

A. HONMAN & V. VULLIEZ.

PROCESS OF AND APPARATUS FOR THE MANUFACTURE OF WHITE LEAD.

No. 489,254.

Patented Jan. 3, 1893.

Fig. 6.

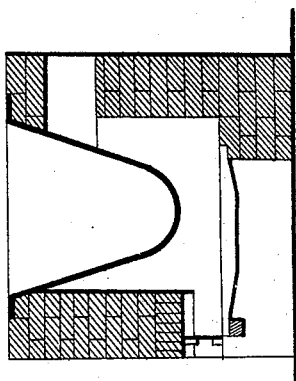


Fig. 8.

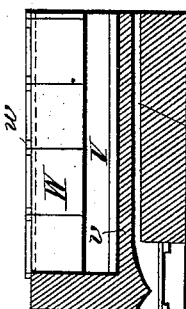
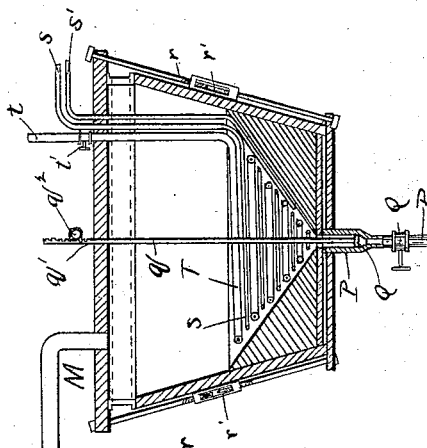
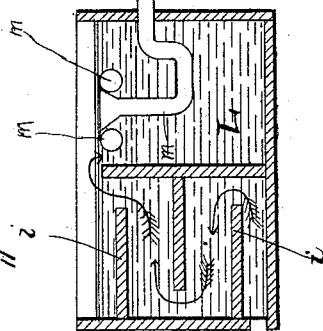
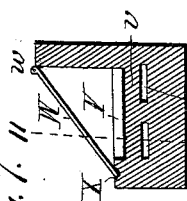


Fig. 7.



Witnesses
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Fig. 1.

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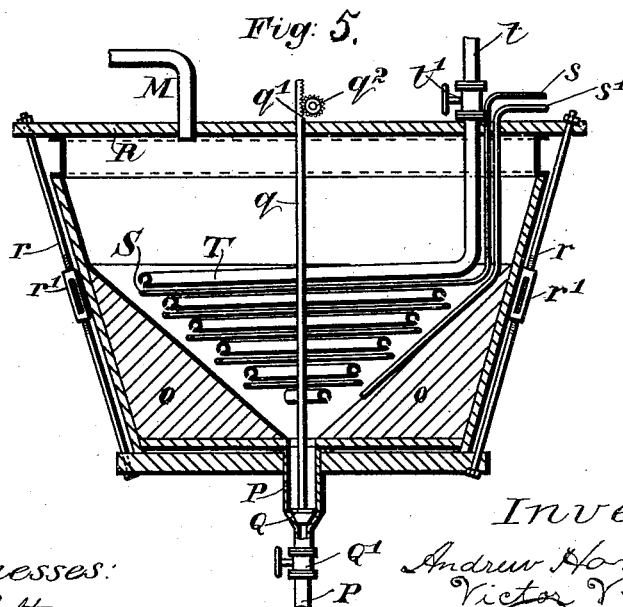
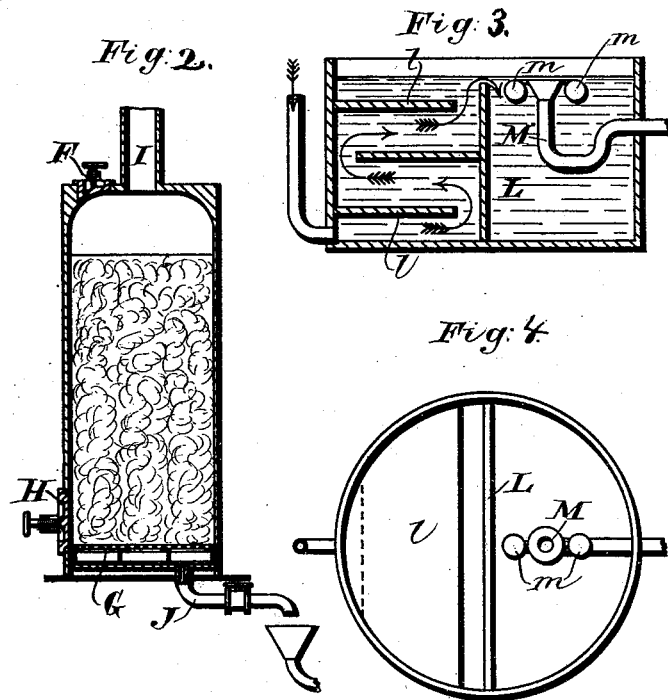
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UNITED STATES PATENT OFFICE.

