

No. 708,116.

Patented Sept. 2, 1902.

M. P. BOSS.
IRON BLAST FURNACE.

(Application filed July 18, 1901.)

(No Model.)

2 Sheets—Sheet 1.

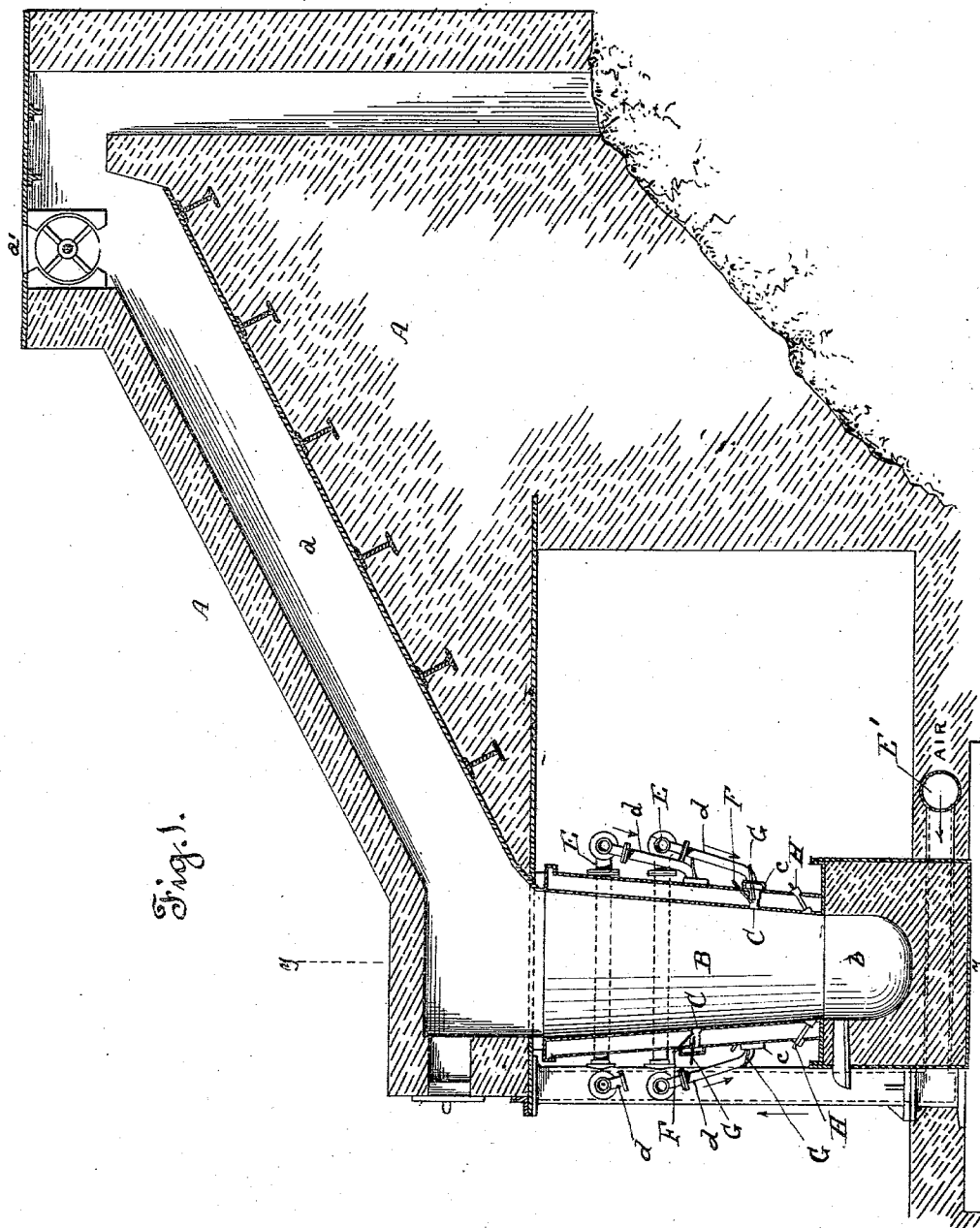


Fig. 1.

Witnesses.

J. H. Monteverde.
Walter E. Vane.

Inventor.

Martin P. Boss.
by H. J. Booth
his Attorney.

