

No. 731,055.

PATENTED JUNE 16, 1903.

M. JACOBI.  
APPARATUS FOR MAKING METALLIC OXIDS.  
APPLICATION FILED FEB. 19, 1903.

NO MODEL.

Fig. 1.

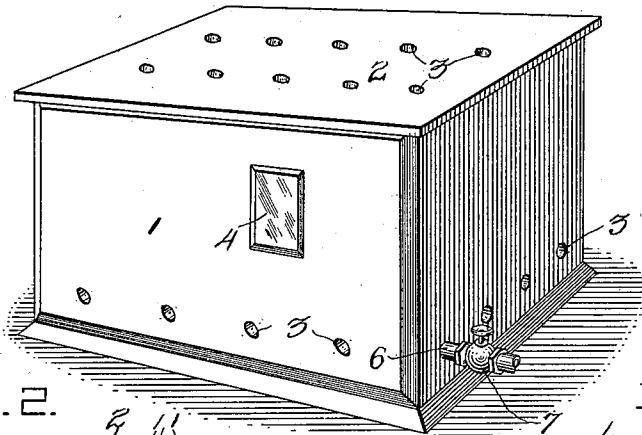


Fig. 2.

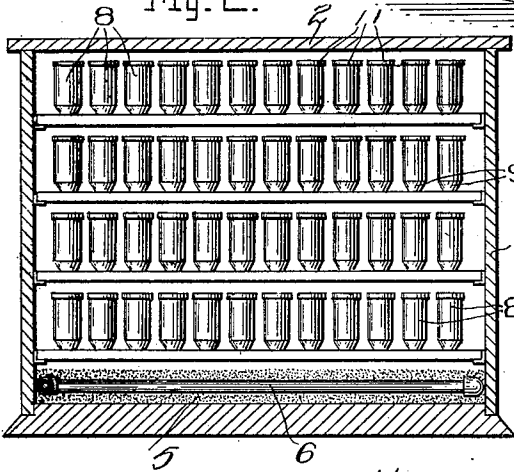


Fig. 3.

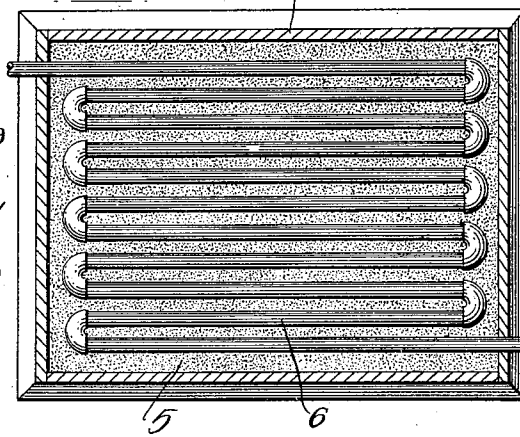


Fig. 4.

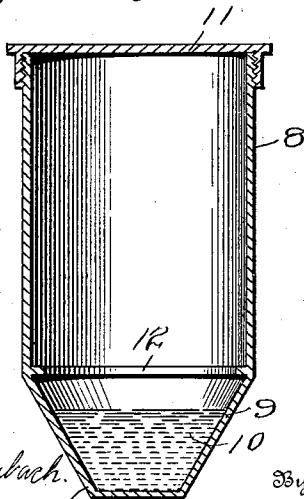
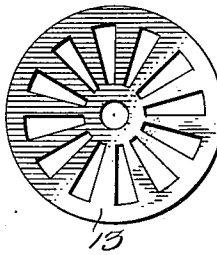


Fig. 5.



Witnesses  
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# UNITED STATES PATENT OFFICE.

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## APPARATUS FOR MAKING METALLIC OXIDS.

SPECIFICATION forming part of Letters Patent No. 731,055, dated June 16, 1903.

Application filed February 19, 1903. Serial No. 144,145. (No model.)

*To all whom it may concern:*

Be it known that I, MAURICE JACOBI, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Apparatus for Making Metallic Oxids; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an apparatus for making oxids of metals by the aid of heat and acids.

With this and other objects in view the invention consists in certain novel features of construction, combination, and arrangement of parts, which will be hereinafter more fully described, and particularly defined in the appended claims.

In the accompanying drawings, Figure 1 is a perspective view of an apparatus for making metallic oxids constructed in accordance with my invention. Fig. 2 is a vertical section of the same, showing the manner of packing the pots or retorts therein. Fig. 3 is a horizontal section showing the arrangement of the steam-pipe. Fig. 4 is a vertical sectional view, on an enlarged scale, of one of the pots or retorts; and Fig. 5 is a plan view of a metallic button.

