

C. RIPLEY.

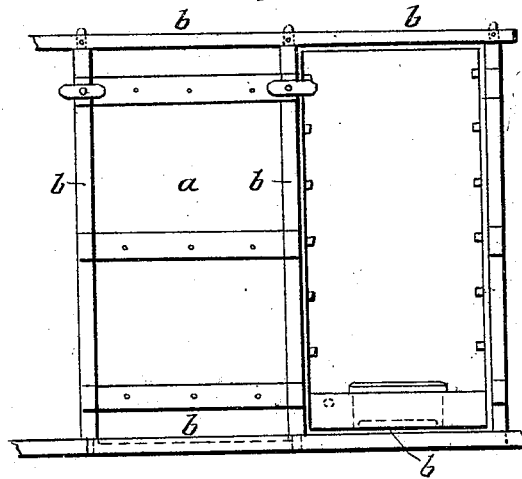
2 Sheets—Sheet 1.

Making White Lead.

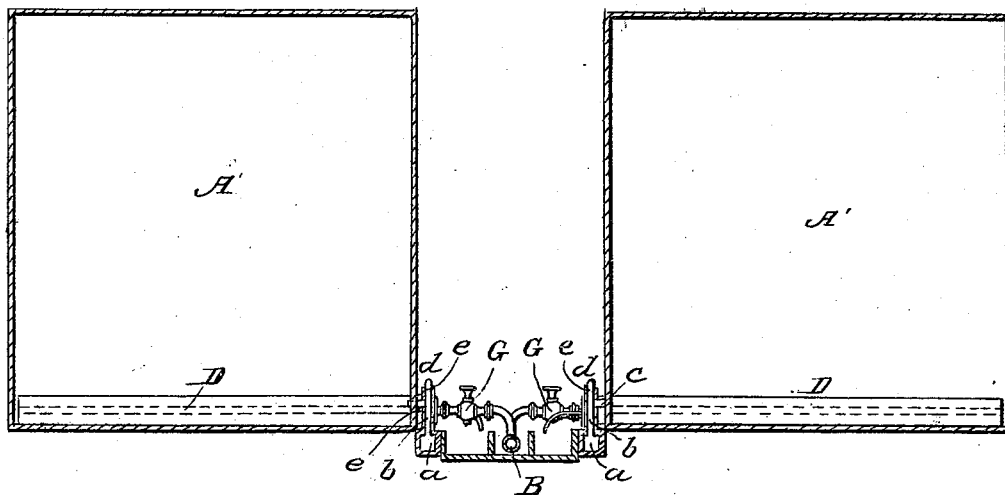
No. 264.

Patented July 11, 1837.

