

# Cuddy & Selden. Making White Lead.

N<sup>o</sup> 104,434.

Patented Jan. 21, 1870.

Fig. 1

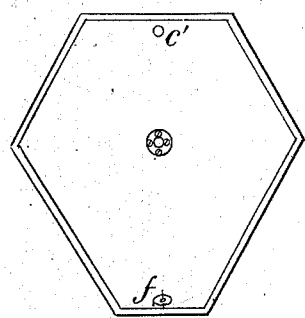


Fig. 2

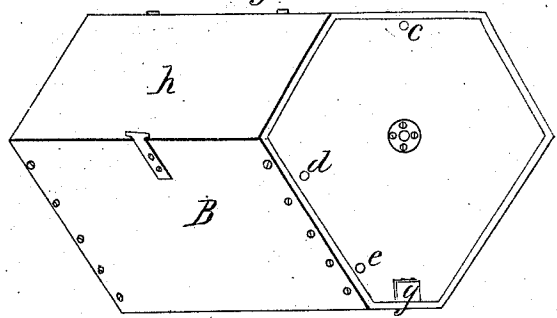


Fig. 4

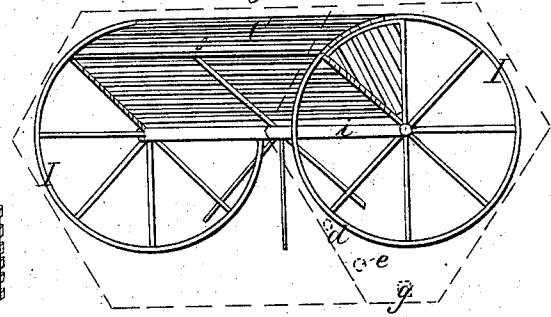


Fig. 3

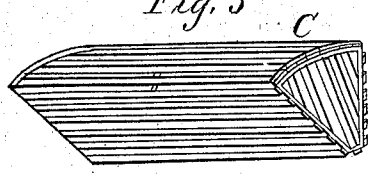


Fig. 5

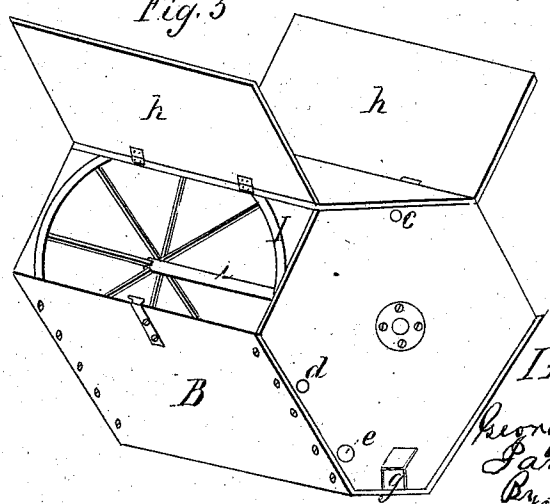
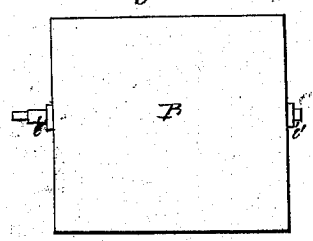


Fig. 6



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Fig. 7

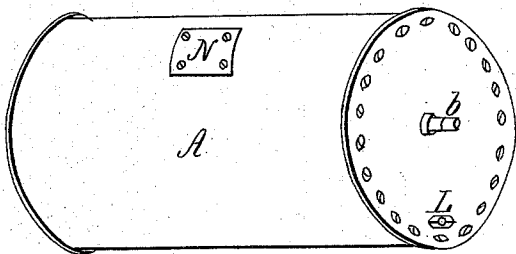


Fig. 8

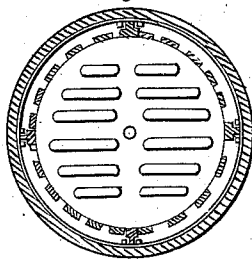


Fig. 9

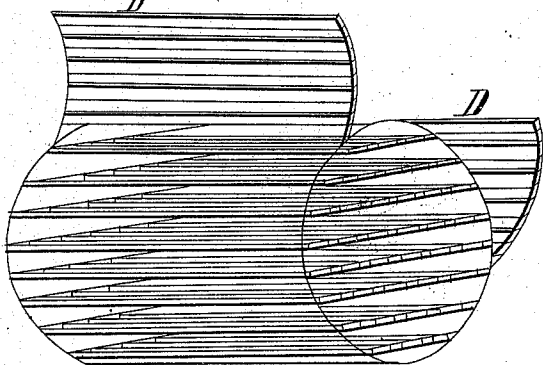
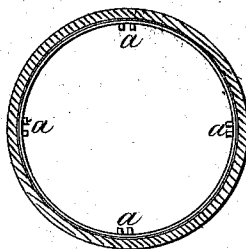


Fig. 10



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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN THE MANUFACTURE OF WHITE LEAD.

