No. 645,899. Patented Mar. 20, 1900.

J. FISHER.

GRATE BAR.

(Application filed Oct. 16, 1899.)

(No Model.) 2 Sheets—Sheet 1.

FIG. 1.

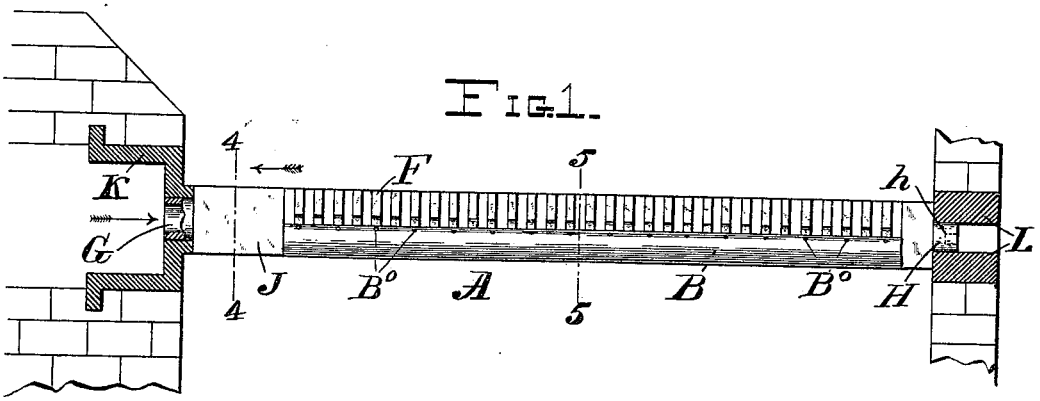
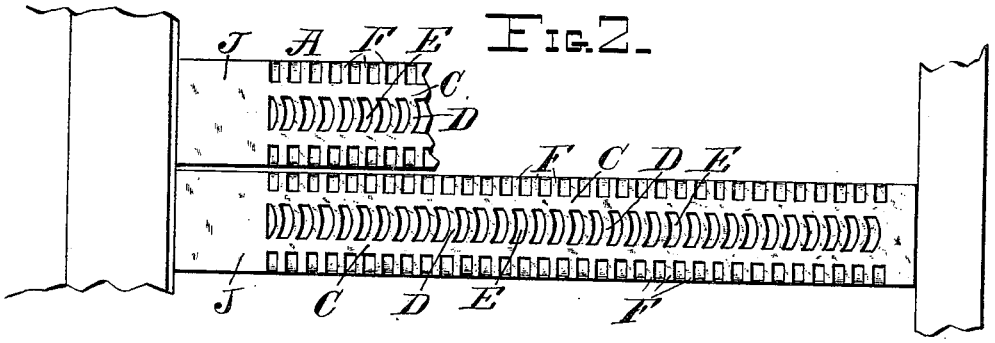


FIG. 2.



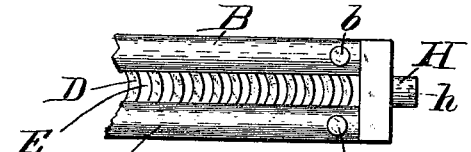


FIG. 3.

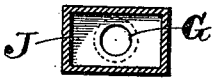


FIG. 4.

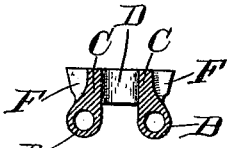


FIG. 5.

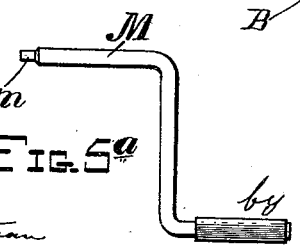


FIG. 5a.

Witnesses
John J. V. Falk
Clarence A. Bateman

Inventor
James Fisher.
by Wilkinson & Fisher.
Attorneys

No. 645,899. Patented Mar. 20, 1900.

J. FISHER.

GRATE BAR.

(Application filed Oct. 16, 1899.)

(No Model.) 2 Sheets—Sheet 2

FIG. 6.

