No. 849,555. PATENTED APR. 9, 1907.

J. H. MONTGOMERY.

METHOD OF MANUFACTURING METALLIC OXIDS.

APPLICATION FILED OCT. 14, 1904.

Fig. 1.

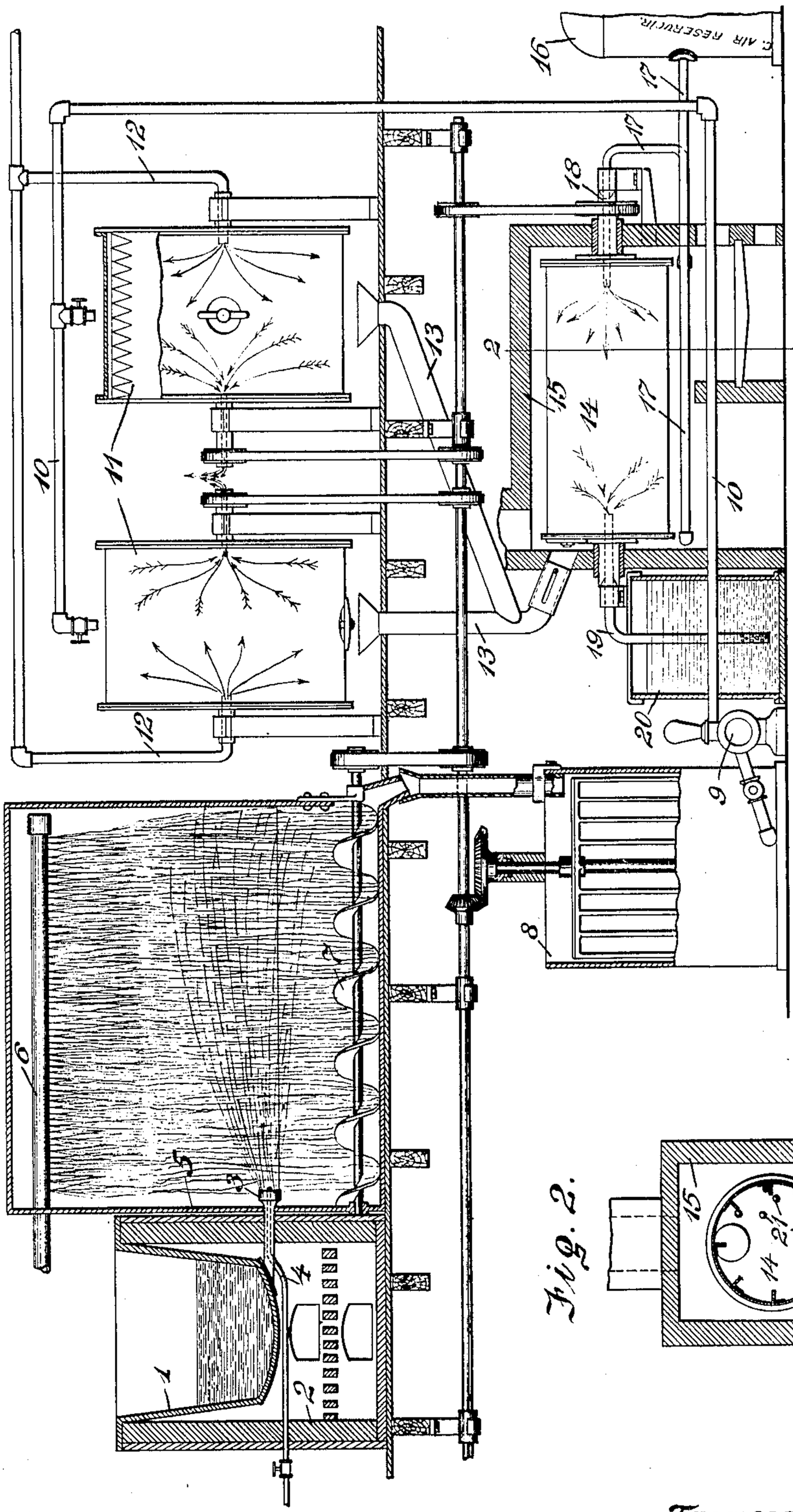

Fig. 3.

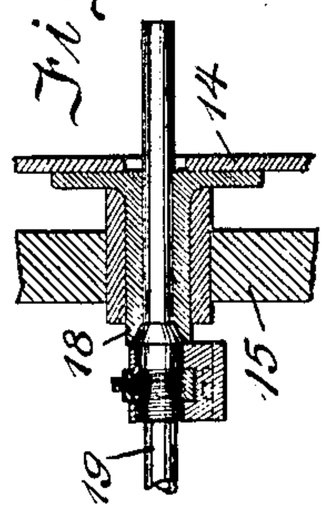

Fig. 2.

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UNITED STATES PATENT OFFICE.

