(No Model.) 2 Sheets—Sheet 1.

G. W. WOOD.

FURNACE.

No. 458,207. Patented Aug. 25, 1891.

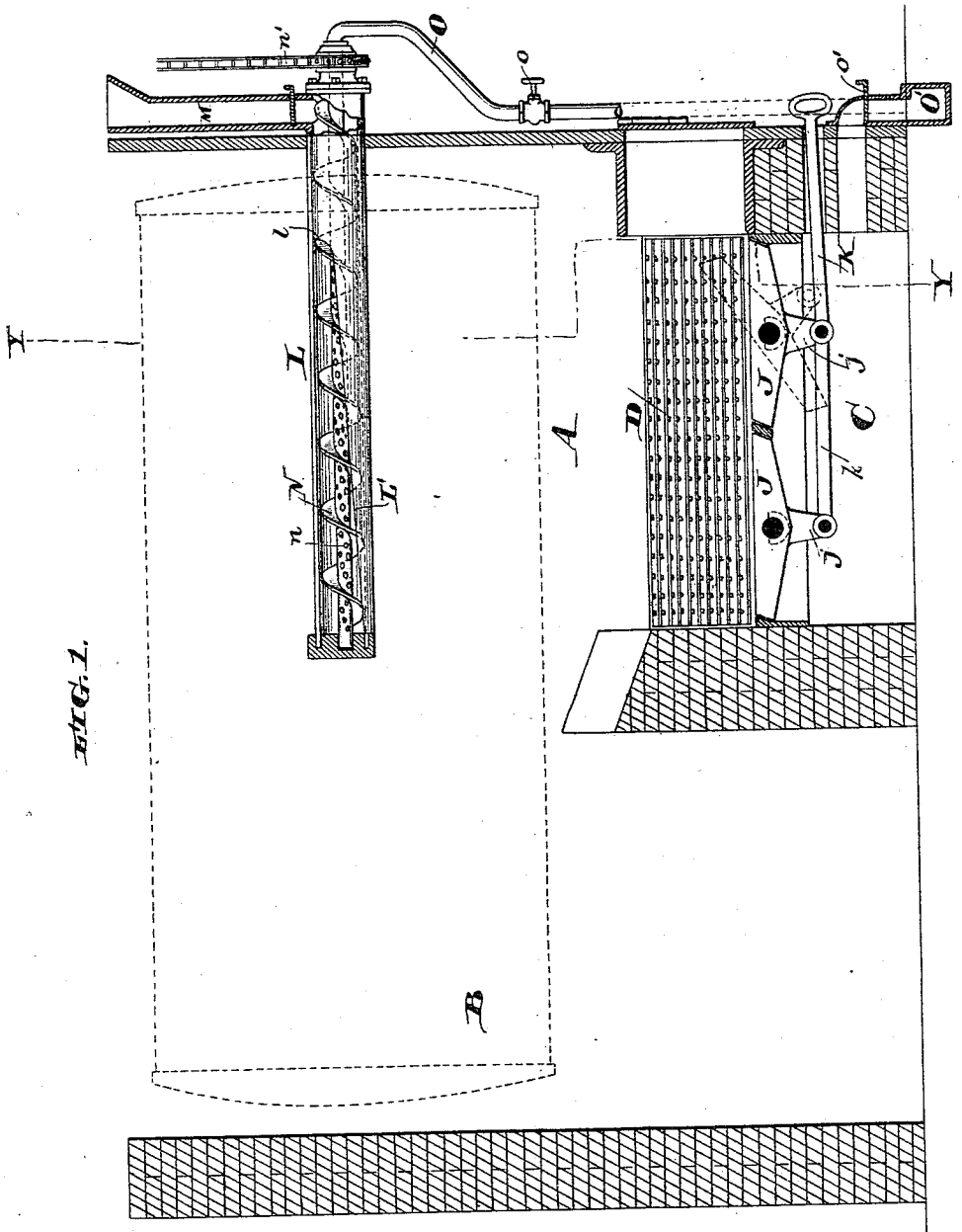


FIG. 1.

Witnesses:
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Joshua Wallack, Jr.

Inventor:
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by his atty.
Francis T. Chamberlain

