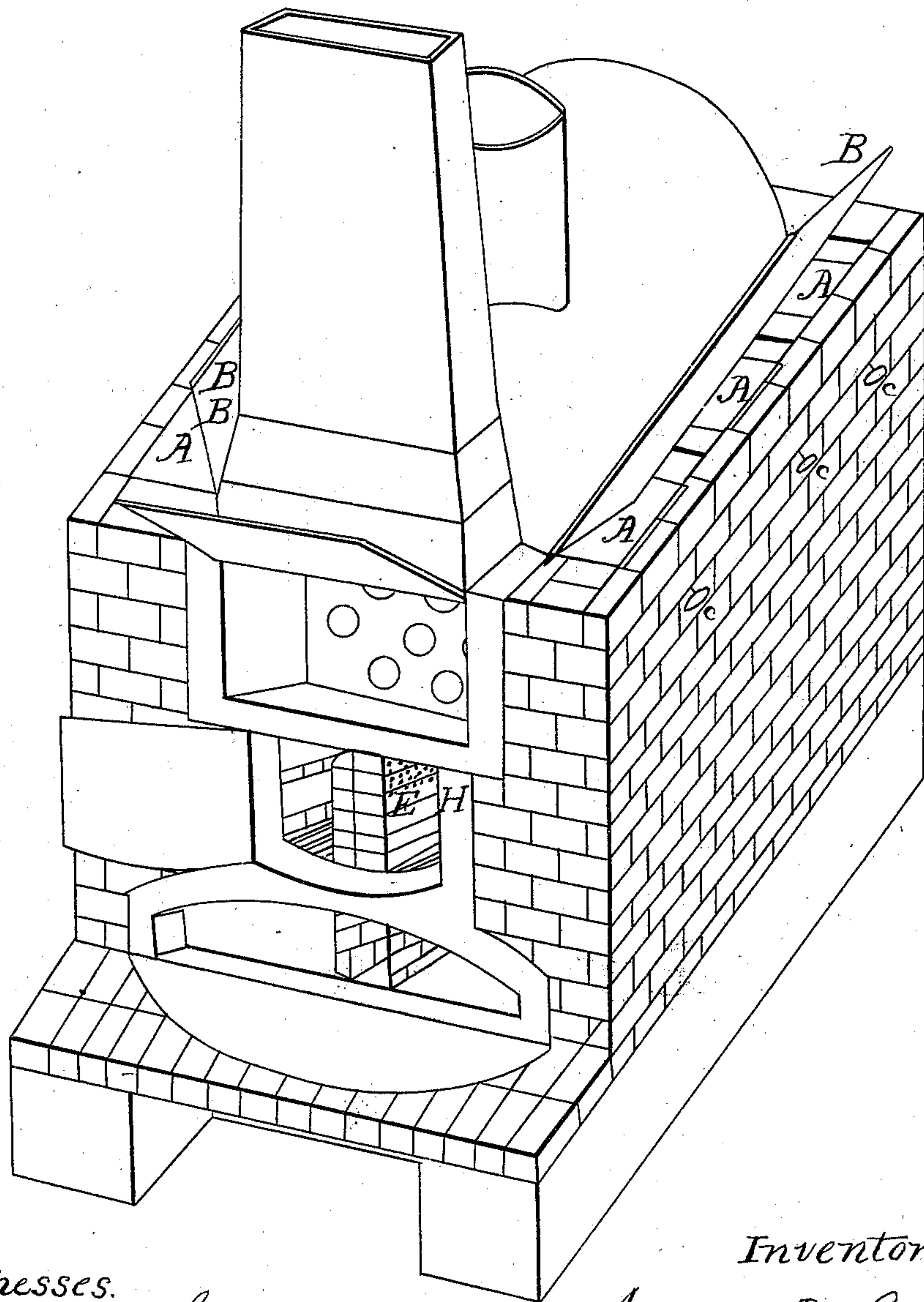


Sheet 1-2 Sheets.

Gardner & Swain,
Feeding Boiler Furnaces,
No. 80,821, Patented Aug. 11, 1868.

