

W. A. DREWETT.

PUMP.

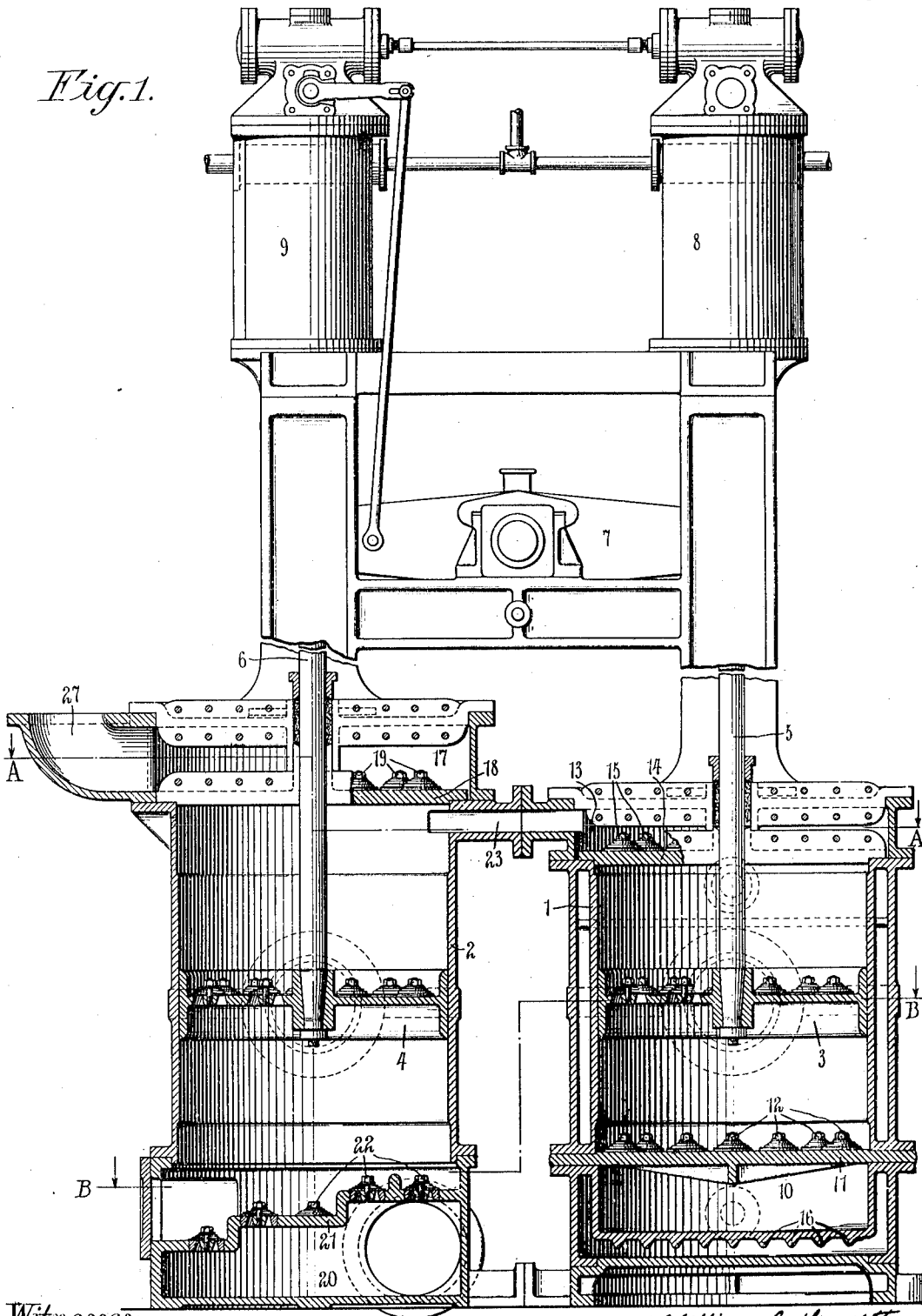
APPLICATION FILED JULY 18, 1911.

