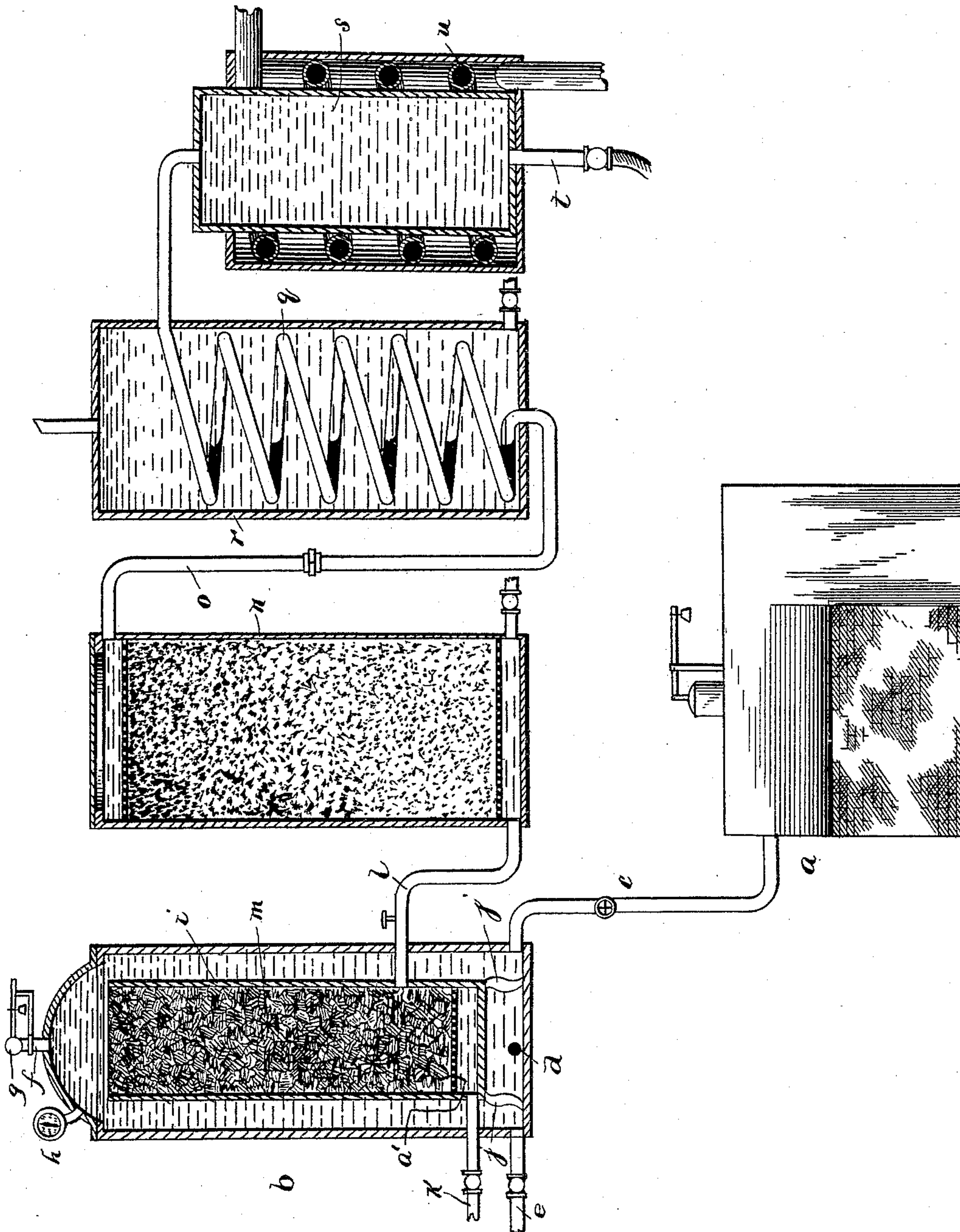


(No Model.)

E. A. QUISENBERRY.
APPARATUS FOR DEAERATING WATER.

No. 460,030.

Patented Sept. 22, 1891.



WITNESSES:

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UNITED STATES PATENT OFFICE.

EDWARD A. QUISENBERRY, OF LEXINGTON, VIRGINIA.

APPARATUS FOR DEAERATING WATER.

SPECIFICATION forming part of Letters Patent No. 460,030, dated September 22, 1891.

Application filed November 29, 1890. Serial No. 373,046. (No model.)

To all whom it may concern:

Be it known that I, EDWARD A. QUISENBERRY, of Lexington, in the county of Rock-bridge and State of Virginia, have invented
5 certain new and useful Improvements in Apparatus for Deaerating Water; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which
10 it appertains to make and use the same, reference being had to the accompanying drawing, and to the letters of reference marked thereon, which forms part of this specification.

This invention relates to certain improvements in apparatus for deaerating and purifying water for use in ice-machines.

