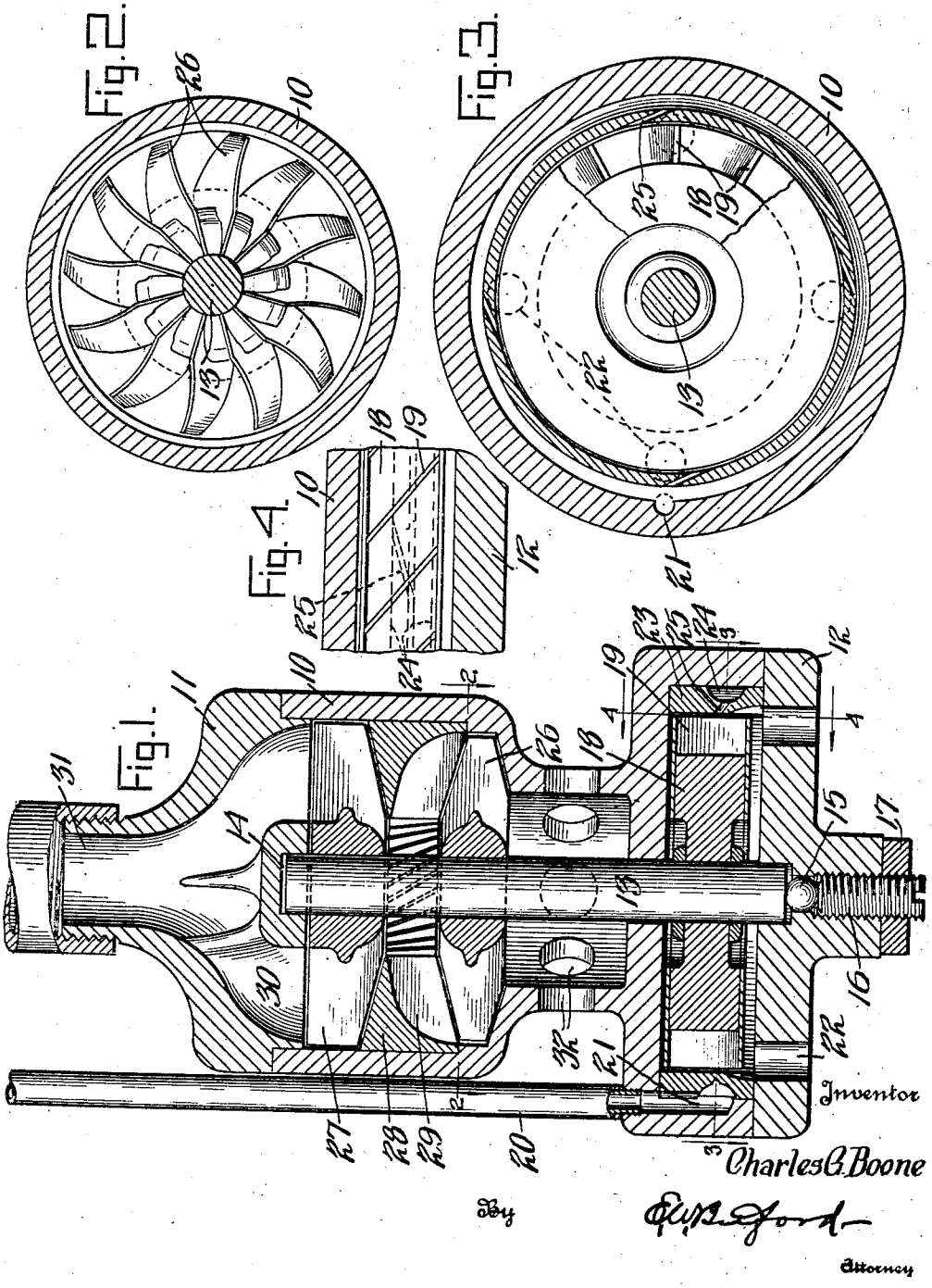
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CENTRIFUGAL OIL WELL PUMP

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CENTRIFUGAL OIL WELL PUMP

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Serial No. 575,626

1 Claim. (Cl. 103—103)

This invention relates to centrifugal pumps operated by turbine or other fluid motors.