Patented Aug. 13, 1912.

4 SHEETS—SHEET 1.

1,035,170.

Fig. 1.



Witnesses:
Harry S. Fischer
George Barry.

Inventor: William A. Drewett
by his attorney
Morse Seward

W. A. DREWETT.
PUMP.

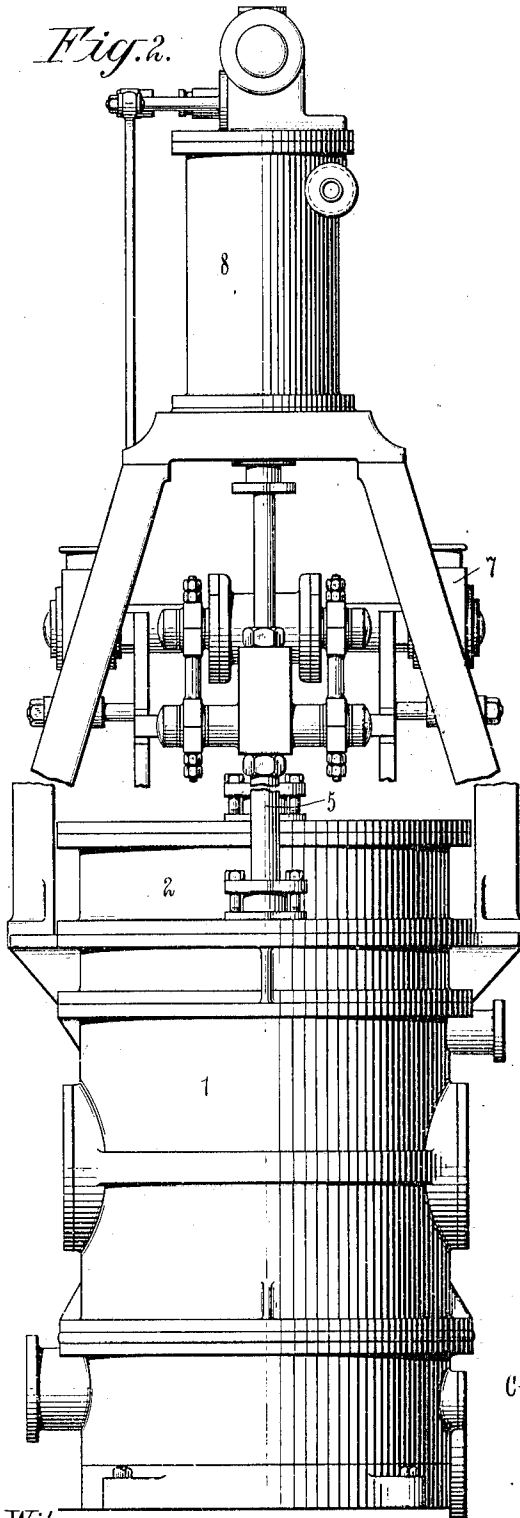
APPLICATION FILED JULY 18, 1911.

Patented Aug. 13, 1912.

4 SHEETS—SHEET 2.

1,035,170.

Fig. 2.



Witnesses:
Harry S. Fleischert
J. George Barry

Fig. 6.

