

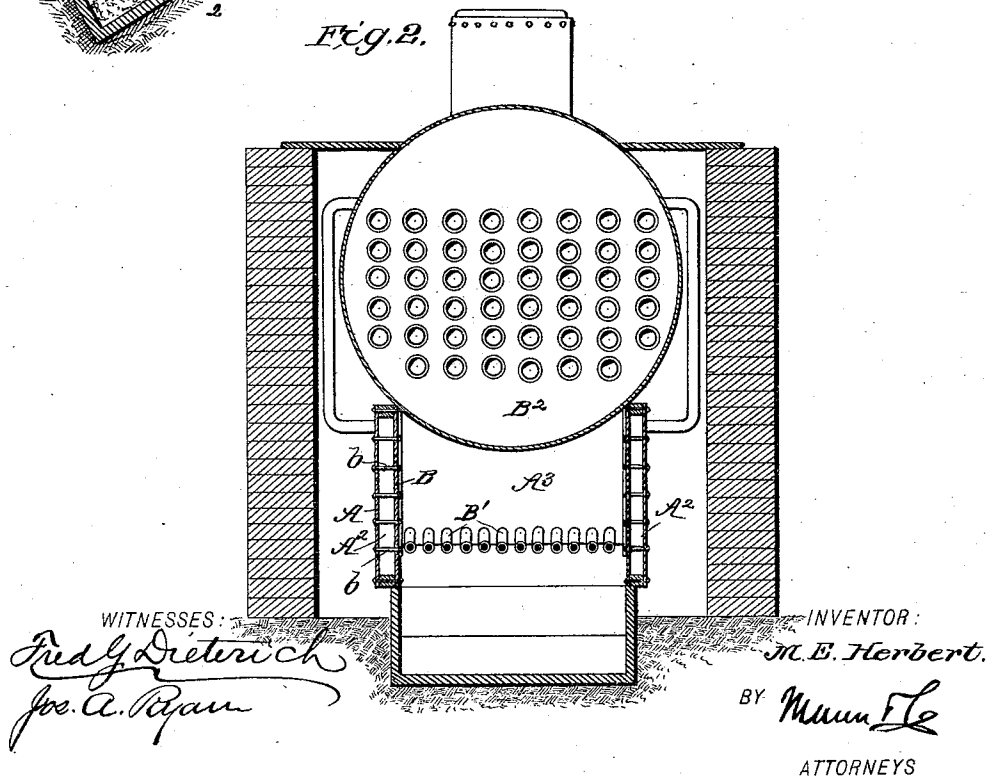
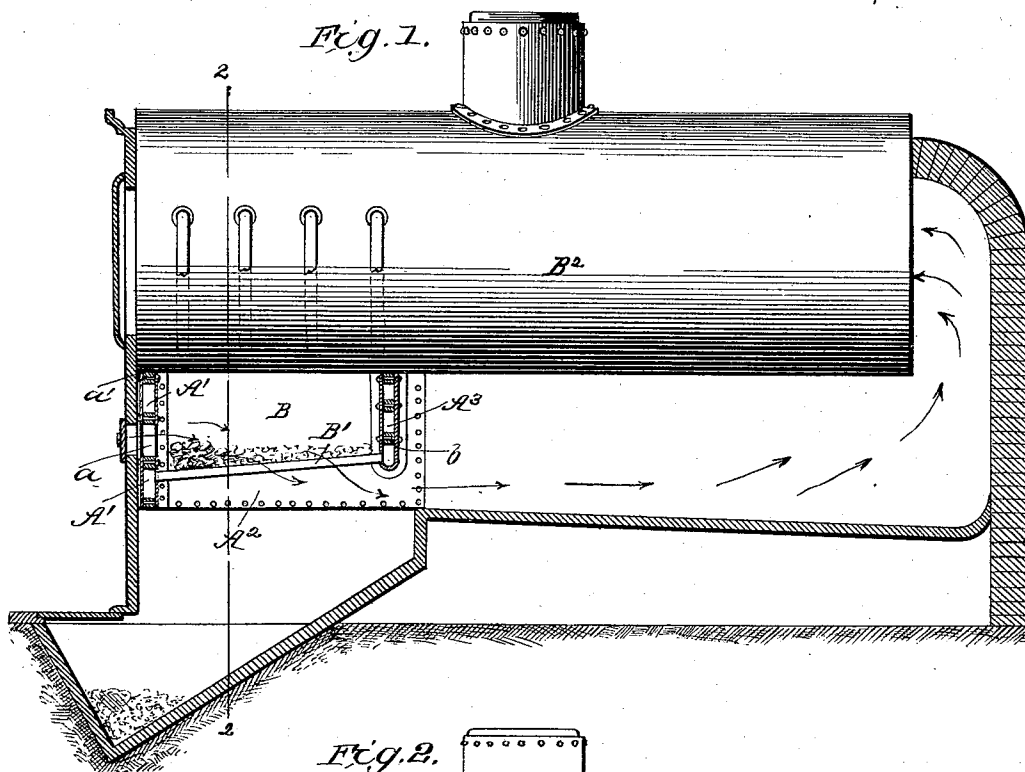
(No Model.)

