

No. 748,461.

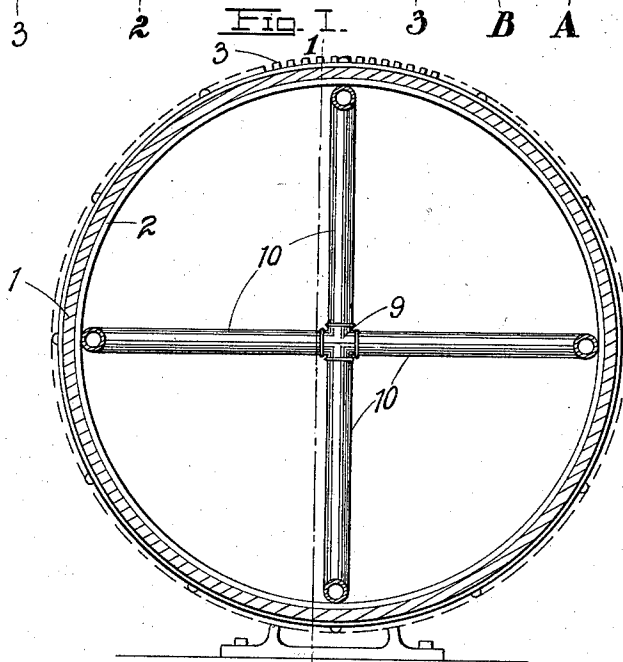
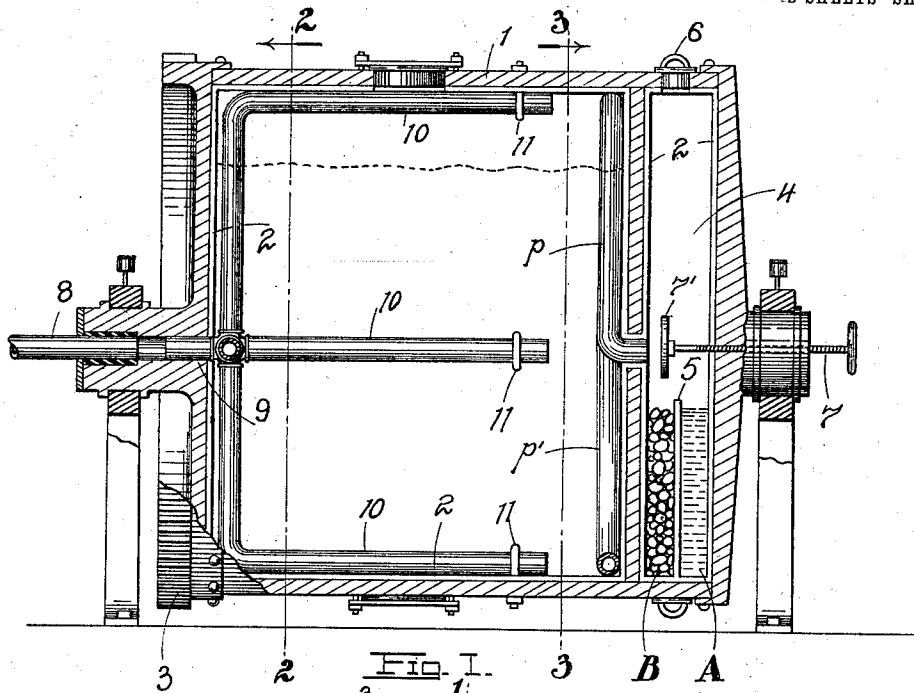
PATENTED DEC. 29, 1903.

W. J. ARMBRUSTER.  
CHLORINATION BARREL.

APPLICATION FILED MAR. 13, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES:

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FIG. 2.

