(No Model.)

M. E. HERBERT.

FIRE BOX FOR STEAM BOILERS.

No. 492,290. Patented Feb. 21, 1893.

Fig. 1.

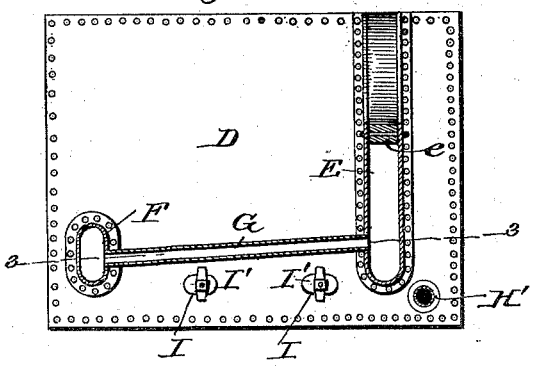


Fig. 2

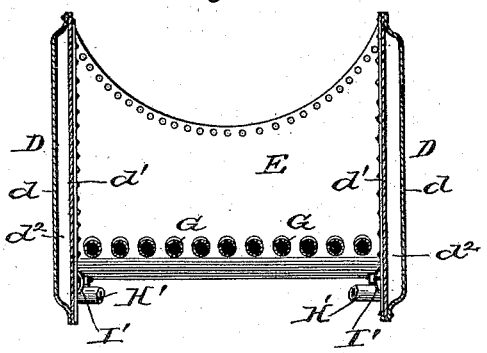


Fig. 3.

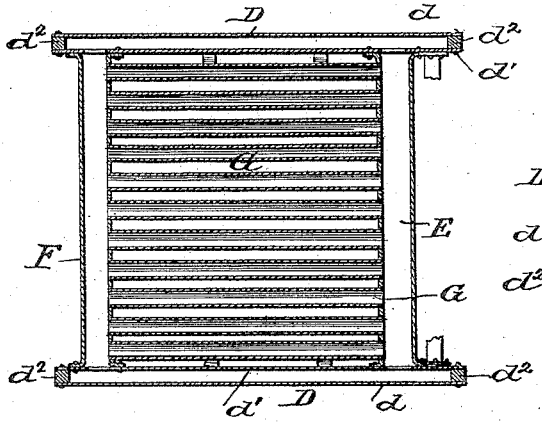


Fig. 4.

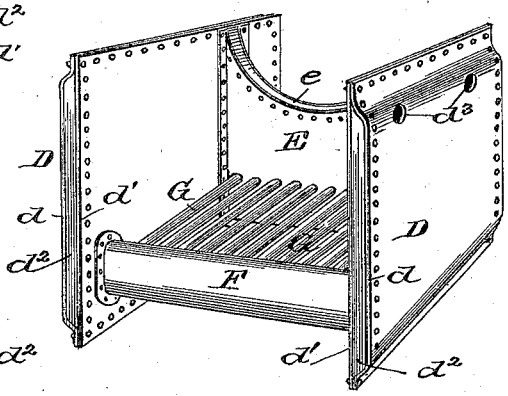
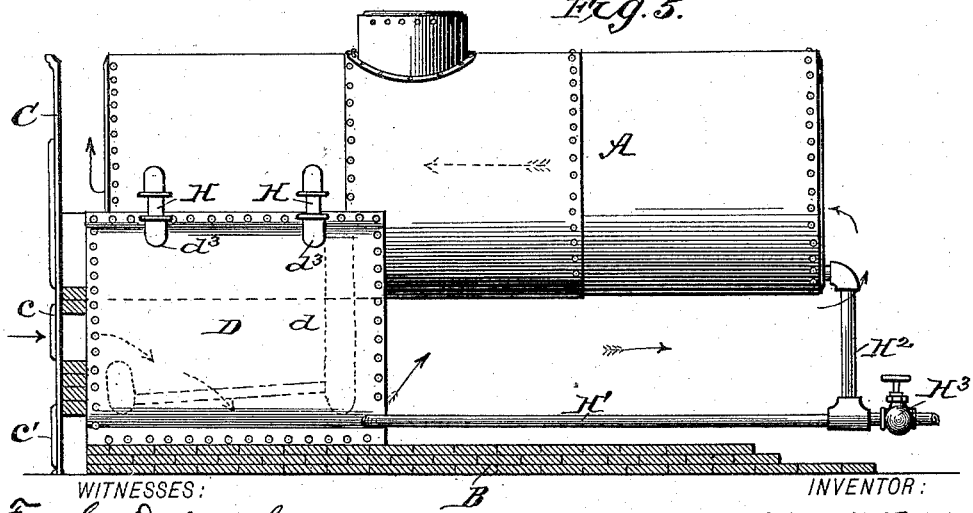


Fig. 5.



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

FIRE-BOX FOR STEAM-BOILERS.

SPECIFICATION forming part of Letters Patent No. 492,290, dated February 21, 1893.

Application filed March 31, 1892. Serial No. 427,288. (No model.)

To all whom it may concern:

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

This invention relates generally to fire boxes for steam boiler furnaces, and particularly to certain improvements upon Patent No. 454,350, granted to me July 16, 1891; and the objects of my present invention are first to provide a fire box that can be attached to an ordinary boiler without removing the boiler, or the brick setting of the same; secondly, to so construct and proportion the various parts of said fire box that it may be used in connection with various sized boilers or fronts, without changing the boiler or front; thirdly, to provide a fire box of this description that shall increase the steaming capacity of an ordinary boiler and also economize in fuel, fourthly, to provide means for removing the sediment from the box; fifthly, to construct and arrange the parts to produce a down draft through the fuel; and finally, to provide a fire box embodying all these features which can be quickly and easily removed from the furnace for repairs &c., and another one substituted in its place.

