P. SULLIVAN.
Boiler-Furnaces and Feed-Water Heaters.

No. 213,468. **Patented Mar. 18, 1879.**

Fig. 1.

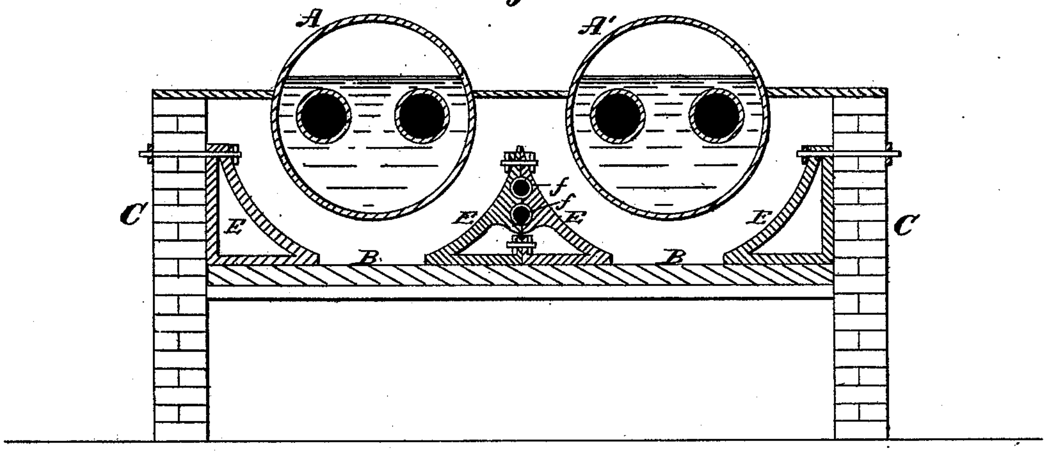
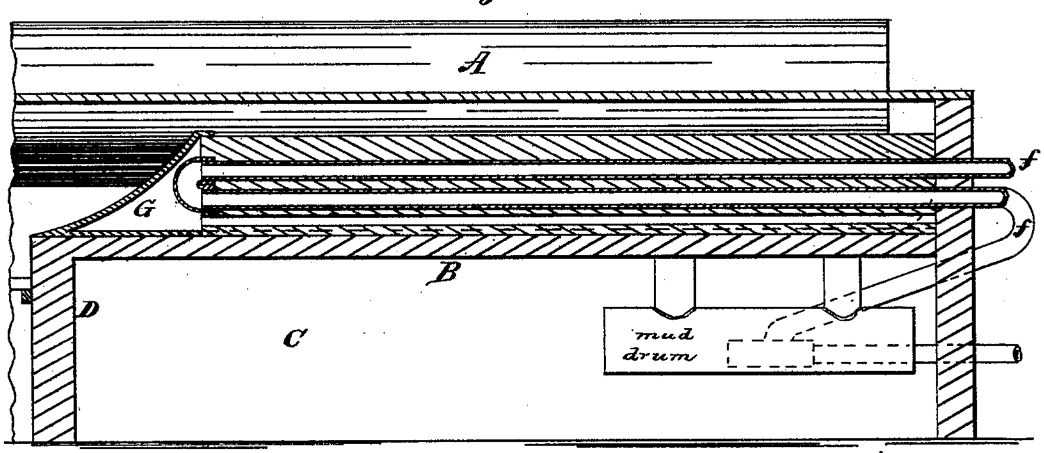


Fig. 2.



Witnesses
Jos. B. Connolly
F. W. Drummond

Peter Sullivan Inventor

By Connolly Bros & McTighe Attorneys

UNITED STATES PATENT OFFICE.

PETER SULLIVAN, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN BOILER-FURNACES AND FEED-WATER HEATERS.

Specification forming part of Letters Patent No. **213,468**, dated March 18, 1879; application filed May 28, 1878.

To all whom it may concern:

Be it known that I, PETER SULLIVAN, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Boiler-Furnaces and Feed-Water Heaters; and I do hereby declare that the following is a full, clear, and exact description of the invention, 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 boiler-furnaces having two or more boilers; and consists in removable flame-spreaders of peculiar construction, whereby the flames are caused to more completely envelop the fire-exposed portion of the shell, and also in utilizing said flame-spreaders for heating feed-water, by means of pipes inserted therein, all substantially as hereinafter fully described and claimed.

My invention is designed for furnaces where a battery of two or more boilers is used.

Figure 1 is a cross-section of furnace, having two boilers, A A′, set as usual, with the fire-bed B underneath, and supported by the usual braces and stays (not shown) and the side walls, C. Fig. 2 is a longitudinal vertical section through the middle. D is the fire-bridge wall.

Thus constructed there is a large useless space between the boilers and at each side, in which much heat is wasted, as it does not come in contact with the surface of either boiler. This causes waste of fuel and forcing of the fires; but I insert on the fire-bed B my flame-spreaders E in this useless space. They are of such shape that their outer surface is concentric with and but a few inches away from the boilers, the middle ones being bolted together, back to back. By this means the space left for the passage of the flames, &c., is narrow, and they must exert more heating energy. Consequently, with less fuel, a given pressure can be secured and maintained without forcing the fires.

The spreaders E extend up about half the diameter of boilers, and are distant at all points four or five inches, and extend from the bridge to the back wall. They are made hollow and of suitable material, such as cast-iron or clay; and the two halves of the spreaders E have each two grooves made in their inner faces, wherein are laid the feed-water pipes *f f*, after which the halves are bolted together, as shown.

The spreader E E has a removable sloping front cap, G, as shown, so that the interior of the spreader may be inspected. The water flows forward through the upper pipe, *f*, and returns through the lower pipe.

It may be preferable to use my heater with another heater, in which case I would use two cocks, one for each heater, so that in case one accidentally should refuse to work the other could be used.

A check-valve outside the mud-drum on the feed-pipe would be found convenient, so that if anything happen to the pump, the pressure decreasing, the check-valve would be closed by the boiler-pressure, and no water could escape.

I claim—

1. The flame-spreaders E and feed-water-heating pipes *f*, combined as set forth.

2. Specifically, the spreaders E E, cast in two parts, having interior grooves for and in combination with the water-pipes *f f*, set in said grooves, substantially as described.

3. The combination of flame-spreaders E E, having pipes *f f* inserted therein, with the removable beveled cap G, as described.

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

PETER SULLIVAN.

Witnesses:

THOS. J. MCTIGHE,

JAMES J. MCTIGHE.