M. LEBLANC.

JET CONDENSER.

APPLICATION FILED JULY 6, 1908.

953,535. Patented Mar. 29, 1910.

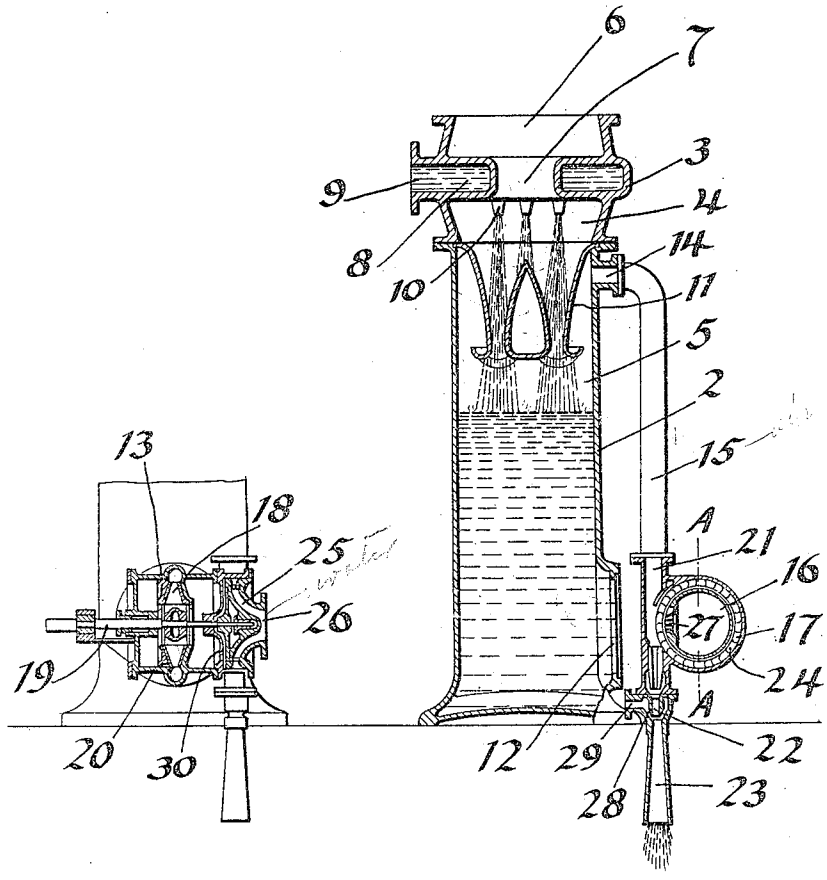

Fig. 2. Fig. 1.

WITNESSES:

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

JET-CONDENSER.

953,535. Specification of Letters Patent. Patented Mar. 29, 1910.

Application filed July 6, 1908. Serial No. 442,077.

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 Jet-Condensers, of which the following is a specification.

This invention relates to condensers, and more particularly to jet condensers.

An object of this invention is to produce an organized condensing apparatus, which I believe to be simpler, less costly and more efficient in operation than other condensing apparatus now known to me. This and other objects I attain in an apparatus embodying the features herein described and illustrated.

In the single sheet drawing accompanying this application and forming a part thereof: Figure 1 is a vertical elevation of an apparatus embodying my invention; and, Fig. 2 is a vertical elevation of a detail embodied in my invention, and is taken on the line A—A of Fig. 1.

Referring to the drawings: A cylindrical shell portion 2 is provided with a removable top 3 and incloses a condensing chamber 4 and a collecting chamber 5. The condensing chamber is adapted to communicate with a source of vapor through a port 6, which is located in the top portion 3 and which is adapted to deliver steam or vapor to the interior of the chamber 4 through a passage 7, which is formed in the top portion. An annular chamber 8 is formed in the top portion 3 and surrounds the passage 7. A port 9 is provided in the top portion and communicates with the annular chamber 8, and is adapted to communicate with a source of condensing water supply. Annularly-arranged jet-delivery nozzles 10 are formed integrally with the top portion, and communicating with the chamber 8, are adapted to discharge water downwardly through the condensing chamber 4.

An annular converging nozzle 11 is located within the cylindrical portion 2 and between the chambers 4 and 5. This nozzle is arranged to receive the mass of separate drops discharged from the annularly arranged separate nozzles 10 and to compress the drops, in their passage through it, into an annular liquid stream which is discharged from the chamber 4 into the discharging chamber 5.

