J. M. Whittemore,

Steam-Boiler Fire-Tube.

No. 478. Patented Nov. 23, 1837.

Fig. 2.

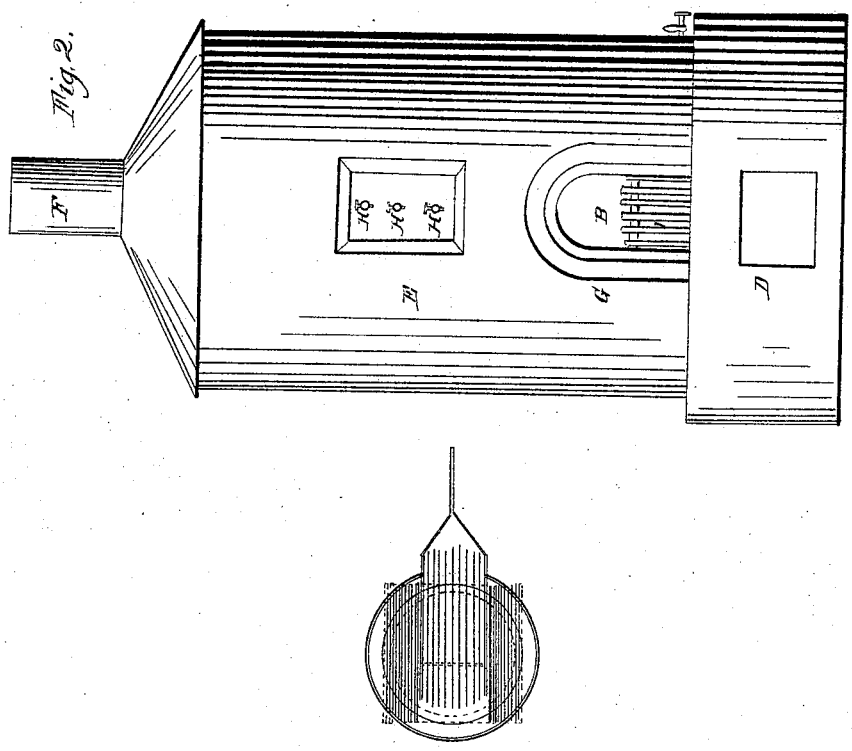
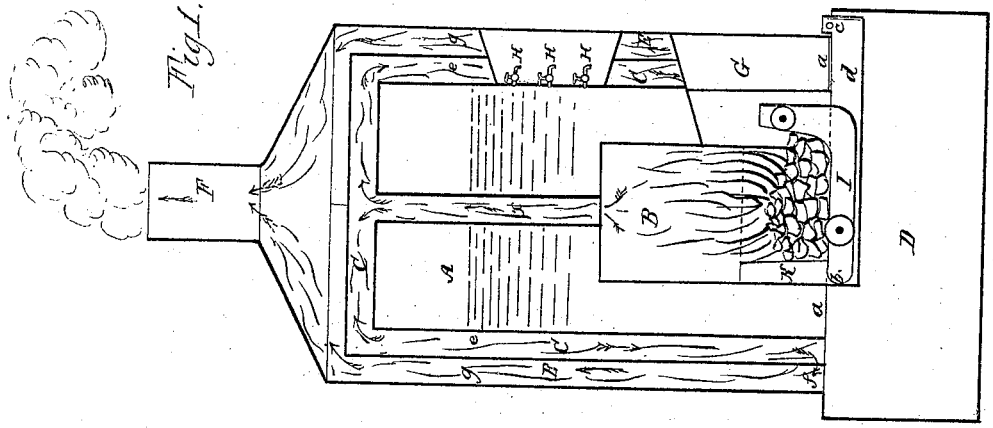


Fig. 1.



UNITED STATES PATENT OFFICE.

JAMES M. WHITTEMORE, OF BRIGHTON, MASSACHUSETTS.

STEAM-BOILER.

Specification of Letters Patent No. 478, dated November 23, 1837.

To all whom it may concern:

Be it known that I, JAMES M. WHITTEMORE, of Brighton, county of Middlesex, and State of Massachusetts, have invented, made, and applied to use a new and useful improvement in generating steam, or which may be otherwise termed an improved steam-boiler for steam-engines or other purposes to which the same may be applied.

