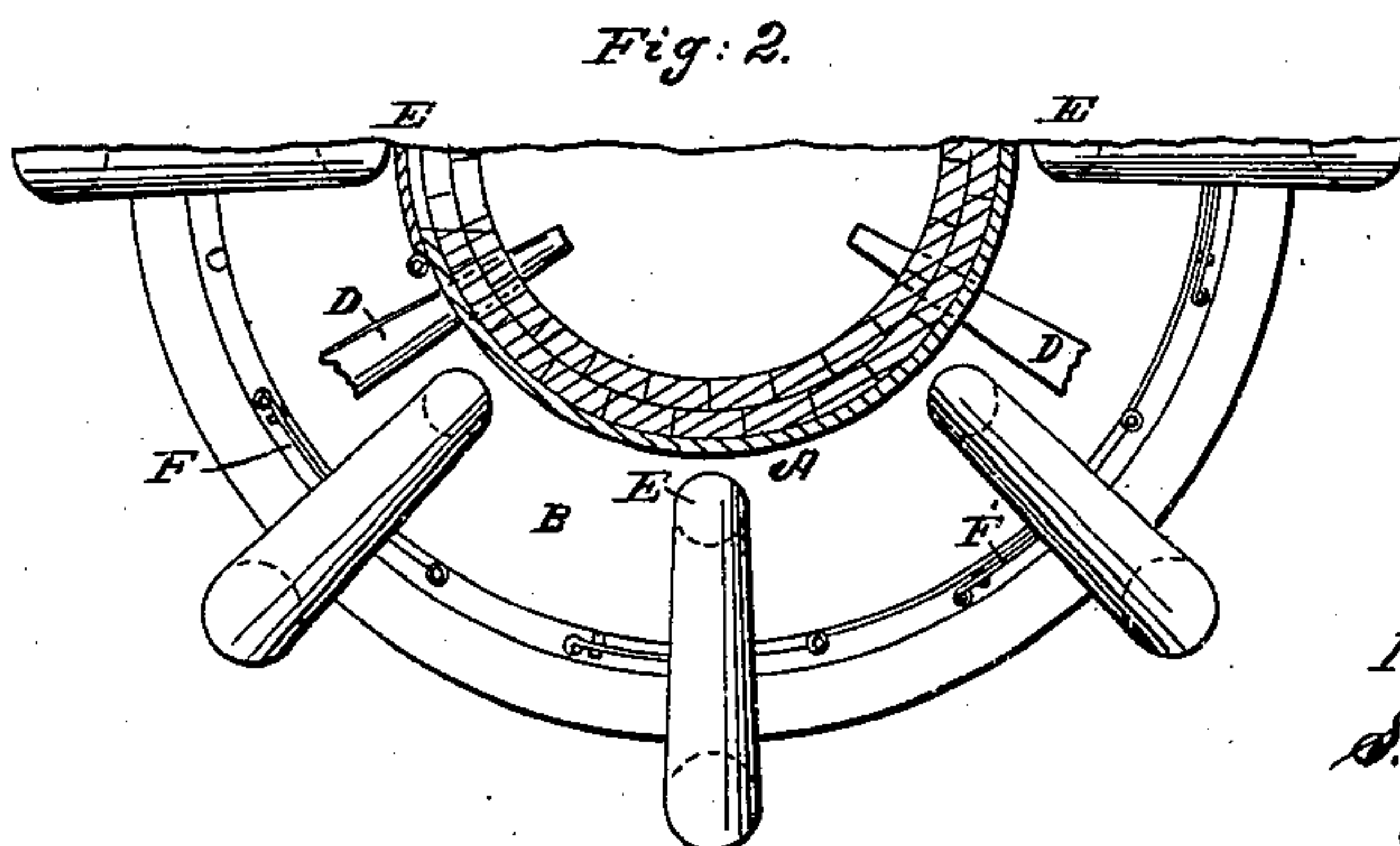
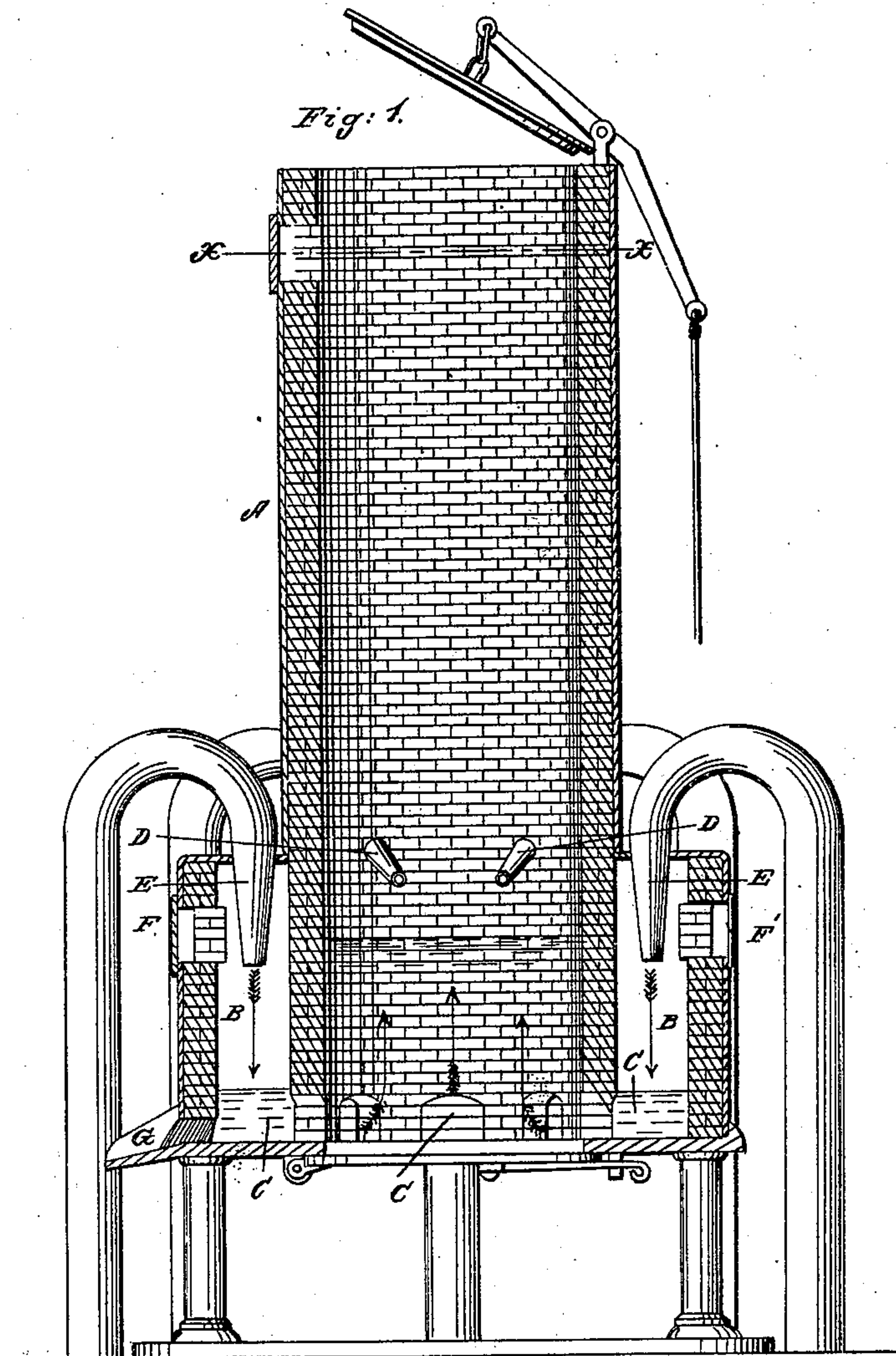


