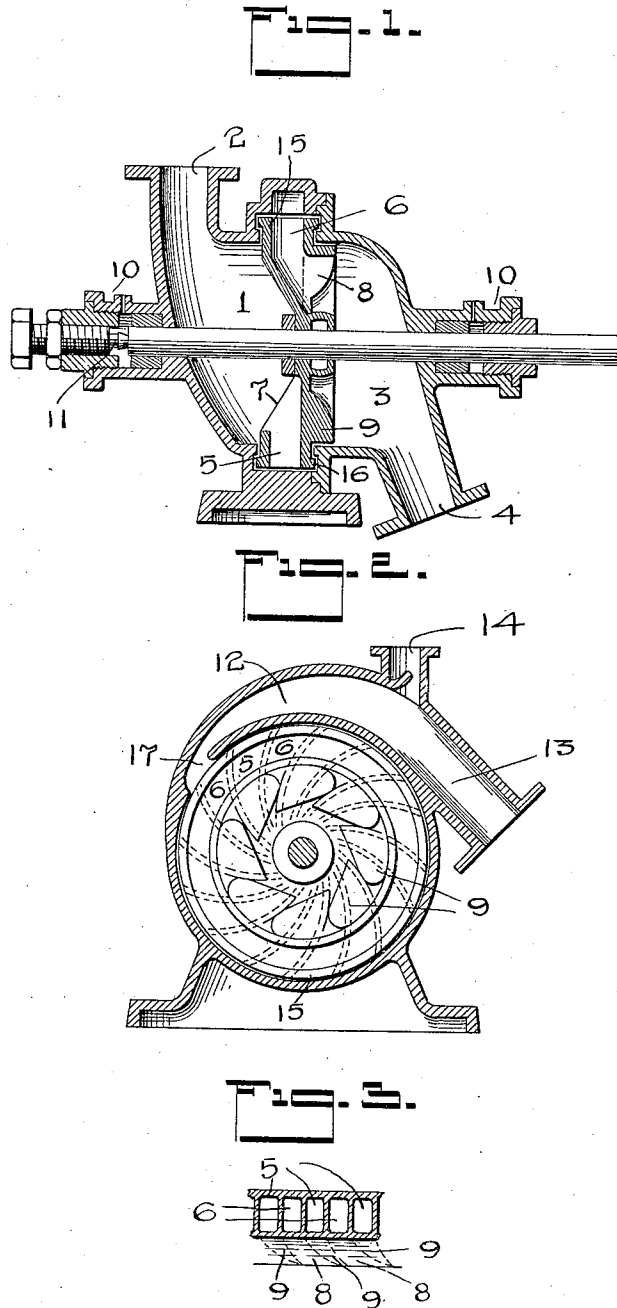


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CENTRIFUGAL AIR PUMP,
APPLICATION FILED AUG. 21, 1911.

1,049,118.

Patented Dec. 31, 1912.



WITNESSES
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GEORGES MASSIP, OF PARIS, FRANCE.

CENTRIFUGAL AIR-PUMP.

1,049,118.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, GEORGES MASSIP, a citizen of the French Republic, and resident of Paris, France, have invented new and useful Improvements in Centrifugal Air-Pumps, of which the following is a full, clear, and exact specification.

The object of the present invention is a centrifugal air pump in which the channels of the wheel alternately are arranged in two groups, and having an air chamber and a water chamber upon its two faces in such a manner that during the operation of the pump one lamel of water follows one lamel of air and pushes the same into a space arranged tangentially to the wheel.

To that and other ends which will be hereinafter more fully explained my invention comprises devices novel features of improvements and combination and arrangement of parts which will be hereinafter described and claimed, reference being had to the accompanying drawing forming part of this specification, wherein—

Figure 1 is a section through the pump upon the axis of the wheel shaft. Fig. 2 is a horizontal section through the wheel and Fig. 3 is a section through the paddles.

The air chamber 1 is connected by a tubular stem 2 to a condenser or to the apparatus in which a vacuum is to be produced. The water chamber 3 sucks the water through the tubular stem 4. The movable wheel is arranged between both chambers and is divided by small wings into channels 5, 5 and 6, 6 which stand in respective communication with the air and water chambers.

