

W. MUIR & P. BUTLER.

Improvement in Grate Bars.

No. 116,080.

Fig. 1.

Patented June 20, 1871.

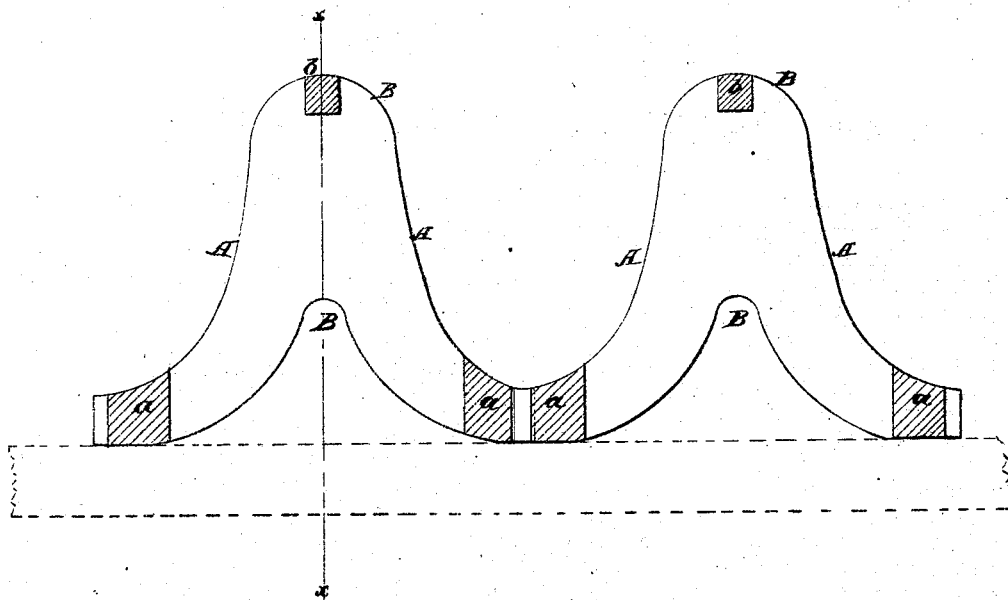
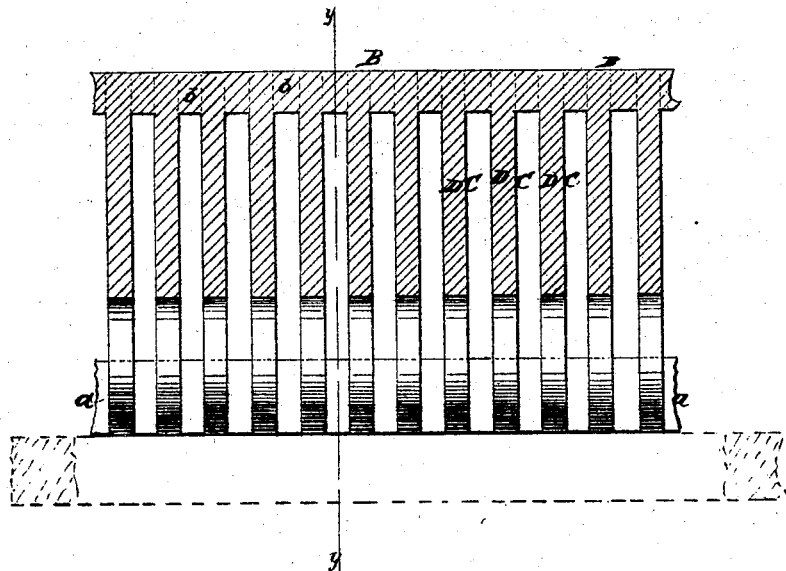


Fig. 2.



Witnesses:

*Philip C. Dietrich.*

*Wm. H. C. Smith.*

Inventors:

*Wm. Muir.*  
*Pierce Butler.*

PER

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## UNITED STATES PATENT OFFICE.

WILLIAM MUIR, OF ARCHIBALD, AND PIERCE BUTLER, OF CARBONDALE,  
PENNSYLVANIA.

## IMPROVEMENT IN GRATE-BARS.

Specification forming part of Letters Patent No. 116,080, dated June 20, 1871.

*To all whom it may concern:*

Be it known that we, WILLIAM MUIR, of Archibald, and PIERCE BUTLER, of Carbon-  
dale, in the county of Luzerne and State of  
Pennsylvania, have invented a new and Im-  
proved Grate-Bar; and we do hereby declare  
that the following is a full, clear, and exact de-  
scription thereof, which will enable others  
skilled in the art to make and use the same,  
reference being had to the accompanying draw-  
ing forming part of this specification.

This invention relates to improvements in  
furnace-grates; and it consists in a bar hav-  
ing a broad base and narrow top, with concave  
sides and oval top, and with a deep longitudi-  
nal groove in the bottom, and having numer-  
ous transverse openings from the bottom up  
through the sides and part of the top, calcu-  
lated to extend upward considerably in the  
fuel to admit the air freely to fine fuel, such  
as culm, sawdust, spent tan-bark, and the like,  
all as hereinafter described.

Figure 1 is a transverse section of our im-  
proved grate-bars, and Fig. 2 is a longitudi-  
nal section of the same.

Similar letters of reference indicate corre-  
sponding parts.

The said bars, which represent in cross-sec-

tion a figure with three wide sides and one  
narrow one, are made quite broad on the bot-  
tom, and as high or thereabout as they are  
broad, with concave sides A and a deep groove,  
B, in the bottom. The upper side B, which is  
quite narrow, is preferably convex. These  
bars are provided with numerous slots C or  
openings from the bottom up through the sides  
and most of the top, alternating with dividing-  
walls D, to admit a free supply of air to a con-  
siderable height in the fuel for burning fine  
and wet fuel. The said dividing-walls D are  
connected together at *a a b* by a sufficient  
amount of metal to insure the proper amount  
of strength. They are made of cast metal.

Having thus described our invention, we  
claim as new and desire to secure by Letters  
Patent—

A furnace-grate having broad base, narrow  
oval top, concave sides, and grooved and aper-  
tured bottom, all made of cast metal and in  
one piece, as specified.

WILLIAM MUIR.  
PIERCE BUTLER.

Witnesses:

J. J. WILLIAMS,  
CHARLES LANE.