INVENTOR

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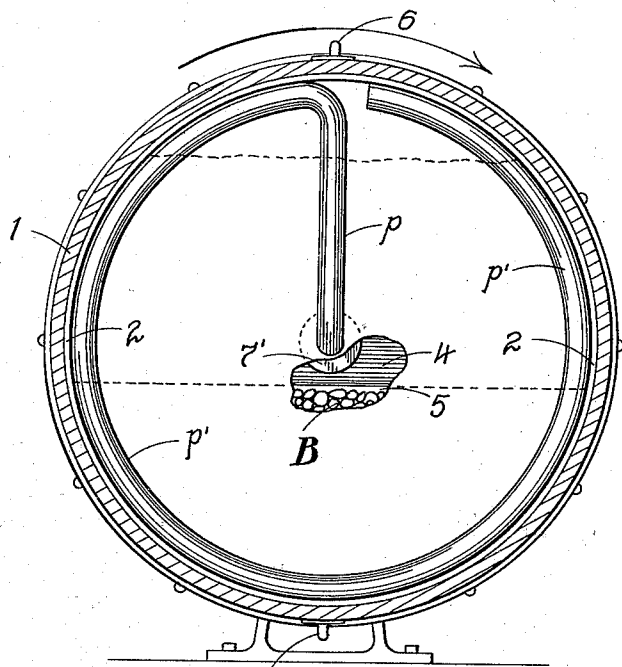
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2 SHEETS—SHEET 2.



6 FIG. 3.

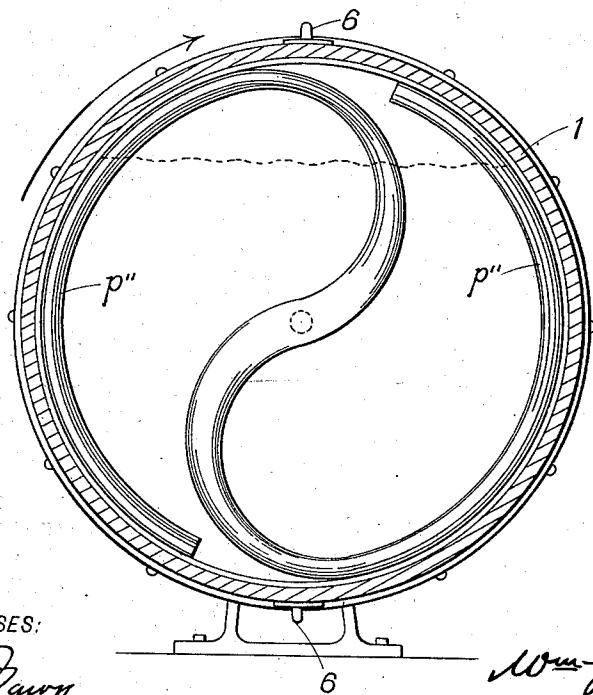


FIG. 4.

WITNESSES:

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# UNITED STATES PATENT OFFICE.

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## CHLORINATION-BARREL.

SPECIFICATION forming part of Letters Patent No. 748,461, dated December 29, 1903.

Application filed March 13, 1903. Serial No. 147,672. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM J. ARMBRUSTER, a citizen of the United States, residing at St. Louis, State of Missouri, have invented certain new and useful Improvements in Chlorination-Barrels, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention has relation to improvements in chlorination-barrels; and it consists in the novel construction of barrel more fully set forth in the specification and pointed out in the claims.

In the drawings, Figure 1 is a vertical middle section on line 1 1 of Fig. 2 of one of the forms which my barrel may assume. Fig. 2 is a transverse section on line 2 2 of Fig. 1. Fig. 3 is a transverse section on line 3 3 of Fig. 1; and Fig. 4 is a similar section showing, however, a modified form of gas-conducting pipe.

The object of my invention is to construct a chlorination-barrel which shall be provided with a special compartment to contain the chemicals from which the chlorin is generated, provision being made to conduct the chlorin-gas from such compartment to the main chamber of the barrel containing the ore or pulp to be treated, such provision being through an open coil disposed adjacent to the inner peripheral surface of the barrel and having its intake or fixed end in direct communication with such compartment. This method dispenses with the objectionable method of mixing the chlorin-generating reagents directly with the pulp and has a decided advantage over the method of conducting the chlorin-gas through a stationary goose-neck passed through the hollow trunnion of the barrel, the latter method being decidedly objectionable owing to the fact that the chlorin in time corrodes the stuffing-box and gland through which the base of the goose-neck passes, a result attended both with a loss of gas and leakage of the barrel.

A further object of my present invention is to provide special means for heating the contents or pulp to be treated.

A further object is to provide means for

cutting off the supply of chlorin at the end of the operation or at any time when occasion therefor may arise.

A further object is to provide means for introducing the chlorin-producing reagents without the danger of their reacting upon each other until after the barrel is set in motion; and a further object is to provide such further and other improvements better apparent from a detailed description of the invention, which is as follows.

