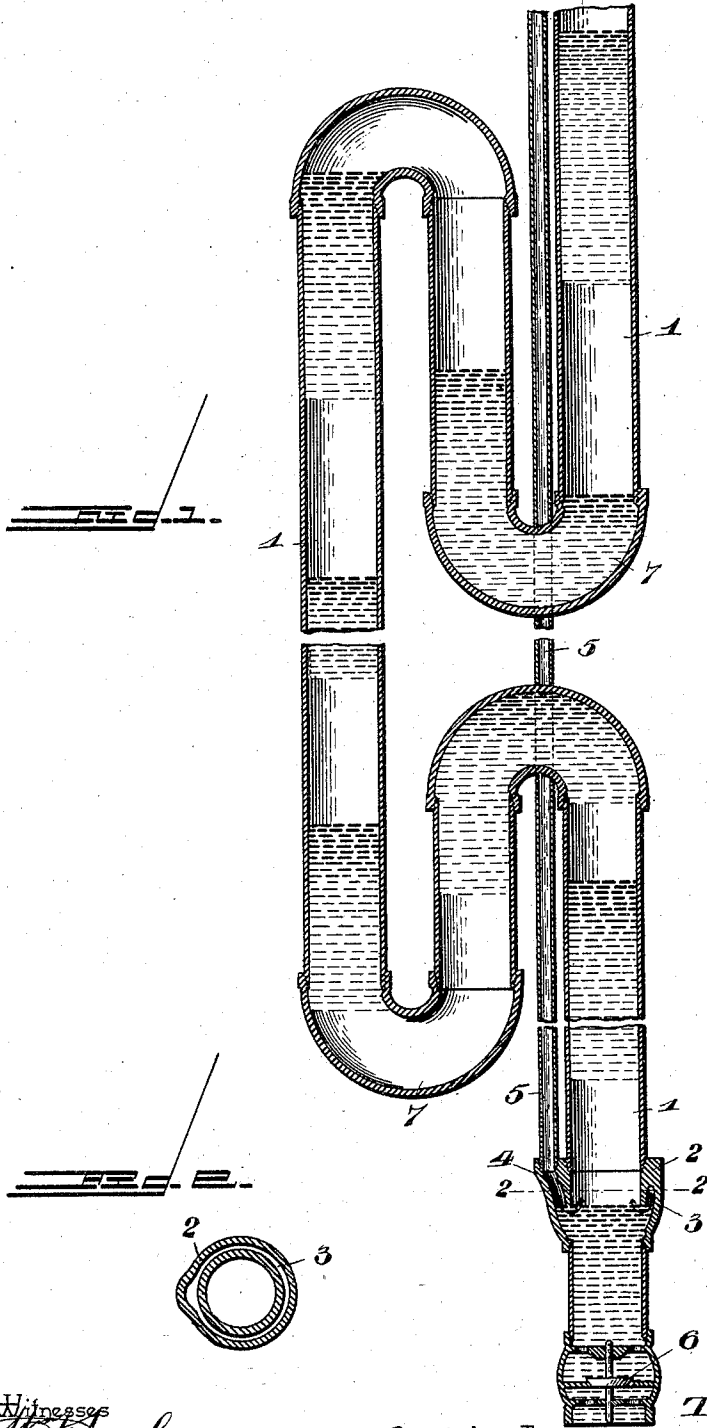


(No Model.)

T. H. APGAR.
AIR LIFT PUMP.

No. 580,540.

Patented Apr. 13, 1897.



Inventor

Theodore H. Apgar.

By his Attorneys,

C. A. Snow & Co.

Witnesses
H. F. Doyle.
C. E. Doyle.

UNITED STATES PATENT OFFICE.

THEODORE H. APGAR, OF BOUND BROOK, NEW JERSEY.

AIR-LIFT PUMP.

SPECIFICATION forming part of Letters Patent No. 580,540, dated April 13, 1897.

Application filed April 24, 1896. Serial No. 588,937. (No model.)

To all whom it may concern:

Be it known that I, THEODORE H. APGAR, a citizen of the United States, residing at Bound Brook, in the county of Somerset and State of New Jersey, have invented a new and useful Air-Lift Pump, of which the following is a specification.

My invention relates to air-lift pumps, and has for its object to provide an improved construction of uptake-pipe whereby the facility of elevation is increased and return of the liquid is prevented, and, furthermore, to provide improved means for introducing air into the uptake-pipe.

Further objects and advantages of this invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

In the drawings, Figure 1 is a vertical central section of a pump constructed in accordance with my invention. Fig. 2 is a transverse section on the line 2 2 of Fig. 1 to show the means for introducing air into the uptake-pipe.

Similar numerals of reference indicate corresponding parts in both figures of the drawings.

1 designates the uptake-pipe, into which is introduced near its lower end a union 2, provided with an annular air-distributing channel 3, having an inlet-port 4, and in communication with this air-inlet port is an air-supply pipe 5. Below this air-distributing channel is located a check-valve 6, controlling the inlet of liquid, whereby during the elevation of the liquid, as indicated by the shading in Fig. 1, the check-valve is closed to prevent the escape of pressure.

The uptake-pipe is provided at intervals with traps or return-bends 7, consisting of goosenecks or oppositely-extended looped portions of the pipe, and the function of said traps is to prevent the return of liquid which has been elevated a portion of the required

distance and present it in proper form for continued elevation by the air. In the operation of devices of this class the liquid, after having been elevated a certain distance, adheres to the surface of the pipe and has a tendency to slip back and thus escape the following plug of air, but by the use of traps arranged as described and shown the liquid thus escaping a plug of air is caught and prevented from returning until the succeeding plug of liquid arrives and advances it toward the upper or discharge end of the pipe. It will be understood that these traps may be arranged at any desired intervals as found by practice to be necessary.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having described my invention, what I claim is—

1. An air-lift pump, of the type in which successive plugs or pistons of air and water rise through the uptake-pipe, the same having its uptake-pipe provided with an intermediate trap, and an air-supply conductor communicating with the uptake-pipe below said trap, substantially as specified.

2. An air-lift pump having gooseneck traps or oppositely-extended looped portions located at intervals to prevent a return of liquid, an air-supply conductor in communication with the uptake-pipe below the lowermost trap, and a check-valve located below the point of connection of the air-supply conductor, substantially as specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

THEODORE H. APGAR.

Witnesses:

FRANK W. SOMERS,
AUG. VANDERVEER.