

(No Model.)

T. H. BURRIDGE.

APPARATUS FOR PURIFYING IRON.

No. 274,717.

Patented Mar. 27, 1883.

Fig. 1.

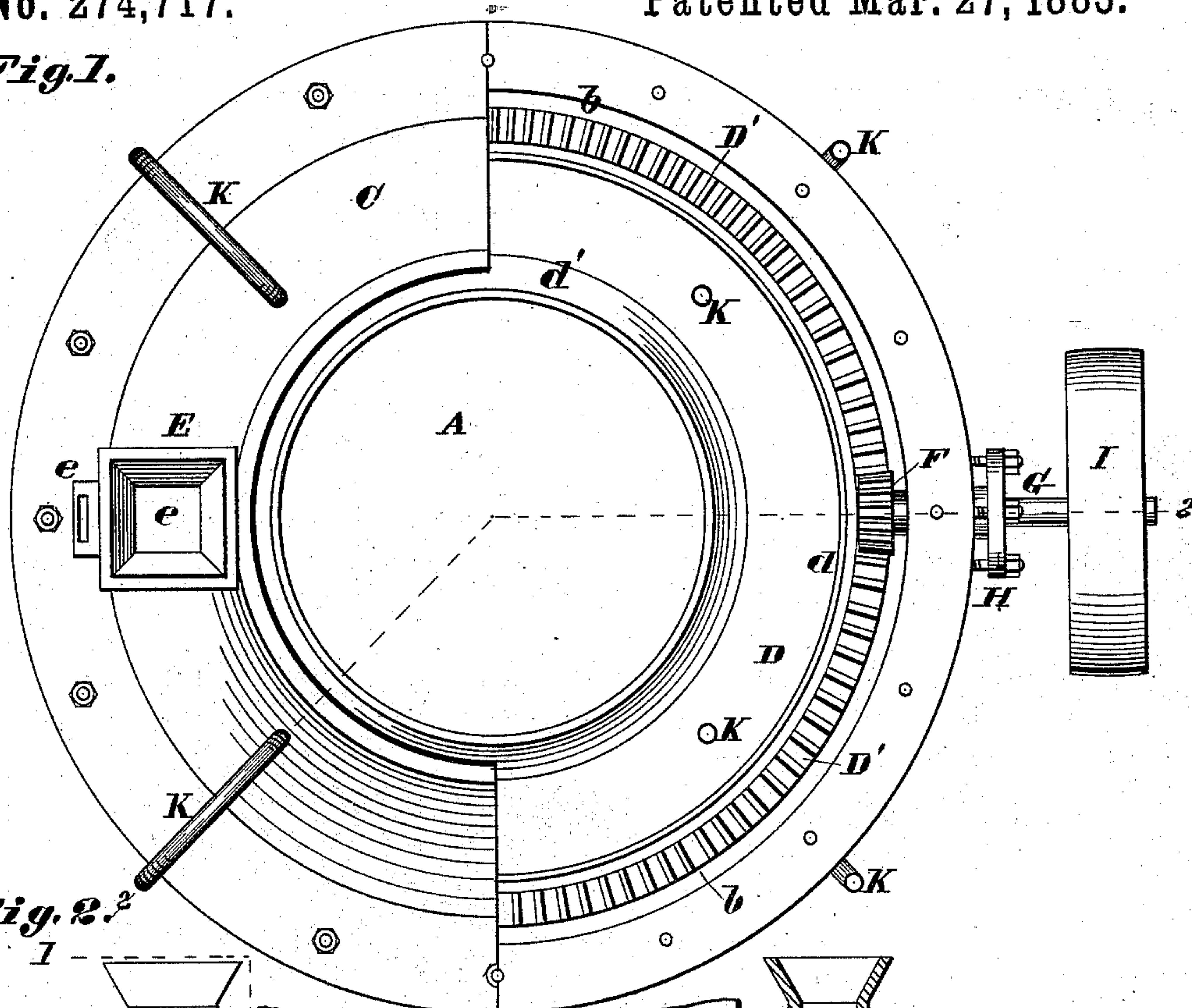
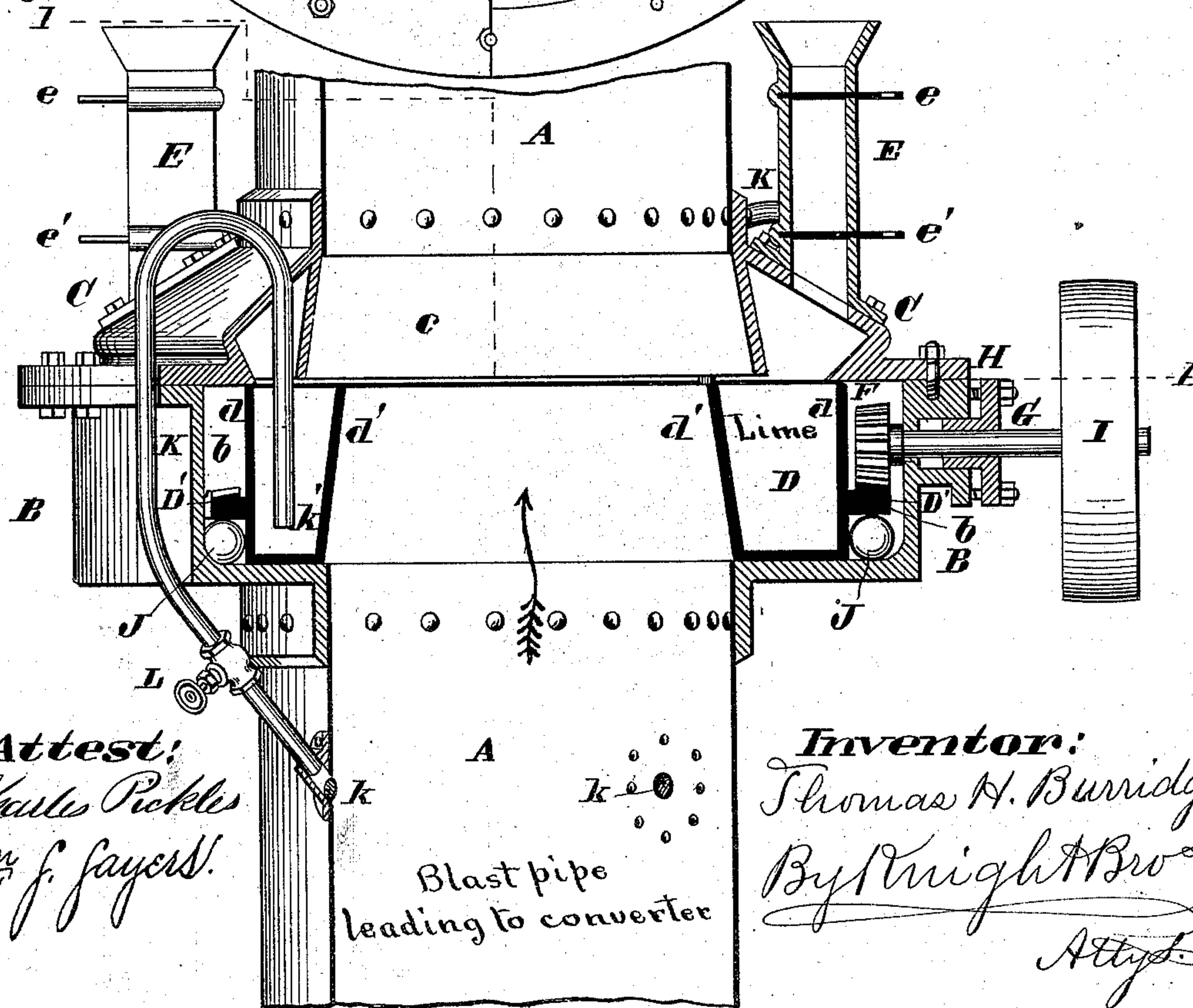


