

Improvement in the Method of
feeding Fuel to Metallurgic
and other Furnaces.

Witnesses.

Inventors.

Edward Rouse.

James D. Welpley.

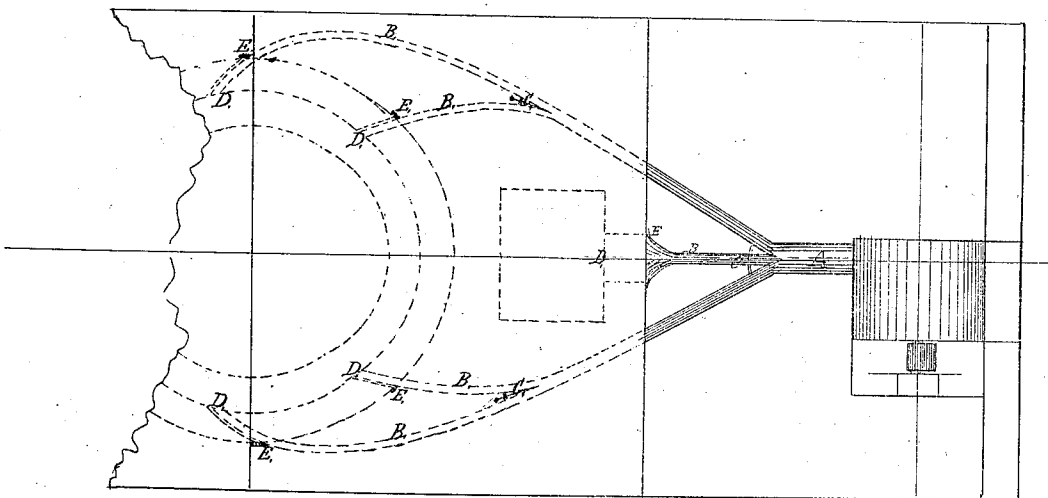
Charles McPherson.

Isaac S. Foster.

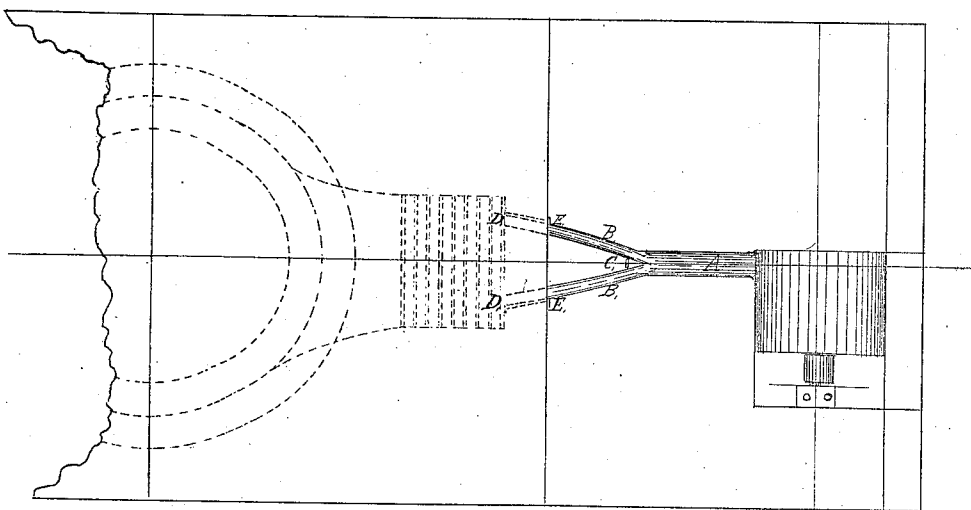
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PATENTED MAY 31 1870

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to Metallurgic and other Furnaces. Inven.

