

H. FAYETTE.
Cupola Furnace.

No. 70,329.

Patented Oct. 29, 1867.

Fig. 1.

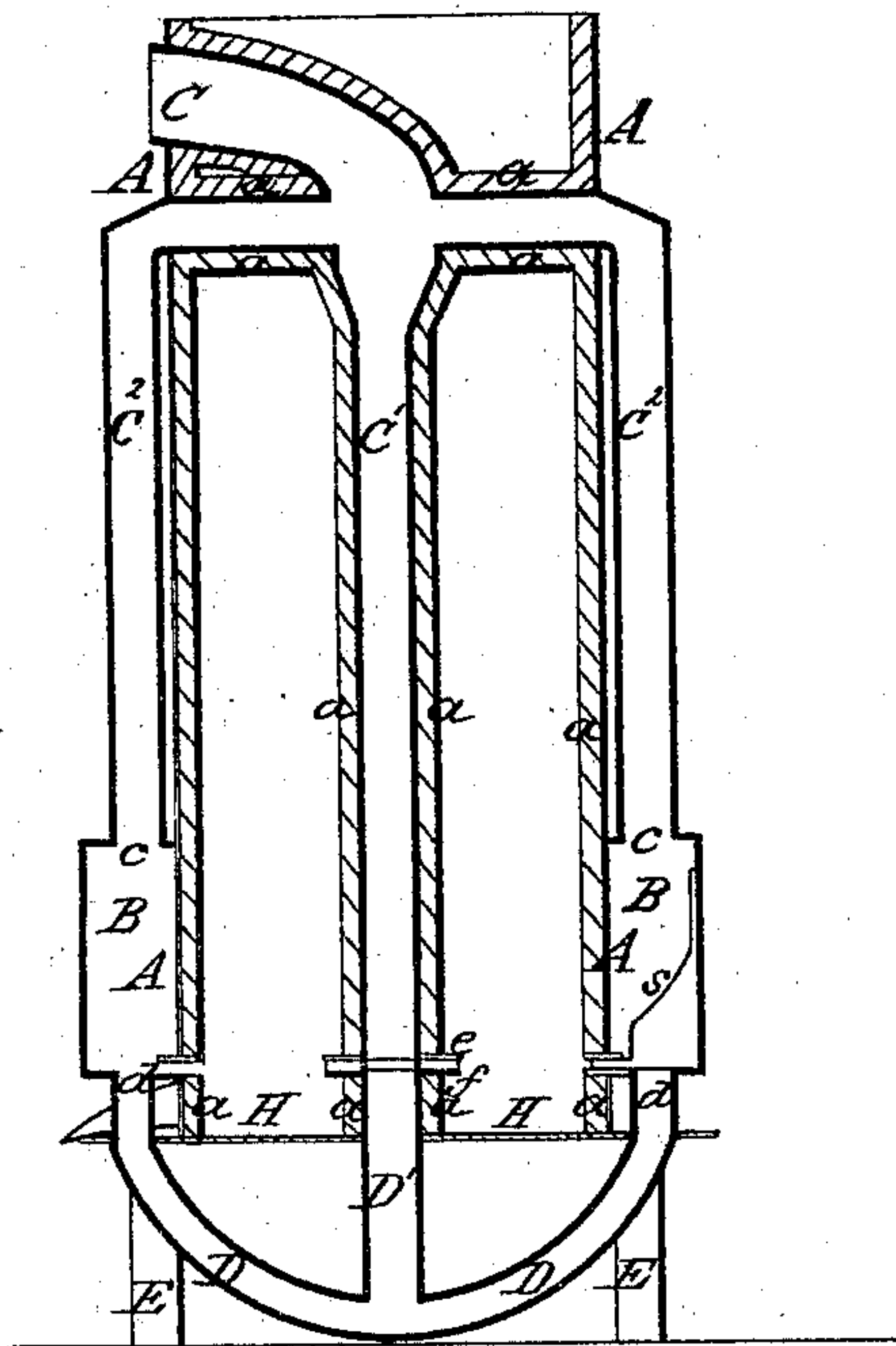


Fig. 3.

