

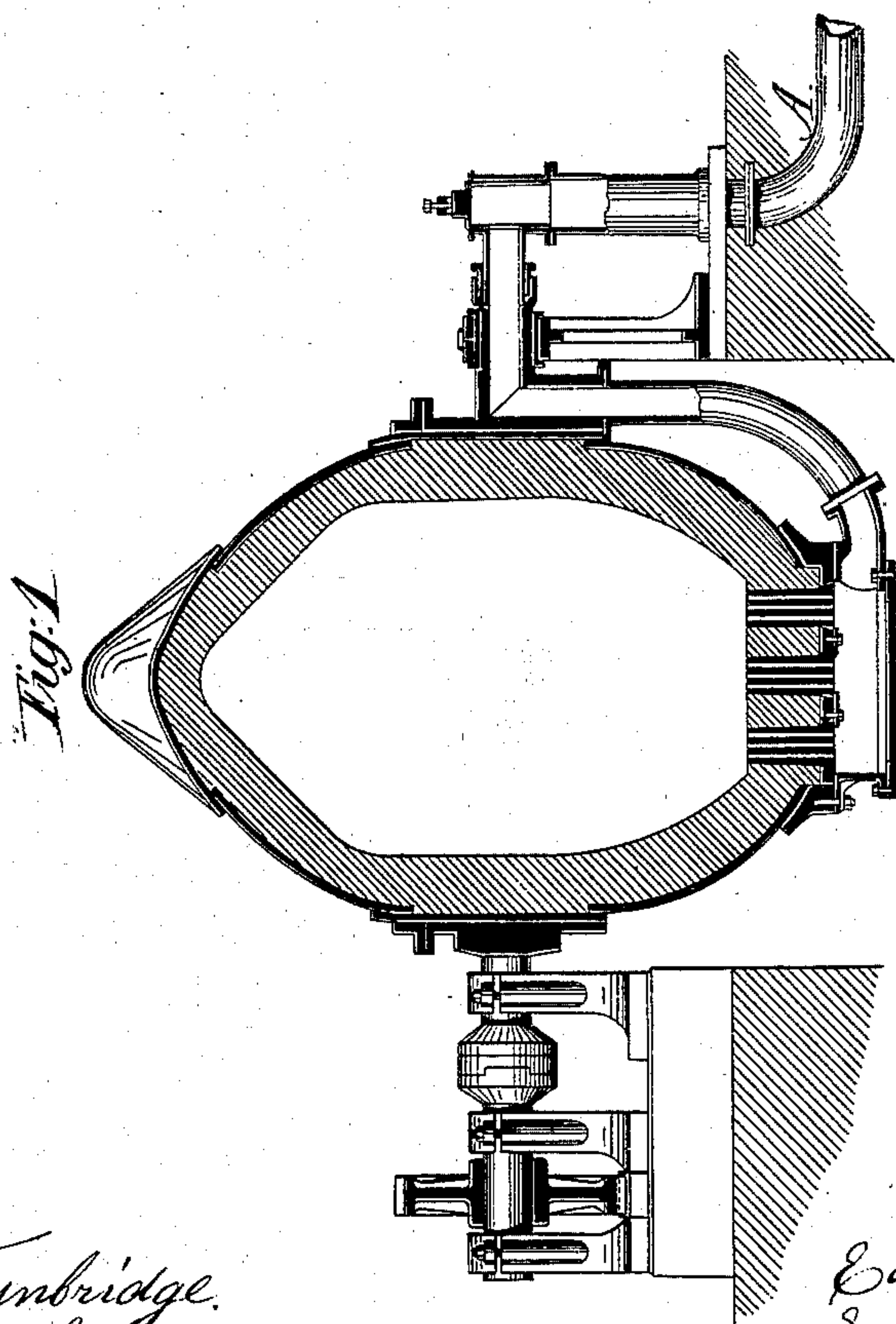
