

No. 774,997.

PATENTED NOV. 15, 1904.

B. J. WHITE.
FEED WATER HEATER.
APPLICATION FILED JUNE 18, 1904.

NO MODEL.

Fig. 1

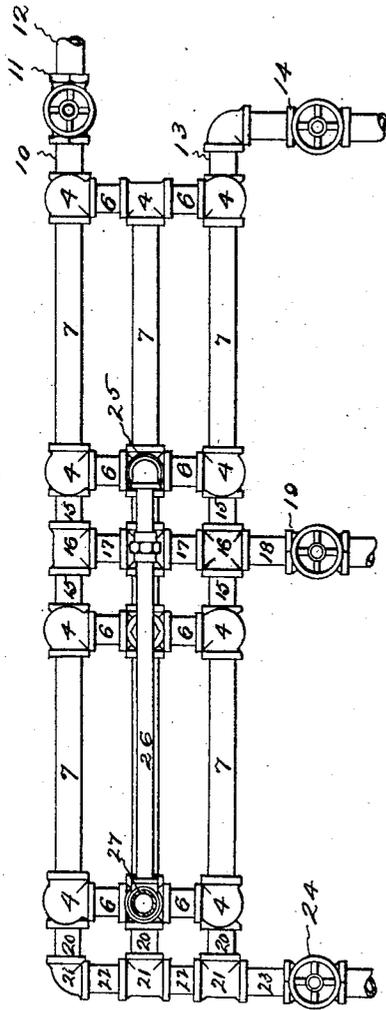
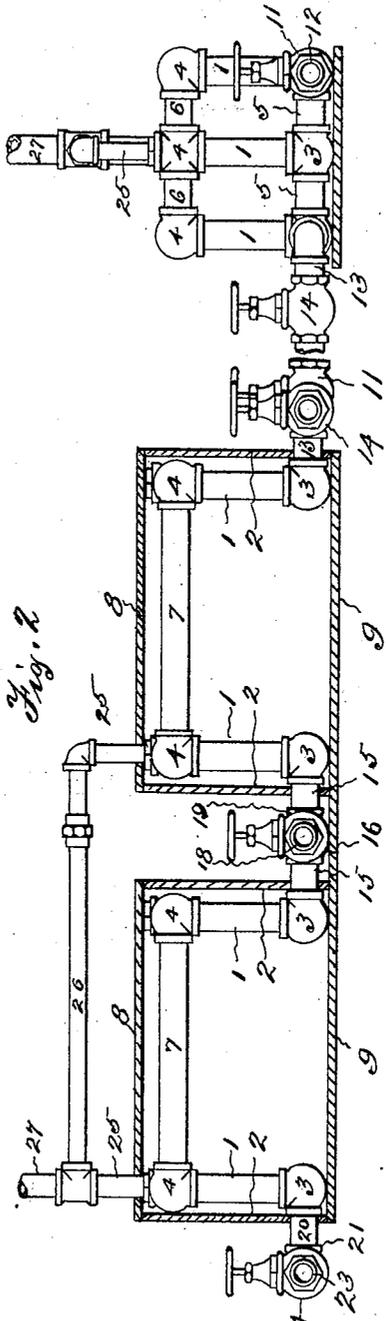


Fig. 3

Fig. 2



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UNITED STATES PATENT OFFICE.

BURDETTE J. WHITE, OF WESTFIELD, MASSACHUSETTS.

FEED-WATER HEATER.

SPECIFICATION forming part of Letters Patent No. 774,997, dated November 15, 1904.

Application filed June 18, 1904. Serial No. 213,151. (No model.)

To all whom it may concern:

Be it known that I, BURDETTE J. WHITE, a citizen of the United States, residing at Westfield, in the county of Hampden and State of Massachusetts, have invented a new and useful Feed-Water Heater, of which the following is a specification.

This invention relates to an apparatus which is designed to be placed in the mouth of a boiler-furnace for affording protection to the walls of the mouth and at the same time raising the temperature of the feed-water.

The object of the invention is to provide an apparatus which is very simple to construct and easy to adapt to various sizes and shapes of furnace-mouths, which effectually reduces the temperature at the mouth of the furnace and efficiently raises the temperature of the feed-water, and which can be applied without making any openings or holes through the base-plate, so that it will not become cracked or leaky as a result of expansion and contraction and can be quickly cleaned to insure a free circulation of water.

The embodiment of the invention that is illustrated is designed for a double-mouth furnace and has pipes adapted to stand vertically inside of each fire-door adjacent to each of the cheek-plates, pipes adapted to extend horizontally between the upper ends of the vertical pipes below the arch-plates, and pipes adapted to extend horizontally from the lower ends of the vertical pipes through the lower parts of the cheek-plates into clean-out pipes that extend to the front of the boiler.

