No. 747,464. PATENTED DEC. 22, 1903.

O. N. MORIN.

PROTECTIVE APPARATUS FOR BOILER FURNACE FRONTS.

APPLICATION FILED MAR. 5, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 2.

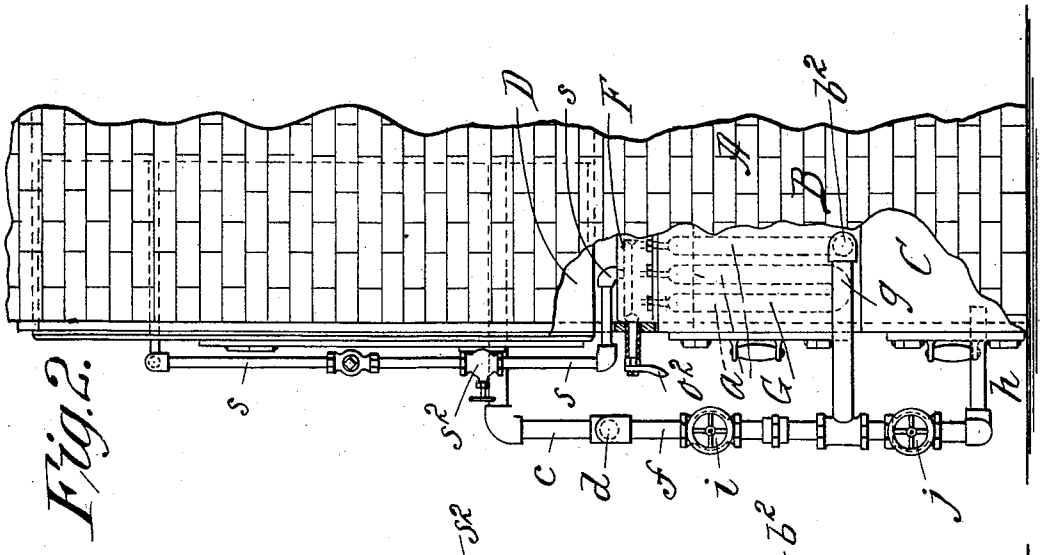
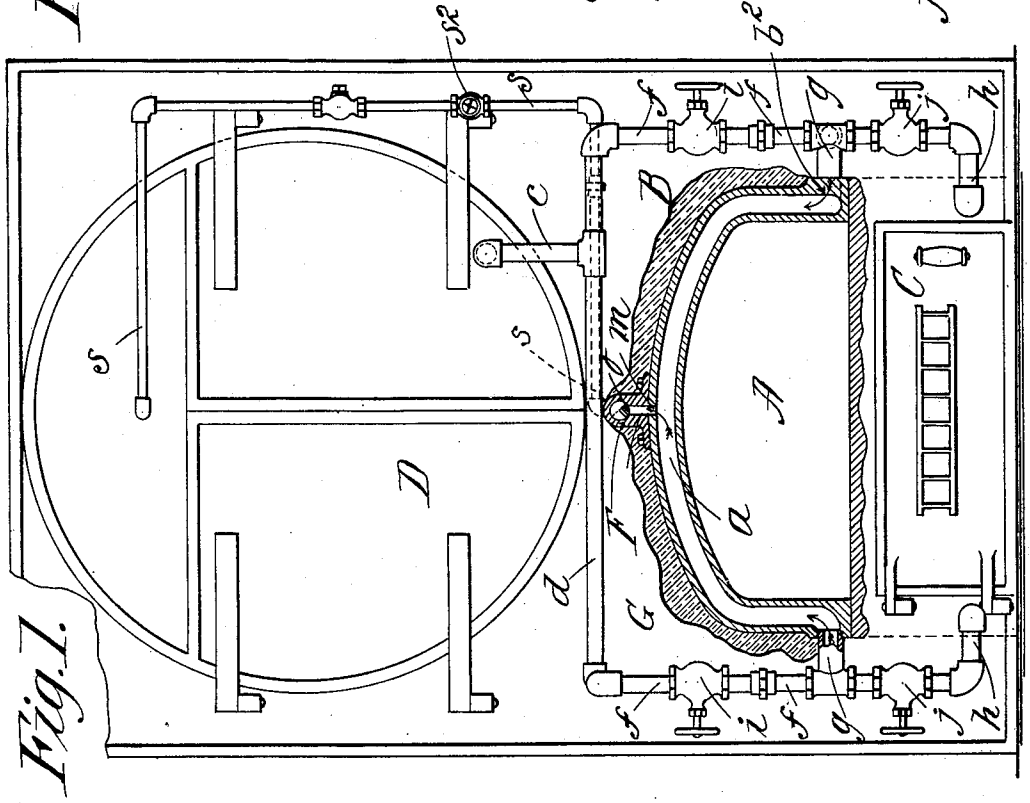


Fig. 1.



