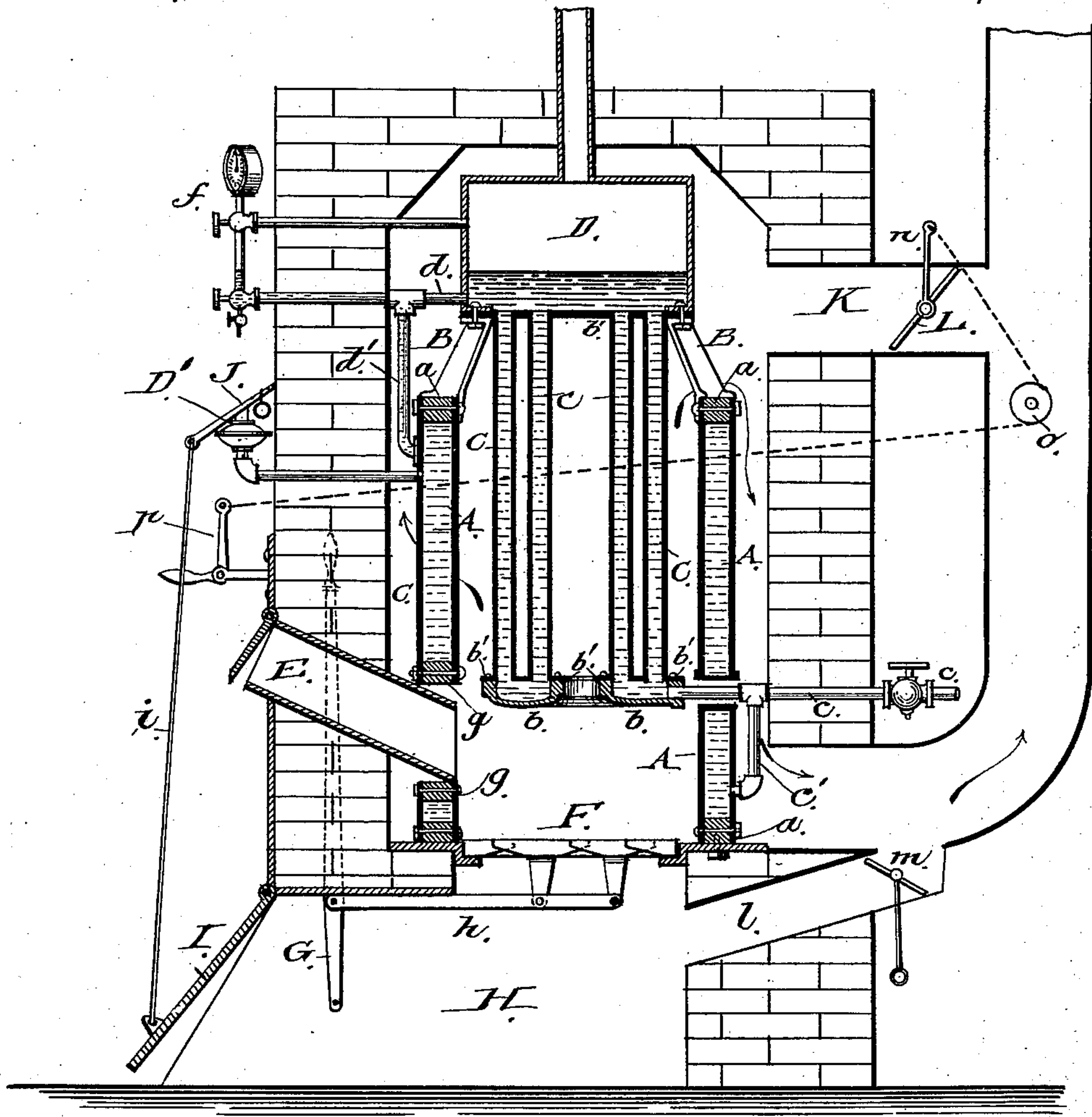


(No. Model.)

W. F. BOSWELL.
UPRIGHT STEAM HEATER.

No. 334,335.

Patented Jan. 12, 1886.



WITNESSES

T. W. Fowler,
H. B. Applewhite,

INVENTOR

Wm. F. Boswell
per A. H. Evans & Co

Attorneys

UNITED STATES PATENT OFFICE.

WILLIAM F. BOSWELL, OF ATCHISON, KANSAS.

UPRIGHT STEAM-HEATER.

SPECIFICATION forming part of Letters Patent No. 334,335, dated January 12, 1886.

