(Model.) 2 Sheets—Sheet 1.

F. F. LANDIS.

Fire Box for Boilers.

No. 242,334. **Patented May 31, 1881.**

Fig. 1.

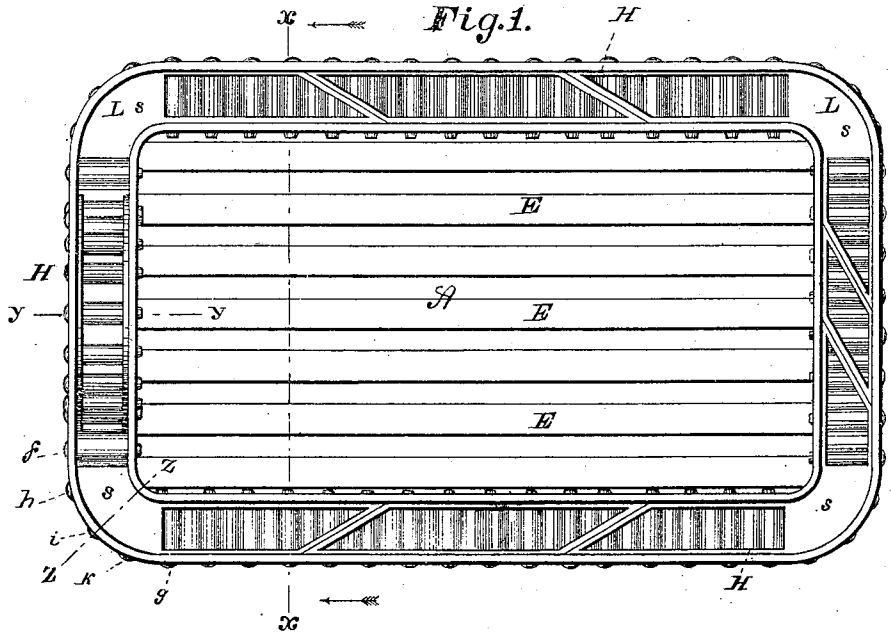
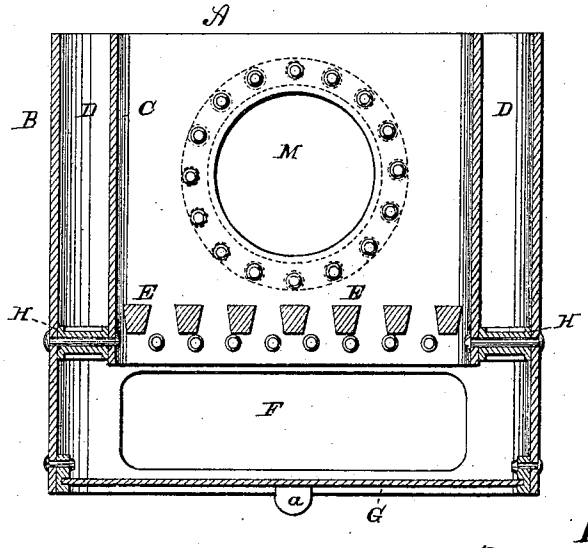


Fig. 2.



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(Model.)

2 Sheets—Sheet 2.

F. F. LANDIS.

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Fig. 3.

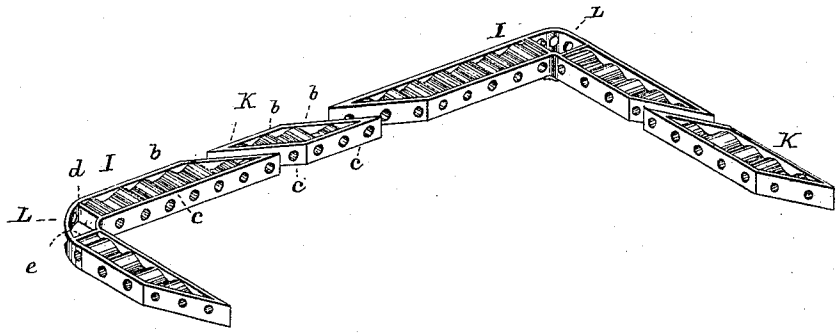


Fig. 4.

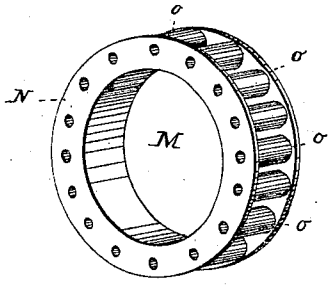


Fig. 5.

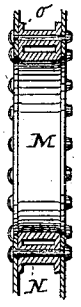
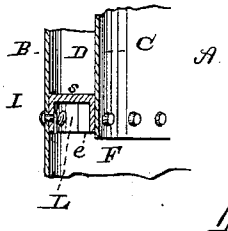


Fig. 6.



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UNITED STATES PATENT OFFICE.

FRANK F. LANDIS, OF WAYNESBOROUGH, PENNSYLVANIA.

FIRE-BOX FOR BOILERS.

SPECIFICATION forming part of Letters Patent No. 242,334, dated May 31, 1881.

Application filed November 26, 1880. (Model.)

