

3 Sheets--Sheet 1.

D. K. TUTTLE & J. A. McCREARY.

Manufacture of White Lead.

No. 148,862.

Patented March 24, 1874.

Fig. 1.

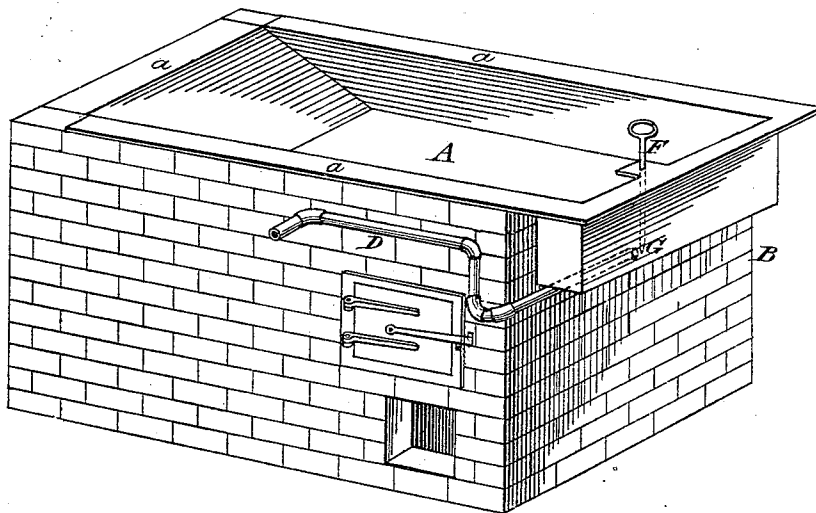
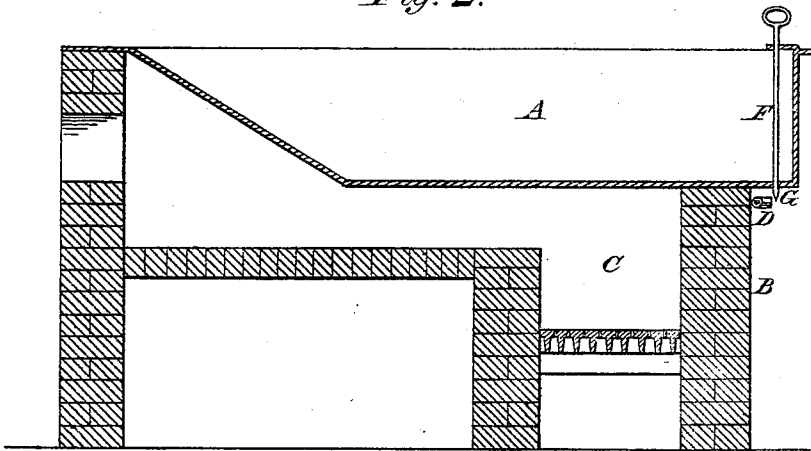


Fig. 2.



Witnesses:

R. G. Sauerwein
Stanley Hutchins

Inventors:

David K. Tuttle
James A. McCreary

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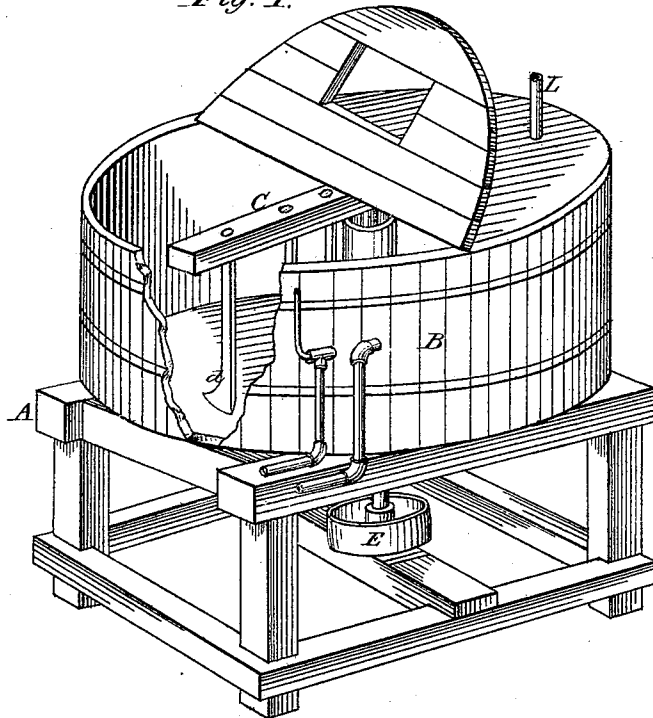
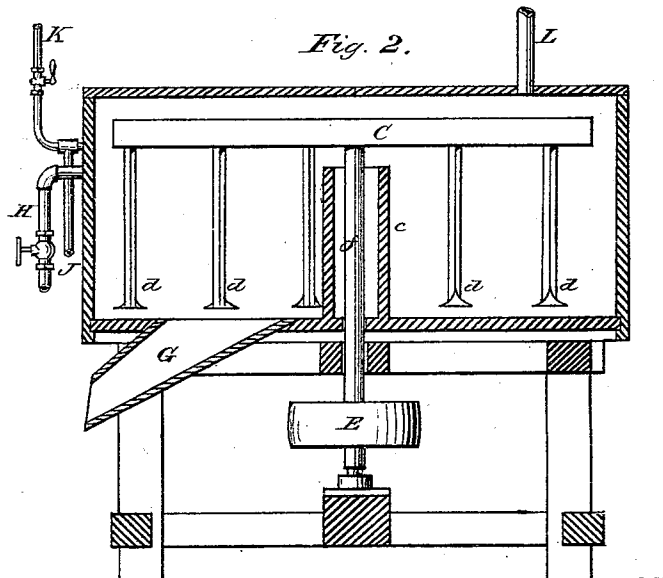