This improvement, the principle thereof, the several modes in which I have contemplated the application of that principle or character by which it may be distinguished from other inventions, together with that part, improvement, or combination which I claim as my invention or discovery, I have fully set forth and described in the following specification and annexed drawings.

Fig. 1 represents a section of the boiler, which is represented in a vertical position. Fig. 2 is a front elevation of the same, exhibiting the fire and ash pit entrances.

The boiler A is a hollow cylinder of metal constructed and shaped as exhibited in the drawings, or in any other convenient manner.

B is the fire place, inserted in the interior of the boiler, having a flue or smoke tube X connected with its top, the other end of the said flue being attached to the top of the boiler or generator. Around the exterior of the boiler is another hollow cylinder C, resting on the upper plate *a* of the wind or ash box D. The lower part of this incasing cylinder is perforated around its edge with openings or holes, for the passage of the smoke or gas evolved during combustion of the fuel, into the second incasing cylinder E, which is formed similar to the cylinder D, and rests on the upper plate *a* of the ash box. To the top of this cylinder is affixed the chimney F, or flue for the final escape of the smoke or heated air. The tops of the cylinders C and E may be hemispherical, conical or flat, if desirable. The boiler or generator and its outer cylindrical casings are properly constructed to admit of a fire door and opening into the fire place, as seen at G; also for the gage cocks H, H, H. The wind box serves the double purpose of an ash pit and a receptacle of the air, which is forced in from the revolving fan or blower of the engine, and may be constructed as represented in the drawings, or in any other convenient and proper manner. The grate I is hung to the upper plate of the wind box by a hinge joint at *b*, and is kept up in a horizontal position, by the pin *c* passing through the arm *d*, projecting from the grate. By withdrawing the pin *c* the grate falls into an inclined position, and the contents may be removed at any time whenever convenient.

A grate frame may be constructed of metal, similar to a shallow box with a circular or other proper shaped opening through its bottom. In this box, the grate bars may be arranged in number and distance from each other as may be most convenient. The box may be hung on a hinge or joint at one end to the lower surface of the top plate of the wind box, and may have a projecting arm or iron bar and pin from its opposite end (similar to the arm *d* and pin *c*) to hold it up in a horizontal position.

The interior of the boiler or generator is preserved from destruction from the immediate action of the fire by the Stealite or Stourbridge clay lining K. The steam and water pipes for supplying steam to the engine and water to the boiler are inserted in any convenient part of the generator, proceeding between and through its casings to the adjacent machinery. The smoke and flame passing up the flue or smoke tube *x*, strikes against the underside of the top plate of the cylinder C, and is deflected through the circular space *e e;* thence passing through the openings *f*, *f*, into the outer annular space *g g*, through which it rushes and escapes into the atmosphere from the chimney F; its course being more particularly denoted by the arrows in the drawing. It will thus be seen that the inside, outside and top surface of the generator is exposed to the action of the flame; and thus a very large surface is brought in immediate contact with the fire; so as to effect a great saving in fuel.

I also construct the boiler and flues as represented by Fig. 3, in which A represents the fire chamber surrounded by water in the outer inclosing case B. The case B communicates with a steam box C by means of a suitable number of pipes *a*, *a*. As the flame passes upward, it impinges against the underside of the steam box C, in which the water stands to a proper depth above

the fire surface; thence the flame is deflected around and between the pipes *a*, *a*, and downward through the passage D D; thus acting on the external surface of the generator B. From this last chamber D D, it passes through the openings E E into the outer casing F F, and ascends and finally escapes through the flue or chimney G.

H is a man hole and plate for the purpose of cleansing the boiler whenever necessary. The fire surface immediately in contact with the flame being mostly if not entirely surrounded by water, there is scarcely any possibility or chance of burning the metal of which the boiler is composed.

I claim as my invention and improvement:

The arrangement of the flues in combination with a boiler, having a furnace located and to operate as I have herein above described.

In testimony that the above is a true specification of my invention and improvement, I have hereto set my hand this fourteenth day of January in the year of Our Lord, one thousand, eight hundred and thirty seven.

JAMES M. WHITTEMORE.

Witnesses:
R. H. EDDY,
ESRA LINCOLN, SR.