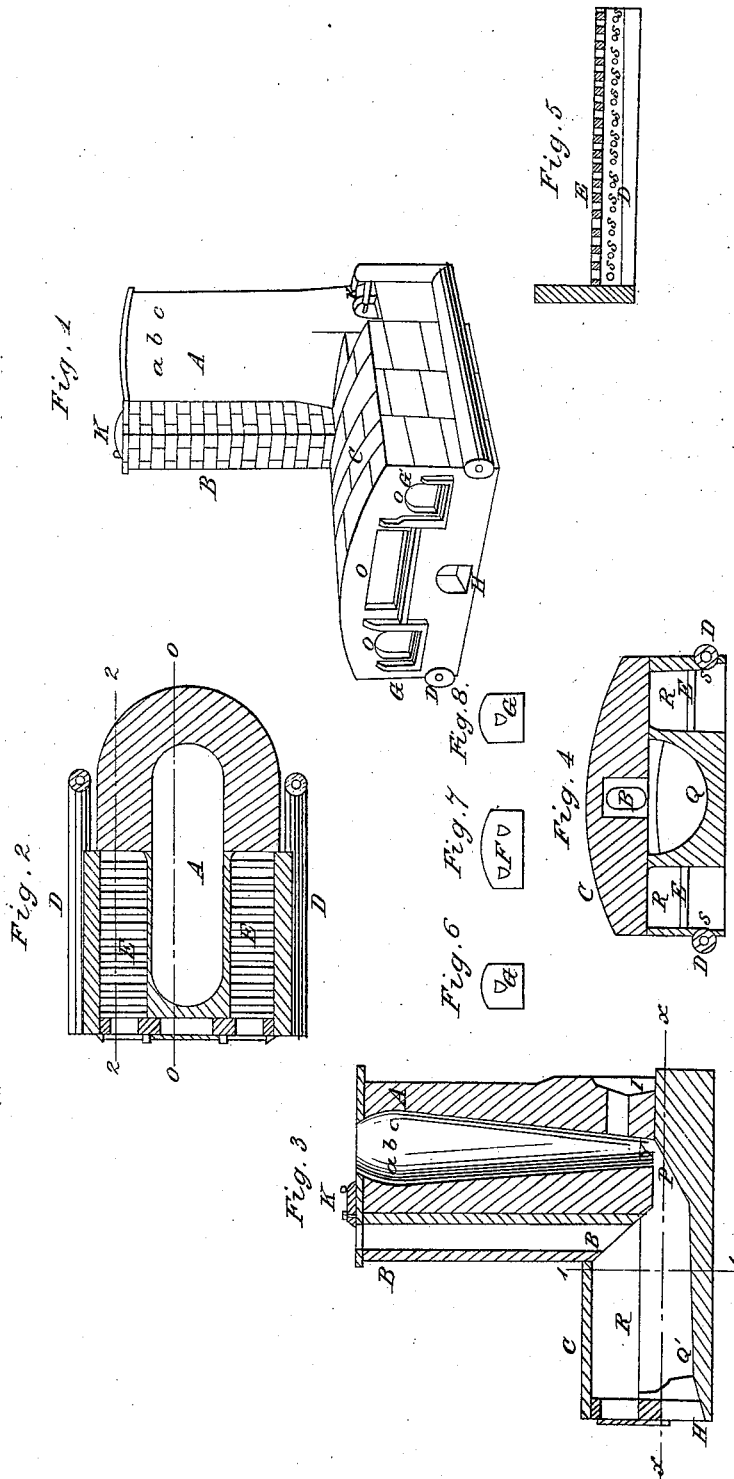


BRIGGS & CHUBBUCK.
 Making Iron Direct from Ore.

No. 1,926.

Patented Jan. 9, 1841



UNITED STATES PATENT OFFICE.

STEPHEN CHUBBUCK AND JEDEDIAH BRIGGS, OF WAREHAM, MASS.

IMPROVEMENT IN THE CONSTRUCTION OF BLAST-FURNACES.

Specification forming part of Letters Patent No. 1,926, dated January 9, 1841.

To all whom it may concern:

Be it known that we the undersigned, STEPHEN CHUBBUCK and JEDEDIAH BRIGGS, both of Wareham, in the county of Plymouth and Commonwealth of Massachusetts, machinists, have jointly invented a mode of constructing blast-furnaces for smelting iron ore with anthracite and bituminous coal upon a new and useful principle, of which the following is a full and exact description, reference being had to the annexed drawings of the same, making part of this specification.

Figure 1 is a perspective view of the furnace. Fig. 2 is a horizontal section of the furnace at the dotted line *xx* of Fig. 3. Fig. 3 is a vertical longitudinal section at the dotted line *00* of Fig. 2. Fig. 4 is a vertical cross-section at the dotted line *11* of Fig. 3; Fig. 5, longitudinal section of one of the grates, showing the draft-holes, taken at the dotted line *22* of Fig. 2; Figs. 6, 7, and 8, the doors which close the openings *000* of Fig. 1.

Similar letters refer to similar parts in the similar figures.

The smelting-stack *A* is built in a cylindrical form, of brick or stone laid in lime, mortar, or other proper cement, its interior surface or tunnel lined with fire-brick. Its height from the tuyeres *J* to the top is ten feet, and its thickness sufficient to give it proper strength, varying from one and a half to two and a half feet, according to the tenacity of the material of which it is constructed. The interior surface or tunnel, which is the recipient for coal and ore, is three feet in diameter at top, and descending with a regular inclination to the bottom, where it is contracted to one-half the diameter of the top. At this lower point of the tunnel the ore in a state of fusion falls on a plane, *P*, constructed of fire-stone or white brick, varying in inclination from thirty-three to forty-five degrees, connected with said tun-

nel by masonry, whence it is conducted by its own gravity to a basin, *Q*, made within an arch, *C*, to receive it. The basin is constructed of the same material with the inclined plane or hearth last mentioned, within an arch arrangement, in which the metal is kept in its liquid state to a proper degree of heat, by means of fires at *R* surrounding it, kindled upon grates *E* of hard iron, and kept alive by a blast through pipes *D*, communicating with said fire-places by lateral apertures *S*, which blast is produced by a common bellows or some other convenient pneumatic agents. The flame from the surrounding fires *R* passes off by a flue, *B*, connected with or standing near the smelting-stack, made of fire-brick, when not wanted for any other purpose; but if needed to augment the heat in the smelting-stack, it may be readily forced therein by means of a damper or dampers, *K*, applied to said flue at the top thereof, or in any convenient place therein, the smoke and heat being turned into the stack at *Y*.

What we claim as our invention, and which we desire to secure by Letters Patent, is—

The mode of keeping the metal in its liquid state to a proper degree of heat by means of fires surrounding the basin containing said metal, and kindled and kept alive in an arch arrangement, in the manner herein set forth, and in combination with the foregoing arrangement, the flue *B*, governed by a damper, *K*, so operating as to permit the draft from the fires in the arch to ascend the flue *B*, or when closed forcing it into the smelting-stack *a b c*, as herein set forth.

STEPHEN CHUBBUCK.
JEDEDIAH BRIGGS.

Witnesses:

WILLIAM BATES,
FRANCIS H. BATES.