

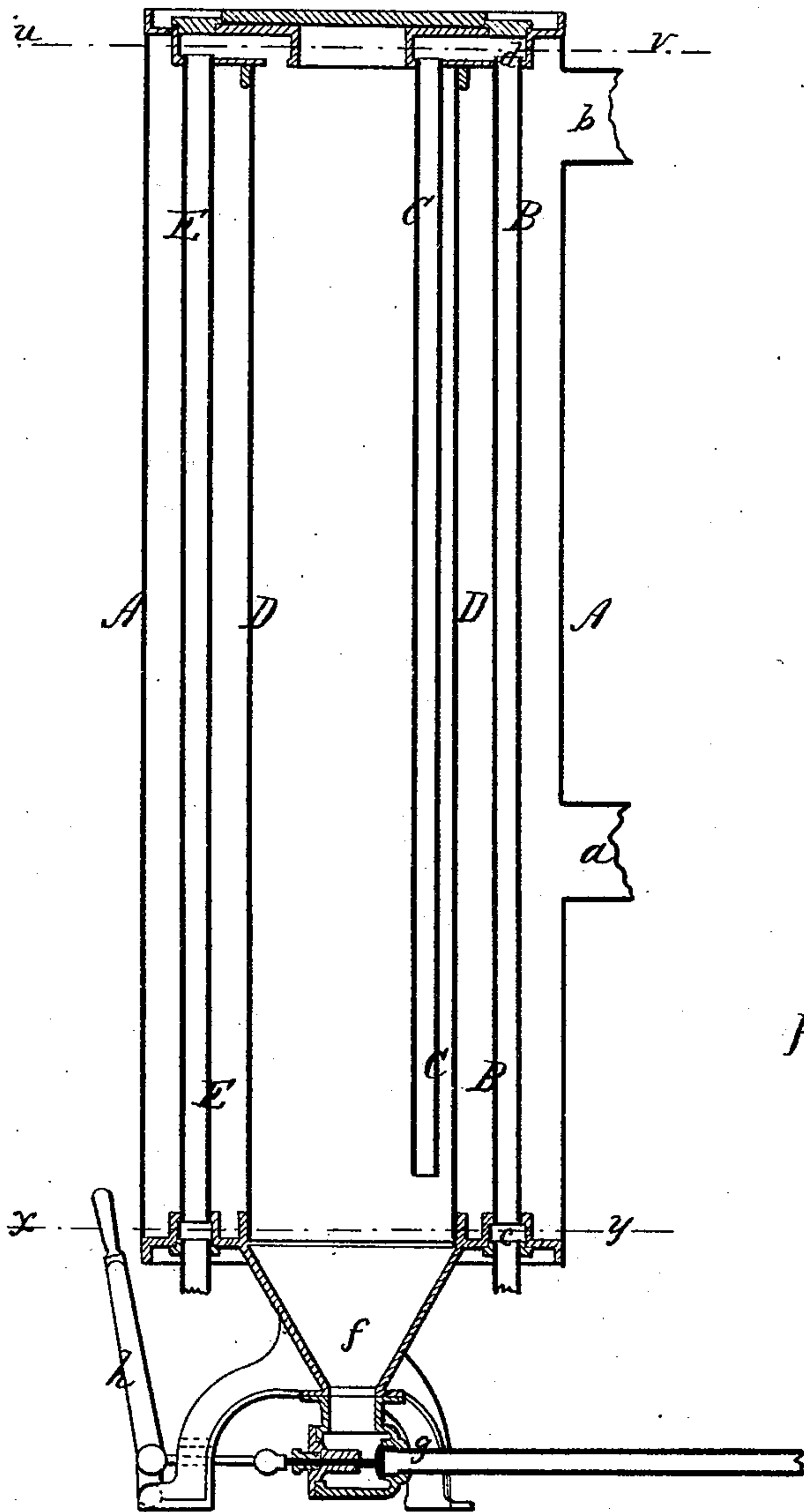
J. G. Goessel

Steam-Boiler Condenser.