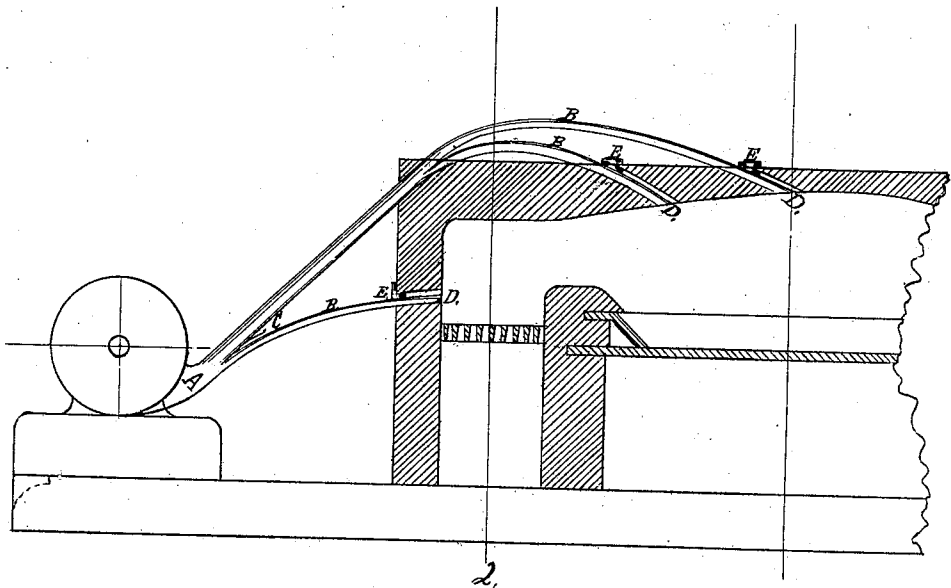
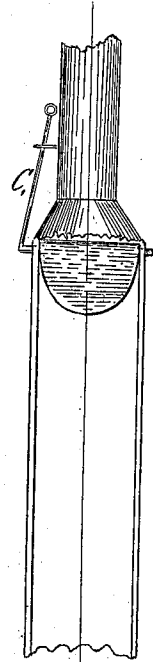
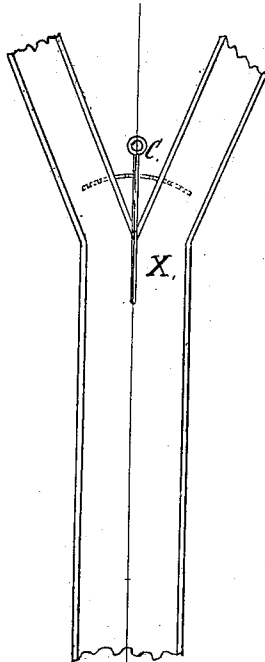
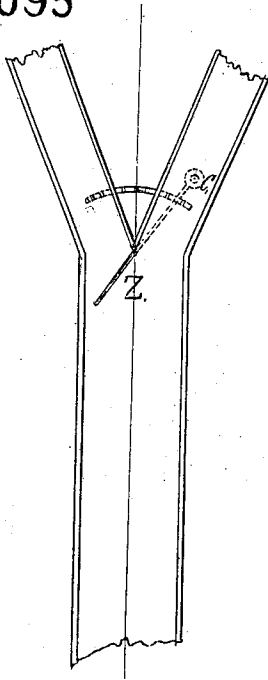
Witnesses.

Edward Renouf.
Charles Mc Nicholas.

James D. Whelpley
Jacob W. Storey.

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3 Sheets Sheet 2.



Improvement in the Method of feeding Fuel
to Metallurgic and other Furnaces.

Witnesses.

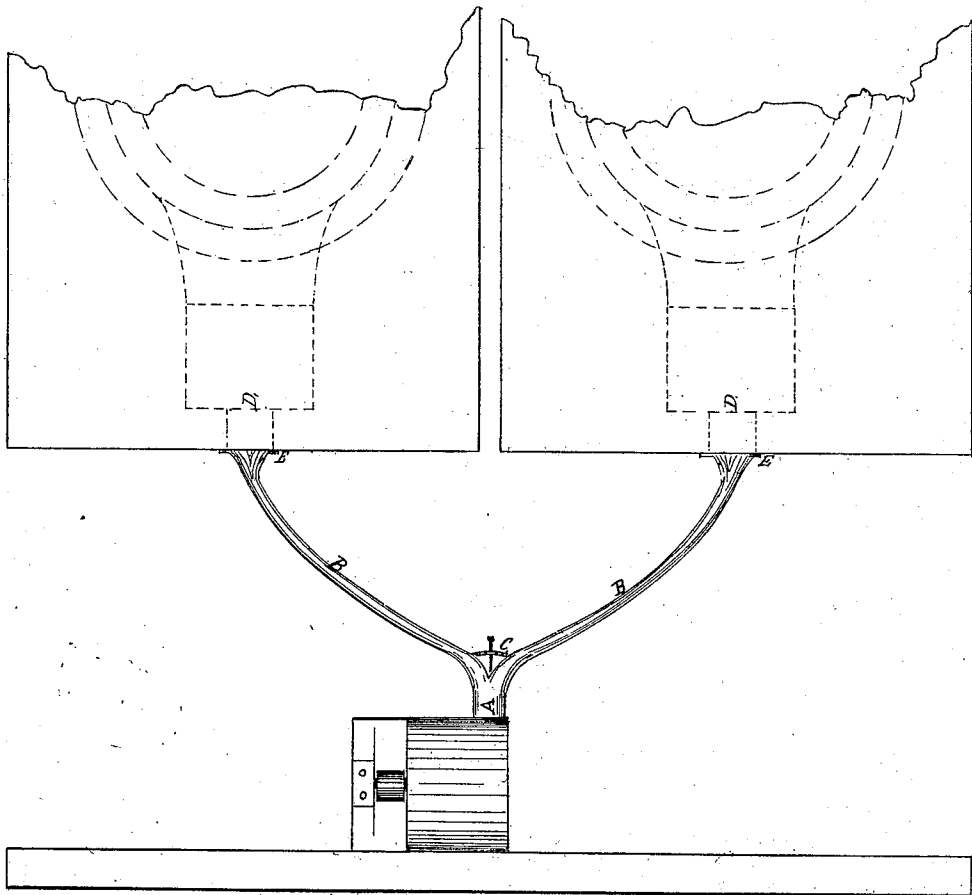
Edward Penroy.
Charles McNickerson.