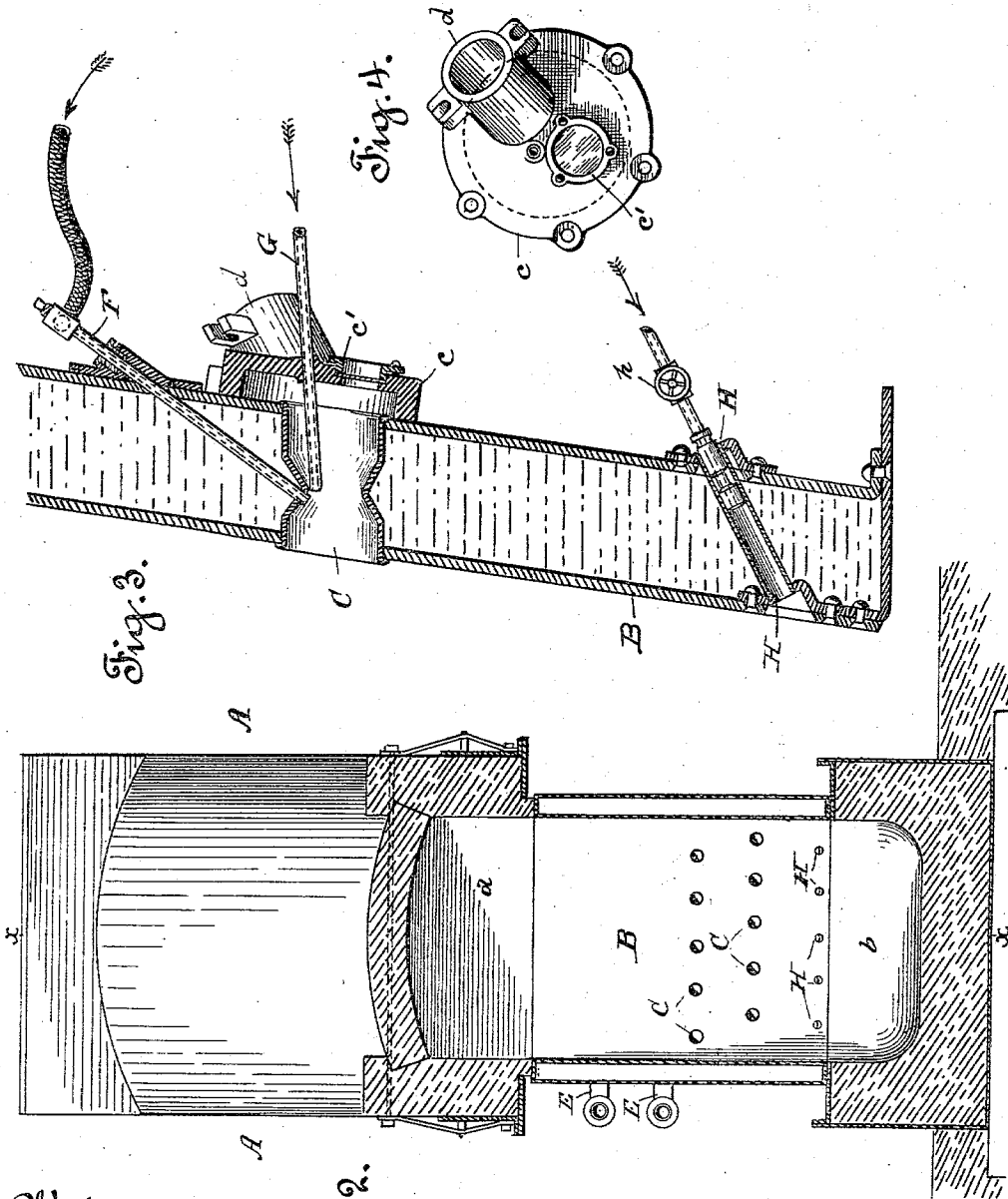
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2 Sheets—Sheet 2.



Witnesses.
Walter D. Vance
(Walter D. Vance.)

Fig. 2.

Inventor.
Martin P. Boss,
by *Wm. F. Booth*
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UNITED STATES PATENT OFFICE.

MARTIN PRIOR BOSS, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO
HYDRO-CARBON SMELTING CO., OF NEW YORK, N. Y., A CORPORATION OF WEST VIRGINIA.

IRON BLAST-FURNACE.

SPECIFICATION forming part of Letters Patent No. 708,116, dated September 2, 1902.

Application filed July 13, 1901. Serial No. 83,738. (No model.)

To all whom it may concern:

Be it known that I, MARTIN PRIOR BOSS, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Iron Blast-Furnaces; and I do hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to blast-furnaces; and it has for its object the adaptation of such furnaces for liquid hydrocarbon fuel, especially the heavier oils, such as crude petroleum.

The essential feature of my invention consists in the introduction to the shaft or fire-room, in a plane below that at which the air-blast is introduced, of a supply or feed of liquid hydrocarbon fuel or the vapor therefrom to effect the carbonizing and by the regulation of this supply or feed to obtain at will a product of cast-iron or of steel.

It also consists in the novel combination, with the air-blast twyers, of the main oil or gas feed and spraying-jet and in their combination in the furnace with the carbonizing-feed below, all as I shall now more fully describe by reference to the accompanying drawings, in which—

Figure 1 is a vertical section of my furnace on line *x x* of Fig. 2. Fig. 2 is a section on line *y y* of Fig. 1. Fig. 3 is an enlarged vertical section of one wall of the shaft or fire-room. Fig. 4 is a front view of the air-blast or twyer cap.

