UNITED STATES PATENT OFFICE.

ROBERT ROWLAND, OF ST. LOUIS, MISSOURI.

IMPROVEMENT IN THE MUTUAL ARRANGEMENT OF VINEGAR-ROOMS AND WHITE-LEAD-CORRODING CHAMBERS.

Specification forming part of Letters Patent No. **13,657,** dated October 9, 1855.

To all whom it may concern:

Be it known that I, ROBERT ROWLAND, of St. Louis, in the county of St. Louis, in the State of Missouri, have invented a new and Improved Method of Manufacturing White Lead; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawing, and to the letters of reference marked thereon.

The nature of my invention, or, better, improvement of manufacturing white lead, consists in saving all the expenses of vinegar, manure, (dung,) pots, and the expensive handling of the same in the process commonly followed and known as the "Dutch (Hollandish) method;" in saving a great deal of time and labor; in not being near so detrimental to the health of those engaged in the manufacture of said article of white lead, and in controlling and regulating as you please the whole of the process of the corrosion of the metallic lead.

To enable others skilled in the art to make and use my improvement, I will proceed to describe its simple process.

As the conversion of metallic lead into the carbonate of lead (white lead) is based upon the chemical law that this process only can take place when carbonic and acetic acid influence together the metallic lead, the only question of an improvement can therefore be to produce the aforesaid gases in another and cheaper manner than by the Dutch method, because the consumption of vinegar, the furnishing of manure and pots, also the handling of them, cause a great deal of useless expenses, which are saved by my method. Hence to manufacture white lead by my method it is necessary to bore holes in sufficient number in the ceilings of a room where vinegar is manufactured, and as naturally and necessarily the upper part of the room will be abundantly impregnated with acetic acid. The latter gas will escape through the holes in the ceilings in the upper room in the second floor, where the metallic lead is placed and intended to be converted into the white lead. On the second story, where the metallic lead is, must be vessels placed with fermentals or other materials to produce carbonic acid (likewise the latter gas can be led in by other means) in quantity sufficient to produce gas enough in proportion to the number of vinegar-tubs and to the quantity of metallic lead desired to be converted into white lead. In the upper part of this room are hung up sheets of metallic lead about the thickness of a card, bent in this form: ∧; but care must be taken that the sheets of lead do not touch each other. Further, this latter room must be kept in conform heat from 70° to 75° Fahrenheit, and air must be prevented from entering it, and, when well managed, the conversion will have taken place in eight or ten days, while the old Dutch method requires six to eight weeks; hence a great saving of time, labor, and many expenses for dung, pots, and handling the same, as above mentioned.

My improved method of manufacturing white lead will prove to be a great deal more advantageous than the old Dutch method for this reason: In the latter method the vinegar used evaporates by the warmth in the dung, (or by another method by the heat of the room,) and is therefore entirely lost; and by my method the vinegar will be saved and remains for sale, as I only use the acetic acid, which will become produced, as is known, necessarily during the manufacturing of said article in each vinegar-factory. Therefore the expenses for vinegar will not only be saved, but the selling of the vinegar will prove a clear profit. By my improved method wort (new beer) or similar substances can be used as fermentals, which may be used, after the fermentation is exhausted, for manufacturing vinegar in the place of whisky, and made valuable in that manner. For example, to convert ten thousand pounds metallic lead into white lead it requires, to manufacture, in sixteen to twenty tubs, seventy barrels vinegar and, as a fermental, twenty-four barrels wort without hops, or a similar substance containing sugar-stuff, and in one week's time the conversion will have taken place, after which the "fermental," as above named, can be, after the fermentation is exhausted, used for manufacturing seventy barrels vinegar, which remains on hand for sale. As it is known that all substances containing sugar-stuff are liable to a vinous fermentation by which the sugar becomes converted into

alcohol, after the exhausted vinous fermentation will the acetous fermentation take place, by which the alcohol will be combusted and converted into vinegar by assistance of the oxygen in the air. The same will be the case with the wort or another similar substance. Therefore it can be used, after the vinous fermentation is exhausted and the sugar is converted into alcohol, in the place of whisky for manufacturing vinegar, because it is one and the same with whisky, (alcohol.) Further, as by the combustion of the alcohol in the shavings of the vinegar-tubs while the acetous fermentation and the conversion of the alcohol into vinegar will be produced a great deal of acetic acid, which escapes through the holes of the vinegar-tubs, impregnating the upper part of the room abundantly with it. The escaped gas will be made useful by my method of manufacturing white lead, while it evaporates completely useless and is lost in all vinegar-factories. Furthermore, it is by my method completely in the power of the manufacturer to regulate and control the whole of the process immediately, as soon as he sees that the one or the other gas should predominate. For instance, in case the manufacturer should see that by a surplus of acetic acid sugar of lead should be produced, it will require only to give more yeast to the fermental and to increase the fermentation by it, and the equilibrium in the process will be quick and easy restored, and so reversed.

The conversion of metallic lead was made by another method in Germany on places where the horse-dung was scarce—viz., by placing vessels with vinegar mixed with dregs of wine in a highly heated up room, where the lead was hung up; but the expenses for the large quantity of evaporated vinegar, dregs of wine, &c., (which are saved by my process,) made it too expensive. Therefore my method is much more preferable.

The bent form of the sheets of lead, as above described, makes it very easy to separate the oxide (white lead) by rollers from the metallic lead, so that the persons handling it may not have to come in contact with the dust of white lead, it being so injurious to the health, as is the case in the Dutch method, by which the oxide only can be separated from the rolled-up metallic lead by stamping or other detrimental means of handling it.

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

Arranging the room wherein the metallic lead is placed immediately above the room wherein the manufacturing of vinegar is going on, and perforating the floor between the two rooms, so that the acetic acid which is generated in the manufacturing of vinegar may pass from the lower room through said perforations into the upper room, and there, in combination with carbonic acid produced in the upper room by the fermentation of wort or other similar substances, (or introduced into the upper room by pipes,) act upon the metallic lead for the purpose of converting the metallic lead into the carbonate of lead.

ROBERT ROWLAND.

Witnesses:

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