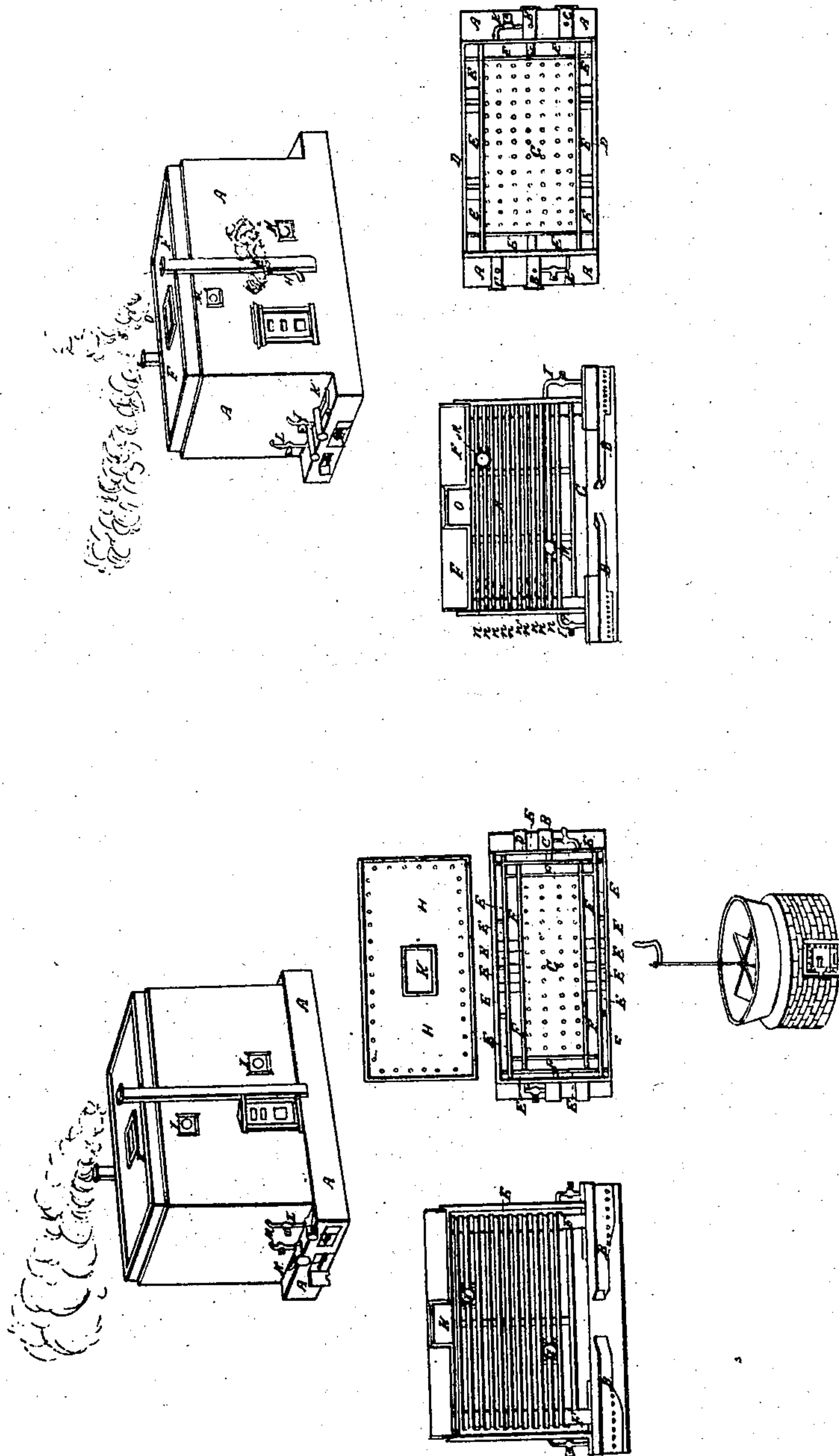


J. RICHARD.
Making White Lead.

No. 95.

Patented Dec. 2, 1836.



UNITED STATES PATENT OFFICE.

JOSEPH RICHARDS, OF PHILADELPHIA, PENNSYLVANIA.

MANUFACTURE OF WHITE LEAD.

Specification of Letters Patent No. 95, dated December 2, 1836.

To all whom it may concern:

Be it known that I, JOSEPH RICHARDS, of the city of Philadelphia, in the State of Pennsylvania, have invented new and useful Improvements in the Process and Apparatus for the Manufacturing of Carbonate of Lead, Commonly Called "White Lead," and that the following is a full and exact description thereof.

10 The process which I have adopted is an improvement of that ordinarily followed in which the conversion of blue lead into carbonate is effected by the heat generated by the fermentation of manure coöperating
15 with the vapor of vinegar, but instead of the heat produced by fermentation I introduce steam from a steam boiler, and the vapor of vinegar produced also by artificial heat. The structure in which the conversion is effected may vary in size but for the purpose of description I give the proportions of one which I have used, and which I have found to answer the intended purpose in a very perfect manner. I build a basement
20 usually of brick, which is thirty three feet long, twelve feet wide, and four feet high. I form two furnaces for heating boilers on each end of this basement. The furnace, and boilers for water I place in the
30 middle of each end the boilers being five feet long by two in diameter. The boiler for acid is considerably smaller, a common hundred gallon still answering the purpose well. This is placed between the water boiler, and
35 the side of the structure. Over this brick basement containing the furnaces, and boilers I erect my converting chamber, and its appurtenances of wood. The framed sills measure thirty feet by twelve from out to
40 out, allowing eighteen inches at each end for the projection of the boilers. Into these sills I mortise four corner posts of five by five scantling, seventeen feet long, and between them place studs of three by five
45 scantling, the narrow way outward. This frame I inclose by a grooved weatherboarding so as to render it perfectly tight securing the inside of it by plastering between the posts, and studs: or if preferred it may
50 be inclosed by surrounding it by a brick wall in lieu of the weather boarding around the inside of this building upon the studs I nail oak laths which may be two inches wide and stand two inches apart. These
55 stand horizontally forming an open rack work from the bottom to the top of the

