(No Model.)

H. L. HILDRETH.

SAWDUST BURNER.

No. 409,285. Patented Aug. 20, 1889.

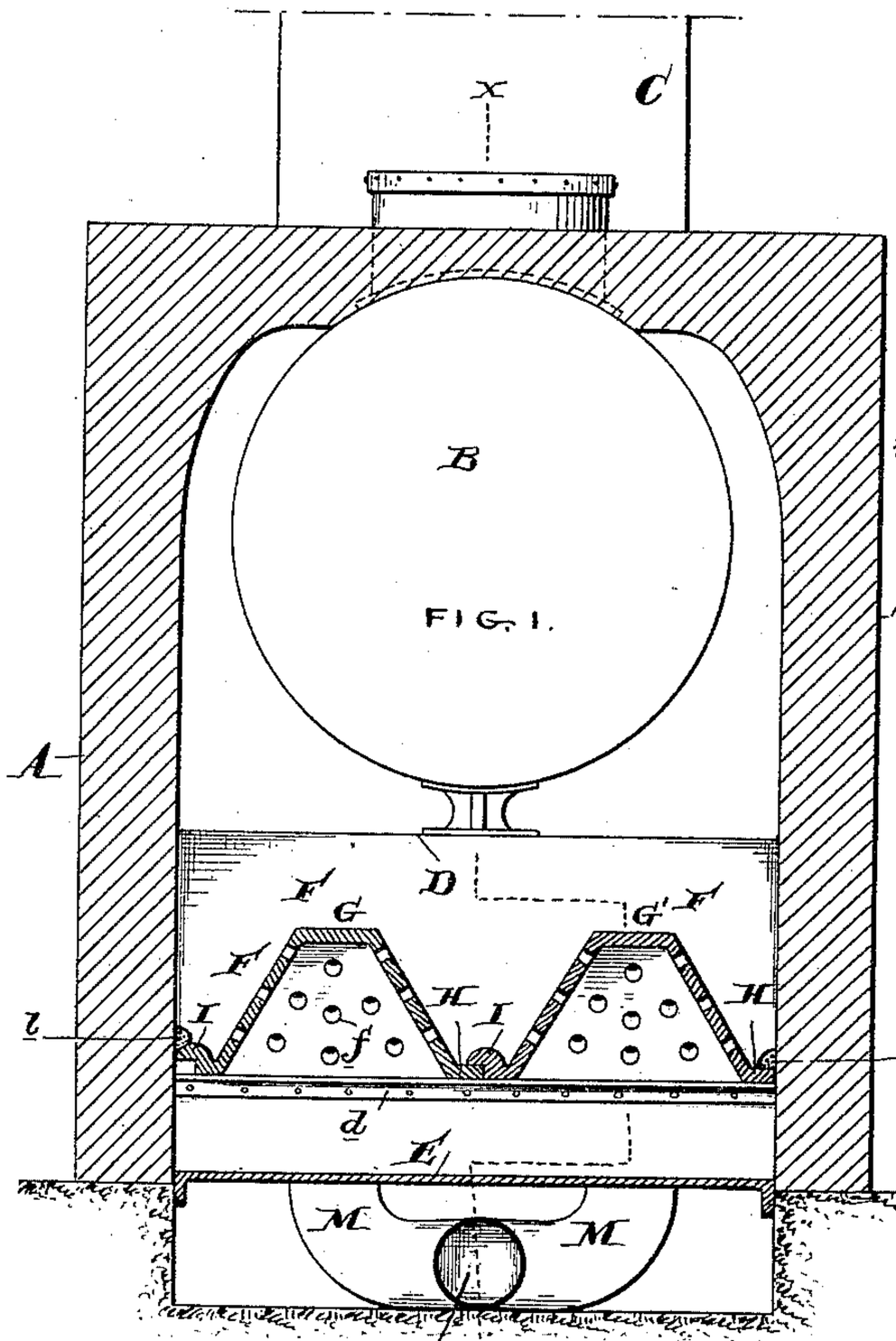

FIG. 1.

