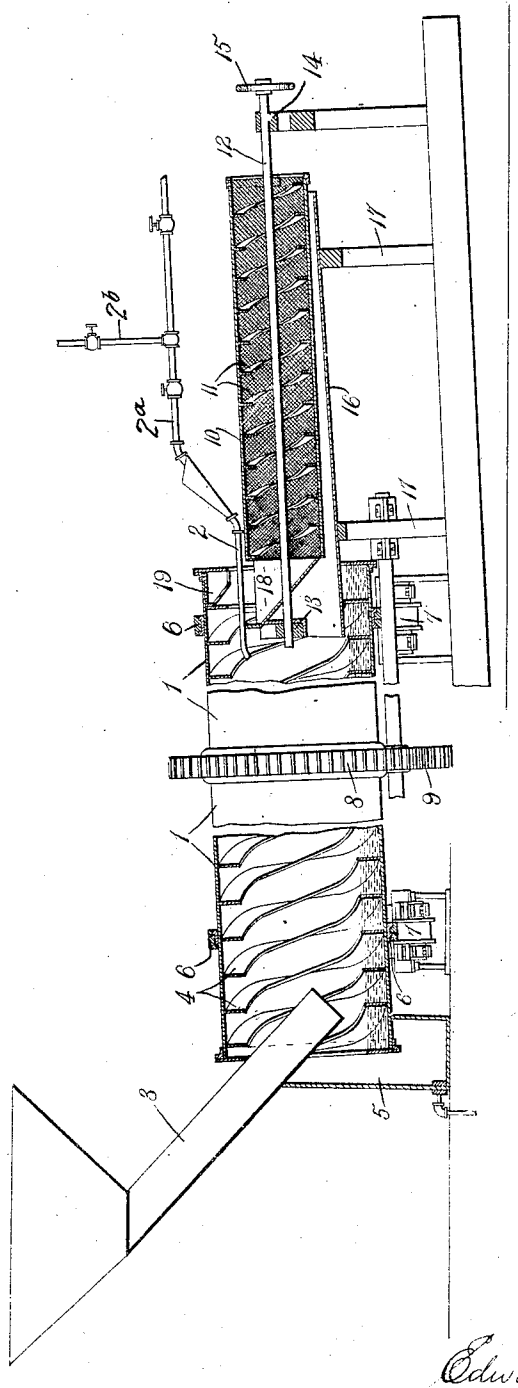
E. N. TRUMP.

LIXIVIATING APPARATUS.

APPLICATION FILED MAY 23, 1908.

1,084,980.

Patented Jan. 20, 1914.



WITNESSES:

Chas. H. Young.

E. K. Daniels

INVENTOR

Edward N. Trump

BY

Parsons Hall & Bodell

ATTORNEYS

UNITED STATES PATENT OFFICE.

EDWARD N. TRUMP, OF SYRACUSE, NEW YORK.

LIXIVIATING APPARATUS.

1,084,980. Specification of Letters Patent. Patented Jan. 20, 1914.

Original application filed August 26, 1897, Serial No. 649,575. Renewed October 12, 1907, Serial No. 397,167. Divided and this application filed May 23, 1908. Serial No. 434,555.

To all whom it may concern:

Be it known that I, EDWARD N. TRUMP, of Syracuse, in the county of Onondaga, in the State of New York, have invented a certain new and useful Lixiviating Apparatus, of which the following is a specification.

My invention has for its object the production of a lixiviating apparatus of the type disclosed in my application co-pending with this application, Sr. No. 397,167, renewal of application Sr. No. 649,575, filed Aug. 26, 1897, which application has now matured into Patent No. 889,159, May 28, 1908 and of which this application is a division; and it consists in the combinations and constructions hereinafter set forth and claimed.

In describing this invention, reference is had to the accompanying drawing, which is a longitudinal sectional view, partly in elevation, of my apparatus.

