(No Model.)

J. GRESTY.

STEAM BOILER FURNACE.

No. 432,402. Patented July 15, 1890.

FIG. 3.

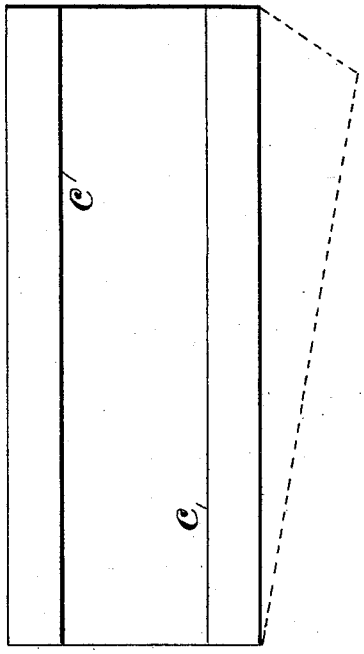


FIG. 5.

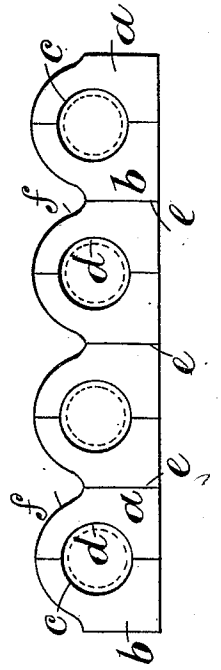


FIG. 1. FIG. 2.

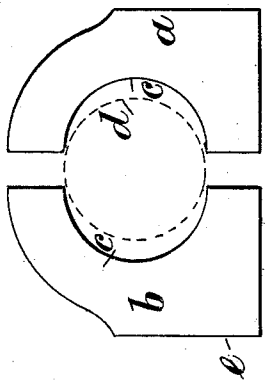
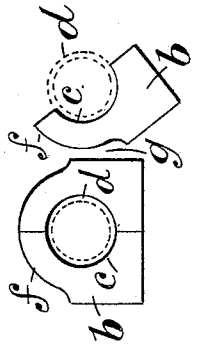


FIG. 4.



Witnesses.
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UNITED STATES PATENT OFFICE.

JONATHAN GRESTY, OF MANCHESTER, COUNTY OF LANCASTER, ENGLAND.

STEAM-BOILER FURNACE.

SPECIFICATION forming part of Letters Patent No. 432,402, dated July 15, 1890.

Application filed March 4, 1890. Serial No. 342,594. (No model.) Patented in England August 7, 1889, No. 12,482.

To all whom it may concern:

Be it known that I, JONATHAN GRESTY, a subject of the Queen of England, residing at Manchester, in the county of Lancaster, England, have invented certain new and useful Improvements in Steam-Boiler Furnaces, (for which I have obtained Letters Patent in England, dated August 7, 1889, No. 12,482;) 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 the letters of reference marked thereon, which form a part of this specification.

The improvements which form the subject of this invention relate to the combustion or flame chambers of water-tube steam-boilers, and consist in the employment of fire-bricks, which are formed so as to be self-fastened and self-sustained when fitted on or between or in connection with the tubes of water-tube steam-boilers, in order to form coverings for the under or upper sides of combustion or flame chamber, particularly in their application to the upper portion of the flame-bridge at the rear end of furnace, and by these means protect the tubes from direct contact with the flame.

In order more clearly to describe this my invention, I have annexed hereunto a sheet of drawings. In the several views therein shown similar letters refer to similar parts.

In this invention I form right and left shaped fire-bricks *a* and *b*, which are, on the inner side *c*, round to fit the tubes *d*, and rectangular on the outside at *e*, in order to form joints with each other.

On the accompanying drawings, Figure 2 is end view of a right, and Fig. 1 end view of a left, shaped fire-brick. Fig. 3 is inner side view of the same with either a parallel or a taper base. Fig. 4 shows method of placing fire-bricks in position, and Fig. 5 shows a range of tubes with fire-bricks adjusted in position.

In the views the internal diameter of the inner rounded portion *c* of the fire-bricks *a* and *b* is made so as to correspond with the external diameter of water-tubes *d*, which form the boiler. I construct the upper external portion *f* of fire-brick of a shape corresponding to the inner side *c* of said fire-brick. The lower external portion I form of a rectangular shape.

Two of the hereinabove-described right and left fire-bricks *a* and *b*, when placed together, form bricks having a rectangular base and sides *e* and a semicircular top *f*, with hole *c* passing longitudinally through the center, said hole being of a diameter corresponding to external diameter of any one of tubes *d* which form boiler. In order to attach these bricks in furnace, I pass the round portion *f* *c* of fire-brick *b* or *a* through one of the openings *g*, entering first above or below fixed position, and when in line of position sliding it down to its required place betwen tubes *d*, and fit another fire-brick *b* or *a* in a reverse position, as shown in Fig. 4, by which means said fire-bricks are effectually secured in position. I repeat the same operation in successive openings *g* between the tubes *d*, and by these means I form the front upper portion of flame-bridge and effectually protect the tubes on their under sides from contact with the flame in combustion or flame chambers.

Having now particularly described and ascertained the nature of this my invention and in what manner the same is to be performed, I declare that what I claim is—

In water-tube steam-boilers, the combination, with the lower range of tubes, of fire-bricks *a* and *b*, constructed with the segmental portion *f*, the rectangular portion *e*, and the semi-cylindrical portion *c*, substantially as and for the purpose specified.

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

JONATHAN GRESTY.

Witnesses:

THOMAS PRESCOTT,

JOHNSON MILLS.