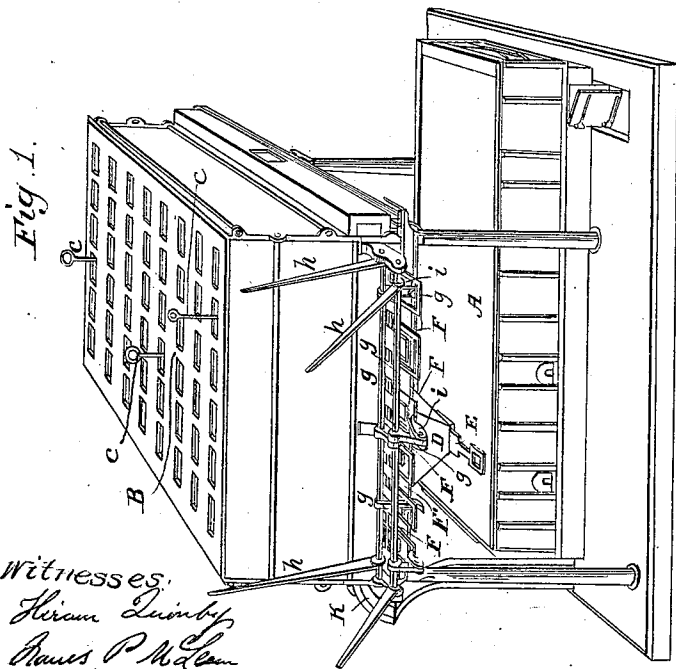
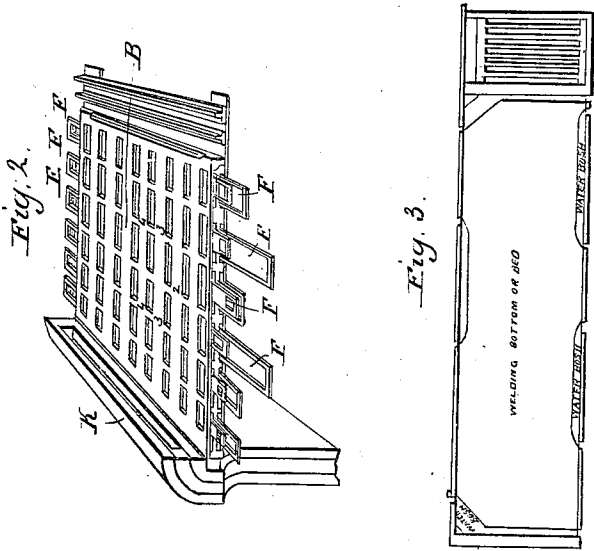


J. M. QUIMBY.
 Making Iron Direct.

No. 25,044.

Patented Aug. 9, 1859.



Witnesses:
 Hiram Quimby
 James P. Malcom

Inventors:
 James M. Quimby
 Albert H. Brown
 Geo. H. Penton
 James C. Redwell

UNITED STATES PATENT OFFICE.

JAMES M. QUINBY, A. H. BROWN, GEO. H. RENTON, AND J. CRISWELL,
OF NEWARK, NEW JERSEY.

IMPROVED FURNACE FOR MAKING IRON DIRECT FROM THE ORE.

Specification forming part of Letters Patent No. 25,014, dated August 9, 1859.

To all whom it may concern:

Be it known that we, JAMES M. QUINBY, ALBERT H. BROWN, GEORGE H. RENTON, and JAMES CRISWELL, in the city of Newark, in the county of Essex and State of New Jersey, have made certain novel and useful Improvements in the Mode of Constructing Reverberatory Furnaces for Making Wrought-Iron Direct from the Ore, &c.; and we hereby declare the following to be a full, clear, and exact description of said improvements, reference being had to the accompanying drawings, which drawings are lettered to correspond with the specification, and with the letters of reference marked thereon.

In order that the public may fully understand the nature of our invention, and those skilled in the art be enabled to construct and operate the same, we will describe it as follows:

Figure 1 is a perspective view of our reverberatory furnace A, deoxidizing chamber or tubes B, provided with rods or bars of iron, C C C, in each tube for the purpose of loosening up and assisting the discharge of the ore into the ore box or hopper D, from whence it is drawn off or let down on the puddling bottom or bed by means of a damper, E, at the lower end of the hopper. This damper serves a double purpose; first, to admit the ore into the puddling-chamber from the ore-box; and, secondly, it prevents the hot gases from passing from the furnace A up into the tubes B through the ore-box. Letters F F F F F F are six pairs of dampers arranged so that the lower damper opens one or more tubes, 3 and 4, and the upper or short damper opens or closes one or more tubes, 1 and 2. These dampers are operated by means of shafts *g g*, which are provided with levers *h h h h*, toggle-joints, and hooks *i i i i*. Letter K is an arch in the flue placed at the back end of the furnace, (or any other suitable place,) to convey the escape heat from the furnace around and among the ore-tubes B at or near the bottom or lower ends thereof, thus keeping a uniform heat throughout the entire length of the tubes, thereby producing a better quality of iron in a shorter time than by any other known process.

Fig. 2 is a perspective plan of our arrangement of deoxidizing-tubes B, showing the *modus operandi* of the dampers or cut-off F F F F F F. All the tubes are closed, excepting 1 and 2 and 3 and 4, which are represented as being open; also showing more clearly the flue and arch K.

The first furnace we constructed, known as the "Renton" furnace, had the deoxidizing-tubes, with the ore box or hopper attached, and these we do not claim as our invention; but the application of the dampers or cut-off, as described, and the manner of operating them by the means set forth, or their equivalents, as shown at Fig. 1, so that each damper will open or close one or more tubes at the same time, together with the manner of regulating the feed from the ore box or hopper by means of a damper at the lower end of the hopper, and the use of an arch or its equivalent in the flue for the purpose of throwing the heat around the bottom end of the tubes, thereby more uniformly deoxidizing the ore and producing a more uniform and better quality of iron, together with the manner of assisting the discharge of the deoxidized ore by means of rods or bars of iron or their equivalents running the entire length of the tubes, were our invention, and we believe them to be new and useful. Therefore

What we claim as novel, and wish to secure by Letters Patent of the United States, is—

1. The arch K, the hopper-damper E, and the rods or bars C C C C, arranged and operated substantially as described.

2. The dampers at the bottom of the tubes, for discharging one or more tubes at the same time into the ore box or hopper, substantially as shown at Fig. 2.

In testimony whereof we hereunto subscribe our names in the presence of two witnesses.

JAMES M. QUINBY.
ALBERT H. BROWN.
GEO. H. RENTON.
JAMES CRISWELL.

Witnesses:

ISAAC L. YOUNG,
JOHN BUTTLE.