*Fig. 1.*



*Fig. 2.*



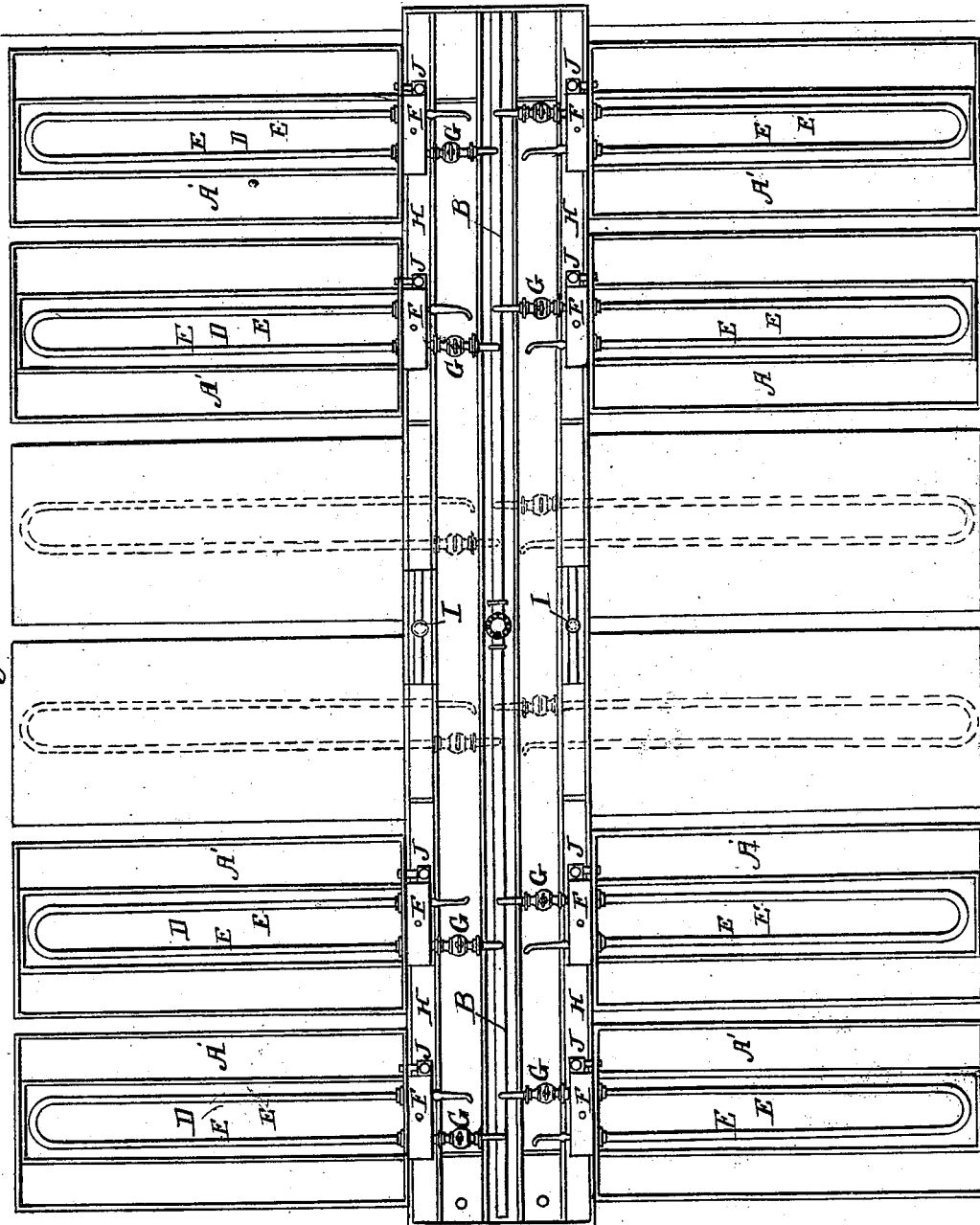
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Fig. 3.



# UNITED STATES PATENT OFFICE.

CHARLES RIPLEY, OF SAUGERTIES, NEW YORK.

## APPARATUS OR MACHINERY EMPLOYED IN THE MANUFACTURE OF CARBONATE OF LEAD OR WHITE LEAD.

Specification of Letters Patent No. 264, dated July 11, 1837.

*To all whom it may concern:*

Be it known that I, CHARLES RIPLEY, of Sangerties, in the county of Ulster and State of New York, have invented certain new and  
5 useful Improvements in Apparatus or Machinery Employed in the Manufacturing of White Lead or Carbonate of Lead; and I do hereby declare that the following is a full and exact description thereof.

10 In describing my improved apparatus, and the manner of using the same, I must, necessarily, describe many things that are not new, as the general principle upon which I proceed, and the general construction of  
15 the apparatus by means of which this principle is carried into useful operation, have been long known and employed; I do this, however, for the purpose of giving a more distinct view of the improvements therein,  
20 which have been made by me.

The general principle upon which I proceed, is to produce white, or carbonate of, lead, by exposing blue, or metallic, lead, in  
25 suitable apartments, or chambers, to the action of the vapor of vinegar, or acetic acid, to carbonic acid, and to oxygen gas, at such a temperature, produced by steam, as shall best promote the chemical reaction of these  
30 agents, so as to produce the substance in question.