Referring to the drawings, 1 represents the barrel, having the usual lead lining 2 and the driving gear-wheel 3. Located at one end of the barrel is a compartment 4, divided at the base into two sections by a division-wall 5, disposed in a plane at right angles to the axis of rotation of the barrel and extending to a point slightly below (or to one side of) said axis, the space on one side of the division-wall being adapted to contain the acid A and that on the other to receive the hypochlorite of calcium or bleaching-powder B, by the reaction of which the chlorin-gas is generated. Each chemical is introduced through an opening closed by the plug 6, and until the barrel is started the reagents are kept apart, so that no chlorin is generated while the reagents are being introduced. Communicating with the compartment 4 through an opening (formed in the inner wall of said compartment) disposed about the axis of rotation of the barrel is the fixed or intake end of a chlorin-conducting pipe, said pipe having a radially-disposed section *p* located adjacent to the wall carrying the same and an outer coil *p'* disposed adjacent to the inner peripheral surface of the barrel and with the rotation of the barrel alternately discharging into the body of the pulp and above the surface thereof, as is apparent. That the delivery or free open end of the pipe *p'* may be kept clear of pulp as much as possible and not obstruct the free passage of the chlorin into the pulp-compartment of the barrel the latter is preferably rotated in the direction indicated by the arrow in Fig. 3, (and Fig. 4,) the open end thus always drawing away from the pulp-surface instead of dipping into it.

In Fig. 4 I have shown the chlorin-conduct-

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ing pipe in the form of two peripheral branches  $p'' p''$ , disposed on opposite sides of the inner peripheral surface of the barrel, the two branches connecting along a reverse curve intersecting the axis of rotation of the barrel. Should it become desirable at any time to cut off the supply of gas, this may be done by a screw-valve 7, carried by one of the trunnions of the barrel, the inner valve disk or head 7' being forced against the open fixed end of the pipe  $p$ , as clearly obvious from Fig. 1.

To provide means for heating the ore or pulp during the chlorination process, one of the hollow trunnions revolves about a stationary steam-pipe 8. In communication with the inner open end of said steam-supply pipe is the hollow stem of a double T-coupling 9, to which are secured the series of radially-disposed heating-pipes 10, whose branches are located, respectively, along the adjacent head of the barrel and the inner peripheral surface thereof, the branches along the periphery being secured to the walls of the barrel by means of straps 11. The stem of the T-coupling makes a tight joint with the hollow trunnion, so that there is no possibility of leakage at that point. Of course the ends of the heating-pipes are closed, so that no steam escapes directly into the pulp. The sinuous dotted line in Figs. 1, 3, 4 represents the surface of the pulp, it being possible under the arrangements shown to treat a maximum quantity of ore.

The division-wall 5, as is obvious, keeps the two reagents by which the chlorin is generated apart while the same are being introduced, so that there can be no disengagement of gas until after the barrel is started, when they will readily mix and react chemically on one another.

The advantages of the present invention over the methods generally practiced are apparent. These methods contemplate either the mixing of the chlorin-generating reagents with the body of the pulp or ore or the passing of the chlorin generated at a point exteriorly to the barrel into the barrel through the trunnions thereof, an arrangement which is objectionable on account of the difficulty of obtaining and retaining a moving and yet tight connection for so highly corrosive a gas as chlorin. On the other hand, the first method (that of introducing the chlorin-generating material into the barrel with the ore) is subject to serious defects owing to the many complex and deleterious reactions that complicate the process and render the subsequent recovery of the gold difficult. Under the present construction there is absolutely no possibility of leakage at the trunnions, since the disengagement of the gas takes place wholly within the confines of the barrel, the chemical-compartment being considered as a part of the structure or unit to which the rotation is imparted. I do not, of course, wish to be limited to the precise details here shown

and described, as they may be departed from without affecting the nature or spirit of my invention.

It will be seen that under the present arrangement the chlorin-conducting pipe revolves with the barrel, alternately discharging the chlorin into the body of the pulp and above it, depending on the position occupied by the delivery end of the pipe in the course of its rotation. The chlorin thus becomes intimately associated with the mass of the pulp and acts upon every particle of ore present therein, the gas being free to flow uninterruptedly into the pulp-chamber and under any degree of pressure, there to become thoroughly incorporated with the mass of wet ore or pulp.

