

(No Model.)

J. H. WHITING.
CUPOLA FURNACE.

No. 526,914.

Patented Oct. 2, 1894.

Fig. 1.

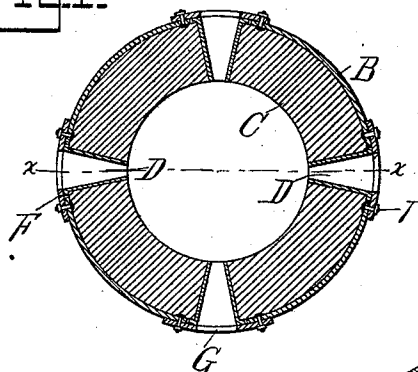


Fig. 2.

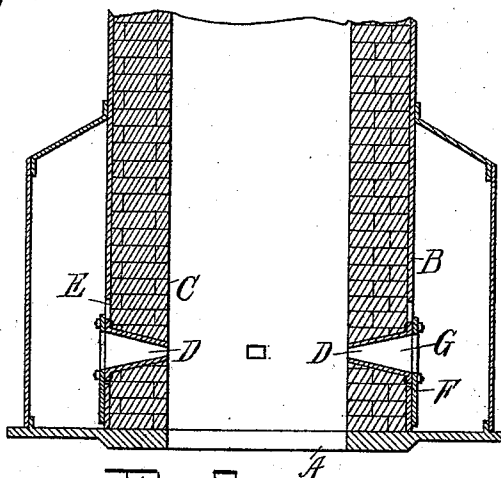


Fig. 4.

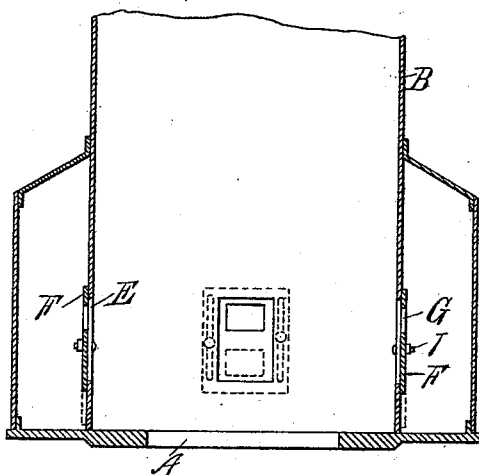
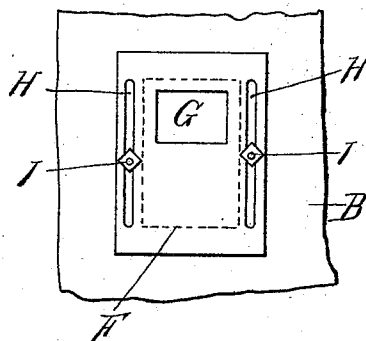


Fig. 3.



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UNITED STATES PATENT OFFICE.

JOHN H. WHITING, OF DETROIT, MICHIGAN.

CUPOLA-FURNACE.

SPECIFICATION forming part of Letters Patent No. 526,914, dated October 2, 1894.

Application filed March 26, 1894. Serial No. 505,092. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. WHITING, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Cupola-Furnaces, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates more specifically to a cupola furnace in which the tuyeres may be adjusted higher up or lower down, and the object of my invention is to devise a construction of cupola in which this may be done
15 more conveniently than at present. For instance, in a stove foundry or a foundry where the iron is running almost continuously it is the rule to hold but a small quantity of iron in the cupola and the tuyeres are placed at a comparatively small distance above the bed.
20 In other work, as in car wheel foundries, these tuyeres are placed at a greater distance, sometimes two feet or more, above the bed in order that the cupola may hold a large quantity of
25 melted iron before tapping. It is also desirable that in a cupola having a small diameter, in small heats, that the tuyeres be placed lower down than in a larger diameter, and it sometimes happens that purchasers buy a
30 large cupola and put in a double lining and expect to take out some of this lining as they require to increase the capacity of cupola duty. For this reason it is desirable that the
35 tuyeres can be placed low down when the inside of the cupola is to be small or at a greater height when the inside diameter is to be increased.

In some localities where foundries are now using coal it may become desirable in the
40 future to use coke. When coal is used, in order to reduce as much as possible the amount of the fuel consumed to a given amount of iron, the tuyeres are placed low down, while when coke is used they are adjusted at a
45 greater height on account of the decreased specific gravity of the fuel. An arrangement therefore which will conveniently allow a vertical adjustment of the tuyeres without the necessity of chipping holes in the shell
50 (which is the only way it can be accomplished at present) constitutes a decided improvement in the construction of cupola furnaces.

To this end my invention consists in means for accomplishing this all as more fully herein-

after described and shown in the drawings, 55 in which—

Figure 1 is a horizontal section through a cupola furnace in the plane of the tuyeres. Fig. 2 is a cross section in line $x-x$. Fig. 3
60 is an outside view of one of the tuyeres. Fig. 4 is a similar view to Fig. 2 with the lining and tuyeres omitted.

A represents the bed of the cupola, B the shell, C the inner lining, and D the tuyere, all
65 arranged and constructed in the usual manner. Each tuyere is secured in an opening E in the shell, which opening is cut considerably larger, that is of a greater height, than the height of the tuyere. Over this opening
70 is placed a plate F in which is cut an opening G (or "tuyere hole") of the proper size to receive the end of the cast iron tuyere. On either side of this opening in the plate F are
75 vertical slots H, through which pass suitable bolts I, with suitable tightening nuts on the outside, to adjustably secure the plate F to the outside of the shell. By making this
80 provision in the construction of the cupola, it will be seen that in setting up a cupola, the tuyeres may be adjusted to any desired height within the limit of the opening in the outer
85 shell, and if desired to afterward change the position of the tuyeres, all that is required is to form new holes in the inner lining.

What I claim as my invention is— 85

1. In a cupola furnace, the combination with a permanent outer shell having a vertically elongated tuyere opening near its base, a vertically sliding plate having a relatively
90 smaller opening therein, means on the casing for adjustably securing the plate in place, and a tuyere arranged in line with the opening in the plate, substantially as described.

2. In a cupola furnace, the combination with a permanent outer casing having a vertically elongated tuyere opening therein, a
95 vertically sliding plate having a relatively smaller opening therein and vertical elongated slots in its side, bolts on the casing passing through the slots, nuts on the bolts
100 and a tuyere arranged in line with the opening in the plate, substantially as described.

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

JOHN H. WHITING.

Witnesses:

M. B. O'DOHERTY,
O. F. BARTHEL.