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PROCESS FOR OBTAINING POTASH FROM DISTILLERY WASTE BY BURNING THE SAME.

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1,403,160. Patented Jan. 10, 1922.

Fig. 2.

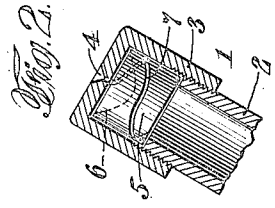


Fig. 1.

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UNITED STATES PATENT OFFICE.

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PROCESS FOR OBTAINING POTASH FROM DISTILLERY WASTE BY BURNING THE SAME.

1,403,160. Specification of Letters Patent. Patented Jan. 10, 1922.

Application filed February 19, 1920. Serial No. 359,861.

To all whom it may concern:

Be it known that I, CARL HANER, JR., a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented a certain new and useful Improvement in Processes for Obtaining Potash from Distillery Waste by Burning the Same, of which the following is a specification.

My invention relates particularly to a process designed for burning distillery waste in order to obtain the potash therefrom in an advantageous manner.

The object of my invention is to provide a process by means of which distillery waste may be burned to recover potassium compounds, that is to say the waste or slop which is left after the alcohol has been separated from alcohol producing materials of various kinds which have been subjected to alcoholic fermentation. The materials used in such alcoholic fermentation may be any of the materials which have been used for the production of alcohol, as for example, molasses. Still another object of my invention is to burn the distillery waste by the aid of the heat produced merely from its own combustion, thus obviating the necessity of consuming other fuels in the production of the potash from the distillery waste.

Further objects of my invention will appear from the detailed description thereof contained hereinafter.

While my invention is capable of being carried out in many different ways, for the purpose of illustration I shall describe only certain ways of carrying out the same hereinafter, and while it is capable of being carried out in connection with many different types of apparatus, I have shown only one type of apparatus for use in connection therewith in the accompanying drawing, in which;

Fig. 1 is a diagrammatic representation of an apparatus which may be used in connection with my invention, and

Fig. 2 is a cross-section of the nozzle.

Assuming that the material to be treated is the distillery waste obtained from molasses fermentation and the distillation of the fermented molasses, which distillery waste has been concentrated by evaporation to a density of 20 to 35° Bé., the latter is injected in the form of a spray from an upwardly delivering spraying nozzle 1 connected to a slop inlet pipe 2. The nozzle 1 may be any kind of spraying nozzle, but as indicated in the drawings, I have shown for this purpose, a nozzle head 3 interiorly screwthreaded on the pipe 2, and having a spray outlet opening 4, said nozzle head 3 containing within the same a loose plug 5, having a liquid recess 6 in its forward face, and a spiral groove 7 to conduct the liquid forwardly and give it a whirling motion in the recess 6. The slop is injected by the nozzle 1 into a combustion chamber 8, having a plurality of grate bars 9 located close together across the same below a normally closed door 10, adapted for the introduction initially of a small quantity of coal or other fuel for initially heating up the chamber 8, and providing a bed 11 over the grate bars 9. In the combustion chamber below the grate bars 9, there is a clean-out door 12, which is normally open, and from which the potash is removed which falls through the grate bars 9. The potash which falls through the grate bars 9 is formed by the burning of the sprayed slop from the nozzle 1, which projects the liquid particles into the chamber 8, in which they are dried and ignited in falling, and finally burnt upon the grate bars 9, where they form a more or less coherent solid porous mass, and are finally incinerated. The volatile materials, as well as the products of combustion, pass out of the chamber 8 through a passageway 13 to a dust collecting chamber 14 having a baffle plate 15 in the upper portion thereof, and a normally closed clean-out door 16 in the lower portion of the same for the potash dust which accumulates from time to time at this point in the apparatus. The gaseous materials having had the potash dust separated therefrom pass from the dust collecting chamber 14 to a stack 17 which discharges them to the outer air. The potassium compounds which are collected from the lower end of the combustion chamber 8 and the dust collecting chamber 14 are brought together, and may be utilized in any desired manner, as for example for fertilization of soils or recovery of the potash salts therein, and which comprise among others the following:

Potassium chloride,
Potassium sulphate,
Potassium carbonate.

The operation of my invention will be ap-

parent from the foregoing description, but in general, it will be understood that the concentrated distillery waste in the form of a fine spray is projected upwardly into the chamber 8, so as to secure the maximum burning effect owing to the long path of travel of the particles of the distillery waste. It burns within the chamber 8, thereby providing its own heat for the evaporation of the volatile materials therefrom, as well as the combustion and ignition of the solid materials contained in the same, thus leaving an ash of potassium compounds of the character above referred to, which is mainly recovered from beneath the grate bars 9, but partially also from the dust collecting chamber 14. From time to time during the burning operation, the bed 11 on the grate 9 is rabbled with a bar or poker introduced through the door 10 to facilitate the passage of the ash through the grate. Furthermore, although initially as above indicated, a supply of coal or other solid fuel may be ignited on the grate bars 9 to provide heat in the initial operation of the apparatus, it will be understood that such fuel upon the grate bars 9 may be entirely dispensed with, and the spray ignited in any other desired manner, as for example, by the introduction and burning of a quantity of oil initially, or by the initial heating in any other way of the combustion chamber 8 to a temperature sufficient to ignite a spray of distillery waste. In fact, the heating of the chamber 8 to the desired ignition temperature may have been accomplished by the burning therein previously of another quantity of the distillery waste.

While I have described my invention above in detail, I wish it to be understood that many changes may be made therein without departing from the spirit thereof.

I claim:

1. The process of burning distillery waste by means of a spray injected into a hot combustion chamber, characterized by spraying the waste into a tall and capacious chamber in the form of a whirling spray so as to provide a long path of travel for the spray particles in order to secure complete evaporation and combustion.

2. The process of burning distillery waste by means of a spray injected into a combustion chamber, characterized by spraying the waste upwardly into a tall and capacious chamber in the form of a whirling spray so as to provide a long path of travel for the spray particles in order to secure substantially complete evaporation and combustion.

3. The process of burning distillery waste by means of a spray injected into a hot combustion chamber, characterized by spraying the waste into a tall and capacious chamber so as to provide a long path of travel for the spray particles in order to secure complete evaporation and combustion.

4. The process of burning distillery waste by means of a spray injected into a combustion chamber, characterized by spraying the waste upwardly into a tall and capacious chamber so as to provide a long path of travel for the spray particles in order to secure substantially complete evaporation and combustion.

In testimony that I claim the foregoing, I have hereunto set my hand this 20th day of January, 1920.

CARL HANER, JR.