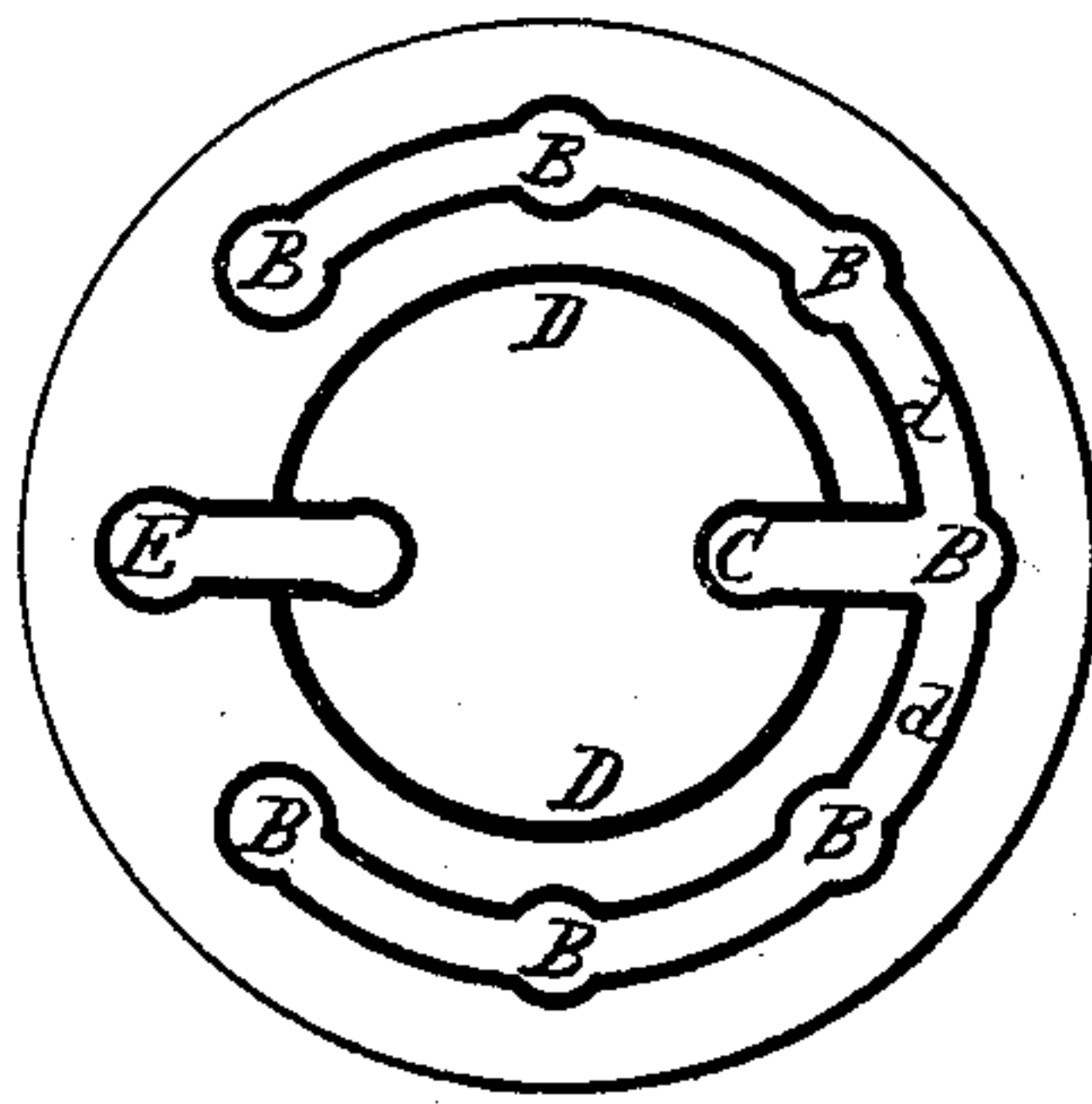
N^o 68,433.

