

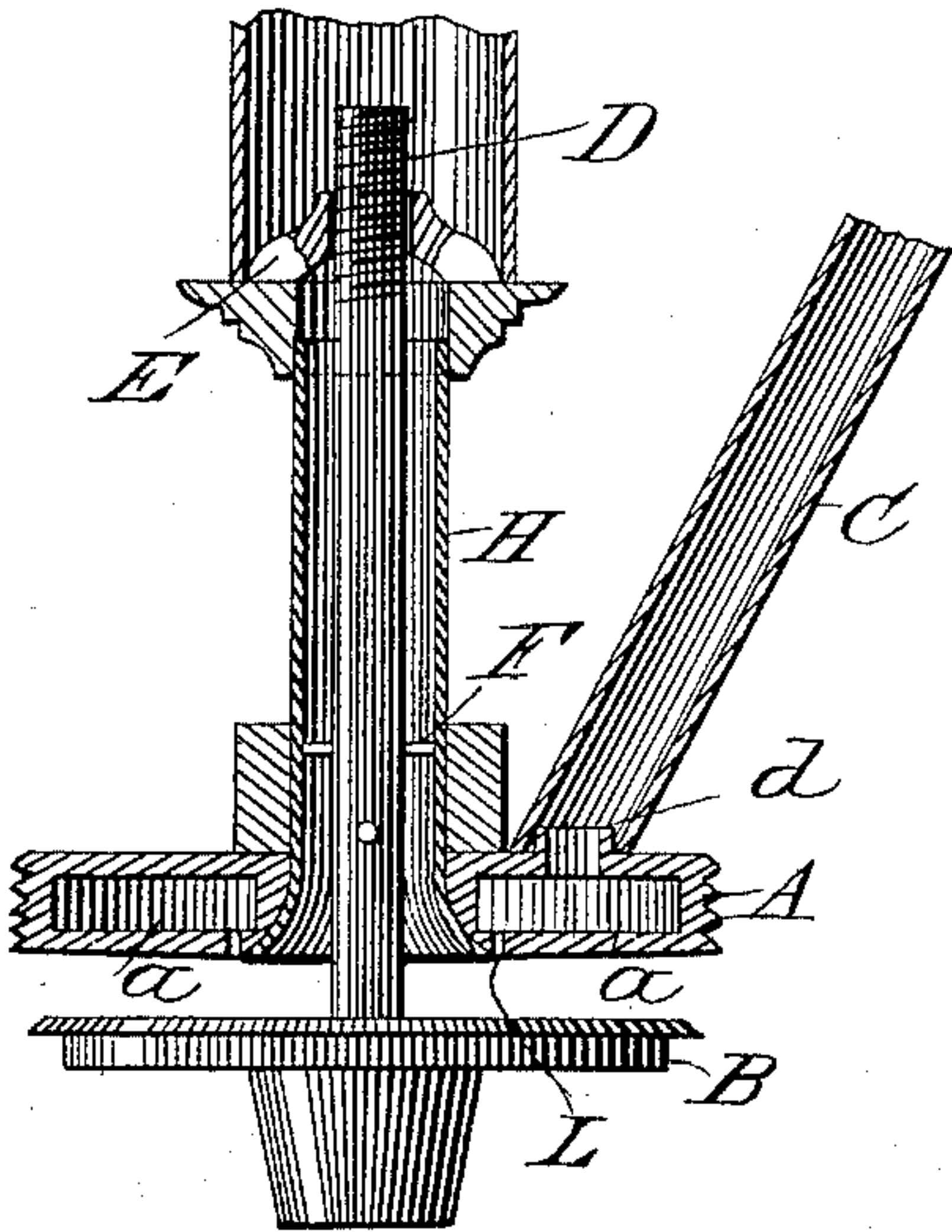
(No Model.)