I construct what are denominated corroding apartments, or chambers, of any suitable material, but usually of wood; they may vary in form, or size, but they are most  
35 convenient when made rectangular; and those which I have preferred are about thirteen feet long, four and a half feet wide, and nine feet in height; these corroding chambers I arrange in rows, side by side, in such  
40 a manner, and in such number, as I find most convenient for the operations to be carried on. In the accompanying drawing, Figure 1, is a top view, showing twelve corroding chambers, placed in two rows; showing also  
45 the arrangement of the pipes, or tubes, and their appendages, by which steam, and the other agents required, are admitted into the chambers. These chambers are marked A, A, and from some of them A', A', A',  
50 the tops are supposed to be removed for the purpose of showing the manner of forming the steam tube, by means of which the requisite temperature is attained. B, B, is the main steam pipe, from which the pipes

that enter the respective cisterns receive 55 their supply. The main pipe which I have used is of copper, three inches in diameter in the bore. It passes horizontally between the two rows of cisterns, and is at its middle, C, connected with a pipe proceeding from  
60 any suitable steam boiler, and which in my apparatus is 5 inches in diameter. The main steam tube, B, is situated about a foot below the level of the bottoms of the corroding chambers, admitting of a convenient connection 65 of the lateral pipes to be presently described!

The vinegar to be evaporated is poured into troughs resting on the bottoms of each of the chambers; in the chambers A', A', A', 70 is represented the trough, D, and the metallic steam pipe E, E, within it, which proceeds from the main pipe B, enters the end of the trough D, at the outside of the corroding chamber, is recurved at, or near, the back end 75 of the trough, and passes out again through a second opening at the end by which it entered. The tubes E, may be made of copper, tin, or other metal upon which acetic acid does not readily act; those used by me are 80 one inch in diameter; they are secured firmly to the front ends of the vinegar troughs, so as to prevent the escape of that fluid, and are not disturbed by any degree of expansion, or contraction, to which the recurved 85 tubes may be subjected, as these move freely within the troughs. The recurved tubes may be taken out of the troughs for the purpose of cleaning, without disturbing that part of them which is fitted to the front, each being 90 provided, for that purpose, with two sets of coupling screws, by which they are coupled to the pieces which pass through the end of the trough. The projecting ends of the troughs are, of course, closed at top, but a 95 perforation is made, through which they may be supplied with vinegar, a suitable stopper being provided to close the opening; this is shown at F, F.

The entrance of steam into each chamber 100 is regulated by means of stop cocks G, G, a throttle valve, or other analogous contrivance, situated between the main horizontal steam pipe and the point where the lateral pipe enters the vinegar trough. That end 105 of each of the lateral pipes which passes out from the vinegar trough, is left open for the purpose of discharging the condensed steam,

or water, contained therein, but it is necessary so to construct such open end as in some degree to obstruct this discharge. I generally effect this by diminishing the aperture, so that it shall be about  $\frac{1}{4}$  of an inch in diameter, only. An effect similar to that of diminishing the aperture may be produced by a system of stop cocks, one to the outer end of each tube, but these would be more complex and troublesome, and would not, in practice, answer a better purpose than the plan which I have indicated of lessening the bore. The ends are bent downward, to discharge the water produced by condensation into a proper trough, or receptacle.

To give the requisite supply of carbonic acid, and of oxygen gas, I employ a second system of tubes, from which there are suitable openings leading into the respective corroding chambers. These tubes, or conduits, may be variously constructed, and may be made of metal entirely, or in part of metal, and in part of wood. I usually obtain the carbonic acid from the draft pipe, or flue, of the steam boiler furnace, when anthracite is used as fuel; and where this is not the case, it may be obtained from a stove in which anthracite, coke, charcoal, or any other fuel is burned which will produce carbonic acid unmixed with smoke; or, in fine, from any other source supplying this agent in an economical way. The oxygen gas is furnished by the air of the atmosphere, which is allowed to intermingle with the carbonic acid, either in the stove in which the combustion is effected, or, subsequently, in the blowing apparatus, or conduit pipes, through which the gases are conveyed into the corroding chambers. The modes of effecting this are so numerous and so obvious as not to require any description, and are practically well known; the quantity of oxygen required is, in fact, but small, that furnished by the decomposition of the acetic acid being nearly sufficient for the purpose intended. Any of the well-known kinds of blowing apparatus may be used for receiving and blowing the gases into the chambers, through tubes adapted to that purpose. In my apparatus, the gas is conducted into two gas trunks, made of wood, and running along the fronts of the corroding chambers, immediately under the projecting ends of the vinegar troughs; they are marked H, H, in the drawing; the tubes which supply them being situated at I, I. A vertical tube, or trunk, J, J, J, rises from the main gas trunk, in front of each of the chambers; these are bored completely through, and the upper end of the bore is rimmed out conically, and has a double, conical plug fitted into it, one end of which plug descends below a tube leading from the trunk into the chamber, and thus closes the communication, while the other end descends no lower than the top of this