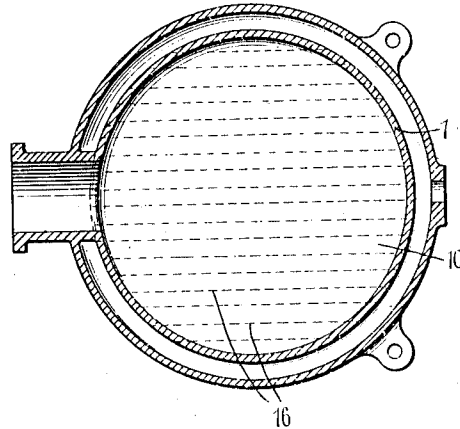
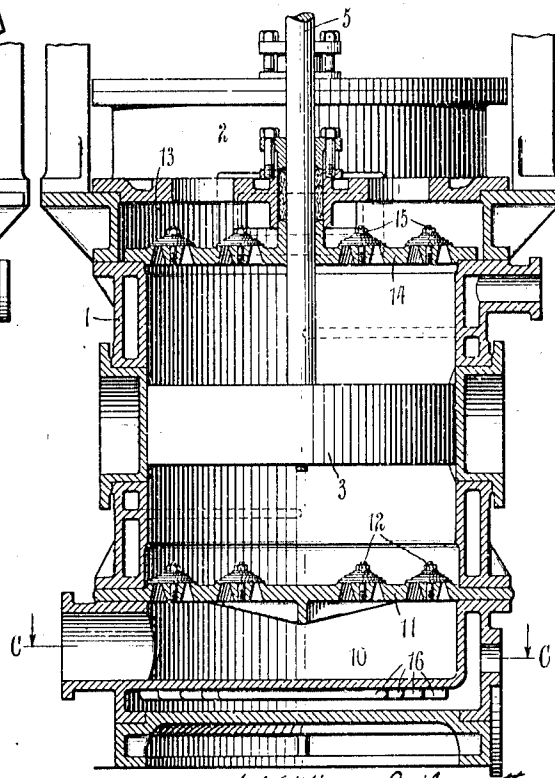


Fig. 3.



Inventor: { *William A. Drewett*
by his attorneys
Brown & Seward

W. A. DREWETT.
PUMP.

APPLICATION FILED JULY 18, 1911.

Patented Aug. 13, 1912.

4 SHEETS—SHEET 3.

1,035,170.

Fig. 4.

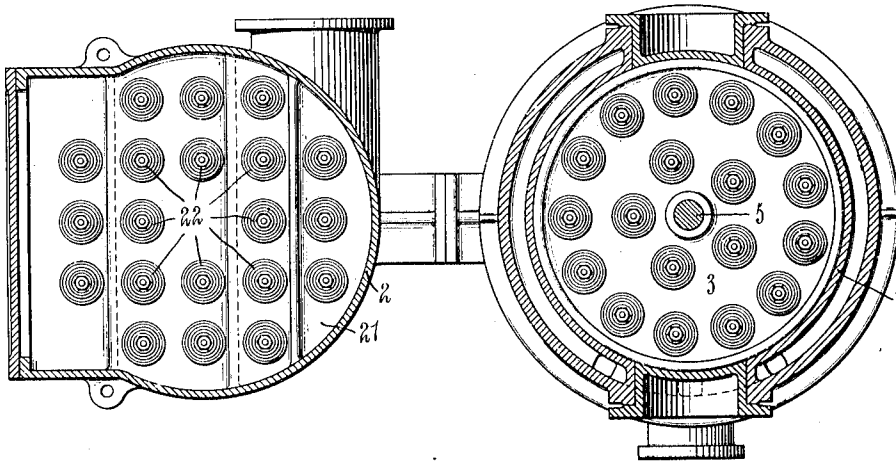
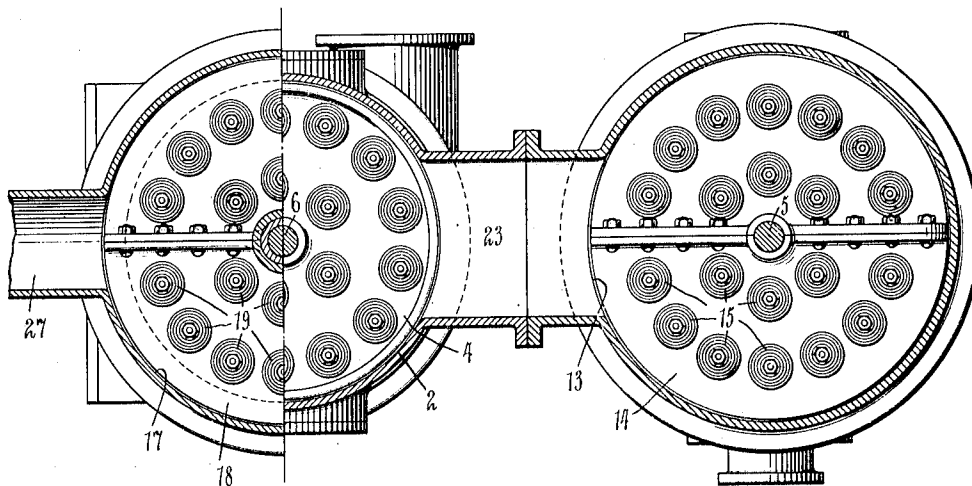