Patented Sep. 3, 1867.

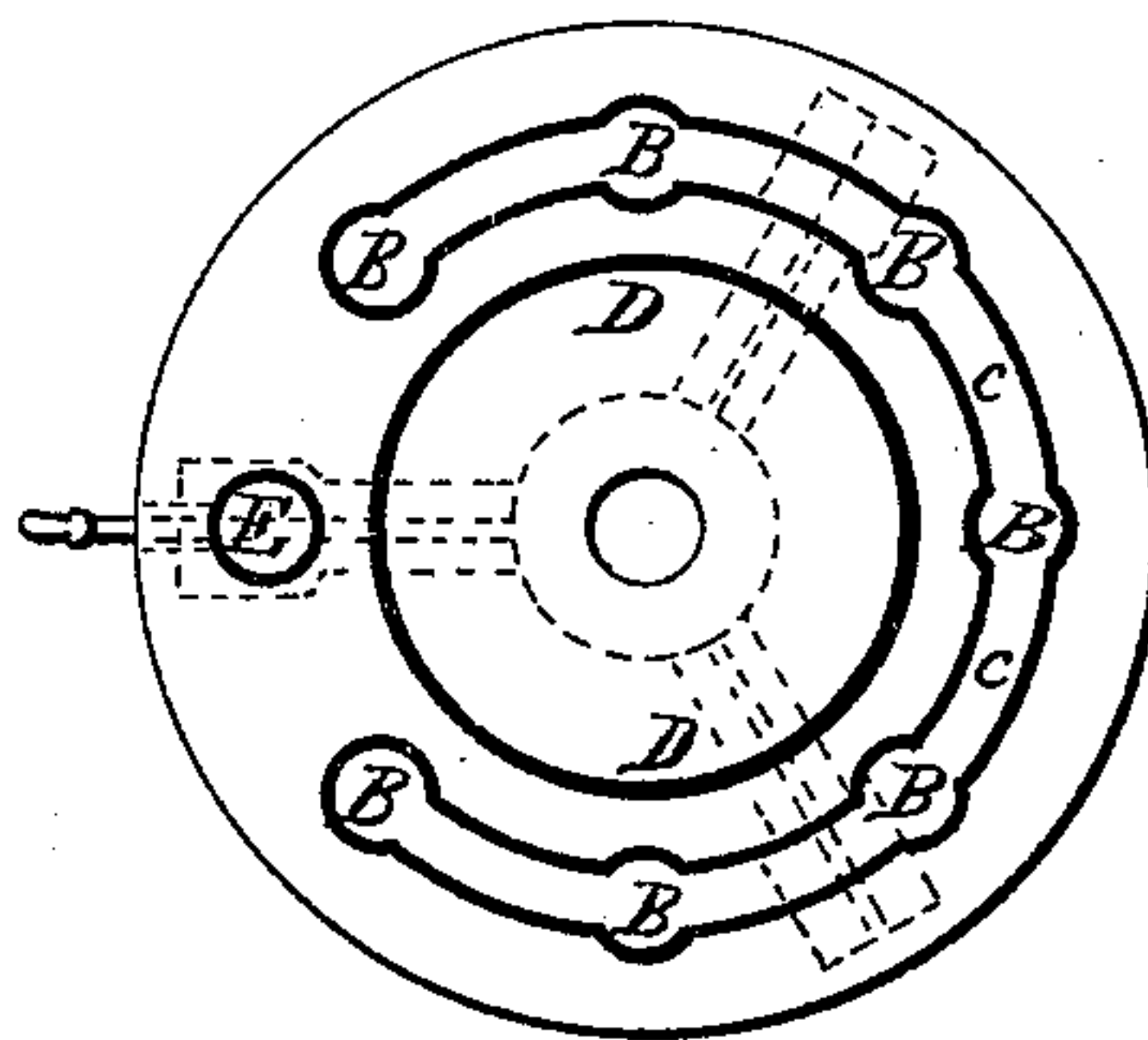
Vertical Section through Centre



Horizontal Section "uv,"



Horizontal Section "xy,"



Witnesses;
Lucretia
J. J. W. W.

