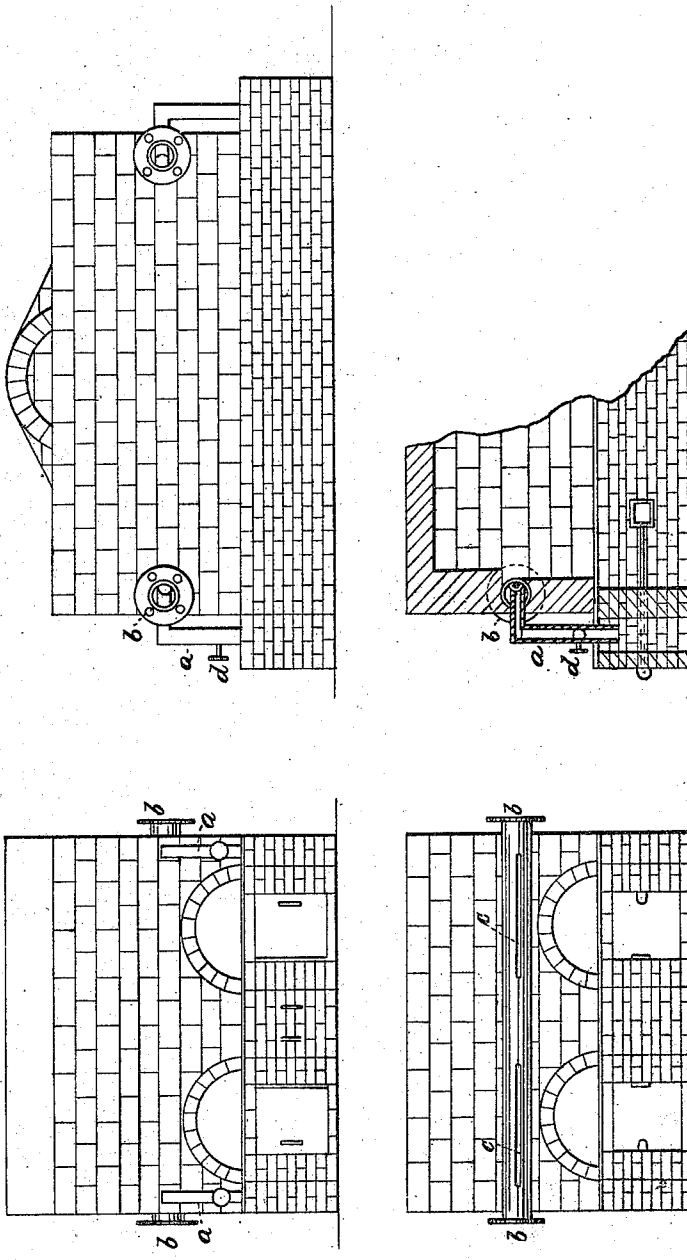


D. LEES.  
Making Oxide of Zinc.

No. 83,643.

Patented Nov. 3, 1868.



Witnesses:  
*Jas. McQuinn*  
*W. Calderwood*

Inventor:  
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# United States Patent Office.

DAVID LEES, OF BLAIR COUNTY, PENNSYLVANIA.

Letters Patent No. 83,643, dated November 3, 1868.

## IMPROVEMENT IN THE MANUFACTURE OF OXIDE OF ZINC FROM SULPHURETTED ORES.

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, DAVID LEES, of Blair county, in the State of Pennsylvania, have invented an Improvement in the Art or Manufacture of Oxide of Zinc, or of a mixture of oxide of zinc and sulphate of lead from ores of sulphuret of zinc, or from sulphuret of zinc containing galena, or sulphuret of lead, by the introduction of a current or blast of air into the ordinary oxide-of-zinc, or other furnaces, in such a manner that there shall be maintained a constant oxidizing-atmosphere above the whole surface of the bath or charge of mixed ore and coal; 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.

The nature of my invention consists in the application of a blast or current of air by means of a supply-pipe, *a*, with slots *c c*, enclosed in pipe *b*, kept constantly filled with water, which water is kept hot by the fire of the furnace, and, whilst it heats the air introduced, prevents the destruction of the pipes. The pipe *a* is also furnished with valves *d d*, for regulating the supply of air which is thereby introduced above the charge, and distributed perfectly over the whole interior surface of the furnace, so as to maintain a constant oxidizing-atmosphere.

By thus applying a hot blast substantially in the manner described, threefold advantages are secured:

First, by introducing the air above the charge of ore and fuel, there is maintained an atmosphere which is always oxidizing, whereas, if the air has access from beneath, it becomes mixed with reducing-gases, such as carbonic oxide, resulting from the imperfect combustion of the fuel, &c. These reducing-gases act injuriously, by preventing the oxidation of sulphuret or sulphide of lead, which is of a dark color, and its conversion into sulphate of the oxide of lead, which is white. In an oxidizing-atmosphere such as I produce,

this chemical change is perfectly effected, and the sulphate of lead is forced over into the ordinary collecting-apparatus, along with the oxide of zinc, by means of the blast or current.

Second, there being a perfect oxidation of the products of the heated mixture of ore and coal, there can be no volatile hydrocarbons and free carbon in a state of minute division carried over with the produced oxide. These would impair the color of the oxide of zinc. By this means bituminous coals can be employed to mix with the ore, instead of only anthracite, as in the ordinary methods.

Third, by distributing this blast over the whole interior surface of the furnace, which is perfectly done only by the above-described arrangement, the oxide of zinc and sulphate of lead are produced in an atmosphere with a temperature sufficiently elevated to decompose all the sulphate of zinc, which is always formed and exists in oxide of zinc, when manufactured from sulphuretted ores in the previously-employed methods. This sulphate of zinc, although white, is of a crystalline nature, and will not admit of being mixed with oil, so as to produce a homogeneous mixture, free from small lumps or granules, adapted to the purposes of an oil-pigment.

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

The application of a hot blast, substantially in the manner and by the process above described, to the manufacture of oxide of zinc, whereby the oxide is always formed in an oxidizing-atmosphere, and at a temperature sufficiently elevated to decompose all injurious products.

DAVID LEES.

Witnesses:

W. L. CALDERWOOD,  
J. P. STEWART.