

(No Model.)

2 Sheets—Sheet 1.

W. BEESLEY.
STEAM BOILER FURNACE.

No. 513,753.

Patented Jan. 30, 1894.

Fig. 1

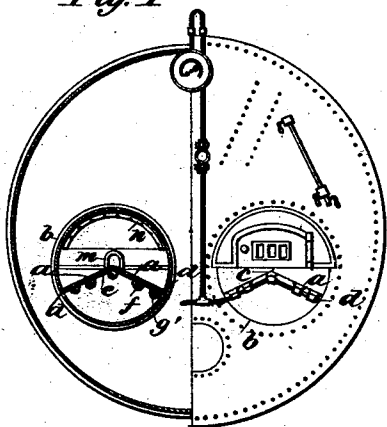


Fig. 3

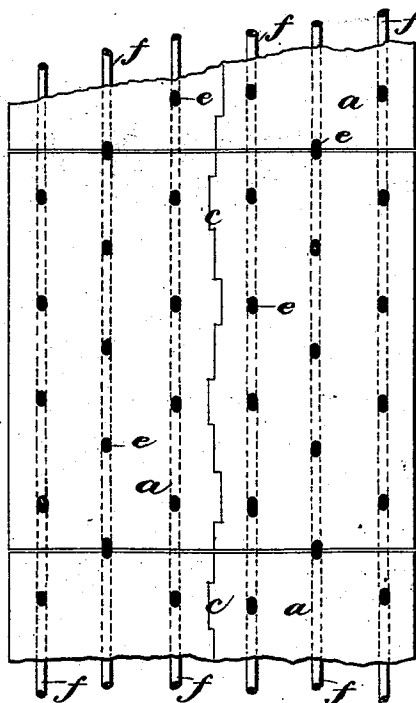
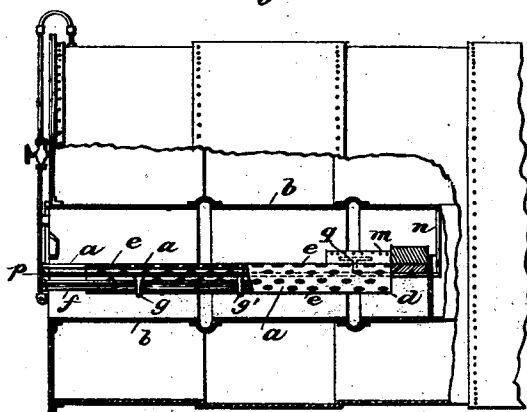


Fig. 2



Witnesses,
J. F. Coleman
Engineer.

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William Beesley.
By W. H. Limerick
Att'y.

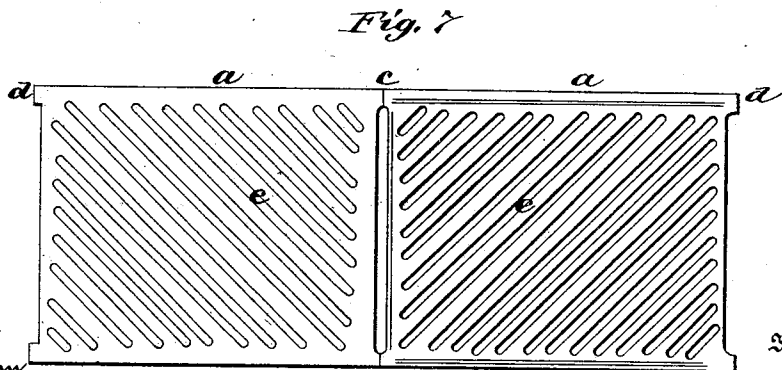
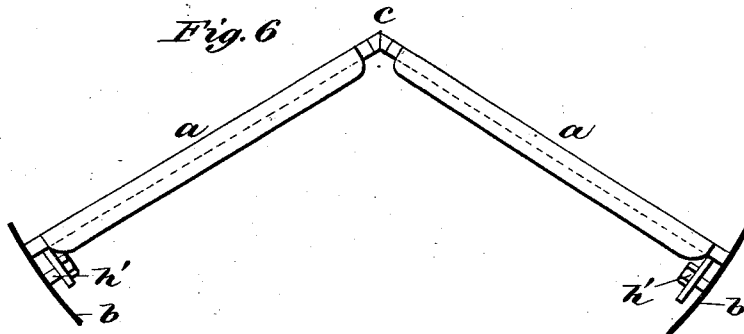
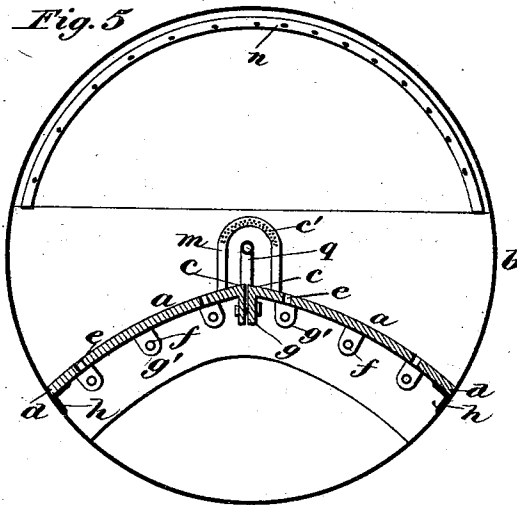
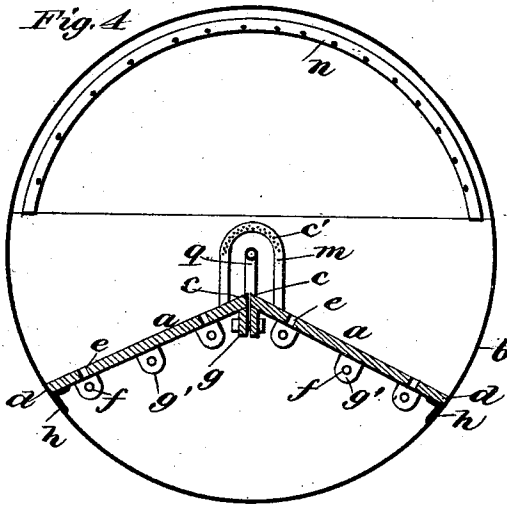
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Witnesses
G. F. Coleman

E. A. Ginnel

Inventor

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UNITED STATES PATENT OFFICE.