In carrying my invention into practice I provide a box or casing 1, having a lid or cover 2, which fits tightly, so as to prevent the access of cold air and the exhaust of the contained heated air. The sides of the box and lid are formed with air-inlets 3 for the purpose of admitting air when desired to regulate the temperature of the interior of the box. In one side of the box an observation-opening, closed by a glass panel 4, is provided to permit examination of the interior to determine whether or not the proper conditions as to moisture, &c., in the process of oxidation exist. At the bottom of the casing is provided a layer of sand 5 or other like heat absorbing and conducting material, and in this sand is embedded a steam heating-pipe 6, provided with a stop-cock 7 on the exterior to regulate the supply of steam thereto. This pipe extends throughout the entire

area of the bottom of the casing back and forth in serpentine or zigzag form, so as to transmit heat equitably to all points of the casing, the heat being taken up and distributed by the sand. The box or casing is adapted to contain a series of oxidizing pots or vessels 8, which are adapted to contain the metal—for instance, zinc—to be oxidized and the acid which is vaporized to effect the oxidation. Each pot has a frusto-conical lower end 9, forming a containing-space for the acid 10, and is closed at the top by a removable airtight cover 11. At the point of junction of the body portion of the pot and the frusto-conical end thereof a supporting flanged rib or bead 12 is formed upon the interior of the pot to support the metal 13, which latter is cast into foraminous disks or buttons of the form shown in Fig. 5, these buttons being arranged one upon the other until the pot is filled and the air-spaces therein allowing the vapor from the acid below to circulate and come in contact with all particles of the metal and effect the ready oxidation of the same. The pots are preferably made of earthenware glazed on the interior and of a suitable height and diameter to serve the purpose.

The mode of operation is as follows: A suitable quantity of acid is placed in each pot, together with the buttons of metal—for instance, lead when it is desired to manufacture lead oxid. The pots are then covered with the lids or covers 11 and arranged in horizontal rows in the casing or chamber one above the other until the box is filled, when the cover 2 is applied to prevent the escape of hot air and the access of cold air. Live steam is then admitted through the pipe 6 by opening the valve 7, and the heat therefrom is transmitted to the bed of sand, which heats the interior of the box to a high degree. This heat is transmitted, of course, to the pots within the box, and the acid contained therein is vaporized, and the vapor circulates in contact with the buttons of metal and gradually effects the oxidation of the same. The temperature throughout the bed of pots should be for, say, three hours 150° Fahrenheit, then gradually reduced until a constant heat of not more than 80° to 85° is obtained. Should the heat in the bed exceed this de-

gree at any time during the process of oxidation, the draft holes or openings 3 may be opened and the temperature regulated accordingly.

5 The advantage of my apparatus is that it will permit an absolute control of heat, thereby insuring a slow evaporation of acids and give a much purer, more reliable oxid; that  
 10 various metals with various acids can be acted upon at the same time in the same beds to form different oxids, and that by putting the metal to be oxidized into pots in the manner described the metal may be readily supplied and the finished product taken out, and the  
 15 process of oxidation is facilitated, being completed by my process in from five to six weeks. The disposition of the pots in layers allows the operation to be made continuous, and each layer when the operation is completed  
 20 may be removed and another substituted therefor, as will be readily understood.

From the foregoing description, taken in connection with the accompanying drawings, the construction, mode of operation, and advantages of my invention will be readily apparent, it is thought, without requiring a  
 25 more extended explanation.

Various changes in the form, proportion, and the minor details of construction may be  
 30 resorted to without departing from the principle or sacrificing any of the advantages of the invention.

Having thus described my invention, what I claim as new, and desire to protect by Letters Patent, is—  
 35

1. In an apparatus for making metallic oxids, the combination of a casing provided with draft-openings and having a bed of sand therein, a heating-pipe embedded in the sand, and rows of pots disposed therein and adapted  
 40 to contain a supply of the metal and acid to be used in the process of oxidation, substantially as described.

2. In an apparatus for making metallic oxids, the combination of a casing, a bed of  
 45 sand disposed in the bottom of the casing, a zigzag or serpentine shaped heating-pipe embedded in the sand, and containers in the casing for holding the metal to be treated, substantially as described.  
 50

3. In an apparatus for making metallic oxids, the combination of a casing, means for heating the interior thereof, and closed containers within the casing, each adapted to contain a supply of metal and a supply of acid,  
 55 substantially as described.

4. In an apparatus for making metallic oxids, the combination of a casing, pots disposed therein, each pot adapted to contain a supply of metal and a supply of acid, means  
 60 for heating the interior of the casing, and means for supplying a regulated amount of cool air thereto, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.  
 65

MAURICE JACOBI.

Witnesses:

BELLA D. BERKHEISER,  
 ANNA K. FILLING.