The air chambers 5, 5 open as at 7, 7 directly toward the center of the wheel upon its left face. As it is difficult to bring the water in at the center, the water channels form a system analogous to the centripetal hydraulic turbines in which the flow of the water is reversed in such a manner that the water is admitted parallel to the axis of the pump through the channel 8 which is greatly facilitated by constructing the paddles 9 in form of ladles. These paddles are at their base of the same size as one of the air channels 5 which construction permits of the regular passage of the water into the wheel notwithstanding the presence of the air channels which are interposed between the water channels. The shaft is supported in water tight bearings 10 provided with a pivot 11 adapted to receive the thrust of the

wheel. Tangentially to the wheel, a discharge channel or space 12 is provided into which the water lamels are projected propelling successively the air lamels. To start the pump it is sufficient to create a vacuum in the space 13 by means, for instance of a trompe, thereby care should be taken to close the vent 14 during this time.

To prevent leakage between the water and the air chamber the wheel is provided at its faces with peripheral projections 15 entering channels 16 in the casing integrally with the frame of the pump. The water lamels acting successively as liquid pistons and in the same sense closely follow one upon the other and consequently no dead space is left. The air lamels are entirely inclosed without that the elasticity of the water lamels need to be taken into consideration. No shock or collision is experienced between water and air, and the air itself has a great velocity when leaving the wheel.

The maximum of power is developed by reducing the cross section of the water channels as much as possible in proportion to the air channels and consequently reducing also the volume of water to be used to a minimum. With the same end in view it is possible to regulate the width of the opening 17 in exact proportion by means of a movable slide operated by an exterior hand wheel not shown in the drawing.

It will of course be understood that the details and construction of the various features of my invention hereinabove described may be varied in many particulars without departing from the scope of my invention.

The object of my invention is to cause a relatively dense fluid or medium to propel a fluid or medium of relatively less density and I have used the term "water and air" merely to clearly designate the mediums of different density and I do not wish to limit my invention, by these terms, or otherwise, except for such limitations as the claims import.

Having thus described my invention what I claim is:

1. A centrifugal air pump comprising in combination, a casing having a circular peripheral wheel way provided with a tangentially disposed outlet, a shaft axially disposed in said casing with respect to said wheel way, said casing having an air inlet and a water inlet leading toward the plane of said wheel way, and an imperforate wheel

on said shaft with its periphery projecting into said wheel way and provided with alternately disposed air and water chambers discharging into said wheel way, the air chambers having their intakes opening to the air inlet of said casing and the water chambers having their intakes opening to the water inlet of said casing, and vanes or paddles on the water side of said wheel, substantially as described.

2. A centrifugal air pump comprising in combination, a casing having a circular wheel way provided with a single outlet passage extending tangentially in a given direction and also provided with axially disposed air and water inlets, and a power driven wheel in said casing and wheel way provided with independent air and water chambers discharging into said single outlet and having their discharge ends extending toward the direction of rotation of the wheel and the direction of rotation of the wheel being similar to the direction in which the single outlet extends, said air chambers having intakes extending toward and opening radially inwardly near the axis of the wheel on the air intake side of the casing and at substantially right angles to the axis of the wheel, said water chambers having intakes opening axially of the wheel and projecting paddles for inducing a radial flow of the water through said water chambers, substantially as described.

3. A centrifugal air pump comprising in combination, a casing having a circular wheelway provided with a single outlet pas-

sage extending tangentially in a given direction and also axially disposed air and water inlets, and a power driven wheel in said casing and wheelway with independent air and water chambers discharging into said single outlet, the wheel being driven in a direction similar to the direction in which said tangential outlet extends, said air chambers having intakes extending toward and opening radially inwardly near the axis of the wheel on the air intake side of the casing, said water chambers having intakes opening axially of the wheel and projecting paddles for inducing a radial flow of the water through said water chambers, substantially as described.

4. A centrifugal air pump comprising in combination, a casing having a single peripheral outlet and axial water and air inlets, and a power driven wheel in said casing having air and water chambers provided with inlets opening near the axis of the wheel to the air and water inlets of the casing, said chambers alternately discharging separated bodies of air and water into the single peripheral outlet, and the water chambers being provided with paddles for inducing a flow of water through the water chambers to propel the air through said peripheral outlet, substantially as described.

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

GEORGES MASSIP.

Witnesses:

H. C. COXE,
BARTLEY F. YOST.