

UNITED STATES PATENT OFFICE.

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METHOD OF PURIFYING METALS.

1,043,371.

Specification of Letters Patent.

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No Drawing.

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To all whom it may concern:

Be it known that I, AXEL GUSTAF SUNDBERG, a subject of the King of Sweden, residing at Kullagatan 8-10, Helsingborg, Sweden, have invented new and useful Improvements in Methods of Purifying Metals, of which the following is a specification.

The present invention has for its object a method of removing impurities such as arsenic, antimony, sulfur and phosphorus from metals. This method has proved to be particularly advantageous for the purification of copper, but can also be used with advantage for other metals, for instance iron. For purifying metals it has previously been proposed to introduce into the fused metal jets of air mixed with scorifying agents and also with hydrocarbons or pulverized charcoal or the like, if required, for obtaining the heat, necessary for the reaction. It has also been proposed for purifying copper to introduce into it currents of compressed air and soda ash. Finally it has been proposed for purifying metals to introduce into them, when in a molten state, for instance soda or potash, oxids of metals and carbon, whereby the latter obviously has for its object to reduce the metallic oxids added.

Now according to the present invention a scorifying agent in a finely divided state and mixed with a combustible (hydrocarbon, coal or charcoal for instance) is introduced into the molten metal beneath its surface, by means of a current of air or gas, so that the purifying substances are caused to pass upward through the molten metal.

But I make use of a special scorifying agent, namely, a carbonate of alkali, because by repeated experiments I have found that agent to be very advantageous for carrying out the refining process rapidly and completely. In ordinary raw copper, for instance, during a certain stage of the refining process, arsenic is present as an arseniate of copper, lead or bismuth which forms an alloy with the copper, but if a current of air with pulverized carbonate of sodium is forced through the copper, the said arseniate is converted into a sodium salt which forms no alloy with the copper but rises to the surface of the bath in the form of slag. It has been found that the consumption of such purifying substance is comparatively small, it being for instance possible to reduce a percentage of 0.02% of arsenic in common raw copper to 0.002% by blowing in a quantity of carbonate of sodium, corresponding to less than $\frac{1}{2}$ % of the total quantity of copper.

Having now particularly described the nature of my invention, I claim as new:

The method of purifying metals which consists in blowing a combustible and a carbonate of an alkali in the molten metal beneath the surface.

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

AXEL GUSTAF SUNDBERG.

Witnesses:

ELVING MÖLLER,
HENNING MANNERS.