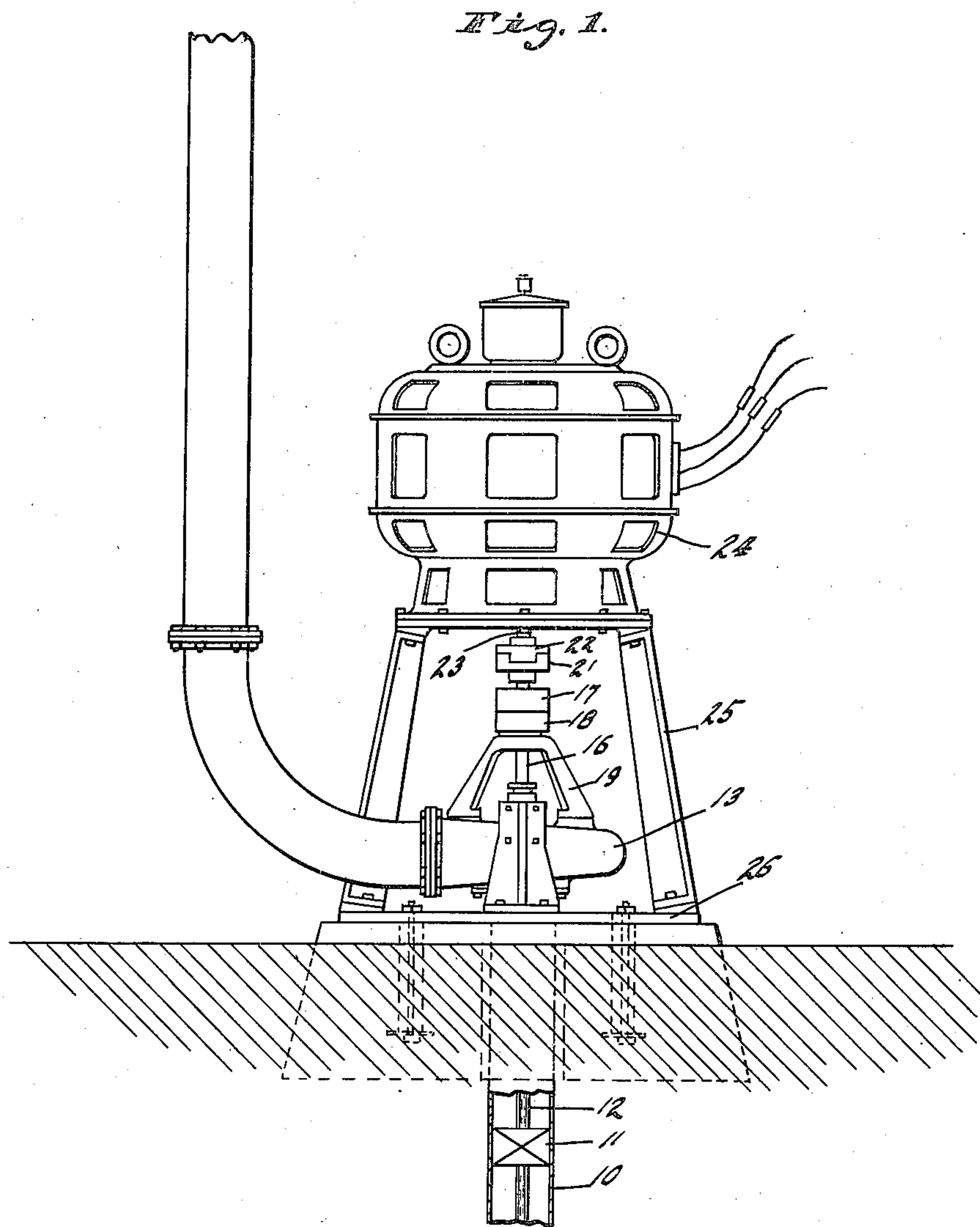


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PROPELLER TURBINE PUMP.
APPLICATION FILED SEPT. 15, 1910.

975,526.

Patented Nov. 15, 1910.