S. H. WHITAKER.
Decarbonizing Furnace.

No. 59,301.

Patented Oct. 30, 1866.



Witnesses:
J. H. Layman.
G. F. Hebbard.

Inventor:
S. H. Whitaker.
By his Attorneys,
Knight Bros.

UNITED STATES PATENT OFFICE.

SAMUEL H. WHITAKER, OF COVINGTON, KENTUCKY.

IMPROVED DECARBONIZING-FURNACE.

Specification forming part of Letters Patent No. 59,301, dated October 30, 1866.

To all whom it may concern:

Be it known that I, SAMUEL H. WHITAKER, of Covington, Kenton county, Kentucky, have invented a new and useful Furnace for Decarbonizing Iron; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the following drawings, making part of this specification.

My invention relates to that class of apparatus in which decarbonization of the crude iron is effected wholly or chiefly by the agency of injected currents of air upon the molten metal within or direct from the cupola or smelting-furnace; and the distinguishing features of my apparatus are—

First. The application to a cupola or other blast-furnace of an auxiliary blast or chamber, which I prefer to be annular in form and to surround the lower portion of the furnace proper.

Second. One or more tuyeres, which, entering the top of the auxiliary chamber, are directed downward toward the molten metal, but without contact therewith. My preferred arrangement of the tuyeres is in one or more opposite couples, so as to balance each other's action, and thus prevent any driving of the molten metal toward one side of the furnace.

Third. A descending blast of air, either hot or cold, through the auxiliary tuyeres of force sufficient to drive backward and traverse the molten contents of the auxiliary chamber.

Figure 1 is an axial section of a cupola embodying my improvement. Fig. 2 is a horizontal section of the same at the line *x x*.

A represents a cupola for the melting of pig-iron. B is an annular chamber tightly inclosed at the top and sides, and surrounding the lower portion of the cupola proper, with whose bottom it communicates by ducts C. D are two of a series of customary tuyeres.

The top of the auxiliary chamber B is traversed by one or more couples of opposite

tuyeres, E E', directed vertically, or nearly vertically, downward into the said chamber, but having their ventages at all times clear of the molten metal therein.

F F' are doors for the introduction of oxide of manganese, or other agents customarily used in the conversion of crude iron. G is a discharge-spout.

I have selected for illustration the form of auxiliary blast-chamber preferred by me, but reserve the right to modify the same in any manner that experience or circumstance may suggest—for example, a number of oppositely-arranged chambers may take the place of the single annular chamber B. A still inferior modification may include a single pit and tuyere on one side of the cupola.

Operation: The melting of the iron having been effected, the auxiliary blast is turned on with sufficient force to depress and maintain the molten metal to or near the level of the top of the ducts. Oxide of manganese or other chemical reagents may be employed as heretofore.

I claim herein as new and of my invention—

1. The inclosed auxiliary chamber or chambers B, communicating with the bottom of the furnace, and provided at the top with one or more downward-discharging tuyeres, placed out of contact of the molten metal, for the objects stated.

2. The annular blast-chamber B, which surrounds the lower portion of a blast-furnace, and is provided with one or more pairs of opposite and downwardly-directed tuyeres out of contact with the molten metal, substantially as set forth.

In testimony of which invention I hereunto set my hand.

SAML. H. WHITAKER.

Witnesses:

HENRY G. WEBBER,
JAMES H. LAYMAN.