The collecting chamber 5 is provided with a liquid discharge port 12 which communicates with the intake of a centrifugal pump 13, and which is adapted to discharge the condensing water and the water of condensation from the chamber. A port 14 is provided in the shell portion 2 near the top of the chamber 5 and is arranged to discharge from the chamber air or other non-condensable fluids which are ejected from the chamber 4 into the chamber 5 by the ejecting action of the coöperating jet nozzles 10 and the annular nozzle 11. The port 14 communicates through a pipe 15 with a rotary fluid ejecting device 16, which is adapted to deliver the air and other non-condensable fluids from the chamber 5 into the atmosphere.

The rotary impeller 17 of the fluid-ejecting device and the impeller 18 of the rotary centrifugal pump 13 are mounted on a common shaft 19 and are provided with a common casing 20.

The ejecting device 16 consists of a combining tube 21 which communicates through the pipe 15 with the port 14. A collecting nozzle 22 is located at the discharge end of the combining tube 21 and communicates therewith. The collecting tube communicates with a divergent diffusing spout 23 which communicates with the atmosphere. The rotary impeller 17 is provided with blades 24 similar to peripherally mounted turbine blades. An annular chamber 25 is located within the casing 18 and communicating with a water supply through a port 26, delivers a flow of water to the blades 24 of the impeller 16 through nozzles 27. The nozzles are so disposed relative to the diffuser tube 21 and the speed and positioning of the blades 24, that when the blades are rotated at a predetermined speed, they will discharge the water through the diffusing tube into the collecting tube 22, and from the collecting tube through the diffuser spout 23 and into the atmosphere.

The diffuser tube 21 is convergent, and its converging walls in compressing the water discharged from the blades 24 into a stream cause the stream to collect and mechanically carry with it globules or segregated portions of air or other non-condensable fluids, which may be exposed to the water issuing from the rotating blades 24. An annular chamber 28 surrounds the collecting nozzle

22 and communicates through a port 29 with a source of steam supply. The construction is such that the chamber 28 in conjunction with the collecting nozzle 22 and the diffuser spout 23 acts as a fluid ejector and is utilized in starting the device 16.

A division plate 30 separates the fluid-ejecting device 16 and the centrifugal pump 13. With this construction there is only one outer joint for the ejecting device, so that it is easy to prevent the entry of air.

In accordance with the provisions of the patent statutes, I have described the principle of operation of my invention, together with the apparatus which I now consider to represent the best embodiment thereof, but I desire to have it understood that the apparatus shown is only illustrative and that the invention can be carried out by other means.

What I claim is:

1. In combination with a condenser, a centrifugal pump communicating therewith for discharging liquid therefrom, a rotary fluid ejector communicating with said condenser, a common shaft and a common casing for said pump and said ejector, and a diaphragm located between said pump and said ejector.

2. In combination with a condenser, a rotary liquid discharge pump and a rotary fluid discharge pump communicating therewith, a common shaft and a common casing for said pumps, and a diaphragm located between said pumps.

3. In a condensing apparatus, a rotary liquid discharge pump, a rotary fluid ejector, a common operating shaft and a common casing for said pump and said ejector.

4. In a condensing apparatus, a rotary liquid discharge pump, a rotary fluid ejector, a common operating shaft, a common casing for said pump and said ejector and means for separating the impeller of said pump from the impeller of said ejector.

5. In a condensing apparatus, a rotary liquid discharge pump, an operating shaft therefor, a fluid ejector comprising a rotary bladed impeller mounted on said shaft and located within the casing of said pump, a distributer for delivering liquid to the blades of said impeller and a combining and diffuser tube for receiving the liquid discharged from said impeller.

6. In a condensing apparatus, a rotary liquid discharge pump, an operating shaft therefor and a fluid ejector comprising a rotary bladed impeller mounted on said shaft and located within the casing of said pump, a distributer for delivering liquid to the blades of said impeller, a combining tube for receiving the fluid discharged from said impeller and means for separating said impeller from the impeller of said pump.

7. In a condensing apparatus, a rotary liquid discharge pump, an operating shaft therefor, a fluid ejecting device comprising a rotary bladed impeller mounted within the casing of said pump and on said shaft, a distributer for delivering liquid to the blades of said impeller, a combining and a diffuser tube for receiving the liquid discharged from the impeller and a plate located within the casing of said pump between the impeller of said ejector and the impeller of said pump.

8. In a condensing apparatus, a condensing chamber provided with a liquid discharge port, a vapor inlet port, a collecting chamber communicating therewith and provided with a liquid discharge port and a non-condensable gas outlet port, a rotary liquid discharge pump communicating with said liquid discharge port, a rotary fluid ejector communicating with said outlet port, a common shaft, a common casing for said pump and said ejector and a common diaphragm for separating the impeller of said pump from the impeller of said ejector.

In testimony whereof I have hereunto subscribed my name this 22 day of June, 1908.

MAURICE LEBLANC.

Witnesses:
BON FRANK GUNZBERG,
H. C. COXE.