Fig. 5.



Witnesses:

Harry E. Fleischer

J. George Barry

Inventor:

William A. Drewett
by his attorneys
Monsieurward

W. A. DREWETT.
PUMP.

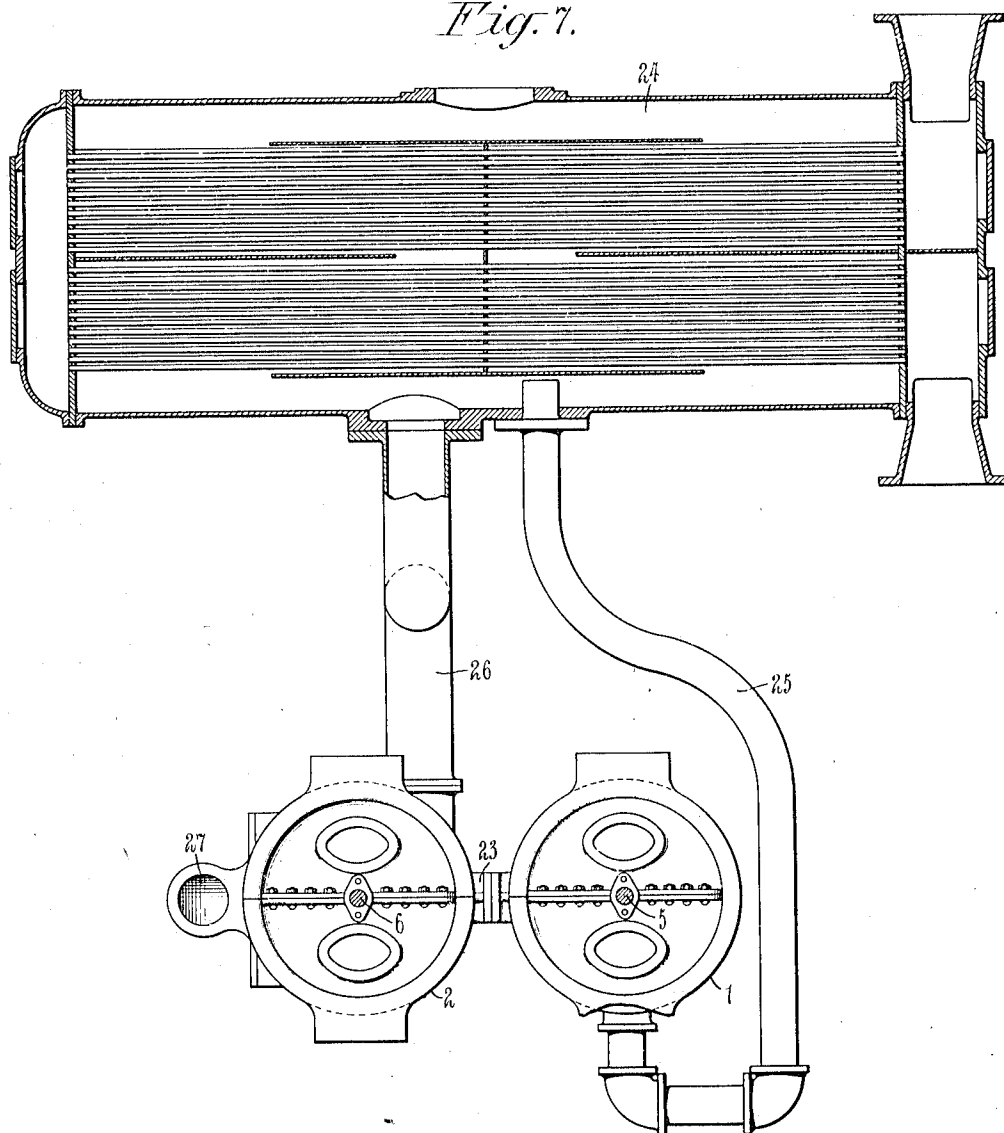
APPLICATION FILED JULY 18, 1911.

