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UNITED STATES PATENT OFFICE.

ALFRED FRANCIS, OF ST. LOUIS, MISSOURI.

METHOD OF REDUCING LEAD ORES.

No. 882,193. Specification of Letters Patent. Patented March 17, 1908.

Application filed August 21, 1907. Serial No. 389,592.

To all whom it may concern:

Be it known that I, ALFRED FRANCIS, a citizen of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Improvement in Methods of Reducing Lead Ores, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

This invention relates to the reduction of ores, and has for its object to provide a novel process or method of treating sulfid ores of lead; namely, ores containing galena (PbS) or concentrates of such ores.

Briefly stated, my method consists in first melting the ore with a suitable flux and then introducing this molten mass into a receptacle or furnace containing a bath of molten lead so that the molten sulfid of lead; namely, the matte, will float on top of the bath of molten lead in the receptacle. I then blow air into or through the bath of molten lead which causes the lead to oxidize and combine with the sulfid or matte, thereby converting the sulfid into metallic lead. For every two parts of lead oxidized, three parts of metallic lead will be produced.

My method or process is continuous as the ore after being melted is allowed to flow into the receptacle or furnace and as the bath of molten lead in said receptacle is subjected to a blast of air to convert the matte into metallic lead, said metallic lead is allowed to flow out of the receptacle, a stream of matte continually flowing onto the bath of molten lead as the metallic lead flows out of said receptacle. Instead of permitting the metallic lead to flow out of the receptacle at the same time the stream of matte is introduced onto the bath of molten lead I can let the metallic lead accumulate in the receptacle and then tap it or let it flow out intermittently. I can also introduce the stream of molten matte onto the bath of molten lead intermittently or at intervals instead of introducing it in the form of a continuous stream.

Any scum or slag which collects on top of the molten mass can be removed or scraped off from time to time by any suitable device or, if desired, it can be left on the molten mass so as to prevent volatilization to some extent.

I have not illustrated an apparatus for practicing my method as any form of blast furnace or reverberatory furnace can be used for melting the ore or concentrates and the receptacle or furnace which contains the bath of molten lead may simply be provided with nozzles or injectors which are so arranged that they will blow air into the bath of molten lead.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

The method of treating sulfid ores of lead or concentrates of such ores, which consists in melting ore having fluxes and fuel mixed therewith to produce an approximately pure lead matte, allowing said lead matte to flow onto a bath of molten lead, and blowing air into said bath of molten lead to oxidize the lead and convert the matte into metallic lead; substantially as described.

In testimony whereof I hereunto affix my signature in the presence of two witnesses, this fifteenth day of August 1907.

ALFRED FRANCIS.

Witnesses:
WELLS L. CHURCH,
CORA BADGER.