A is the masonry of the furnace, formed with the inclined feed-tunnel *a*, with a mouth and suitable feed *a'* at its upper end and terminating at its lower end in the vertical water-jacketed shaft or fire-room B, having at its base the crucible or hearth *b*.

C represents the air-blast twyers, fitted in the shaft-walls and opening into the interior. There may be as many of these as desired. I have here shown a number both on the front and back walls of the shaft and in two planes or rows, so that they are evenly and fully distributed. Over the outer end of each twyer is secured a cap *c*, Figs. 3 and 4, with which the branch *d* from the air-pipes E, Figs. 1 and 2, communicates, said air-pipes being supplied from the main E' below. A removable

cap *c'* on cap *c* affords access to the twyer, Figs. 3 and 4.

Fitted in the shaft-wall is the feed device F for the oil or gas. There is one of these near each twyer. It is fitted at a downward inclination and opens at its lower end into the twyer, near the inner end of the latter. It receives its supply of oil from any suitable source.

Fitted to each twyer-cap *c* is a pipe G, which extends into the twyer and terminates in such position with relation to the oil-feeder F that a jet of compressed air derived from proper source meeting the oil will properly spray it into the shaft B.

Fitted in the walls of shaft B in a plane below the twyers are feeders H in suitable numbers, which are connected with an oil-supply. (Not shown.) These feeders are of suitable character and are adapted to supply the oil or the vapor therefrom to the shaft below the air-blasts, thereby providing the fuel to carburize the iron. The feed through these feeders H may properly be regulated through the medium of suitable cocks *h* or otherwise, as found expedient.

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

1. In a blast-furnace, a water-jacketed fire-chamber, a twyer extending therethrough, an oil-feeder inserted through the water-jacket of said chamber and communicating with the interior of the twyer at a point intermediate of its ends, and an air-feeder projecting into the twyer, and adapted to discharge at a point adjacent to the point of discharge from the oil-feeder.

2. In a blast-furnace, a water-jacketed fire-chamber, a twyer extending therethrough, an inclined oil-feeder projecting through the outer wall of said chamber and into the upper portion of the twyer at a point intermediate of its ends, and an air-feeder projecting into the said twyer and arranged to discharge at a point adjacent to the point of discharge from the oil-feeder.

3. In a blast-furnace, a fire-chamber, a twyer extending through the wall thereof, an oil-feeder projecting through said wall at a

point above the twyer and arranged to discharge thereinto, and an air-feeder arranged longitudinally of the twyer and projecting thereinto from the outer end thereof, said
5 feeder being arranged to discharge at a point adjacent to and below the point of discharge from the oil-feeder.

4. In a blast-furnace having an air-blast twyer extending through the wall thereof, an
10 oil-feeder inserted through the wall of said twyer, a cap-plate *c* fitting over the outer end of the twyer and an air-feeder projecting into the twyer through said cap-plate and adapted to discharge at a point adjacent the discharge
15 from the feeder at an angle thereto, substantially as described.

5. In a blast-furnace having an air-blast twyer extending through the wall thereof, an
20 oil-feeder inserted through the wall of said twyer, a relatively flat cap-plate fitting over the outer end of the twyer and an air-feeder projecting into the twyer through said cap-plate and adapted to discharge at a point adjacent the discharge from the feeder at an angle
25 thereto, and a removable auxiliary cap covering an opening in the cap-plate in alinement with the twyer, substantially as described.

6. In a blast-furnace, a water-jacketed fire-chamber, air-blast twyers *C* extending
30 through and supported at opposite ali-

points in the opposite walls of said chamber, oil-feeders passing through the water-jacket of said chamber and leading into said twyers and valved feeder-pipes *H* below said twyers *C* also extending through and supported at
35 alined points in the opposite walls of the water-jacket, substantially as described.

7. In a blast-furnace, a water-jacketed fire-chamber, a twyer extending therethrough, and oil and air feeders associated with said
40 twyer and projecting thereinto and arranged to discharge into the fire-chamber, said oil-feeder passing through the water-jacket of said chamber, substantially as described.

8. In a blast-furnace, a water-jacketed fire-
45 chamber, an air-blast twyer *C* extending through and supported in the opposite walls of said chamber, an oil-feeder passing through the water-jacket of said chamber and leading into said twyer, and a second feeder-pipe *H*
50 below said twyer and also extending through the water-jacket of the fire-chamber and arranged to discharge into said fire-chamber, substantially as described.

In witness whereof I have hereunto set my
55 hand.

MARTIN PRIOR BOSS.

Witnesses:

C. F. PATTON,
IRA C. BOSS.