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

G. W. WOOD.

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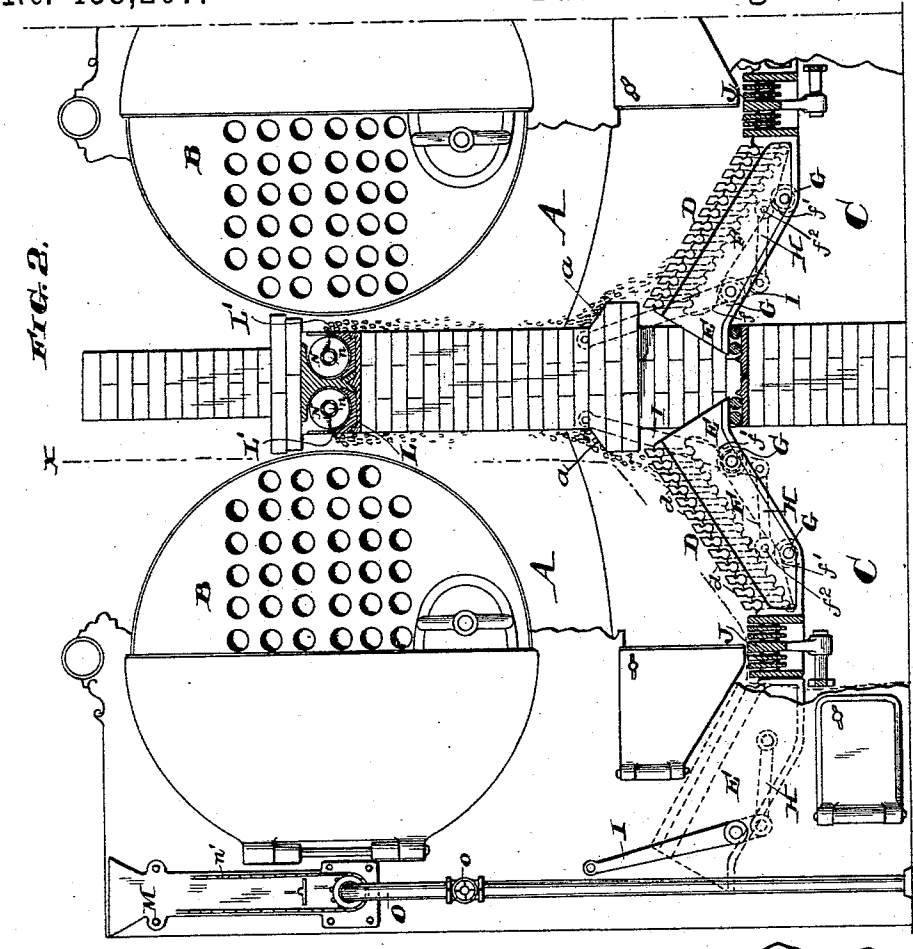


FIG. 2.

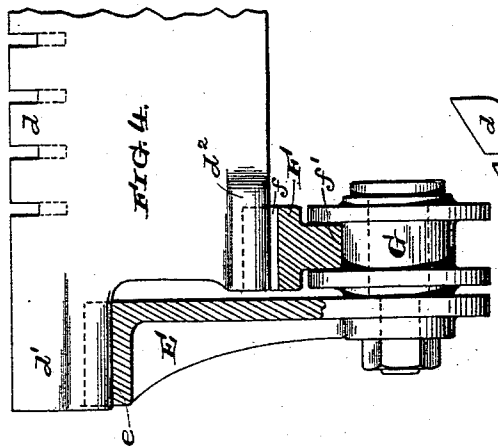


FIG. 4.

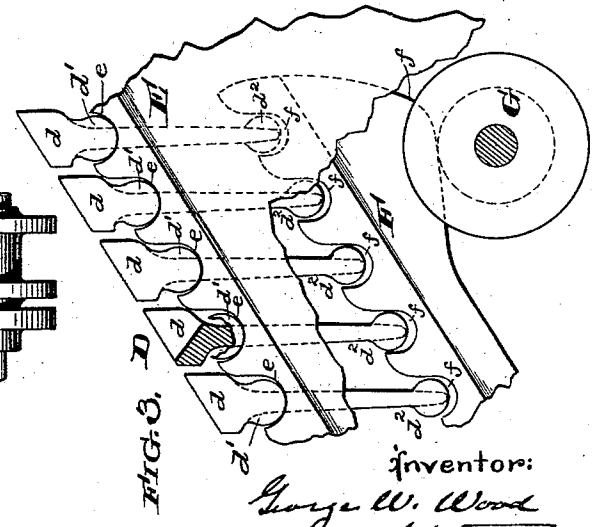


FIG. 3.

Witnesses:
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UNITED STATES PATENT OFFICE.

GEORGE W. WOOD, OF PHILADELPHIA, PENNSYLVANIA.

FURNACE.

SPECIFICATION forming part of Letters Patent No. 458,207, dated August 25, 1891.

Application filed July 28, 1890. Serial No. 360,179. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. WOOD, of the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Furnaces, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to boiler-furnaces, and has for its object to provide improved means for feeding and burning finely-divided carbonaceous material such as small coal and coal-waste.

The nature of my improvements will be best understood as described in connection with the drawings, in which they are illustrated, and the novel features which I desire to protect by these Letters Patent are hereinafter clearly set forth in the claims.