tube, thereby enabling the workman to open, or close, the communication, by simply inverting the plug. This arrangement is shown in Fig. 2, where *a* is a section of the main gas trunk—*b*, the vertical trunk—*c*, the tube leading into the chamber *d*; and *e*, the double conical plug.

In the corroding chambers heretofore made, a space has been left opposite to a man-hole, or door, at which the workman entered to arrange the metallic lead, or to inspect the process; but by my improvement the chamber is so constructed that it may be filled with metallic lead throughout, allowing the necessary space only between the sheets, for the circulation of the vapor and gases. For this purpose, the back of each chamber (see Fig. 3) constitutes a door, or shutter *a*, which may be opened, or removed, and which when closed fits accurately into grooves, or ledges *b*, *b*, adapted thereto. It is manifest that by this simple contrivance, the whole chamber may be filled with lead, as above stated, and that the charging, inspection, and removal thereof may be performed with the utmost facility. The manner of charging the chambers is the same with that heretofore pursued; the sheets being either bent into coils and placed upon shelves, or ledges; or suspended by means of slats, or otherwise. In the door, or shutter, above described, I make an opening, or openings, with stoppers fitting therein, which may be removed when it is desired to examine the progress of the corrosion, without opening the door, or shutter.

Having thus fully described the construction of the apparatus employed by me in manufacturing white-lead, and pointed out the use of the respective parts thereof, I hereby declare, as already intimated in the commencement of this specification, that I do not claim as my invention the introduction of the vapors of vinegar carbonic acid, and oxygen, into corroding chambers containing metallic lead; nor do I claim the evaporating of the acid, or the production and maintenance of the requisite temperature by means of steam; this process having been known, and described in public works, upward of twenty years since, but owing to a defective construction of the apparatus, or from other causes, not continued in successful operation. Nor do I claim the general construction of the apparatus herein described, for effecting the conversion of metallic, into white lead, but only that particular construction and arrangement of certain parts thereof, by means of which the process is not only facilitated, but is also rendered much more effective than heretofore.

What I do claim, therefore, is—

1. The main, horizontal steam pipe, running between, or in front of, the rows of corroding chambers of sufficient capacity to

supply the whole of the lateral tubes connected therewith, and running into the respective chambers.

2. I claim the use of distinct lateral steam  
5 tubes, passing into the vinegar troughs, at their outer ends, and extending along them nearly to their inner ends, where they are recurved, and return back so as to pass out again at the same end at which they entered;  
10 together with the manner in which the admission of steam into them, and the discharge of steam, or waste water, from them, is regulated, and governed, for the purposes set forth.

15 3. I claim the particular arrangement of the gas, and vertical trunks, and the manner described of governing the admission of the

gases through them into the respective corroding chambers.

4. I claim the constructing of a door, or  
20 shutter, at the back of the corroding chamber, in the manner, and for the purposes, herein fully made known. And I do hereby further declare that I do not intend to confine, or limit, myself to the precise construction, or arrangement, of the respective  
25 things herein claimed, but to vary these as I may think proper, while the effects produced, and the means adopted, are substantially unchanged.

CHARLES RIPLEY.

Witnesses:

THOS P. JONES,  
CLEMENT F. FOOTE.