C. H. Swain.

Smelting Furnace.

No. 91,493. Patented Jun. 15, 1869.

Fig: 1.

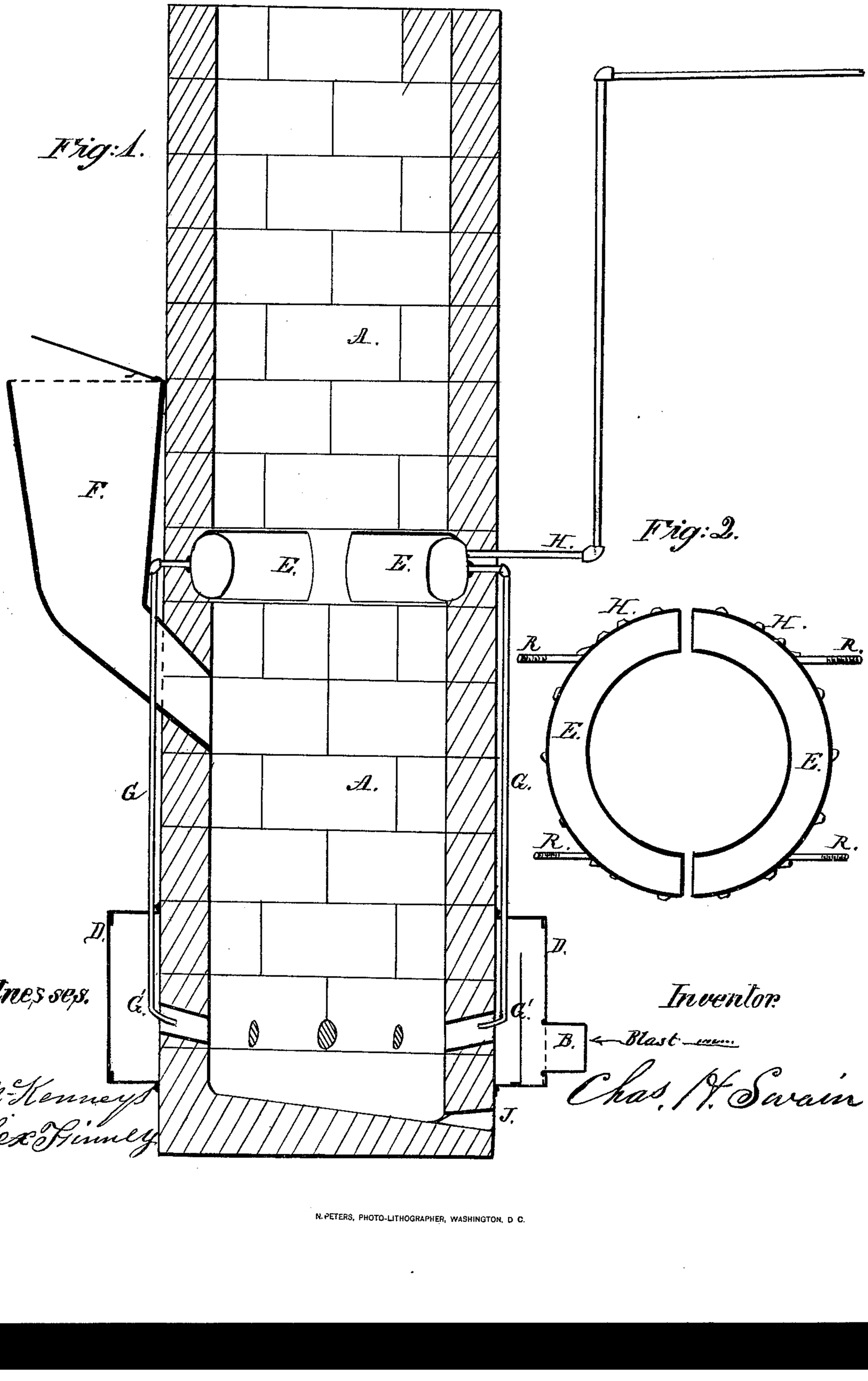

Fig: 2.

Witnesses.

J. McKenney

Alex Finney

Inventor.

Chas. H. Swain

United States Patent Office.

CHARLES H. SWAIN, OF BROOKLYN, NEW YORK.

Letters Patent No. 91,493, *dated June* 15, 1869.

IMPROVED SMELTING-FURNACE.

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

To all whom it may concern:

Be it known that I, CHARLES H. SWAIN, of the city of Brooklyn, New York, have made new and valuable Improvements in Furnaces for Smelting Ores; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

The nature of my improvements consists in the arrangement of the pipes for the supply of gas and atmospheric air, and in the general construction of the interior of the furnace.

To enable others skilled in the arts to make and use my improvements, I will proceed to describe its construction and operation.

Figure 1 is an upright sectional view of the furnace.

A A is the inside of the furnace, properly lined with fire-brick, or other material, to protect it from burning.

B shows the opening through which atmospheric air is passed, the oxygen of which unites at G′, with the gas, as it is expelled by the expansion of the vapors from the hydrocarbon-fluids in the retorts E E, through the pipes G.

D D is an air-drum, placed around the furnace, near the bottom, into which the air from a blower is blown, and unites at G′ G′ with the gas, and is with gas blown into the furnace through holes in the fire-brick lining, as shown at G′ G′.

E E are retorts, Figure 2, placed in an open space, made by leaving one course of the lining out, and may be made in one or more parts, and arranged, as shown in fig. 2, with rods of iron, that pass through the outside of the furnace, by means of which the retorts may be drawn away from the front or face of the lining, to the back side of the same, and placed, at pleasure, in such position as is necessary to vaporize the hydrocarbon-fluids, and at the same time not have too great a heat against the side of the retort to melt it.

F is the feed, through which ore is supplied to the inside of the furnace.

G G are pipes, through which the vaporized fluid from the retorts E E passes through the opening at G′ G′ to the inside of the furnace.

H is a pipe, leading from a vessel containing the fluid to the retorts E E.

J is the outlet for the slag and ore.

R R R R, fig. 2, are rods of iron, to change the position of the retorts, more particularly described at E E.

To commence operations with this furnace, I proceed as follows:

I supply the oil or fluid to the retorts E E, and make a fire of light and combustible material, and heat the retorts to a degree sufficient to vaporize the fluid. When the flow of gas, caused by the expansion of the fluid, comes to the mouth of the pipes at G′ G, it is carried through the holes in the linings, and at once ignites as it enters into the furnace. The flames are carried upward, and brought in contact with the retorts E E, thus continuing to vaporize the fluid.

When a steady supply of gas is obtained, and the furnace becomes properly heated, I supply it with ore, to be drawn off at J when smelted.

This process is applicable to all kinds of ores, not mentioned in my patent of March 9, 1869, and may be advantageously used for melting metals in crucibles, or otherwise.

Claims.

I do not confine myself to the size or shape of the furnace, the number or position of the retorts, or the number of pipes or jets of gas, or the position in which they may enter the furnace, placing then at the sides or under the bottom of the furnace, or in both at the same time, if desired; but

What I do claim as my improvements, and desire to secure by Letters Patent, is—

The arrangement of the retorts in the sides of the furnace, with pipes leading from them, and conveying the vaporized fluid to the inside of the furnace, or under the bottom of the same, and mixing it with the oxygen of the air through the openings at G′ G′, and driving the combined gas and oxygen into and up through the ores to be smelted.

Witnesses: CHARLES H. SWAIN.

ALEX. FINNEY,

J. MCKENNEY.