No. 884,077.

PATENTED APR. 7, 1908.

A. W. P. CRAMER.

CONDENSER.

APPLICATION FILED AUG. 1, 1907.

2 SHEETS—SHEET 1.

Fig. 1.

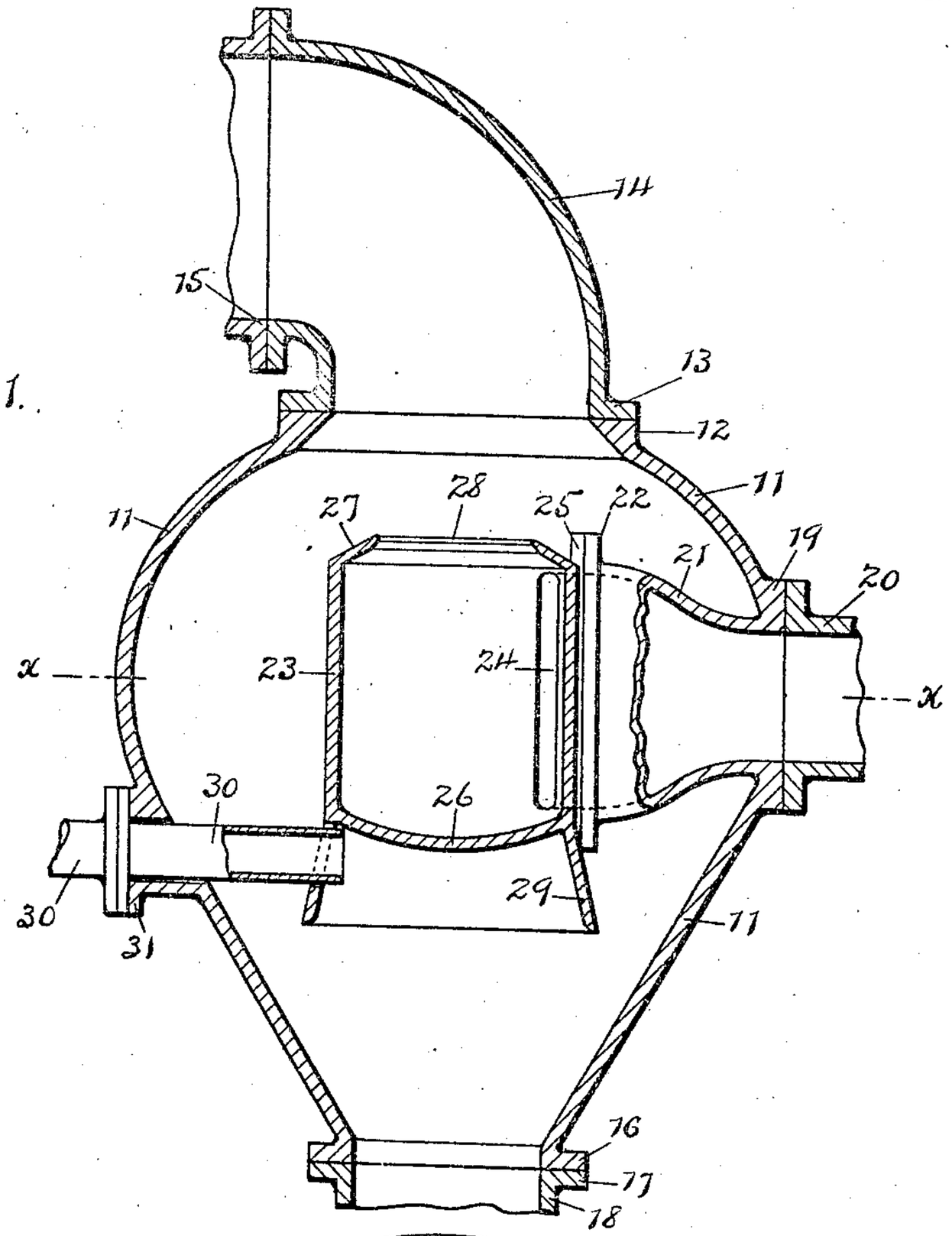
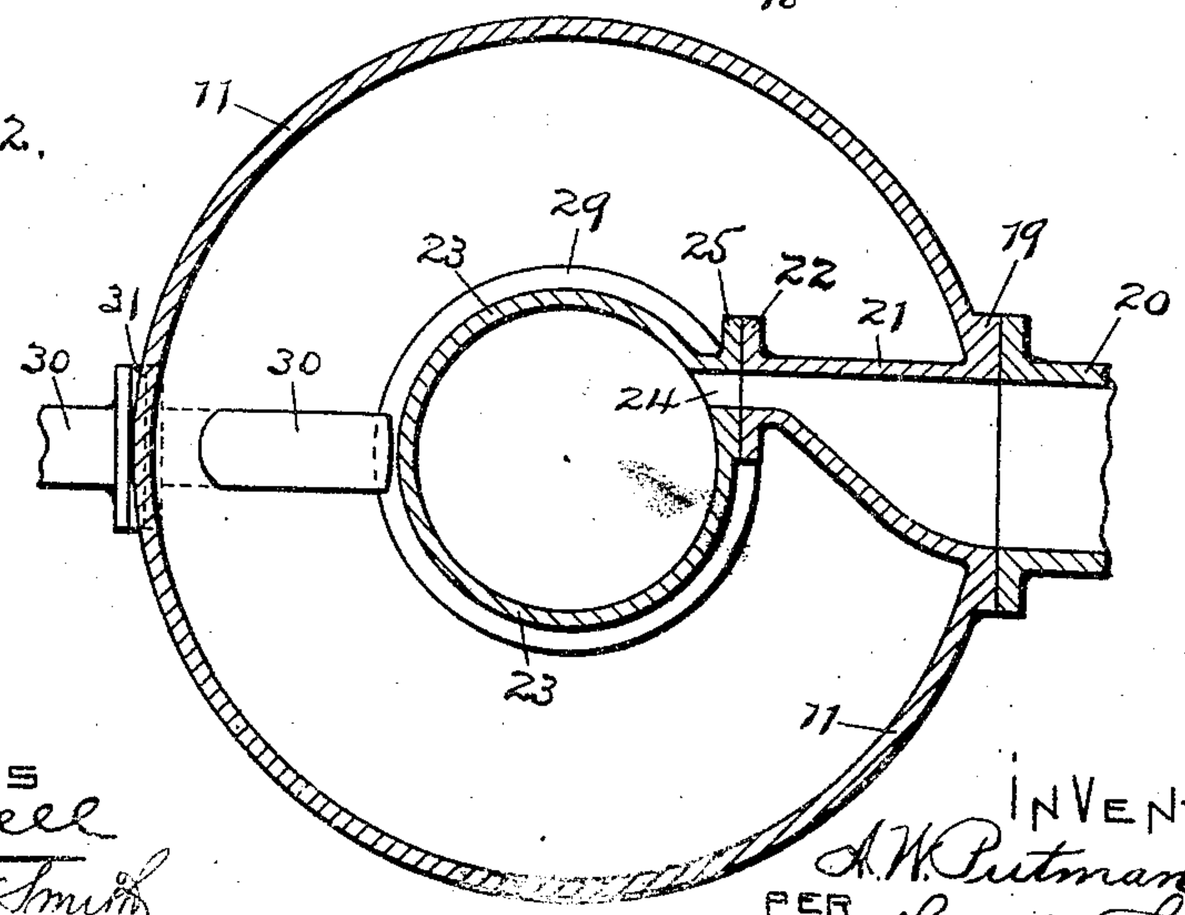