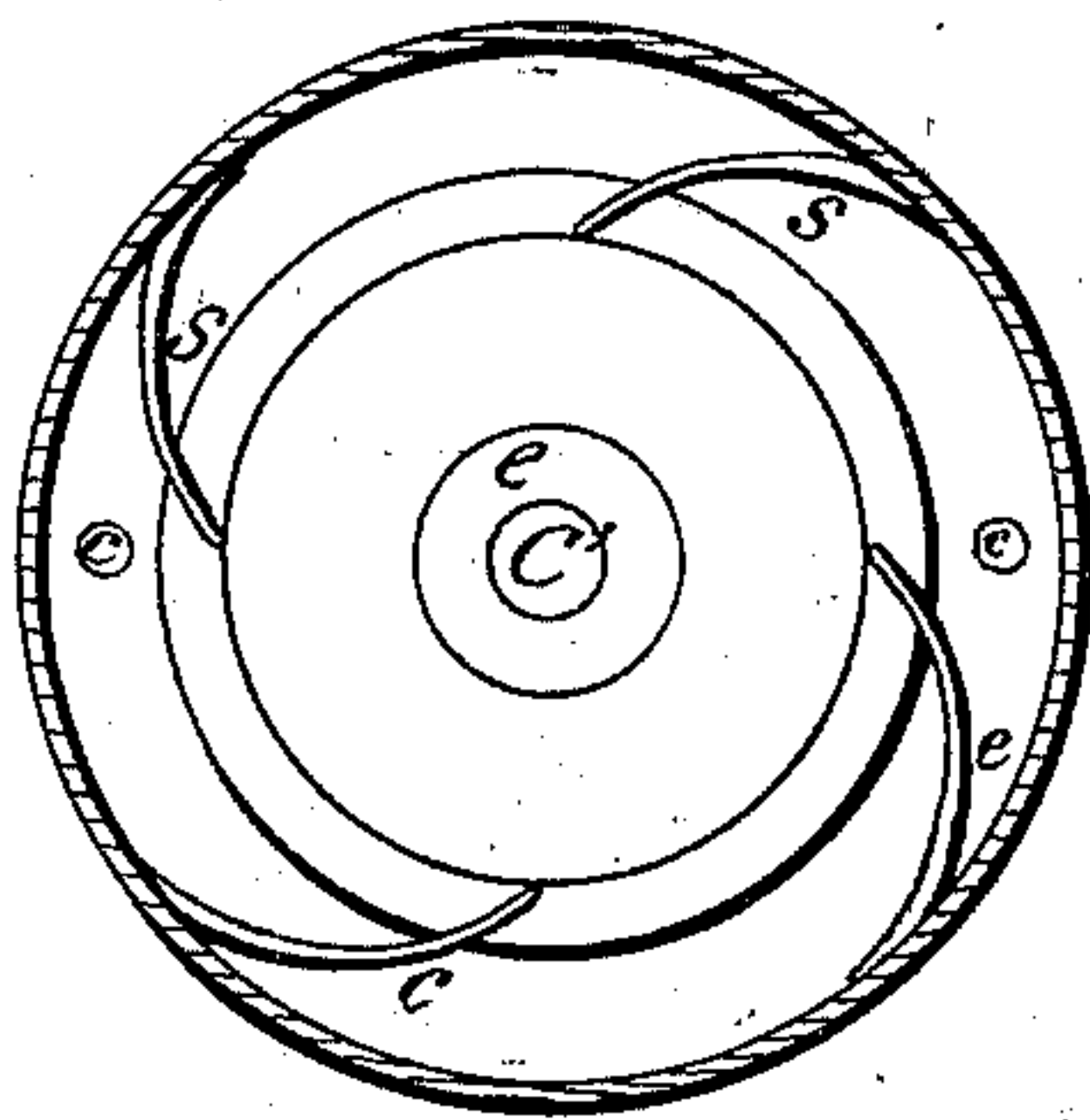
