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MANUFACTURE OF LEAD OXID AND WHITE LEAD.

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988,963. Patented Apr. 11, 1911.

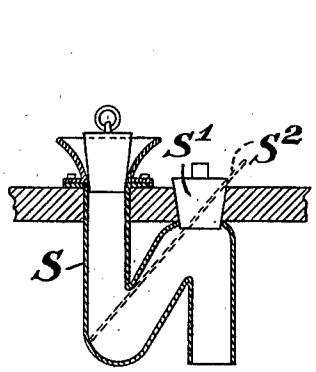


Fig. 1a.




Fig. 1.

Witnesses

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# UNITED STATES PATENT OFFICE.

GEORGE VINCENT BARTON, OF LIVERPOOL, ENGLAND.

## MANUFACTURE OF LEAD OXID AND WHITE LEAD.

988,963. Specification of Letters Patent. Patented Apr. 11, 1911.

Application filed February 15, 1909. Serial No. 477,963.

*To all whom it may concern:*

Be it known that I, GEORGE VINCENT BARTON, subject of the King of Great Britain, residing at Mossley Hill, Liverpool, in the county of Lancaster, in the Kingdom of England, have invented certain new and useful Improvements in the Manufacture of Lead Oxid and White Lead, of which the following is a specification.

This invention has for its principal ultimate object the manufacture of white and red lead.

At present in the manufacture of white lead from oxid of lead by dissolving the latter in acetate of lead solution, nearly half the lead remains behind as sludge. Indeed the reason why the precipitation process for the manufacture of white lead has never paid commercially is because such a very large amount remains undissolved, and has to be refurnaced. This is owing to the oxid of lead having been fused in its manufacture, and no matter how finely it is ground afterward, this fused oxid is in large part insoluble in the acetate of lead solution.

Now by my invention I avoid the fusing of the oxid altogether by making it as a highly soluble massicot at a temperature a long way below the fusing point, and thus the difficulty hitherto experienced in working commercial litharge is entirely avoided. Further, in the manufacture of red lead it is also very desirable to have the lead oxid in as fine a state of division as possible, to avoid the fusing of the oxid, and to have every particle of the charge at the same degree of oxidation, and especially to avoid powdered lead in the charge, as the lead takes much longer to oxidize to red lead than the fused oxid, and the fused oxid much longer than the finely divided unfused oxid. It is thus impossible to bring all the lead oxid at the same time to the right color, and individual parts are too much oxidized, and others too little.

Now my invention is designed to obtain a lead oxid manufactured at a temperature very much below the fusing point, and of the very finest possible state of division, and entirely free from metallic lead, every particle of the material being at the same degree of oxidation.

In my United States Patent No. 663,533, dated September 19, 1899, the apparatus therein set forth enabled me to get oxid of lead in a very fine state of division, but the difficulty was that it contained a very large percentage of extremely finely divided metallic lead. The product therefore was unsuited either for white lead or for red lead manufacturing purposes, as in the white lead precipitation process, the lead remains behind as a sludge, which is difficult to refurnace or reoxidize, and if this product be used in the red lead process the red lead is spoiled through having a bad color owing to the metallic lead being under oxidized while the finely divided oxid is over oxidized.

Now by my present invention I obtain a product which fulfils the conditions hereinbefore mentioned and is entirely dissolved in the acetate of lead solution with the exception of a very small percentage of dirt consisting almost entirely of non-metallic matter or matter other than lead, and lead oxid.

My invention, broadly stated, consists in heating the effluent material to a high temperature, and maintaining such temperature until the lead is entirely converted into oxid of lead. In my patent aforesaid, an exit $A^2$ was provided in the side of the pot for the passage of the oxid and gases. Now I have found that if I bring this exit upward through a highly heated chamber whereby the exit pipe is heated to nearly a red heat, the whole of the lead is converted into finely pulverulent lead oxid, and in the manufacture of white lead from it there is only a very trifling amount of sludge, and this consists almost entirely of mineral matter, soil and the like other than metallic lead. The lead oxid thus produced is made into white lead by the precipitation process in the ordinary manner or if required for making red lead can also be made into red lead in an ordinary red lead furnace.

I will illustrate my invention by showing my apparatus as applied to red lead manufacture.

In the drawing A is the pot in my plant, having a stirrer B, and a 50 millimeter air pipe C driven by a 4½ millimeter steam jet; D is a baffle plate fixed to the top of the pot.

F is an exit proceeding upward instead of horizontally as set forth, in my Patent No. 633533. This is surrounded by a jacket H which is provided however with the necessary entrance for air and gas as shown.

G is a series of Bunsen jets bearing against the pipe F, and heating it to a dark red heat. It is obvious however that any other well-known method of heating pipe F can be adopted.

M is a downward passage to the settling chamber E.

The lead oxid pot A is supplied with lead through a trap S to a height of about 1 to 1½ decimeters, the pot being 13½ decimeters in diameter. In Fig. 1ª is shown an enlarged view of the trap S.

S′ is a large hollow screw plug useful for holding up the trap and when removed its hole can be used for passing a rod through to clean out the trap as shown in dotted lines at $S^2$.

The mode of action is as follows:—The blast of air and steam being set on, and the pot being filled to about from 1 to 1½ decimeters with lead through trap S and being at about 380 degrees to 400 degrees centigrade, and the stirrer being set revolving, the lead is brought into violent action, which is hindered by the baffle plate or diaphragm, causing a considerable disturbance in the lead. The air and steam acting on this disturbed lead converts the same into an extremely fine powder of oxid combined with the very fine powder of lead, and the two are driven out by uptake F together. This uptake however being heated to a red heat increases the heat of the effluent gases sufficiently to oxidize the lead present, and the entire contents of the pot in about six or seven minutes are deposited in the collecting chamber. The air and steam escape up through a chimney not shown, in which there are filtering devices to prevent any escape of lead dust and this chamber is from time to time scraped out and emptied. When by a sharp ringing sound it is found that the action is completed the blast is still allowed to go on, cooling the pot, for about a quarter of an hour, when it has got down again to 380 to 400 degrees centigrade. Another charge is now introduced through the trap S and the action again commenced.

I declare that what I claim is:—

1. The process of manufacturing lead oxid, which consists in subjecting metallic lead to a blast of air and steam, discharging the mixed dust and gases in an upward direction, and at the same time heating said dust and gases to a degree slightly below that necessary to fuse the oxid until the entire lead contents are converted into oxid.

2. The improvement in the process of making finely pulverulent lead oxid without handling, or exposure of the workmen to poisonous dust, which consists in acting on a charge of lead with a blast of air and steam within a closed chamber, heating the mixture of fine dust and gases thus produced while the gases are suspended in air to a heat somewhat below that at which the oxid fuses until all the lead content is converted into oxid, passing the dust and gases into a closed depositing space, and separating the remaining effluent air by filtration.

3. As a new article of manufacture, a sublimed intensely fine powder of unfused lead oxid, the particles of which are all at the same degree of oxidation and contain no metallic lead or vitrified or fused oxid, and capable of dissolving freely and entirely in a solution of acetate of lead.

4. The process of manufacturing lead oxid, which consists in subjecting metallic lead to a blast of air and steam, discharging the mixed dust and gases, and at the same time heating said dust and gases to a degree slightly below that necessary to fuse the oxid until the entire lead contents are converted into oxid.

In witness whereof, I have hereunto signed my name this 3rd day of February 1909, in the presence of two subscribing witnesses.

GEORGE VINCENT BARTON.

Witnesses:

JOHN KIRBY,

WM. PIERCE.