W. C. WREN & M. WATERHOUSE.

Improvement in Apparatus for Heating Steam-Boilers.

No. 131,044. Patented Sep. 3, 1872.

Fig. 1

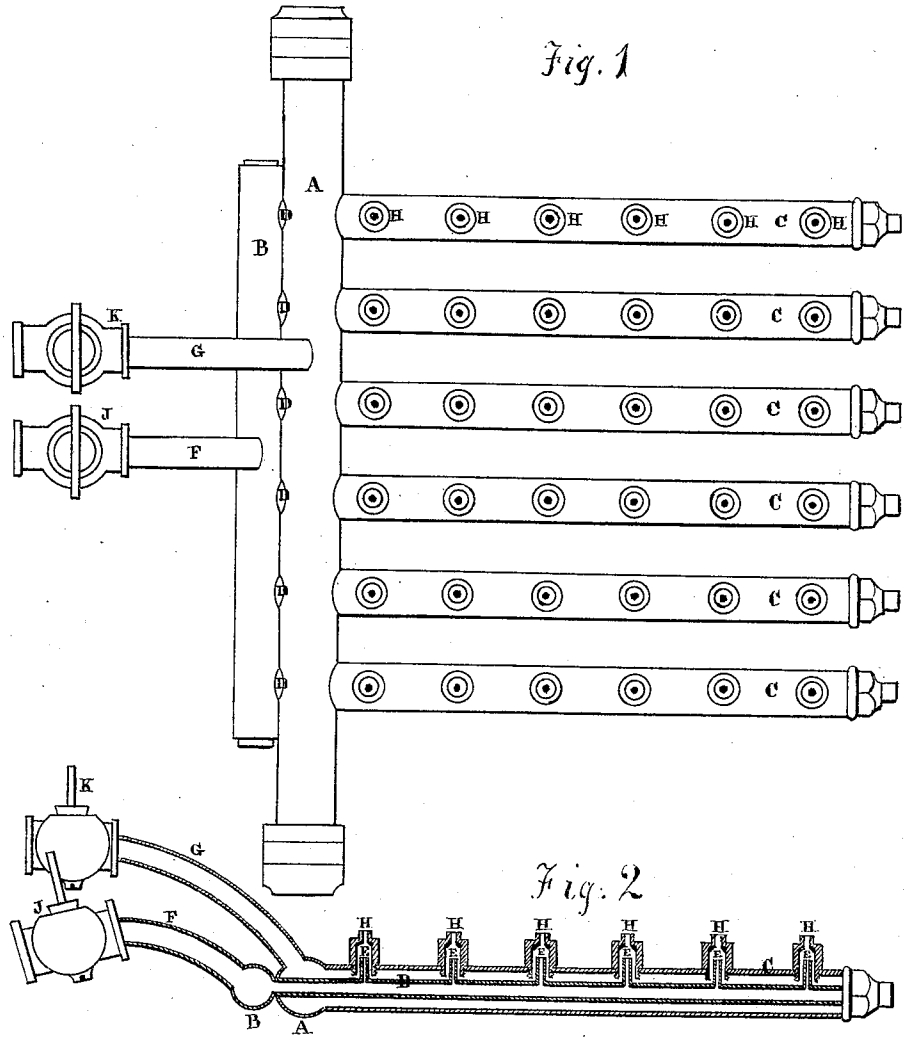

Fig. 2

Witnesses
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AM. PHOTO-LITHOGRAPHIC CO. N.Y. (OSBORNE'S PROCESS)

UNITED STATES PATENT OFFICE.

WILLIAM C. WREN, OF BROOKLYN, NEW YORK, AND MILES WATERHOUSE, OF PASSAIC, NEW JERSEY.

IMPROVEMENT IN APPARATUS FOR HEATING STEAM-BOILERS.

Specification forming part of Letters Patent No. **131,044**, dated September 3, 1872.

To all whom it may concern:

Be it known that we, WILLIAM C. WREN, of the city of Brooklyn, State of New York, and MILES WATERHOUSE, of the town of Passaic, State of New Jersey, have invented a new and Improved Method of Heating Steam-Boilers; and we do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawing and the letters of reference marked thereon making part of this specification.

The nature of our invention consists in using a fixed gas in combination with atmospheric air for the purposes of fuel and the means by which the same is accomplished.

Figure 1 is a top view of a series of tubes; Fig. 2, a sectional view of one outer and one interior tube, all of the series being alike.

We construct a furnace of any of the usual forms, and on top of or in the place of the ordinary grate-bars we put a series of tubes made to conform to the shape of the furnace or boiler. The tubes are so constructed that there shall be a smaller tube, D, running inside the larger tube C all the way, the outside or larger tubes C jointed to the main supply-pipe A, and the smaller tubes passing through the pipe A and jointed into the other supply-pipe, B. In each of the pipes C we put a series of outlets or nipples, as shown by H, slightly cone-form in shape on the inside, with a smaller nipple projecting into them from the pipe D. The small nipple E, Fig. 2, projects above the line of the outside pipe C and into the nipples H, as shown at Fig. 2. The cock K and pipe G connect with the main supply-pipe A, and the cock J and pipe F connect with the main supply-pipe B.

Having described the parts, we will now describe the method of using the same. One of the sets of pipes are used for introducing the gas, and the other for introducing the air with a pressure or blast. Either the outside or inside pipes can be used for air; but we prefer to use the outside pipes for gas and the inside pipes for air. Having made the arrangement of pipes as described, and adapted the same to the shape of the furnace or boiler, we attach the supply of gas to the cock K, and regulate the flow by the same, and attach the air or blast to the cock J, and regulate it by the same. We, in addition to the above, put more or less loose brick or stone on the top of the pipes, for the purpose of breaking up the flame, and after the brick or stone is hot more air can be used and less gas. The brick or stone is not shown, as the pieces are thrown on these bars the same as coal would be thrown on ordinary grate-bars.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The combination of the pipes C D, provided with the cone-shaped nipples H E, substantially as and for the purpose set forth.

2. The arrangement of the pipes C D, constructed as described, in relation to the furnace or boiler, substantially as specified, and for the purpose set forth.

3. The method of employing air and a fixed gas for assisting combustion by means of the pipes C D, constructed and arranged substantially as described.

WILLIAM C. WREN.
MILES WATERHOUSE.

Witnesses:
ISAAC S. WATERS,
GEO. WREN.