The object of the machine is to provide an improved apparatus for deaerating and purifying water for use in ice-machines, which
20 shall prevent air or steam escaping with the water from the heating and deaerating boiler or tank, and which shall be exceedingly simple in construction and operation.

This object is accomplished by and my invention consists in certain novel features of construction and in combinations of parts more fully described hereinafter, and particularly pointed out in the claims.

The accompanying drawing represents an
30 apparatus for the above purposes partially in section.

In the drawing the reference-letter *a* indicates any suitable steam-generator.

b is the closed deaerating water boiler or
35 tank. Steam-pipe *c* extends from the steam-generator into the bottom or lower portion of this boiler. *d* is a water-supply pipe into the lower portion or bottom of said boiler.

e is a valved blow-off pipe from the bottom
40 or lowest portion of said boiler. The top of the boiler is dome-shaped, preferably, and is provided with the valved blow-off pipe *f* from its uppermost portion. This blow-off pipe is provided with the automatic safety-valve *g*,
45 which can be set to withstand various pressures. The boiler can be provided with the steam-gage *h*, if desirable.

i is a vessel within the boiler, extending almost the entire length of the same. This inner vessel has imperforate sides and bottom,
50 and is open at the top within the upper portion of the boiler, and is provided at its bot-

tom with suitable legs or supports *j*, resting on the bottom of the boiler and supporting the inner vessel a suitable distance above said
55 bottom of the boiler. This inner vessel is smaller in diameter than the boiler, and has a valved blow-off pipe *k* from its bottom extending to the exterior of the boiler, and also has a water-discharge pipe *l* extending there-
60 from a distance above its bottom to the exterior of the boiler. If desirable, this inner vessel can be provided with a transverse perforated diaphragm *a'* a distance above its bottom to support suitable filtering material
65 *m*. However, I do not limit myself to the use of this filtering material within the inner vessel. The lower discharge-pipe *l* from the inner vessel of the boiler extends into a filtering-tank *n*, and a pipe *o* extends from said
70 tank *n* to the water-cooling coil *q* within the cooling-tank *r*. This water-cooling coil discharges into the purified deaerated water supply tank *s*. This supply-tank is provided with a valved discharge-pipe *t*. The water
75 within this water-supply tank is kept cool by the cooling-coil *u*, surrounding the same. This present application relates only to the boiler, and the remaining part of the apparatus herein shown and described is set forth in
80 my application filed September 6, 1890, Serial No. 364,113.

In operation the boiler is filled completely full of water from any suitable source through the water-supply pipe, and steam is discharged
85 thereinto from the generator. The water is thereby highly heated, causing the air to be released therefrom and heavy impurities to settle to the bottom of the boiler. When the pressure within the boiler rises above a cer-
90 tain amount, the top blow-off pipe is automatically opened, and a portion of the water in the upper part of the boiler, containing the scum, air, and impurities, is blown out or discharged through said pipe. Whenever de-
95 sired, the bottom blow-off pipe can be opened and water from the lowest portion of the boiler, containing the sediment, is discharged through said pipe. When the water within the boiler has been treated a sufficient length
100 of time to purify and deaerate it, the water-discharge pipe from the lower portion of the inner vessel is open and water is drawn off therefrom into the filter.

The purpose of the inner vessel within the boiler is to prevent the escape of any air or impurities from the boiler through the water-discharge pipe. The filtering material which
5 may be used within the inner vessel will hold impurities and prevent their escape through the water-pipe. The impurities can be blown off from the bottom of this inner vessel from the blow-off pipe. The air and vapor are
10 separated from the water as it passes up within the boiler at the exterior of the inner vessel, and when it reaches the top of the boiler said impurities are blown off, while the deaerated water descends within the inner
15 vessel, and hence is discharged through the water-pipe free from air.

It is evident that various changes might be made in form and arrangement of the parts described without departing from the spirit
20 and scope of my invention. Hence I do not wish to limit myself to the precise construction herein set forth.

What I claim is—

1. In combination, the closed boiler having
25 a discharge or blow-off from one end and steam and water supply pipes, and the small inner vessel within said boiler arranged so that the water flows from the upper portion of the boiler into said inner vessel and the de-

aerated water discharged from the inner 30 vessel.

2. In combination, the boiler having steam and water inlet pipes into its lower portion, the inner vessel longitudinally located within said boiler and supported a distance above 35 the bottom thereof, and having imperforate sides and bottom and open top at the upper portion of the boiler, and the water-discharge pipe from the lower portion of said inner vessel, substantially as described. 40

3. In combination, the closed boiler having steam and water inlet pipes and blow-off pipes from its opposite ends, and the inner vessel having a blow-off from its bottom and the water-discharge pipe from its lower por- 45 tion, substantially as described.

4. The herein-described boiler having water and steam inlets, and the inner vessel containing filtering material, substantially as set forth, and provided with the water-dis- 50 charge pipe from its lower portion.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

EDWARD A. QUISENBERRY.

Witnesses:

J. C. MOORE,

W. F. PIERSON.