J. H. CLARK.

Ore-Roasting Furnace.

No. 160,649. Patented March 9, 1875.

FIG. 1.

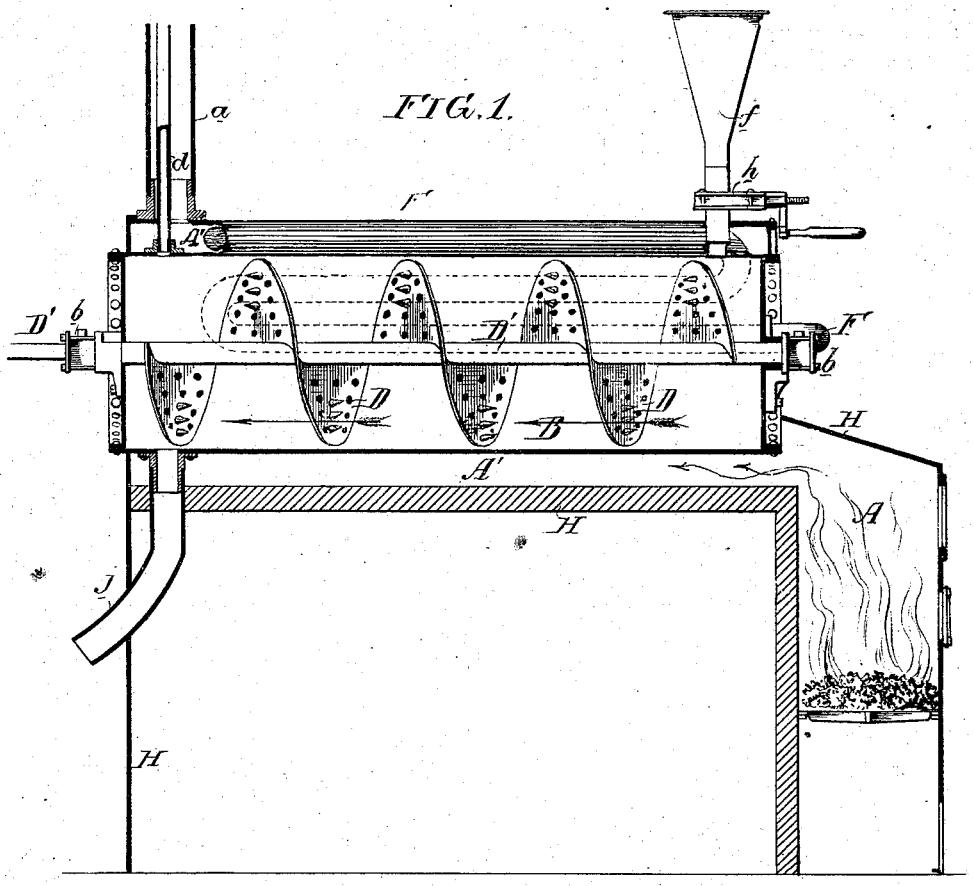
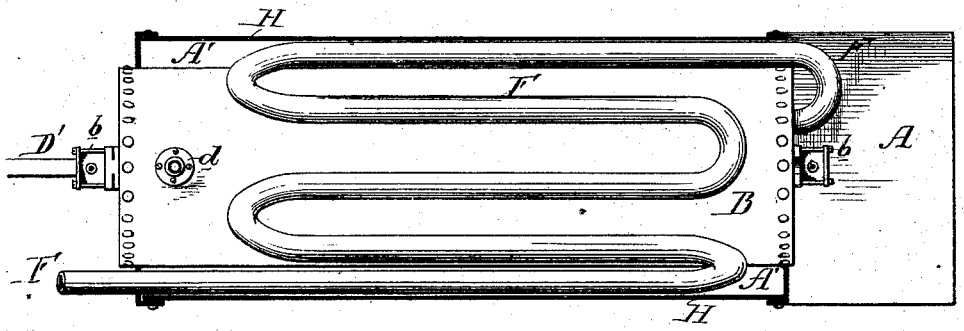


FIG. 2.



Witnesses, E. H. Eckfeldt
Harry Smith

Jacob H. Clark
by his attys.
Howson and Sons

UNITED STATES PATENT OFFICE.

JACOB H. CLARK, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO GEORGE STURGES AND JACOB H. CLARK, OF SAME PLACE.

IMPROVEMENT IN ORE-ROASTING FURNACES.

Specification forming part of Letters Patent No. **160,649**, dated March 9, 1875; application filed July 2, 1874.

To all whom it may concern:

Be it known that I, JACOB H. CLARK, of Philadelphia, Pennsylvania, have invented an Improved Desulphurizing Apparatus, of which the following is a specification:

The object of my invention is to separate sulphur and other volatile impurities from precious and other ores, slag, tailings, &c., by the process and apparatus which I will now proceed to describe, reference being had to the accompanying drawing, in which—

Figure 1 is a sectional elevation of the apparatus; and Fig. 2, a plan view, with the casing in section.

At one end of the casing H of the apparatus is a furnace, A, the products of combustion from which, before reaching the chimney *a*, are caused to circulate through a chamber, A′, and around a cylindrical retort, B, contained in the said chamber. Within this retort is a screw-conveyer, D, on a shaft, D′, which turns in bearings *b b* at the opposite ends of the retort, and is operated by any suitable system of gearing. (Not shown in the drawing.) A pipe, F, through which air is forced under pressure, communicates with one end of the retort, and is coiled around the latter within the annular chamber A′, in the manner plainly shown in Fig. 2; and at the opposite end of the said retort there is a pipe, *d*, which extends upward into the chimney *a*, and is finally bent downward, and terminates in a water-vessel. (Not shown in the drawing.)

The ore or other material to be treated is introduced into the retort through a hopper, *f*, provided with a valve, *h*, by which the quantity to be admitted is regulated, and a slow rotary movement is imparted to the screw-conveyer D, by which the ore is gradually moved through the retort in the direction of the arrow. In its passage the ore is thoroughly heated, not only by the direct action of the products of combustion on the exterior of the retort, but by the blast of air from the pipe F, which is intensely heated in its passage through the coiled portion of the said pipe, and which acts directly upon, and enters the interstices of, the mass of ore, the consequence being that the ore, which is overturned and kept in constant motion by the conveyer, is crumbled by the trituration and heat, and is thus reduced to the best possible condition for the disengagement of the sulphur, which, in the form of a vapor, is carried off by the blast through the pipe *d*, and is finally condensed in the water-vessel, before referred to. The ore, after having been thus treated, passes from the retort through a pipe, *j*, into any suitable receptacle.

The screw-conveyer D is perforated throughout with holes *k*, through which the air-blast from the pipe F can pass from one end of the retort to the other; and the said conveyer is also armed with projections or points *m*, which facilitate the agitation and breaking up of the ore. (See Fig. 1.)

I have found that the hot-air blast much facilitates the operation of the apparatus, and that the air can be heated most economically by coiling the pipe within the furnace, in the manner described, before connecting it to the retort.

I am aware that desulphurizers have been used in which the ores are conveyed through heated retorts while subjected to the action of steam, and I therefore make no claim to such apparatus; but

I claim as my invention—

1. A desulphurizing apparatus in which are combined a furnace, A, a retort, B, arranged within the said furnace and containing a screw-conveyer, D, and a pipe, F, coiled around the retort within the furnace, and from which a blast of hot air is forced into and through the said retort, all substantially as specified.

2. The screw-conveyer D, constructed substantially as described, with perforations *k* and projections or points *m*, for the purpose specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

J. H. CLARK.

Witnesses:
WM. A. STEEL,
HARRY SMITH.