

(No Model.)

C. H. GADEY.
GRATE BAR.

No. 513,565.

Patented Jan. 30, 1894.

FIG. 1.

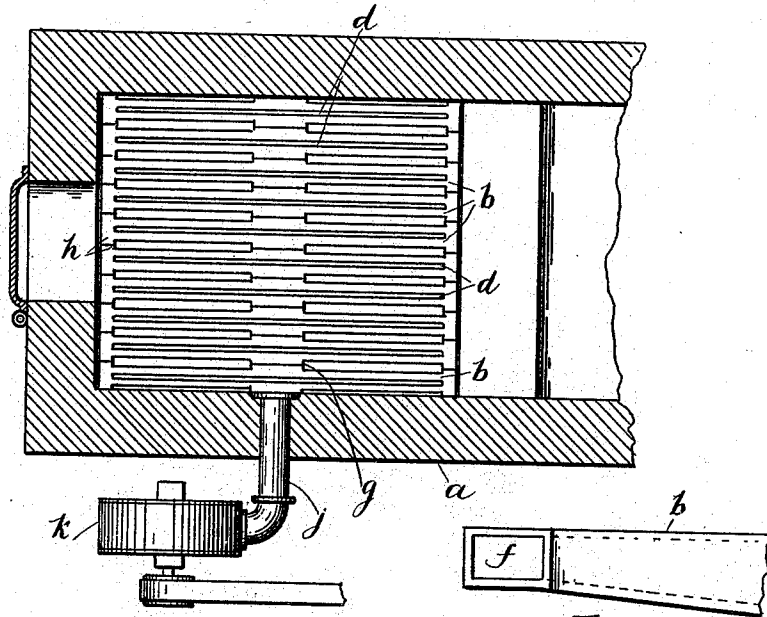


FIG. 2.



FIG. 3.

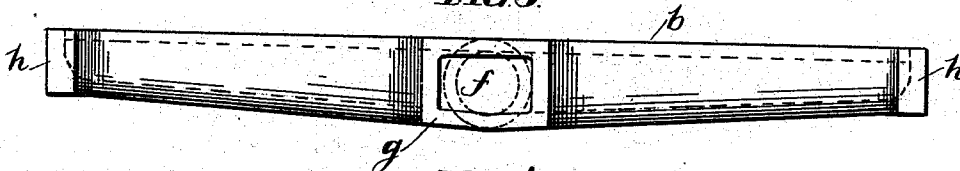


FIG. 4.

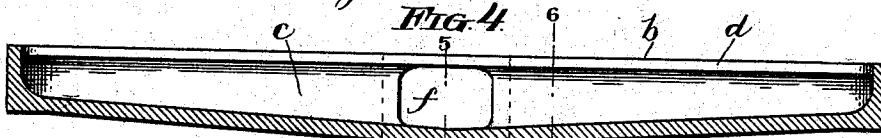


FIG. 5.

Witnesses:
J. Halpenny
C. Ashford.

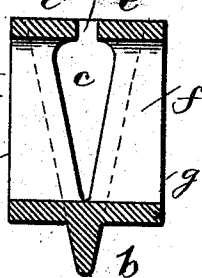
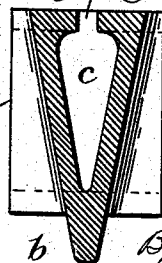


FIG. 6.

Inventor:
Charles H. Gadey.
By David H. Fletcher,
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UNITED STATES PATENT OFFICE.

CHARLES H. GADEY, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO
THE BROWN BROTHERS MANUFACTURING COMPANY, OF SAME PLACE.

GRATE-BAR.

SPECIFICATION forming part of Letters Patent No. 513,565, dated January 30, 1894.

Application filed October 5, 1893. Serial No. 487,285. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. GADEY, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Grate-Bars, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in which corresponding letters of reference in the different figures indicate like parts.

The object of my invention is to provide a hollow grate-bar which may be so constructed that, in addition to the regular draft, air may be introduced therein and admitted to the furnace at the point of combustion without resorting to undue pressure or causing an excessive draft;—thus enabling uniform and complete combustion to be maintained over the entire grate surface;—all of which is hereinafter more particularly described and definitely pointed out in the claims.

In the drawings, Figure 1, is a horizontal sectional view in plan of an ordinary boiler furnace, showing my improved grate-bars as they appear when in use. Fig. 2, is a plan view of one of said grate-bars. Fig. 3, is a side view of the same. Fig. 4, is a longitudinal vertical sectional view thereof. Fig. 5, is a transverse vertical sectional view taken upon the line 5, Fig. 4. Fig. 6, is a like sectional view taken upon the line 6, Fig. 4, and Fig. 7, is a side view of a portion of a grate bar showing a modification of said invention.