Figure 1 of the accompanying drawings shows a plan of an apparatus that is designed to protect a double-mouth furnace and to heat the feed-water for the boiler of such a furnace. Fig. 2 shows a front elevation of the same, and Fig. 3 shows a side elevation.

The apparatus shown has three pipes 1, arranged vertically one behind the other adjacent to the cheek-plates 2 on each side of each mouth into the furnace. Each vertical pipe has a fitting 3 at the bottom and a fitting 4 at the top.

The lower fittings of each set of vertical pipes are coupled together from front to back by pipes 5, and the upper fittings of each set are coupled together from front to back

by pipes 6, so that each vertical pipe at bottom and top is in communication with the adjacent vertical pipe. The top fitting of each vertical pipe is also connected with the top fitting of the corresponding pipe on the opposite side of the mouth by a horizontal pipe 7. The top horizontal pipes extend across the upper part of the mouths just below the arch-plates 8. The vertical and horizontal pipes form practically three square arches, one back of the other in each mouth. The lower fitting of each vertical pipe rests upon the base-plate 9.

Connected with the lower fitting of the back vertical pipe on one side of one arch is an inlet-pipe 10, that is provided with a cock 11, which is adapted to be connected with a pipe 12 with the reservoir containing the feed-water that is to be heated and that is to keep down the temperature of the mouth of the furnace. The pipe 12 may lead from any source of water-supply, as a hot-well or pump, or it may lead from the lower part of the boiler.

Connected with the lower fitting of the front vertical pipe on one side of one mouth is a pipe 13, that extends toward the front and is provided with a cock 14, which when open permits all mud and sediment which has collected at the lower ends of the vertical pipes on that side of the mouth to be blown out in front of the boiler.

Each of the lower fittings of the vertical pipes at the middle are connected by pipes with fittings 16, that are connected by pipes 17. The outer one of these fittings is connected with a pipe 18, that has a cock 19, which when open permits the sediment collected at the bottom of the inner vertical pipes and in these cross-pipes to be blown out in front of the boiler.

Each of the lower fittings on the outside of one of the arches is connected by a pipe 20 with a fitting 21. These fittings are connected by pipes 22. From the front fitting extends a pipe 23, which is provided with a cock 24, that when open permits the sediment collected at the bottom of the vertical pipes on this side and in these horizontal pipes to be blown out in front of the boiler.

Extending upwardly from a middle top fit-

ting of each arch is a pipe 25. These pipes are connected by a pipe 26, and leading from them is a pipe 27, which is intended to extend to the boiler above the water-line.

5 All of the fittings used in the construction of this apparatus may be made of the same material as the pipes, so that the expansion and contraction will be equal, and all of the fittings and the pipes may be made of malle-
10 able iron, so that there will be no tendency to crack under variations of temperature. These parts can be readily procured and can be easily assembled originally or can be readily replaced if one part is damaged or deteri-
15 orates in use.

The apparatus can be conveniently adapted to the mouths of furnaces of various sizes and shapes. It is readily located in place and thoroughly protects the mouths and efficiently
20 raises the temperature of the feed-water. In placing this apparatus in position it is not necessary to make openings through the base-plate, and the only openings required through
25 the crown-plates are the two for the passage of the return-pipes that lead to the boiler. The pipes can be kept free from sediment and rust by simply opening the valves which are at the front and allowing the sediment to blow
30 out with the water from the bottoms of the vertical pipes and the clean-out pipes.

The invention claimed is—

1. A feed-water heater and furnace-mouth protector having vertical pipes adjacent to the

cheek-plates, horizontal pipes extending for-
wardly and backwardly and connecting the
upper and lower ends of the vertical pipes on
the same sides, horizontal pipes extending
below the arch-plate and connecting the upper
ends of the vertical pipes on opposite sides,
pipes extending horizontally from the lower
ends of the vertical pipes outwardly through
the lower portions of the cheek-plates, and
clean-out pipes extending forwardly from
these latter pipes higher than the base-plate
and in front of the boiler being provided with
45 blow-out cocks, substantially as specified.

2. A feed-water heater and furnace-mouth protector having vertical pipes adjacent to the
cheek-plates, fittings at the top and bottom
of the vertical pipes, couplings extending for-
wardly and backwardly and connecting the
50 fittings at the top and bottom of the pipes on the same side, pipes connecting the fittings
at the top on opposite sides, forwardly-ex-
tending clean-out pipes higher than the base-
55 plate, pipes extending horizontally from the fittings at the lower ends of the vertical pipes
and entering the clean-out pipes, a pipe con-
nected with a lower fitting on one side for the
inflow of water, and a pipe connected with an
60 upper fitting at the other side for the outflow of water, substantially as specified.

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