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G. F. JAUBERT.

MANUFACTURE OF PEROXID OF POTASSIUM.

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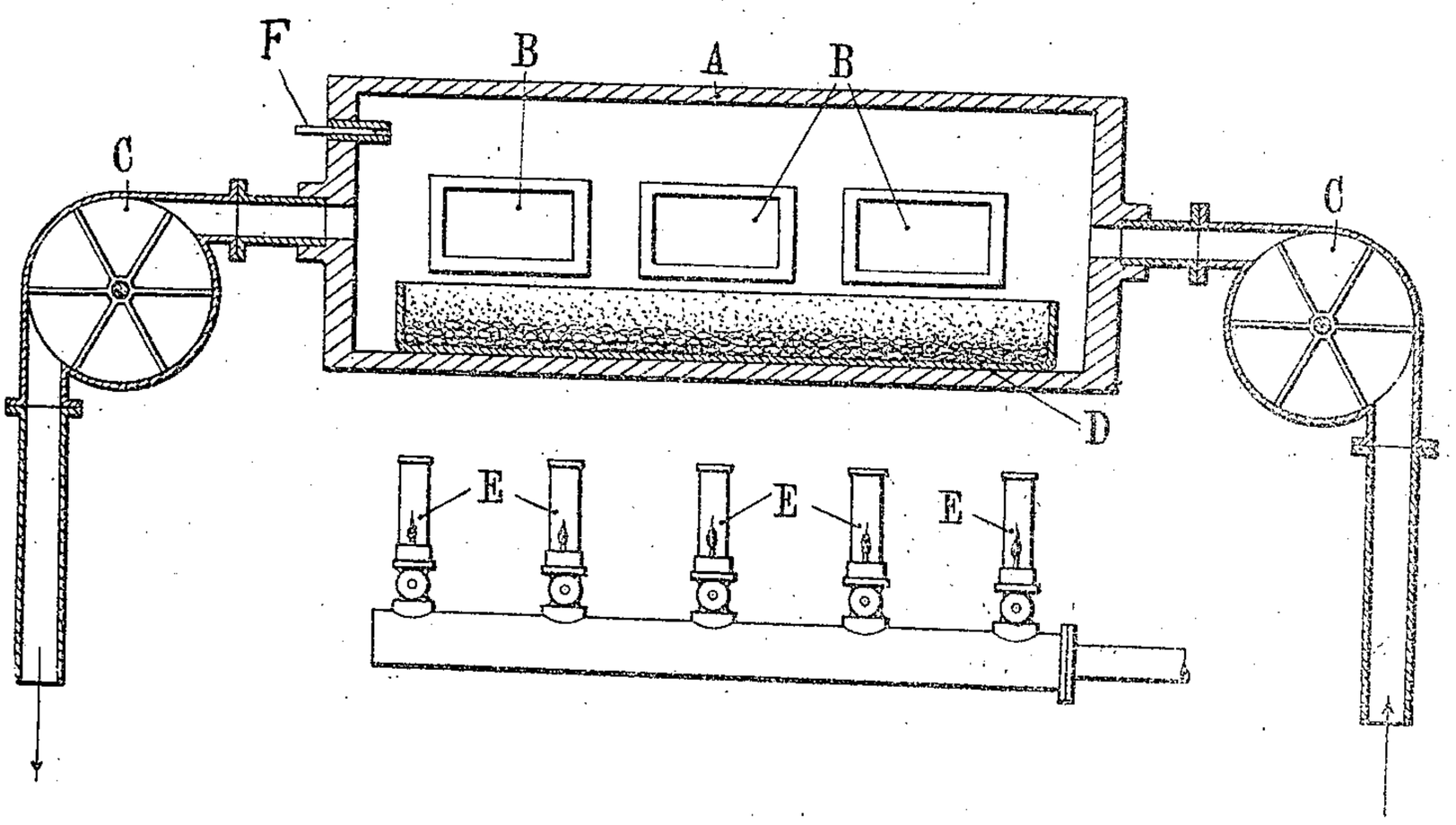

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UNITED STATES PATENT OFFICE.

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MANUFACTURE OF PEROXID OF POTASSIUM.

No. 897,980. Specification of Letters Patent. Patented Sept. 8, 1908.

Application filed May 16, 1907. Serial No. 373,995.

To all whom it may concern:

Be it known that I, GEORGE FRANÇOIS JAUBERT, a citizen of the Republic of Switzerland, residing at Paris, France, 155 Boulevard Malesherbes, have invented certain new and useful Improvements in the Manufacture of Peroxid of Potassium or Mixtures Containing the Same; and I do hereby 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 improved process for the preparation of peroxid of potassium or of a mixture rich in peroxid of potassium, in powder or in the form of agglomerates.

Peroxid of potassium is ordinarily obtained by heating metallic potassium in a current of air; the potassium ignites and becomes converted into peroxid of the composition K_2O_4. This process presents the grave defect of necessitating the employment of metallic potassium, and as this element can only be prepared in small quantities and in a costly manner, the price of the peroxid of potassium required for certain industries is very high. It is known that when alloys of potassium with other metals such as lead, tin, sodium, etc., are burned, these alloys peroxidize in burning, the first two furnishing respectively anhydrous plumbate, and stannate of potash, and the latter the trioxid $KNaO_3$.