ANDREW HONMAN AND VICTOR VULLIEZ, OF WILLIAMSTOWN, VICTORIA.

PROCESS OF AND APPARATUS FOR THE MANUFACTURE OF WHITE LEAD.

SPECIFICATION forming part of Letters Patent No. 489,254, dated January 3, 1893.

Application filed May 28, 1891. Serial No. 394,452. (No model.) Patented in Victoria September 24, 1889, No. 7,127, and in Tasmania October 8, 1890, No. 857.

To all whom it may concern:

Be it known that we, ANDREW HONMAN, surgeon, a subject of the Queen of Great Britain, residing at Electra Street, Williamstown, in the British Colony of Victoria, and VICTOR VULLIEZ, white-lead manufacturer, also a subject of the Queen of Great Britain, residing at Osborne Street, Williamstown, in the British Colony of Victoria aforesaid, have invented new and useful Improvements in the Process of and Apparatus for the Manufacture of White Lead, (for which the said ANDREW HONMAN has obtained Letters Patent in the British Colony of Victoria, dated September 24, 1889, No. 7,127, and for which we, the said ANDREW HONMAN and VICTOR VULLIEZ, obtained Letters Patent in the British Colony of Tasmania, dated October 8, 1890, No. 857,) of which the following is a specification.

This invention relates to a method of manufacturing white lead in which the roasted ore is subjected to the action of lead acetate, the clear solution from which has a stream of carbonic acid passed through it, and its object is to obtain white lead which is in finer crystals and more uniform in quality than when manufactured by the ordinary process.

It consists mainly in preserving the basic acetate of lead at a uniform temperature of about 120° Fahrenheit throughout the whole of the operation.

In manufacturing white lead by our process we take the ordinary galena and crush and wash it as in the ordinary manner. We then roast it in a reverberatory furnace which has a more than ordinarily large area of surface relatively to the fire-place, and this latter is provided with a boiler arranged immediately above it for the purpose of providing a supply of steam which is conducted through a pipe or pipes just beyond the bridge, so as to discharge a series of steam jets in the direction of and above the galena in course of roasting. By practical experiments it has been found that great advantages are attained by roasting the galena in the presence of steam.

Referring to the drawings, Figure 1 is a diagrammatic view of an apparatus for carrying my process into effect. Fig. 2 is a view

of one of the cylinders. Fig. 3 is a section of the settling tank. Fig. 4 is a plan of the same. Fig. 5 is a view of the vat. Fig. 6 is a sectional view of the precipitating vat. Fig. 7 and 8 are sectional views of the drying apparatus.

The galena is suitably roasted to drive off the greater part of the sulphur. When this has been accomplished we remove it from the furnace and place it in one of a series of tinned copper cylinders (such as is shown in Fig. 2 of our drawings), F being a man-hole door through which the material is fed and G being a perforated false bottom covered with coarse linen, and H a man-hole door for removing the contents after they have been treated. I is a pipe for conducting a stream of hot neutral lead acetate into this cylinder, and J is a pipe at the bottom for the purpose of conveying this stream (which has then been converted into basic lead acetate) to a settling tank shown in Figs. 3 and 4. The hot lead acetate is supplied to this cylinder at about 15° Baumé and is continued until it ceases to have any effect on the material under treatment, which is ascertained by testing the solution discharged through pipe J.