With these various objects in view, my invention consists in the peculiar construction of the different parts and the novel manner of combining or arranging the same whereby the objects are accomplished as will be fully set forth in the description and designated in the claims.

In the drawings forming a part of this specification Figure 1 is a vertical longitudinal section of my improved fire box. Fig. 2 is a vertical, transverse section of the same. Fig. 3 is a section taken on the plane of the line 3—3 of Fig. 1. Fig. 4 is a perspective view of my complete fire box ready for attachment to an ordinary boiler, and Fig. 5 is a side elevation of my fire box arranged in connection with an ordinary horizontal tubular boiler.

To avoid confusion, the usual stay bolts have been omitted from the drawings and no reference will be made to them in the description.

Referring to the drawings, A indicates a horizontal tubular boiler, B the brick setting, and C the cast front provided with the feed door *c* and ash pit door *c'*, and it will be understood that all of these parts may be of the ordinary or any approved pattern.

Beneath the forward end of the boiler and entirely independent of the same is arranged my improved fire box, said box serving also as a support for the end of the boiler as will appear farther on, and consists of the side water legs D D, the supporting water leg E which connects the rear ends of the side legs and supports the end of the boiler the water drum F, which connects the forward ends of the side legs near their bottoms and is in turn connected with the lower end of the supporting leg by means of the tubular grate bars G G. The side legs are composed of the outer shells *d*, and the inner shells *d'*, said shells being properly spaced by means of the end bars d^2, and the ends, tops and bottoms of said legs are securely closed by riveting as clearly shown in Figs. 2 and 4. Apertures d^3 are formed in the outer shells *d* near the tops of the same for a purpose disclosed farther on.

The supporting water leg E connects the rear portion of the side water legs and thus affords a water passage from one side to the other. This leg E is also intended to support the end of the boiler A and for this purpose its sides are curved out at the top and securely riveted to a concavo-convex plate or bar *e*, thus providing a semi-circular seat for the reception and support of the boiler. This supporting leg E like the side water legs is entirely independent of the boiler but communicates with the said side legs.

The water drum F is essentially cylindrical in shape and connects the forward ends of the side legs near their bottoms and in practice is arranged between the feed and ash pit doors so as not to interfere with either of them. This drum F is also independent of the boiler, and is connected with the lower portion of the supporting water leg by the tubular grate bars G G, upon which the fuel is fed through the feed door *c*, and as the supporting leg E extends nearly to the bottom of the sides, a down draft is thereby produced, which carries the gases and smoke

down through the coked fuel and there consumes the same, thus avoiding in a great measure the nuisance of smoke and gases, while the heat from the combustion passes downward under the supporting leg upward and backward under the boiler and then forward through the flues or tubes into the air in the usual manner.

Pipes H H are employed to connect the boiler and side water legs; said pipes being secured in the apertures d^3 heretofore referred to. Pipes H′ H′ are connected to the lower rear ends of the side legs, said pipes connecting with a blow off pipe H^2 which is also connected with the rear end of boiler and provided with a blow off cock H^3 through which sediment may be drawn off from the fire box, but in order to provide for the removal of scales and sediment which might collect in the bottom of the legs, I produce hand holes I I in the inner shells, and close the same by means of the ordinary hand hole plate I′ I′.

In applying my invention to an ordinary boiler which may be in use and inclosed in a brick setting it is only necessary to remove the cast front carrying with it the doors, and then place my invention beneath the ordinary boiler as seen in Fig. 5, and make the pipe connections H, H′ and H^2, thus connecting the boiler with my improved fire box, and then by replacing the cast front and suitable door liners the attachment is complete and ready for use. The drum should always rest between the doors *c* and *c′* and as these doors vary, I elevate or lower the drum to conform therewith, thus accommodating my box to various shaped fronts.

From the above it will be seen that I provide a simple and efficient form of fire box which is independent of, and supports the boiler, one that can be quickly and easily placed beneath any boiler and one that can be made to conform to the setting and front without departing from the spirit of the invention.

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

1. As an improved article of manufacture, a fire box composed of side water legs closed at their top, bottom and ends, a supporting water leg connecting the rear ends of the side water leg said supporting legs being closed at the top and bottom and concaved at the top, the water drum connecting the forward ends of the side water legs near the bottom of the same, and the tubular grate bars connecting the drum and supporting leg, said fire box being adapted to dispense with the fire brick lining and support the forward end of boiler substantially as shown and described.

2. The combination with the boiler of a front having the feed and ash pit doors, and a fire box independent of the boiler and front and composed of the side legs, the supporting water leg connecting the rear ends of side legs and the water drum connecting the forward ends of the side legs, said drum being arranged between the feed and ash pit doors, substantially as shown and described.

3. The combination with a boiler of a front having the feed and ash pit doors and a fire box independent of the boiler and front composed of the side water legs, the supporting water leg connecting the rear ends of the side legs, the water drum connecting the forward ends of the side legs, said drum being arranged between the doors, and the tubular grate bars connecting the drum and boiler end of the supporting leg, substantially as shown and described.

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