Specification forming part of Letters Patent No. **104,434**, dated June 21, 1870.

*To all whom it may concern:*

Be it known that we, JAMES CUDDY, of the city of Pittsburg, and GEORGE S. SELDEN, of the city of Philadelphia, Pennsylvania, have invented a new and useful Improvement in the Manufacture of White Lead; and we do hereby declare the following to be a full, clear, and exact description of the same.

Our invention consists in an improvement in the process of converting metallic lead into white lead, whereby the time consumed in the operation is greatly shortened.

In order to enable others to use our invention, we will now proceed to describe a mode of carrying the same into effect, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is an end view of the apparatus. Fig. 2 is a side and end view, doors closed. Fig. 3 is a sectional view of one of the cases. Fig. 4 is an interior view, showing the revolving spider with one of the cases in position. Fig. 5 is a side and end view of the apparatus with lids open, showing revolving spider. Fig. 6 is a side view, showing projection of shaft. Fig. 7 is a view of another apparatus. Fig. 8 is a vertical cross-section of said machine. Fig. 9 is a perspective view of the cage withdrawn from the inside of the apparatus, Fig. 7. Fig. 10 is a cross-section of Fig. 7, showing the notches or cleats for holding No. 9 in position.

Like letters represent like parts in the different drawings.

A is a cylinder, which may be made of wood, metal, or other suitable material, with journals on each of the heads of the cylinder, so that the cylinder may be made to revolve by any of the ordinary means.

C is a cylindrical cage or basket made of slats of wood divided into several shelves or separate compartments, and may be constructed in two or more sections or segments, which, before being put into operation, are securely fastened together, forming the cylindrical cage or basket, which is held in position by part of its frame-work being secured within the grooves formed by the cleats *a a a a*, fastened within the cylinder A. Inside of this cylindrical cage or basket thin sheets of metallic lead are placed, and when all the shelves or compartments are

filled with the same the doors D D are closed and secured and the cylindrical cage pushed or placed within the cylinder A, which is then closed up. This cylindrical cage or basket may be removed or changed, as occasion may require, by removing the head of the cylinder; or it may be so constructed that sections of it may be changed or removed, as may be required, through openings in the head or side of the cylinder A made for that purpose. A jet of steam is then thrown into the cylinder A to raise the temperature and assist in oxidizing the lead; and after the steam has been thus used for about one hour, the cylinder A is then put in motion, and a supply of vinegar introduced into the cylinder A through a stationary pipe running through the journal *b* to the opposite end of the cylinder, said pipe being perforated with very small holes for its entire length in the inside of the cylinder, through which the vinegar will percolate and every portion of the metallic lead become thoroughly and equally sprinkled or wetted with the vinegar. The cylinder is then thrown out of gear and stopped, and after the lapse of about an hour a stream of carbonic-acid gas (produced by the combustion of coke, charcoal, or any other of the ordinary means) is driven or forced into the cylinder A by means of a fan or blowing cylinder or other device, through a pipe connected with one of the journals arranged for that purpose, the supply being regulated by a valve in the pipe. L is a hand-hole, which can be opened whenever a test or sample is required to be drawn in order to ascertain the progress of the corrosion of the lead. These operations are repeated as often as the lead becomes dry, when the vinegar is again introduced, followed by the carbonic-acid gas, as before.

After the corrosion has been continued for three or four days the man-head or door N may be removed, a rake introduced by the operator, and a large portion of the white lead which falls upon the lower part of the cylinder taken out through the door N; or a stationary chamber, B, Fig. 2, (the shape is immaterial, although slanting sides inclining toward the center are considered preferable,) may be built of wood, brick, or other suitable material, but having

a horizontal door or doors, *h h*, running the whole length of the chamber B, and wide enough to permit the insertion and removal of the sectional crates or baskets C. In the ends of this chamber B are placed bearings to receive the journals *e' e'* of the shaft *i*, near both ends of which shaft, but inside of the chamber, are attached wheels or spiders, whose spokes or arms are secured to it, dividing the wheels or spiders into sections, with grooves made to receive and secure the crates or baskets C in position, and that these sectional crates or baskets may be more firmly secured in their intended position, spokes or arms corresponding to the spokes or arms at the ends may be inserted at intervals around the shaft. The sectional crates or baskets C are made of slats or lattice-work, or in any suitable way so as to permit of the free circulation of the different acids and gases used in the operation and the passage of the carbonate as it is detached from the lead. The shape of these crates or baskets and their size are only material so far as they affect the convenience of handling and filling or packing the cylindrical spider in which they fit.

