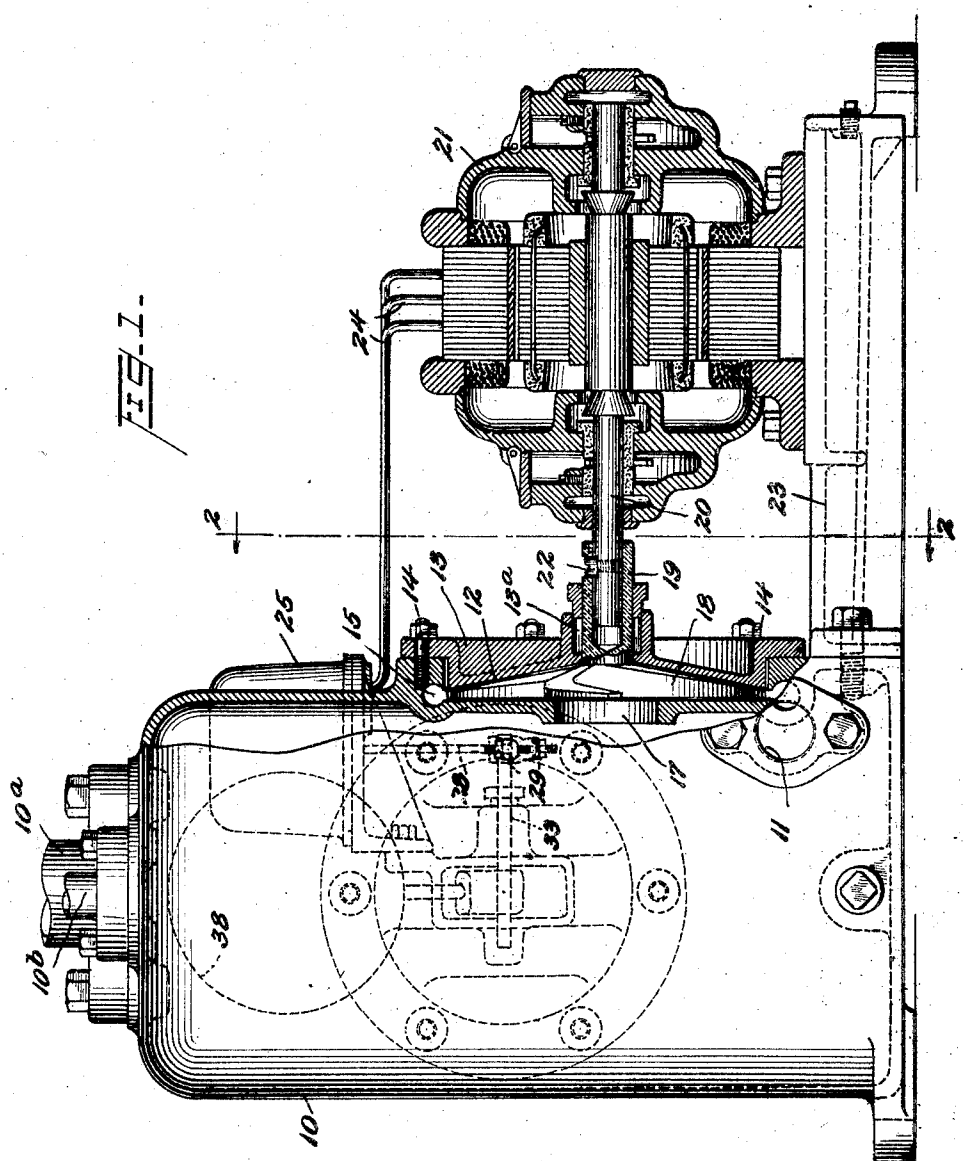
July 13, 1926. 1,592,025

I. C. JENNINGS

CONDENSATION PUMP

Original Filed Nov. 17, 1922 3 Sheets-Sheet 1

FIG. 1.



INVENTOR

I. C. Jennings

BY

Watson, Cole, Grosvenor & Fraser

ATTORNEY

July 13, 1926. 1,592,025

I. C. JENNINGS

CONDENSATION PUMP

Original Filed Nov. 17, 1922 3 Sheets-Sheet 2

FIG. 2.

