

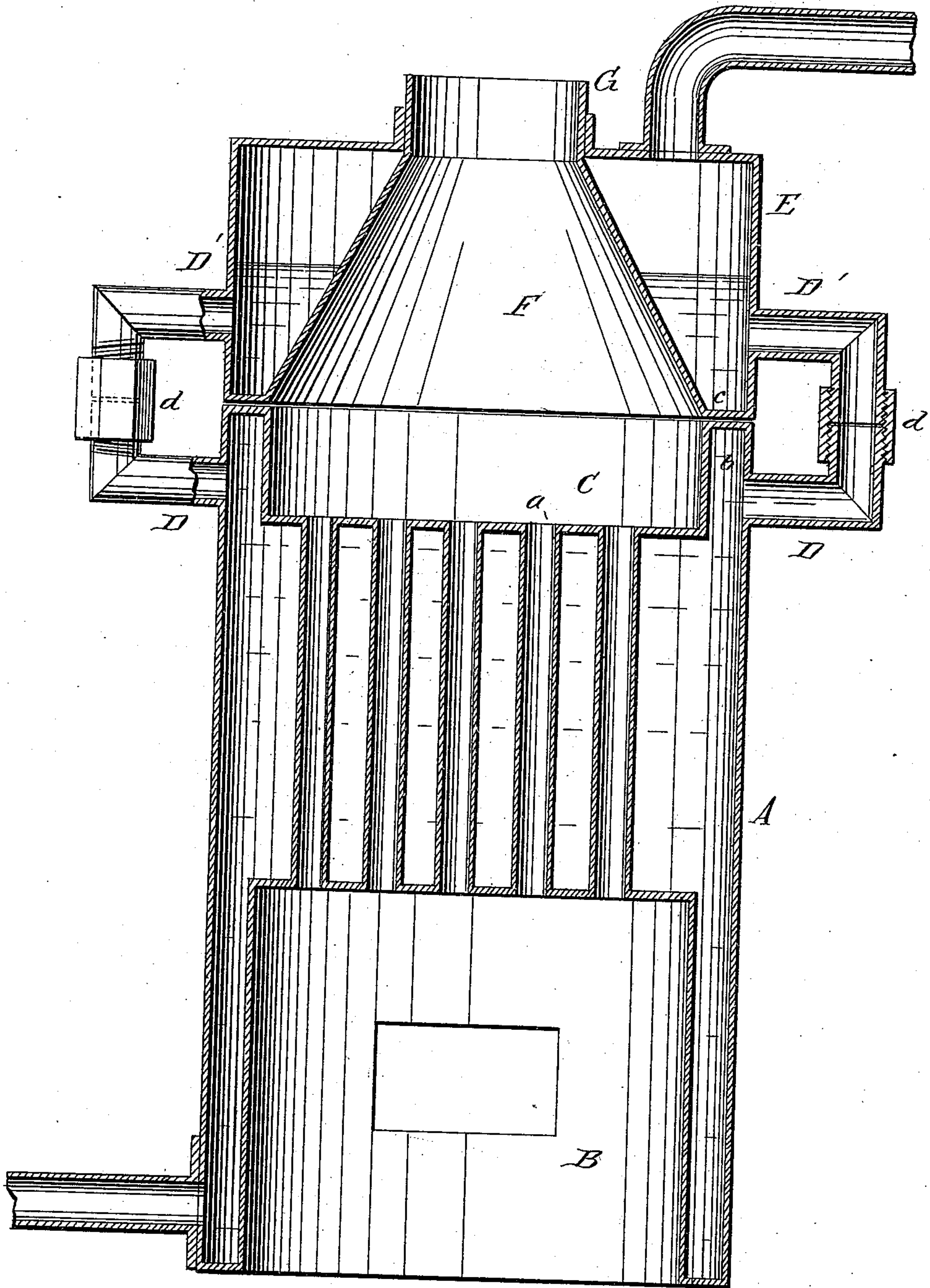
(No Model.)

W. J. CHAPMAN.

STEAM BOILER.

No. 354,686.

Patented Dec. 21, 1886.



WITNESSES:

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UNITED STATES PATENT OFFICE.

WILLIAM JACKSON CHAPMAN, OF RUTLAND, VERMONT.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 354,686, dated December 21, 1886.

Application filed April 1, 1886. Serial No. 197,434. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM JACKSON CHAPMAN, of Rutland, in the county of Rutland and State of Vermont, have invented a new and useful Improvement in Steam-Boilers, of which the following is a specification, reference being had to the annexed drawing, forming a part thereof, which is a side sectional elevation of a boiler embodying my improvement.

My invention relates to vertical boilers; and it consists in the combination, with a vertical boiler having vertical flues and a recessed head, of an auxiliary annular chamber, forming a receptacle for water and steam, and connected with the upper part of the boiler by series of tubes, the auxiliary chamber forming, in connection with the recessed head, a smoke-chamber and an extended heating-surface for utilizing a part of the heat which is usually allowed to escape from the smoke-pipe.

In vertical boilers as commonly constructed, the upper ends of the vertical flues being exposed to hot steam upon one side and the heat of the fire upon the other, and the upper head or flue-sheet being also subjected to the action of steam upon one side and the fire upon the other side, the flues soon become leaky and are eventually destroyed.

The object of my invention is to obviate this difficulty by arranging the boiler so that the upper ends and the flues will be continuously submerged in water.

The body A of my improved boiler is provided with a fire-box, B, with a recessed head, C, and vertical flues *a*, passing through the flue-sheet of the fire-box and through the recessed head. The annular space *b*, surrounding the recessed head C, is provided with series of outlet-pipes D, which vary in number and size with the size of the boiler.

Above the boiler, and resting upon the annular surface at the top thereof, is a chamber, E, preferably of the same diameter externally as the body of the boiler. A hollow cone, F, having a flange, *c*, at its base, is secured in the chamber E. The upper and smaller end of the hollow cone F connects with a collar, G, adapted to receive the smoke-pipe.

The internal diameter of the base of the hollow cone is the same as the internal diameter

of the recessed head C, and the hollow cone forms in connection with the recessed head a smoke-chamber, in which is received the products of combustion rising through the flues *a*.

In the side of the chamber E, near the bottom thereof, are inserted series of tubes D', corresponding with the tubes D in the body A of the boiler. The tubes D' are turned downward at right angles, and the tubes D are turned upward at right angles, the two tubes being united by a union or coupling, *d*, screwed upon the adjacent ends of the tubes, as indicated in the drawing.

By means of the tubes D D' communication is established between the upper part of the body A of the boiler and the lower part of the chamber E. The water-level in my improved boiler is preferably maintained above the mouths of the tubes D'. In this manner the submerging of the flues *a* is always insured.

The chamber E, besides raising the water-level of the boiler so that the flues are protected, provides efficient steam-room, increases the heating-surface of the boiler, and utilizes the heat of the flues, which without my improvement would pass directly to the smoke-pipe and be lost. By connecting the chamber E with the body A of the boiler in the manner described, the chamber can at any time be removed for repairs or for repairing the boiler.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with the boiler-body A, having the recessed head C, and annular space *b* above the flues, of the auxiliary annular chamber E, formed around the hollow cone F, and connected with the annular space *b* of the boiler by pipes D D', substantially as herein shown and described.

2. As an improved article of manufacture, a boiler formed of the body A, having a fire-box, B, the recessed head C, and flues *a*, the annular chamber E, formed around the hollow cone F, the pipes D D', and couplings *d*, connecting said pipes, substantially as herein shown and described.

WILLIAM JACKSON CHAPMAN.

Witnesses:

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