

(No Model.)

J. F. CASEY & M. M. HEDGES.
HOLLOW BLAST GRATE BAR.

No. 579,955.

Patented Apr. 6, 1897.

Fig. 1

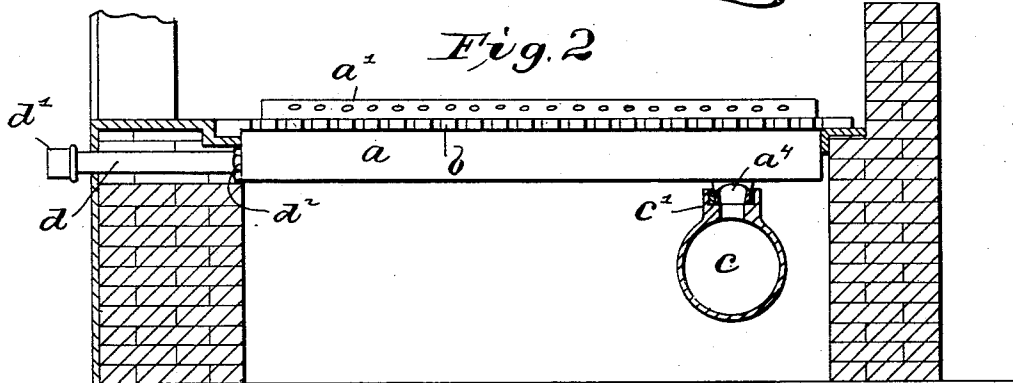
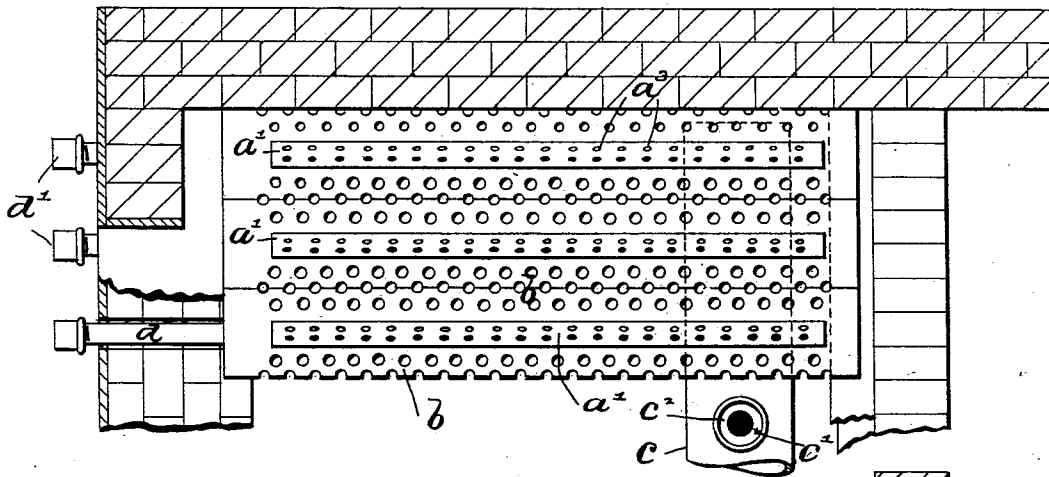


Fig. 3

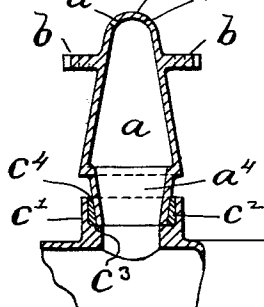
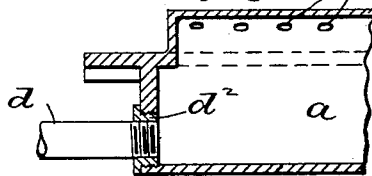


Fig. 4



Witnesses
G. M. Bridley
Chas. J. Welch

Inventors
James F. Casey
and M. M. Hedges
By their Attorney
Paul H. Hines

UNITED STATES PATENT OFFICE.

JAMES F. CASEY AND MERTLAND M. HEDGES, OF CHATTANOOGA,
TENNESSEE.

HOLLOW BLAST GRATE-BAR.

SPECIFICATION forming part of Letters Patent No. 579,955, dated April 6, 1897.

Application filed October 12, 1896. Serial No. 608,565. (No model.)

To all whom it may concern:

Be it known that we, JAMES F. CASEY and MERTLAND M. HEDGES, citizens of the United States, residing at Chattanooga, in the county of Hamilton and State of Tennessee, have invented certain new and useful Improvements in Hollow Blast Grate-Bars, of which the following is a specification.

Our invention relates to improvements in hollow blast grate-bars especially designed for boiler and similar furnaces; and the invention consists in the various constructions and combinations of parts hereinafter described, and set forth in the claims.

In the accompanying drawings, Figure 1 is a plan view of a portion of the furnace to which our improved grate-bar is applied. Fig. 2 is a longitudinal sectional view of the same. Fig. 3 is a transverse sectional view in detail of our improved grate-bar, showing the manner of connecting the same to the air-trunk. Fig. 4 is a longitudinal sectional view of a portion of the grate-bar in detail.