Fig. 2.



WITNESSES

A. L. Berrell

Chas. A. Smith

INVENTOR

A. W. P. Cramer

PER Harold Serrell

Attorney

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2 SHEETS—SHEET 2.

Fig. 3.

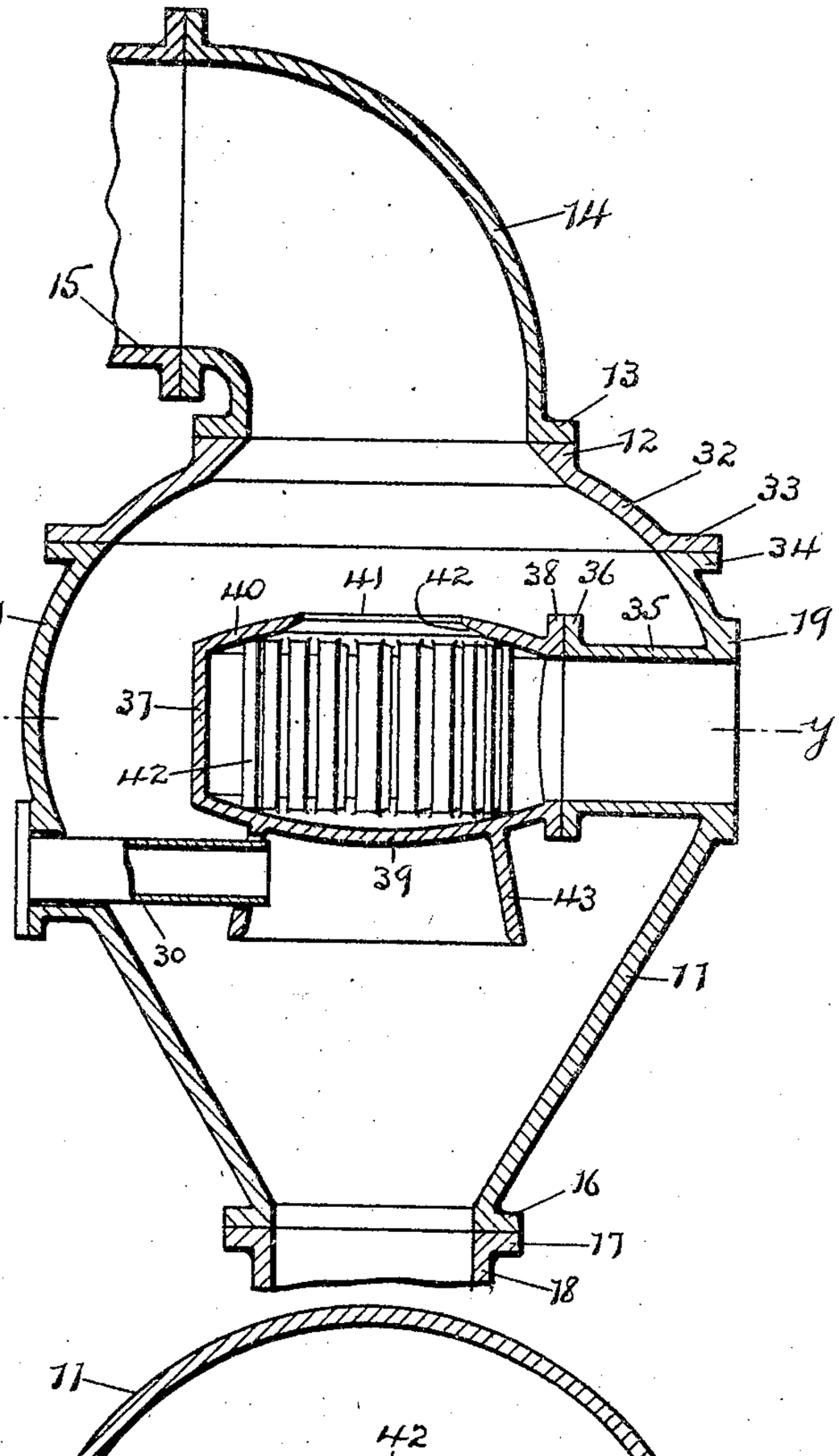
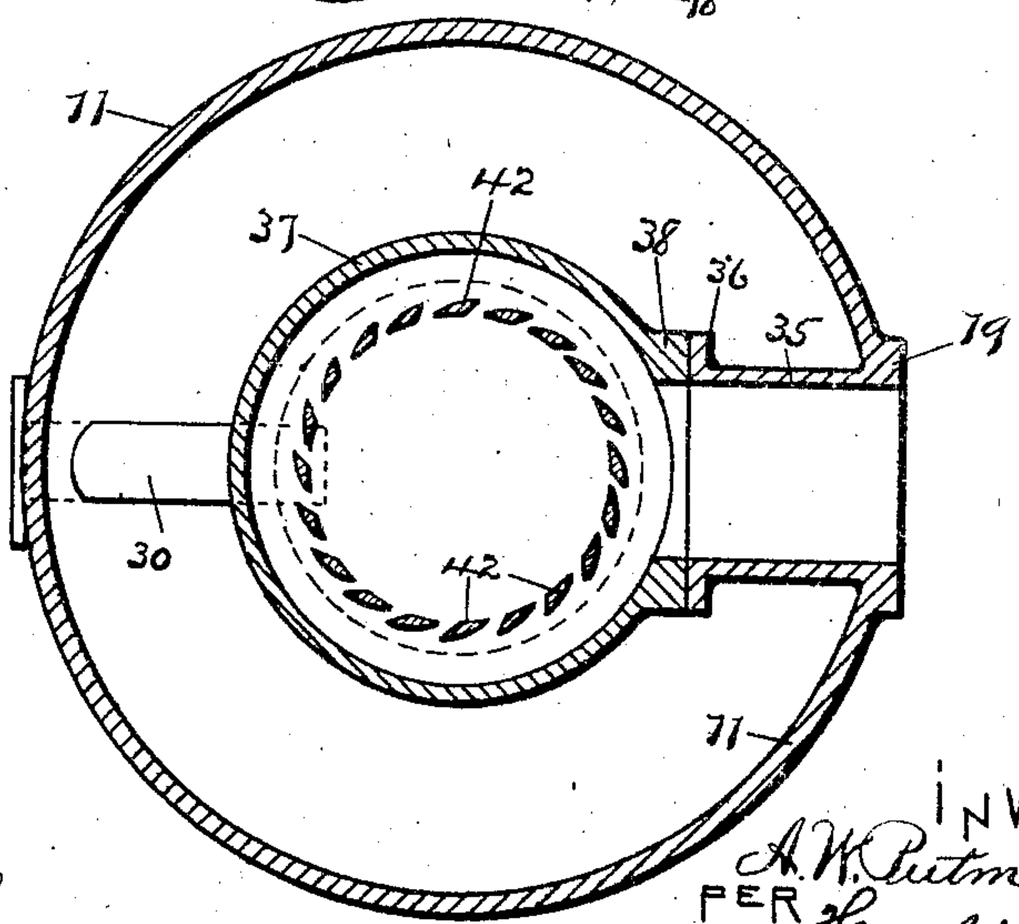