2 SHEETS—SHEET 1.



Witnesses
Frank A. Fahy
Thomas W. McMeans

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Ernest K. Hood

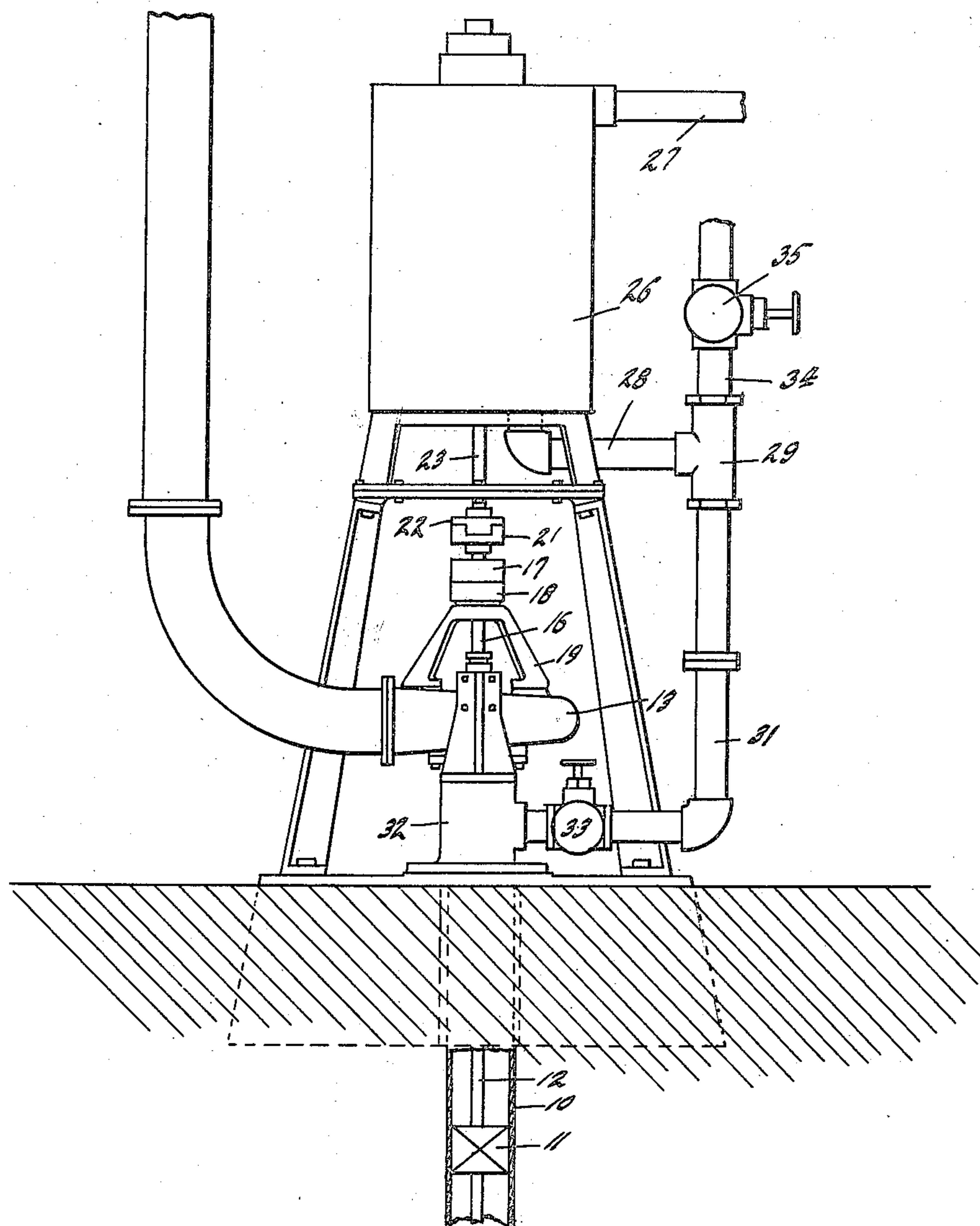
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Fig. 2.



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UNITED STATES PATENT OFFICE.

ERNEST K. HOOD, OF INDIANAPOLIS, INDIANA.

PROPELLER TURBINE-PUMP.

975,526.

Specification of Letters Patent.

Patented Nov. 15, 1910.

Application filed September 15, 1910. Serial No. 582,120.

To all whom it may concern:

Be it known that I, ERNEST K. HOOD, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented a new and useful Propeller Turbine-Pump, of which the following is a specification.

The object of my invention is to produce a pumping apparatus comprising a screw-propeller lifting-machine, a pressure pump, such as a centrifugal or turbine pump into which said screw-propeller lifting-mechanism will discharge, and a motor or driving element connected (preferably directly), with the lifting mechanism and pressure pump, the structure being preferably such that the shafts of the three elements are in direct alinement.

A further object of my invention is to use, in the combination already defined, a steam turbine engine, the exhaust of which is delivered into the water line so that the water line serves to produce proper condensation in the exhaust line of the turbine.

The accompanying drawings illustrate my invention.

Figure 1 is a side elevation of an apparatus embodying the fundamental features of my invention, the motor being an ordinary electric motor; Fig. 2 a similar view of a complete embodiment of my invention wherein the motor is a steam turbine.