C. BIRKERY.  
AIR PUMP.

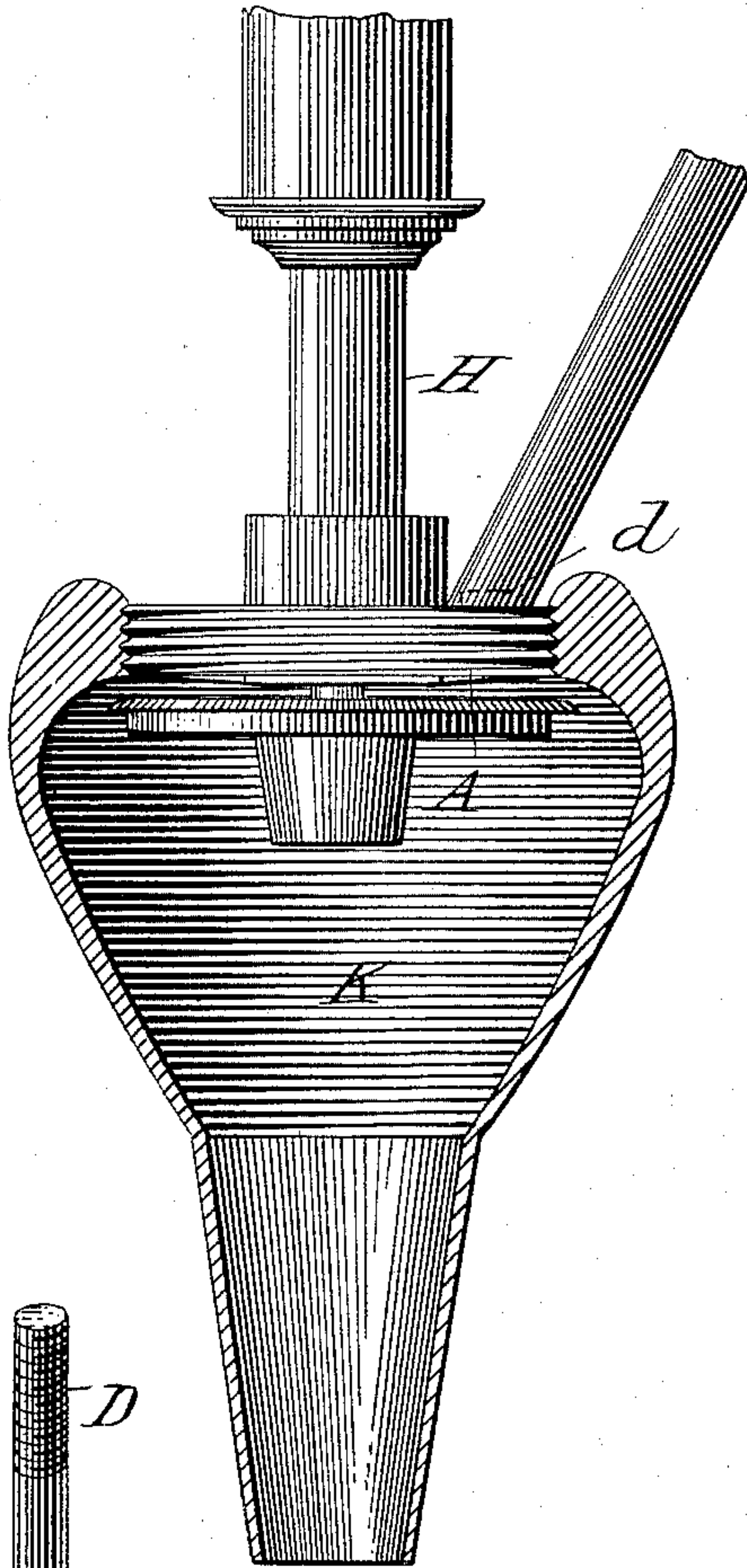
No. 435,008.

Patented Aug. 26, 1890.