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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 3.

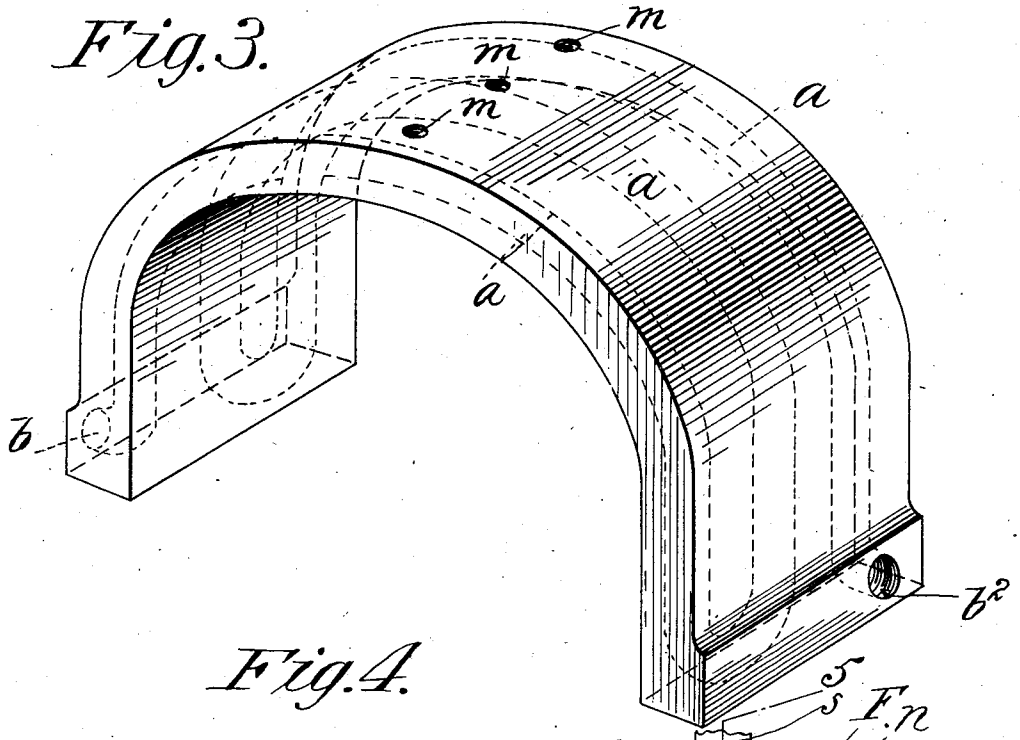


Fig. 4.

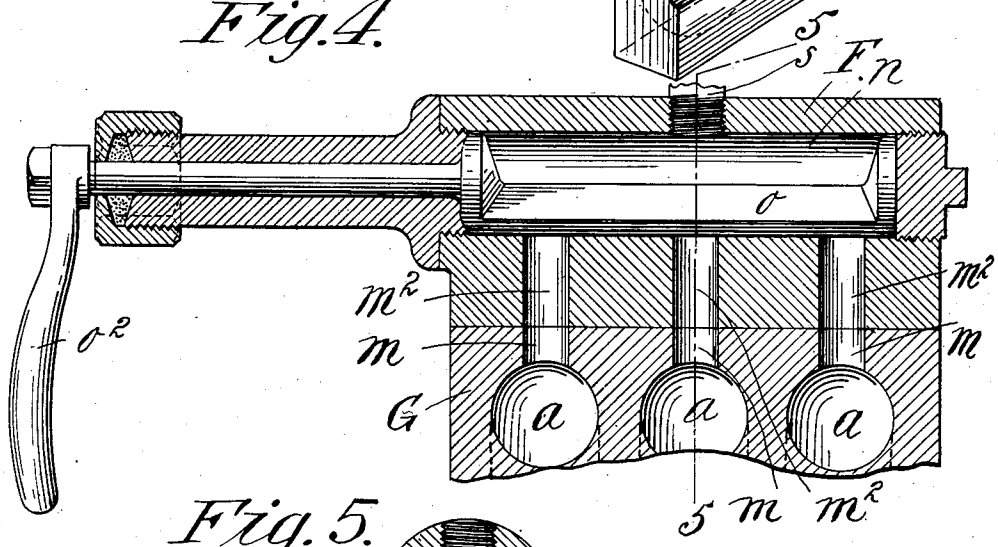
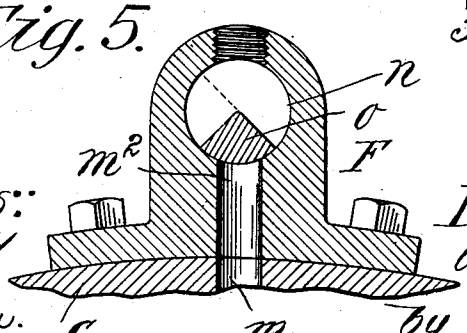


