

No. 656,572.

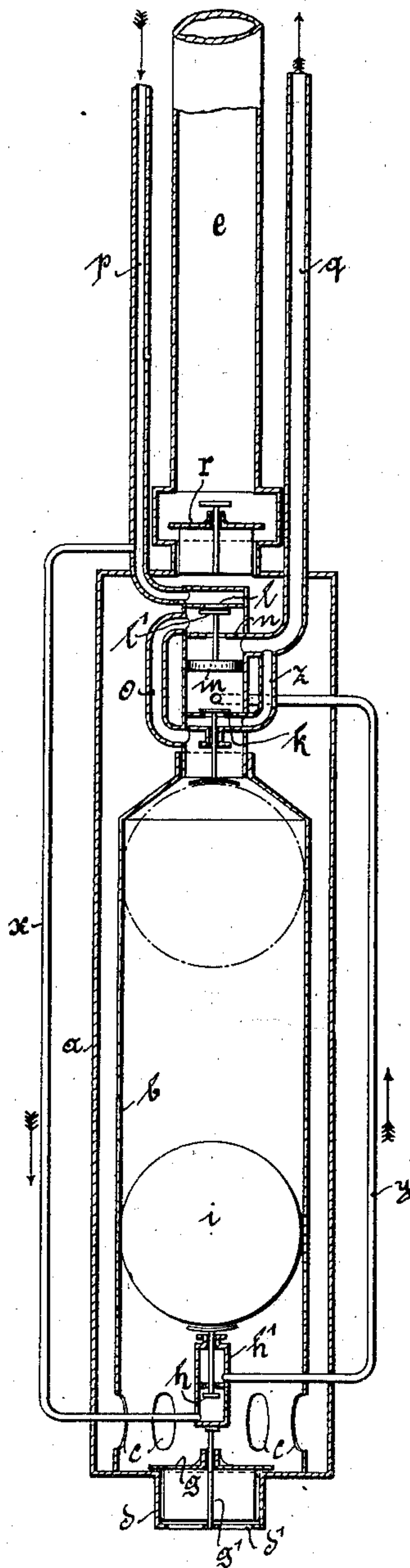
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J. PETERMANN.

APPARATUS FOR RAISING WATER BY COMPRESSED AIR.

(Application filed Apr. 17, 1900.)

(No Model.)



WITNESSES:

Ella L. Giles

Oliver

INVENTOR

Julius Petermann

BY

Richardson

ATTORNEYS

UNITED STATES PATENT OFFICE.

JULIUS PETERMANN, OF CRIMMITZSCHAU, GERMANY.

APPARATUS FOR RAISING WATER BY COMPRESSED AIR.

SPECIFICATION forming part of Letters Patent No. 656,572, dated August 21, 1900.

Application filed April 17, 1900. Serial No. 13,269. (No model.)

To all whom it may concern:

Be it known that I, JULIUS PETERMANN, civil engineer, a subject of the King of Saxony, residing at Crimmitzschau, Kingdom of Saxony, Germany, have invented a new and useful Improvement in Apparatus for Raising Water by Compressed Air, of which the following is a specification.

My invention relates to an improvement in apparatus for raising water by compressed air of the kind having but one raising-chamber.

The invention consists in the arrangement of a combined valve for the inlet and outlet of air which is actuated by the compressed air contained in the supply-pipe in lieu of the known separated valves for the inlet and outlet of air, which are actuated by the water contained in the delivery-pipe. The new combined valve is set into the water-space proper of the apparatus. In consequence of the arrangement of the combined valve set into the water-space and being operated by the compressed air only a narrow place is rendered necessary for the use of the apparatus. Therefore the apparatus is particularly suitable for use as a bore-hole pump. I attain this object by the arrangement of the combined air inlet and outlet valve illustrated in the accompanying drawing, which shows a vertical section of the apparatus.

a represents a tube-like casing surrounding an inner casing *b*, provided with openings *c* at the under part, by which openings the two casings are in communication. The outer casing is provided with a socket *d*, having perforations *d'*, and a water-inlet valve *g*, fitted on a bar *g'*. The latter is connected at the under end with the socket *d* and bears at the upper end a valve-casing *h'*. The latter casing contains a valve *h*, which remains in its open position when the float *i* rests upon it as to allow the compressed air to flow from pipe *p* through pipes *x* and *y* under the piston *m* of the combined air-inlet and outlet valve *l'*. This valve is arranged in a cylindrical extension of the casing *b*, which also contains a valve *k*, which is opened by the float *i* when the latter reaches its upper position. The valve *k* when opened permits the outlet of the compressed air contained in the space between the piston *m* and the valve *k* through

pipes *z* and *q*. The space between the air-inlet *l* and the air-outlet *n* communicates with the casing *b* by a branch *o*. *r* represents a return-valve which is provided in the delivery-pipe *e*.

The operation of the apparatus set forth is as follows: The apparatus when dipped into water becomes filled by the valve *g* and at the same time the air contained in the casing *b* escapes through branch *o*, air-outlet *n*, and pipe *q*. The compressed air supplied by pipe *p* and pressing upon the disk *l'* will then force the combined valve down, which thereby opens the air-inlet *l* and closes the air-outlet *n*. Thus the compressed air is permitted to flow through branch *o* into the casing *b* and to force the water contained in this casing out through openings *c* into the space between the inner and outer casings, from which space the water enters the delivery-pipe *e*. The float *i* sinking with the water in casing *b* opens by its own weight the valve *h*, whereupon compressed air from pipe *p* enters by means of pipes *x* and *y* the space below the piston *m* and lifts the latter, thereby closing air-inlet *l* and opening air-outlet *n*. Now the compressed air, which after having raised the water rests in the casing *b*, may escape through branch *o*, air-outlet *n*, and pipe *q* to the atmosphere. The apparatus now is ready for again filling with water. The water admitted to the casing *b* lifts the float *i* until it strikes the valve *k* and opens the same, so that the compressed air which was contained in the space below the piston *m* now may escape through branch *z* and pipe *q*. When this takes place, the piston *m* descends by its own weight, thereby closing the air-outlet *n* and opening the air-inlet *l*. By this means the compressed air from tube *p* is again allowed to enter the casing *b* through branch *o* and to raise the water.

What I claim as my invention, and desire to secure by Letters Patent, is—

In combination in an apparatus for raising water, a water-chamber, a discharge-pipe for the water leading therefrom, air inlet and outlet pipes *p*, *q*, a combined inlet and outlet valve *l'* having a piston and controlling the passage of the air through both of said pipes, a second valve *k* for controlling the position of the valve *l'*, an air-pipe leading

to the space between the piston of the valve l' and the valve k , an outlet z leading from said space and controlled by the valve k said outlet z connecting with the outlet-pipe q , and a
5 pipe o connecting the space between the air-inlet valve l' and the air-outlet pipe with the water-chamber, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

JULIUS PETERMANN.

Witnesses:

ALVIS SICBER,
WOLDEMAR HAUPT.