

(No Model.)

J. DOUGLAS.
SMELTING FURNACE.

No. 579,705.

Patented Mar. 30, 1897.

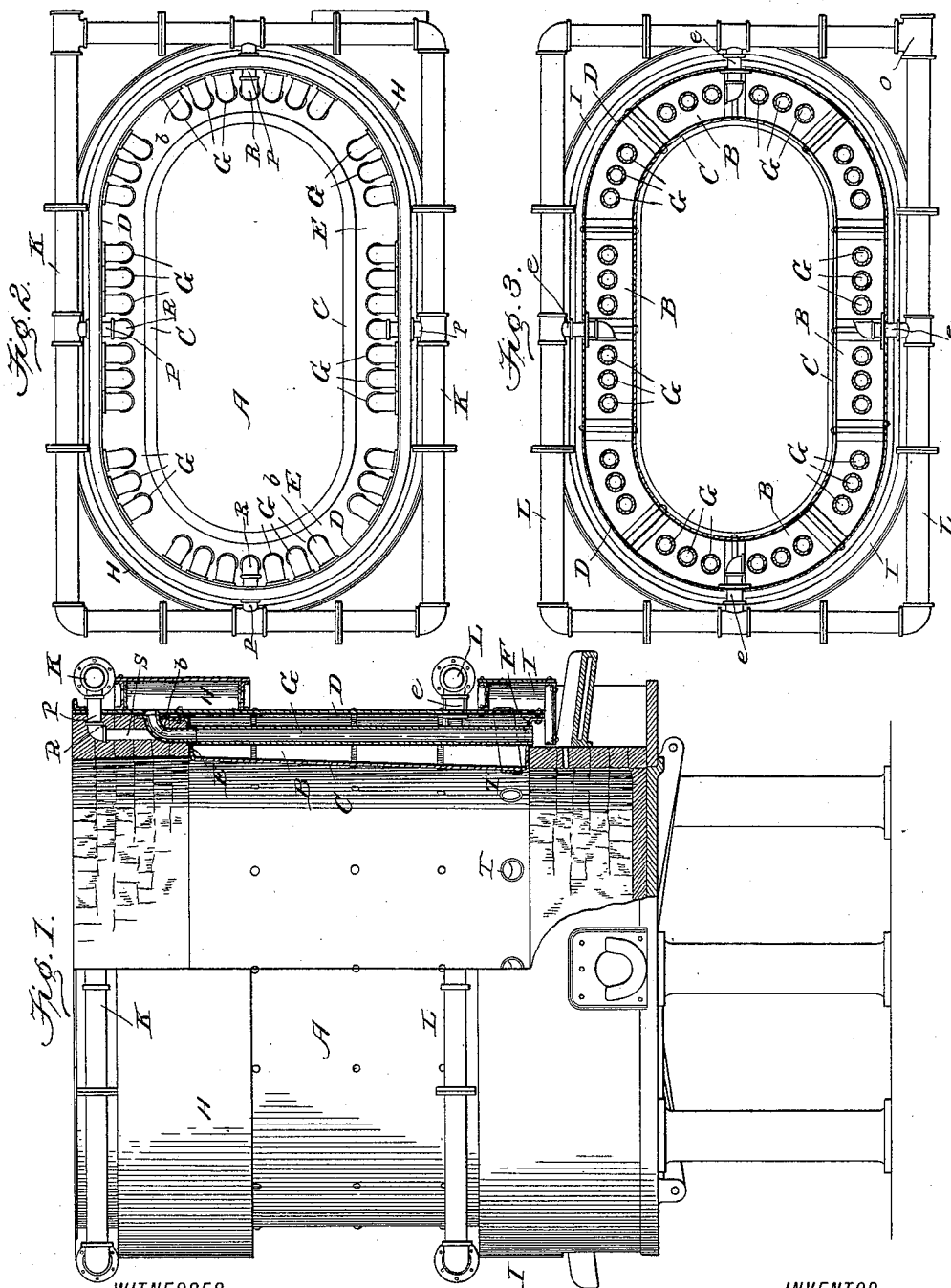


Fig. 1.