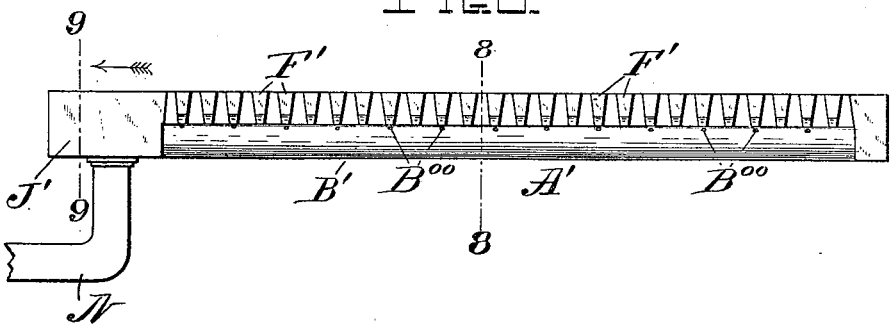


FIG. 7.

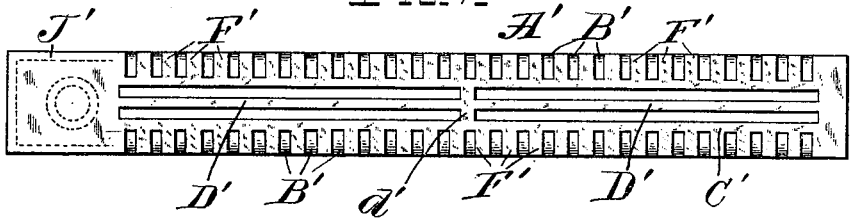


FIG. 8.

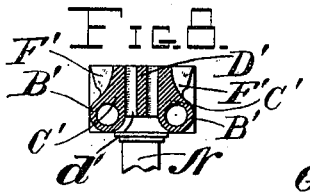
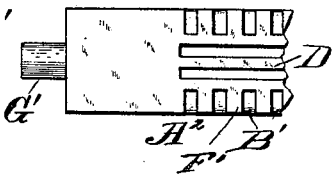


FIG. 10.



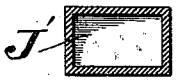


FIG. 9.

Witnesses
John N. Walk
Clarence A. Bateman

Inventor
James Fisher,
by Wilkinson & Fisher,
Attorneys

UNITED STATES PATENT OFFICE.

JAMES FISHER, OF NEW ORLEANS, LOUISIANA.

GRATE-BAR.

SPECIFICATION forming part of Letters Patent No. 645,899, dated March 20, 1900.

Application filed October 16, 1899. Serial No. 733,818. (No model.)

To all whom it may concern:

Be it known that I, JAMES FISHER, a citizen of the United States, residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented certain new and useful Improvements in Grate-Bars; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention relates to improvements in grate-bars, and more especially to hollow blast grate-bars for use in burning bagasse, sawdust, and the like, and is designed especially for use in connection with the bagasse-burning apparatus shown and described in the Letters Patent granted to me and numbered 564,918 and 591,752, respectively. It will, however, hereinafter be seen that my said invention is also adapted for use in burning coal and wood as well as bagasse, sawdust, and the like.

In order to more fully describe my said invention, reference will be had to the accompanying drawings, in which—

Figure 1 represents one of my grate-bars in side elevation. Fig. 2 is a top plan view showing two of the grate-bars in position, one being shown broken away. Fig. 3 is a fragmentary plan view showing the lower side of a portion of one of the grate-bars. Fig. 4 represents a section taken on the line 4 4, Fig. 1, and looking in the direction of the arrow. Fig. 5 represents a section taken on the line 5 5, Fig. 1. Fig. 5ª represents in side elevation a crank for rotating the bars. Fig. 6 represents in side elevation another form of grate-bar embodying my invention. Fig. 7 represents a top plan view of the same. Fig. 8 represents a section taken along the line 8 8, Fig. 6; and Fig. 9 represents a section taken along the line 9 9, Fig. 6, and looking in the direction of the arrow. Fig. 10 represents a fragmentary top plan view of another form of my invention.