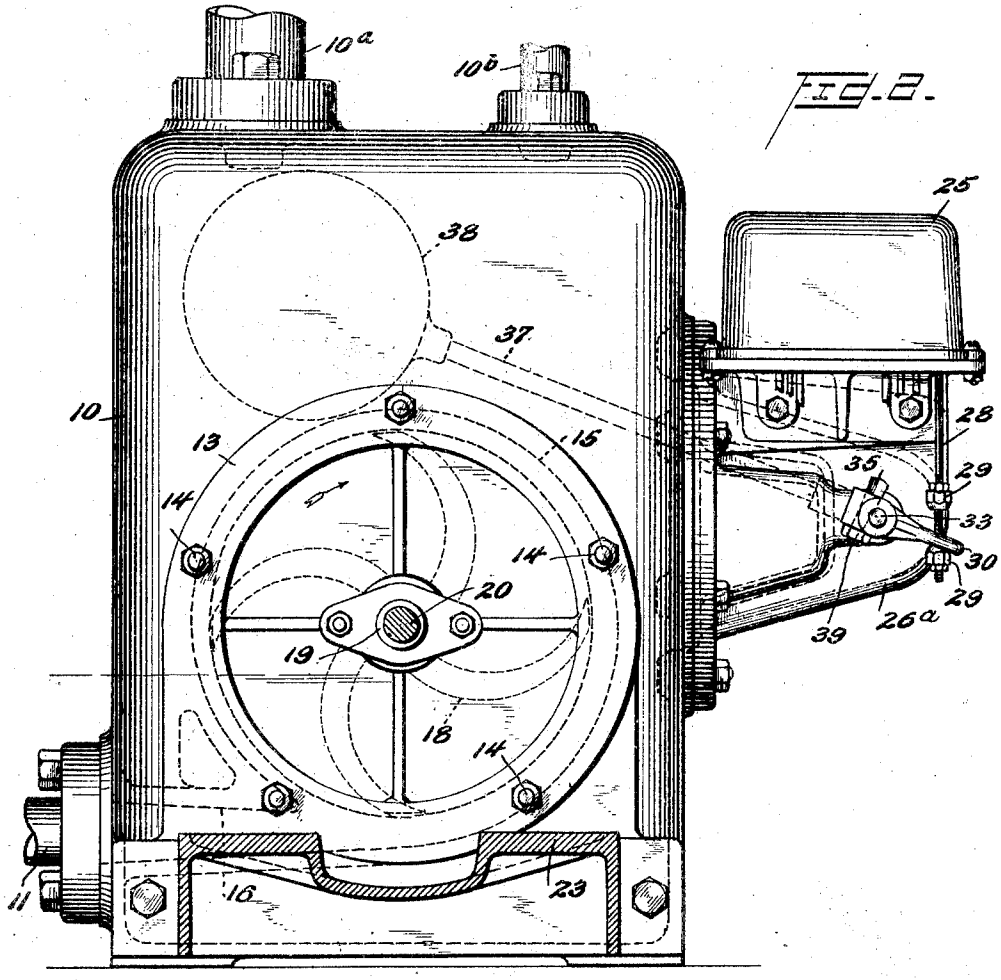
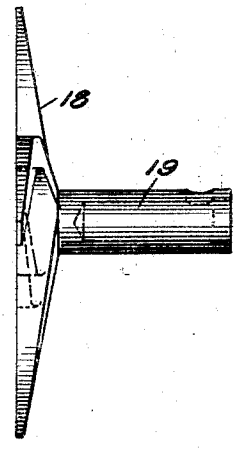


FIG. 3.



INVENTOR

I. C. Jennings

BY

Watson Cole Moser & Grindle

ATTORNEY

July 13, 1926. 1,592,025

I. C. JENNINGS

CONDENSATION PUMP

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FIG. 5.

