

UNITED STATES PATENT OFFICE.

CHARLES ROLLIN, OF NEWCASTLE-UPON-TYNE, ENGLAND.

PROCESS OF MAKING BARIUM OXID.

1,008,070.

Specification of Letters Patent.

Patented Nov. 7, 1911.

No Drawing.

Application filed December 17, 1910. Serial No. 597,811.

To all whom it may concern:

Be it known that I, CHARLES ROLLIN, B. Sc., F. G. S., a subject of the King of Great Britain and Ireland, residing at Newcastle-upon-Tyne, England, have invented a Process of Making Barium Oxid, of which the following is a specification.

In the specification of Letters Patent No. 974,921 granted to me, I have described a method of manufacturing barium oxid in a condition specially suitable to admit of its use in the manufacture of barium peroxid, by heating amorphous anhydrous barium hydroxid to a high temperature in a furnace with a barium compound, such as barium peroxid or barium nitrate, capable of evolving gas when heated and of leaving a residue of barium oxid.

To prevent the barium hydroxid, when melted, from dissolving impurities from the material of which the furnace is made and thereby rendering the barium oxid finally obtained, impure, the floor of the furnace is formed of or provided with a firm protective bed of barium oxid. In practice however it is found that this protective bed is liable to become disturbed or damaged by the removal therefrom of the finished barium oxid resulting from the heat treatment of the anhydrous barium hydroxid, owing to some of such barium oxid having become firmly attached to the protective bed during the heat treatment.

Now the object of the present invention is to prevent or minimize this disadvantage. For this purpose, according thereto, a temporary layer or bed of material that is inert or not injurious to the charge of amorphous anhydrous barium hydroxid to be treated, such for example as loose barium oxid, barium peroxid or barium nitrate, or a mixture of any two or all of these barium compounds, is arranged between the protective bed of barium oxid, forming the floor of the furnace, and the charge of anhydrous barium hydroxid to be treated. In this way the barium hydroxid, when melted, is prevented, or is to a large extent prevented, from injuriously affecting the firm protective furnace floor of barium oxid. The charge of amorphous anhydrous barium hydroxid may be mixed with barium peroxid or barium nitrate, as heretofore, or with a mixture of these compounds, or it may be unmixed with any other barium compound

or compounds, the charge being heated to a high temperature, as heretofore, for effecting the conversion of the barium hydroxid into barium oxid. At the end of the heat treatment of the barium hydroxid, the resulting barium oxid, together with the barium oxid forming the loose protecting layer or bed, or resulting from the decomposition of the barium compound or compounds used to form the temporary protecting layer or bed, can be removed from the floor of the furnace without disturbing or damaging the same. The proportions of the material forming the upper layer and the temperatures of treatment can be such as set forth in the specification of the aforesaid Patent No. 974,921, while the material constituting the intermediate layer can be any one of the constituents named or any desired proportionate mixture whether of all the said ingredients or not. As an alternative, powdered amorphous anhydrous barium hydroxid and a barium compound, such for example as barium peroxid, or barium nitrate, or barium oxid, or a mixture of any two or all of these last mentioned barium compounds, may be charged alternately into the furnace in comparatively small quantities at a time so as to form successive layers of the barium hydroxid and other barium compound or compounds, or a rough mixture of the said substances, upon the temporary protective layer or bed of a barium compound or compounds such as hereinbefore mentioned which is first placed upon the floor of the furnace.

The anhydrous barium hydroxid used may advantageously be produced according to the process described in the specification of Letters Patent No. 974,993 granted to me, or according to one or other of the processes described in the specification of an application for Letters Patent filed by me dated 8th October 1910 Serial No. 586049 according to which crystallized barium hydrate is melted in a suitable vessel at a comparatively low temperature and under atmospheric pressure in its water of crystallization and a current of dry inert gas caused to flow over the melted material until it is incrustated or solidified after which the mass is broken up and further dehydrated, preferably by heating it at a comparatively low temperature in a partial vacuum.

The thickness of the temporary layer or

bed of the barium compound or compounds used as described can be varied to suit requirements.