Patented Aug. 13, 1912.

4 SHEETS—SHEET 4.

1,035,170.

Fig. 7.



Witnesses:

Harry E. Fleischer

George Barry

Inventor:

William A. Drewett
by his attorney
Morgan & Wood

UNITED STATES PATENT OFFICE.

WILLIAM A. DREWETT, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO M. T. DAVIDSON COMPANY, OF BROOKLYN, NEW YORK, A CORPORATION OF NEW YORK.

PUMP.

1,035,170.

Specification of Letters Patent.

Patented Aug. 13, 1912.

Application filed July 18, 1911. Serial No. 639,175.

To all whom it may concern:

Be it known that I, WILLIAM A. DREWETT, a citizen of the United States, and resident of the borough of Brooklyn, in the city and State of New York, have invented a new and useful Improvement in Pumps, of which the following is a specification.

My invention relates to pumps and more particularly to intercoacting or twin pumps for maintaining a vacuum in the condenser into which an engine exhausts.

It has been found necessary in certain types of engine, for example the turbine engine, to maintain a more perfect vacuum than has hitherto been considered satisfactory, and my present invention is directed to means for efficiently accomplishing this result.

A practical embodiment of my invention is represented in the accompanying drawings, in which—

Figure 1 is a view of the intercoacting pumps in front elevation, partly in section, Fig. 2 is a view in side elevation, Fig. 3 is a vertical central section through the so-called "dry vacuum pump", Fig. 4 is a horizontal section in the plane of the line A—A. of Fig. 1, Fig. 5 is a horizontal section in the plane of the line B—B of Fig. 1, Fig. 6 is a horizontal section in the plane of the line C—C of Fig. 3, and Fig. 7 is a diagrammatical view showing the connections of the pumps with the engine condenser, the latter being shown in section.

The cylinder of the "dry vacuum pump" is denoted by 1 and the cylinder of the "wet vacuum pump" by 2. These cylinders are conveniently placed side by side, and their pistons denoted by 3 and 4, respectively, have their rods 5 and 6 connected by a walking beam 7 driven by steam cylinders 8 and 9. The pistons 3 and 4 move simultaneously in opposite directions and each is provided with a gang of valves opening upward as is common.

The "dry" pump cylinder 1 is superposed on an air and vapor inlet chamber 10 and its interior is separated from the said chamber by a stationary valve plate 11 provided with a gang of valves 12 opening upward.

An outlet chamber 13, at the top of the cylinder 1, is separated from the interior of the chamber by a stationary valve plate 14 provided with a gang of valves 15 opening upward. The cylinder 1 is water jack-

eted as is also the chamber 10, the latter being further provided with a wall having heat radiating ribs 16 formed thereon, the object being to provide for cooling the chamber 10 to a very low degree by circulating a cold medium about the chamber, either cold fresh or salt water or even the brine or cooling mixture from an ice plant.