The process forming the subject of the present invention is differentiated from the above mentioned processes in that the peroxidizing goes on slowly and without ignition, and it consists particularly in moderately heating a potassium alloy, as distinguished from metallic potassium, and at the same time limiting the supply of oxygen to the alloy, thereby effecting the slow absorption of the oxygen, and the peroxidizing of the potassium, without ignition.

The process may be carried into practice in the following manner, and by means of the instrumentalities illustrated in the drawing.

An iron tube A is provided with mica windows B and furnished with an air meter C at each extremity for enabling the quantity of air absorbed in the reactions to be controlled. This tube may be heated by means of the burners E, or by any other appropriate means. Within the tube an iron vessel or basket D is arranged, and at one end the thermometer F. Into this vessel D is placed for example an alloy of lead with a proportion of 20 to 25% of potassium obtained by the electrolysis of melted chlorid of potassium with a lead cathode. A very slow current of dry and decarbonated air is caused to pass through the tube containing the vessel, a moderate heat, say 150 to 200° C. being applied, the progress of the reaction being observed through the mica windows, great care being taken that the mass does not catch fire at any time. The air entering the tube is partly absorbed by the reaction and the quantity of air absorbed decreases in proportion as the operation progresses, this being ascertained by consulting the meters arranged at the inlet and the outlet of the tube. After a certain time, air is only absorbed slowly; the temperature is then raised, but it should not exceed 300° or 350° C. When air is no longer absorbed, the operation is terminated, and cooling is allowed to take place. The vessel then contains lead, or oxid of lead collected in large pieces or in granulated powder and pulverulent peroxid of potassium which is readily separated by sifting. The peroxid thus obtained presents the form of a yellow powder which is extremely hygroscopic and difficult to handle.

In order to render possible the handling of this powder, it need only be compressed into any desired form without any binding medium, and in this manner cartridges or cakes of sufficient power of resistance to withstand subsequent handling are obtained. The alloy of potassium and lead may be replaced by an alloy of potassium and tin, or by any other alloy rich in potassium. When alloys very rich in potassium, such as those having the formula NaK and NaK_2 are utilized, it is preferable to peroxidize the entire alloy, that is, in the instance mentioned, both the sodium and the potassium, under the same conditions of low temperature and limited supply of oxygen.

The reaction takes place in accordance with the formula

$$2K_2Na + 5O_2 = 2K_2O_4 + Na_2O_2$$

We thus obtain a mixture of peroxid of potassium and peroxid of sodium which may be separated one from another by sifting, as required.

Heretofore, by the oxidation of an alloy of sodium and potassium a single body was obtained having the formula $KNaO_3$.

So far as I am aware, it is broadly new to form potassium peroxid from potassium alloyed with other metals, by moderately heating the potassium alloy in the presence of a limited quantity of oxygen, thereby effecting the slow absorption of the oxygen without ignition and the consequent peroxidizing of substantially the potassium alone, and the broad claims hereto appended should have a correspondingly broad interpretation.

What I claim is:—

1. The method of manufacturing peroxid of potassium, which consists in subjecting a potassium alloy to the action of heat in the presence of oxygen and so proportioning the temperature employed to the amount of oxygen supplied as to cause the potassium to absorb the oxygen slowly without ignition and without combination of the potassium peroxid with the other metal contained in the alloy; substantially as described.

2. The method of manufacturing peroxid of potassium, which consists in placing a potassium alloy in an inclosing chamber and heating the chamber externally while passing through it a slow current of air, and so limiting the temperature and air supply as to cause the potassium to absorb a considerable part of the oxygen of the air without ignition and without combination of the potassium peroxid with the other metal contained in the alloy; substantially as described.

3. The method of manufacturing peroxid of potassium, which consists in placing a potassium alloy in an inclosing chamber and heating the chamber externally to a temperature not to exceed 350° centigrade, while passing through said chamber a slow current of air, thereby effecting the slow absorption of a considerable part of the oxygen of the air without ignition and without combination of the potassium peroxid with the other metal contained in the alloy; substantially as described.

4. The method of manufacturing peroxid of potassium, which consists in placing a potassium alloy in an inclosing chamber and heating the chamber externally to a temperature not to exceed 350° centigrade, while passing through said chamber a slow current of dry and decarbonated air, thereby effecting the slow absorption of a considerable part of the oxygen of the air without ignition and without combination of the potassium peroxid with the other metal contained in the alloy; substantially as described.

5. The method of manufacturing peroxid of potassium, which consists in placing a potassium alloy in an inclosing chamber, heating the chamber externally to a temperature of about 150° to 200° centigrade, while passing through said chamber a slow current of air, and increasing the temperature, but not to exceed 350° centigrade, as the absorption of the air decreases; substantially as described.

6. The method of manufacturing peroxid of potassium, which consists in placing an alloy of potassium in an inclosing chamber, heating the chamber externally to a temperature of about 150° to 200° centigrade, passing through said chamber a slow current of dry and decarbonated air, increasing the temperature, but not to exceed 350° centigrade, as the absorption of air decreases, separating the potassium peroxid thus obtained and compressing it into cartridges or cakes without any binding medium; substantially as described.

7. The method of manufacturing peroxid of potassium, which consists in subjecting an alloy of potassium and sodium rich in potassium to the action of heat in the presence of oxygen and so proportioning the temperature employed to the amount of oxygen supplied as to cause the potassium and sodium to absorb the oxygen slowly without ignition; substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses.

GEORGE FRANÇOIS JAUBERT.

Witnesses:
H. C. COXE,
HENRY SCHWAB.