Fig. 1.



Witnesses.

Francis Wright
W. H. Walter

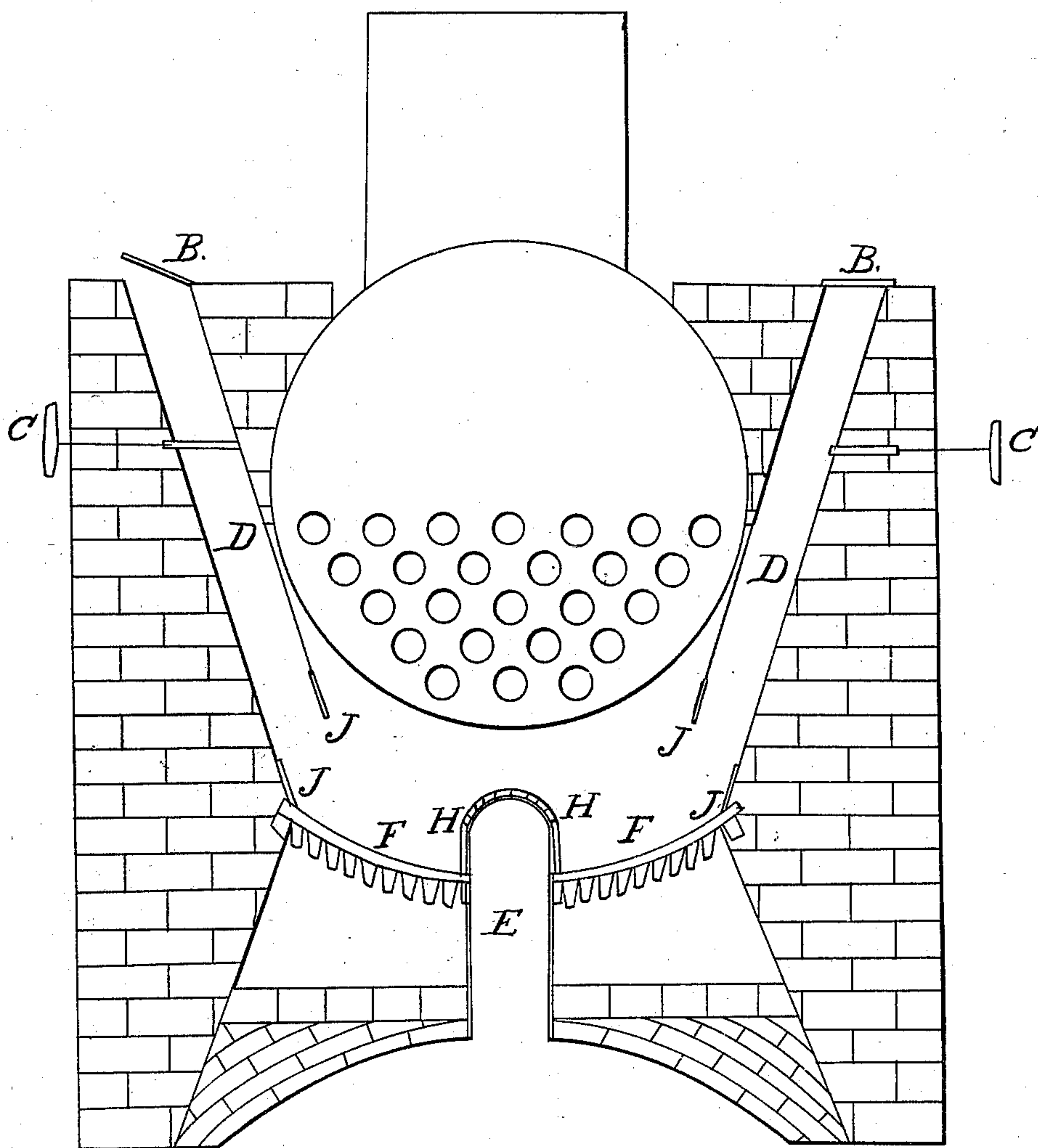
Inventor

Jerome B. Gardner
Chas. H. Swain

Sheet 2-2 Sheets.

