

UNITED STATES PATENT OFFICE

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PROCESS FOR EXTRACTING IODIN, CHLORIN, POTASSIUM HYDROXID, AND OTHER USEFUL PRODUCTS FROM THE ASH OF SEaweEDS OR OTHER MARINE FORMS OF ALGÆ.

1,051,984.

Specification of Letters Patent.

Patented Feb. 4, 1913.

No Drawing.

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(DEDICATED TO THE PUBLIC.)

To all whom it may concern:

Be it known that we, FRANK K. CAMERON and RICHARD B. MOORE, citizens of the United States, and employees of the Department of Agriculture, said FRANK K. CAMERON residing in the city of Washington, District of Columbia, (whose post-office address is Washington, District of Columbia,) and said RICHARD B. MOORE being a legal resident of the city of Indianapolis, of the State of Indiana, temporarily residing in the city of Washington, District of Columbia, (whose post-office address is Washington, District of Columbia,) have invented a new and useful Process for Extracting Iodin, Chlorin, Potassium Hydroxid, and other Useful Products from the Ash of Seaweeds or other Marine Forms of Algæ.

This application is made under the act of March 3, 1883, chapter 143 (22 Stat., 625), and the invention herein described and claimed may be used by the Government of the United States or any of its officers or employees in the prosecution of work for the United States, or by any person in the United States, without the payment of any royalty thereon.

The object of our invention is to provide a method for extracting iodine, chlorine, potassium hydroxid and other useful products from the residue obtained by the partial or complete charring of seaweeds or other marine forms of Algæ.

It is well known that the residue or ash of seaweeds consists very largely of potassium chlorid with traces of iodids and other salts. By long experiments we have evolved a process for extracting these products from the ash. The separation may be performed in two ways. According to one mode of treatment the ash is lixiviated with water and the solution filtered or drawn off from the insoluble portion by any well known method. The solution is then evaporated until the less soluble salts crystallize out. After this operation, the mother liquor containing all the soluble iodids and some of the chlorids is subjected to the following treatment: The mother liquor is placed in the anode compartment of an electrolytic cell. Such anode compartment is separated

from the cathode compartment by means of a diaphragm composed of any suitable material but preferably of unglazed porcelain or earthenware. On the passage of an electrolytic current the chlorine and iodine appear at the anode and potassium hydroxid is found at the cathode. The chlorine which is first formed reacts with any unacted upon salt of iodine liberating free iodine. When all of the iodine is so liberated, the process may be stopped and the free iodine recovered by any suitable process, such as dissolving in a solvent like carbon tetrachlorid, or carbon disulfid, but the process is preferably continued until all the salts are decomposed. A portion of the chlorine will escape at the anode and may be collected and used for any convenient purpose. The iodine meanwhile is being oxidized, at the loss of a part of the chlorine, to iodic acid. The products derived are potassium hydroxid at the cathode and chlorine and iodic acid at the anode. The iodine may be recovered from the iodic acid by adding ferrous sulfate and sulfuric acid, iron and sulfuric acid, or by any other suitable method.

In practicing our other method in treating the ash of seaweeds, we place water in both the anode and cathode compartments of an electrolytic cell, and then add the seaweed ashes to the anode compartment. The ashes are stirred in any convenient manner and the current passed. The soluble salts pass into solution and the changes that occur are the same as disclosed in the previous process, viz: potassium hydroxid being obtained at the cathode and iodine, or chlorine and iodic acid, at the anode. The insoluble residue settles to the bottom of the anode chamber and may be dumped out or separated by any suitable process.

Having thus described our invention we claim as follows:

1. The herein described method for extracting iodine, chlorine, potassium hydroxid and other useful products from the ash of seaweeds, consisting in lixiviating the ash with water, filtering and partially evaporating the solution, subjecting the mother liquor to electrolysis in a cell in which the anode and cathode chambers are separated

by a diaphragm, thereby oxidizing the liberated iodine to iodic acid, then treating the anode solution with ferrous sulfate and sulfuric acid for separating iodine from such
5 iodic acid.

2. The herein described method for extracting iodine, chlorine, potassium hydroxide and other useful products from the ash of seaweeds, consisting in lixiviating the ash
10 with water, filtering and partially evaporating the solution, subjecting the mother liquor to electrolysis in a cell in which the anode and cathode chambers are separated

by a diaphragm, thereby oxidizing the liberated iodine to iodic acid, then treating the anode solution with iron and sulfuric acid for separating iodine from such iodic acid.

In testimony whereof we affix our signatures in the presence of two subscribed witnesses.

FRANK K. CAMERON.
RICHARD B. MOORE.

Witnesses:

W. O. ROBINSON,
HARRY BRYAN.