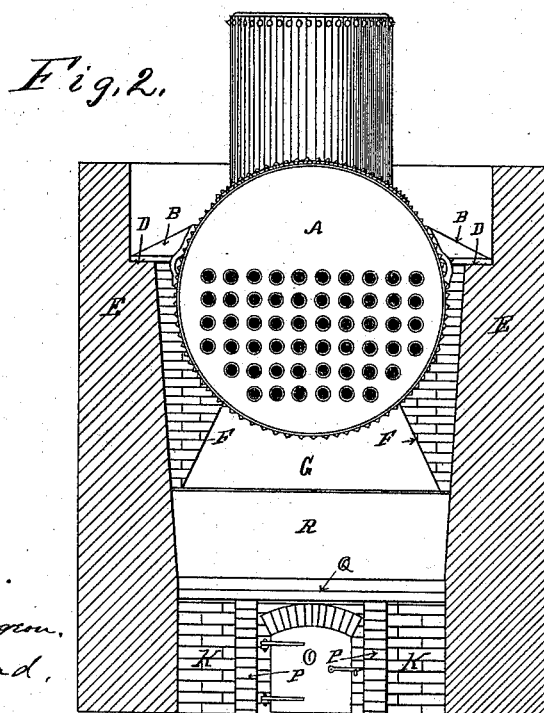
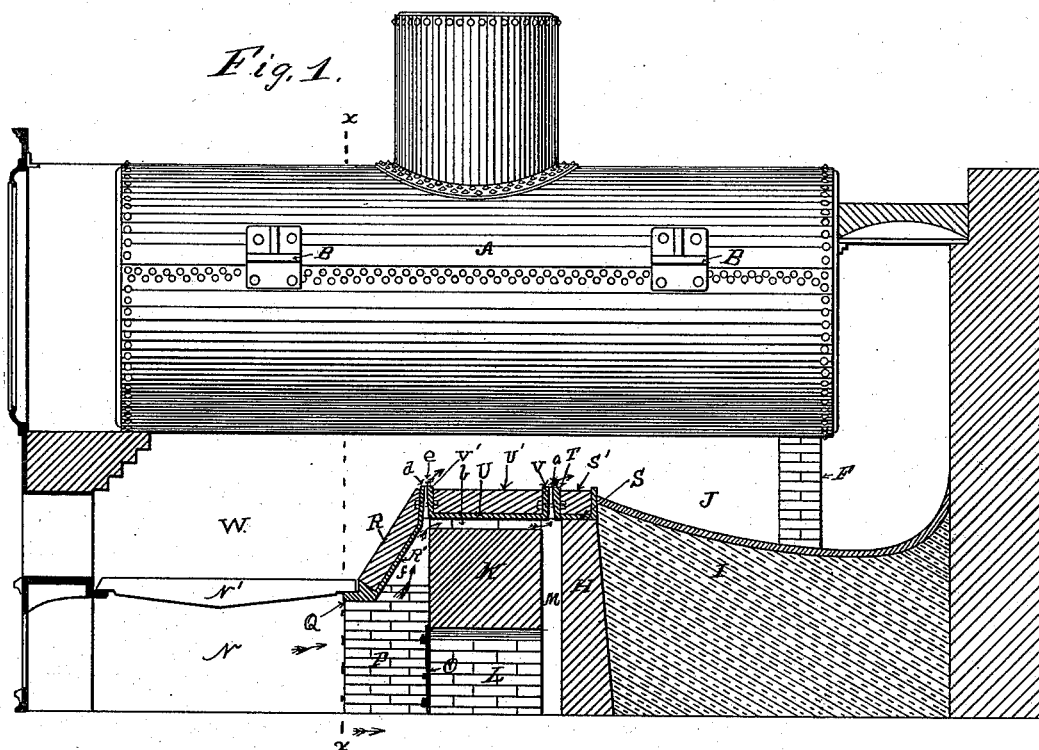


(No Model.)

T. REESE, Jr.  
FURNACE BRIDGE WALL.

No. 382,109.

Patented May 1, 1888.



Witnesses.

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Att'y.

# UNITED STATES PATENT OFFICE.

THOMAS REESE, JR., OF ERIE, PENNSYLVANIA.

## FURNACE BRIDGE-WALL.

SPECIFICATION forming part of Letters Patent No. 382,109, dated May 1, 1888.

Application filed January 31, 1888. Serial No. 262,564. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS REESE, Jr., a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Furnace Bridge-Walls; 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, forming part of this specification.

My invention consists in the improvements in boiler-furnaces and bridge-walls, hereinafter set forth and explained, and illustrated in the accompanying drawings, in which—

Figure 1 shows a vertical longitudinal section of my improvement, the boiler being shown in elevation. Fig. 2 shows a cross-section of same on line *xx* in Fig. 1, the boiler not being in section.

Like letters refer to like parts in all the figures.

The principal objects of my invention are, first, to provide air ducts or passages in or adjacent to the bridge-wall for conducting air from the ash-pit, and heating, conveying, and intermixing it with the unconsumed gases as they pass over the bridge-wall and into the combustion-chamber, so as to facilitate their combustion; second, to construct the rear of the fire-box and the air-passages in and adjacent to the bridge-wall in such shape that the air in passing from the ash-pit to the exit-openings in the bridge-wall will be subject to and will absorb the maximum amount of heat practicable.

The features of my invention will appear hereinafter in the specification and claims.

