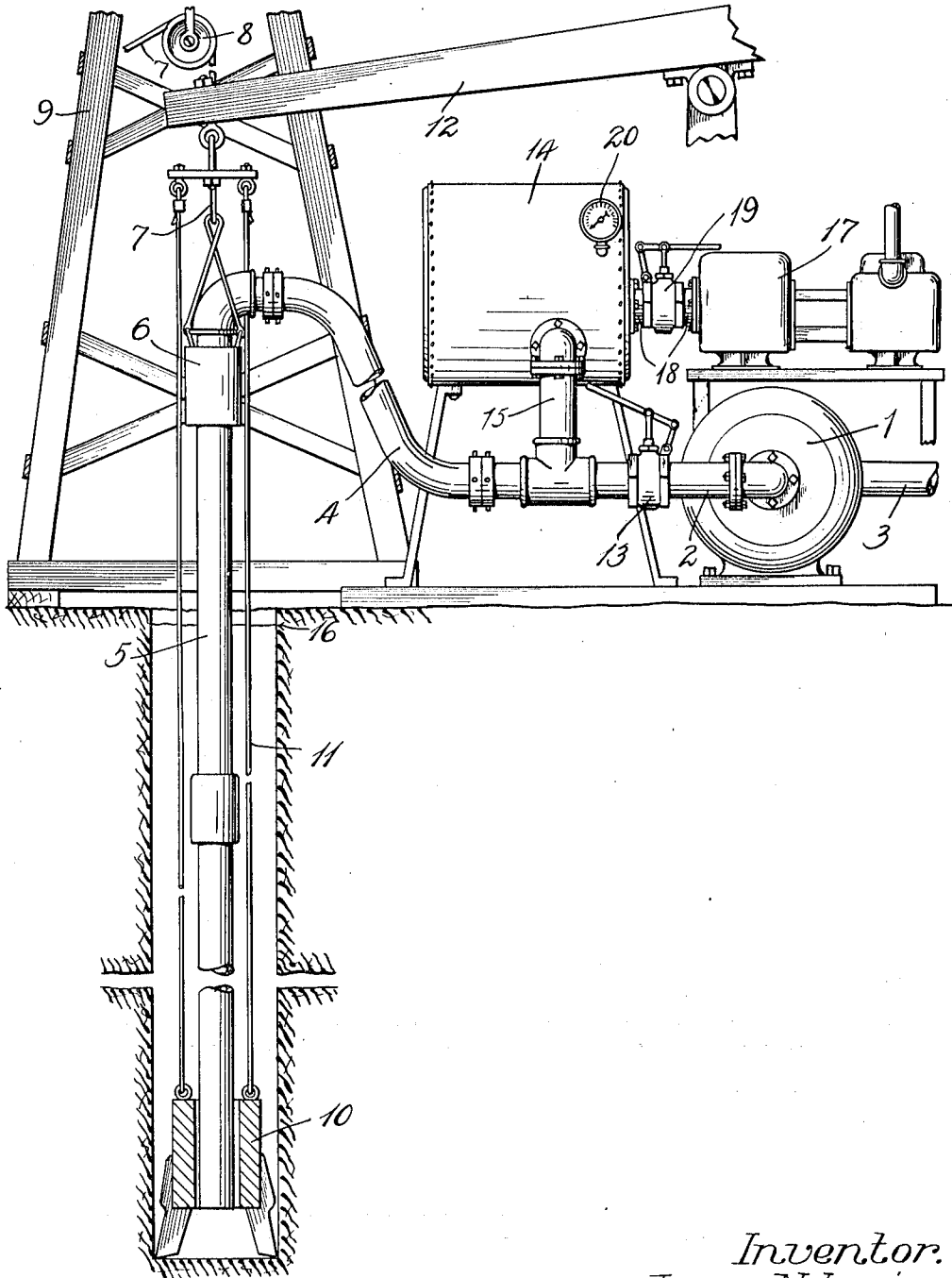


J. N. LEWIS.
CENTRIFUGAL PUMPING MECHANISM.
APPLICATION FILED MAY 8, 1911.

1,053,615.

Patented Feb. 18, 1913.



Witnesses.

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JAMES N. LEWIS, OF LOS ANGELES, CALIFORNIA.

CENTRIFUGAL PUMPING MECHANISM.

1,053,615.

Specification of Letters Patent.

Patented Feb. 18, 1913.

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To all whom it may concern:

Be it known that I, JAMES N. LEWIS, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Centrifugal Pumping Mechanisms, of which the following is a specification.

This invention relates to improvements in pumping mechanisms and it has particular relation to means for establishing and maintaining a proper suction for the operation of a centrifugal pump.

The mechanism is particularly designed to provide an auxiliary means for establishing such a suction and thus permitting of the intermittent use of a rotary or centrifugal pump, especially where water or other materials are to be raised from varying depths below the pump.

It is well known that it is difficult to start the operation of a centrifugal pump for the reason that a vacuum cannot always be secured for establishing the flow of materials through said pump. By means of the present invention an auxiliary device can be employed to start the pumping mechanism, and establishing a condition at the suction side of the rotary pump which will insure the establishing of the proper vacuum when the pump is brought into operation.