Inside of the top of the chamber B, and right over and lengthwise with the shaft of the cylindrical spider, is placed a small pipe perforated on its under side with little holes, through which, when necessary during the operation, can percolate drops or jets of vinegar supplied from some convenient fountain, and which, as the cylinder revolves, will moisten or wet every portion of its contents evenly and effectually.

Steam may also be introduced into the chamber B through the opening *d*, as and when required, and carbonic-acid gas through the opening *e*, all of which being introduced through pipes, the quantities may be regulated by any suitable cock for that purpose.

At the bottom of the chamber B is an opening through the end, which opening is closed during the operation, but which can be opened, and the white lead or carbonate which has fallen to the bottom be removed as often as desirable, without delaying or materially interfering with the operation. Sight-holes filled with glass may also be made in any convenient part of the chamber.

When it is desired to commence operation the crates or baskets are properly filled or loaded with thin sheets, ribbons, plates, or scraps of lead brought to the chamber B, the doors *h h* opened, and a crate or basket placed, keyed, or fastened in each of the sections or spaces forming the cylinder. When all the sections or spaces are thus filled the doors *h h* are closed and the steam introduced as before, after which the cylinder B is put in motion by means of any suitable device attached to the shaft *i*. The cock regulating the supply of vinegar is opened and a proper quantity allowed to spirt or percolate through the small holes in that part of the pipe inside of the chamber, and thus every particle of lead is in turn

moistened or wetted with the vinegar. The motion of the cylinder is then stopped, and at the proper time a stream of carbonic-acid gas is introduced as before. These operations are repeated as often as required until all the lead is duly converted, each subsequent revolution of the cylinder after the first, by the jarring or attrition of the metallic lead, causing the separation of the carbonate or white lead from the metallic and allowing the carbonate or white lead to fall or pass through the openings in the crates or baskets to the bottom of the chamber, when it can be readily removed through an opening made for that purpose. As the corrosion progresses and the sheets, ribbons, plates, or scraps of lead grow thinner, no danger of their being packed or crushed together need be apprehended, as they will more likely be shaken loose and separated by each revolution, and fresh surfaces are thus consecutively presented to the action of the vinegar and carbonic-acid gas. These cylinders and cages or baskets are only intended to revolve during the flow and percolation of the vinegar and for a sufficient length of time to clean off by jarring or attrition the carbonate or white lead and allow it to fall to the bottom, from whence it can be removed through the proper openings as often as occasion shall require. During all the balance of the operation—viz., the oxidation, acetization, and carbonization—the cylinder and crates or baskets remain stationary.

It will be obvious from the foregoing that when the corrosion is completed there is no loss of time such as occurs in working with ordinary chambers, because the white lead having been removed by instalments or having fallen to the bottom and duplicate cages or baskets being ready filled, the empty cages or baskets can be removed and the full cages put in their places in a few minutes, when the operation can be repeated as before.

Another most important consideration arises from the fact that by this process the necessity for the operator entering the chamber is entirely dispensed with, the danger and loss of health to the operator attending which has been one of the greatest obstacles in the manufacture of white lead by those processes requiring such exposure.

It requires no explanation to prove that where the carbonate or white lead is periodically removed from the metallic, exposing regularly and consecutively clean surfaces of metallic lead for the action of the different agents, the process is greatly facilitated and the time occupied in the operation vastly reduced.

Having thus explained our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The intermittent revolving of a white-lead chamber, constructed and operated substantially as and for the purposes as described.
2. The intermittent revolving of a horizontal

cylindrical crate or crates within a stationary chamber, constructed and operated substantially as and for the purposes as described.

3. The intermittent or periodical agitation of the metallic lead, as and for the purposes substantially as described.

4. The employment of movable crates or baskets, as and for the purposes substantially as described.

5. The wetting or moistening the metallic lead with vinegar, as and for the purposes substantially as described.

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