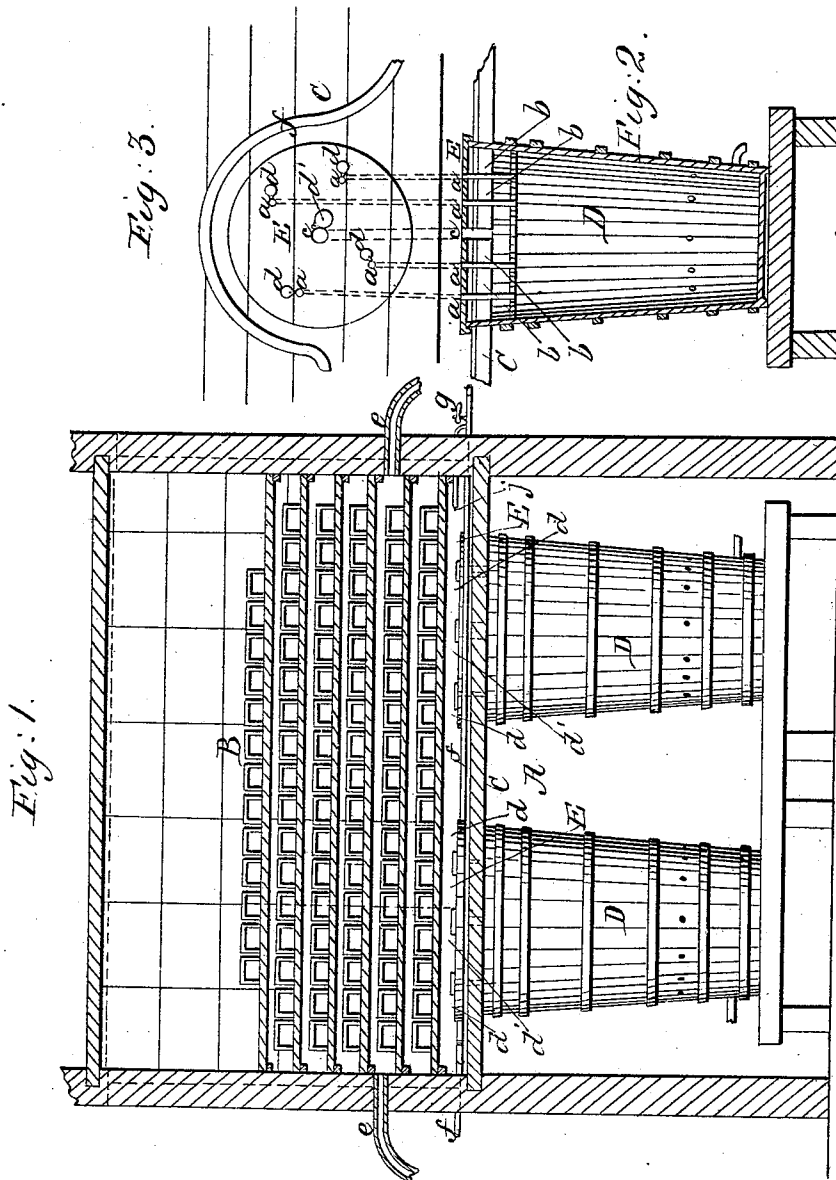


R. ROWLAND.  
Making White Lead.

No. 20,731.

Patented June 29, 1858.



# UNITED STATES PATENT OFFICE.

ROBERT ROWLAND, OF NEW YORK, N. Y.

## IMPROVEMENT IN APPARATUS FOR MANUFACTURING WHITE LEAD.

Specification forming part of Letters Patent No. **20,731**, dated June 29, 1858.

*To all whom it may concern:*

Be it known that I, ROBERT ROWLAND, of the city, county, and State of New York, have invented certain new and useful Improvements in Apparatus for the Simultaneous Manufacture of White Lead and Vinegar; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is an elevation, partly sectional, of a white-lead factory in which my improvements are represented. Fig. 2 is a vertical section of one of the vinegar-tubs and of the floor of the lead-corroding room above the tubs. Fig. 3 is a plan of one of the covers of the vinegar-tubs and a portion of the surrounding floor.

Similar letters of reference indicate corresponding parts in the several figures.

This invention consists in certain improvements in the apparatus the arrangement of which forms the subject of Letters Patent granted to me bearing date October 9, 1855. In the apparatus as there described the acetic acid escaping from the vinegar-tubs rises into the upper part of the vinegar-room and a very considerable portion of it is condensed against the under side of the floor above, and thus prevented entering the corroding-room, and no provision is described in the specification of those Letters Patent for admitting light to the corroding-room, as at the time of that invention the importance of the action of light in the decomposing process was not yet known to me, and I found after by practical experience what an important agent the light was for accelerating the process of corrosion.

The first of my present improvements consists in certain means of compelling all the acetic acid that escapes from the vinegar to pass into the corroding-room.