Referring to the drawings, *a* represents the walls of an ordinary boiler furnace in which my improved grate-bars *b*, are placed parallel with each other, being supported at the respective ends in the usual way upon suitable cross-bars. I prefer to make said grate-bar of greater depth at the middle than at the ends, and to make the body thereof V-shaped in cross section, as shown in Figs. 5 and 6. Said bar is provided with a hollow chamber *c* throughout its length, as clearly shown in Figs. 4 to 6 inclusive, which chamber is made to conform substantially to the shape of the body of the bar. Upon the top of the bar and throughout its length, is formed a slot *d*, which communicates with the chamber *c*, the latter being rounded at the top and ends as shown

at *e e*, Figs. 5 and 6, to provide against possible obstruction.

In order that outer communication may be established with the chamber *c* so as to admit air thereto, as well as to convey it simultaneously from a common source to the chambers in the various bars, I provide one or more, but, by preference, a single horizontal opening *f*, which may be of any suitable shape, though preferably rectangular as shown. Laterally extended flanges *g*, are formed around said opening upon the opposite sides of the bar, and their outer faces are extended downwardly at right angles to the top of the bar, as shown in Figs. 5 and 6, so that when said bars are placed side by side, the ends of said flanges may fit against each other as shown in Fig. 1, thereby forming one continuous opening or passage through the grate-bars across the entire furnace. While I prefer to place the opening *f* at or near the middle of the bar, it is obvious that it may be located elsewhere, as, for example, at one end, with good results; though I regard it as best to be located at the middle, inasmuch as a more uniform distribution of air may be secured by fixing it at that point.

In Fig. 7, the opening *f* is represented as being at the end of the bar. Upon the respective ends of each bar is formed laterally projecting flanges *h h*, corresponding in length to the flanges *g*, for the purpose of separating the bars and maintaining them parallel with each other.

My improved bars are utilized in the following manner: Opposite to the transverse passage-way formed by the openings *f* in the successive bars, I place a pipe *j*, Fig. 1, which is secured in the side wall of the furnace, one end thereof being in communication with said passage, while the other is connected with a suitable blower *k*. Upon injecting the air with a moderate pressure from the blower through the pipe *j*, the air passes into the passage-way formed by the openings *f* and is distributed from thence laterally into the chambers *c*, from whence it passes through the slots *d* to the fire. The slots are sufficiently wide to admit the air to the fire without undue pressure; and as they extend throughout the length of the bars, the distribution of

air is uniform and the accumulation of ashes upon the grate is prevented, while at the same time the regular draft of the furnace through the door is not interfered with and no
5 excessive blast is produced to cool the furnace; moreover, the cool air entering through the grate-bars will prevent their burning as in the ordinary grate-bar.

I have, in practice, been able with the aid
10 of my improved grate-bars, to produce a perfect combustion of the poorest kinds of slack coal and "screenings," such as could not be burned to advantage, if at all, in any ordinary furnace, and that without causing a
15 forced or unnatural draft.

I am aware that hollow grate-bars having perforations in the top or sides or both, with or without valves, are not new; and that the same have been employed in connection with
20 a blower, and I therefore make no claim to such construction.

What I do claim, however, and desire to secure by Letters Patent, is—

1. A grate-bar having a recess therein extending substantially throughout the length
25 of the body of the bar, a slot in the top of the bar corresponding in length to said recess and communicating therewith, a horizontal transverse opening extending through said bar and

in communication with said chamber, and
30 laterally extended flanges surrounding said opening and adapted to fit against corresponding flanges upon adjacent bars, substantially as described.

2. The grate-bar *b*, having the recess *c* extending throughout its length, slot *c*, communicating and coextensive therewith, opening
35 *f* in communication with the chamber *c*, and laterally extended flanges *g g*, substantially as and for the purpose set forth.

3. The combination with a furnace, of a series of loosely placed grate-bars *b*, provided with chambers *c* extending throughout their length, slots *d* coextensive therewith, transverse openings *f* in communication with said
40 chambers, laterally projecting flanges *g g*, whereby a continuous transverse passage is formed through said grates, a pipe through the furnace wall in communication with said passage, and means for forcing air into said pipe, 50 substantially as described.

In testimony whereof I have signed this specification, in the presence of two subscribing witnesses, this 10th day of September, 1893.

CHARLES H. GADEY.

Witnesses:

D. H. FLETCHER,
P. MONSON.