In the construction of my invention shown the boiler A is supported by means of brackets B B, secured to each side thereof, which rest upon ledges D D on the side walls, E E, of the boiler-setting, so as to leave the lower half, longitudinally of the boiler, exposed to the action of the fire. At the rear end of the boiler, however, wing walls F F extend inwardly, closing the space between the side walls, E E, and the boiler A, so as to force all

the products of combustion through a constricted opening, G, directly beneath the end of the boiler.

The bridge-wall of my boiler-furnace I construct of a rear transverse wall, H, which is adapted to support the filling I, forming the bottom of the combustion-chamber J, and in front of the wall H, and some distance from it, I build another transverse wall, K, of somewhat less height than the wall H, so as to leave a vertical chamber, M, between them, and through the wall K, I construct an arched passage, L, which opens at one end into the vertical passage or chamber M between the walls H and K, and at the other end into the ash-pit N, the end of the passage L next the ash-pit N being, however, provided with a door, O, as and for the purpose hereinafter set forth. On each side of the door O from the transverse wall K, I build longitudinal walls P P, which extend into the ash-pit N far enough to serve as supports for the central portion of the transverse grate-bar support Q and the inclined rear end, R, of the fire-box W.

On the top of the rear portion, H, of the bridge-wall I secure a cap or plate, S, adapted to receive and retain a fire-brick fire surface or lining, S', the front side, T, of this plate or cap S extending over and covering nearly half of the width of the vertical chamber M. Over and at some little distance above the top of the wall K, I secure a cap or plate, U, so as to make a horizontal passage, b, between the bottom of the plate U and the top of the bridge-wall K, the plate U being adapted to support a fire surface or lining, U', and also extends over the chamber M, so that the rear edge, V, thereof nearly meets the front edge, T, of the plate S on the top of the wall H, leaving a narrow transverse slit, a, between them nearly central over the chamber M. The slit a being wider at the bottom than at the top, any dust or ashes entering it will fall freely to the bottom of the vertical chamber M, when they can be removed through the passage L in the wall K and the door O, opening into the ash-pit N.

From the grate-bar support Q to the top of the front edge, V', of the cap or plate U is a plate, R', which stands, preferably, at an inclination of about forty-five degrees and forms

a support for the fire surface or lining of fire-brick, forming the back end, R, of the fire-box W. The upper edge, *d*, of this plate R' is so secured that it does not quite touch the front edge, V', of the plate U, leaving a narrow transverse slit between them, the inclination of the sides *d* and V of the slit *e* being such that it is wider at the bottom than at the top, so that any dirt or ashes entering it will fall freely through the air-passage *f* to the bottom of the rear end of the ash-pit N.

It will be readily seen that the arrangement and location of the plate R' with relation to the front of the wall K, forming the air-passage *f*, and of the plate U, so as to form the horizontal air-passage *b* between the bottom of the plate U and the top of the wall K, is such that all of the air passing out of the opening *a* is subjected to the heat from the plates R' and U, which become very hot from the intense heat of the fire passing from the rear of the fire-box W over the top of the bridge-wall, and the air passing out of the opening *e* is subjected to the heat from the plate R', so that the air issuing from the openings *e* and *a* becomes highly heated in its passage from the ash-pit N thereto.

Another feature of my improvement is that the air-exit openings *e* and *a* are located at quite a distance apart, one of them, *e*, being substantially at the extreme front edge of the bridge-wall, while the other, *a*, is near the rear edge of the bridge-wall, so that the first current of air is supplied to the unconsumed gases just as they leave the fire-box W, and the second just as they enter the combustion-chamber J, and, as the top of my bridge-wall is considerably wider than the tops of bridge-walls as ordinarily constructed, the air-exit openings *e* and *a* are far enough apart to inject the heated air-currents into the unconsumed gases at the points desirable for producing the best results.

In the description of my invention I have referred to the openings *e* and *a* as transverse slits. The form of these openings may, however, be varied, if desired, as other forms of exit-openings will produce good results.

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

1. The combination, in a boiler-furnace, of

two plates, one an inclined plate, forming the rear of the fire-box, and the other a horizontal plate without openings therein over the top of the bridge-wall, and air-passages between said plates and the front and top of the bridge-wall, with one transverse air-exit opening between the rear edge of the inclined plate and the front edge of the horizontal plate, and another transverse air-exit opening at the rear edge of the horizontal plate, whereby the air in its traverse from the ash-pit through said passages is brought into contact with said plates and discharged into the furnace at two points only, one at the front edge and one at the rear edge of the bridge-wall, substantially as and for the purpose set forth.

2. The combination, in a boiler-furnace, of the plates R' and U, forming the upper walls of air-passages *f* and *b*, and adapted to heat the air during its passage through them, with an air-exit opening, *e*, from said passages between the plates R' and U, at the front of the bridge-wall, and an air-exit opening between the plate U and a plate, S, at the rear of the bridge-wall, substantially as and for the purpose set forth.

3. The combination, in a boiler-furnace, of the bridge-wall K and the rear wall, H, with the rear wall cap-plate, S, the plate U, raised above the bridge-wall K, the air-exit opening *a* between the plates U and S at the rear of the bridge-wall, and the air-exit opening *e* between the plates U and R' at the front of the bridge-wall, substantially as and for the purpose set forth.

4. The combination, in a boiler-furnace, of the wall H, cap-plate S, the bridge-wall K, the plate U, and air-exit opening *a*, with the passages *b* and M, communicating with the opening *a*, the opening L through the bridge-wall K and its door O, the wing walls P P, supporting the rear plate, R', of the fire-box, the air-passage *f*, and the air-exit opening *e* at the front of the bridge-wall, substantially as and for the purpose set forth.

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

THOMAS REESE, JR.

Witnesses:

WM. P. HAYES,  
W. H. RILLING.