

(No Model.)

W. W. FORREST.

GRATE BAR.

No. 349,639.

Patented Sept. 21, 1886.

Fig. 1.

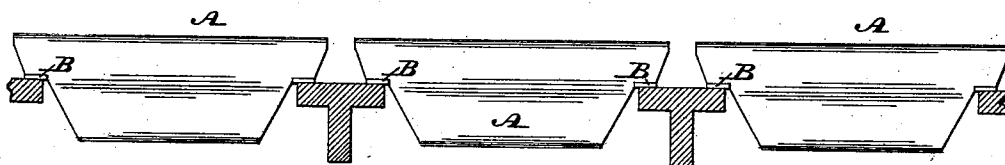


Fig. 2.

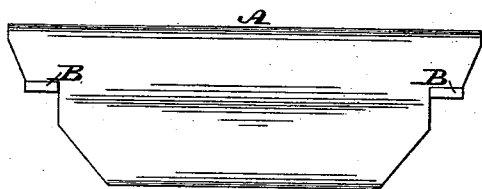


Fig. 3.

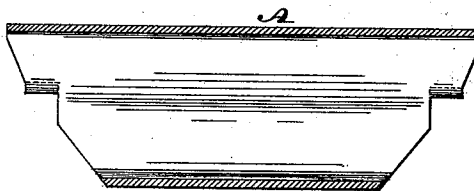


Fig. 4.

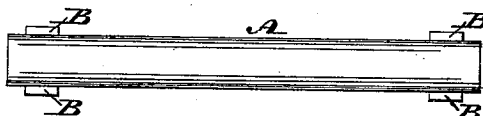
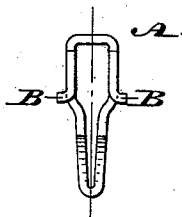


Fig. 5.



WITNESSES:

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UNITED STATES PATENT OFFICE.

WILLIAM W. FORREST, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO GEORGE S. HENSEL AND STEPHEN B. COLLADAY, BOTH OF SAME PLACE.

GRATE-BAR.

SPECIFICATION forming part of Letters Patent No. 349,639, dated September 21, 1886.

Application filed December 15, 1885. Serial No. 185,701. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM W. FORREST, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Grate-Bars, which improvement is fully set forth in the following specification and accompanying drawings, in which—

Figure 1 represents a side elevation of grate-bars embodying my invention, the supports thereof being sectional. Fig. 2 represents a side elevation of one of the grate-bars on an enlarged scale. Fig. 3 represents a longitudinal vertical section thereof. Fig. 4 represents a top or plan view thereof. Fig. 5 represents an end view thereof.

Similar letters of reference indicate corresponding parts in the several figures.

My invention consists of a grate-bar that is light, strong, durable, may be kept cool, prevents the adhesion of clinkers, serves to increase combustion, and possesses other advantages, as will be hereinafter fully set forth.

Referring to the drawings, A represents a grate-bar embodying my invention, the same being formed of an iron or steel tube, which is open at both ends and of such shape that in cross-section it resembles somewhat a wedge, the wider part being above, and on which the fuel is supported. The ends of the bar are cut away inwardly and downwardly, thus reducing the length of the bottom of the bar and directing the cold air into the bar, and said ends are provided with lips B, which are turned horizontally in the lateral direction of the bar and form supports therefor, said lips resting on the frame or cross-bars of the grate, and aid in preventing any rocking or oscillating motion of the grate-bar. It will be seen that the bar may be readily handled and set up, and it is light, strong, and durable; that clinkers are prevented from adhering to it, as only a small portion of the bar is exposed to the direct action of the heat of the furnace, and a constant current of cold air is caused to flow into, through, and around the bar at all points, keeping it cold, it being known that clinkers only attack highly-heated surfaces. Furthermore, the bar is prevented from breaking or cracking from expansion or contrac-

tion, or the use of fire-tools. The weight of the bar is less than that of one made of cast-iron, whereby the bearing-bars are less liable to sag. As the bar is open at both ends and a short distance removed from the dead-plate and back wall, there is avoided clogging of the fuel over the dead-plate and bearing ends of the bars, it being evident that the open-air space at each end of the furnace promotes a ready expansion of the bar in the longitudinal direction, thus preventing the raising or lowering of the bar at the middle thereof. As cold air from the ash-pit would flow into, around, and through the bar, the current of heated air passing from the interior of the bar through the fuel, while it increases combustion by the air being nearer the temperature of the furnace, as the constant circulation of air from the inside takes place the heat of the bar is absorbed and carried away by the currents of cold air which pass between the bars. Again, the bar may be made of wrought-iron pipe or doubly-thick wrought-iron pipe or steel, and as but a small portion or surface of the bar is exposed to the fire, and the bar, owing to its shape, possesses a greater depth, the bar will be admirably adapted for a furnace, the bearing-bars on each end of the bar being so constructed as to break and divide the current of air, making it practically two distinct currents.

In setting up the grate I may either employ a number of short bars, as shown in Fig. 1, or I may employ a bar of length sufficient to reach across the support-frame. By the employment of short bars having their ends opposite to but separated from each other, the extension of the said bars by the action of heat is permitted without the same being lifted at their ends, and at the same time the currents of cool air from below the grate, which enter the bars at the cut-away portions, freely pass from one bar to another.

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

1. A grate-bar formed of a tube of approximately wedge shape, having lips extending horizontally in the lateral direction of the bar, substantially as and for the purpose set forth.

2. A tubular grate-bar having its ends cut
away inwardly and downwardly, and having
lips extending from the sides at both ends,
whereby the said bar is firmly held in position,
5 substantially as described.

3. A grate having tubular bars of wedge-
shaped form open at both ends, having cut-
away lower ends, and a series of bearing-bars,

the said tubular bars having their open ends
opposite to but separate from each other, all 10
combined substantially as and for the purpose
set forth.

WILLIAM W. FORREST.

Witnesses:

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