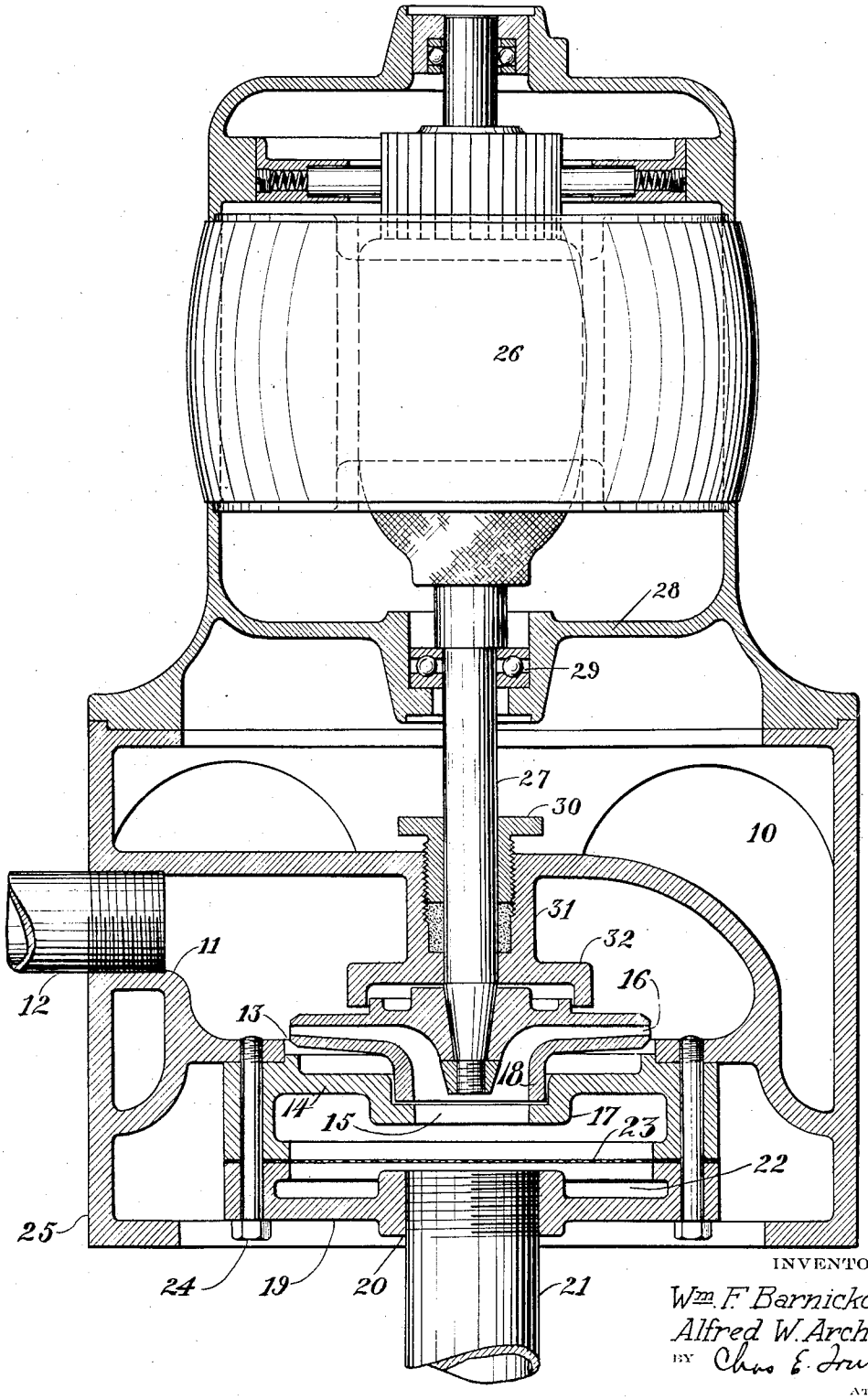
W. F. BARNICKOL AND A. W. ARCHER.

VERTICAL PUMP.

APPLICATION FILED FEB. 4, 1920.

**1,367,450.** **Patented Feb. 1, 1921.**




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## VERTICAL PUMP.

1,367,450. Specification of Letters Patent. Patented Feb. 1, 1921.

Application filed February 4, 1920. Serial No. 356,167.

*To all whom it may concern:*

Be it known that we, WILLIAM F. BARNICKOL and ALFRED W. ARCHER, citizens of the United States, residing at Stockton, in the county of San Joaquin and State of California, have invented new and useful Improvements in Vertical Pumps, of which the following is a specification.

This invention relates to a turbine construction.