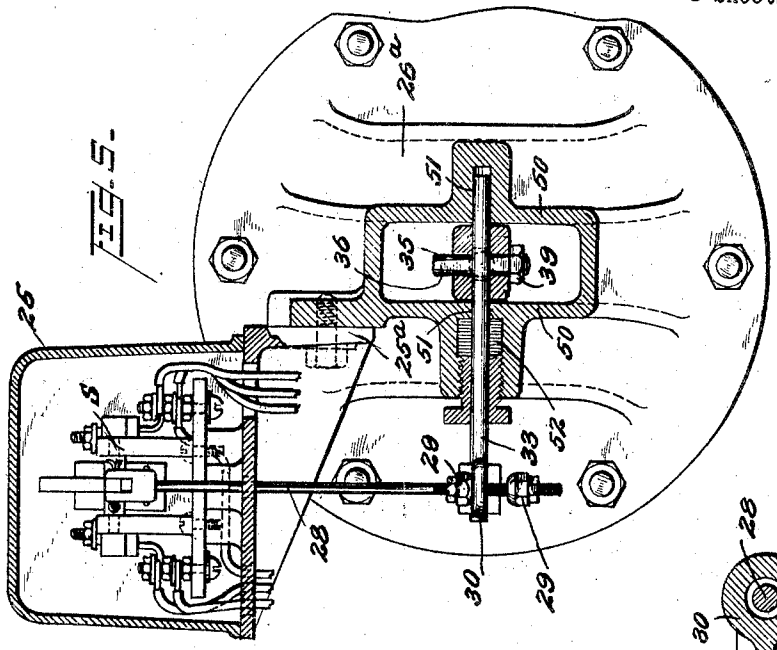


FIG. 6.

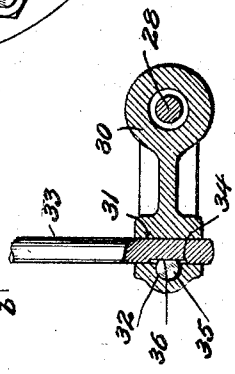
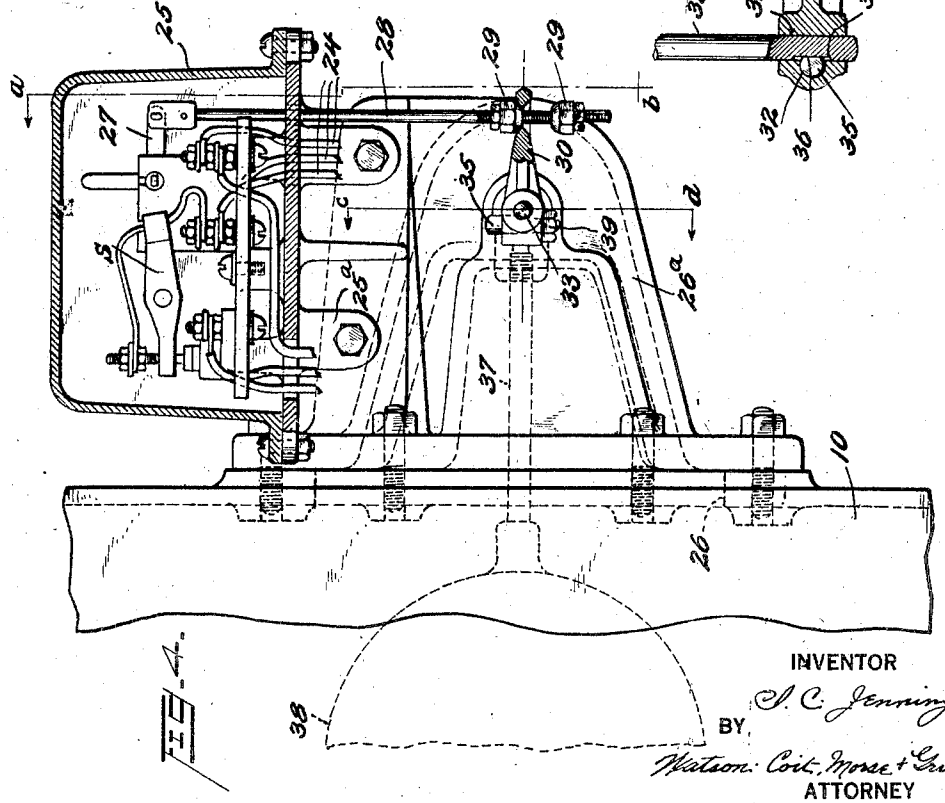


FIG. 4.



INVENTOR

I. C. Jennings.

BY

Watson, Cole, Morse & Grindle

ATTORNEY

Patented July 13, 1926. 1,592,025

UNITED STATES PATENT OFFICE.