Inventor;
J. G. Goessel

United States Patent Office.

JOHN GEORGE GOESEL, OF ST. LOUIS, MISSOURI.

Letters Patent No. 68,433, dated September 3, 1867.

IMPROVEMENT IN FEED-WATER HEATERS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL TO WHOM IT MAY CONCERN:

Be it known that I, JOHN GEORGE GOESEL, of the city and county of St. Louis, State of Missouri, have invented a new and improved Apparatus for Purifying and Heating Feed-Water of Steam-Boilers; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The nature of my invention consists, first, in purifying water by introducing it in a heated state in the lower part of a vertical water-tank, placed inside of a vertical steam-drum, which latter receives steam either from the exhaust of a steam engine or from a steam-generator; and by discharging the water through an opening in the upper part of the tank, so that in ascending it may leave the solid particles behind; second, in heating water by admitting it at the lower connection of a series of pipes being connected at both ends, and by submitting the same to the heating action of steam in said vertical steam-drum during its simultaneous ascension through all those pipes; third, in conducting the water contained in the series of pipes to the lower part of the water-tank by a vertical pipe, connected at its upper end to the series of pipes; fourth, in conducting the water from the upper part of the water-tank through the steam-room of said steam-drum, by means of a vertical pipe, to the lower end of said steam-drum, and from thence by an outside pipe connection to feed-pump or directly to boiler.

The vertical steam-drum A A, (see vertical section through centre,) being connected by pipe *a* to exhaust-port of a steam-cylinder, or to a steam-generator, and having its upper part pipe *b* discharging the steam in the air, is provided on its lower bottom with an annular space, *c*, (see vertical section and horizontal section *x y*,) connecting the pipes B B; the upper end of the drum being provided with a similar annular space, *d*, (see vertical section and horizontal section *u v*,) which is connected to pipe C inside the water-tank D. This latter is again connected in its upper part to pipe E, and through it to a feed-pump, or directly to the boiler.

The operation and action of this apparatus are as follows: The cold water from an outside water-tank, or by means of a force-pump, enters through pipe *p* into the annular space *c*, then it rises simultaneously in the series of pipes B B, and is gradually heated by the action of the steam in the drum A A. After reaching the upper annular space *d* it is conducted downward through the pipe C, near the funnel-shaped bottom of the inside water-tank D, where it takes again an upward motion. The area of the inside water-tank being very extended this upright motion will be very slow, and hence allow the solid particles contained in the water to be left behind in the funnel *f*, from which this sediment may be blown off through valve *g*, operated from time to time by the hand-lever *h*. The purified water in the upper part of water-tank D is conducted through pipe E to feed-pumps or directly to boilers, as the case may be.

What I claim as my invention, is—

1. The combination of a vertical steam-drum, receiving steam either from the exhaust of a steam engine or directly from a steam-generator, and an inside hot-water tank, substantially as described.
2. The combination of said steam-drum with a series of vertical pipes, being connected at both ends, substantially as described.
3. The combination of the inside water-tank D and pipe C, connected at its upper end with the series of pipes B, and discharging the already hot water near funnel *f*, substantially as described and for the purpose specified.
4. The combination of inside water-tank D with pipe E, connected to the upper part of water-tank D, and conducting the water through steam-space of steam-drum, either directly or by means of force-pumps, to boilers.

J. G. GOESEL.

Witnesses:

J. J. WITZIG,
HERMANN MENCK.