Reference is to be had to the drawings which illustrate my invention, and in which—

Figure 1 is a longitudinal section through a boiler-furnace provided with my improvements, taken on the irregular line *x x* of Fig. 2. Fig. 2 is a front elevation showing two adjacent furnaces, partly in section on the irregular line *y y* of Fig. 1, and Figs. 3 and 4 are views showing details of the construction of the grate on an enlarged scale.

A is the boiler-furnace; B, a boiler situated therein; C, the ash-pit; D, inclined grates extending downward from each wall of the furnace to a dumping-grate J, situated at or near the center thereof. The inclined grate-surfaces D are made up of a series of bars constructed and arranged in the way best shown in Figs. 3 and 4. These bars, the head *d* of which make up the inclined grate-surfaces, are each provided with trunnions *d'*, which rest in an inclined support E, bearings *e e*, &c., being provided for each trunnion. A portion d^2 of the grate-bars extends downward below the trunnion, and the extremity of this downwardly-extending portion is engaged in bearings *f f*, &c., of a reciprocating bar F, which bar rests upon idler-pulleys G G, by means of properly-shaped extensions *f'*, which cause the bars to move up and down at the same time that they are reciprocated longitudinally. The reciprocation of these bars F is accomplished by means of levers I and connecting-rods H. The dumping-grate in the center consists of pivoted grate-bars J, which are dumped by means of extensions *j*, to which an operating-rod K is attached. (See Fig. 1.) L L are fuel-boxes extending longitudinally through the furnaces above the grate, and, as shown, built into the side wall of the furnace. These boxes are provided with a front wall L' of greatly-decreasing height from front to back, and are connected at their front ends with a feed-chute M, through which culm or other small fuel is fed into them. They are also provided with conveyers, which draw the fuel from the chute through the boxes, a portion of it falling over the inclined wall L', which at the further extremity vanishes in the bottom of the box, so that all the fuel is delivered from the fuel-box and throughout the operative length thereof, which in the construction shown begins at the point *l* and extends to the extreme rear of the box. I also prefer to lead an air-blast into the box, so as to provide for combustion on the same level at which the finely-divided fuel is fed to the furnace. This air-blast thus led through the fuel-box L, I have found to give greatly improved results in the economical combustion of gases and pulverized particles of fuel mixed with the culm. As shown in the drawings, my preferred method of feeding the culm through the fuel-box and into the furnace is by means of a spiral conveyer N, operated by means of a sprocket-wheel on its outer extremity and a chain *n'*. The shaft *n* of this conveyer I make hollow and full of perforations, and I connect the hollow shaft with an air-blast pipe O, so that the air is forced into the hollow shaft of the conveyer and issues through the perforations therein into the box L, whence it passes over the inclined wall L' to the interior of the furnace-chamber.

O' indicates a blast-pipe leading into the bottom of the furnace, and *o o'* are regulating-valves.

In connection with my improved fuel-feeding device I prefer to use a furnace-grate of the general construction shown and above described—that is, with downwardly-converging grate-surfaces extending from each wall toward the center; and I prefer to place between the top of the grate-surface and the fuel-box a deflecting-surface—such as *a*, Fig. 2—upon which the fuel will fall from the box and

which will tend to scatter it over the adjacent inclined grate-surface. This construction of the grate-surface I believe will give the best results in connection with my feeding-device.

The invention covered by the claims in this case is exhibited but not claimed in another application filed by me October 23, 1890, Serial No. 369,036.

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

1. In a furnace, the fuel-box L, having a wall L′ of gradually-decreasing height arranged along the inside of the furnace, in combination with a supply-chute leading into the end of the fuel-box and a conveyer situated and operating in said box, as described, and so as to draw the fuel through said box and feed it over the top of wall L′.

2. In a furnace, the fuel-box L, having a wall L′ of gradually-decreasing height arranged along the inside of the furnace, in combination with a supply-chute leading into the end of the fuel-box, an air-blast pipe leading into the fuel-box, and a conveyer situated and operating in said box, as described, and so as to draw the fuel through said box and feed it over the top of wall L′.

3. In a furnace, the combination of inclined grates, as D D, converging downward from the side walls thereof, fuel-boxes L L, situated in or along the walls and having walls L′ of gradually-decreasing height, supply-chutes leading to said boxes, and conveyers situated and operating in the boxes as described.

4. In a furnace, the combination of inclined grates, as D D, converging downward from the side walls thereof, fuel-boxes L L, situated in or along the walls and having walls L′ of gradually-decreasing height, inclined deflectors, as *a a*, situated beneath the fuel-boxes and above the top edges of the inclined grates, supply-chutes leading to said boxes, and conveyers situated and operating in the boxes, as described.

5. In a furnace, a fuel-box L, having a wall L′ of gradually-diminishing height, a supply-chute leading into said box, a spiral conveyer N, situated and working in the box and having a hollow perforated shaft, and an air-blast pipe leading into the hollow conveyer-shaft, all substantially as and for the purpose specified.

GEORGE W. WOOD.

Witnesses:
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