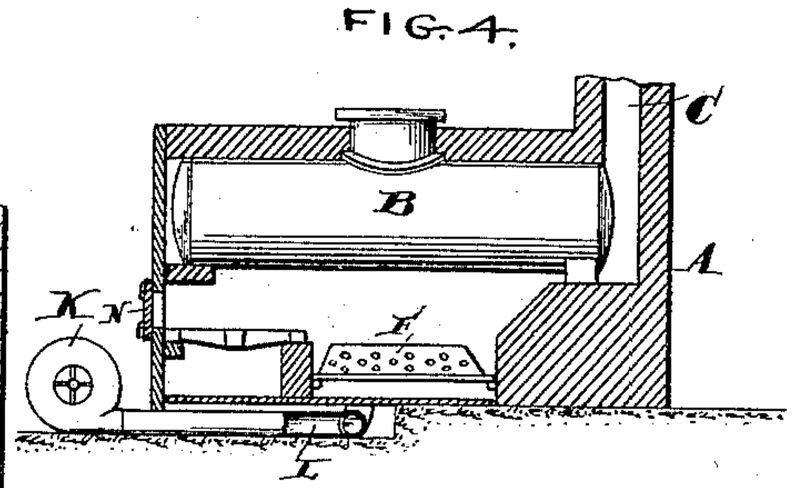

FIG. 4.

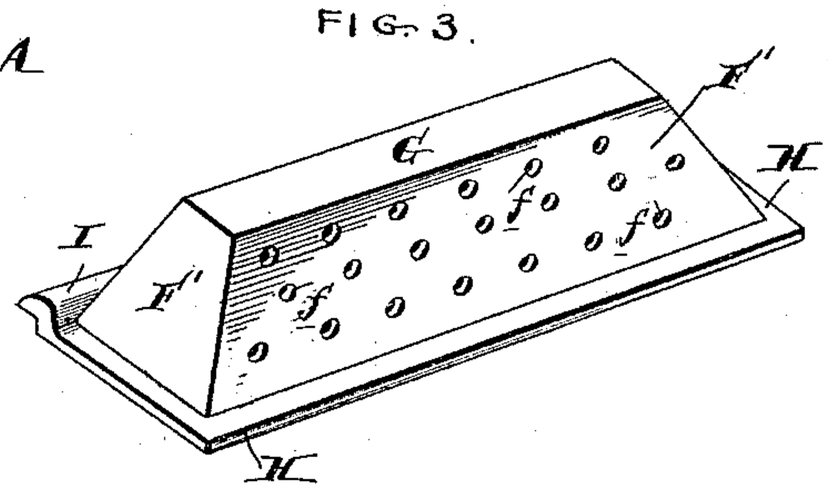

FIG. 3.

FIG. 2.

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HENRY L. HILDRETH, OF SAGINAW, MICHIGAN.

SAWDUST-BURNER.

SPECIFICATION forming part of Letters Patent No. 409,285, dated August 20, 1889.

Application filed April 17, 1889. Serial No. 307,541. (No model.)

To all whom it may concern:

Be it known that I, HENRY L. HILDRETH, of Saginaw, county of Saginaw, and State of Michigan, have invented an Improvement in Sawdust-Burners, of which the following is a specification.

My invention relates to sawdust-burners; and it consists of certain improvements, which are fully set forth in the following specification and shown in the accompanying drawings.

Heretofore it has been found difficult to construct a practically successful sawdust-furnace for the purpose of generating steam in sufficient quantities for practical use and in an economical manner. In saw-mills and places where there is a large quantity of waste wood and sawdust it is highly desirable to utilize the sawdust and waste wood as fuel for the purpose of generating steam to run the mills. While more or less success has been obtained with the sawdust of soft wood—such as pine—it has been impossible to successfully utilize hemlock and hard-wood sawdust—such as oak, elm, maple, ash, &c.—from which a sufficiently hot fire has not heretofore been obtained.

The object of my invention is to overcome this difficulty and to produce a practically successful sawdust-furnace for burning any kind of sawdust and obtaining therefrom sufficient heat for the generation of steam in sufficient quantities. This I accomplish by the construction and arrangement of my grate, whereby a large grate-surface is obtained, and by the employment of a forced draft through the grate, as is hereinafter more fully described.

In the drawings, Figure 1 is a vertical sectional view of my improved sawdust-burner, on an enlarged scale, through the line *y y* of Fig. 2. Fig. 2 is a longitudinal sectional view through the line *x x* of Fig. 1. Fig. 3 is a perspective view of one of my improved grate-bars; and Fig. 4 is a longitudinal sectional view of a sawdust-burner, illustrating a modified arrangement of the parts.