Fig. 2.



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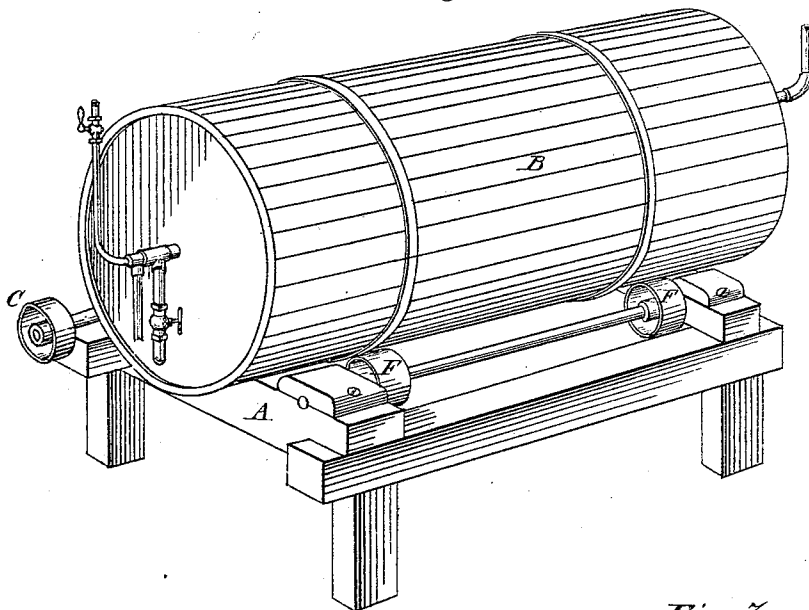


Fig. 2.

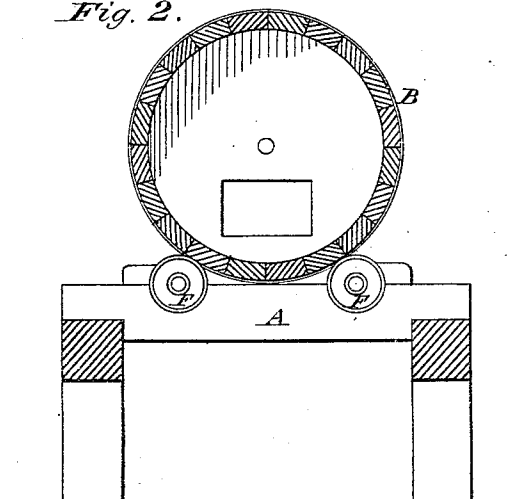
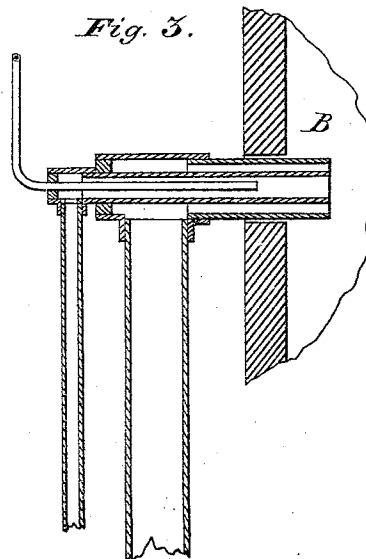


Fig. 3.



Witnesses:

R. C. Sauerwein
Stanley Hutchins

Inventors:

David K. Tuttle
James A. McGreary

UNITED STATES PATENT OFFICE.

DAVID K. TUTTLE AND JAMES A. MCCREARY, OF BALTIMORE, MARYLAND.

IMPROVEMENT IN THE MANUFACTURE OF WHITE LEAD.

Specification forming part of Letters Patent No. **148,862**, dated March 24, 1874; application filed September 16, 1873.

To all whom it may concern:

Be it known that we, DAVID K. TUTTLE and JAMES A. MCCREARY, both of the city and county of Baltimore and State of Maryland, have invented a new and Improved Process for the Manufacture of White Lead, of which the following is a specification:

This invention relates, in the first place, to an improved method of preparing the metal for subsequent corrosion; and, second, to an improved process for converting the metal so prepared into white lead.

