(No Model.)

B. H. DEAR.

STEAM BOILER FURNACE.

No. 492,148. Patented Feb. 21, 1893.

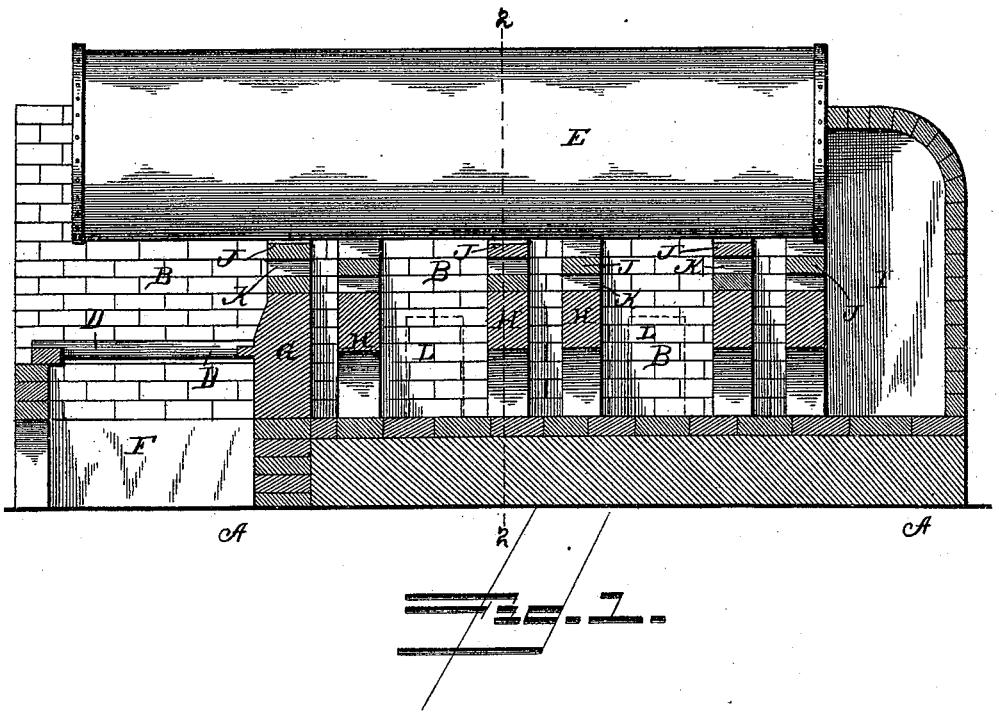

FIG. 1.

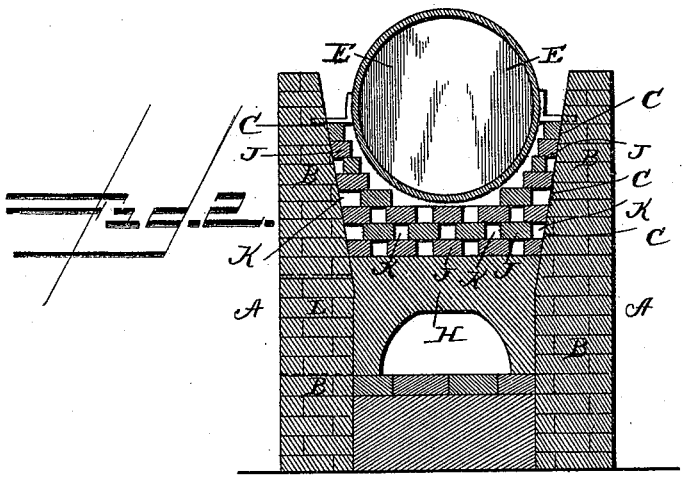

FIG. 2.

Witnesses
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By his Attorneys,
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UNITED STATES PATENT OFFICE.

BARTON H. DEAR, OF PUEBLO, COLORADO.

STEAM-BOILER FURNACE.

SPECIFICATION forming part of Letters Patent No. 492,148, dated February 21, 1893.

Application filed July 13, 1892. Serial No. 439,906. (No model.)

To all whom it may concern:

Be it known that I, BARTON H. DEAR, a citizen of the United States, residing at Pueblo, in the county of Pueblo and State of Colorado, have invented a new and useful Steam-Boiler Furnace, of which the following is a specification.

This invention relates to steam boiler furnaces; and it has for its object to provide an improved furnace which is especially adapted for the setting of the boiler therein, while at the same time providing flue devices tending to produce a thorough and complete combustion, and thereby a saving, of fuel.

