

No. 776,601.

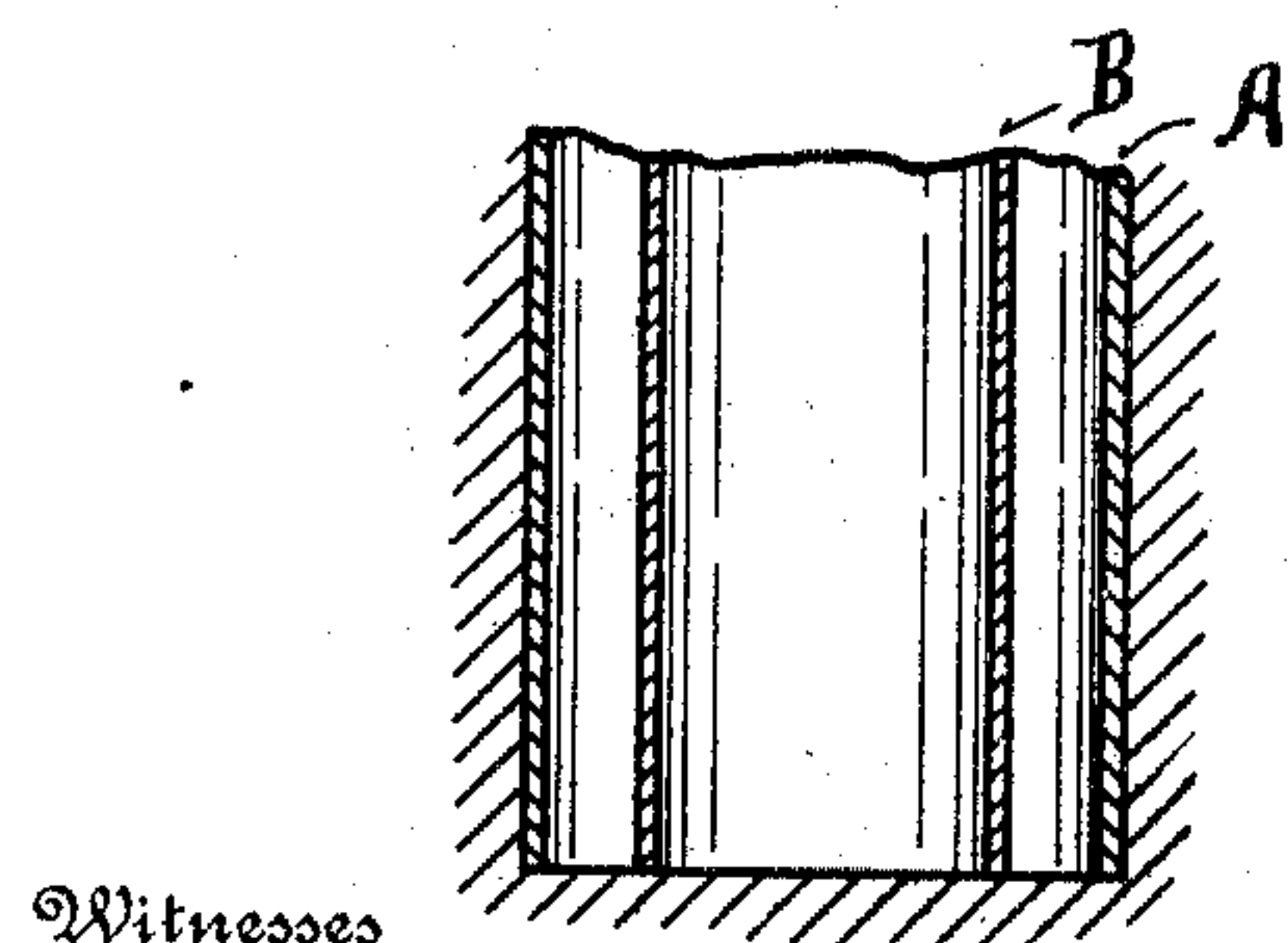