WILLIAM BEESLEY, OF FRESHFIELD, ASSIGNOR OF ONE-HALF TO ALFRED VENTOM WRIGHT, OF FORMBY, ENGLAND.

STEAM-BOILER FURNACE.

SPECIFICATION forming part of Letters Patent No. 513,753, dated January 30, 1894.

Application filed June 3, 1893. Serial No. 476,427. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM BEESLEY, a subject of the Queen of Great Britain, residing at Freshfield, near Liverpool, England, have invented a certain new and useful Improvement in Steam-Boiler Furnaces, of which the following is a full, clear, and exact description.

My invention relates to improvements in steam boiler furnaces, and the objects of my improvements are first, the production of steam at a high temperature with greater economy in fuel than in furnaces previously employed, and second, the consumption and prevention of smoke. I attain these objects by the mechanism hereinafter described and as illustrated in the accompanying drawings, in which—

Figure 1 is part cross section and part end view of a boiler and furnace, with my invention applied. Fig. 2 is a side view of the same boiler partly in section, showing the furnace which is also partly in section. Fig. 3 is plan of perforated plates forming the furnace drawn to an enlarged scale. Fig. 4 is transverse section of the same showing plates with a straight surface placed at an angle. Fig. 5 is a transverse section showing plates of an elliptical form. Fig. 6 is an end view and Fig. 7 is plan of plates constructed with angular slots or openings of a taper form.

In the views similar letters refer to similar parts.

In this invention in lieu of the ordinary firebars, I employ a greater or less number of plates or grids *a* that are of the forms hereinbefore described, so that they may be placed in the flue *b* with their inner edges *c* meeting at a point in the vertical center at a considerably higher level than their outer edges *d*. I form lugs *g* under said inner edges by which the plates may be bolted together in the angular position shown on the drawings, or the inner edges of the plates may be dovetailed to fit into each other so as to be retained without bolting. The outer or lower edges *d* may either rest on angle bars *h*, or other suitable projections attached to the interior of the flue *b*, or may be secured by studs *h'* as shown in Fig. 6 or said outer edges may rest on the interior surface of the flue only.

I form either holes or slots *e* in the hereinbefore described plates *a*, said holes or slots being arranged either in rows or otherwise and of any preferred size or shape. I place pipes *f* preferably of small diameter under each of the plates *a*, said pipes being supported by lugs *g'* or other suitable carriers that are formed on or attached to the under side of said plates. I form holes at intervals in the pipes *f* the position of said holes corresponding with the holes that are formed in the plates *a* or in any position that may be preferred when plates with slots are employed. By these means jets of dry steam, or compressed air that may be heated, are introduced into the fuel at any angle from the center toward the sides of the flue.

At the rear end of the furnace near the bridge, I place over the angle formed by the junction of the plates *a*, an air dome *m*, said dome being perforated in the upper part, and over the bridge I place a pipe *n* bent to the radius of the crown of the flue with holes formed therein at an angle. I place a pipe *p* along under the furnace plates *a*, and carry a branch pipe *q* with a T end up under the dome *m*, extending the pipe *p* so as to form a connection with the pipe *n*. Steam or compressed air is introduced into the furnace from the branch pipe *q* through the holes *c'* in the dome *m*, and also at an angle onto the flame from the holes in the pipe *n*. By these means more perfect combustion is obtained and the smoke is more effectually consumed.

I am aware that prior to my invention, furnaces have been constructed with the center placed at a higher level than the sides. I therefore do not claim this form of construction broadly, but

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. In a steam boiler furnace, the grate constructed of perforated plates or grids placed at an angle and having their central meeting ends at a higher level than their sides, a bridge, pipes arranged beneath said perforated plates or grids and having openings registering with the perforations of said plates or grids, a dome *m* arranged above the grate next the bridge and provided with openings for the escape of steam or air into the furnace, and a pipe *p*

also arranged beneath the grate plates or grids and having a branch *q* extending and opening into said dome, all combined substantially as and for the purpose described.

- 5 2. In a steam boiler furnace, the grate constructed of perforated plates or grids placed at an angle and having their central meeting ends at a higher level than their sides, a bridge; pipes arranged beneath said perforated plates
10 or grids and having openings registering with the perforations of said plates or grids, a dome *m* arranged above the grate next the bridge and provided with openings for the escape of steam or air into the furnace, and a pipe *p*

also arranged beneath the grate plates or 15 grids and having a branch *q* extending and opening into said dome, and a branch *n* arranged above the bridge and provided with holes or perforations constructed at an angle therein to introduce steam or air onto the 20 flame at an angle, all combined substantially as and for the purpose described.

In testimony whereof I have hereunto set my hand this 9th day of May, A. D. 1893.

WILLIAM BEESLEY.

Witnesses:

CHAS. E. YEARDYE,
THOMAS PRESCOTT.