The method of preparing the metal is as follows: The lead, being melted and heated to a temperature at which it flows freely through a small aperture, is struck in its fall by a jet of steam, and the product, which is metallic lead in a more or less fine state of division, according to the steam-pressure employed, and the temperature of the lead, is blown by the jet into a suitable chamber for collection.

Plate 1 in the drawings shows a furnace, which, in practice, may be of any desired size and form, upon which is placed a melting pot or kettle, A, provided with one or more nozzles, G, from which a stream of melted lead is permitted to flow by raising the valve F. D is a steam-pipe, from which a jet is made to impinge directly on the falling stream of lead. The finely-divided metal is blown into a chamber, (not shown in the drawing, but which may be of any convenient size and shape, care being used to provide such capacity that the metallic particles will chill before striking the inclosing walls of the chamber.)

Plate 2, Figs. 1 and 2, shows a corroding vessel or cylinder, to which the comminuted metal is transferred for conversion into white lead. A is a stout frame, upon which is supported the cylinder B. C is a sweep, carrying the fingers *d d d*, and rotated on the shaft *f* by the pulley E. The central opening in the cylinder, through which passes the shaft *f*, is provided with a collar, *c*, which may be left open for the escape of waste gases from the cylinder, or may be provided with a leather disk closely embracing the shaft, so as to practically prevent escape of the contents of cylinder by this route, and still leave the shaft free to rotate. H is a pipe for conveying car-

bonic acid to the cylinder from a coke or charcoal fire. It also serves for the conveyance of atmospheric oxygen, or any desired admixture of these gases. J is a steam-pipe, also communicating with the cylinder, and provided with suitable stop-cock K, communicates above with a receptacle containing acetic acid or a solution of acetate of lead, and terminates below either immediately in the steam-pipe J, or just in front of the jet from such pipe, in such manner that the flowing stream from K may be struck by the jet of steam, and diffused as a spray over the contents of the cylinder.

Plate 3 shows another device which may be substituted for that shown in Plate 2. Plate 3, Fig. 1 is a perspective view, and Fig. 2 a section, of a cylinder, B, mounted on the frame A by the friction-rollers F F, in such manner that the cylinder may be revolved, while leaving its centers free for the entrance of the stationary pipes H J K. In Fig. 3 the arrangement of these pipes is shown in section. H is the pipe for conveying carbonic acid mixed with more or less air, as desired. J is a steam-pipe, and K the acetic-acid pipe, serving the same purpose as in the former description. Motion is communicated to the cylinder by revolving the rollers F F, one set or both.

Having thus described the method of preparing the metal, and the apparatus used for corrosion, the process may be briefly described as follows: A suitable charge of the comminuted lead is placed in one of the corroding-cylinders B, Plates 2 and 3, and kept in slight movement by the revolution of the fingers *d*, in Plate 2, or by the revolution of the cylinder in Plate 3. A jet of steam is admitted through J, and at the same time a stream of acetic acid is allowed to descend through K, and be diffused over the contents of the cylinder. The acid may be either the undiluted article or mixed with water, and the choice of one or the other will depend somewhat on the more or less moist condition of the charge of lead. The whole charge of acid may be put on at once, or in portions at suitable intervals, the quantity to be used not differing materially from that required in other processes. No more steam or water should be admitted than is necessary to maintain a merely moist con-

dition of the corroding mass, avoiding as objectionable a pasty condition, and a humid atmosphere, charged with carbonic acid and air, is maintained in the cylinder. This is obtained by injecting the suitably-washed gases from a coke fire. The slow movement of the particles of lead and the injection of corroding gases are maintained uninterruptedly, or at suitable short intervals, until the completion of the process. The corrosion may be pushed till no appreciable quantity of metallic particles remain, and the product removed for grinding and washing; or the process may be interrupted when any desired percentage of the mass has been corroded, and the carbonate separated from residual metallic lead, by running water on the mass and floating off the specifically lighter carbonate. In either case the product is ground, washed, and dried as in any known process. Nitric acid, or the nitrate or acetate of lead in solution, may be substituted for acetic acid in the corroding process above described.

The comminuted lead as prepared by our process may be advantageously employed in the manufacture of sugar of lead, litharge, &c.

What we claim as new, and desire to secure by Letters Patent, is—

1. The process herein described for comminuting lead, the same consisting in causing a steam-jet to impinge on the melted metal, substantially as described.

2. The process of converting lead into white lead by acting on the finely-communited metal, while in a nearly dry or merely moist condition, by means of acetic acid, or its equivalent, carbonic acid, and air, substantially as set forth.

3. The combination of the cylinder B with the revolving sweep C and fingers *d*, together with the pipes H J K, substantially as described, for the purpose set forth.

4. The combination of the revolving cylinder B with the rollers F F, and with the pipes H J K, substantially as described, for the purpose set forth.

In testimony that we claim the foregoing, we have hereunto set our hands this 13th day of September, 1873.

DAVID K. TUTTLE.
JAMES A. MCCREARY.

Witnesses:

PETER G. SAUERWEIN,
STANLEY HUTCHINS.