A are the walls of the furnace, in which the boiler B is supported in the usual manner.

C is the smoke-stack.

D is a wall or abutment to support the grates.

E is the hearth.

F are the grate sections or bars, supported upon suitable supports *a* and *d*, located, respectively, on the front wall and on the abutment or wall D. These grate sections or bars are formed, preferably, in the inverted box or trough shape, as shown, having the upwardly-extending and inwardly-inclining walls F and the flat top G. These walls are provided with perforations or holes *f*. I prefer, however, to form the forward end walls and the top walls unperforated, as shown, to prevent clogging of the grate and blowing of the flames and out through the furnace-door.

The object of forming the grate sections or bars in the manner described is to obtain a larger and more effective grate-surface, and it is apparent that the particular shape shown may be varied in many ways without departing from the principles of my invention. Thus, the walls might be arched or V-shaped in cross-sections.

H is a rim about the base of the grate section or bar, which is adapted to fit closely against the walls of the furnace and the rim of the adjacent section. I prefer to construct one side of the rim with a ledge or flange I, which is adapted to fit over the rim of the adjacent section to prevent a draft through any openings between the adjacent sections or bars.

Any number of sections may be used, arranged side by side, as shown, with the flanges I fitting over the rims of the adjacent sections. The side edges where the rims H come in contact with the walls A and D should be luted, preferably with fire-clay, as shown at *l*. By this means and by the flanges or ledges I the passage of air through the grate is entirely prevented, except through the holes or perforations *f*.

K is a blower.

L is a pipe leading from the blower K and opening under the grate. I prefer to lead the air directly under each grate-section F by means of branch pipes M, with an extended grate-surface formed of a number of grate-sections. It is apparent that a number of boilers may be used.

The sawdust is introduced through a door or opening N, or in any other convenient manner. I prefer to have the grate sections

or bars F set low in the fire-box, as thereby a large fuel-space is obtained. The sawdust is placed through the door N upon the grate formed of the sections of the bars F, or, when a number of boilers are used, it may be introduced from the top between the boilers. By means of the blower K a draft is forced through the holes or perforations *f* and through the fuel, which is caused thereby to burn with a great heat, the luting of the sides and ends with fire-clay, as heretofore described, preventing the passage of air except through the holes or perforations *f*. The products of combustion pass off through the stack C.

In Fig. 4 is shown a modification in which my improved burner is employed in combination with the usual grate and fire-box. In this arrangement my improved sawdust-burning grate is arranged behind the ordinary grate O and preferably slightly lower, so that the larger pieces of wood and lumber may be burned on the grate O, and the sawdust and smaller pieces falling upon the grate F will be there consumed in the manner heretofore described.

While I prefer the details of construction here shown, I do not limit my invention thereto, as it is apparent that they may be varied in many ways without departing from the principles of my invention.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a sawdust-burner, the combination, with the fire-box, of a grate for the sawdust supported in said fire-box, having raised portions provided with holes or perforations, and having its edges in contact with the sides of said fire-box luted to make a tight joint, substantially as and for the purpose specified.

2. In a sawdust-burner, the combination, with the fire-box, of a grate consisting of a number of sections supported in the fire-box, said sections being provided with raised perforated portions and overlapping each other on adjacent edges to form substantially air-tight contact.

3. A grate-section for a sawdust-burner, consisting of a hollow box adapted to be supported over the hearth and having its bottom open thereto, provided with upwardly-inclining side walls and a flat top to support the fuel during combustion, and provided with holes or perforations in said side wall opening into the body of the fuel supported upon the section, said section being closed to the passage of air except through said holes, substantially as and for the purpose specified.

4. A grate-section for a sawdust-burner, consisting of a hollow box having upwardly-inclining side walls and a flat top, holes or perforations in said side walls, and a rim or flange about the base of said grate-section for the purpose of supporting it within the fire-box.

5. A grate-section for a sawdust-burner, consisting of a hollow box, upwardly-inclining side walls, and a flat top, holes or perforations in said side walls, a rim or flange about the base of said grate-section for the purpose of supporting it within the fire-box, and a projecting ledge upon one side of said rim or flange, adapted to fit over the rim or flange of the adjacent grate, to form substantially air-tight connection between them.

In testimony of which invention I hereunto set my hand.

HENRY L. HILDRETH.

Witnesses:
C. C. STEVENS,
C. H. MCARTHUR.