In the drawings, 10 indicates the tube or casing of a well in which are mounted a desired number of screw-propeller lifting-elements 11, of any ordinary form, which are carried by a shaft 12 which is projected upwardly through the casing.

Arranged at the top of the casing 10 is a centrifugal or turbine pump 13 of any desired and ordinary form, the details of which are entirely immaterial so far as the present invention is concerned. This centrifugal or turbine pump is so arranged that the casing 10 discharges into the receiving eye of the pump and the shaft 16 of the pump and the shaft 12 of the rotary element of the turbine are directly connected and arranged in alinement. If desired, the propeller shaft may be projected through the pump and the rotary element of the pump directly connected to that shaft. The upper end of the shaft 16 is provided with a thrust bearing element 17 which co-acts with a corresponding thrust bearing element 18 carried at the upper end of a suit-

able bracket 19 which may be conveniently mounted directly upon the pump casing, this thrust bearing preferably embodying either balls or rollers, but the details of this bearing are immaterial. Shaft 16 at its upper end carries a clutch member 21 adapted to mesh with a corresponding clutch member 22 carried by the motor shaft 23. In the form shown in Fig. 1 the motor 24 is an ordinary electric motor supported in place by a suitable support pedestal 25 carried by base plate 26 which supports the casing 10 and the pump 13. In the form shown in Fig. 2, the arrangement is substantially the same as that shown in Fig. 1, so far as the correspondingly numbered parts are concerned, but the motor is steam turbine 26, the shaft 23 of which is connected to the pump shaft as already described. The turbine 26 is provided with suitable steam inlet pipe 27 and with an exhaust pipe 28. The pipe 28 is carried into tee 29, one end of which is connected by pipe 31 to a tubular fitting 32 which is preferably introduced in the line between casing 10 and the receiving eye of the pump 13. Arranged in pipe 31 is a valve 33. The other end of the tee 29 is provided with an outlet pipe 34 in which a valve 35 is mounted.

In operation, a rotation of the motor causes a rotation of the pump shaft and propeller shaft and water within the well casing is vertically lifted by the propellers 11 and delivered from the top of casing 10 at comparatively low pressure, it being impossible to obtain any material amount of pressure with screw propeller lifting elements. This water, however, passes directly from the upper end of casing 10 into the high pressure centrifugal pump and is by it delivered at any desired pressure depending, of course, upon the particular characteristics of the propeller element and the speed of rotation.

In the form shown in Fig. 2 the apparatus is started by closing valve 33 and opening valve 35 so that the exhaust of the engine is not driven down into the well but as soon as the water begins to flow from the casing 10 into the pump 13, valve 33 is opened and valve 35 is closed so that thereafter the steam turbine exhausts into the flowing stream of water and is thereby condensed so as to produce a material and efficiency-increasing vacuum in the exhaust line of the turbine.

By arranging the propellers, the centrifugal pump, and the motor in alinement I reduce the possible loss of power due to change in direction of application of power so that
5 the entire force of the motor is exerted directly, and without change of direction of application, upon the lifting and pressure elements, thus materially increasing the amount of water which may be lifted under
10 pressure with a given amount of power.

I claim as my invention:

1. A fluid pumping mechanism consisting of a screw-propeller lifting-member, a centrifugal pumping-element arranged in alinement with the lifting-element and in position to receive the discharge from the lifting-element, and a motor connected with
15 said lifting and pumping elements and arranged in alinement therewith.

20 2. A fluid pumping mechanism consisting of a screw-propeller lifting-member, a centrifugal pumping-element arranged in position to receive the discharge from the lifting-element, and a motor connected with said
5 lifting and pumping elements.

3. A fluid pumping mechanism comprising a screw-propeller lifting-element, a centrifugal pumping-element arranged to receive the discharge from the lifting element,

a steam motor connected to said lifting and
pumping elements, and a connection between
the exhaust of said steam motor and the
line of flow of fluid whereby the motor may
exhaust into, and the exhaust be condensed
by, the fluid stream. 30

4. A liquid pumping mechanism comprising a screw-propeller lifting-element, a centrifugal pumping-element arranged in alinement with the lifting-element and receiving the discharge therefrom, a steam turbine arranged in alinement with the lifting-element and pumping-element and connected thereto, and a connection between the exhaust side of the steam turbine and the interior of the lifting and pumping elements. 35 40

5. A liquid pumping mechanism comprising a screw-propeller lifting-element, a centrifugal pumping-element arranged in alinement with the lifting-element and receiving the discharge therefrom, and a steam turbine arranged in alinement with the lifting-element and pumping-element and connected thereto. 45 50

ERNEST K. HOOD.

Witnesses:

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