T. J. COGGESHALL.

Making White Lead.

No. 45,587. Patented Dec. 27, 1864.

Fig. 1. Sectional View.

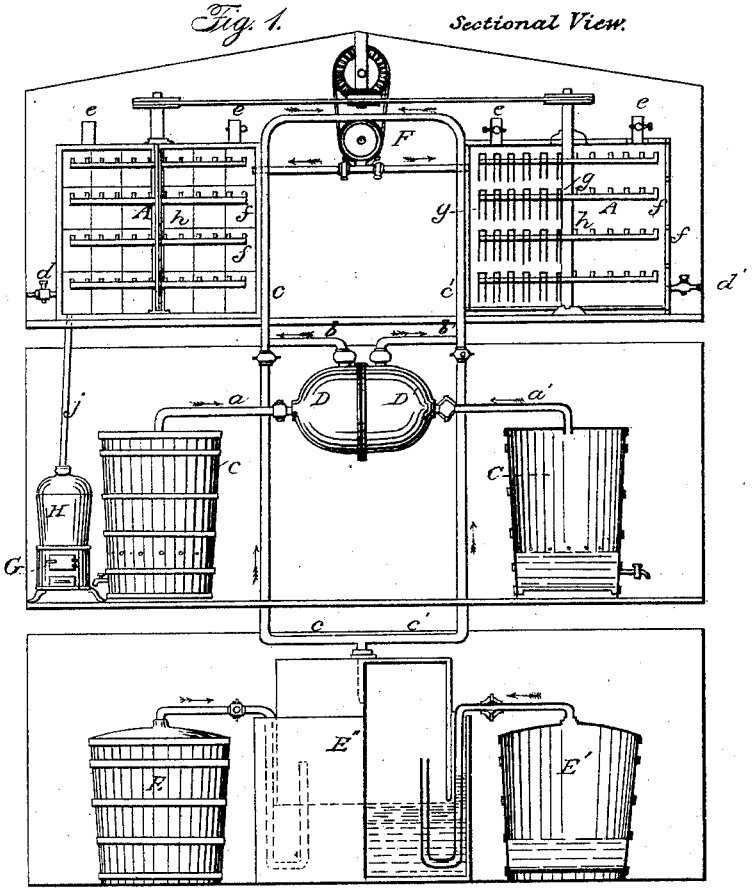


Fig. 3.

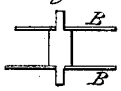
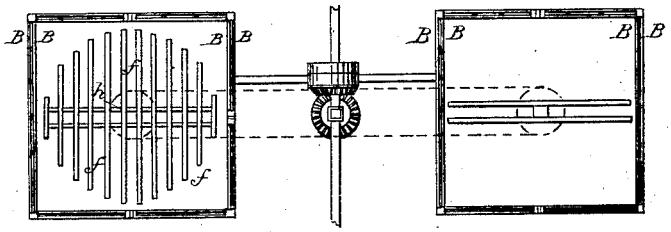


Fig. 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

THOMAS J. COGGESHALL, OF NEW YORK, N. Y.

IMPROVED APPARATUS FOR MAKING WHITE LEAD.

Specification forming part of Letters Patent No. **45,587**, dated December 27, 1864.

To all whom it may concern:

Be it known that I, THOMAS J. COGGESHALL, of the city, county, and State of New York, have invented certain new and useful Improvements in the Apparatus for Manufacturing White Lead; and I do hereby declare that the following specification, taken in connection with the drawings, making a part of the same, is a full, clear, and exact description thereof.

Figure 1 is a front view of a manufactory for making carbonate of lead with my apparatus. Fig. 2 is a plan of the corroding-rooms and the revolving frame upon which the metallic lead is suspended. Fig. 3 is a section of the two casements.

The invention which is the subject of this patent relates to an improvement in the apparatus by which the process for converting metallic lead into the carbonate of lead, described in the two Letters Patent granted to Robert Rowland, dated, respectively, October 9, 1855, and June 29, 1858, is carried on. The process which is described in these two patents is substantially as follows: The metallic lead is suspended in a small room, which is called the "corroding-room," the walls of which are as far as possible of glass, to admit freely the rays of light. Into this room the fumes of acetic acid are admitted. There is also admitted into the same room a supply of carbonic-acid gas. These agents, acting in combination with moisture, which should be supplied from a steam-pipe, and the oxygen of the atmosphere under a high degree of heat—say from 130° to 150° of Fahrenheit—act as follows: The basic acetate of lead becomes decomposed by the action of the carbonic acid, and forms moist neutral acetate of lead and basic hydrated carbonate of lead. The metallic lead, when exposed in a high temperature to the influence of neutral acetate of lead and oxygen, is disposed to oxidate and produce again the basic combination, which by the further action of barbonic acid is transformed into the carbonate of lead, the chemical changes being in all the stages assisted and stimulated by the action of light.

I have discovered, after long experience in manufacturing white lead upon the principle and by the substantial apparatus described in the said patents granted to Robert Rowland, that a much more satisfactory result can be obtained and the process of chemical transformation be greatly hastened by surrounding the sides and top of the corroding-rooms with a stratum of fixed air inclosed between casements of glass. The effect of this arrangement is to insure a more equable temperature within the corroding-room, the surrounding stratum of confined air being a non-conductor of heat, while the beneficial effect of the rays of light transmitted through the two casements of glass and the intermediate stratum is not only not impaired thereby, but, on the contrary, experience has proved that it is increased.