Fig. 4.



WITNESSES
A. L. Burrell
Chas. A. Smith

INVENTOR
A. W. Putman Cramer
PER Harold Burrell
HIS ATT'Y

UNITED STATES PATENT OFFICE.

ANTHON W. PUTMAN CRAMER, OF MONTCLAIR, NEW JERSEY, ASSIGNOR TO THE WHEELER CONDENSER AND ENGINEERING CO., OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

CONDENSER.

No. 884,077. Specification of Letters Patent. Patented April 7, 1908.

Application filed August 1, 1907. Serial No. 386,529.

To all whom it may concern:

Be it known that I, ANTHON W. PUTMAN CRAMER, a citizen of the United States, residing at Montclair, in the county of Essex and State of New Jersey, have invented an Improvement in Condensers, of which the following is a specification.

My invention relates to a condenser and particularly to a barometric jet condenser. So far as I am aware, it has been usual heretofore in the class to which this invention relates, to employ a valve or similar mechanism interiorly of the condenser body and operative exteriorly thereof,—not only to control the volume of the injection water, but this valve mechanism has usually been so constructed as to effect the discharge of the injection water in evenly distributed sprays or jets. Now as will be obvious, due to the impurities of the water and other causes, these valves become incrusted in such a manner as to impair their efficiency and oftentimes to such an extent as to render the valves inoperative.

The object of my present invention is to overcome the hereinbefore named difficulties, and in carrying out the same, I prefer to employ a condenser body and means therein for evenly distributing the injection water and whereby the volume thereof is dependent only on the discharge from the circulating pump, the usual and customary means for making connections with a circulating pump, air pump, the exhaust steam pipe and the well or cistern by way of the tail pipe, are also employed, as will be hereinafter more particularly described.

In the drawing, Figure 1 is a central vertical section illustrating the construction of my improved barometric condenser. Fig. 2 is a cross section on line *x*, *x*, Fig. 1. Fig. 3 is a view similar to Fig. 1, showing a modified form of the invention, and Fig. 4 is a cross section on line *y*, *y*, Fig. 3.

Referring particularly to the drawing, and to that form of the invention shown in Figs. 1 and 2, 11 indicates the body of the condenser, which is preferably conical at the lower portion thereof and dome-shaped at the upper portion thereof. At the top of the body portion 11 is a flange 12, to which is secured the flange 13 of an elbow 14 connected to the exhaust steam pipe 15. At the base of the conical portion of the body 11 is a flange 16, adapted to be secured to the flange 17 of the tail pipe 18 leading to a well or cistern as customarily employed with a barometric condenser. In a suitable position, the body 11 is provided with a flange 19 to which is connected a pipe 20 leading to the circulating pump and extending inwardly from the flange 19 is a nozzle 21, which as is plainly shown in Fig. 2, preferably tapers from a circular cross section at the flange 19 to an elongated rectangular section at the flange 22.

