

UNITED STATES PATENT OFFICE.

HENRY W. ADAMS, OF NEW YORK, N. Y.

IMPROVEMENT IN PREPARING ZINC FROM THE ORES.

Specification forming part of Letters Patent No. 9,145, dated July 27, 1882.

To all whom it may concern:

Be it known that I, HENRY W. ADAMS, of the city, county, and State of New York, have invented a new and improved process for the manufacturing of metallic zinc in the form of a fine powder by the use of steam; and I do hereby declare the following to be a full, clear, and exact description thereof.

I take any of the ores of zinc, as the blende or sulphuret, the silicate or calamine, and the oxide of zinc. I mine, sort, calcine, prepare, and reduce these ores in the same manner and by the use of the same machinery and processes of metallurgy as those now in use and more particularly described in scientific books; but instead of condensing the volatilized metal over water and obtaining in it metallic globules or small drops of metal in the vessel containing the water, and in which the iron pipe conducting the volatilized metal is sealed to exclude the air, I introduce a jet of steam into this pipe, which fills the pipe and gradually condenses into water upon the surface of the water in the vessel below. The volatilized metal as it passes from the retort is thus brought into contact with the steam and cooled at once in a state of impalpable powder. This powder is metallic zinc in such a state of perfect comminution of particles as to be mixed with oil and used as paint without any further process. It is of a bluish-white color, unoxidized, and can be either melted or cast into metallic slabs, like the common zinc of commerce, or it can be burned and oxidized in the air, and converted into zinc-white for paint. The only condition necessary to obtain this dark-grayish metallic powder is this: As zinc melts at about 700° of heat and volatilizes at a still higher heat, it is necessary that the temperature of the steam should be less than the melting-point of the zinc, so as to cool the volatilized metal instantly and reduce it to a state of impalpable metallic powder. Otherwise, if the steam be raised to a temperature equal to or above the volatilizing heat of the zinc, another result will take place, which I have

already patented—to wit, the oxygen of the steam will combine with the metal and produce white oxide of zinc and liberate hydrogen gas.

The advantage of this process is that it enables me to manufacture metallic zinc from ore ten per cent. cheaper than it has heretofore been done, as a loss of ten per cent. is now sustained in melting and casting the condensed metal into spelter for commercial uses.

Secondly. This metallic powder is worth more pound for pound than the present zinc of commerce, as it can be immediately used for painting ships' bottoms, galvanizing iron, and covering surfaces with a perfect metallic coating. It can also be converted with small expense into zinc-white by sifting it into a wide flat-bottomed oven made of fire-tiles, or other suitable materials, raised to a white heat with access of air. The metallic powder is perfectly burned and oxidized in a few minutes with an increase of weight of nineteen pounds to every eighty-one pounds.

This process gives no poor quality of oxide resulting from an imperfect burning, but its particles being in such a state of minute division that when they are brought into contact with the proper heat, with access of air, the complete oxidation of every particle takes place in a few minutes. I am therefore enabled to manufacture a commercial product of metallic zinc ten per cent. cheaper than has been done heretofore.

Having thus fully described the nature of my invention or discovery, and shown the method in which it may be accomplished, what I claim therein as new, and desire to secure by Letters Patent, is—

The process of manufacturing metallic zinc in a state of impalpable powder by the cooling agency of steam, substantially in the manner herein set forth.

HENRY W. ADAMS.

Witnesses:

A. B. STOUGHTON.

B. K. MORSELL.