

G. L. WALLACE.

APPARATUS FOR CIRCULATING THE LIQUID IN PLATING TANKS.

APPLICATION FILED MAY 15, 1909.

950.973.

Patented Mar. 1, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

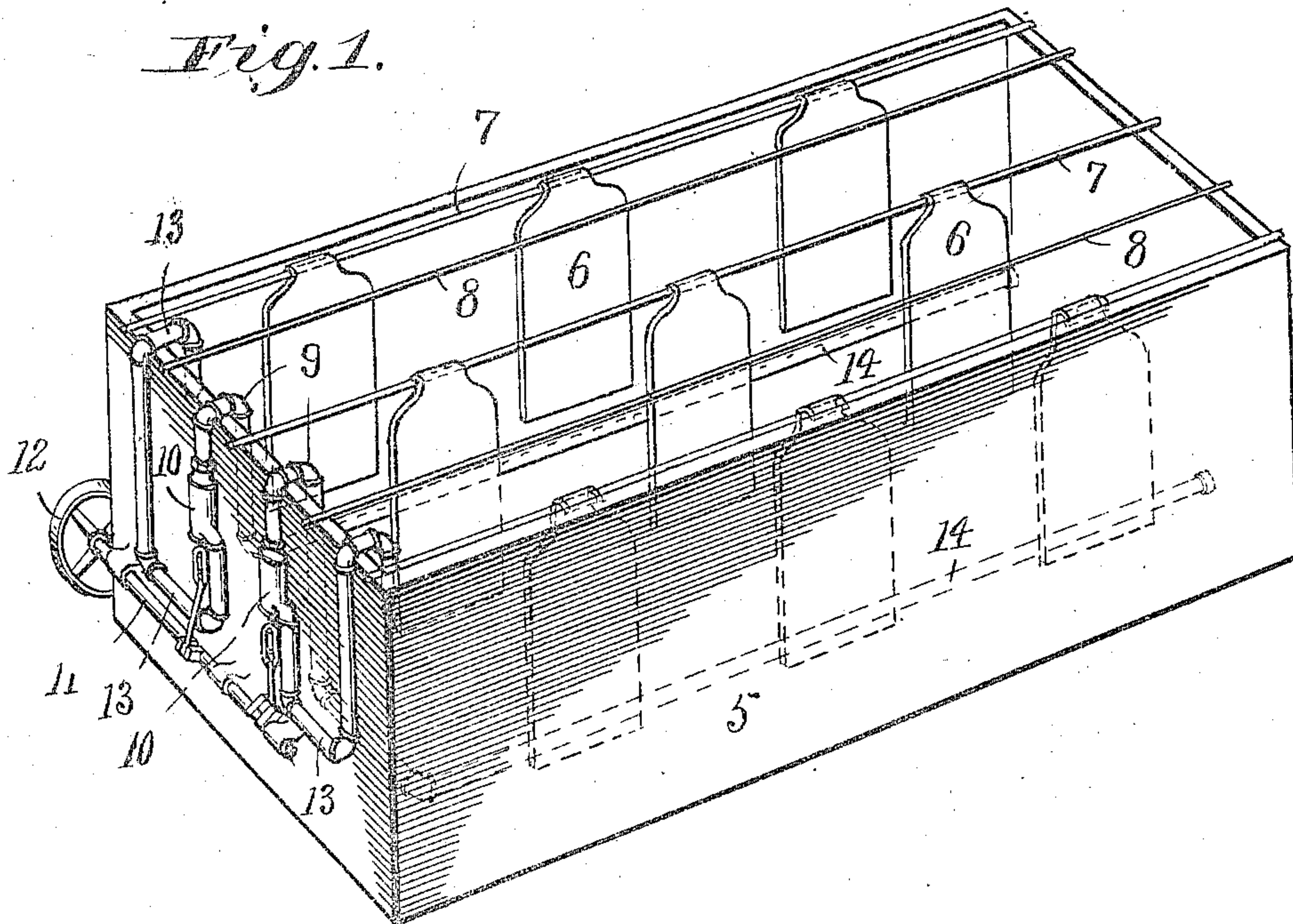
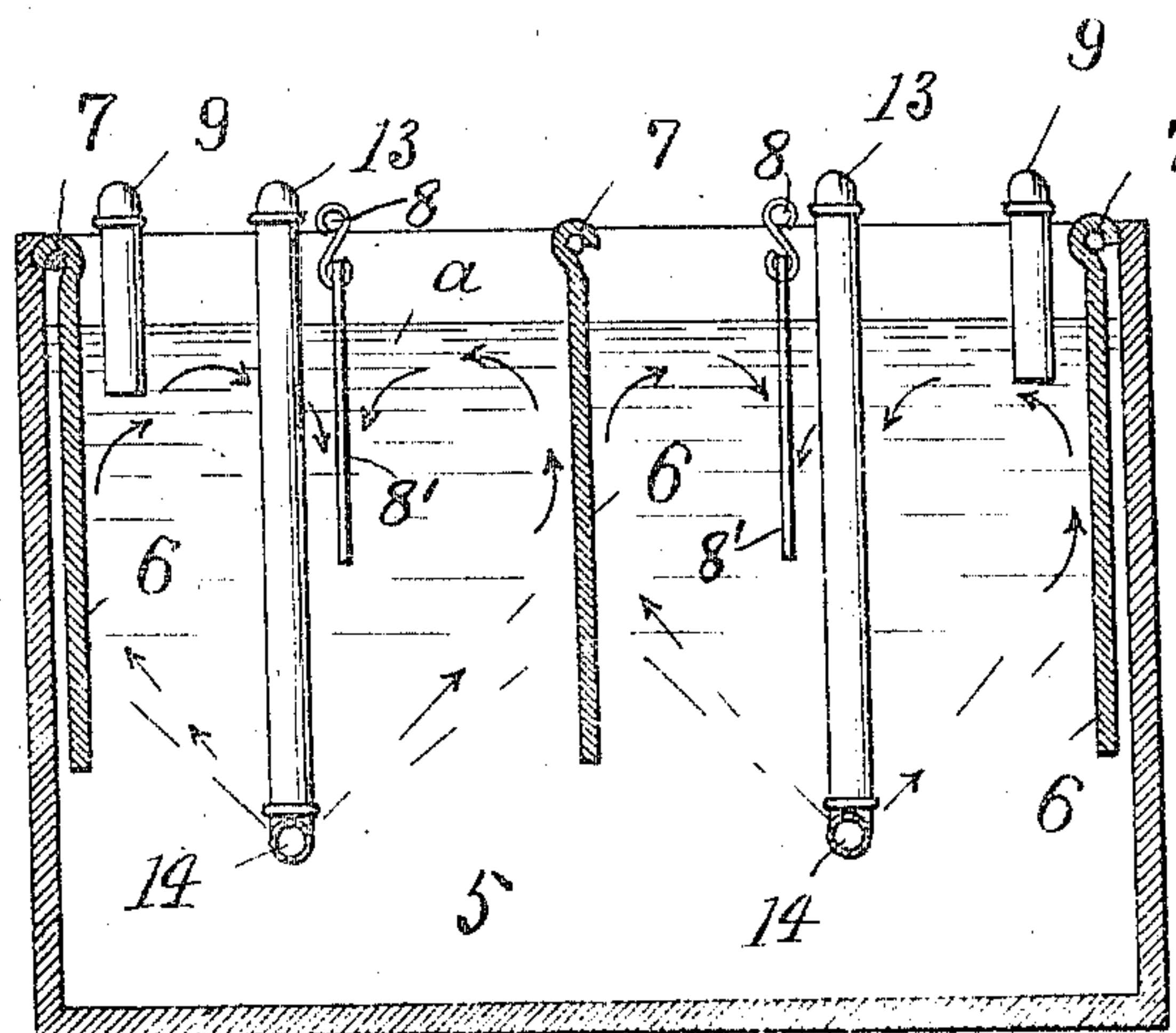