In the accompanying drawing forming a part of this specification, the figure illustrates a mechanism which is well suited to the carrying out of the present invention, and the details of the invention will now be fully described, reference being had thereto.

In the drawing, 1 indicates a rotary or centrifugal pump of any ordinary or desired type, 2 an inlet pipe leading to the suction side of said pump and 3 indicates a discharge pipe. Since the mechanism is well adapted for use in connection with a well or any other place where it is necessary to raise liquids and substances carried thereby, the invention has been illustrated as applied to a well. The pipe 2 is connected usually by means of a flexible pipe as 4 with well tubing or piping as 5 which is adapted to extend downwardly into the bore of a well as the excavation proceeds. The drawing also discloses a supporting collar 6 for the well tubing which is suspended in any suitable manner as for instance by a cable 7 which passes upwardly over a sheave or pulley 8, usually supported upon a framing or

derrick 9 located at the mouth of the well. The drawing also illustrates a well digging implement or tool as 10 which is suspended by cables 11, from a walking beam 12, the walking beam being supported in any usual or well known manner and operated in the usual way for boring the well. The tube 3 may be lengthened from time to time to extend it as the well is deepened. The end of the tube is thus in close proximity to the digging tools and receives the material as well as the water that is supplied for washing out the same so that the pump may clear the well as it is driven.

Adjacent to the pump 1, a gate or other suitable valve 13 is provided, and interposed in the pipe 2 so that the connection between the well and the said pump may be shut off when desired. A tank 14 is generally mounted adjacent to the pump, and is connected by a branch pipe 15 with the suction pipe 2. The water level in the well is ordinarily maintained near the surface of the ground as indicated at 16 upon the drawing, and the tank 14 is preferably made of sufficient capacity to receive the contents of the piping 2, 4 and 5 which reaches from the said tank to the water level in the well. This tank of course may be made of greater capacity as found desirable. Connected with the tank 14 is an ordinary wet vacuum pump 17 which is capable of pumping both air and liquids. The pump 17 is generally connected with the tank 4 by means of a pipe 18 in which is generally located a cut off valve 19 of any desired type. The tank 14 may also be provided with a vacuum gage 20 for indicating pressure within the tank 14.

In starting the pumping operation, the valve 13 is closed and the pump 17 is then started for pumping the air from the pipes 2, 4 and 5, and drawing the water from the well up to the tank 14. As soon as this has been accomplished the valve 13 is opened, the centrifugal pump having been first started to operate, and the water which the auxiliary pump 17 has drawn into the pipe and up to the tank, will thus be in such a position that the proper continuous suction will be established for the operation of the centrifugal pump. After the centrifugal pump has taken up the pumping operation, it is not necessary to continue the operation of the pump 17. In the event of the changing of tools in the well, and the lengthening of

the piping 5, it is necessary to stop the pumping operation temporarily, and but for the mechanism above described it would be very difficult if not impossible to reestablish the proper suction condition necessary for the operation of the centrifugal pump, for the piping from the water level to the centrifugal pump must be filled with water. As soon as the tools and piping in the well have been readjusted it is only necessary to start up the pump 17, the valve 13 having been closed before the previous pumping operation was discontinued. The auxiliary pump 17 will in a few minutes withdraw the air from the piping and fill the pipes with water, and thus prepare the proper conditions for the continuing of the pumping operation by means of the centrifugal pump.

The mechanism described has been found in practice to operate admirably in connection with the pumping from wells and makes it possible to not only pump water and excavating materials from shallow wells but makes it possible also to use a centrifugal pump in wells of any depth.

It should be understood that it is not intended to limit the mechanism to the pumping of materials or liquids from wells since the mechanism can be used for pumping from rivers or streams as in dredging, and makes it possible to successfully employ a rotary centrifugal pump for lifting liquids charged with heavy materials, and materials of any size that pass through the piping employed in connection with the pump.

The auxiliary pump 17 need not be of large size, and is generally only employed when in starting the operation of the centrifugal pump. The mechanism is simple and of economic construction and can be readily taken from place to place so as to

be employed in all kinds of operations where pumps are used. The device greatly widens the scope of the usefulness of the centrifugal pump.

It is frequently found that gas escapes from reservoirs in the ground into the well and its presence materially reduces the efficiency of the rotary pump, and this I overcome by the maintenance of a pressure of lower intensity in the tank 14 sufficient to draw the gas into the tank and not have it enter and "air check" the action of the rotary on the flow of water.

While the pumps are in operation the pressure exerted by the rotary must be greater and in practice it is found advisable to keep the pressure in the tank sufficient to hold an amount of water in the tank so that the entrance of air into the tank would displace sufficient water to keep the centrifugal primed.

What I claim is:

A pumping mechanism, comprising a centrifugal suction pump, a suction pipe leading therefrom and extending to a point from which liquid materials are to be raised, a valve mounted in said suction pipe adjacent to the centrifugal pump, a pressure tank, branch piping connecting the suction pipe with said tank between the valve and the well and a vacuum pump connected with the said tank auxiliary to and operable in conjunction with the said centrifugal pump.

In witness that I claim the foregoing I have hereunto subscribed my name this 3rd day of May, 1911.

JAMES N. LEWIS.

Witnesses:

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