Fig. 2.²



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THOMAS H. BURRIDGE, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-THIRD
TO WILLIAM L. REYNOLDS, OF SAME PLACE.

APPARATUS FOR PURIFYING IRON.

SPECIFICATION forming part of Letters Patent No. 274,717, dated March 27, 1883.

Application filed October 18, 1882. (No model.)

To all whom it may concern:

Be it known that I, THOMAS H. BURRIDGE, of St. Louis, in the State of Missouri, have invented a certain new and useful Apparatus for Purifying Iron, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to an improved apparatus for supplying to the air-blast of a converter or iron-furnace an ingredient in fine powder or gaseous condition to be carried by the blast to the metal for the purification of the same. For instance, finely-powdered lime may be used to combine with the phosphorus contained in the iron in a converter to form phosphate of lime. Other substances may be used for removal of other noxious matters. The apparatus has a revolving trough surrounding the blast-pipe, and in communication therewith, the contents of the trough being stirred or agitated by fixed air-pipes with which the contents come in contact, whose open ends descend into the trough, and supply air to take the place of the air drawn out with the blast-current. These pipes connect with the blast-pipe beneath.

Figure 1 is a horizontal section on line 1 1, Fig. 2. Fig. 2 is a vertical section at angular line 2 2, Fig. 1.

A is an air-blast pipe leading from the blower to a Bessemer or other converter, or to a furnace containing melted iron to be dephosphorized. An annular casting or case consisting of a lower member or body, B, and an upper member or cap, C, is placed in or forms part of the blast-pipe, being firmly secured to the pipe proper, A, at top and bottom, as shown. The case is of larger diameter than the pipe A, forming an annular recess, *b*, that receives the annular trough D. The outer side, *d*, of the trough is vertical; but the inner side, *d'*, inclines inward, thus contracting upwardly and serving to accelerate the speed of the current and to concentrate the same, so as to form a suction at the top of the trough, or, rather, to increase the amount of suction to draw out the contents of the trough and mix it with the air ascending through pipe A. The cap C has a

downwardly-flaring circular flange, *c*, forming a mouth to the upper part of pipe A. The cap has one or more hoppers, E, for the purpose of feeding finely-powdered slaked lime to the trough D. The hopper has two sliding valves, *e* and *e'*, one at or near the top and the other at or near the bottom, the purpose being to admit the lime-powder without the admission of air. Thus to fill the hopper the upper valve, *e*, is opened and the lime emptied in. Then the upper valve is closed and the lower valve, *e'*, opened, allowing the lime-powder to fall into the circular trough D.

D' is a bevel cog-wheel upon the circumference of the trough, engaged by a cog-wheel, F, upon the shaft G. The shaft G turns in a stuffing-box, H. It carries a pulley, I, or cog-wheel, by which it is turned, causing the revolution of the trough D. The trough may have ball-bearing J, or may be supported entirely by direct contact with the case B, or may be supported by any suitable bearing device.

K are pipes, of which there may be one or more, (four being shown.) The pipes K communicate at the lower end, *k*, with the interior of the blast-pipe. They ascend above the cap C, where they have a return-bend extending downward through the cap and ending at *k'*, near the bottom of the trough, said end being open, so that air can pass through it into the trough to take the place of that drawn out with the lime at the top. The ends of the pipes act as agitators to stir the lime in the trough and assist its escape. The pipes K have valves L to regulate the amount of air passing through them. I have more particularly described apparatus for the dephosphorizing of iron; but the apparatus would be substantially similar if there were furnished to the blast any substance in pulverulent condition, or any substance in the trough to produce gases for the purifying of the iron.

I claim—

1. The combination, with the blast-pipe of a metal-furnace or converter, of a trough surrounding and in communication with the interior of the blast-pipe, and means for stirring, extending downward into the trough, for the purpose set forth.

2. A rotary angular trough surrounding a blast-pipe of a metal-furnace or converter, with fixed stirrers descending into the revolving trough, for the purpose set forth.
- 5 3. The combination, with the blast-pipe A of a metal-furnace or converter, of a revolving trough surrounding said pipe, partly closed at top, and in communication with the blast-pipe and fixed air-pipes K, extending down
10 into the trough, for the purpose set forth.
4. The combination of blast-pipe A, body

consisting of casting B, cap C, having flaring mouth c, trough D, hopper E, bevel cog-wheel D' on trough, and shaft G, carrying cog-wheel F and pulley I, as set forth.

- 15 5. The combination of blast air-pipes K k k', main blast-pipe A, body B C c, trough D, and means for revolving said trough, as set forth.

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Witnesses:

SAML. KNIGHT,

GEO. H. KNIGHT.