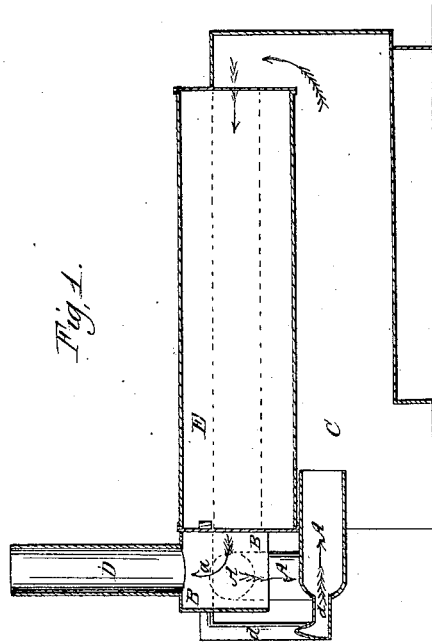
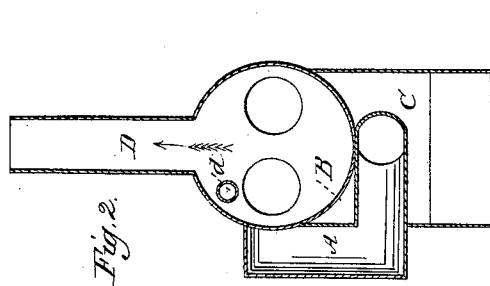


J. H. Webster,
Feeding Boiler Furnaces,
No. 53,367. *Patented Mar. 20, 1866.*



Witnesses.

S. M. Randolph.

A. Wagner.

Inventor.

J. H. Webster
By his atty
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UNITED STATES PATENT OFFICE.

JOSEPH H. WEBSTER, OF ST. LOUIS, MISSOURI.

IMPROVEMENT IN STEAM-BOILER FURNACES.

Specification forming part of Letters Patent No. 53,367, dated March 20, 1866.

To all whom it may concern:

Be it known that I, JOSEPH H. WEBSTER, of the city and county of St. Louis, and State of Missouri, have invented a new and useful Improvement in Smoke-Flues for Steam-Boiler Furnaces; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

Of the accompanying drawings, Figure 1 is a longitudinal section of a steam-boiler to which one of the improved smoke-flues is attached. Fig. 2 is a transverse section through the breech on the forward end of the boiler.

The nature of my invention consists in the construction and arrangement of a smoke-flue connected directly with the breeching of steam-boilers and fire-box of the furnace, and providing the same with a pipe connected directly with the boiler, whereby an increased draft in the smoke-flue is obtained, which serves to attract the heated air and smoke, which, when within said flue, are forced repeatedly through the furnace and flues of the boiler, thereby burning an increased per cent. of the carbon of the smoke before the same is conveyed off through the chimney.

I am aware that furnaces supplied with smoke-flues, in combination with steam-boilers for the combustion of smoke, have been used; but the same, by practical tests, have been found deficient in the required construction and arrangement of said flues to insure the retention of the smoke sufficiently long within the furnace and flues of the boiler to secure the perfect combustion thereof. My improvements are specially directed to this end, and by connecting the smoke-flue directly with the breeching of the boiler and the fire-box and creating an increased draft in said flue by the introduction of steam therein, in the manner herein described, it is obvious that the increased draft obtained serves to attract the smoke and at the same time impel it through the furnace and flues of the boiler, which, as practice has proved, accomplishes the end sought for.

To enable those skilled in the art to make and use my improved flues, I will proceed to describe its construction and operation.

I employ a smoke-flue, A, which connects the breeching B with the fire-box C. After

the fire has been burning long enough to heat the fire-box C the smoke, or at least a portion of it, will enter the flue A and be conducted through it again into the fire-box, where a portion of the carbon of the smoke will be burned. The smoke-flue A and the chimney D are both connected with the breeching B, and there is nothing interposing between them to prevent the smoke from entering either or both of them at the same time. Therefore the smoke will pass most freely into the avenue which has the stronger draft.

In order to increase the draft in the flue A, I take a small steam-pipe, *a*, one end of which is inserted into the boiler E above the water-line, and the other end of said steam-pipe is arranged to discharge steam taken from the boiler into the flue A in the direction indicated by the red arrow in the drawings. The lower portion of the breeching is omitted in the model and drawings for the purpose of disclosing the several parts to view. In practice this part will be closed up.

Although the flue A is represented as discharging the smoke into the fire-box in the accompanying drawings, it is obvious that the discharge might be made farther back under the boiler; but in that event the smoke would not be submitted to so high a degree of heat as it would were it to again pass through the fire-box, and a less amount of the carbon of the smoke would thereby be consumed.

By the above-described arrangement the smoke will ordinarily pass several times through the flues of the boiler and thence back again into the fire-box without going up the chimney. A large portion of the carbon of the smoke will thereby be consumed, and the heated air and smoke being retained a long time in and around the boiler, a great economy of fuel will thereby be effected.

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

The construction and arrangement of smoke-flue A and steam-pipe *a*, in combination with breeching B and fire-box C, substantially in the manner and for the purpose herein set forth.

JOSEPH H. WEBSTER.

Witnesses:

M. RANDOLPH,
A. WAGNER.