It is the principal object of the present invention to provide a turbine adapted to be easily mounted in a horizontal position over a pipe outlet and which is directly connected with the vertical driving shaft of a motor supported upon the turbine casing, said structure providing a direct driving action for the turbine and insuring that efficient operation on the turbine will take place.

The present invention contemplates the use of a horizontally disposed volute casing of large sectional area and within which a horizontally moving runner is positioned, said runner being fixed in relation to a vertical motor shaft and acting to impel a fluid from an inlet to an outlet passage-way.

The invention is illustrated, by way of example, in the accompanying drawings, in which the figure shows a view through the turbine as indicated in section and elevation.

Referring more particularly to the drawings, 10 indicates a volute casing here shown as horizontally disposed and as having an eduction opening 11, within which an exhaust pipe 12 is mounted. A circular induction opening 13 is formed in the lower horizontal wall of this casing and is partially closed by a nozzle plate 14, having a central opening 15 through which a fluid or liquid may be delivered to the runner, 16. It is to be noted that the plate 15 is formed with a counter-bored boss 17, into which hub 18 of the runner extends. Secured beneath the nozzle plate 14 is a suction pipe flange 19, having a central threaded opening 20 into which a suction pipe 21 is secured. It will be noted that a large circular compartment 22 is formed around the opened end of the pipe 21 and between it and the opened end of the nozzle plate 14. Interposed across this compartment is a screen 23 of reticulated material which will act to clean the liquid being drown into the casing. The screen, as well as the flange 19 and the plate 14, are secured in position by bolts 24.

A cylindrical casing 25 is formed integral with the volute portion of the casing and not only provides a suitable base for the pump, but also a support for a driving motor 26. The motor here shown has a vertical armature shaft 27 which extends downwardly through a motor cage 28 and is supported by radial and thrust bearings 29. The lower end of this shaft extends through a stuffing gland 30 mounted within a central hub portion 31 of the volute casing. The portion of the shaft terminating below the hub 31 is fitted with the runner 16. The upper hub portion of the runner 16 is inclosed within a cup 32, formed upon the lower end of the casing of 31.

Attention is especially directed to the fact that the sectional area of the volute casing is relatively large in comparison with that of pumps now made and in comparison with the dimensions of the runner 16. For this reason it is contended that a large quantity of water will be able to pass from the runner.

In the operation of the present invention the suction pipe 21 will be connected with any body of liquid to be transferred, and after the motor 26 has been placed in operation, the runner 16 will revolve in a manner to create a suction and elevate the liquid into the volute casing 10 and thereafter assist it in passing form the volute casing and out through the eduction pipe 12.

While we have shown the preferred form of our invention as now known to us, it will be understood that various changes might be made in the combination, construction and arrangement of parts by those skilled in the art without departing from the spirit of the invention as claimed.

Having thus described our invention what we claim and desire to secure by Letters Patent is—

1. A pump comprising a horizontally disposed volute casing, a runner therein driven by a vertical shaft, a nozzle plate secured beneath the casing and formed with an induction opening, a suction plate secured in spaced relation to the nozzle plate and carrying a suction pipe.

2. A pump comprising a horizontally disposed volute casing, a runner therein driven by a vertical shaft, a nozzle plate secured beneath the casing and formed with an induction opening, a suction plate secured in spaced relation to the nozzle plate and carrying a suction pipe, and a screen secured

between the two plates and interposed between the end of the suction pipe and the induction opening.

3. A pump comprising a horizontally disposed volute casing, a runner rotatable therein, a nozzle plate secured across the induction opening of the casing and beneath the runner, a suction flange secured beneath the nozzle plate and forming an enlarged chamber between said flange and plate, and a suction pipe communicating with said chamber through the flange.

4. A pump comprising a horizontally disposed volute casing, a runner rotatable therein, a nozzle plate secured across the induction opening of the casing and beneath the runner, a suction flange secured beneath the nozzle plate and forming an enlarged chamber between said flange and plate, a suction pipe communicating with said chamber through the flange, and a screen stretched across the chamber and interrupting the flow of liquid from the suction pipe to the induction opening of the volute casing.

5. A pump comprising a hollow base having formed therein a horizontally disposed volute casing, a nozzle plate secured beneath the casing and in communication with a suction pipe, a runner in said volute casing disposed over said nozzle and having an annular flange formed about its hub or center, a motor mounted on said casing and a shaft connecting said motor with said runner, a step bearing for said motor, a packing gland casing for said shaft formed in said volute casing and extending downwardly therein and a cup formed on the lower end of said packing gland casing adapted to encompass the annular flange on the runner.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

WILLIAM F. BARNICKOL.
ALFRED W. ARCHER.

Witnesses:
FRANCIS CUTTING,
L. M. CUTTING.