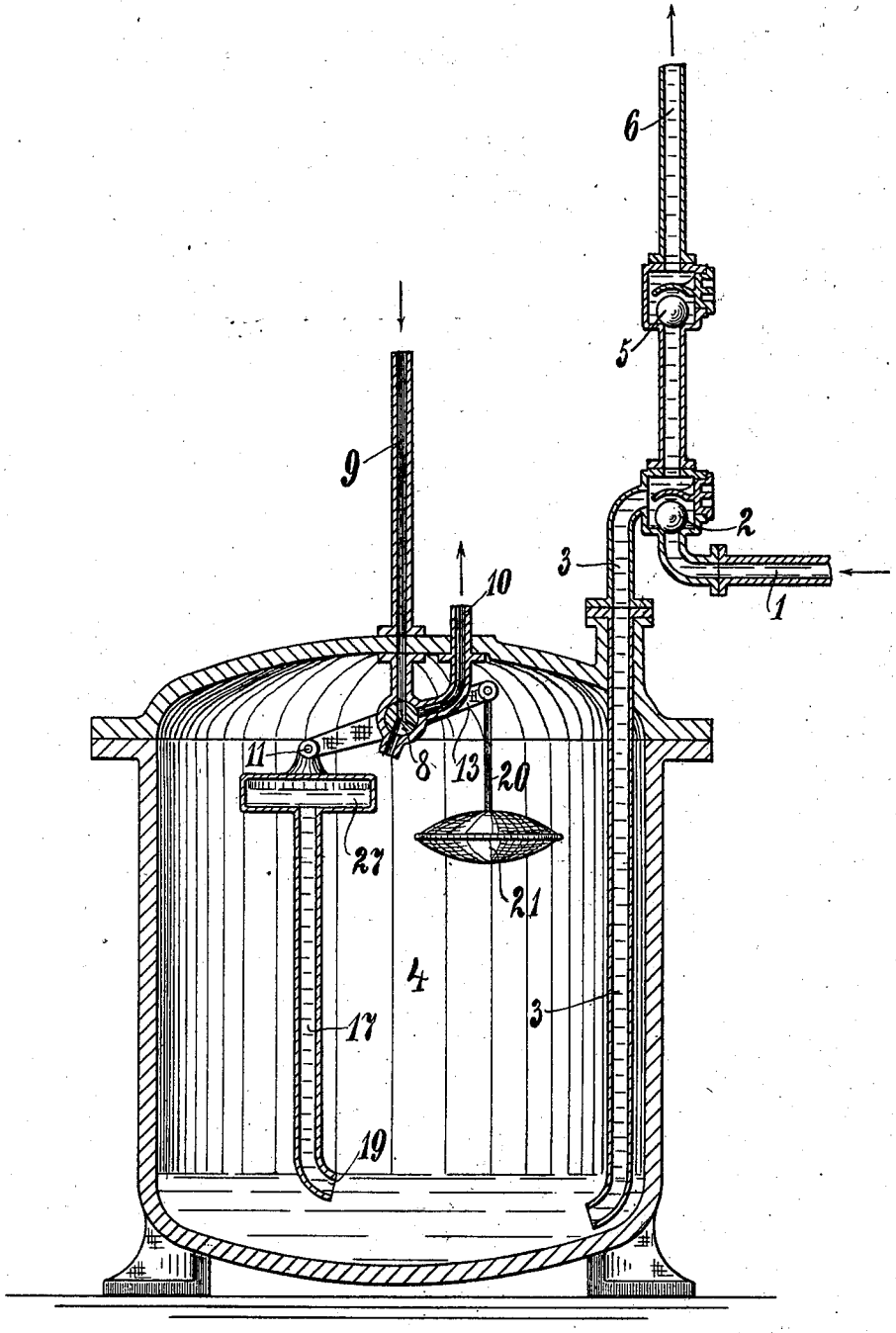
No. 724,051. PATENTED MAR. 31, 1903.

A. SCHOLL.

APPARATUS FOR RAISING LIQUIDS.

APPLICATION FILED MAY 31, 1902.

NO MODEL.



Witnesses
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UNITED STATES PATENT OFFICE.

ALBERT SCHOLL, OF MANNHEIM, GERMANY.

APPARATUS FOR RAISING LIQUIDS.

SPECIFICATION forming part of Letters Patent No. 724,051, dated March 31, 1903.

Application filed May 31, 1902. Serial No. 109,771. (No model.)

To all whom it may concern:

Be it known that I, ALBERT SCHOLL, a subject of the Grand Duke of Baden, residing at Mannheim, Germany, have invented certain new and useful Improvements in Apparatus for Raising Liquids, of which the following is a specification.