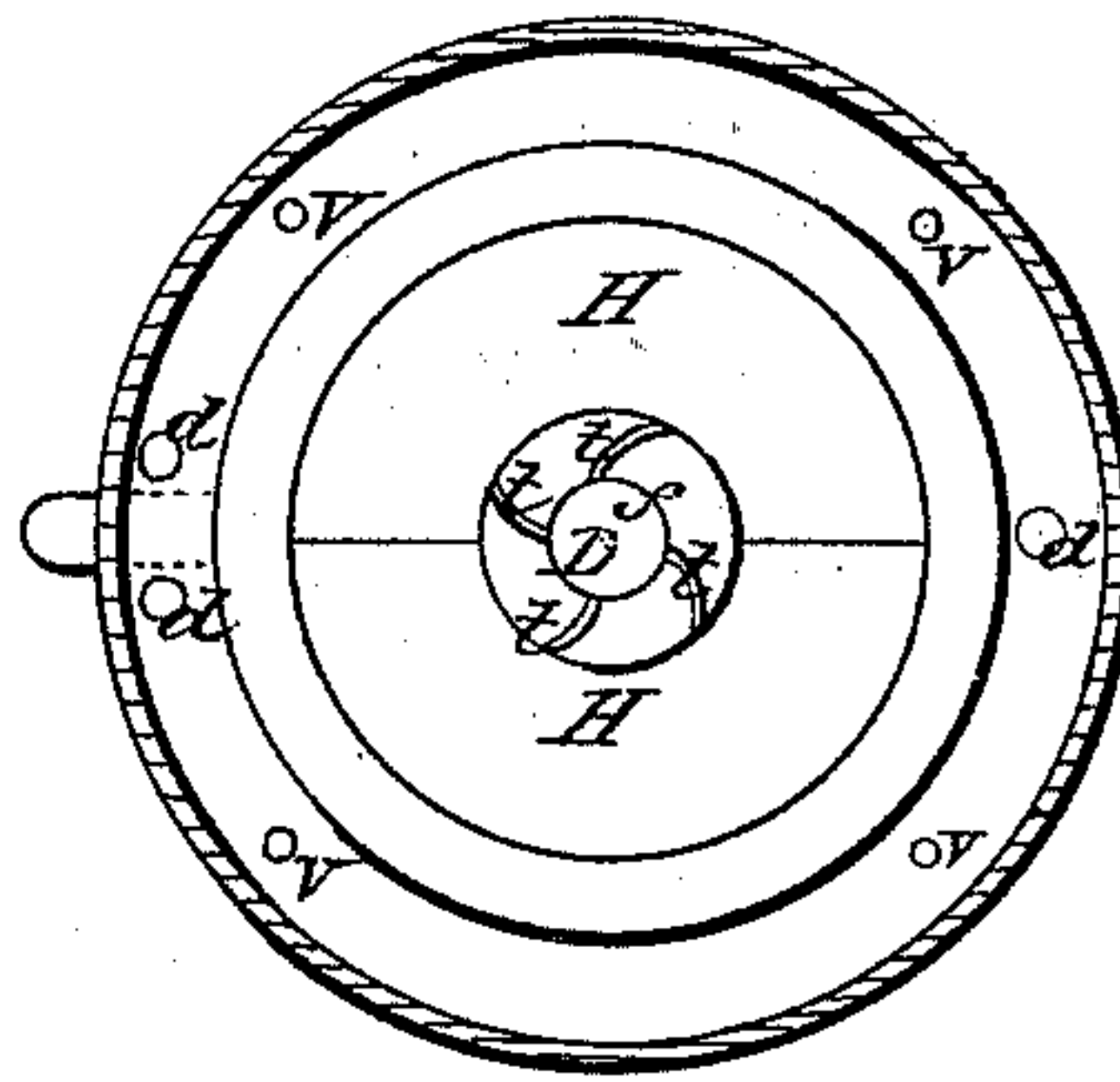