Fig. 2.



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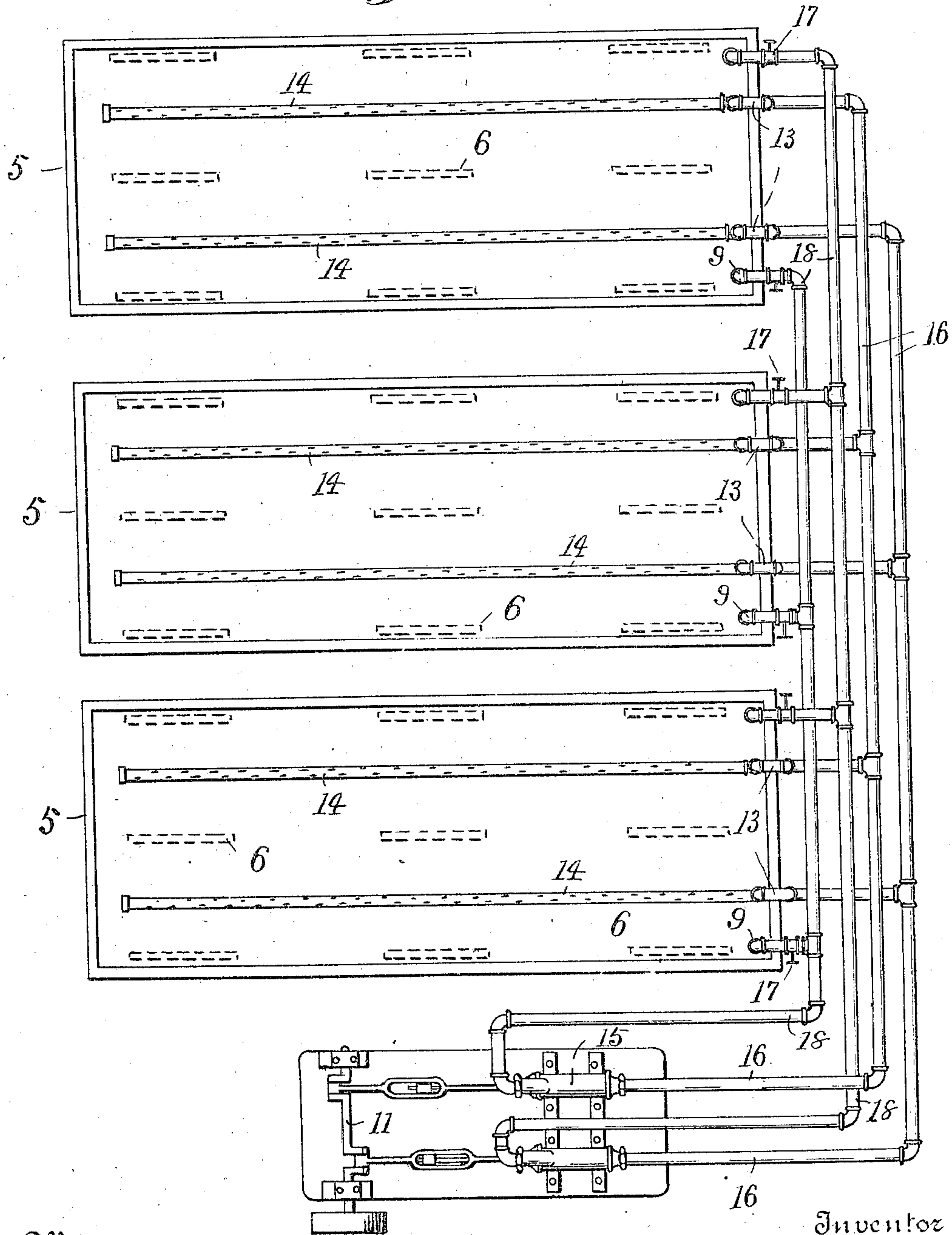
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Fig. 3.



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UNITED STATES PATENT OFFICE.

GEORGE L. WALLACE, OF BRIDGEPORT, CONNECTICUT.

APPARATUS FOR CIRCULATING THE LIQUID IN PLATING-TANKS.

950,973.

Specification of Letters Patent.

Patented Mar. 1, 1910.

Application filed May 15, 1909. Serial No. 496,312.

To all whom it may concern:

Be it known that I, GEORGE L. WALLACE, a citizen of the United States, and resident of Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Apparatus for Circulating the Liquid in Plating-Tanks, of which the following is a specification.

My invention relates to new and useful improvements in stationary electroplating tanks and particularly to means for circulating or agitating the liquid so as to insure the strength and quality of the same remaining uniform throughout.

It is the purpose of the device to produce means for continually circulating and agitating all sorts of plating solutions in tanks of this sort by drawing the same off from the top and injecting it into the bottom; to so construct and arrange the pipe connections through which the solution is passed that the same will be deflected toward the anodes when injected into said tank; to provide means which will permit of several tanks being connected in series and the solution therein circulated through a single medium and finally to employ as such circulating medium one or more pumps of an efficient and practical design which may be connected up for either a single tank or a series as preferred.

Upon the accompanying two sheets of drawing forming a part of this specification similar characters of reference are used to denote like or corresponding parts throughout the several figures, and of which,

Figure 1, shows a perspective view of a plating tank provided with my improved means for circulating and agitating the solution. Fig. 2, is a vertical cross section of Fig. 1, and Fig. 3, shows a plan view of a series of tanks connected up with my improved circulating means.