Fig. 3.

Fig. 2.

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SMELTING-FURNACE.

SPECIFICATION forming part of Letters Patent No. 579,705, dated March 30, 1897.

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To all whom it may concern:

Be it known that I, JAMES DOUGLAS, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Smelting-Furnaces; and I do hereby declare that the following is 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, reference being had to the accompanying drawings, which form a part of this specification.

My invention has relation to improvements in water-jacketed smelting-furnaces, and the object is to reduce the cost of operating and at the same time to increase the efficiency of the same; and to these ends the novelty consists in the construction, combination, and arrangement of the same, as will be hereinafter more fully described, and particularly pointed out in the claims.

In the accompanying drawings the same reference-letters indicate the same parts of the invention.

Figure 1 is a side elevation, partly in section, of my improved smelting-furnace. Fig. 2 is a plan view with the top bricks removed. Fig. 3 is a horizontal section above the twyers.

A represents the body of the furnace, consisting of the inner and outer shells C and D, separated by the stay-bolts *a a* to form the usual water-jacket space B.

H represents the upper wind-box surrounding the upper ends of the water-jacket space B, and this wind-box H communicates with an annular series of vertical pipes G G by means of the elbows *b b*. The said pipes G G extend downwardly the entire length of the water-jacket space B, through its bottom F, and communicate with the interior of a second lower wind-box I, from which the blast passes inwardly through the twyers T into the furnace.

K represents the water-inlet pipe, which receives its supply through the coupling N, the water passing through said pipe K and through the branch pipes P P, elbows R R, and vertical pipes S S to the water-jacket space B, which it completely fills, thereby surrounding the vertical air-blast pipes G G.

A pipe L extends completely around the outside of the lower ends of the water-jacket space B and communicates therewith by a series of short branch pipes *e e*, by means of which the water is drawn from the water-jacket space B and discharged through outlet connection O.

From the above construction it will be seen that the temperature of the water in the water-jacket space is considerably lowered by the cold-air blast passing through the series of blast-pipes G, extending through the entire length of the water-jacket space. At the same time the heat abstracted from the water is utilized to raise the temperature of the air-blast, in which condition it is conveyed through the lower wind-box I and twyers T to the interior of the furnace, whereby the benefits of a hot blast are received.

While I have particularly described a specified means of carrying out my invention, I do not wish to be confined to the same, as various modifications will readily suggest themselves to those skilled in the art without departing from the spirit thereof.

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

1. A smelting-furnace comprising the inner and outer shells C D forming a vertical water-jacket B, the upper wind-box H, surrounding the upper part of the water-jacket, a series of vertical wind-pipes G G extending entirely through said water-jacket, a series of elbows *b b* connecting the upper ends of said vertical wind-pipes with the upper wind-box, in combination with the lower wind-box I, surrounding the lower end of said water-jacket, and in communication with the lower ends of said vertical wind-pipes, and a series of twyers T, extending through the lower end of said water-jacket and having one end opening into said lower wind-box, and the other end into the furnace, substantially as shown and described.

2. A smelting-furnace, comprising the inner and outer shells C D, forming a water-jacket B, a series of vertical wind-pipes G G passing entirely through said water-jacket, a water-inlet pipe K, surrounding the upper ends of said water-jacket, a series of branch pipes P,

elbows R and vertical pipes S, connecting said inlet-pipe K, with the upper end of said water-jacket, in combination with the outlet-pipe L surrounding the lower portion of said water-jacket and a series of branch pipes *e* connecting said water-jacket with said outlet-pipe, substantially as shown and described.

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

JAMES DOUGLAS.

Witnesses:

GEORGE CHAPMAN,
CHAS. A. AUSTIN.