Similar letters refer to similar parts throughout the several views.

The grate-bar A is preferably made in one casting, having the lower parallel tubular portions B, which extend upward, forming the solid parts of the bar C. These solid parts are connected by the central curved ribs D, which form the openings E.

Along each side of the grate-bar are the lugs F, which extend from the tubular portions B to the top of the bar, while at the ends of the bar are the trunnions G and H, the trunnions G being hollow.

The tubular portions B of the bar are closed at one end and open at the other into an air-chamber J.

B° B° represent small apertures through the tubular portions B of the grate for the escape of the air or steam. Plugs *b* are inserted in the tubes B and act as safety-plugs, which may be blown out if the pressure becomes too great and act also as a means for allowing cinders or trash to be removed from the tubes.

These grate-bars may be rotatably mounted in the furnace in any suitable way. In the drawings I have shown them supported upon the trunnions by mounting the latter—viz., the trunnion G in an air-box K, located in the fire-wall, and the trunnion H in the bearing L of the opposite fire-wall. The trunnion H is provided with a recess *h*, into which may be inserted the end *m* of a crank M, by which the bar may be rotated.

Air or steam is forced into the grate-bar through the trunnion G, from whence it passes through the chamber J to the tubular portions B and then out through the apertures B°. The lugs F extend out over the apertures B°, and thus prevent them from becoming choked. The air or steam thus issuing from the grate-bar greatly facilitates the combustion by furnishing an increased draft, while at the same time prolonging the life of the grate-bar by preventing the burning and warping of the same. In the complete furnace-grate a plurality of these bars are mounted alongside each other, as shown in Fig. 2.

In Figs. 6 to 9, inclusive, I have shown a form of grate-bar which while embodying my present invention is in some respects different from the form above described. The bar A′ in this case is provided with the parallel tubular portions B′ and lugs F′, as in the first form; but in this case the central ribs D are omitted and the longitudinal central ribs D′ are employed, connecting at the center of the bar with a cross-rib *d*′. The lugs

F′ differ from the lugs F in that the former are dovetail in section. The form of bar, Figs. 6 to 9, is shown as adapted to be fixed in the furnace and not rotatable, as in the former case, the air entering the chamber J′ through the pipe N and then passing into the tubular portions B′ and out through the apertures B°°; but it is obvious that this form of bar may also be rotatably mounted by providing the same with trunnions, as shown in Fig. 10. It is also obvious that I do not confine myself to the precise construction herein shown, as the same may be varied in many ways without departing from the spirit of my invention.

Having thus fully described my said invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. A grate-bar comprising two longitudinal tubular portions, central ribs formed integral with and located between said tubular portions, a series of lugs projecting from each side of said grate-bar, apertures through the tubular portions of said grate-bar opening beneath said lugs, means for mounting the grate-bar in a furnace, and means for conducting a blast fluid to the said tubular portions, substantially as described.

2. A grate-bar comprising two longitudinal parallel tubular portions, a series of central cross-ribs transverse to said bar integral with and located between said tubular portions forming a central row of openings through said bar, a series of lugs formed on said grate-bar and projecting angularly above said tubular portions and from the sides of the grate-bar, apertures formed in said tubular portions directly beneath the angular face of said lugs, means for mounting the grate-bar in a furnace, and means for conducting a blast fluid to said tubular portions, substantially as described.

3. A grate-bar comprising two longitudinal parallel tubular portions, a series of curved central cross-ribs transverse to said bars integral with and located between said tubular portions forming a central row of openings through said bar, a series of lugs formed on said grate-bar and projecting angularly above said tubular portions and from the sides of the grate-bar, apertures formed in said tubular portions directly beneath the angular face of said lugs, a trunnion at each end of said bar, one of said trunnions being hollow, means provided upon the other trunnion for rotating said bar, and a chamber affording a communication from the hollow trunnion to the said tubular portions, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES FISHER.

Witnesses:
JOHN J. SAUCIER,
E. W. BURBANK.