

UNITED STATES PATENT OFFICE.

JAMES NOAD, OF LONDON, ENGLAND.

METHOD OF AND MEANS FOR PRODUCING LEAD OXID.

SPECIFICATION forming part of Letters Patent No. 570,712, dated November 3, 1896.

Application filed August 11, 1896. Serial No. 602,401. (No model.) Patented in Belgium May 7, 1896, No. 121,232.

To all whom it may concern:

Be it known that I, JAMES NOAD, engineer, residing at East Ham, London, Essex, England, have invented certain new and useful
5 Improved Methods of and Means for Producing Lead Oxid, (for which I have obtained Belgian Patent No. 121,232, dated May 7, 1896,) of which the following is a specification.

10 This invention relates to an improved process of and means for converting metallic lead into lead oxid, whereby, among other advantages, the desired product can be more speedily obtained than by any existing process, and
15 in an impalpable floury condition, rendering it greatly superior to lead oxid as hitherto produced for such uses in the arts and manufactures to which it is ordinarily applied.

To this end the invention consists in effect-
20 ing the production of the oxid by subjecting metallic lead in a molten condition in a closed lead-melting tank to the combined influences of water (as such) and air injected or fed thereonto, while the mass of liquid metal and
25 the surface thereof are kept in turbulent motion, with the object of causing a continuous circulation of the molten particles and of any partly-oxidized metal particles floating thereon, and bringing the same into the most intimate contact with the elements of the air and
30 water at a temperature which will dissociate such elements and will facilitate the desired combination, such process being effective in causing the lead to be oxidized more expeditiously and more completely and less expensively than is effected by any existing process of making lead oxid.

The accompanying drawings represent an arrangement of apparatus which may be used
40 with advantage in carrying out the improved process, but I do not restrict myself to the exact construction or arrangement of the parts as illustrated.

Figure 1 represents an elevation, partly in
45 section; and Fig. 2 represents a plan, partly in section.

A represents a lead-melting tank heated by a furnace *b* and connected by a hood *c* with a series of any required number of hoppers *d*,
50 wherein the lead oxid produced in and carried over from the tank *a* deposits in a floury condition, as aforesaid.

The tank is fitted with a revolving agitator *e*, formed with radial arms *e'*, adapted to plough over the bottom of the tank, and with
55 vanes or blades *e''*, adapted to deflect the peripheral portions of the molten lead toward the center, and with stirrers *e'''*, adapted to agitate the mass of the molten metal and to break up and keep the surface thereof and
60 any partly-oxidized metal floating thereon in turbulent motion. The agitator-shaft *e''''* projects through the hood *c* and is connected by gearing *f* with a driving-shaft *g*, which is supported in brackets *h* and is fitted with a driving-pulley *i*, adapted to be driven by any convenient motive power, and with a pulley *j*.
65 The tank is also fitted with an air-tube *k*, fitted with jets *k'*, serving to direct jets of air onto the surface of the molten lead, the air
70 being supplied to the tube under pressure by a blower *m*, driven from the pulley *j*. The tank is also fitted with pipes *n*, serving to direct jets of water onto the surface of the molten lead, the water being supplied to the pipes
75 *n* by a common main *o* from any convenient reservoir, or otherwise in any convenient manner under any required pressure.

The piping supplying the air and water is fitted with cocks *p*, or like means of regulating the respective supply.
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The end hopper *d* is connected to a condensing-chamber *q* of any required capacity, into which any lead oxid which may be carried by the current past the hoppers will deposit and in which any watery particles which may be carried over will also condense. The chamber *q* is covered by layers of fabric *r*, or may be otherwise provided with means adapted to relieve the internal pressure due
90 to the operations effected within the tank *a* and to the current carrying over the lead oxid, while preventing the escape of the latter, and is also fitted with a tap *s* for drawing off any condensed water and formed with
95 a doorway *t* for removing the deposited oxid.

In carrying out the invention, when the lead in the tank *a* is wholly molten, I set the agitator in rapid rotation, so as to stir through the entire mass of the fluid metal and to
100 break up and keep its surface in turbulent motion and continue such agitation throughout the process, during which the water is run or may be injected in fine jets onto the

turbulent surface of the liquid metal and partly-oxidized metal floating thereon, by which it is instantly dissociated into its elements and explosively disperses the adjacent metal particles and strips off the oxid coating from any partly-oxidized metal particles, while the air is also simultaneously injected onto such surface, where, consequently, the molten lead particles and the partly-oxidized and oxid-stripped lead particles and the elements of the water and air are brought into the most intimate contact at a temperature which will facilitate the desired combination, the process resulting in an extremely rapid and continuous production of lead oxid, which is carried over in a cloud-like impalpable floury condition, in which it deposits into the hoppers *d*, from which it may be directly charged into casks or other containers in condition for immediate use in the arts or manufactures to which it is applicable, the process continuing without interruption until the metal is wholly oxidized.

By the improved process I am enabled at will to produce lead oxid of any color from a pale straw to a deep red, as may be required, according to the intended purpose of the product, by simply regulating the tempera-

ture of the lead-bath, increasing the temperature the darker the color is required.

I claim as my invention—

1. The process of producing lead oxid from metallic lead, consisting in subjecting lead, in a molten condition, in a closed lead-melting tank, to the combined influences of water (as such) and of air injected or fed thereonto, while the mass of the metal and the surface thereof are kept in turbulent motion, substantially as described.

2. The described means of producing lead oxid from metallic lead, the same consisting in a lead-melting tank connected by a hood with a series of depositing-hoppers and a condenser, and fitted with an agitator adapted to keep the mass and the surface of the molten metal in turbulent motion, and with means respectively serving to direct jets of water and of air onto the molten metal, substantially as described.

Signed at London, England, this 29th day of July, 1896.

JAMES NOAD.

Witnesses:

CHARLES AUBREY DAY,
ARTHUR WILLIAM MORETON.