This lixiviating apparatus comprises, generally, a main shell for receiving a solvent and the material to be treated, a second shell for receiving the undissolved material from the main shell and including means for separating the fine undissolved particles from the coarser material, and means for receiving said particles from the second shell and returning the same to the main shell to be again subjected to the solvent.

As here illustrated, the main shell 1 is formed cylindrical and arranged in lying down position with its axis inclined out of a horizontal plane, and associated with the shell 1 is an inlet, as a pipe 2, for the solvent, discharging into the high portion of the shell 1, and also an inlet 3 for the material to be treated, discharging into the lower end of said shell. A feed pipe 2^a communicates with the pipe 2, such feed pipe having one or more branches, as the branch 2^b. Preferably, the shell 1 is provided with means, as an internal spiral blade 4 for feeding the material being treated against the current of solvent toward the high end of the shell 1. The convolutions of the blade 4 divide the shell 1 into compartments, and the solvent feed downwardly from compartment to compartment over the edges of portions of the blade 4 at the bottom of the shell 1 and escapes into a stationary vessel 5 at the lower end of said shell. The vessel 5 also supports the inlet 3 for the material to be treated. Said main shell 1 is preferably provided with tires 6 resting on bearings 7, and is revolved by any suitable means, here shown as a peripheral gear 8 and a driving gear 9 meshing therewith and connected to a motor, not shown. Preferably, the second shell 10 is formed cylindrical, is inclined, and is arranged endwise relatively to the high end of the main shell 1, the cylindrical wall of the shell 10 outside of the main shell 1 being perforated for permitting fine undissolved particles of the material being treated to pass through the perforations of said wall and become separated from the coarser material, which is conveyed lengthwise of the shell 10 and discharged from the high end thereof by an internal spiral blade 11 fixed to the shell 10. Said shell 10 is actuated in any suitable manner, and as here shown, is mounted on, and rotatable by, an axle 12, which is journaled in bearings 13 and 14 at opposite ends of the shell 10 and is provided at its outer end with a pulley 15 for connection with a motor, not shown.

The means for receiving the fine undissolved material passed through the perforations of the shell 10 and returning the same to the main shell 1 preferably consists of a third shell or trough 16 which extends under, and partly surrounds, the perforated shell 10, and is inclined downwardly toward the main shell 1, the lower end of the member 16 extending into the main shell for facilitating the discharge into such shell of the fine undissolved material feeding into the shell 16. Said lower end of the shell 16 also serves as a support for the bearing 13 for the axle 12 of the perforated shell 10. This third shell or trough 16 is supported by suitable supports 17.

My apparatus is preferably provided with means for feeding the material from the main shell 1 to the perforated shell 10, the same comprising a chamber 18 and a pocket 19, the chamber 18 being fixed relatively to to shells 1 and 10, and being supported by the lower end of the shell or trough 16 and arranged endwise relatively to the shell 10, said chamber 18 having its top open and having its side opposed to the shell 10 open and discharging into said shell 10, and the pocket or scoop 19 being fixed to the inner face of the high end of the shell 1 thus being movable into and out of the solvent for picking up the undissolved material therein

and discharging the same into the open end of the chamber 18.

My apparatus is particularly applicable for extracting, by percolation of water, alkaline salts from any of the various solids containing such salts and in operation, the material being treated is fed in the main shell 1 through the inlet 3 against the current of solvent, the solid material is conveyed from the high end of the main shell 1 to the lower end of the perforated shell 10, the fine material passes with the solvent through the perforations of the shell 10 to the shell 16 and thence to the main shell 1, and the coarse material is discharged from the high end of said shell 10.

What I claim, is:—

1. A lixiviating apparatus comprising a main shell for receiving a solvent and the material to be treated, the main shell arranged in lying down position, a second shell arranged to receive undissolved material from the main shell, the second shell arranged in lying down position and including means outside of the main shell for separating the fine undissolved material from the coarser material, and means for feeding the undissolved material from the main shell to the second shell, substantially as and for the purpose described.