23 designates a barrel which is provided with an elongated longitudinally disposed aperture 24 and a nozzle terminating in the flange 25, which is adapted to be connected to the flange 22. The barrel 23 is closed at its lower end by a bottom 26, and at its upper end this barrel 23 is provided with a tapering top 27 having a central opening 28. The lower portion of the barrel 23 is provided with a flaring apron 29. 30 indicates a pipe which is connected to the air pump, the pipe 30 being secured to a suitable flange 31 on the body 11 of the condenser through which this pipe 30 passes, the pipe 30 also passing through an opening in the apron 29 and terminating below the bottom 26 of the barrel 23.

From the hereinbefore described structure, it will be manifest that the water under pressure as discharged from the circulating pump, will be forced through the nozzle 21 and caused to enter the barrel 23 through the offset aperture 24 therein, whereby the water is caused to take a rotary path and to be discharged centrifugally from the opening 28 in a spray which is evenly distributed over the entire interior surface of the hollow body 11 of the condenser.

Referring now to Figs. 3 and 4, instead of employing the barrel structure as hereinbefore described together with the necessary off set nozzle therefor, I may employ a cylindrical nozzle 35 extending interiorly from the flange 19 on the surface of the hollow condenser body and the flattened barrel 37 provided at one side with an opening and a flange 38 adapted to be connected to the flange 36 at the inner end of the nozzle 35. The lower part of the barrel 37 is closed by a bottom 39 and the upper part of the barrel 37 is also provided with tapering portions 40 and a central circular opening 41. The tapering portions 40 of the top of the barrel 37 are preferably undercut adjacent to the edge of the opening 41 and

within the barrel 37 I employ a circular series of vertically placed spaced apart rods 42, which are approximately triangular in cross section and so placed as to cause the injection water after the same enters the barrel 37 to assume a rotary motion and to be discharged through the opening 41 in a manner similar to that hereinbefore described in connection with the discharge of the injection water from the opening 28 in the barrel 23, shown in Figs. 1 and 2, and the barrel 37 is preferably provided with an apron 43 through which the pipe 30 for the vacuum pump connection passes similarly to that shown in Figs. 1 and 2. In this structure in order to admit the barrel 37 it will generally be necessary to make the body member in two parts, the upper portion 32 being provided with a flange 33 adapted to rest upon and to be secured to a flange 34 on the lower portion.

It will thus be seen that an even distribution of the injection water and the control of the volume thereof by means of the circulating pump only may be effected by the employment of my improved condenser and this without the use of any intermediately placed valve or any other regulating device.

The volume of discharge water will be increased or decreased as the speed of the pump is increased or decreased; the discharge opening not being obstructed by any regulating device, the limit of the quantity of water which can be discharged is only governed by the area of the discharge opening and the speed and capacity of the pump, but is at all times under full control by the speed of the pump.

I claim as my invention:

1. A condenser comprising a body member, an internal nozzle connected therewith and a barrel connected to the said internal nozzle and so constructed as to positively control the volume of the injection water only by the discharge from the circulating pump and evenly distributing the same over the entire inner surface of the condenser body.

2. A condenser comprising a body member, an internal nozzle connected therewith and a barrel connected to the said internal nozzle and having an inlet from the same, said barrel having a closed bottom and a circular opening in the top thereof and a series of spaced apart circularly arranged bars adapted to cause the water to rotate within the said barrel and to be discharged therefrom through the said opening in the top thereof.

3. A valveless jet condenser comprising a hollow body receiving the vapor to be condensed, a tubular intake for the injection water under the regulated power of the circulating pump, a centrally located cylindrical vessel having a closed bottom and an opening in the top and means within said vessel for causing an agitation of said water and delivering the same from the said opening in the top of the said cylindrical vessel.

4. A valveless jet condenser comprising a hollow body receiving the vapor to be condensed, a tubular intake for the injection water under the regulated power of the circulating pump, a centrally located cylindrical vessel having a closed bottom and an opening in the top and a series of circularly arranged bars forming a grating within the said cylindrical vessel adapted to cause an agitation of the said water and the delivery of the same through the said opening in the top of the vessel.

Signed by me this 23rd day of July, 1907.

A. W. PUTMAN CRAMER.

Witnesses:
ARTHUR H. SERRELL,
BERTHA M. ALLEN.