A second improvement consists in certain means of controlling the supply of acetic acid to the corroding-room, which means serve at the same time to prevent the white lead falling through the floor of the corroding-room into the vinegar during the operations of removal from and supplying new lead to the corroding-room.

A third improvement consists in the employment of a steam-pipe for the purpose of

keeping the corroding-room at a desirable temperature, with certain provisions for the admission of steam to the said room, for the purposes hereinafter specified.

A fourth improvement consists in constructing the walls and roof of the corroding-room as far as practicable or to a great extent of glass, mica, or other translucent or imporous material for the admission of light to the room to aid in the decomposing action of the acids and to prevent the absorption of the gas.

The principles of the conversion of metallic lead into the carbonate of lead in my improved apparatus are as follows: Basic acetate of lead becomes decomposed by carbonic acid in such a way that moist neutral acetate of lead and basic hydrated carbonate of lead become formed. If, further, neutral acetate of lead and oxygen come under a high temperature in contact with metallic lead, the latter becomes disposed for oxidating and for producing again the basic combination, which, by the addition of carbonic acid, again forms carbonate of lead. It requires, therefore, that metallic lead be exposed to the mutual influence of acetic acid, carbonic acid, oxygen, moisture, and heat to convert in such a manner by the medium of a proportionally small quantity of acetic acid a large quantity of metallic lead into carbonate of lead.

To enable others to make and use my invention, I will proceed to describe its construction and operation.

A represents the vinegar-room and B the lead-corroding room, and C is the floor which separates them.

D D are the vinegar-tubs, which are extended through the floor C, to which they fit closely, and these tubs are fitted with covers E E, in which are a number of openings *a a a*, through which a corresponding number of pipes *b b b b*, fitted into the sieve-bottoms F of the vinegar-tubs, establish communication from below the sieve-bottoms to the corroding-room B. Each cover E has also an opening *c* to convey to the corroding-chamber the acetic acid which escapes through the sieve-bottom. The openings *a a a a* and pipes *b b b b* serve to admit to the corroding-room the whole of the acetic acid that is unavoidably escaping during the manufacture of vinegar. The said openings are severally provided with sliding valves *d d d d d'*, which

serve to close them for the purpose of preventing the white lead from falling into the tubs during its removal from the corroding-room or during the placing of new lead in the corroding-chamber, and by closing one or more of the valves *d d d* the supply of acetic acid to the corroding-room may be regulated, the surplus in the latter case having a proper means of escape provided for it below the floor C.

*e e* are pipes for the admission of carbonic acid from a suitable generating apparatus to the corroding-chamber B.

*f* is a steam-pipe running through the corroding-room for the purpose of keeping up a uniform temperature of from 150° to 170° Fahrenheit in the said room during the corroding process. This pipe *f* is provided with a branch or branches *j*, that can be opened by a cock or cocks *g* or their equivalent, for the purpose of admitting to the said room, when it is necessary, sufficient steam to supply the corroding-room with a desirable amount of moisture in case of that supplied from the vinegar-tubs failing or being insufficient. These cocks also serve to admit steam to lay (by its condensation) the dust produced in the corroding-chamber by the removal of the white lead, which dust is so injurious to the health of laborers, and much of which would otherwise escape and be lost. The laying of the dust in this way also permits the valves *d d d d'* to be reopened without delay to recommence the corroding operation. The cock or cocks *g* may be so arranged as to be capable of being opened from the outside of the corroding-chamber or in another convenient manner.

In Fig. 1 the sides and roof of the corroding-room are represented as being composed entirely of glass or mica; but they may be constructed with windows in such a way as to admit of the largest possible or a very large amount of light to the room. The greater the

quantity of light that is admitted to the chamber the more readily is the carbonic acid decomposed and the carbonate of lead formed. Another advantage of making the walls of the above-specified materials will be to save a great deal of gas, as wooden walls would absorb a very considerable portion of it.

As my white lead (carbonate of lead) is protected against any impurity, and likewise against any pernicious influence of injurious gas, it must surpass every other article of the kind by its whiteness; and as I am further enabled to convert almost all the usually-remaining unconverted acetate of lead into the carbonate of lead I gain from thirty to thirty-three per cent. more weight of white lead over the weight of the metallic lead. In consequence of the arrangements above described I need not manufacture so much vinegar as in the apparatus described in my former patent, as the manufacture of thirty-six barrels will be sufficient to corrode six tons of white lead.

What I claim, and desire to secure by Letters Patent in the combined manufacture of vinegar and white lead, and for the purpose of carrying both on advantageously and without injury to the one or the other, is—

Fitting the tops of vinegar-vats D (when said vats are placed in a room below the corroding-room) to the floor C of the corroding-room, substantially as above described, in combination with cover E, provided with openings *a* and valves *d*, or any equivalent means for regulating the supply of acid, or altogether closing up the communication between the interior of the vats and the corroding-room whenever necessary, all substantially as above described, and represented in the accompanying drawings.

ROBERT ROWLAND.

Witnesses:

W. TUSCH,  
W. HAUFF.