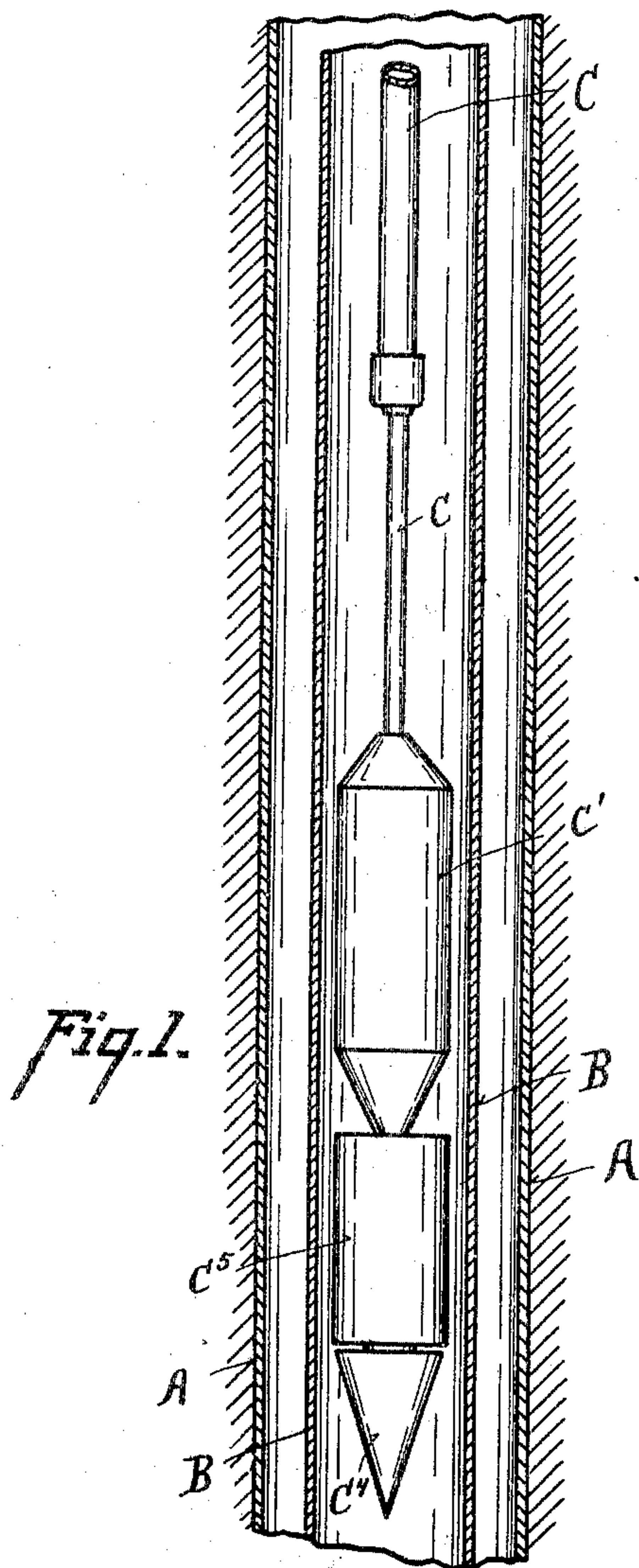
PATENTED DEC. 6, 1904.