posts, thus leaving a space of five inches between them, and the weatherboarding or wall for a purpose to be presently explained. I place a floor over the inside, supporting it
60 upon suitable timbers two feet above the furnaces. This floor is made of narrow boards standing one inch apart, or the boards may be placed close together, and perforated with numerous holes to admit
65 the passing of steam through the floor. Upon this floor I place studs of three by four scantling their inside edges standing at the distance of a foot from the rack work of laths, and upon these inside edges I nail
70 oak laths all around so as to leave a space of twelve inches between the two linings of laths all around the structure. I cover this structure with a tight covering of boards well secured together, and having a ledge
75 around its edge rising to the height of three or four feet so as to form a box or trough for containing tan or saw dust to that depth. Around the edges of the covering immediately over the spaces within the weather-
80 boarding I bore a number of half inch holes through which steam may pass from those places into the tan or saw dust. In the middle of the covering I make a sky-light, cutting a hole through the center for that purpose, and surrounding this hole by a casing
85 or curbing to rise above the tan, or saw dust, I in like manner make windows through the sides, usually two on each side casing them through the spaces between the exterior and
90 interior of the structure, thus admitting light in order to inspect the process.

A door also is made on one side properly cased, and affording an entrance into the interior. Two steam pipes proceed from each
95 of the steam boilers, one of which leads into the space under the floors, and the other into the interior, or corroding chamber, each being furnished with a stop-cock to govern the admission of steam. A similar pipe
100 leads from each of the acid boilers into the corroding chamber, proper flues are erected to carry off the smoke, &c.

Having thus fully described the structure in which the process is to be carried on, I
105 now proceed to show the manner in which the same is to be used.

I cover the floor to the depth of two feet more, or less, with saw-dust, tan, or other similar article. I in like manner fill the
110 twelve inch space above described between the two linings of laths with tan or saw-

dust taking care to leave the above named five inch space entirely open to form flues or channels for the passage of steam. With the same material I fill in my covering to the depth of three, or four feet. Thus surrounding the corroding chamber on all sides by a bed, bank, or covering of saw-dust, tan, or other similar article. The lead prepared in thin sheets is rolled up with the usual precautions, and is placed on racks so as to fill the whole of the corroding chamber, and thus arranged everything is ready for the commencement of the process. Having caused the water to boil in the steam boiler, I admit steam through each of the steam tubes so that it passes at the same time into the space under the floor, and up the flues or openings left for that purpose, and also into the corroding chamber. This I continue to do for about ten hours. I then commence the sending in of the vapor from my acid boilers, the acid having been made to boil for that purpose. The quantity of acid in my boilers is usually about one pint for every two pounds of lead, but this will vary according to the strength of the acid. The acid vapor is admitted until its strength is exhausted. This part of the process usually occupies about ten days. While the acid vapor is being admitted, the admission of steam also, is continued, but the quantity admitted into the corroding chamber is diminished, and that admitted under and around it increased, thus producing a pressure from the outside which much accelerates the process by the forcing the steam through the tan or saw-dust into the interior, and effectually preventing the escape of carbonic acid therefrom. After I have admitted the vapor of vinegar for a sufficient length of time so that it is believed that more will not be required, I continue to admit steam from the steam boilers for about twenty days, at the end of which period I expect to find the white lead perfectly formed, but if upon inspection any defect is discovered, it is corrected by repeating such part of the described process,

and to such extent as may be deemed necessary. I will here observe that the principle upon which I proceed, namely that of surrounding the corroding chamber with tan, sawdust, &c., and the effecting the corrosion by the heat from steam, and the vapor of acetic acid may be carried out in a structure varied in some particulars from that which I have described, although as I believe in a less perfect manner. Thus for example, the flues or steam spaces at the sides, and ends of the structure may be omitted, the steam chamber for the outside pressure existing under the floor only, and the bank of tan or saw-dust at the ends, and sides, resting against the outside wall or weatherboarding of the structure. Other variations, also may be made in the process, while the principle upon which it is dependent will remain substantially unchanged. When the last described mode of forming the structure is adopted, there should be tubes or openings from the steam chamber under the floor to allow the escape of superfluous steam therefrom.

What I claim as my invention, and wish to secure by Letters Patent, in the above described structure, and process of manufacturing of carbonate of lead is—

The effecting of the corrosion of the lead, and the conversion thereof into white lead by the admission of steam from boiling water, and of the vapor of vinegar, or other fluid containing acetic acid into a corroding chamber, which corroding chamber is properly charged with lead, and is surrounded in the manner herein described by layers, and banks of sawdust, tan, or other like material into, and through which layers, and banks steam from water is forced so as to enter the corroding chamber substantially in the manner, and for the purpose herein set forth.

JOSEPH RICHARDS.

Witnesses:

THOS. JONES,
CHAS. M. KELLER.