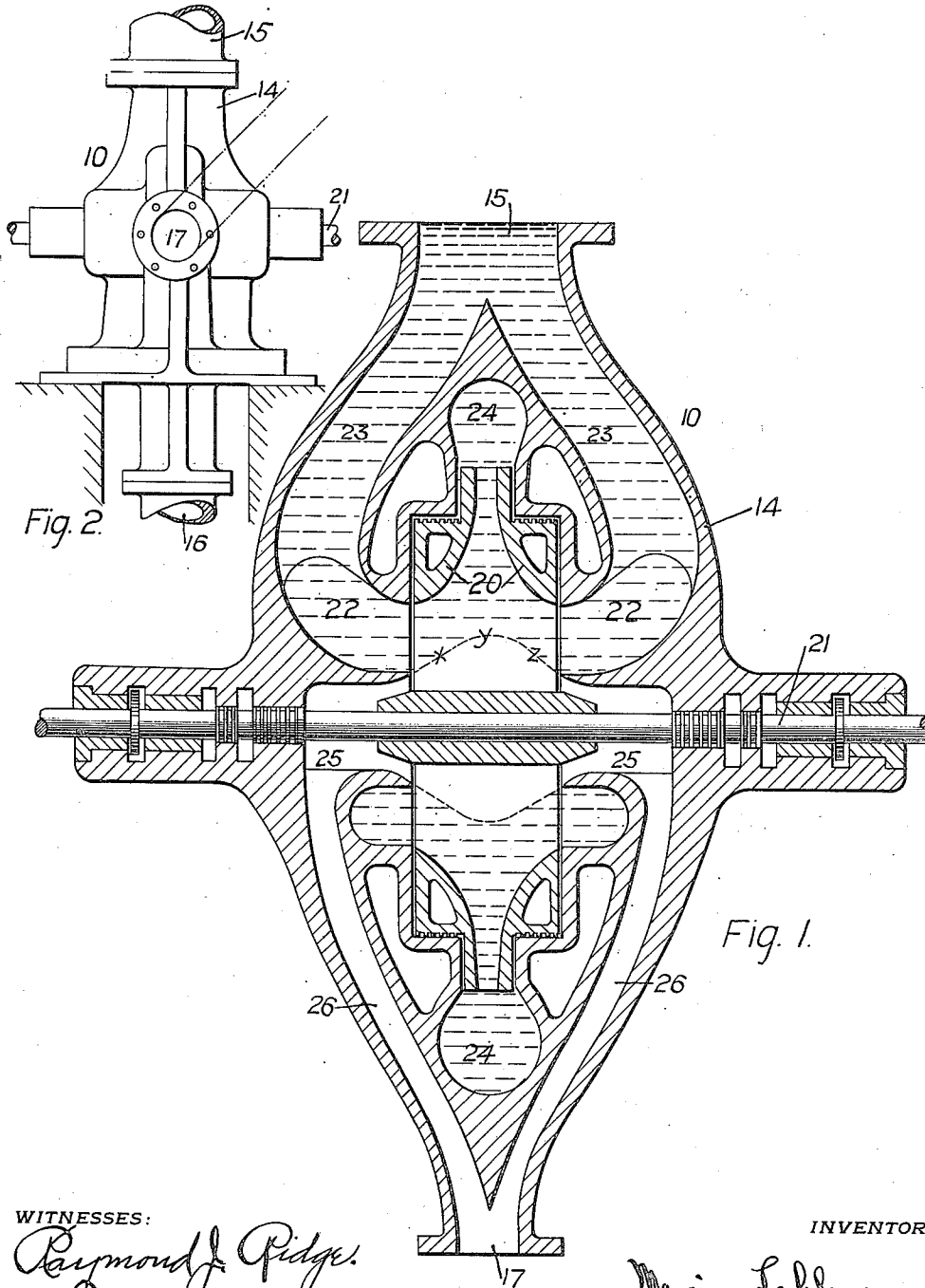


M. LEBLANC.
CENTRIFUGAL PUMP.
APPLICATION FILED MAR. 9, 1911.

1,150,686.

Patented Aug. 17, 1915.



WITNESSES:

Raymond J. Ridge.
B. Thum

INVENTOR.

Maurice Leblanc

BY

Jno. S. Green

HIS ATTORNEY IN FACT.

UNITED STATES PATENT OFFICE.

MAURICE LEBLANC, OF PARIS, FRANCE. ASSIGNOR TO SOCIETE ANONYME POUR L'EXPLOITATION DES PROCEDES WESTINGHOUSE-LEBLANC, OF PARIS, FRANCE.

CENTRIFUGAL PUMP.

1,150,686.

Specification of Letters Patent.

Patented Aug. 17, 1915.

Original application filed December 5, 1906, Serial No. 346,473. Divided and this application filed March 9, 1911. Serial No. 613,380.