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METHOD OF MANUFACTURING METALLIC OXIDS.

No. 849,555. Specification of Letters Patent. Patented April 9, 1907.

Application filed October 14, 1904. Serial No. 228,444.

To all whom it may concern:

Be it known that I, JOHN H. MONTGOMERY, a citizen of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Improvement in the Methods of Manufacturing Metallic Oxids, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a conventional illustration of an approved form of apparatus used in carrying out my improved method. Fig. 2 is a vertical sectional view through the furnace, and Fig. 3 is a detail view through the hollow trunnion of the heating-cylinder.

This invention relates to a new and useful improvement in the method of manufacturing metallic oxids, such as litharge and red lead, the object being to shorten the length of time usually required in the process as practiced under methods now commonly in vogue.

I will describe my improvement as practiced in connection with the manufacture of litharge and red lead; but it is obvious that other metals could be similarly treated, but at different temperatures, however.

In the drawings I have shown an apparatus for carrying out my improved method, in which—

1 indicates a melting-pot containing molten metallic lead. This pot is preferably located over a furnace 2, the molten lead passing down through a pipe into an atomizer 3, whence it is blown by air or steam passing through a pipe 4 in the form of a fine spray into a blow-room 5. The small atomized particles of lead entering the blow-room are precipitated by sprays of water from one or more pipes 6, located in the upper portion of the blow-room. The small particles of lead (and water) in the blow-room are carried by a conveyer 7 into a receptacle 8, preferably containing agitator-arms for keeping the particles of lead in suspension in the water. A pump 9 is used for pumping the leaden particles and water through a suitable pipe 10 into revolving cylinders 11. These cylinders are known as "oxidizing-cylinders" and after receiving a charge of lead and water are revolved for a period of about eight hours, during which time air under slight pressure is forced through the hollow trunnions of the cylinders from a suitable source of supply through pipes 12. The leaden particles so treated in the cylinders 11 are conveyed, by means of spouts 13, into a revolving cylinder 14, heated by means of a fire from a furnace 15. Cylinder 14 is preferably made of metal and, like the cylinders 11, contains angle-flights on its inner periphery for lifting the particles of lead and keeping them in a constant state of agitation.

16 indicates a reservoir or other suitable source of compressed air, the air in this instance being under a relatively high pressure, which air is heated by means of a coil-pipe 17 and introduced into a hollow trunnion 18 of the revolving cylinder 14. The opposite end of cylinder 14 is also provided with a hollow trunnion, through which leads a pipe 19 down into a receptacle 20, containing water, the lower end of said pipe being submerged in the water.

In practicing my process the lead is atomized in the blow-room, precipitated by water, and conveyed to the agitator in the form of metallic lead coated with a suboxid. From the agitator it is pumped into the cylinders 11, each cylinder being supplied with a "charge" and rotated for a period of about eight hours to thoroughly treat the leaden particles contained therein. From cylinders 11 the lead is conveyed to the cylinder 14, which is heated by the furnace beneath it, and in addition to this the lead is subjected to the action of the heated air passing through the coil 17. This air is heated to about 700° Fahrenheit, and consequently the water and moisture is quickly driven off, and the lead, being in a state of constant agitation, will soon be converted into a monoxid, which is the litharge of commerce.

The color of the finished product will depend upon the temperature of the air introduced into the cylinder 14. About 700° or more will produce the ordinary litharge of commerce, while an increase of temperature and continued treatment will deepen the color. The lead is kept in the cylinder 14 for a period of about twelve hours, and the sediment collected in the water seal 20 is from time to time put back into the cylinder 14 until the entire charge is converted into red lead, (Pb_3O_4.)

As the lead in the cylinder 14, due to the presence of water and moisture coincident with its introduction into the cylinder, has a tendency to cake on the sides of the cylinder, I prefer to employ balls 21, which are carried around with the cylinder and, falling onto the lead, not only have a tendency to pulverize it, but also to keep the inner face of the cylinder free and clean.

I am aware that my invention may be practiced by the use of apparatus other than that shown in the accompanying drawings, and therefore I do not wish to be understood as limiting the same to the use of the particular apparatus shown and described.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. The herein-described method of manufacturing red lead which consists in atomizing molten metal, agitating the atomized particles in the presence of water, then oxidizing said particles by the action of water and circulating air, and thereafter introducing them into a closed receptacle and agitating them while they are subjected to heated air under pressure; substantially as described.

2. The herein-described method of manufacturing red lead which consists in first atomizing the metal, subjecting the atomized particles to a constant agitation in a chamber containing circulating air, for a predetermined length of time, then conveying said particles into a heated closed receptacle and agitating them for a certain length of time and subjecting them to heated air under pressure during the time they remain in said chamber; substantially as described.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 4th day of October, 1904.

JOHN H. MONTGOMERY.

Witnesses:
CORA BADGER,
GEORGE BAKEWELL.