The object of the invention is to provide a pump particularly adapted for oil wells in which the pump and motor may be enclosed in a single unit.

A further general object is to simplify pump motor combinations suitable for oil wells.

Further general objects and advantages will become apparent from the description which follows:

Referring to the accompanying drawing, which is made a part hereof and on which similar reference characters indicate similar parts,

Figure 1 is a vertical section through the motor and pump,

Figure 2 is a section on line 2—2 of Figure 1 showing the pumping unit,

Figure 3, a section on line 3—3 of Figure 1 showing the motor unit, and

Figure 4 a section on line 4—4 of Figure 1, showing a detail of the motor impeller.

The motor and the pump are enclosed in a housing 10, the upper end of which is closed by a cap 11 and the lower end by a cap 12, the caps being held to the housing in any suitable way such as by bolting them thereon. A pump and motor shaft 13 has its lower end journaled in the cap 12 and its upper end in a bearing 14 which is made integral with the cap 11. The lower end of the shaft 13 preferably rests upon a thrust bearing 15 which bearing may rest upon a screw 16 which is threaded through the cap. Endwise play of the shaft 13 may be taken up by adjustment of the screw 16. The motor consists of an impeller wheel 18 secured upon the shaft 13, this impeller being provided with vanes 19 on its periphery. A pressure fluid line 20 connects to the motor casing at 21 and outlets for motive fluid are provided at 22. A ring 23 within the casing forms a casing for the motor chamber and this ring has an annular groove 24. Port openings 25 direct motor fluid from the groove 24 upon the vanes 19. As shown the openings 25 are equally spaced about the motor chamber so as to provide a balanced effect to the rotation of the motor. While four such port openings 25 are shown, obviously the invention is not limited to this number, the important thing being that the openings are equally spaced to provide a balanced effect. The vanes 19 are placed at an angle on the rotor 18 so that motive fluid will give a lifting effect to the rotor 18 to offset to some extent the pressure of the pumped fluid.

The pumping unit consists of impellers 26 and 27 which form centrifugal pumps which operate in series. Between the impellers 26 and 27 is placed a ring 28 which has spirally shaped vanes 29 which pick up the fluid delivered from the impellers 26 and deliver it to or near the center of the impellers 27. Positioned in the cap 11 are spiral wings or blades 30 which receive the fluid delivered by the impeller 27 and direct it to the outlet 31. The pumping impellers 26 are preferably somewhat curved vanes which are set at a slight angle with the axis of the shaft to which they are attached. The angular position on the shaft 13 assists in forcing the fluid upwardly as well as outwardly due to the centrifugal effect produced by rotation of the impellers. The casing 10 is provided with a number of inlet openings 32 through which the pumped fluid is drawn. Pressure fluid for operating the motor 18 may be supplied by any suitable hydraulic pressure pump.

While I have shown two sets of pumping impellers 26 and 27 operating in series I do not limit myself to this number of groups of impellers as obviously certain operating conditions such as depth of the well and the type of fluid being pumped may require a greater number of groups in order to develop sufficient pressure for lifting the pumped fluid. Likewise while a single motor impeller has been shown I do not limit myself to such specific structure as it may be found more efficient to operate a motor impeller in series with one or more such impellers.

It will be obvious to those skilled in the art that various changes may be made in my device without departing from the spirit of the invention and therefore I do not limit myself to what is shown in the drawing and described in the specification, but only as indicated by the appended claim.

Having thus fully described my said invention, what I claim as new and desire to secure by Letters Patent, is:

An oil well pump comprising a casing having a shaft journaled therein, a rotary pump piston mounted on said shaft, said piston comprising a plurality of impeller blades, a ring mounted in said casing adjacent said piston, said ring having spirally arranged baffle plates for delivering fluid to be pumped to the suction of said piston, a second piston mounted on said shaft and having a plurality of impeller blades arranged to deliver pumped fluid through the said ring, a plurality of fluid inlet ports arranged about said casing, and a plurality of spirally arranged ribs in said casing at the discharge side of the first-named piston, said ribs terminating at their center in a bearing, one end of the pump shaft being journaled in said bearing, substantially as set forth.

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