Fig. 5.



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UNITED STATES PATENT OFFICE.

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PROTECTIVE APPARATUS FOR BOILER-FURNACE FRONTS.

SPECIFICATION forming part of Letters Patent No. 747,464, dated December 22, 1903.

Application filed March 5, 1903. Serial No. 146,327. (No model.)

To all whom it may concern:

Be it known that I, OLIVER N. MORIN, a citizen of the United States of America, and a resident of Holyoke, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Protective Apparatus for Boiler-Furnace Fronts, of which the following is a full, clear, and exact description.

This invention relates to improved arrangements for the protection of the casing or portion at the front of a boiler-furnace which constitutes the door opening into the furnace from the effects of the excessive heat from the furnace, which heat too often results in melting away of the metallic frame or casing surrounding the door-opening.

The present invention contemplates the provision of an arch-shaped receptacle for water fitted at the front of the furnace-chamber around the opening into the fire-box and the combination therewith of conduits, connections, and valves whereby the chamber in the arch-shaped box is filled from time to time with water, whereby the steam which may make therein may be carried therefrom, preferably into the steam-space at the top of the boiler, whereby the water in the door-opening chambered protective arch-shaped setting is constantly replenished from time to time as the same may become dissipated and whereby the said chambered setting may be occasionally "blown out" by the force of water directed therethrough first in one direction and then in the opposite direction or with steam.

An approved manner in which my invention is carried out is illustrated in the accompanying drawings, in which—

Figure 1 is in part a front elevation at the front of a boiler and its furnace and in part a vertical sectional view through the setting about the opening into the front of the fire-box. Fig. 2 is in substance a side elevation of the arrangements shown in the preceding figure. Fig. 3 is a perspective view of the arch-shaped and internally-cored-out setting. Fig. 4 is a sectional view longitudinally through a valve-case connected at the top of the setting and showing the valve therein. Fig. 5 is a cross-section of the same as taken on line 5 5, Fig. 4.

Similar characters of reference indicate corresponding parts in all of the views.

In the drawings, A represents the opening leading into the fire-box of the furnace B, at the bottom of which is the ash-pit C and above which is the boiler D, as usual. The side and top boundaries for the front opening into the fire-box is constituted by the setting G, which may be of cast-iron or malleable iron or other suitable material and constructed in the form of an arch, as clearly shown in Figs. 1 and 3, the same having therein, by coring and casting in a manner well known to iron-founders, the chamber or passage *a*, which is of a sinuous form, the same starting at the bottom of one side near the front of the casting, thence pursuing the arched course to the opposite side, whereat it has a rearward progression, thence crossing over in a different plane from the first-mentioned course to the initial side, whereat it has a second rearward progression continued in a third course to the opposite side, whereat it has an opening or port b^2 opposite the port *b*.

c represents a section of pipe connected with the bottom portion of the boiler and connected with the horizontal pipe *d*, which extends horizontally across the front of the furnace and has coupled thereto the vertical branches *f f*, located at either side outwardly beyond the opposite sides of the cast-iron chambered setting G. The short horizontal branches *g* connect the vertical branches with the terminals of the sinuous chamber *a* and other branches *h* connect the train of pipes *c*, *d*, and *f* for communication with the ash-pit and also connect the conduit *a* and branches *g* for communication with the ash-pit. Valves or shut-off cocks *i i* are provided in the pipe-sections *f* above the branches *g*, and shut-off cocks *j j* are provided in the connections leading to the ash-pit below the branches *g*.