To all whom it may concern:

Be it known that I, MAURICE LEBLANC, a citizen of the Republic of France, residing at Villa Montmorency, Auteuil, Paris, France, have made a new and useful Invention in Centrifugal Pumps, of which the following is a specification, this application being a division of an application filed by me which matured into Patent No. 1,004,664, of October 3, 1911.

This invention relates to a centrifugal pump.

One object of the invention is to produce a pump of simple construction and effective in operation.

Other objects and advantages, as well as the novel details of construction of the invention will appear hereinafter, it being understood that changes in form, proportion and minor details of construction may be resorted to without departing from the spirit of the invention or sacrificing any of the advantages thereof.

In the drawings: Figure 1 is a sectional view of a pump constructed in accordance with my invention, the upper part of the view being a vertical section through the axis and the lower part a horizontal section through the axis; and Fig. 2 is a reduced elevational view of the pump.

The pump is here shown as being provided with a stationary casing 14, in which a suction port 15, a discharge port 16 and an auxiliary or air discharge port 17 are located. The suction port 15 may communicate with a condenser; the air port 17 may communicate with a fluid-ejecting device and the discharge port 16 may communicate with a sump pit or well.

The rotor element or runner 20 of the pump is mounted on a shaft 21, which is provided with suitable bearings located in a casing 14. Chambers 22 are located on each side of the rotor element and communicate with the suction port 15 through passages 23 formed within the casing. The vortex or worm 24 of the pump is formed in the usual manner and communicates with the discharge port 16. Cylindrical chambers 25 are formed on each side of the rotor element around the shaft 21 and communicate with the port 17 through passages 26 formed in the casing.

The water from the condensing chamber

inlet may be divided into two streams by the passage 23 and delivered to the chambers 22 from which it is delivered to the working passages of the rotor 20. The air or other non-condensable gases entrained by the water is separated from it by centrifugal force, the water being projected outwardly and air or gas forced inwardly around the shaft. The line of separation between the water and gas, to some extent, affects the form of the surface of rotation, the bounding lines of which are shown in Fig. 2 by dotted lines *x, y, z*. If the non-condensable gases separated from the water were not removed from the pump, they would eventually invade the chambers 22 and thereby obstruct the admission passages 23.

With the pump constructed as described with the pump to eject the air, the danger of choking the pump with air or gas is overcome, since the air is removed from the chambers 25 as fast as it is separated from the water and there is in reality a partial vacuum around the shaft and in the chambers 25. The non-condensable gases exhausted from the pump by the fluid-ejecting device contain very little, if any, water because they cannot pass from the chambers 22 into the chambers 25 without passing through a portion of the rotor passages and being subjected to the separating action of the centrifugal force. An ordinary dry vacuum pump could therefore be used to exhaust the non-condensable gases from the pump 10, or any other suitable device may be used if desired.

Having thus described my invention what I claim is:

1. In a centrifugal pump for transferring water and air commingled and separately discharging them, a runner and a casing provided with an inlet, a water outlet and an air outlet which extends inwardly to and surrounds the runner shaft.

2. In a centrifugal pump for transferring water and air commingled and separately discharging them, a runner, a casing surrounding the runner and provided with an inlet, a water outlet, an air outlet and a chamber for conduit means extending from said air outlet inwardly to and around the runner shaft.

3. In a centrifugal pump, a rotatable shaft, a bylaterally symmetrical runner

- mounted on the shaft and having oppositely disposed intakes surrounding oppositely disposed annular air offtakes which surround the pump shaft, and a casing surrounding the runner, and having a volute chamber communicating with the liquid passages of the runner and with an outlet port formed in the casing and an air outlet port communicating with the air offtakes through by-laterally symmetrical passages formed in the casing.
4. In a centrifugal pump, a pump runner having a liquid passage formed therein, a casing surrounding the runner and having an inlet port, a liquid delivery chamber surrounding the pump shaft and communicating with the inlet port and with the liquid passage of the runner, an air chamber surrounding the pump shaft and located between it and the liquid delivery chamber, a volute chamber communicating with a discharge port formed in the casing and with the liquid passage of the runner, and an air outlet port communicating with the air chamber, and a pump shaft on which the runner is mounted.
- 5 the runner, and having a volute chamber communicating with the liquid passages of the runner and with an outlet port formed in the casing and an air outlet port communicating with the air offtakes through by-laterally symmetrical passages formed in the casing.
- 10 laterally symmetrical passages formed in the casing.
- 15 an inlet port, a liquid delivery chamber surrounding the pump shaft and communicating with the inlet port and with the liquid

In testimony whereof, I have hereunto subscribed my name this 23 day of Feb., 1911.

MAURICE LEBLANC.

Witnesses:

DEAN B. MASON,
T. DELOPHE.