

# UNITED STATES PATENT OFFICE.

SMITH GARDNER, OF NEW YORK, N. Y.

## IMPROVEMENT IN THE PROCESS OF MANUFACTURING WHITE LEAD.

Specification forming part of Letters Patent No. 1,744, dated August 28, 1840.

*To all whom it may concern:*

Be it known that I, SMITH GARDNER, of the city of New York, in the State of New York, have invented an Improvement in the Process of Manufacturing White Lead, known to the chemist under the name of "Carbonate of Lead;" and I do hereby declare that the following is a full and exact description thereof.

The first part of my procedure consists in the treating of metallic lead by the well-known process by which a pulpy substance is produced which is known to manufacturers under the name of "suboxide of lead." This process consists in the placing of granulated lead or lead in fragments in vessels lined with sheet-lead and containing water. These vessels may be in a cylindrical form and made to revolve on their axes, like barrel-churns; or they may have a reciprocating instead of a revolving motion, and they may be and have been varied in form in different ways, the only essential point in their construction being that the lead contained within them may be subjected to continued attrition.

Thus far the process is identical with that which has been adopted and followed in many manufactories, in which it has been attempted to manufacture white lead from the suboxide of lead so produced. In these attempts it has been proposed to carbonate the suboxide of lead by putting portions of carbonate of potash, carbonate of soda, or other carbonates into the water with the lead undergoing attrition, it having been supposed that the alkaline carbonate would give up its carbonic acid to the oxide of lead as said oxide was formed. Independently of the known affinities of the respective articles named, I have proved by repeated experiments on a large scale that carbonate of lead cannot be produced in that way. Another attempt to convert the suboxide of lead obtained by trituration into white lead has been by taking the said pulpy oxide, agitating it in a vessel containing water, and forcing a stream of carbonic acid, or of carbonic acid mixed with atmospheric air, through it. By this process a carbonate of lead has been produced, but in so imperfect a manner as to leave it destitute of all the essential properties of that article, wanting the density, body, and freedom from color found in good white lead.

In consequence of these defects the attempts hitherto made to manufacture white lead from the suboxide produced by trituration of fragments of lead in leaden vessels under water have proved abortive; but by a very simple variation of the process I have succeeded in producing good white lead, and which has been pronounced by judges to be equal to the best that is imported.

As it was fully proved that the suboxide would not combine with the carbonic acid after said suboxide had been fully formed, I determined to vary the process so as to present the carbonic acid, in conjunction with a portion of atmospheric air, to the suboxide of lead in its nascent state, and this I have found perfectly effectual. In order to effect it I triturate my lead with water in leaden cylinders or other vessels, as above described; but instead of leaving such vessels open or perforating them for the admission of atmospheric air, I make them close by means of suitable shutters or stoppers, which may be removed whenever it is necessary so to do, and during the whole time that the trituration is continued I introduce carbonic acid, accompanied by atmospheric air, into the trituration-vessels. When these vessels are in the form of horizontal cylinders I pass the gases into them through hollow gudgeons—a mode of construction and procedure well known to machinists. Under other forms or modes of constructing my trituration-vessels I adopt whatever means I may consider the best for introducing the gases within them. The result of this process is that the nascent suboxide of lead presented to the oxygen of the atmospheric air and to the carbonic acid combines with them and at once produces a perfect carbonate of lead, possessing all the essential properties of that article. I in general open each trituration-vessel once in about twelve hours to remove the carbonate of lead which has been formed within it. This may be done more or less frequently, according to circumstances.

When the carbonate of lead thus manufactured is first obtained it generally has a light tinge of blue; but this disappears in the process of drying, and it is not important, therefore, to adopt means to prevent it. I have found, however, that by introducing a very

small portion of the vapor of vinegar, in conjunction with the atmospheric air and carbonic acid, the white lead is at once obtained perfectly free from color.

The carbonic acid may be generated by the combustion of coal, or by the decomposition of carbonate of lime or of other carbonates.

Having thus fully shown the manner in which I conduct the process of manufacturing white lead or carbonate of lead, and pointed out the difference in the process as adopted by me from those heretofore followed, what I claim therein as of my invention, and desire to secure by Letters Patent, is—

Simply the introduction of carbonic acid and

of atmospheric air into closed vessels in which fragments of or granulated lead is subjected to long continued attrition in water, the introduction of these gases being intended to supply the portion of oxygen and of carbonic acid necessary to convert the nascent suboxide of lead into white lead, by which means a perfect combination is effected and the desired result attained, as herein set forth.

In testimony whereof I have hereunto set my hand this 14th day July, 1840.

SMITH GARDNER.

Witnesses:

THOS. P. JONES,  
GEO. WEST.