A port or passage *m* leads the central upper portion of each of the three (more or less) courses of the sinuous chamber *a* through to the top of the casting or setting G, and a cham-

bered casing F is bolted on the top of the setting, having therein the cylindrical socket n for the rotary shut-off or valve o, which may leave open or closed, according to the position thereof, the passages m^2, which are continuations of the aforementioned passages m, and from the upper part of the cylindrical valve-chamber in the part F the therewith-connected comparatively small steam-relief pipe s extends to connection with the steam-chamber in the upper part of the boiler. The valve o is of such formation that a quarter-the turn, as performed by its lever-handle o^2 at end of its axial stem, will fully open all of the passages m m^2 and leave the sinuous chamber in communication with the steam-space in the boiler, although the pipe s may terminate elsewhere than within the boiler. The pipe s has a shut-off valve s^2 at any convenient location between the setting G and its other terminal.

In practice the pipes at the front of the boiler are to be arranged closely against or near the face of the boiler; but in Fig. 2 of the drawings a somewhat distended arrangement is shown for purposes of perspicuity.

A check-valve may be provided in the steam-relief pipe s, if deemed necessary, so that the steam from the boiler may not have pressure communication with the chamber a in the protective setting, and yet so that the relief of steam from the latter may not be obstructed.

The utility and manner of operating this apparatus will now be briefly stated. The valve o is to be normally open and the receptacle a in the setting is to be filled with water from the boiler, valves i i being open and j j being generally closed. Thus a water-jacket protecting the opening into the fire-box is maintained with provision for steam relief. The water is automatically continuously replenished from the boiler. When the chamber a in the protective setting shall have become foul and clogged, as from sediment from the water, rust, or scale, and it is desired to "blow off" and clear the receptacle, the valve o is shut, the left-hand cock i is, for instance, closed, and the left-hand lower cock j is opened, whereupon the water from the boiler having ample pressure will run through the conduit or chamber a and down the left-hand branch into the ash-pit, carrying more or less of the obstructing matter therewith, and to acquire the highest degree of the clearing out the left-hand cock i will be opened, right-hand cock being closed, and the left-hand lower cock j closed and the lower right-hand cock j opened, whereupon a reversal of the clearing flow will be established through the setting, and any remnants of obstructing matter will be discharged into the right-hand side of the ash-pit.

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

1. In an apparatus of the character described, an arch-shaped metallic setting for the front of the fire-box opening having the chamber of sinuous form crossing and re-crossing within the setting and having terminal ports at lower opposite portions, and having upwardly-leading passages at the top middle portion of the setting connected with respective courses of said sinuously-extending chamber, the valve-casing F at the top of the setting having a valve-chamber, and a valve, therein, said upwardly-leading passages communicating with the valve-chamber, the steam-relief pipes connected with the valve-chamber and with an upper portion of the boiler, a pipe connecting the chamber in the setting with the boiler having intermediately thereof a shut-off cock, a pipe connected with the chamber in the setting and extended for waste, and a shut-off cock therein, substantially as described.

2. In an apparatus of the character described, in combination, the arch-shaped setting G having the chamber a of sinuous form as described and having terminal ports b b^2 at lower opposite side portions of the setting and having the upwardly-leading passages m at the top middle portion of the setting, the valve-casing F at the top of the setting having a valve-chamber and valve therein and having passages m^2 continued from the passages m into the valve-chamber, the steam-relief pipe s connected with the valve-chamber, and with an upper portion of the boiler, a pipe c leading from a lower portion of the boiler, the horizontal cross-pipe d therewith connected, the vertical pipe continuation f f at the opposite sides of the setting connected with the pipe d and having the pipe branches g g therewith connected, and connected with the said ports b b^2, extensions of said pipe-sections f f terminating in the ash-pit, the shut-off cocks for closing communication between the branches g g and the ash-pit-pipe terminals, and shut-off cocks above and between the branches g g and the boiler connection c all substantially as described and for the purposes set forth.

Signed by me at Springfield, Massachusetts, in presence of two subscribing witnesses.

OLIVER N. MORIN.

Witnesses:
A. B. THORPE,
WM. S. BELLOWS.