Application filed August 25, 1885. Serial No. 175,278. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM F. BOSWELL, a citizen of the United States, residing at Atchison, in the county of Atchison and State of Kansas, have invented certain new and useful Improvements in Upright Steam Heaters and Boilers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, forming part of this specification, in which the figure represents a vertical longitudinal sectional view of a steam heater and boiler embodying my improvements.

My invention relates to an improved steam-boiler and heating apparatus for buildings and for any other purpose for which a steam-heater may be used; and my invention consists in the construction and combination of devices hereinafter described and claimed, whereby great economy of construction, safety from explosion, and increased circulating-heat capacity are obtained.

To enable others skilled in the art to make and use my invention, I will now describe its construction and the manner in which I have carried it out.

In the said drawing, A represents a continuous water-jacket suitably supported and forming between its inner sides the fire-box. At the upper and lower ends of this water-jacket are suitable cast-iron heads, *a a'*, which are riveted to the sides of the water-jacket casing, as shown in the figure. Upon the top of the water-jacket A are mounted the braces B, which support the steam dome, or superheater D and the inner tubes of the boiler. The tubes C depend from the superheater, and are so arranged inside the flues that the heat and fire pass upon their outside, and by thus circulating around these tubes the water contained therein is more quickly heated than in many of the steam-heaters now used, and in which just the opposite construction is employed.

The lower and upper ends of tubes C are inserted and expanded in cast steel or iron plates *b'*, to which is bolted head *b*, thereby forming an annular chamber, with which the tubes communicate. The lower ends of tubes being in direct connection with each other, thereby form a continuous circulation for the

double row of tubes. A connection, *c*, extends from the lower ends of one of the rows of tubes C, and passes through the water-jacket and brick casing. A short pipe, *c'*, is attached by a T-coupling to this connection *c*, the lower end of the former being in direct communication with the water-jacket. The steam dome or superheater has a pipe, *d*, and the upper end of the water-jacket has a connection, *d'*, to the superheater and to the water and steam gage *f*, while a water-valve, *D'*, extends from the water-jacket to the outside of the casing, where it may be in the control of the engineer.

The fire-box is located directly beneath the tubes C, and it has a fire-door, E, which passes through the water-jacket between suitable heads, *g g*, as shown.

F represents the rocker fire and dump grate, connected by a rod, *h*, to an operating-lever, G.

H represents the ash-pit, and I an ash and damper regulating door, attached by a connection, *i*, to a weighted lever, J.

The surplus heat and products of combustion, after circulating around the tubes, pass into the chamber on the outside of the tubes, and thence into the main flue or chimney, and the dust and gas from the ash-pit escape into the chimney through the flue *l*, the same being controlled by a damper, *m*.

K represents the direct draft-flue to main chimney, and this flue is controlled by a damper, L, to which is attached a lever, *n*. A cord or chain or similar device is attached to the lever, and, passing around a sheave, *o*, extends to the front of the heater, and is operated by a lever, *p*, as shown.

By the arrangement of the parts described I am enabled to construct a steam-heater that has increased circulating and heating capacity, one that is not liable to the dangers of explosion, and also one that may be constructed without extra expense or labor.

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

1. A steam-heater comprising a continuous water-jacket, a steam-dome, a superheater, brackets for supporting the superheater above and within the water-jacket, the circulating-tubes in direct communication with the water-

95

100

jacket and superheater, and the annular head to which the tubes are bolted, substantially as herein described.

2. In a steam-heater, the combination, with the water-jacket having cast iron or steel heads bolted thereto, of the superheater or dome, the braces which support the superheater, and the circulating water-tubes C within the water-jacket, whereby the heat from the fire circulates around on the outside of the tubes and establishes a continuous circulation between the water-jacket, the superheater, and the tubes, substantially as herein described.

3. The combination, with the water-jacket, the braces on the top thereof, and the superheater supported above and within said water-jacket, of the plates b' , the tubes C, and the head b , beneath the tubes, whereby a chamber is formed and the lower ends of the tubes

brought in direct communication with each other, substantially as herein described.

4. The combination of a water-jacket, the superheater, the braces for supporting the same, the circulating water-tubes, and the head b , having an annular chamber with which the lower ends of the tubes communicate, substantially as herein described.

5. The water-jacket, the superheater supported thereon, and the tubes C, in combination with the lower pipes, c c' , connecting the tubes and water-jacket, and the upper connection, d e , between the latter and the superheater, and a suitable water and steam gage, substantially as herein described.

WILLIAM F. BOSWELL.

Witnesses:

C. H. FARWELL,

R. B. DRURY.