Principally to this end the invention primarily aims to secure an improved construction of steam boiler furnaces.

With these and many other objects in view which will readily appear as the nature of the invention is better understood the same consists in the novel construction combination and arrangement of parts hereinafter more fully described, illustrated and claimed.

In the accompanying drawings;—Figure 1 is a vertical longitudinal sectional view of a steam boiler furnace constructed in accordance with this invention. Fig. 2 is a vertical transverse sectional view of the same, on the line 2—2 of Fig. 1.

Referring to the accompanying drawings;—A represents a steam boiler furnace having the opposite side walls B, which side walls are flared upon their inner sides as at C from the grate D, arranged within the front end of the furnace, to the fire line thereof, in order to leave a widened heat circulating space between the sides of the boiler E and the furnace wall throughout the entire length of the furnace, in order to secure a greater heating area therefor. The grate D is arranged over the usual ash pit F and the inner end thereof abuts against the usual bridge wall G. Mounted upon the bridge wall G near the front of the furnace, and upon the bottom supporting arches H, from said bridge wall to the rear smoke box I of the furnace, is a series of regularly spaced combined flue and supporting walls J. The said walls J are arranged in separated pairs from said bridge wall to the smoke box, or may be stated as to be a plurality of walls or supports arranged at intervals apart and each consisting of two independent walls spaced apart from each other so as to leave heat spaces therebetween. The bricks comprising the several walls of the series of each pair are set up or laid all the same way so as to leave a multiplicity of flues or openings K, the flues or openings of one wall being out of line with the flues or openings of the adjacent wall, so that the heat, smoke and other products of combustion may have a circuitous or zigzag course throughout the furnace until it passes into the flues of the boiler. By this arrangement the bricks of the several walls become intensely hot and therefore keeps up the temperature of the furnace when the same is being replenished with fuel, and also provides for the complete combustion thereof. The several flue or cross walls J, during the operation of the furnace, become intensely heated and not only radiate heat themselves, but assist in the combustion of the gases in their passage through the furnace. The space left between the flue walls and the boiler permits the same draft at the boiler as elsewhere, and together with the highly heated bricks break up and ignite the gases, and with the flaring walls, allow a perfect circulation of the water in the boiler its entire length. This prevents unequal settling of sediment in the boiler, as must necessarily be the case if the walls contacted with the boiler. The construction described also allows for a complete expansion of the boiler while at the same time the widened heat circulating space remains.

Suitably arranged cleaning doors L are formed in the sides or end of the furnace in order to clean out ashes and other foreign matter that may have accumulated between the several walls and their supporting arches, which cannot be conveniently effected in other furnaces without tearing down a part of the wall. The upper portions of the walls J are curved as illustrated in the drawings to correspond to the curvature of the boiler, but do not contact therewith so as to leave an additional flue space for the heat and other products of combustion to circulate through.

By reason of flaring the inner sides of the furnace walls from the grate line up to the upper ends thereof, the ordinary construction and size of furnace can be employed with

that size of boiler usually employed with such size of furnace, that is of a diameter agreeing with the width of the fire box so that the entire volume of products of combustion may be directed against a similar area of boiler surface. It will be quite obvious that to secure the same result, to wit, leaving a widened heat circulating space at opposite sides of the boiler extending from the bottom thereof above the longitudinal center, either the side walls of the furnace have to be set away from the sides of the boiler, making a wider furnace or a smaller size of boiler selected with a reduced amount of heating surface so that its diameter will be less than the space between the side walls of the furnace. This is avoided by flaring the inner sides of the walls, and such flaring also serves to direct the heat into the circulating space formed thereby.

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

The combination of a steam boiler furnace having its opposite inner vertical sides flared from the grate line to a point opposite the sides and above the center of the boiler therebetween, to form enlarged or widened side spaces for the side circulation of heat the entire length of the boiler, a series of supporting arches resting on the bottom of the furnace, and a series of flue walls arranged in separated pairs on said arches from the bridge wall to the rear end of the boiler so as to leave heat spaces therebetween, each of said flue walls comprising courses of brick disposed in the same direction and filling the space between their supports and the boiler and the widened heat circulating spaces at opposite sides of the boiler, said bricks being out of contact with the boiler to allow a draft space thereunder and so arranged as to form flue openings or perforations in each wall, the flue openings or perforations of one wall being out of line with the perforations of the wall immediately adjacent thereto, substantially as set forth.

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

BARTON H. DEAR.

Witnesses:
D. R. GREENE,
R. W. GRIGGS.