In the accompanying drawings, A, Fig. 1, represents the corroding-room; and B B, Fig. 2, the casements of glass, between which is the stratum of confined air. Underneath the rooms are placed the vats C C, in which the acetic acid is formed in the usual way. Each of the vats is connected with a separate receiver, D D′, by the pipes *a a′*. The receivers in turn are connected by the pipes *b b* with the main pipe *c c*. Underneath the acetic-acid vats are located the generators E E′, in which the carbonic-acid gas is formed, and the receiver E″, in which the same is collected and held. The main pipe *c c′* is connected with the gas-holder E″, as shown.

F is a rotary force-pump, which may be driven by a belt or any convenient way, and which, as the several pipes are provided with stop-cocks, will operate to pump the gas or fumes of the acid from the receiver with which it may be connected, and deliver the same to the corroding-chambers. By this arrangement the gases are kept under perfect control, upon which the success of the process of carbonating the lead depends. Thus the fumes of the acetic acid can be drawn from one or more of the receivers for the number of minutes desired, and then all further supply be cut off, while the carbonic-acid gas is introduced for the length of time which experience proves to be the best.

All connection between the corroding-rooms and the apparatus for forming the gases is limited to the pipes, which can be closed at pleasure, and are operated by a forcing-pump. This last-mentioned fact constitutes a great improvement over the apparatus as heretofore worked. While the connection between the vinegar-tubs and the corroding-rooms was such as shown in Rowland's patent of June 29, 1858, the fumes from the corroding-room,

being of greater gravity than the fumes from the acetic acid, would often descend and arrest the process of fermentation in the tubs, while by my contrivances this difficulty is not only prevented, but there is the capacity afforded for forcing into the rooms the gases to the density of more than one atmosphere. Moisture, which has been spoken of as a necessary element in the conversion of metallic lead into the carbonate of lead, is admitted into the corroding-room by the pipes *d d*, provided with stop cocks for regulating the supply. I also provide the rooms with ventilators *e e e e*, which can be opened or closed at pleasure for the purpose of clearing the rooms from time to time from the impure vapors and gases which are formed, and which, if permitted to remain in the room, will retard the process.

I have represented in the drawings the works as occupying three floors of a building, the corroding-rooms being placed in the upper story, the vinegar-tubs directly beneath, and the apparatus for making carbonic-acid gas upon the lowest floor. Though I think that this arrangement is the most convenient under all circumstances, it is not an indispensable one, as by my system of connecting the corroding-rooms with the other parts of the apparatus by means of pipes and by forcing into the corroding-rooms the requisite supply of the gases by the aid of a pump the entire process can be conducted upon one floor. It should also be understood that any number of tubs and gas generators can be connected together to supply the number of corroding-rooms which the building can accommodate.

Another improvement consists in the use of a frame with a series of arms, *f f*, upon which the metallic lead *g g* is suspended, and which frame is capable of being revolved within the corroding-chamber, so that every portion of the lead will be brought equally to the action of the gases and of the light. In the drawings, the frame is represented as made with a central part, *h*, having arms and cross-bars, as shown in Fig. 2, which is provided with a bearing at the ceiling and a step at the foot fitting into a socket upon the floor of the room. The shaft extends through the ceiling, and has a pulley upon it, to which motion may be communicated from a belt. It is obvious that it may be made in various other forms.

By the apparatus which has been described the fumes only of the acetic acid are conveyed to the corroding-chambers, the advantage of which is that the vinegar which is formed from the whisky and water used in the process remains as a valuable article of manufacture. In many instances, however, as in the case of extreme cold weather, it will become desirable to convey to the rooms the vapor of venegar. To do this I have shown at the side of one of the tubs a small stove, G, which has a boiler, H, attached to it, the top of which is connected by the pipe *j* with one the corroding-rooms. This arrangement may be made with each room, and will be found to be a great convenience, as it furnishes a means for supplying the vapor of acetic acid combined with the vapor of water, by which, if there be a supply of carbonic acid gas, the process of carbonating lead can be carried on with advantage, but not with the economy which results from the use of the arrangement for supplying the fumes only of the acetic acid, introducing the moisture by a separate pipe, and thereby saving the vinegar.

What I claim as of my invention, and desire to secure by Letters Patent, is—

1. Surrounding the sides and top of the corroding-rooms, wherein metallic lead is converted into carbonate of lead by the process above described, with a stratum of air confined between double casements of glass, as herein described, for the purposes specified.

2. Connecting one or more of the vats in which the acetic acid is formed with one or more of the generators in which the carbonic acid is formed, with one or more of the corroding-rooms by means of pipes fitted with stop-cocks, as shown, and operated by a pump, F, substantially as described, for the purposes specified.

3. Providing each of the corroding-rooms with a revolving-frame, upon which the metallic lead is suspended, for the purpose of subjecting all portions of the lead to the uniform influence of the decomposing and carbonating agents.

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Witnesses:

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