

W. ECKFORD.
MANUFACTURE OF RED LEAD.
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1,010,356.

Patented Nov. 28, 1911.

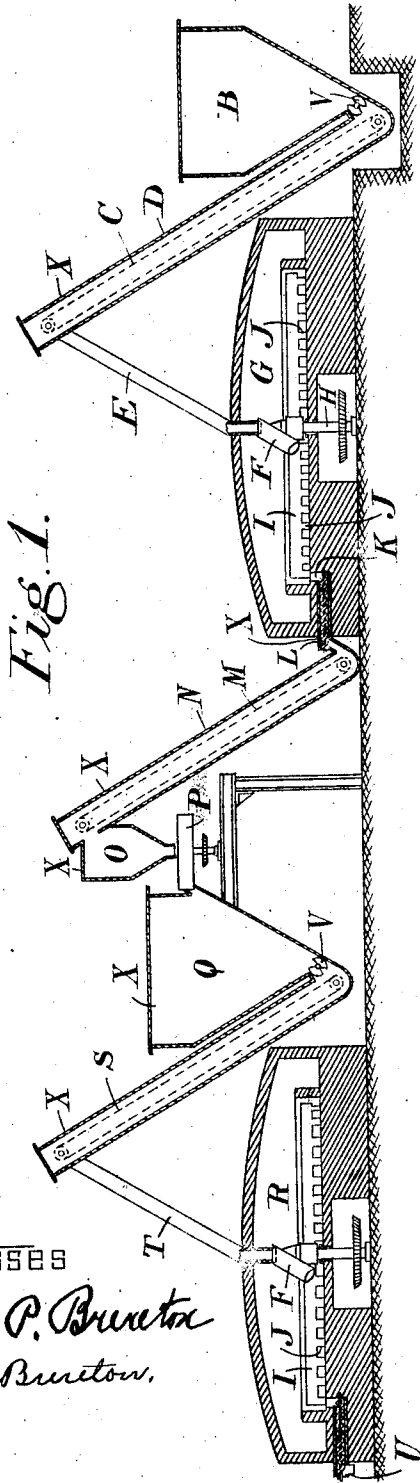


Fig. 1.

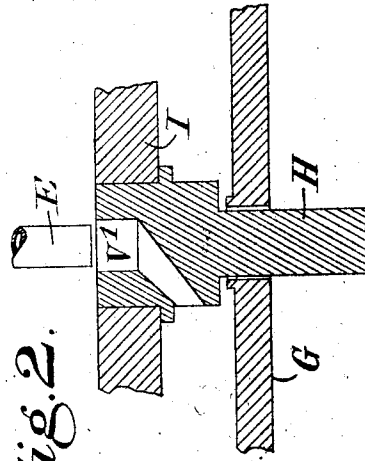


Fig. 2.

Witnesses

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UNITED STATES PATENT OFFICE.

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MANUFACTURE OF RED LEAD.

1,010,356

Specification of Letters Patent. Patented Nov. 28, 1911.

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To all whom it may concern:

Be it known that I, WILLIAM ECKFORD, subject of the King of Great Britain, residing at Rhyl, in the county of Flint, in the Principality of Wales, England, have invented certain new and useful Improvements in or Relating to the Manufacture of Red Lead, of which the following is a specification.

10 The following process which constitutes my invention for the production of red lead from granulated lead, metallic lead powder, oxid of lead, massicot or litharge is a dry process, and yet no appreciable portion of lead oxid can escape into the open air to contaminate it.

In carrying the invention into effect, the granulated lead, metallic lead powder, oxid of lead, massicot or litharge, is supplied to a mechanical coloring oven preferably without being damped, and preferably under a slight suction draft, so that if there be any leakage it will not be outward to the atmosphere.

25 After being partly converted into red lead in the coloring oven the product is ground dry in an inclosed mill, with preferably a slight inward suction at the inlet of the mill, this grinding being to break up the powder and enable it to color quickly and more thoroughly. It is again colored and again ground dry in the same manner, and again colored, and so on until the desired red lead is obtained. The sole object of the slight suction is that if there be any leakage it shall be inward and not outward.

35 The operations of coloring and grinding are rendered consecutive and continuous without any hand manipulation, and the accompanying drawings show one apparatus by which the invention is carried into practical operation, in which,

Figure 1 is a diagrammatic view of the apparatus; and Fig. 2, a detailed view.

