

G. E. BANNER.
 Steam-Engine Boiler.

No. 203,698.

Patented May 14, 1878.

Fig. 1.

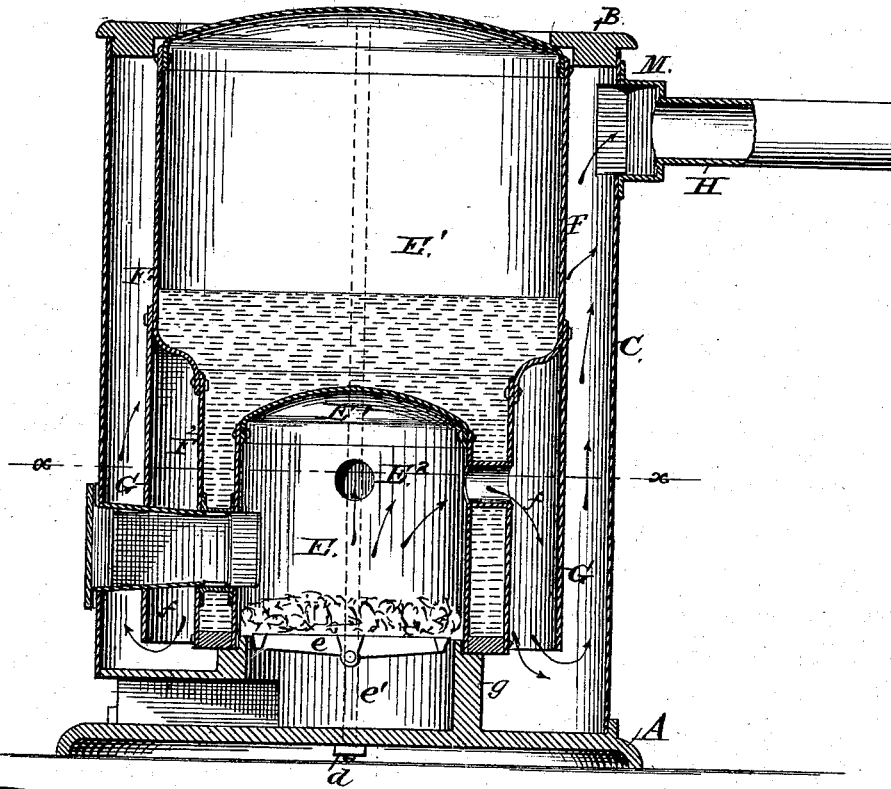


Fig. 2.

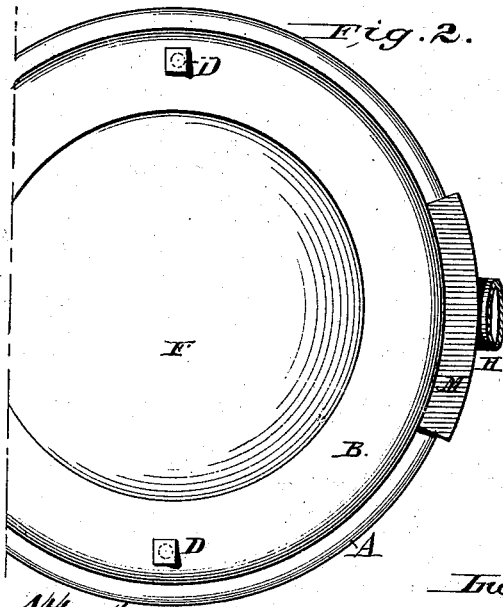
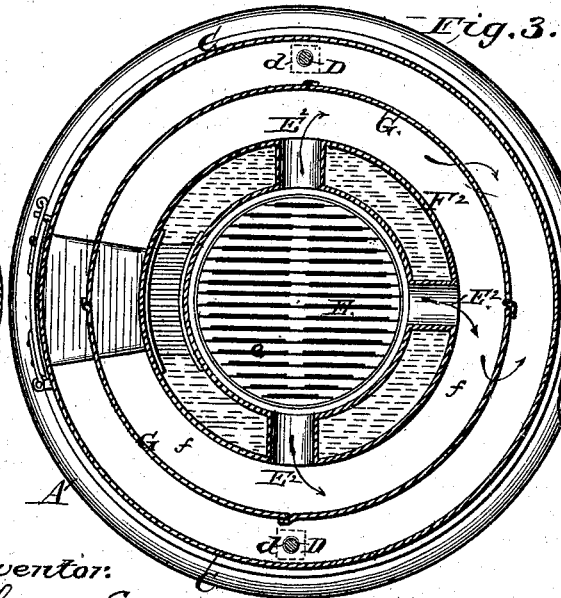


Fig. 3.



