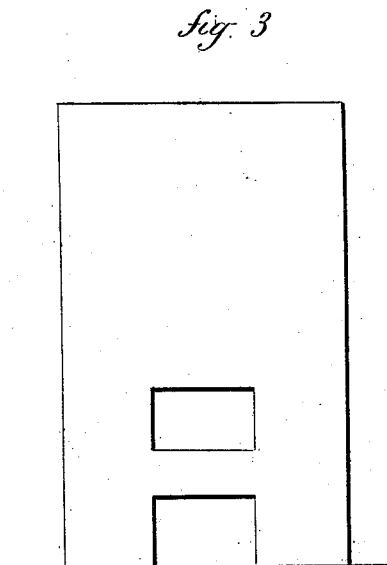
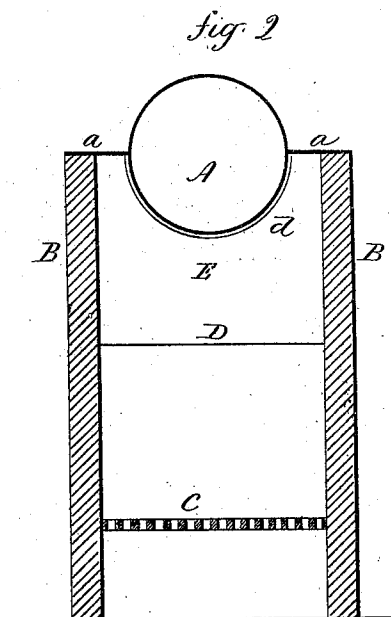
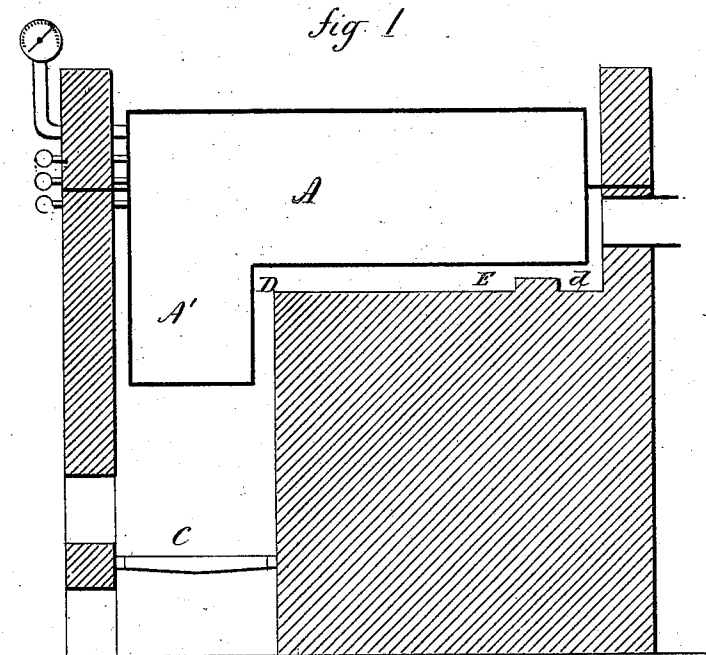


S. SMITH.
STEAM-BOILER.

No. 177,760.

Patented May 23, 1876.



Witnesses:
J. H. ...
Clara Broughton.

Sidney Smith
Inventor
By atty. *Wm. J. ...*

UNITED STATES PATENT OFFICE.

SIDNEY SMITH, OF WORCESTER, MASSACHUSETTS.

IMPROVEMENT IN STEAM-BOILERS.

Specification forming part of Letters Patent No. **177,760**, dated May 23, 1876; application filed September 28, 1875.

To all whom it may concern:

Be it known that I, SIDNEY SMITH, of Worcester, in the county of Worcester and State of Massachusetts, have invented a new Improvement in Steam-Boilers; and I do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, longitudinal section; Fig. 2, transverse section on line *x x*.

This invention relates to an improvement in the construction of steam-boilers; and it consists in constructing a longitudinal boiler with a downward projection below the lower level of the boiler, extending into the fire-box over the fire.

A is the boiler, constructed with a longitudinal flange, *a*, on each side, and below the water-line, the said flanges projecting from the boiler, and so as to rest on the supporting-walls B, and leave a space between the said walls and the boiler at the flanges. C is the fire-box, of substantially usual construction. The boiler is constructed with an extension, A', down into the fire-box, which forms practically the principal heating part of the boiler, and tends to distribute or spread the flame or heat.

This arrangement of the walls affords a considerable space for the passage of the heat and the products of combustion around the entire exposed surface of the boiler. The front wall or bridge for the furnace is left down and straight across, as at D, Fig. 2; but the rear wall E extends up to the flange *a*, and conforms to the shape of the boiler, leaving only a narrow space, *d*, through which the products of combustion must pass.

This method of suspending the boiler so as to leave an open and clear space up to the point where the boiler is suspended possesses a great advantage over the usual method of setting boilers—that is to say, in the usual method the wall is brought up into close contact with the boiler at the point of suspension, thus leaving a space so narrow as to prevent all possible circulation of heat around the ad-

jacent portions of the boiler, and thereby confining the heat to the lower part of the boiler where there is sufficient room for circulation; but by constructing the boiler with the flanges *a* to extend out onto the distant walls, a clear space for circulation is attained up to these flanges, and the whole of the boiler below the flanges properly exposed to the heat from the fire, and this full effect is insured by making the forward bridge open, and closing up the rear bridge, so as to leave only a narrow space through which the products of combustion may pass. This tends to spread the fire, or rather draw it into close contact with the entire exposed surface.

For the purpose of facilitating combustion, a flue, F, is arranged across the rear of the fire-box, and above the fuel, perforated to form numerous openings into the fire-box above the fuel. From this flue a conductor, *f*, leads to the outside of the furnace, and a regulator or register, *h*, is arranged so as to vary the capacity of the flue.

The advantage of mingling air with the products of combustion, to produce more perfect combustion, is too well known to require explanation in this specification.

This regulated inlet is applicable to other furnace-fires than that for heating steam-boilers. I therefore do not wish to be understood as confining the invention to steam-boiler furnaces.

I do not wish to be understood as broadly claiming the construction of a steam-boiler, so that a portion of it, extending into the fire-box, may be entirely enveloped by the products of combustion.

I claim—

In combination with the fire-box, the steam-boiler arranged longitudinally over the fire-box, and constructed with a projection, A', from the lower plane of the boiler down into the fire-box, and with an open flue directly from the fire-box to expose the lower surface of the boiler, substantially as described.

SIDNEY SMITH.

Witnesses:

JOHN E. EARLE,
CLARA BROUGHTON.