F. J. KUHLMANN.

AIR LIFT PUMP.

APPLICATION FILED MAY 31, 1902.

NO MODEL.



Witnesses
C. W. Miles.
A. Lehmkühl

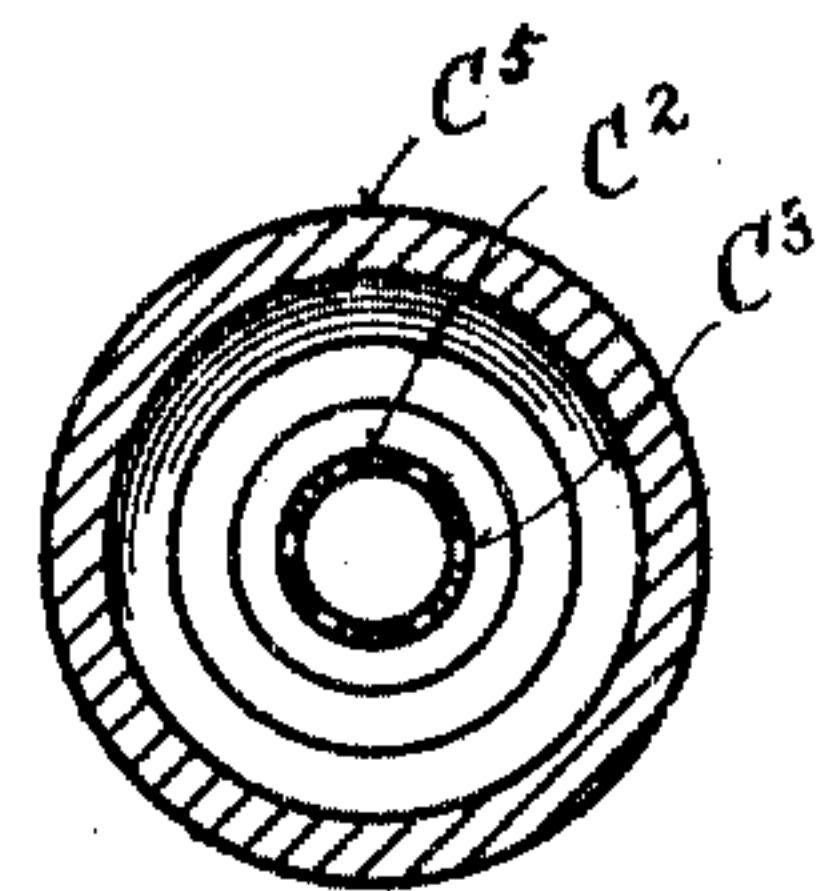
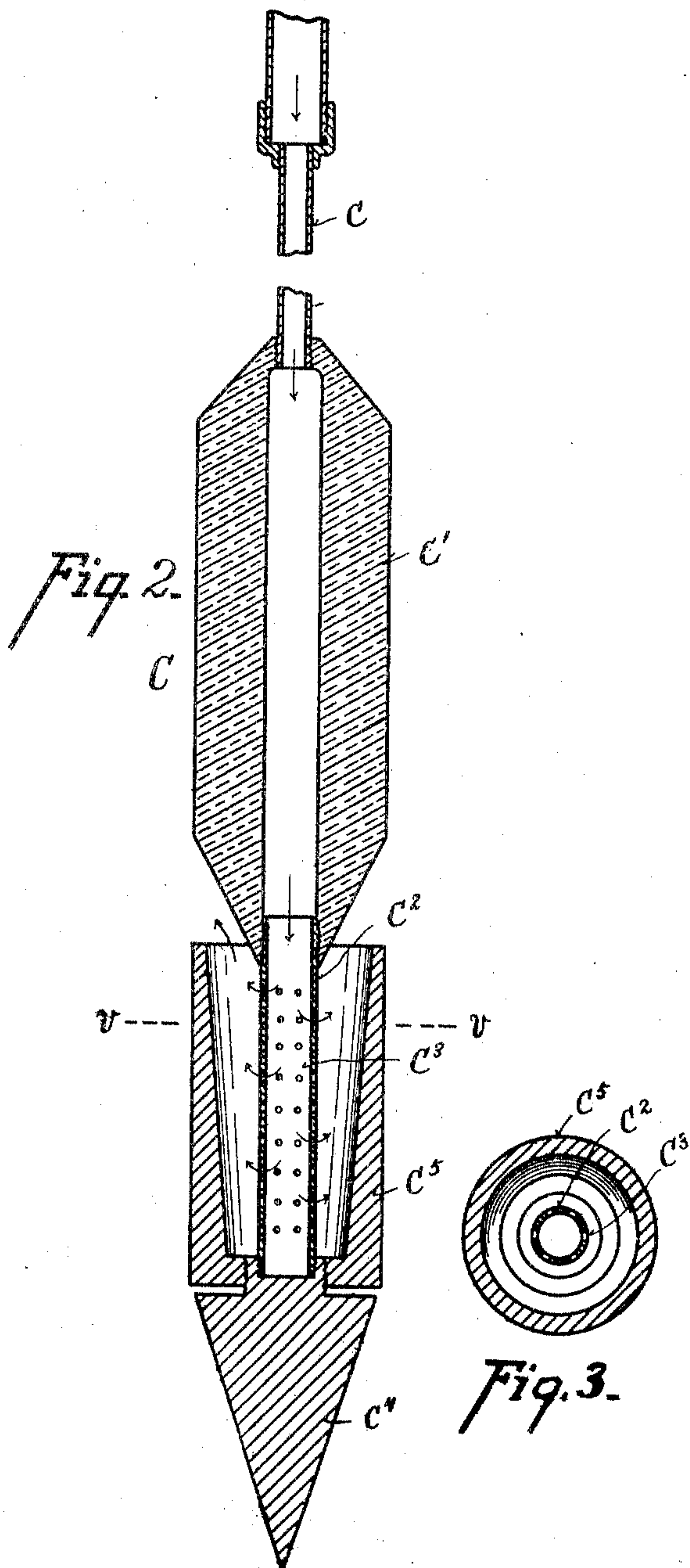


Fig. 3.

