UNITED STATES PATENT OFFICE.

CHARLES M. ALLEN, OF BUTTE, MONTANA.

PROCESS OF CONVERTING AND SMELTING PRECIOUS ORES.

SPECIFICATION forming part of Letters Patent No. 519,217, dated May 1, 1894.

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To all whom it may concern:

Be it known that I, CHARLES M. ALLEN, a citizen of the United States, residing at Butte city, Montana, have invented certain new and useful Improvements in Processes of Converting and Smelting Precious Ores, of which the following is a specification.

My invention relates particularly to the converting and smelting of gold, silver, and precious ores which require high degrees of temperature to reduce to a molten condition, and has for its object the providing of a simple, economical and efficient process for converting and smelting precious metals in a continuous operation.

To this end it consists, in first reducing the raw material to a molten condition in a suitable converter, by subjecting it to an intense heat and blast of air, then changing the position of the molten material in the converter so as to remove it from the action of the air, drawing off a desired quantity of such molten material of the gravity desired, changing the remaining molten material back to its original position and adding a sufficient quantity of new material, subjecting such mixture to the direct action of a blast of air until the whole mixture has again been reduced to a molten condition, again changing the position of the molten material and removing it from the action of the blast of air and drawing off the quantity of molten metal desired.

In carrying out my process I prefer to use a converter having the usual converting or smelting chamber, and which may or may not be provided with water jackets as desired. The converter should be mounted on hollow trunnions and have its upper open end entering a dust chamber which has proper communication or connection with a smoke stack. Through one of the hollow trunnions should be introduced a blast pipe through which a blast or current of air can be conveyed in and through a continuation of the same, leading such blast or current of air to the lower end of the converter which is provided with a set of tuyeres entering the converting chamber for the purpose of subjecting the molten metal to the action of the air and raising its temperature to such a point as will melt any raw material that is added, the tuyeres being so arranged that when the position of converter is changed they are raised above the surface of any molten material that may be contained in the converting chamber, so that such molten material is not subjected to a current or blast of air so that its temperature is further raised, but which allows such current of air to pass over such surface of molten material and out through the opposite end of the converter. The converter should have a suitable tap through which the desired quantity of the molten metal can be drawn off.

In using my process I prefer to have my converter in its original upright vertical position and build a fire therein subjecting the same to a blast of air to raise the temperature and obtain the intense heat necessary to reduce the gold, silver, or other precious metals to a molten condition. I then add the desired quantity of precious ores to be melted to such converter and thoroughly melt the mixture. The converter is then tipped or its position changed so that the molten mass is removed from the action of the blast of air and allowed to cool to the desired temperature, so that the quantity of the molten metal of the gravity desired, may be drawn off through a suitable tap. The converter is then changed back to its original position, new raw material added and the mixture subjected to the action of a blast of air until it has been sufficiently melted when it is again removed from the action of the blast of air and such quantity of the molten material drawn off as may be desired. These successive casts, addition of raw material and blasts are repeated as often as may be desired, all from the first initial melting of the material and do not require the starting of a new fire or the addition of molten material to continue the same, but providing one continuous process for the smelting or converting of precious ores. It will be understood that it is expected that there is sufficient sulphur in the ores treated to supply the requisite amount of fuel for their melting after the first charge has been ignited.

I claim—

The process of smelting and converting precious metals, which consists in supplying raw material to material in a converter al-

ready in a molten condition, subjecting the old and new material to the action of a blast of air until a desired quantity is in a molten condition, changing the position of the molten material in the converter to remove it from the action of the blast of air, drawing off a desired quantity of the molten material, and then restoring the remaining portion to its original position to receive additional raw material, substantially as described.

CHARLES M. ALLEN.

Witnesses:
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