Inventors.

James D. Mellpley
Jacob L. Storer.

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3 Sheets Sheet 3.



4.

United States Patent Office.

JAMES DAVENPORT WHELPLEY AND JACOB JONES STORER, OF BOSTON,
MASSACHUSETTS.

Letters Patent No. 103,695, dated May 31, 18

IMPROVEMENT IN FEEDING FUEL TO METALLURGIC AND OTHER FURNACES.

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

To all to whom these presents shall come:

Be it known that we, JAMES DAVENPORT WHELPLEY and JACOB JONES STORER, both of Boston, in the State of Massachusetts, have invented an Improvement in the Method of Feeding Fuel to Metallurgic and other Furnaces, which the following specification and accompanying drawings sufficiently explain.

We have described in our patents of March 13, 1866, No. 53,208; reissue No. 3,857, dated March 1, 1870; March 31, 1868, No. 76,280; and March 22, 1870, No. 101,067, our method of introducing pulverized fuel into fire-boxes and furnaces.

In those patents the pipe for introducing the fuel from the pulverizer into the furnace is a simple straight or curved pipe, with the delivery end round or flattened and spread to a fan-shape.

Experiments have demonstrated to us that, in many cases, a different style would be advantageous. We have invented one, of which the following is a correct description.

Description of the Accompanying Drawings.

Figure 1 is a plan showing pipe with branches in some horizontal plane.

Figure 2, elevation showing pipe with branches in a vertical line.

Figure 3, plan showing pipe with branches in same or nearly same horizontal line, entering end and sides of furnace.

A main pipe, A, fig. 1, leading from the pulverizer, branches off into two or more pipes, B B, whose combined area is equal to the area of the pipe A, which enter the fire-box of the furnace on the same horizontal plane, the delivery end of these pipes being, preferably, made fan-shaped.

By this arrangement it will be seen that a broader and more widely-distributed flame or flames can be made than by use of the single jet.

Most double puddling-furnaces, and some other furnaces, such as furnaces for heating armor-plate, &c., are as wide or wider than they are long, so that the advantages of a branching pipe, broadly distributing the flame, are, in such, very decided.

For applying the pulverized fuel to very long furnaces, as, for instance, to those for heating spike-rods and tube-plates, where a uniform heat is requisite throughout the whole length, we have designed a fuel-delivery pipe, from the pulverizer to the furnace, with two or more branches, fig. 2, in a vertical line, entering at different points along the long axis of the furnace, the shorter branch entering, preferably, into one end of the furnace, and the longer branches at different points in the roof, as shown in the drawings.

And we have also designed, as shown in fig. 3, a delivery-pipe for the pulverized fuel, with several branches in the same or nearly the same horizontal

plane, through which the fuel is introduced into the end and sides of the furnace.

Another special advantage in the use of the branched pipe is, that two or more furnace or boiler-fires, as at fig. 4, may be fed with pulverized fuel by one machine, one pulverizer sufficing for a group of two or more (within reasonable limits) boilers or furnaces, carrying a branch pipe to each one of them. Thus, great economy in space, labor, and cost is effected.

It will be seen that the valves or vanes C C C C may be so adjusted, as at X, that an even delivery of fuel shall be made through each branch of the delivery-pipe, or so that, as at Z, the delivery through the branches shall be unequal.

The openings D D D D, in the walls of the furnace or fire-box through which the pipes are introduced are larger than the pipes themselves, and those portions of them not filled by the pipes are closed from without by plugs or doors, E E E E.

When the jets of pulverized fuel and air are being introduced through the pipes into the furnace or fire-box, any one or all of these plugs or doors may be wholly or partially withdrawn or opened, to permit the introduction of more air at any desired point.

By these arrangements, we are able not only to maintain, if desirable, an even temperature in every part of the furnace or fire-box, but, by regulating the distributing vanes C and the plugs E E E, we can so proportion and deliver the fuel and air through each branch pipe, and at their entrance into the furnace or fire-box, that we can produce in any part of the furnace whatever character of flame, either oxidizing, reducing, or neutral, we may prefer.

By this arrangement of the openings D D D, into which the pipes enter, the air which may enter them is drawn in by the slight vacuum created just at these points by the moving column of air and pulverized fuel jetting from the mouths of the pipes.

We do not confine ourselves to this method of introducing an additional supply of air at any of these points, for sometimes we may introduce it by pressure or blast from a blower, and when we desire to introduce it heated, its temperature may be raised by being forced or drawn through channels or chambers in the walls of the furnace or stack.

What we claim, and desire to secure by Letters Patent, is—

The device for introducing and regulating the supply and introduction of pulverized fuel and air into furnaces and fire-boxes, for the purposes and in the manner and with the apparatus substantially as described.

JAMES D. WHELPLEY.
JACOB J. STORER.

Witnesses:

EDWARD RENOUF,
CHARLES M. NICKERSON.