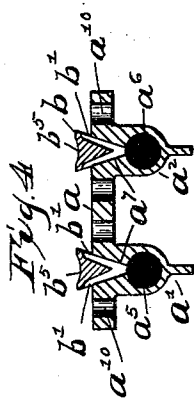
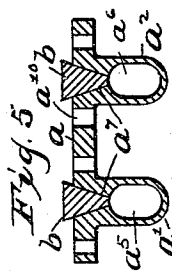
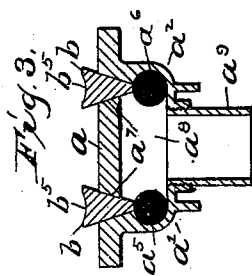
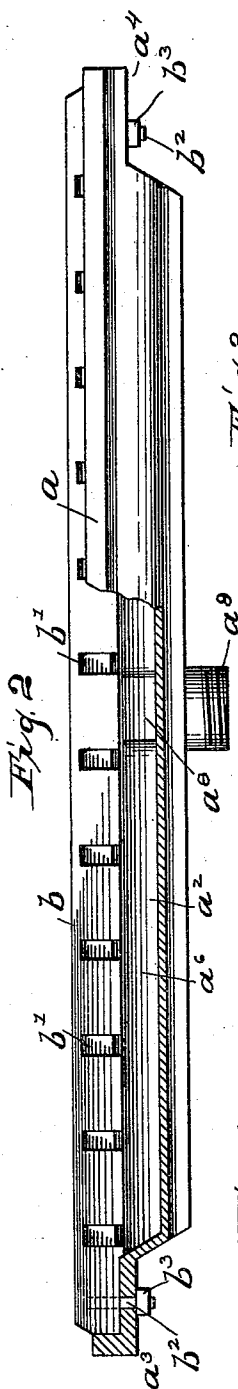
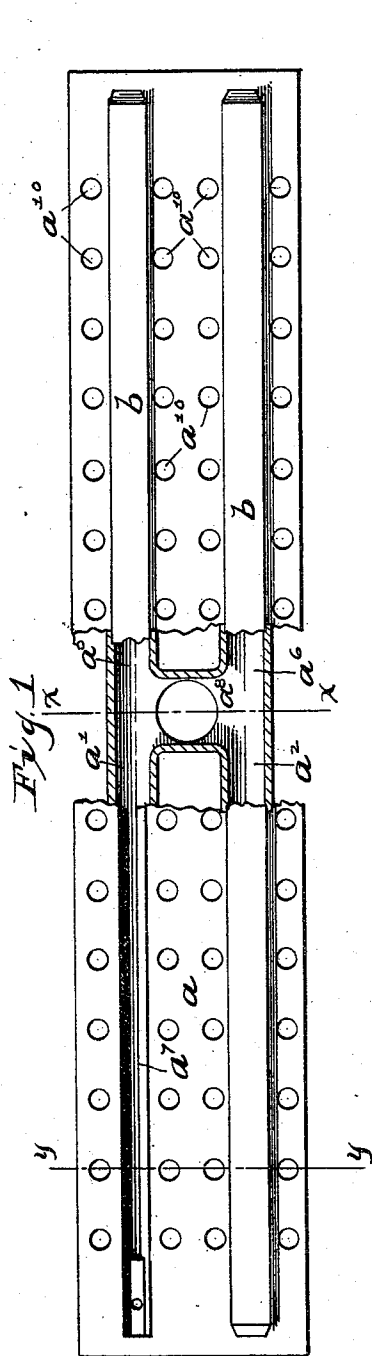


(No Model.)

J. F. CASEY.
GRATE BAR.

No. 550,216.

Patented Nov. 19, 1895.



Witnesses
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Chas. J. Welch

Inventor
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By his Attorney
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UNITED STATES PATENT OFFICE.

JAMES F. CASEY, OF CHATTANOOGA, TENNESSEE, ASSIGNOR TO THE CASEY & HEDGES MANUFACTURING COMPANY, OF SAME PLACE.

GRATE-BAR.

SPECIFICATION forming part of Letters Patent No. 550,216, dated November 19, 1895.

Application filed September 16, 1895. Serial No. 562,615. (No model.)

To all whom it may concern:

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

My invention relates to improvements in grate-bars especially adapted for boiler-furnaces, and it particularly relates to a grate-bar to which a blast of air is adapted to be forced from a suitable blower to increase the combustion.

The object of my invention is to provide a grate-bar of simple construction, the parts of which are readily accessible for cleaning, and which, when in operation, is not liable to become choked by ashes or by the material which blast grate-bars are especially adapted for burning, the constructions being also such that the bar may be used as an ordinary grate-bar in the event that the blast for any reason should be turned off. I attain these objects by the constructions shown in the accompanying drawings, in which—

Figure 1 is a plan view of a device embodying my invention, a part of the top being broken away and the under part being shown in section. Fig. 2 is a side elevation of the same with a part broken away and shown in longitudinal section. Fig. 3 is a transverse sectional view on the line $x x$ in Fig. 1. Fig. 4 is a transverse sectional view on the line $y y$ in Fig. 1. Fig. 5 is a transverse sectional view of the part shown in Fig. 4 slightly modified.