The present invention relates to an apparatus for raising liquids, particularly acids and caustic liquids, by means of compressed gas, compressed air, or steam.

The annexed drawing is a vertical cross-section through the apparatus.

The apparatus works automatically. The liquid to be raised passes through pipe 1, valve 2, and pipe 3 into the vessel 4, which is closed on all sides, and the liquid is forced out through pipe 3, valve 5, and pipe 6. 1 is therefore the supply-pipe, 6 the outlet or ascending pipe, 2 the supply-valve, and 5 the pressure-valve. The pipe 3 reaches nearly to the bottom of the vessel 4. The said vessel 4 is connected by the pipe 9 either with a steam-boiler or with a vessel containing compressed gas or air. For the sake of simplicity compressed air will be referred to in the present description, the effect being the same in either case. A three-way cock 8 is arranged in the pipe 9 within the vessel 4 in such a manner that when the cock is open, as shown in the figure, compressed air can pass into the vessel 4 through said pipe 9 and valve 8; but when the cock is closed the air inclosed in the vessel 4 can pass out through valve 8 and orifice 10 into the atmosphere.

A double-armed lever 11 13 is rigidly connected with the plug of the three-way cock 8. From the end 11 a stand-pipe 17 is suspended, forming at its upper end a comparatively large chamber 27, closed at its top. This stand-pipe 17 reaches nearly to the bottom of the receptacle 4 and remains immersed in the liquid to be raised during the whole pressure period—*i. e.*, till the liquid forced out of the receptacle 4 through pipes 3 and 6 falls below the end of the stand-pipe 17. From the end 13 of the lever the hollow float 21, carried by the rod 20, is suspended. This float 21 forms a counterweight normally heavier than the parts 17 and 27.

The action of the apparatus is as follows: The liquid to be raised enters the vessel 4 through pipe 1, valve 2, and pipe 3 while the float is in its lowest position, and the three-way cock 8 is consequently in the position in which the interior of the vessel 4 communicates with the outer atmosphere through pipe 10. When the vessel 4 is filled with liquid, the float 21 rises and the parts 13, 8, 11, and 17 assume the positions shown in the drawing. The compressed-air conduit 9 is thus placed into communication with the vessel 4, and the compressed air entering forces the liquid through the pipe 3 and the valve 5 into the pipe 6. At the same time part of the said liquid is forced into the stand-pipe 17, which forms one hollow body with the chamber 27, until the air above the liquid in the stand-pipe balances the compressed air in the vessel 4. During the period of pressure the float 21 remains in its upper position, for the reason that the hollow body 17 27 is heavier, owing to the liquid contained therein. When, however, toward the end of the period of pressure the level of the liquid falls below the end 19 of the pipe 17, the column of liquid in the latter descends, so that the hollow body 17 27 is relieved of weight, whereupon the float 21, which is now the heavier, descends and closes the cock 8.

What I claim is—

1. The combination with a closed vessel having inlet and outlet for liquid, of a pipe for pressure medium passing into said vessel, an exhaust-pipe leading from said vessel, a closed float suspended within said vessel and adapted to be raised by the incoming liquid, a hollow body into which liquid is forced by the pressure agent also suspended within said vessel and closed at its upper side said hollow body consisting of a chamber and a stand-pipe reaching approximately to the bottom of the vessel and remaining immersed in the liquid to be raised during the whole pressure period, and means operated by said float and hollow body to respectively open the pressure-pipe on the float rising, and close it on the level of liquid in the stand-pipe falling below the bottom thereof and simultaneously open the exhaust-pipe substantially as described for the purpose set forth.

2. The combination with a closed vessel having inlet and outlet pipes for liquid and antireturn-valves in said pipes, of a pipe for

pressure medium passing into said vessel, a three-way cock in said pipe within the vessel, an exhaust-pipe controlled by the cock aforesaid, a double-armed lever carried by said cock, a closed float suspended from one arm of said lever adapted to be raised by the incoming liquid so as to open the pressure-pipe, and a hollow body closed at its upper side, suspended at the other end of said lever, said hollow body consisting of a chamber and a stand-pipe reaching approximately to the bottom of the vessel and remaining immersed in the liquid to be raised during the whole pressure period, into which hollow body liquid is forced by the pressure agent so as to overbalance the float and close the pressure-pipe when the level of liquid falls below the bottom of stand-pipe and simultaneously open the aforesaid exhaust-pipe, substantially as described for the purpose set forth.

In witness whereof I have signed this specification in the presence of two witnesses.

ALBERT SCHOLL.

Witnesses:
JACOB ADRIAN,
H. W. HARRIS.