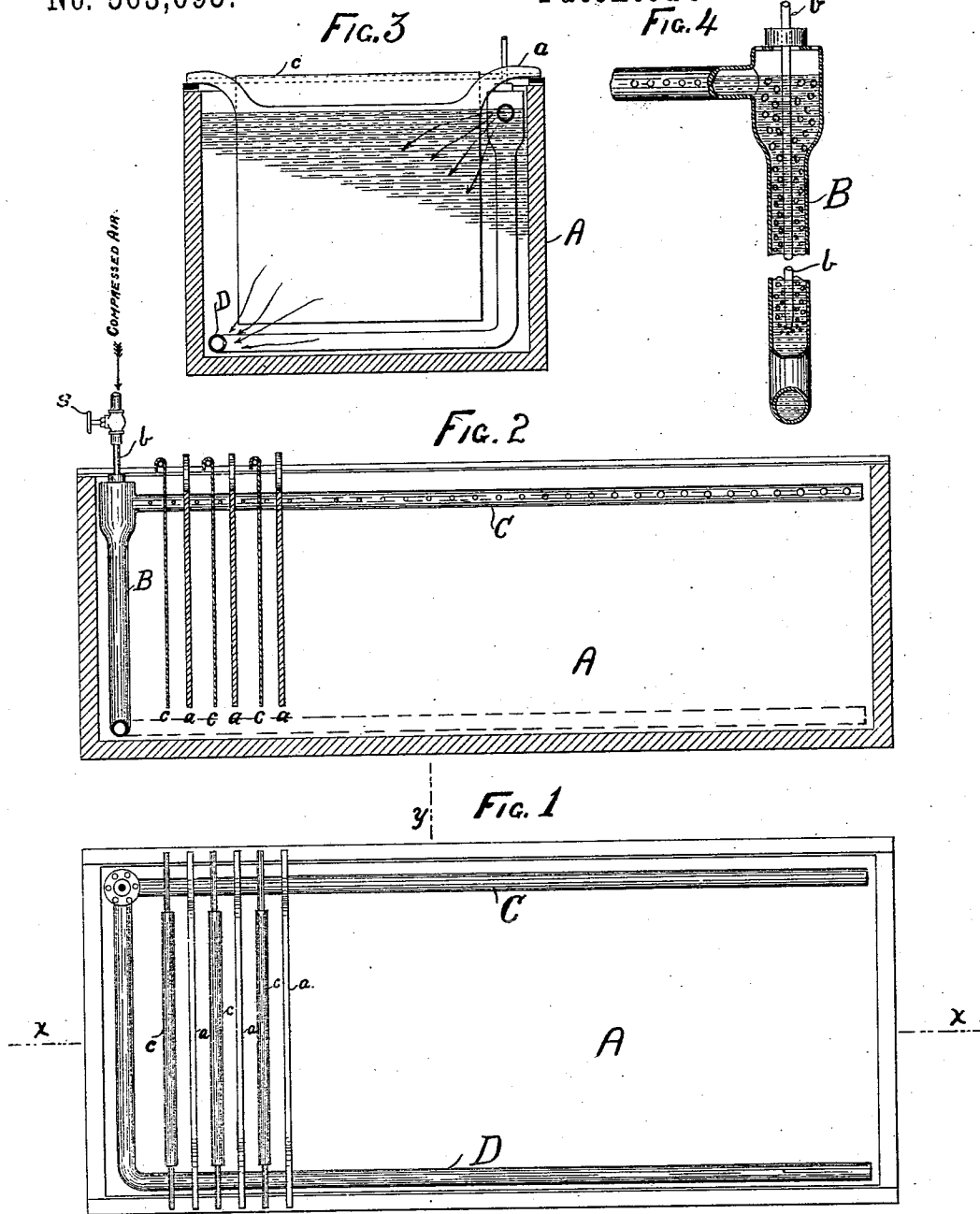


(No Model.)

O. SZONTAGH & A. F. SCHNEIDER.
APPARATUS FOR CIRCULATING LIQUIDS IN TANKS.

No. 563,093.

Patented June 30, 1896.



WITNESSES:

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OSCAR SZONTAGH AND ALBERT F. SCHNEIDER, OF PERTH AMBOY, NEW JERSEY.

APPARATUS FOR CIRCULATING LIQUIDS IN TANKS.

SPECIFICATION forming part of Letters Patent No. 563,093, dated June 30, 1896.

Application filed March 12, 1896. Serial No. 582,899. (No model.)