2 Sheets—Sheet 1.

M. E. HERBERT.
STEAM BOILER FURNACE.

No. 484,153.

Patented Oct. 11, 1892.



WITNESSES:

Fred. Dietrich
Jos. A. Ryan

INVENTOR:

M. E. Herbert.

BY *Munn & Co.*

ATTORNEYS

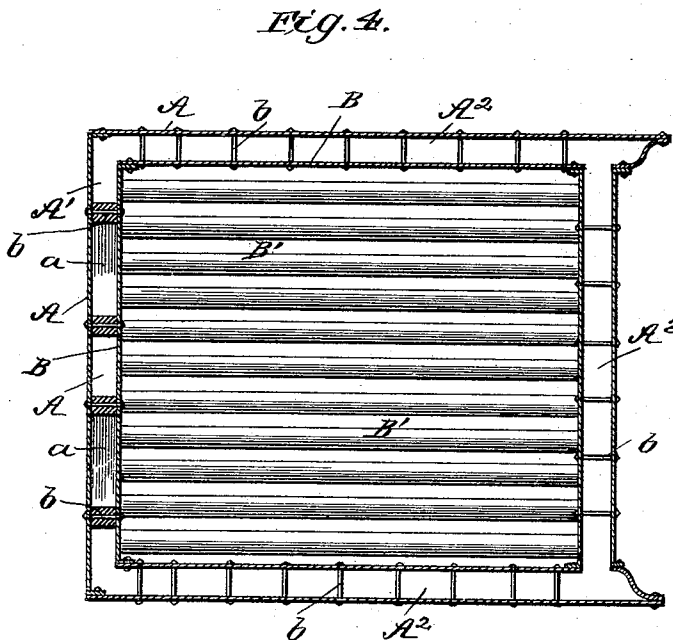
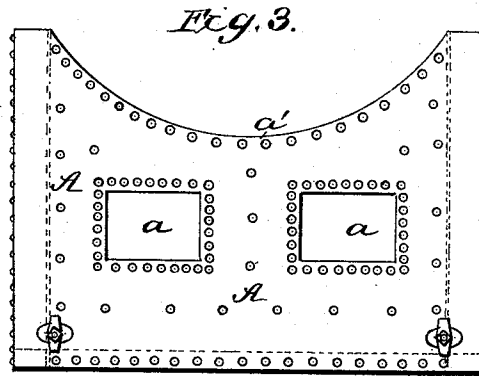
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UNITED STATES PATENT OFFICE.

MICHEAL E. HERBERT, OF ST. JOSEPH, MISSOURI.

STEAM-BOILER FURNACE.

SPECIFICATION forming part of Letters Patent No. 484,153, dated October 11, 1892.

Application filed August 20, 1891. Serial No. 403,248. (No model.)

To all whom it may concern:

Be it known that I, MICHEAL E. HERBERT, of St. Joseph, in the county of Buchanan and State of Missouri, have invented a certain new and useful Improvement in Steam-Boiler Furnaces, of which the following is a specification.

This invention relates generally to steam-boiler furnaces, and more particularly to certain improvements on Patents Nos. 421,863 and 454,350, granted to me February 8, 1890, and June 16, 1891, respectively.