Like parts are represented by similar letters of reference in the several views.

Our improved grate-bar consists, essentially, of a hollow body or trunk *a*, preferably larger at the bottom than at the top and rounded at the top, as shown at *a'*, this hollow body or trunk being provided at a point below the top thereof with longitudinal laterally-projecting flanges *b*, which form the grate-bar proper. These flanges *b b* are perforated in any suitable manner after the style of grate-bars now in use, and the flanges of one bar are adapted to join with the adjacent bars and furnish a grate-surface for the furnace.

The upper part *a'* of the hollow body *a* stands above the grate-surface formed by the flanges *b* in the nature of a half-round twyer and is provided with angularly-arranged openings *a² a³*, which extend from the inside to the outside, preferably at an angle of about forty-five degrees and at a point considerably above the top of the grate-surface formed by said flanges. Each of the bars is provided with a hollow nipple *a⁴*, preferably cast integral with the body *a*, and adapted to form a connection with the main air-trunk or supply-pipe *c*. These nipples *a⁴* are made slightly

tapering, and the air-trunk or supply-pipe *c* is provided with a hollow boss or projection *c'*, which is formed at its outer end with a recess *c²*, into which the nipple *a⁴* is adapted to project, so as to rest on a seat or shoulder *c³*, which constitutes the bottom of said recess.

Each of the bars or the hollow portion *a* thereof is provided with a normally-closed outlet-pipe *d*, which consists, preferably, of an ordinary iron pipe or tube which is connected at one end to the hollow body *a* and projects through the wall of the furnace to the outside of said furnace, so as to be readily accessible, preferably through the furnace-front, said pipe being normally closed by a removable cap *d'*.

In order to cheapen the construction and at the same time provide an effective device for connecting the pipes *d*, we employ a nipple *d²*, screw-threaded on the outside and inside, and this nipple we cast into the metal which forms the hollow portion *a* of the bar. The end of the pipe *d* being screw-threaded and screwed directly into said nipple, the labor of boring and tapping out the end of the hollow portion *a* is thus dispensed with.

In assembling our improved grate-bar the nipple *a⁴* is placed in the recess *c²* of the boss *c'* and the said recess filled with a suitable packing, preferably asbestos or a similar cement, so as to form a tight joint around the same, as shown at *c⁴*. The bars are laid adjacent to each other, so that the flanges connect to form the grate-surface; or, if desired, they may be placed alternately with a plain bar having perforations corresponding to the perforations of the flanged or grate surface of the blast-bar, in which case every alternate bar will be a hollow blast-bar and the remaining surface be the ordinary plain natural draft-grate surface, or they may be arranged in any other suitable manner. The outlet-pipes *d*, with the caps *d'* thereon, will be fixed in their positions, preferably at one end or the other of the hollow portion *a*, and project through the furnace-wall with the removable caps *d'* thereon. Air is supplied from the supply-pipe *c* from any suitable source, and, passing through the hollow portion *a*, escapes through the twyer portion *a² a³* at a point

considerably above the grate-surface. It will thus be seen that the grate-surface always has a certain amount of fuel below the twyer-openings, so that the danger of forcing the air down through the grate-bars by the draft is obviated. At the same time the twyer-openings being arranged at an angle to the hollow body or trunk, and being located at a point considerably above the grate-surface, are less liable to permit the introduction of ashes or other substances into the air-trunk.

The longitudinal outlet-pipes *d*, extending to the outside of the furnace and having the removable caps *d'*, furnish the means for readily cleaning the air-trunk or twyers of each bar by removing the caps and permitting the air from the supply-pipe to blow through said trunk and through the outlet-pipe. In case of a stoppage by any foreign substance, the same may be removed by inserting a rod or bar through the pipe *d*, so as to remove the obstruction, which will be blown out by the air from the supply-pipe.

Having thus described our invention, we claim—

1. A hollow grate-bar, substantially as described, having a hollow body or trunk and laterally-projecting flanges arranged at a point below the top of said hollow body or trunk, and an outlet-pipe extending from the end of

said hollow body or trunk and provided with a removable cap, substantially as specified.

2. A hollow grate-bar having laterally-projecting flanges or grate portions, and a hollow portion or trunk, an outlet-pipe extending longitudinally from the end of said trunk and having a detachable cover, said pipe being screwed into a nipple which is cast into said trunk, substantially as specified.

3. The combination with the hollow grate-bar and the outlet-pipe as described, of an externally and internally screw-threaded nipple cast directly into the metal which forms said bar, substantially as specified.

4. The combination with a hollow grate-bar having an air-trunk, as described, and a supply-pipe below said grate-bar, said supply-pipe being provided with a recessed boss adapted to receive a projection formed on said grate-bar, and a connection between said boss and projection formed by cement inserted into said recess, substantially as specified.

In testimony whereof we have hereunto set our hands this 2d day of October, A. D. 1896.

JAMES F. CASEY.

MERTLAND M. HEDGES.

Witnesses:

J. H. JOHNSON,

WILL STEPHENS.