2. A lixiviating apparatus comprising a main shell for receiving a solvent and the material to be treated, a second shell arranged to receive undissolved material from the main shell, the second shell including means outside the main shell for separating the fine undissolved material from the coarser material, means for feeding the undissolved material from the main shell and the second shell, and means for returning the fine undissolved material to the main shell, substantially as and for the purpose specified.

3. A lixiviating apparatus comprising a main shell for receiving a solvent and the material to be treated, the main shell arranged in lying down position, a second shell arranged to receive undissolved material from the main shell, the second shell arranged in lying down position and including means outside of the main shell for separating the fine undissolved material from the coarser material, means for feeding the undissolved material from the main shell to the second shell, and means for returning the fine undissolved material to the main shell, substantially as and for the purpose set forth.

4. A lixiviating apparatus comprising a main shell for receiving a solvent, and the material to be treated, the main shell being arranged in lying down position, a second shell arranged in lying down position and arranged to receive the undissolved material from the main shell, the second shell having a perforated wall outside of the main shell for separating the fine undissolved material from the coarser material, and means for feeding the undissolved material from the main shell to the second shell, substantially as and for the purpose described.

5. A lixiviating apparatus comprising a main shell for receiving a solvent and the material to be treated, the main shell being arranged in lying down position, a second shell arranged in lying down position and located to receive undissolved material from the main shell, the second shell having a perforated shell outside of the main shell for separating the fine undissolved material from the coarser material, means for feeding the undissolved material from the main shell to the second shell, and means arranged to receive the fine undissolved material passed through the perforated shell and returning the same to the main shell, substantially as and for the purpose specified.

6. A lixiviating apparatus comprising a main shell for receiving a solvent and the material to be treated, a second shell for receiving undissolved material from the main shell, the second shell including means for separating the fine undissolved material from the coarser material, means for feeding undissolved material from the main shell to the second shell, and a third shell for receiving the fine undissolved material from the second shell, the third shell extending into the main shell, substantially as and for the purpose specified.

7. A lixiviating apparatus comprising a main shell for receiving a solvent and the material to be treated, the main shell arranged in lying down position, a second shell for receiving undissolved material from the main shell, the second shell arranged in lying down position and including means for separating the fine undissolved material from the coarser material, movable means for feeding the undissolved material from the main shell to the second shell, a third shell extending beneath the second shell in position to receive the undissolved material from the second shell, the third shell inclined out of a horizontal plane toward the main shell and discharging thereinto and being fixed relatively to said movable means, substantially as and for the purpose described.

8. A lixiviating apparatus comprising a main shell for receiving a solvent and the material to be treated, a second shell for receiving undissolved material from the main shell, the second shell including means for separating the fine undissolved material from the coarser material, means for feeding undissolved material from the main shell to the second shell, and a third shell for receiving the fine undissolved material from the second shell, the third shell being in-

clined and having its lower end extending into the main shell, substantially as and for the purpose described.

9. A lixiviating apparatus comprising a main shell for receiving a solvent and the material to be treated, said shell being arranged with its axis inclined out of a horizontal plane and being provided with means for forcing the material being treated toward its high end, a second shell for receiving undissolved material from the main shell, the second shell being arranged endwise relatively to the main shell and having a perforated wall for separating the fine undissolved material from the coarser material, means for feeding undissolved material from the high end of the main shell to the second shell, and a third shell extending under the second shell for receiving the fine undissolved material passed through the perforated wall of the second shell, the third shell being inclined and having its lower end extending into the main shell, substantially as and for the purpose specified.

10. A lixiviating apparatus comprising a main shell for receiving a solvent and the material to be treated, said shell being rotatable about an axis inclined out of a horizontal plane and having associated therewith an internal spiral blade for feeding the material being treated to the high end of said shell, a second rotatable shell for receiving undissolved material from the main shell, the second shell being inclined and having its lower end arranged endwise relatively to the high end of the main shell, said second shell having an internal spiral blade for feeding the coarser material to the high end thereof, and also having a perforated wall for separating the fine undissolved material from the coarser material, means for feeding undissolved material from the high end of the main shell to the low end of the second shell, and a third shell for receiving the fine undissolved material from the second shell, the third shell being fixed relatively to the main and second shells and being inclined and having its lower end extending into the high end of the main shell, substantially as and for the purpose set forth.