Inventor
Frederick J. Kuhlmann
By Murray & Murray
Attorneys

UNITED STATES PATENT OFFICE.

FREDERICK J. KUHLMANN, OF CINCINNATI, OHIO, ASSIGNOR TO JULIA A. KUHLMANN, OF CINCINNATI, OHIO.

AIR LIFT-PUMP.

SPECIFICATION forming part of Letters Patent No. 776,601, dated December 6, 1904.

Application filed May 31, 1902. Serial No. 109,644. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK J. KUHLMANN, a citizen of the United States of America, and a resident of Cincinnati, county of Hamilton, State of Ohio, have invented certain new and useful Improvements in Air Lift-Pumps, of which the following is a specification.

The object of my invention is an air-lift which will raise and discharge the fluid in a steady stream. This object is attained by the means described in the specification, particularly pointed out in claims, and illustrated in the accompanying drawings, in which—

Figure 1 is a view of an air-lift embodying my invention, the outer jacket and the uptake-pipe being shown in vertical section with their lower ends broken off and brought together to economize space and the compressed-air conveyer being shown in side elevation. Fig. 2 is a vertical central section of the air-conveyer upon an enlarged scale. Fig. 3 is a horizontal section of the same, taken upon line *vv* of Fig. 2.

Referring to the parts, the outer jacket A and the uptake-pipe B extend into the earth to the rock-line. The compressed-air conveyer C is suspended within pipe B below the water-line therein, but at a considerable distance above the bottom of the pipe. Air-conveyer C consists of a narrow pipe *c*, which leads into an enlarged cylinder *c'*, which is of an internal diameter greater than pipe *c* and has at its lower end a short pipe *c²* of a diameter equal to the internal diameter of cylinder *c'* and having in its walls a series of equally-spaced perforations *c³*. Pipe *c²* is screw-threaded at its lower end into a cone-shaped extension *c⁴*, which at its upper end has a screw-threaded neck to engage the bottom of an inverted cup *c⁵*, which surrounds pipe *c²*. The lower end of cylinder *c'* is cone-shaped, and cup *c⁵* flares outward somewhat toward its upper end. The effect of having cylinder *c'* of a greater diameter than pipe *c* is twofold. First, the reduced pipe *c* compresses the air, which expands as it passes into cylinder *c'* and

pipe *c²*, issuing from the perforation *c³* and being directed by the flared cup and the cone-shaped end of the cylinder *c'* outward beneath the water above that point, and, second, the reduced portion *c* above the enlarged portion *c'* forms a reservoir or chamber within pipe B above the portion *c'*, so that the air may not escape up along the side of the conveyer, but must carry the water upward before it. The cone-shaped end *c⁴* separates the rising column of water gradually, so that it does not come in contact with any direct obstructions which would tend to create a downward suction.

With my construction it is seen that the air is directed upward in the direction of the outflow and that a fresh supply of water is rising continually from the lower end of the uptake-pipe and that therefore the compressed air not only is pushing the water out, but is also assisting in bringing the water in from beneath—that is, it never is moving in a direction contrary either to the outflowing or the incoming water, and that thus a continuous stream of water is maintained at the discharge.

What I claim is—

1. In an air lift-pump the combination of an uptake-pipe, and an air-conveyer suspended within the pipe below the water-line and above the inlet-opening of the pipe and which consists of a pipe having an air-discharge near its lower end, above the air-discharge an enlarged portion and above the enlarged portion a reduced portion, substantially as shown and described.

2. In an air lift-pump the combination of an uptake-pipe, and an air-conveyer suspended within the pipe below the water-line and above the inlet-opening of the pipe and consisting of a pipe having at its lower end a perforated portion surrounded by an inverted flaring cup above which is an enlarged portion and above the enlarged portion a reduced portion, substantially as shown and described.

FREDERICK J. KUHLMANN.

Witnesses:

W. F. MURRAY,

C. A. LEHMKUHL.