What I claim is:—

- 5 1. A process for producing barium oxid from barium hydroxid, said process consisting in heating a charge of anhydrous barium hydroxid to a high temperature upon a temporary layer or bed of material that is not
10 injurious to the charge of anhydrous barium hydroxid and which is in a loose or powdered condition and supported upon a protecting bed of barium oxid in a firm or solid condition.
- 15 2. A process for producing barium oxid from anhydrous barium hydroxid, said process consisting in heating a charge of anhydrous barium hydroxid to a high temperature upon a temporary layer or bed of an
20 oxygen compound of barium arranged between the charge and a firm protective bed.
- 25 3. A process for producing barium oxid from anhydrous barium hydroxid, said process consisting in heating a charge of anhydrous barium hydroxid to a high temperature upon a temporary layer or bed composed of a barium compound capable of evolving gas when heated and supported by a firm protective bed of barium oxid.
- 30 4. A process for producing barium oxid from anhydrous barium hydroxid, said process consisting in heating a charge of anhydrous barium hydroxid to a high temperature upon a temporary layer or bed comprising barium peroxid supported upon a
35 firm protective bed of barium oxid.
- 40 5. A process for producing barium oxid from anhydrous barium hydroxid, said process consisting in heating to a high temperature, a charge of anhydrous barium hydroxid with a barium compound capable of evolving gas when heated, upon a temporary layer or bed of material that is not injurious to the charge of barium hydroxid and which
45 is in a loose or powdered condition supported upon a firm protective bed of barium oxid.
- 50 6. A process for producing barium oxid from anhydrous barium hydroxid, said process consisting in heating to a high temperature, a charge of anhydrous barium hydroxid with a barium compound capable of evolving gas when heated, upon a temporary layer or bed composed of an oxygen compound of barium supported upon a firm
55 protective bed of barium oxid.
- 60 7. A process for producing barium oxid from anhydrous barium hydroxid, said process consisting in heating to a high temperature, a charge of anhydrous barium hydroxid with a barium compound capable of evolving gas when heated, upon a temporary

layer or bed composed of a barium compound capable of evolving gas when heated and arranged between the charge and a firm protective bed. 65

8. A process for producing barium oxid from anhydrous barium hydroxid, said process consisting in heating to a high temperature, a charge of anhydrous barium hydroxid with a barium compound capable of evolving gas when heated, upon a temporary layer or bed composed of barium peroxid in a loose or powdered condition supported upon a firm protective bed of barium oxid. 75

9. A process for producing barium oxid from anhydrous barium hydroxid, said process consisting in heating to a high temperature, a charge composed of alternate layers of anhydrous barium hydroxid and a barium compound capable of evolving gas when heated, upon a temporary layer or bed of material that is not injurious to the charge of barium hydroxid and which is in a loose or powdered condition and is supported upon a firm protective bed of barium oxid. 80 85

10. A process for producing barium oxid from anhydrous barium hydroxid, said process consisting in heating to a high temperature, a charge composed of alternate layers of anhydrous barium hydroxid and a barium compound capable of evolving gas when heated, upon a temporary layer or bed composed of an oxygen compound of barium, said temporary layer or bed being supported upon a firm protective bed of barium oxid. 90 95

11. A process for producing barium oxid from anhydrous barium hydroxid, said process consisting in heating to a high temperature, a charge composed of alternate layers of anhydrous barium hydroxid and a barium compound capable of evolving gas when heated, upon a temporary layer or bed composed of barium peroxid in a loose or powdered condition supported upon a bed of material in a firm or solid condition. 100 105

12. A process for producing barium oxid from anhydrous barium hydroxid, said process consisting in heating to a high temperature, a charge composed of alternate layers of anhydrous barium hydroxid and a barium compound capable of evolving gas when heated, upon a temporary layer or bed composed of barium peroxid in a loose or powdered condition supported upon a bed composed of barium oxid in a solid or firm condition. 110 115

Signed at the city and county of Newcastle-upon-Tyne this second day of December 1910.

CHARLES ROLLIN.

Witnesses:

ALEX. WARDLAW,
FRED H. DUKE.