11. A lixiviating apparatus comprising a main shell for receiving solvent and the material to be treated, the main shell being arranged in lying down position, a second shell for receiving undissolved material from the main shell, the second shell extending into the main shell and being alined therewith and of less diameter than the main shell, and means for feeding undissolved matter from the main shell to the second shell including a chamber associated with the second shell and located within the main shell, said chamber being open at its top and conveying means within the main shell and movable relatively to such chamber from below the same to above the same into position to discharge into the open top thereof, substantially as and for the purpose specified.

12. A lixiviating apparatus comprising a rotatable main shell for receiving a solvent and the material to be treated, a second shell for receiving undissolved material from the main shell, and means for feeding undissolved material from the main shell to the second shell, the same including a chamber fixed relatively to the main shell and discharging into the second shell, and means rotatable with the main shell and discharging into said chamber, substantially as and for the purpose set forth.

13. A lixiviating apparatus comprising a main shell for receiving a solvent and the material to be treated, a second shell for receiving undissolved material from the main shell, the second shell being rotatable, and means for feeding undissolved material from the main shell to the second shell, the same including a chamber fixed relatively to the second shell and discharging thereinto, and means within the main shell movable relatively to said chamber and discharging thereinto, substantially as and for the purpose described.

14. A lixiviating apparatus comprising a rotatable main shell for receiving a solvent and the material to be treated, a second shell for receiving undissolved material from the main shell, the second shell being rotatable, and means for feeding undissolved material from the main shell to the second shell, the same including a chamber fixed relatively to said shells and arranged within the main shell and endwise relatively to the second shell, said chamber having its top open and having its side opposed to the second shell open and discharging thereinto, and means rotatable with the main shell and discharging into the open top of said chamber, substantially as and for the purpose specified.

15. A lixiviating apparatus comprising a main shell for receiving a solvent and the material to be treated, a second shell for receiving undissolved material from the main shell, the second shell including means for separating the fine undissolved material from the coarser material, means for feeding undissolved material from the main shell to the second shell, the same including a chamber discharging into the second shell, and a third shell for receiving the fine undissolved material from the second shell, the third shell extending into the main shell and forming a support for said chamber, substantially as and for the purpose set forth.

16. A lixiviating apparatus comprising a main shell for receiving a solvent and the material to be treated, said shell being rotatable about an axis inclined out of a hori-

zontal plane and having associated therewith an internal spiral blade for feeding the material being treated to the high end of said shell, a second rotatable shell for receiving undissolved material from the main shell, the second shell being inclined and having its lower end arranged endwise relatively to the high end of the main shell, said second shell having an internal spiral blade for feeding the coarser material to the high end thereof, and also having a perforated wall for separating the fine undissolved material from the coarser material, means for feeding the undissolved material from the high end of the main shell to the low end of the second shell, the same including a chamber fixed relatively to said shells and arranged within the main shell and endwise relatively to the second shell, said chamber having its top open and having its side opposed to the second shell open and discharging thereinto, and means rotatable with the main shell and discharging into the open top of said chamber, and a third shell for receiving the fine undissolved material from the perforated wall of the second shell, the third shell being fixed relatively to the main and second shells and being inclined, and having its lower end extending into the high end of the main shell and forming a support for said chamber, substantially as and for the purpose described.

In testimony whereof, I have hereunto signed my name in the presence of two attesting witnesses, at Syracuse, in the county of Onondaga, in the State of New York, this 21st day of May, 1908.

EDWARD N. TRUMP.

Witnesses:
H. C. Eible,
Chas. H. Young.