While it is true that the discharge of the chlorin above the pulp is intermittent with a construction such as shown by pipe  $p p'$ , yet it is practically continuous with the arrangement shown in Fig. 4, where the discharge end of one of the pipes  $p''$  is practically above the surface of the pulp, while the discharge end of the other is below the surface. Were the number of pipes  $p''$  increased still more, this continuity of discharge above the surface would be still more enhanced, and we should then have not only a continuous discharge of chlorin into the body of the pulp, but above it as well.

Having described my invention, what I claim is—

1. A chlorination-barrel having a pulp-chamber, a chlorin-generating compartment located contiguous thereto and in communication therewith, said compartment having a series of sections for retaining apart the reagents intended to generate the chlorin, substantially as set forth.

2. A chlorination-barrel having a pulp-chamber, radiating-pipes rotatable with the barrel for heating the contents of said chamber, and a rotatable chlorin-generating compartment contiguous to, and in communication with said chamber, substantially as set forth.

3. A chlorination-barrel having a pulp-chamber, radiating-pipes rotatable with the barrel for heating the contents of said chamber during the rotation of the barrel, and a chlorin-generating compartment contiguous to and in communication with said chamber, and rotatable therewith, substantially as set forth.

4. A chlorination-barrel having a pulp-chamber, a chlorin-generating compartment located contiguous thereto and rotatable therewith, a chlorin-conducting pipe revolving with the barrel and having an intake or fixed end disposed about the axis of rotation of the barrel and in communication with the chlorin-generating compartment, and a delivery or discharge end opening into the pulp-chamber at a point removed radially a suitable distance from the intake end of said pipe, substantially as set forth.

5. A chlorination-barrel having a pulp-chamber, a chlorin-generating compartment in open communication with said chamber and rotatable therewith, a steam-supply pipe entering one of the trunnions of the barrel, a series of radiating-pipes disposed along the inner surface of the barrel and rotating therewith, and having their converging ends in open communication with said steam-pipe, substantially as set forth.

6. A chlorination-barrel having a pulp-chamber, a chlorin-generating compartment located contiguous thereto and rotatable therewith, a chlorin-conducting pipe rotatable with the barrel and having a fixed end disposed about the axis of rotation of the barrel and in open communication with the chlorin-generating compartment, the opposite end of the pipe communicating with the pulp-chamber at a point removed radially a suitable distance from the fixed end of the pipe, substantially as set forth.

7. A chlorination-barrel having a pulp-chamber, and a chlorin-generating compartment divided into a series of sections for temporarily separating the chlorin-generating materials, substantially as set forth.

8. A chlorination-barrel having a pulp-chamber, a chlorin-generating compartment located contiguous thereto and rotatable therewith, a chlorin-conducting pipe revolving with the barrel and having an intake end disposed about the axis of rotation of the barrel and in communication with the chlorin-generating compartment, and a delivery end opening into the pulp-chamber at a point removed radially from the axis of rotation of the barrel, and a valve controlling the intake

end of the revolving pipe, substantially as set forth.

9. A chlorination-barrel having a pulp-chamber, a chlorin-generating compartment located contiguous thereto, a chlorin-conducting pipe leading from said compartment to the pulp-chamber and revolving with the barrel, the delivery end of said pipe being adapted to discharge the chlorin alternately into the body of the pulp and above the surface thereof depending on the position of the delivery end in the course of its rotation, substantially as set forth.

10. A chlorination-barrel having a pulp-chamber, a chlorin-generating compartment carried by and rotatable therewith, a chlorin-conducting pipe leading from said compartment to the pulp-chamber and revolving with the barrel, the delivery end of the pipe being adapted to discharge the chlorin alternately into and above the pulp during the rotation of the barrel, substantially as set forth.

11. A chlorination-barrel having a pulp-chamber, a chlorin-generating compartment carried by and rotatable therewith, a chlorin-conducting pipe leading from said compartment to the pulp-chamber and revolving with the barrel, said pipe being extended a suitable distance radially from the axis of rotation of the barrel, and having a delivery end discharging into the pulp-chamber, substantially as set forth.

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

WILLIAM J. ARMBRUSTER.

Witnesses:

EMIL STAREK,  
G. L. BELFRY.