The object of my present invention is to provide a novel form of fire-box which can be arranged in connection with an ordinary horizontal boiler without any alterations being made to the fire-box or boiler, and it is also intended to provide a fire-box that shall dispense entirely with fire-brick, thereby saving the original cost of the brick and the continual expense of renewal; and a still further object of my invention is to construct the fire-box in such a manner as to abate the smoke nuisance without the use of complicated devices, and also to increase the steaming capacity of the ordinary boiler.

With these various objects in view my invention consists of a fire-box composed of four water-legs, essentially independent of the boiler, the end legs being concaved at their upper sides, adapted to receive and support the boiler, and the tubular grate-bars connecting the said end legs.

My invention consists, further, in certain details of construction and combination of parts, all of which will be described hereinafter, and pointed out in the claims.

In the drawings forming a part of this specification, Figure I is a vertical longitudinal section of the fire-box, the boiler being shown in elevation. Fig. II is a transverse section on line 2 2 of Fig. I. Fig. III is a front view of the fire-box, and Fig. IV is a horizontal section of the same.

In constructing my improved fire-box I employ the outer shells A and the inner shells B, said shells being properly spaced and braced by stay-bolts *b* and producing the front water-leg A' and the side water-legs A², all of which are closed at the top and essentially independent of the boiler, the only connection between said boiler and box being by means

of ordinary circulation-tubes, as hereinafter described.

The front water-leg A' is provided with one or more openings *a*, through which fuel is introduced into the fire-box, and the upper side of said front leg is concaved, as shown at *a'*, the purpose of which will appear farther on. The rear portions of the side legs are connected with each other by means of a depending water-leg A³, the upper side of which is concaved similar to the front water-leg A', and said front leg and depending water-leg are connected with each other by means of a series of hollow tubes or grate-bars B', whereby a continuous circulation of water through all the water-legs is established. The depending water-leg does not extend to the bottom of the side legs, thereby allowing the heated products to escape beneath the ordinary boiler B², which is supported at its forward end upon the concaved sides of the front and depending legs, said boiler being connected with the fire-box by means of ordinary circulating-tubes.

In operation, the boiler being supported as shown, fuel is fed through the feed-openings upon the tubular grate-bars. The draft then carries the heated products downward between said tubular bars and backward beneath the depending water-leg, as indicated by the arrows. The draft then passes downward beneath the ordinary boiler to its rear end and then forward through the flues to the open air in the usual manner. The grate-bars being tubular and communicating with the front and depending legs permit a continual circulation of water through said bars, thereby preventing the bars being burned out, while providing a means for rapidly heating the water in the fire-box.

The fire-box being composed of four water-legs provides a large heating-surface and entirely dispenses with the necessity of using fire-brick.

The draft of air passes through the feed-opening downward through the fresh fuel first, then through fuel next the doors, which has already been coked, thus carrying the smoke and gases from the fresh fuel through the coked fuel, thereby causing the consumption of the said smoke and gases.

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

1. The combination, with the side legs, of the front and rear legs connected with the side legs, all of which are closed at the top, the upper sides of the front and rear legs being concaved and adapted to form a rest for the boiler, the rear leg being shorter than the front leg, whereby a downdraft may be secured, substantially as and for the purpose described.

2. The combination, with the side legs, of the front and rear legs, all of which are closed at the top, the rear legs being shorter than the front and side legs, and the tubular grate-bars connecting the lower portion of the front leg with the lower end of the rear leg, whereby a downdraft through the fire-box is produced, substantially as shown and described.

3. The combination, with the side legs, of the front and depending legs connecting the side legs, all of said legs being closed at the top, the front and end legs having concaved upper sides, and the tubular grate-bars connecting the front and depending legs, substantially as shown and described.

4. The combination, with a boiler, of a fire-box essentially independent thereof and composed of the side water-legs closed at the top, and the front and depending water-legs also closed at the top and concaved to receive and support the boiler, the tubular grate-bars connecting the front and depending legs, and the circulating-tubes connecting the side legs and boiler, substantially as shown and described.

MICHEAL E. HERBERT.

Witnesses:

G. F. GLASKIN,
CHAS. WILSON.