To all whom it may concern:

Be it known that we, OSCAR SZONTAGH, a subject of the Emperor of Austria-Hungary, and ALBERT F. SCHNEIDER, a citizen of the United States, and residents of Perth Amboy, in the county of Middlesex and State of New Jersey, have invented certain new and useful Improvements in Apparatus for Circulating Liquids in Tanks, of which the following is a specification.

Our invention relates to improved apparatus for circulating liquids in tanks, in particular such as tanks for the electrolytic deposition of copper and other metals; and it consists in particular in providing in the upper and lower part of the tank perforated pipes closed at one end, and connected at their open ends by a pipe through which by suitable means, such as an air-lift, the liquid is drawn from the tank by the lower pipe and delivered into the upper pipe, to be discharged back into the tank through the perforations of the upper pipe, as fully set forth in the following specification and illustrated in the annexed drawings, in which—

Figure 1 is a plan view of an electrolytic tank with part of the electrodes removed. Fig. 2 is a longitudinal section on the line *xx* of Fig. 1. Fig. 3 is a cross-section upon the line *yy* of Fig. 1. Fig. 4 is a sectional view on a larger scale of the air-lift.

Similar letters refer to similar parts throughout the several views.

In the drawings, the letter A designates an electrolytic tank; *a* and *c*, electrodes; B, a vertical pipe, by preference of lead and placed into one corner of the tank; C and D, perforated horizontal pipes, closed at the outer ends and connected at their inner ends to the vertical pipe B, as shown, said pipes C and D being located on opposite sides of the tank, one of them, C, near the top, the other near the bottom of the tank.

A tube *b*, preferably of glass, is inserted into the pipe B, terminating near its bottom, and connected to any suitable supply of compressed air or other gas, the admission of which may be regulated by a stop-valve *s*, Fig. 4.

When air is discharged through the pipe *b* into the lower part of the pipe B, the fluid is

caused to rise therein and to flow from the lower part of the tank A, through the pipes D and B into the upper pipe C, from which it is discharged back into the tank through the perforations.

When the apparatus is used for the electrolytic deposition of metals, the perforations of the pipes C and D are located between the electrodes, so as to cause circulation between the latter from the top diagonally to the bottom, as indicated by the arrows in Fig. 3. The perforations are by preference made of diameters slightly increasing with the distance from the pipe B. Instead of causing circulation of the liquid by an air-lift, other suitable means may be used, such as a pump or a steam-injector.

While the apparatus shown in the drawings is designed in particular for electrolytic purposes, it may also be used for other purposes, such as dissolving salts.

What we claim as new is—

1. The combination with an electrolytic tank adapted to receive anodes and cathodes, of a vertical pipe placed therein; a horizontal pipe located along one of the sides of the tank near its top, closed at one end, provided with perforations directed toward the spaces between the anodes and cathodes, and connected to the upper part of the vertical pipe; a similar pipe located on the opposite side of the tank near its bottom and connected to the lower part of the vertical pipe; and means, such as an air-lift, to produce circulation from the lower part of the tank through the lower horizontal perforated pipe and through the vertical pipe into the upper horizontal pipe and back into the upper part of the tank between the anodes and cathodes, substantially as specified.

2. The combination with the electrolytic tank A adapted to receive electrodes *a* and *c*, of a vertical pipe B placed therein, a tube *b* inserted into the pipe B and adapted to discharge compressed gas or air into the lower part thereof; a pipe C connected to the upper part of the pipe B, located at one of the sides of the tank A near the top and provided with perforations between the electrodes, a similar pipe D located on the opposite side of the tank near its bottom and connected to the lower end of the pipe B, and an air-lift, for causing

circulation of the liquid from near the bottom of the tank through the pipes D, B and C to near the top of the tank, substantially as shown and described.

- 5 3. The combination with the electrolytic tank A and its electrodes *a* and *c*, of a vertical pipe B closed at the lower end; a tube *b* inserted into the pipe B from the top and projecting toward the lower end thereof, said tube
10 *b* being open at the lower end and connected by its upper end to any suitable supply of compressed air or gas; a pipe C connected to the upper part of the pipe B, located at one of the sides of the tank near the top and
15 provided with perforations between the elec-

trodes; and a similar pipe D, located on the opposite side of the tank near its bottom, and connected to the lower end of the pipe B, substantially as and for the purpose specified.

In testimony that we claim the foregoing 20 as our invention we have signed our names in presence of two witnesses.

OSCAR SZONTAGH.

ALBERT F. SCHNEIDER.

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