To all whom it may concern:

Be it known that I, FRANK F. LANDIS, a citizen of the United States, residing at Waynesborough, in the county of Franklin and State of Pennsylvania, have invented certain new and useful Improvements in Fire-Boxes for Steam-Generators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification, and in which—

Figure 1 is a top view of a horizontal cross-section of a fire-box, taken just above the furnace-door. Fig. 2 is a vertical cross-section taken on the line *x x* of Fig. 1. Fig. 3 is a perspective view of the "mud-ring," showing the bottom. Fig. 4 is a perspective view of the ring for the furnace-door. Fig. 5 is a vertical section down through the furnace-door ring, taken on the line *y y* of Fig. 1. Fig. 6 is a vertical section through the corner, taken on the line *z z* of Fig. 1, showing the corner in section.

My invention has reference to the construction of fire-boxes for traction, portable, and locomotive steam-engines and other steam-generators, the object being to increase the strength at the corners and around the mouth of furnace when the parts are united, to cheapen construction and produce uniformity of size; and it consists in a mud-ring made in sections and of peculiar construction, as will be hereinafter more fully set forth and claimed.

A represents the fire-box, B C the outer and inner walls of the water-leg D surrounding the fire-box, and E the grate-bars.

F represents the ash-pit, provided with a sliding bottom, G, which moves in grooves on the sides of the pit, and has a stout lug, *a*, on the bottom, used in drawing out the bottom for the purpose of dropping the ashes.

The plates of the outer wall, B, extend to the bottom of the ash-pit, and the plates of the inner wall, C, to a suitable distance below the grate-bars.

At the bottom of the water-leg D is placed a mud-ring, H, which is secured in its place by rivets passing from the inside of the wall C through the mud-ring and the wall B, where they are riveted hot. This mud-ring is constructed in sections, as shown in Figs. 1 and 3 of the drawings. The corner-section I consists of parts of two sides united by a rounded box, L, all in one piece of metal, and the middle sections, H, of a straight piece of any desired length necessary to make the size of fire-box necessary for the required amount of grate-surface. In constructing these sections the use of cast-steel or malleable iron is preferred, and the sections have an outer flange or calking edge, *b*, and an inner flange or calking edge, *c*, both flanges extending below the body of the mud-ring, so as to permit of calking on the under side by means of an iron and hammer. Both of these flanges are extended above the body of the ring to get the requisite strength with the minimum weight of metal, and the requisite thinness of material to permit of the proper annealing of cast-steel or malleable iron.

The flanges *b* and *c* are extended along the edges of the adjoining surfaces of the section-joints to give the necessary strength and to permit of the joint being tightly calked.

The body of the mud-ring presents a corrugated surface on the top and bottom, occasioned by an increase of metal, for the reception of the rivets connected by flanges.

In casting the sections they are cored for the rivet-holes, and if smoothly cast, properly annealed, and well calked, they may be used without being dressed.

The joint between the sections should be made to extend obliquely across the mud-ring, so as to cross at least three rivets and be clamped by them between the plates of the walls B and C. This insures ample strength.

The box L, which forms the corner, is composed of an extension of the outer flange, *b*, and the inner flange, *c*, rounded, as shown in Figs. 1 and 3 of the drawings, and vertical flanges *d* and *e*, forming the ends of the box and of the body of the straight part of the sides. The top of the box is closed by a suitable thickness of metal, *s*, extending over the flanges *b*, *c*, *d*, and *e* flush with the outside edges. The corner-plates of the walls B and C are rounded to fit the flanges *b* and *c* of the box exactly, and the rivets *f* and *g* hold the in-

side plate securely in place, the curve of the plate making a strengthening-arch. The rivets *h*, *i*, and *k* pass through the flange *b* from the inside of the box and the outside plate, and are riveted, making a tight corner.

In the construction of this device the plates composing the wall B may extend to the bottom of the ash-pit, and all rivets are riveted hot on the outside of the plates of the wall B, thereby making plain work; and either one of the corner-sections will fit either one of the four corners, or will do for any other fire-box when repairs are needed.

M represents the mouth of the fire-box, which is provided with the ring N, to which the plates of the walls B and C are riveted. This ring has two flanges extending outward, connected at suitable distances apart by hollow braces *o*, cored to receive the rivets necessary to make a steam-tight joint.

The ring and braces are cast in one piece of cast-steel or malleable iron, the braces having a clear space between them and the ring, allowing a free circulation of water around them and affording a solid foundation for riveting upon.

In constructing the smaller sizes of fire-boxes I may cast the entire ring in one piece of metal with corner-boxes, flanges, and corrugated surfaces, omitting the straight sections.

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

1. A mud-ring for a fire-box, composed of sections, constructed substantially as shown and described.

2. A mud-ring for a fire-box, provided with a corner box, substantlally as shown and described.

3. A corner-section for a mud-ring for a fire-box, cast from cast-steel or equivalent material, composed of a box and parts of the sides, substantially as shown and described.

4. A box for a mud-ring, consisting of flanges *b*, *c*, *d*, and *e* and top *s*, substantially as described.

5. A ring for the mouth of a fire-box cast of cast-steel or equivalent material, with flanges and cored braces for receiving rivets, having an open space beneath and surrounding the braces for the circulation of water, substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK F. LANDIS.

Witnesses:

WM. G. HENDERSON,

HERM. LAUTEN.