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

My improved grate-bar consists, essentially, of an upper or top plate a , which is formed integral with two downwardly-projecting legs a' a^2 , which are cored out or otherwise formed hollow for their entire length, said legs extending longitudinally under the grate-bar for the greater portion of the length of the plate a , the ends of the plate being projected slightly beyond the ends of said legs, as shown at a^3 and a^4 . The hollow portions a^5 a^6 of the legs a' a^2 are each connected to the top of the plate a by a means of a V-shaped slot or opening a^7 , extending for almost the entire length

of the plate a , said slot being larger at the top than at the bottom, so that an opening from the hollow portion of the respective legs is formed at the top of the same of a gradually-increasing width as it extends upwardly through the plate. The hollow portions a^5 a^6 , which are adapted to form air conduits or trunks, are connected together, preferably at the center of the bar, by a longitudinal passage a^8 , with which there is connected a pipe or nipple a^9 to which the pipe or conduit from any suitable blower is connected. This pipe or nipple a^9 preferably consists of an ordinary wrought-iron nipple screw-threaded and cast into the grate-bar proper by placing the nipple in the mold and pouring the metal forming the grate-bar around the same.

Fitted into each of the slotted openings a^7 is a longitudinal V-shaped bar b . This bar is formed on the sides at suitable intervals with a series of notches or openings b' , extending from the bottom thereof upwardly to a point near the top. These longitudinal bars b are formed of a greater height than that of the openings a^7 , in which they are fitted, so that they project above the face of the plate a , and, having their inclined sides formed on straight lines, the top edges of said bars project over the upper edges of the slotted openings a^7 . The notched openings b' in the respective bars are preferably tapered slightly, being larger at the bottom than at the top, and when the bars are in place in the slotted openings the notched openings form a series of orifices along each side of the respective bars and under the overhanging or projecting edges of the same and form discharge-openings from the air-trunks a^5 a^6 in the hollow legs a' a^2 .

To provide for more readily cleaning the grate-bar and also to furnish means for supplying air by natural draft, I construct the upper plate a with a series of openings a^{10} on each side of the hollow legs and between the same, said openings extending entirely through the plate and adapted to permit the discharge of ashes through the same into the pit below in the usual manner and also to furnish draft when required by natural means.

Each of the longitudinal notched bars b is extended beyond the hollow leg or trunk into

which it is fitted and rests at each end in suitable notched supports at the offset portions $a^3 a^4$ of the plate, and is further provided with a downwardly-projecting stud b^2 , which extends through a suitable opening formed in the bottom of the plate, and is provided with a suitable fastening device, preferably a screw-threaded nut b^3 , as shown in Fig. 2. It will be understood that these longitudinal notched bars b fit snugly in the slotted openings formed in the upper portion of the air trunks or conduits of the hollow legs and close the same, except at the places where the notched openings b' occur, so that the air is permitted to escape only through the discharge-orifices, as described.

The tops of the longitudinal bars b are each preferably grooved or slightly depressed, as shown at b^5 in Figs. 3 and 4, so that the outer edges only will form the supports for the fuel placed thereon.

It will be seen from the above description that I provide a grate-bar of very simple construction. It will be understood that a series of these grate-bars are to be used in operation, the upper plates forming a substantially-continuous surface with the longitudinal notched bars b forming elevated supports for the fuel. The air from the blast, which is communicated to the hollow legs, is discharged laterally at an angle from beneath the edges of the projecting bars b , which support the fuel, and prevent the same from falling into said openings, the overhanging or projecting edges of said bars preventing any ashes or loose material from falling into the air-trunks or hollow legs. In case the orifices should become stopped up the longitudinal bars may be readily removed by disconnecting the fastenings of the studs b^1 and lifting the bars out of the slotted openings, so that the discharge-orifices may be readily cleaned and any foreign substance removed from the hollow legs or air-trunks.

Having thus described my invention, I claim—

1. The combination with the upper plate formed integral with the hollow legs as described, said plate being formed with V-shaped slotted openings which communicate with said hollow legs through the top of said plate, longitudinal V-shaped bars having a series of notches in the sides thereof extending from near the top to the bottom of said bars, said longitudinal bars being fitted into said slotted openings so as to form a series of discharge orifices in said hollow legs, with the upper edges of said bars overhanging the tops of said orifices, substantially as specified.

2. The combination with the plate having the hollow legs formed integral therewith, and openings through said plate adjacent to said hollow legs, an air supply opening communicating with said hollow legs, and a series of discharge openings from said hollow legs to the top of said plate, longitudinal bars projecting above said plate to form fuel supports, said bars having laterally-projecting edges which extend over said discharge openings, substantially as specified.

3. The combination with the upper plate formed integral with the hollow legs as described, an air supply opening communicating with said hollow legs, and a series of independent openings extending through said plate adjacent to but not connected with said legs, upwardly-projecting bars extending from the top of said plate, said bars having inclined sides which project inwardly from the top of said bars to the top of said plate, and a series of discharge openings formed in said bars under said projecting edges, said openings being connected with the hollow legs and adapted to form discharge orifices therefrom, substantially as specified.

In testimony whereof I have hereunto set my hand this 13th day of July, A. D. 1895.

JAMES F. CASEY.

Witnesses:

OLIVER H. MILLER,
CHAS. I. WELCH.