The cylinder 2 is provided at its top with a discharge chamber 17, separated from the interior of the cylinder by a stationary valve plate 18 provided with a gang of upwardly opening valves 19. The said cylinder 2 is superposed on a water inlet chamber 20, separated from the interior of the cylinder by a stationary valve plate 21 provided with a gang of upwardly opening valves 22. The outlet or compression chamber 13 at the top of the "dry" pump cylinder 1 communicates with the interior of the cylinder 2 through a conduit 23.

The air and vapor inlet chamber 10 communicates with the air and gaseous vapor within the condenser 24, (see Fig. 7), through a pipe 25, terminating within the condenser at a point above the bottom of the condenser, as shown.

The water inlet chamber 20 communicates with the interior of the condenser 24 through a pipe 26 terminating at the bottom of the condenser.

The discharge chamber 17 above the cylinder 2 communicates, through an outlet 27, with the hot well, not shown.

In operation: During the downward stroke of the piston 4 and simultaneous upward stroke of the piston 3, the air and gaseous vapor, freed from moisture as far as feasible and cooled, is lifted by the piston 3 and discharged into the cylinder 2 through the conduit 23, the pressure tending to hold the valves 15 down being materially relieved by the downward movement of the piston 4. During the downward movement of the piston 3 and upward movement of the piston 4, a new charge of air and gaseous vapor passes through the valves in the piston 3 and the charge of water, air and gaseous vapor in the cylinder 2 is discharged into the chamber 17 and thence into the hot well, not shown, to be returned to the boiler in any well known or approved manner.

By discharging the "dry vacuum" cylinder into the "wet vacuum" cylinder, back pressure on the valves at the top of the cyl-

inder 2 is very materially reduced increasing the efficiency of the "dry vacuum" pump and by cooling and condensing as far as may be the combined atmosphere and gaseous vapor as it enters the "dry vacuum" pump from the condenser, the efficiency of this pump is still further increased, so that the desired increase in the degree of vacuum in the condenser is readily obtained and maintained.

The "dry vacuum" pump will, from time to time, pump the water of condensation from the chamber 10, as it accumulates therein.

What I claim is:—

1. The combination with a condenser, of inter-coacting pumps, the delivery side of one pump connecting through check valves with the delivery side of another pump, a cooling chamber in communication with the air and gaseous vapor portion of the condenser and with one of the pumps and means for placing another pump in communication with the water portion of the condenser.

2. The combination with a condenser, of inter-coacting pumps in which the pistons simultaneously reciprocate in opposite directions, a cooling chamber communicating through check valves with one of the pumps and through a pipe with the air and gaseous vapor portion of the condenser, a pipe leading from the water portion of the condenser to the other pump and a valved conduit leading from the delivery side of the pump with which the cooling chamber connects to the delivery side of the other pump.

3. In combination, a condenser, a pair of inter-coacting pumps, the pistons of which move simultaneously in opposite directions, one of the pumps being connected to receive its supply from the air and gaseous vapor portion of the condenser and the other to receive its supply from the water portion of the condenser, a conduit leading from the delivery side of one pump to the delivery side of the other pump, a cooling chamber at the base of one of the pumps through which the air and gaseous vapor is required to pass and a water chamber at the base of the other pump.

4. In combination, a condenser, a pair of inter-coacting pumps, one in communication with the air and gaseous vapor portion of the condenser and the other in communication with the water portion of the condenser, each pump being provided with a stationary valve plate at its head and foot, valves seated in the said plates, a conduit connecting the delivery sides of the two pumps and a cooling chamber interposed between the condenser and the pump in communication with the air and gaseous vapor portion thereof through which the air and gaseous vapor is required to pass.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two witnesses, this twenty-ninth day of June 1911.

WM. A. DREWETT.

Witnesses:

F. GEORGE BARRY,
HENRY C. THIEME.