Referring in detail to the characters of reference marked upon the drawings, 5 indicates a tank for containing the liquid α composing the electrolytic bath to be circulated, and which may be of any suitable or preferred construction.

7 represents the anode supports arranged upon the tank and 6 the anodes hung from said supports.

8 represents cathode rods upon which the work 8' is suspended as in the usual or any preferred way.

The number and size of anodes is op-

tional and can be employed in a way best suited to the particular class of plating desired.

The tank would be filled with a properly proportioned and mixed depositing solution made in accord with the particular class of work to be performed. The means and connections for circulating this solution as will next be described is constructed with a view of maintaining a uniform quality of solution throughout all parts of the tank and avoiding any portion thereof from becoming stagnant or idle and whereby the heavier and acid portions of the solution continually move, thereby insuring its thorough mixture throughout the whole body of the liquid. The connections and apparatus for accomplishing this agitation comprises one or more pairs of pipes 9—9 for each tank which are extended over and into the top portion of the tank to a depth required to draw off the top portion of the solution. These pipes are connected with one or more plunger pumps 10—10 according to the number of pairs of pipes used mounted upon the end of the tank. These pumps are of a like construction and operated from the same crank shaft 11, driven by a belt wheel 12, fixed to the end portion of the shaft, or any other convenient means. When one pump is used it is obvious that the liquid is withdrawn from and discharged into the tank alternately. When pumps are arranged in pairs they are preferably set to operate alternately, that is to say one is drawing in while the other is forcing out. Pipes 13 are connected to the opposite valve chamber of the pumps 10, that in turn are carried up over and down into the bottom portion of the tank where each is connected with a longitudinal perforated pipe 14 that extends through the bottom portion of the tank and serves to deliver there the solution pumped off from the top and sent down through the pipes 13. These perforated pipes are arranged intermediate of the anodes before mentioned and the perforations are placed in their upper side portions so as to insure the jets when forced therefrom to be deflected at various angles to insure an intimate contact of jets of solution with adjacent sides of and over the entire face of said anodes from bottom to top. The force of the jets of solution turns upon reaching the top portion of the main body of solution and circulates downward over the cathode surface with sufficient force to

remove any gas bubbles which may have collected thereon. It will be seen that these jets of solution not only create a thorough circulation and mixing of the solution but
5 clean the anodes and remove the gas bubbles that usually form on the cathodes in all electroplating of metals.

In Fig. 3, I have shown a diagram of a series of tanks each of which are connected
10 substantially the same as the other pipe connections 9 shown in Figs. 1 and 2, and to be operated by one or more pumps 15 driven from a single shaft 11 and mounted if necessary at a distant point from the tanks. In
15 connecting up a series of tanks in this manner it will be obvious of course that we must use two long runs of pipes 16 intermediate of the intake pipe 13 and the pumps and further that it is desirable to employ in the said
20 pipes 13, a valve 17 whereby the suction of the solution may be regulated. It will also be noted that longer runs of pipes 18 are similarly employed intermediate of the said pump 10 and the perforated delivery pipes
25 14 and whereby the service pipes and tanks are connected to be operated simultaneously.

Having thus described my invention what I desire to secure by Letters Patent is:—

1. An apparatus for circulating the liquid
30 in electroplating tanks comprising a tank, anodes supported therein, pumps having

pipe connections with the top portion of the tank, a delivery pipe also connected with said pumps and extending longitudinally through the bottom portion of the tank and
35 parallel with and between the anodes and having perforations in the top side portions of the pipes so arranged to direct the jets toward the sides of the said anodes.

2. An apparatus for circulating the liquid
40 in electroplating tanks comprising a tank, several rows of anodes and cathodes supported thereon having pipe connections with top portion of the tank, a pair of pumps set to operate alternately so that one is drawing
45 in the solution from the top portion of the tank while the other is discharging in the bottom portion, a delivery pipe for said discharge connected with each of said pumps and extending through the bottom of the
50 tank between and parallel with the rows of anodes the top side portions of said pipes being perforated to direct jets of solution against the sides of the anodes and back upon the cathodes.

Signed at Bridgeport, in the county of Fairfield, and State of Connecticut, this 12th day of May, A. D. 1909.

GEORGE L. WALLACE.

Witnesses:

C. M. NEWMAN,
RUTH RAYMOND.