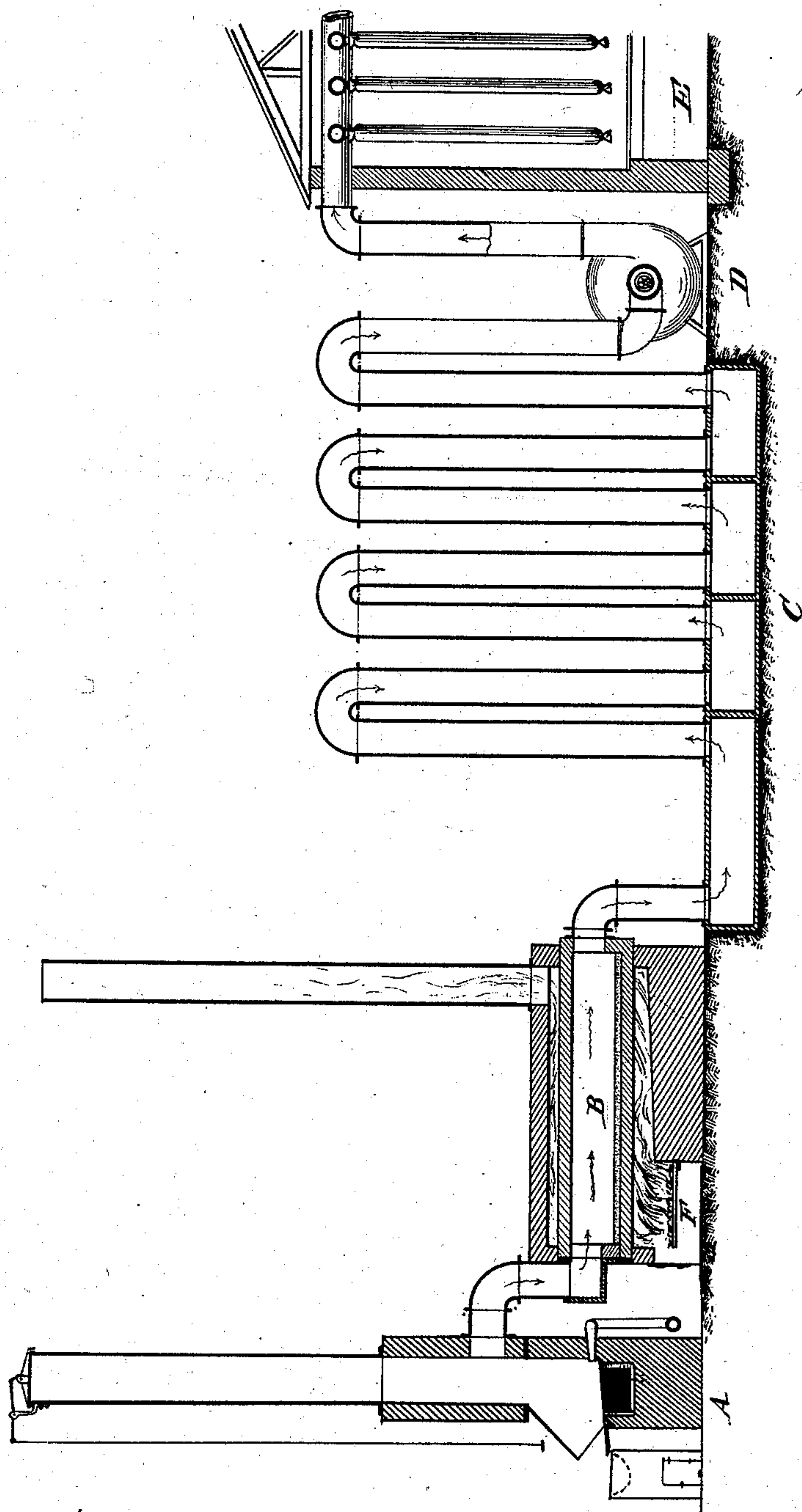


G. T. LEWIS.
 Process of Refining Waste Lead Fumes.
 No. 224,548. Patented Feb. 17, 1880.



Attests

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UNITED STATES PATENT OFFICE.

GEORGE T. LEWIS, OF PHILADELPHIA, PENNSYLVANIA.

PROCESS OF REFINING WASTE LEAD-FUMES.

SPECIFICATION forming part of Letters Patent No. 224,548, dated February 17, 1880.

Application filed November 20, 1879.

To all whom it may concern:

Be it known that I, GEORGE T. LEWIS, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Process for Refining Waste Lead-Fumes from Lead-Smelting, of which the following is a specification.

Heretofore the waste fumes from smelting a sulphuret of lead have been caught in a crude state, in which state they were unsuitable as a white pigment; but they were then refined by the joint action of heat and air, as described in another pending application for patent by George T. Lewis and E. O. Bartlett.

When roasted sulphureted lead ore has been used, or any oxidized lead ore, like carbonate of lead or a mixture of much oxidized lead ore with sulphureted lead ore, then the crude lead fumes may be refined before reaching the catching apparatus by passing them over or through a second fire which does not smoke, or by burning generator-gas in the flues leading from the smelting-furnace to the cooling and catching apparatus, as described in a pending application of Lewis and Bartlett.

This method cannot be used when sulphureted ore alone is smelted, since in this case only lead amounting from ten to fifteen per cent. of the lead in the ore passes off as fumes, while nearly all of the sulphur passes off. The lead-fumes will then be mixed with gases containing a great deal of sulphurous-acid gas—much more than can combine with the lead—and this sulphurous acid, in passing over the second fire in company with the fumes, was converted to a great extent into sulphuric acid, sufficient in quantity, in a very short space of time, to destroy the textile fabric in which the fumes are collected, besides making the pigment unfit for use without washing. The formation of this sulphuric acid was due to the hydrogen set free from the moisture in the blast of the refining-fire, or from the hydrocarbons in the coal of the same, which hydrogen, combining with free oxygen in the presence of sulphuric

acid and oxygen, forming hydrated sulphuric acid. I could wash out this sulphuric acid with water; but I found that I also lost considerable of the fumes. Hence I have found it more economical to use the present process of refining.

I have, however, found that by passing the air-blast for the refining-fire over burned lime or other suitable material for extracting the moisture the formation of sulphuric acid was prevented.

I also found that by heating to redness clay or cast-iron retorts externally and letting the waste fumes pass through them before reaching the cooling and catching apparatus, I prevented the formation of free sulphuric acid, while I refine the lead-fumes perfectly. In this case any kind of fuel may be used; hence it is the most desirable process, and since the gases from the fire do not enter the catching apparatus the atmosphere around the bags is not so poisonous as is otherwise the case.

Even for non-sulphureted lead ore this process is desirable, since the fire is open and easily managed.

In the drawing, A shows the Scotch hearth in which the ore is smelted, the fumes from which pass through the clay retort B, which is heated externally by a fire, F. From the retort they pass through the cooling-pipes C, through which they are drawn by the suction-fan D, and by which they are forced into the catching apparatus E.

I claim—

The process of refining waste lead-fumes from lead-smelting furnaces by passing the waste fumes through tubes or retorts heated externally before collecting them, substantially as described.

In testimony of which invention I hereunto set my hand.

GEORGE T. LEWIS.

Witnesses:

GORDON SECKEL,
H. B. RIANHARD.