Gardner & Smain,
Feeding Boiler Furnaces.
No 80,821, Patented Aug. 11, 1868.

Fig 2.



Witnesses.

Francis Wright
W. G. Walton

Inventor

Jerame B. Gardner
Chas. Smain

United States Patent Office.

JEROME B. GARDNER AND CHARLES H. SWAIN, OF NEW YORK, N. Y.

Letters Patent No. 80,821, dated August 11, 1868.

IMPROVEMENT IN STEAM-BOILER FURNACES.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that we, JEROME B. GARDNER and CHARLES H. SWAIN, of the city, county, and State of New York, have invented new and useful Improvements in Furnaces for Steam-Boilers; and we hereby declare that the following is the manner the same are to be constructed, reference being had to the accompanying drawings, and letters of reference thereon, and as particularly described and set forth hereinafter.

Plate 1, Figure 1, is a perspective view of a horizontal steam-boiler.

A A A A are openings on each side of the boiler, into the fuel or feed-chamber D D, in plate 2, fig. 1, for the admission of fuel by which the furnace is supplied.

B B are covers over the openings A A A A.

C C C are slides, operating in the fuel or feed-chambers D D, in plate 2, fig. 1; these slides to be always closed when the covers, B B, are open.

E is an air-conductor, passing from below the ash-pits, up and through the grate-bars F F, in plate 2, fig. 1, and a little above the fuel, perforated on the upper side by small holes, H H, to admit free passage of air through them in fine streams, supplying oxygen in sufficient quantities to unite with all the carbon of the fuel.

Plate 2, Figure 1, is a sectional end view of a steam-boiler, furnace, and improvements.

D D are the fuel or feed-chambers, supplying fuel through the openings A A A A in plate 1, fig. 1, to the grate F F.

E is the air-conductor, perforated on the upper side by holes H H.

J J J J are fire-brick, or other material, to prevent the exposed sides of the fuel-chambers D D from fusing. The upper side of the air-conductor E is covered by suitably-formed fire-brick, or other material, to protect it from the intense heat.

F F are grate-bars, placed upon a concave frame, to cause the fuel to fall from the feed-chambers, D D, towards the centre of the furnace.

To show how these improvements are constructed, and to enable others skilled in the arts to manufacture and operate them, proceed as follows:

The fuel or feed-chambers, D D, are to be constructed on the sides of the boilers, with bearings at suitable distances for the support of the boilers, and running the entire length of them, or less, if desired, of any width or depth, depending upon the size, shape, and position of the boiler, and manner the furnace is set.

The air-conductor, E, may be constructed of iron, covered with fire-brick, or other suitable material, and should run the entire length of the grate-bars, or may be wholly of fire or other brick, or other suitable material, and be of enough superficial surface to admit the requisite supply of air to unite with all the carbon of the fuel.

To operate the furnace, and to charge the fuel or feed-chambers, proceed as follows:

The slides C C, plate 2, fig. 1, must be closed to prevent the escape of gas from the furnaces. The covers B B are then opened, and the fuel put into the fuel-chambers above the slides C C.

The covers B B are then closed, and the slides C C opened. The fuel then falls below them to the grate-bars F F. The fuel-chambers, to be filled with fuel up to the slides C C, continue to supply the furnace with fuel till all is consumed.

The air-conductor E, plate 2, fig. 1, supplies air through the small holes H H, directly above the fuel on the grates, and may have slides or dampers, to regulate the quantity of air admitted.

Air may also be admitted or introduced through pipes or tubes always, though perforated directly above the fuel with small holes, to admit the air in fine streams.

Claims.

1. We claim the combination of the feed-chambers for the furnaces of steam-boilers, with the perforated pipes or conductors, E, which are protected by suitable coverings, as described and set forth.

2. The arrangement of the grate-bars F F upon a concave frame, causing the fuel to fall to the centre, in combination with the feed-chambers and air-pipes and conductors, as described and set forth.

JEROME B. GARDNER,
CHAS. H. SWAIN.

Witnesses:

W. A. WALTON,
FRA'S WRIGHT.