Fig. 2.



Witnesses:

Jos. L. Coombs
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Inventor:

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By J. J. Coombs
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United States Patent Office.

HENRY FAYETTE, OF PORT CHESTER, NEW YORK.

Letters Patent No. 70,829, dated October 29, 1867.

IMPROVEMENT IN CUPOLA, BLAST, AND SMELTING-FURNACES.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, HENRY FAYETTE, of Port Chester, in the county of Westchester, and State of New York, have invented a new and useful Improvement in Cupola, Blast, or Smelting-Furnace; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, in which—

Figure 1 is a vertical section of a furnace constructed pursuant to my invention.

Figure 2 is a plan view of the lower section of said furnace, divided in the line *x x*, fig. 1; and

Figure 3 is a similar view of the upper section, inverted.

A is the outer casing of the stock, and *a*, (colored,) a lining of fire-brick. B is an annular air-chamber surrounding the lower portion of the furnace. C is the induction pipe, through which the blast is blown; C¹, a central blast pipe, and C² C² side blast pipes, all branching from the induction-blast pipe C. D D is a blast pipe, in the form of an inverted arc, connecting at its upper ends with the air-chamber B, and at its centre with the branch pipe D¹. The lower end of the central blast pipe C¹ is surrounded by a circular flange, *e*, and the upper end of the pipe D¹ by a similar flange, *f*. In the space between said flanges *e* and *f* are four curved wings or air-guides, *t*, dividing said space into four separate outlets or passage-ways for the air blown down through the pipe C¹, or upward through the pipe D¹. The air-chamber B is also provided with four curved wings or air-guides, *s*, the form of which is shown in fig. 1. These wings extend clear across the bottom of the air-chamber, as shown in fig. 3, but do not extend to the upper portion of it. The blast pipes C² enter the air-chamber at *c c*, and the ends of the curved blast pipe D enter it at *d d d*. At the side where the spout is located said pipe D is shown in the drawing as branching, and entering the chamber on each side of the spout.

The blast blown in at induction pipe C will divide, one portion going down the central pipe C¹, and the residue down the outside pipes C² C² into the air-chamber B, and from the air-chamber a portion will be forced into the curved pipe D; thence up the central branch pipe D¹ to the open space between the flanges *e* and *f*, where it will meet the descending current through pipe C¹, and the air from both pipes will be thrown out into the furnace by a whirling centrifugal motion imparted by the curved wings *t*. At the same time, a portion of the air forced into the chamber B will be driven from said chamber into the furnace, between the curved wings *s*, with a whirling centripetal motion, imparted by said wings, so that the two currents of air, whirling in opposite directions, will meet in the furnace. The air passing down the central pipe C¹, and down the side pipes, will become highly heated before passing out of said pipe into the body of the furnace, and thus produce the effects of a hot blast.

For small furnaces, however, I propose to dispense with the central blast pipe C¹ altogether, and blow the whole blast into the upper part of the air-chamber B, from which a portion will be forced into the furnace between the curved wings *s*, and the residue down the curved pipe D, and thence up through the central pipe D¹, as above described. In such case the blast will not be heated, but in all other respects the operation will be the same as above described.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A downward central blast through a pipe so located in the furnace that the air will become heated by the fire of the furnace before being discharged into the same, substantially as shown and described.
2. A divided downward blast, one portion passing down a flue or pipe through the centre of the furnace, and the residue down side flues, so located that the air in all said flues will become heated in passing down the same, substantially as described.
3. An upward central blast from below the furnace, substantially as shown and described.
4. The combination of an upward and downward central blast, substantially as shown and described.
5. In combination with the air-chamber B, I claim the curved wings *s*, to conduct the blast into the furnace with a whirling centripetal motion, substantially as described.
6. In combination with a central blast, whether from above or below, or both, I claim the flanges or disks *e* and *f*, with the intervening curved wings *t*, to give the blast from the centre a whirling centrifugal motion, as described.
7. In combination with the air-chamber B and curved wings *s*, I claim a central blast from above or below, or both, with the curved wings *t*, all constructed and arranged substantially as and for the purposes described.
8. In combination with an annular air-chamber, as described, I claim passage-ways for a portion of the air to be forced therefrom into the circumference of the furnace, and a curved or bent pipe or flue for conducting another portion of the air from said chamber down below, and thence up through the bottom of the furnace, centrally, as described.

HENRY FAYETTE.

Witnesses:

JOHN B. BARRETT,
SETH M. ELDREDGE.