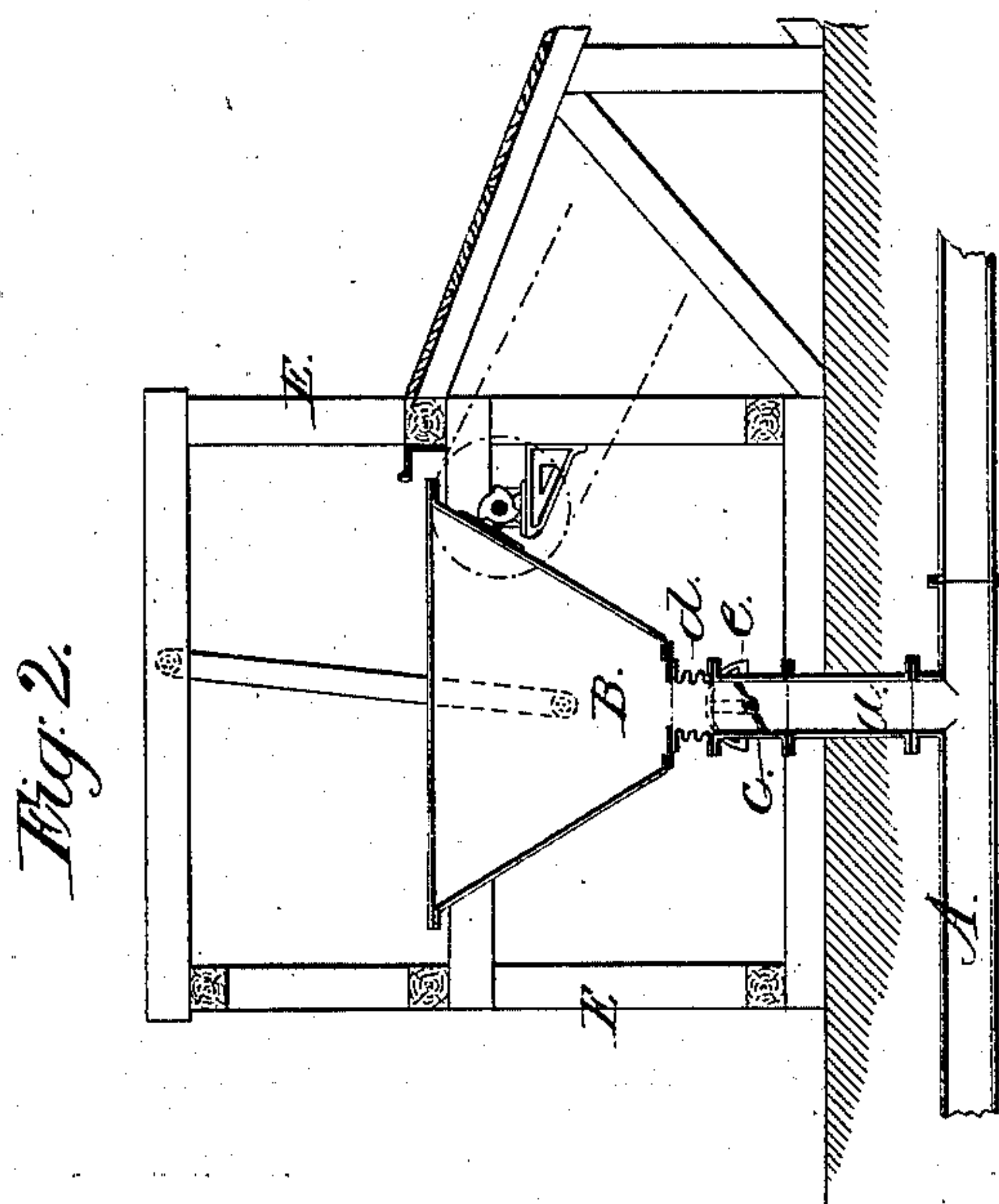
(No Model.)