The settling tank, which is represented in section and plan at Figs. 3 and 4, is divided into two parts by a vertical partition L, one part of which contains a series of baffle plates for the purpose of preventing the stream of liquid rising too rapidly to the top and by compelling it to pursue a circuitous course to give greater opportunities for it to deposit any solid matter it may hold in suspension. The overflow from this half passes into the second half in which there is a discharge pipe M made of india rubber or other flexible material and having its mouth supported by floats *m* so as to receive only the purer liquid which is at the upper part of the vessel. The clear solution of basic lead acetate thus being discharged through pipe M is conveyed into a vat constructed as shown in Fig. 5, said vat being lined with tinned copper and its bottom being made so as to converge toward the center. This we prefer to effect by filling up that portion of the vat marked O with cement. To the center of this vat we connect

a discharge pipe P which we provide first with a plug Q and secondly with a stop-cock Q' so that both must be operated before the liquid can escape. To the plug Q is attached
 5 a rod q having a rack q' at the top with which gears a pinion q^2 by operating which the plug Q may be either opened or closed. This vat has a lid or cover R which is securely fastened down by means of two or more right and left hand
 10 screw-threaded rods $r-r'$ provided each with a correspondingly screw-threaded link r' , whereby the two parts of said rods may be drawn closer together or vice-versa, as will be well understood. The solution in this vat is
 15 kept at an even and regular temperature of 120° Fahrenheit or thereabout by means of a worm S into which steam enters at s , and the exhaust from which finds its exit at s' . In this vat we also provide a worm T arranged
 20 spirally so as to be parallel to the cemented sides of the vat. This worm is perforated throughout its whole length so as to admit of the escape of a stream of carbonic acid which is conveyed to it from any suitable source by
 25 means of pipe t , which of course is provided with a stop-cock t' to cut off the supply whenever needed. By preference we force the stream of carbonic acid through said worm by means of a pump, and the result of this proceeding is to
 30 cause the basic lead acetate to precipitate lead carbonate—white lead. When the solution, which is at first about 18° Baumé, decreases to 15° Baumé, the supply of carbonic acid is cut off and a few minutes allowed for the precipitate to settle down to the bottom from whence
 35 it is drawn through the pipe P and is then immediately replaced by a fresh quantity of clear basic lead acetate from the settling tank, shown in Figs. 3 and 4, so as to bring the so-
 40 lution again to the density of about 18° Baumé when the supply of carbonic acid is again turned on and the same operation repeated. The lead carbonate—white lead—which is thus discharged through pipe P together with
 45 its accompanying solution is conducted to a settling tank, where the white lead deposits itself and the clear solution at the top is pumped back to a cylinder (such as is illustrated in Fig. 2) and when the oxide therein
 50 has been entirely dissolved the sulphate of lead, which forms a portion of the residue, is dissolved by a solution of caustic soda, caustic potash, or ammonium acetate. The solution thus made is conveyed to a tinned cop-

per pan, such as shown in Fig. 6, wherein it is preferably maintained at a fairly high temperature in order that finer crystals may be produced than would otherwise be the case,—and wherein the white lead is precipitated by means of a solution of carbonate of soda, potash or ammonium. The white lead thus produced either from the decomposition of the sulphate of lead or from the discharge from the vat (shown in Fig. 5) is first thoroughly washed and then dried in an apparatus shown
 65 in Figs. 7 and 8. This drier consists of a cast iron pan supported on a bed of bricks V, and the two heating flues V'. This apparatus is provided with metal lids W, which it will be seen are hinged at w , and are inclined at about forty-five degrees. The ends of the lids rest in a groove or channel X so that as the vapor condenses on the lids W it runs down into this channel and is conveyed away
 75 outside of the pan. This pasty white lead should be spread upon this pan three or four inches deep and kept there until thoroughly dried. When dried it is broken up, pressed through fine sieves and packed for transportation.
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Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed we declare that what we claim is:

1. The hereinbefore described process consisting of reducing and roasting the galena, subjecting it to hot neutral lead acetate, conveying the resultant basic lead acetate to a settling tank, discharging the clear solution of basic lead acetate to a closed vat and maintaining it at an even temperature, and subjecting it to the action of carbonic acid to precipitate the white lead, substantially as described.
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2. The described apparatus consisting of a holder or receiver, a settling tank with connections from the receiver, a closed vat and a pipe connection from the surface of the solution in the settling tank to the vat, means for heating the contents of the vat, and means for supplying the carbonic acid thereto provided with a discharge, substantially as described.
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