IRVING C. JENNINGS, OF SOUTH NORWALK, CONNECTICUT.

CONDENSATION PUMP.

Application filed November 17, 1922, Serial No. 601,638. Renewed March 5, 1926.

The present invention relates to pumping apparatus and particularly to pumps designed and constructed to withdraw the water of condensation from the returns pipe of a steam heating system and force the same again into the boiler.

The object of the invention is to provide a pump of this character having a number of improved features of construction. In my copending application Serial No. 532,000 filed January 26, 1922, a pumping apparatus is disclosed in which a tank is provided for receiving the returns from a steam heating system, a centrifugal pump is secured adjacent an aperture in the wall of the tank, and a motor is provided for operating the centrifugal pump, the base upon which the motor is mounted being bolted to the wall of the tank. The present invention contemplates an arrangement of parts similar to that disclosed in the prior application above mentioned but in which a number of important details have been modified and improved. The invention may be embodied in various forms one of which is illustrated in the accompanying drawings.

In the drawings:

Figure 1 is a view, partly in section and partly in side elevation of an apparatus constructed in accordance with the invention;

Figure 2 is a view on the line 2—2 of Figure 1;

Figure 3 is a side elevation of the rotor of the centrifugal pump;

Figure 4 is a side elevation of portion of the tank showing the switch operating mechanism, the switch casing being broken away;

Figure 5 is a view from the right of Figure 4, partly in section on the line *a—b*, and partly in section on the line *c d*.

Figure 6 is a sectional view illustrating a detail.

The tank 10 has an inlet 10^a at its top for receiving air, vapor and water of condensation from the return pipe of a steam heating system and has an outlet opening 11 at its bottom which may be connected by means of a suitable conduit with the boiler and through which the water of condensation is pumped. A suitable outlet 10^b is provided in the top of the tank for the escape of air. As clearly shown in Figure 1, a pump chamber 12 is enclosed between the outer surface of one wall of the tank and the inner surface of a plate 13 secured thereto by bolts 14. The volute 15 of the pump chamber is formed integral with the wall of the tank 10 and communicates through a conduit 16 with the outlet 11. An aperture 17 is provided in the wall of tank 10 axially of the pump chamber which aperture constitutes an inlet for the pump. The rotor 18 has its supporting shaft 19 formed integrally therewith and the shaft extends outwardly through an aperture in the plate 13 which is in alignment with the inlet aperture 17. Shaft 19 is hollow to receive the end of the shaft 20 of motor 21, a screw 22 securing the two shafts together. The motor 21 is mounted upon a base 23 which is bolted to the tank 10.

The power for the motor is supplied through leads 24 and is turned on and off by a switch S in a housing 25. The switch is mounted on a bracket 25^a secured to a support described below, and is operated by a link 28 secured to the switch arm 27. The following means are provided for controlling this link to operate the switch. The tank has an opening 26 in its side, and a dome-shaped support 26^a is bolted to the tank around this opening to form a watertight closure therefor. The dome 26^a has a pair of cheeks 50 in which are formed bearings 51 for a rocker shaft 33 extending outside the dome, and a packing gland 52 to prevent leakage around the shaft. A float arm 37 carrying a float 38 within the tank is secured to the shaft between the checks 50, and a rocker arm 30 is secured to the end of the shaft. The arm 30 has an eye through which the link 28 passes, and the link is provided with nuts 29 on each side of the arm 30 which form adjustable abutments actuated by movement of the rocker arm.

Novel means are provided for securing the float arm and rocker arm to the rocker shaft. These means are exactly similar in each instance and are illustrated in Fig. 6 and described in detail for the arm 30. One end of the arm is provided with an aperture preferably in the form of a circular bore 31 and a second aperture or bore 32 whose axis is perpendicular to, but spaced to one side of the axis of bore 31. The distance between these axes is less than the sum of the radii of the two bores, so that the bores intersect each other. The rocker shaft 33 is placed in the bore 31 and has a flat face 34 formed therein opposite the intersection of the two

bores. A wedge in the form of a round pin 35 having a flat taper or wedge surface 36 is placed in the bore 32, and the wedge surface is drawn firmly in contact with the flat surface of the rod 33 by means of a nut 39 threaded on the end of the pin. This forms a very convenient and economical means for fastening the arm 30 and rocker shaft 31 rigidly together.