Attest,
 W. D. Penne
 C. La Dow.

Inventor:
 George Edward Banner.
 By W. H. Babcock. Atty.

UNITED STATES PATENT OFFICE.

GEORGE E. BANNER, OF NEWARK, NEW JERSEY, ASSIGNOR OF ONE-HALF HIS RIGHT TO ANNA GRAY FALES, OF HARTFORD, CONNECTICUT.

IMPROVEMENT IN STEAM-ENGINE BOILERS.

Specification forming part of Letters Patent No. **203,698**, dated May 14, 1878; application filed—April 27, 1878.

To all whom it may concern:

Be it known that I, GEORGE EDWARD BANNER, of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Steam-Engine Boilers; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates to boilers for steam-engines; and consists, chiefly, in providing said boilers with annular partitions or diaphragms of pendent plates of metal extending on all sides to the bottom of the boiler proper, and adapted to deflect the heated air from the fire-tubes, so that it will pass down the outside of the water-legs before passing through the uptake of the flue, as hereinafter more fully described and claimed.

In the accompanying drawings, Figure 1 represents a vertical section of my improved boiler, and Fig. 2 represents a plan view of the same. Fig. 3 represents a horizontal section through the line *x x* of Fig. 1.

A designates the bed-plate or stand of my boiler; B, the cap or crown piece of the same; and C, the outer shell, clamped between them by means of vertical rods D, which extend from top to bottom of the boiler, and are screw-threaded to receive nuts *d d*. By the use of these rods and nuts I dispense with a multiplicity of fastening-bolts generally heretofore used for directly attaching said shell, and make attachment and removal much more convenient.

E designates the fire-box of my boiler, provided with grate *e*, crown-plate E¹, and ash-box *e'*. Said fire-box is provided with horizontal fire-tubes E², which extend radially from the upper part of its periphery.

F designates the shell of the boiler, consisting of an enlarged upper part, F¹, and a cylindrical smaller lower part, F². These parts F¹ and F² may be constructed in a single piece, or made separately and then riveted together.

The enlargement of upper part F¹ increases the steam-space of the boiler without interfering with the other arrangements, hereinafter described.

G designates an annular partition, consisting of plates of metal attached to enlarged part F¹ of the shell F, and extending downward or pendent therefrom, so as to surround lower part F², leaving an annular space, *f*, between them. Tubes E² extend through said lower part F² of said shell F, so that the heated air and products of combustion pass down through said space *f* to the lower end of partition G. Said heated air then passes under said lower end of said partition and up through the space between said partition and the jacket or outer shell to the outlet-flue H, which conveys it to the smoke-stack. The water in the boiler is thus exposed to the heat from the fire-box, the tubes, and the annular surrounding space *f*, as the heated air passes through them in succession, so as to give the full benefit of its steam-producing powers. The said jacket-casing or outer shell is provided with an offset or chamber, M, at and about the inner end of outlet-flue.

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

1. In a steam-boiler, the combination, with a fire-box, fire-tubes, shell, and outer casing, of a pendent annular diaphragm, consisting of plates of metal attached to said boiler-shell, and arranged and operating substantially as and for the purposes set forth.

2. In a steam-boiler, the combination, with a fire-box, fire-tubes, boiler-shell, and outer jacket or casing, of an annular diaphragm extending on all sides down to a level with the bottom of the boiler proper, and arranged and operating substantially as and for the purposes set forth.

3. In a steam-boiler, the combination, with a fire-box, fire-tubes, boiler-shell, and outer casing, of a pendent annular diaphragm or partition, consisting of sheets of metal attached to said boiler-shell, extending on all sides down to a level with the bottom of the boiler, and arranged and operating substantially as and for the purposes set forth.

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

GEORGE EDWARD BANNER.

Witnesses:

W. J. BABCOCK,
W. H. BABCOCK,