45 B is a hopper to which the granulated lead, metallic lead powder, oxid of lead, massicot or litharge is supplied, and which in its turn supplies the elevator C incased by the casing D, from which there can be no leakage outward into the open air, and thence by the chute E to the pipe F, which revolves and which distributes the granulated lead, metallic lead, oxid of lead, massicot or litharge, to the bed of the coloring 55 oven G. This oven has a circular bed, and is

provided with a vertical shaft H passing through the bottom of the oven, and carrying the revolving arm I, which carries the scrapers J. These scrapers are so arranged that they distribute the granulated lead, metallic lead powder, oxid of lead, massicot or litharge in the furnace on the circular bed after it has been discharged from the pipe F which revolves with the arm I. These scrapers J on the arm are so set that they at one side of the arm cut furrows of oxid or red lead made by the scrapers on the other side of the arm, and are set at such an angle as to gradually work the oxid from the center to the outside. The scrapers outside, or farthest from the center collect and at each revolution as they pass the hole K discharge a portion of the now partly colored red lead into the screw conveyer L, which feeds the incased elevator M, thus lifting the partly colored red lead to the hopper O, to supply the incased grinder P. The ground red lead is discharged into the hopper Q, and is supplied to or near the center of the coloring oven R by the incased elevator S and chute T. This oven with its arms I, scrapers J and pipe F, is the same as the oven G, and finished red lead is discharged at the opening U into the desired receptacle for weighing or packing into barrels or other vessels, or the grinding and coloring can be repeated again and again as often as required by adding more grinding mills and ovens. When desired, I connect the chutes, elevators, hoppers, etcetera, with ducts at say points X to a suction fan, so that no powder can escape, and any leakage of air shall be inward and not outward.

The pipes F convey the lead oxid or red lead close down on to the bed of the oven, and so greatly prevent the raising of dust.

V is a revolving drum at the bottom of the hoppers B and Q, which is provided with pockets, into which the lead oxid enters by gravity and the revolution of the drum delivers the lead oxid from the pockets in regulated quantities, so that the conveyers C and S cannot get blocked with the rush of oxid or red lead. The elevators C shown in the drawing are of the bucket type, but I do not confine myself to using bucket elevators, as screw or other conveyers can be used instead. Also, instead of using the vertical shaft grinder P, any other suitable grinder may be used, such as one with hori- 110

zontal or inclined shafts, or ball grinding mills, or other suitable dry grinding apparatus. When the lead oxid is fed by hand into the hopper B, instead of automatically from the oxid producer, then suction draft is indispensable at the hopper B.

Fig. 2 shows an alternative arrangement for feeding the powder on to the oven bed F. In this, G is the brick bed of the oven, H the vertical shaft, I the revolving arm, and E the chute. The pipe F is in this case dispensed with, and a passage V¹ is formed in the shaft H. This passage, starting in the center of the shaft, is deflected toward the side and has its orifice near the brick bed. The powder delivered by the chute E passes through this passage and is discharged on to the oven bed G at or near the center thereof.

The mechanical ovens need not be of the form shown. They may, instead of the fixed bed and the revolving scraper type, be made with a revolving bed and fixed scraper, or of a revolving inclined cylinder as used for roasting cement. The mechanical ovens may be muffled.

In this process the usual levigating and separating of the oxid of lead from the metallic particles are dispensed with, no water is used, and thus a great saving of heat and of labor is effected, any metallic lead which may be in the material being converted in the coloring oven first into monoxid and then into red lead, without any mechanical separation from the other material.

I declare that what I claim is:—

1. In the manufacture of red lead, subjecting the granulated lead, metallic lead powder, oxid of lead, massicot or litharge in a dry or floury state, to the action of heat on the bed of a mechanical coloring oven, and either under atmospheric pressure or under a suction draft or pressure slightly below that of the atmosphere, and grinding the resulting partly colored red lead in a dry state under a slight vacuum or suction, again coloring it on the bed of a mechanical coloring oven, and again grinding it, the operations of alternate coloring and grinding being repeated as often as required to obtain the desired red shade of red lead.

2. The process of producing red lead from granulated lead, metallic lead powder, oxid of lead, massicot or litharge, consisting in subjecting the material in a dry state to alternate treatments on the beds of mechanical coloring ovens and dry grinding, as often as required until the desired shade of red lead is obtained, the lead oxid or partly formed red lead being conveyed from the coloring ovens to the grinding devices without exposure to the open air.

In witness whereof, I have hereunto signed my name this 17 day of November 1909, in the presence of two subscribing witnesses.

WILLIAM ECKFORD.

Witnesses:

G. C. DYMOND,
H. WATSON.