The float rises and falls with the level of the liquid in the tank and the arrangement of parts just described is such that the link 28 will be lowered and the switch closed when the liquid level rises to a predetermined height. Closing of the switch causes energization of the motor and hence actuation of the pump. The pump quickly reduces the level of the liquid in the tank by forcing the liquid outwardly through the aperture 11 and as the liquid level falls the float, of course, falls until finally the arm 30 engages the upper abutment nut 29 and lifts the rod 28 to cause the switch to be opened, whereupon the pump ceases operation.

The particular combination and arrangement employed results in an apparatus of simple construction, one economical to manufacture, and one which is readily assembled and has no parts likely to get out of order.

The invention, however, is not limited to the particular details of construction described by way of example, but includes such changes and modifications as fall within the scope of the appended claims.

Having thus described the invention what is claimed as new and desired to be secured by Letters Patent is:

1. In a pumping system, in combination, an integral tank and pump structure comprising a tank for the reception of liquid having an aperture therein and a volute for a centrifugal pump formed around said aperture, a cover plate secured to the tank to form a pump chamber, and a rotary impeller disposed in said chamber.

2. In a pumping system, in combination, a unitary structure comprising a tank and motor base, the tank having an aperture, a volute for a centrifugal pump formed integral with the tank around the aperture, a motor mounted on the base and in alignment with the aperture, a rotary impeller supported by the shaft of the motor adjacent the aperture, and a cover plate secured to the tank to form a housing for the impeller.

3. In a pumping system, in combination, a unitary structure comprising a tank and a motor base, the tank having an aperture, a volute for a centrifugal pump formed around the aperture, a cover plate secured to the tank to form a pump chamber, said plate having an opening in alignment with said aperture, a rotary impeller mounted in the housing and having an integral shaft projecting through said opening in the plate, a motor mounted on the base and aligned with said shaft, the shaft of the impeller being connected to and supported by the shaft of the motor.

4. In a pumping system, in combination, a unitary structure comprising a tank, a motor base and a pump chamber having an aperture therein, a rotary impeller mounted in the chamber and having an integral shaft projecting through the aperture, a motor mounted on the base and in alignment with said shaft, the motor shaft being connected to and supporting the impeller shaft.

5. Apparatus of the character described, including in combination, a tank having an inlet for liquid and gas and a gas outlet near the top thereof, a plate secured thereto and disposed to form an impeller chamber between a wall of the tank and said plate, one of said wall and plate parts having a volute in communication with said chamber, said wall having an aperture therethrough constituting an inlet for the impeller chamber thereby placing said chamber in communication with the interior of said tank, and an impeller in said chamber.

6. Apparatus of the character described, including in combination, a tank having an inlet for liquid and gas and a gas outlet near the top thereof, a plate secured thereto and disposed to form an impeller chamber between a wall of the tank and said plate, one of said wall and plate parts having a volute in communication with said chamber, said wall having an aperture therethrough constituting an inlet for the impeller chamber thereby placing said chamber in communication with the interior of said tank, an impeller in said chamber having an integral shaft projecting through an opening in said plate, and means to prevent leakage of fluid along said shaft.

7. Apparatus of the character described, including in combination, a tank having an inlet for liquid and gas and a gas outlet near the top thereof a plate secured thereto and disposed to form an impeller chamber between a wall of the tank and said plate, one of said wall and plate parts having a volute in communication with said chamber, said wall having an aperture therethrough constituting an inlet for the impeller chamber thereby placing said chamber in communication with the interior of said tank, said plate having an opening, a motor rigidly secured to the tank, an impeller in said chamber having a shaft projecting through said plate opening, and means rigidly securing said impeller shaft to the motor shaft.

8. Apparatus of the character described, including in combination, a tank adapted to receive liquid and gas and having a gas outlet, a liquid pump for withdrawing liquid

from said tank, a motor for operating said pump, said pump and motor being rigidly secured to said tank forming a unitary structure, a rock shaft projecting from said tank, a float within the tank secured to said shaft, an arm secured to said shaft outside of said tank, a switch for controlling the operation of the motor carried by said tank, and a link connecting said arm and switch whereby the operation of the motor is controlled by the position of the float in the tank.

In testimony whereof I hereunto affix my signature.

IRVING C. JENNINGS.