E. & E. PIRATH.

Apparatus for Dephosphorizing Iron.

No. 239,621.

Patented April 5, 1881.



Witnesses:  
John C. Tunbridge.  
Willy G. E. Schultz.

Inventors:  
Edward Pirath  
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by their attorney  
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# UNITED STATES PATENT OFFICE.

EDUARD PIRATH AND EMIL PIRATH, OF FRANKFORT-ON-THE-MAIN,  
GERMANY.

## APPARATUS FOR DEPHOSPHORIZING IRON.

SPECIFICATION forming part of Letters Patent No. 239,621, dated April 5, 1881.

Application filed May 7, 1880. (No model.)

*To all whom it may concern:*

Be it known that we, EDUARD PIRATH and EMIL PIRATH, of Frankfort-on-the-Main, in the Empire of Germany, have invented a new and Improved Apparatus for Dephosphorizing Iron, of which the following is a specification.

Our invention relates to improvements in apparatus for dephosphorizing iron in the Bessemer process of manufacturing steel.

In carrying out the process we proceed as follows: For a dephosphorizing agent we may employ magnesia, (dolomite,) soda, or other suitable substance, or artificial mixtures, calcined and finely powdered, for the purpose. This pulverized dephosphorizing agent we inject into the molten metal in the converter in any convenient manner. We propose to blow it into the metal with the decarbonizing-blast or by a separate air-supply. By this mode of injecting the dephosphorizing agent into the molten metal it will be thoroughly mixed with the iron, and the dephosphorizing effect will be most complete and satisfactory. The advantage of this method is, that the converter can be lined with fire-brick in the usual way, and when a sufficient quantity of the dephosphorizing agent is mixed with the whole bulk of molten metal in the converter, and is thoroughly distributed throughout the mass, the chemical influence in dephosphorizing the iron is complete.

The manner of carrying out the process will be more fully understood by reference to the accompanying drawings, wherein—

Figure 1 represents a vertical sectional elevation of a Bessemer converter. Fig. 2 represents, in section, the apparatus for supplying the dephosphorizing agent to the tuyere-pipe of said converter.

A represents the blast-pipe connected with the tuyere of a Bessemer converter. A stand-pipe, *a*, has its lower end connected with the blast-pipe A, and at its upper end it is connected, by means of a flexible neck, *d*, with a

hopper, B, which is hung in a frame, E, so as to oscillate freely without losing its connection with the pipe *a*. The pulverized dephosphorizing agent is placed in the hopper B, which, by its oscillating or shaking movement, prevents the powder from packing.

In the pipe is a valve, *c*, operated by a lever, *e*. This valve stops the pipe, and also regulates the amount of the powder passing from the hopper to the blast-pipe. When the converter is charged and the blast turned on, the valve *c* is opened, and the pulverized dephosphorizing agent falls down into the blast-pipe, and is carried by the blast through the tuyere and injected into the molten iron in the converter and thoroughly distributed through the mass.

By means of the valve *c* the quantity of the agent supplied to the metal can be exactly regulated.

The converter may have oblique tuyeres connected with a blast-pipe, in addition to the tuyeres through the bottom, which are connected with the blast-pipe A, for injecting the dephosphorizing agent into the converter.

The quantity of soda, magnesia, or the like supplied to the iron will, of course, vary, as is well known, with the proportionate impurity of the iron.

We claim—

The combination of a Bessemer converter and its blast-pipe A with feed-hopper B, having flexible neck *d* and regulating-valve *c*, for supplying the powdered dephosphorizing substance directly to the blast-pipe, and with mechanism for oscillating the hopper, substantially as specified.

The above specification of our invention signed by us, in presence of two witnesses, this 18th day of February, 1880.

DR. EDUARD PIRATH.

DR. EMIL PIRATH.

Witnesses:

THEODOR SORT,  
HERMANN ROGHE.