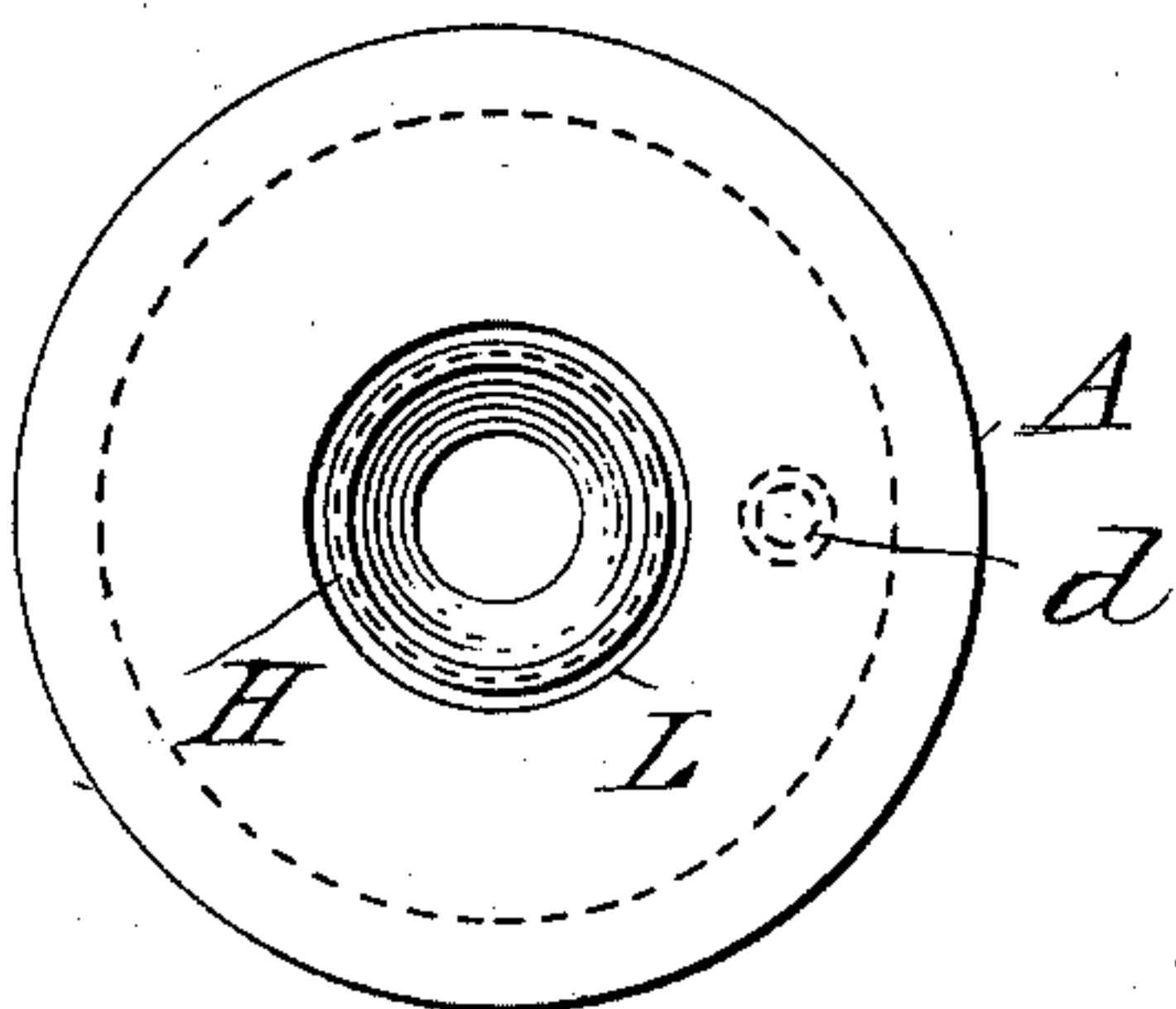
*Fig. 1.*



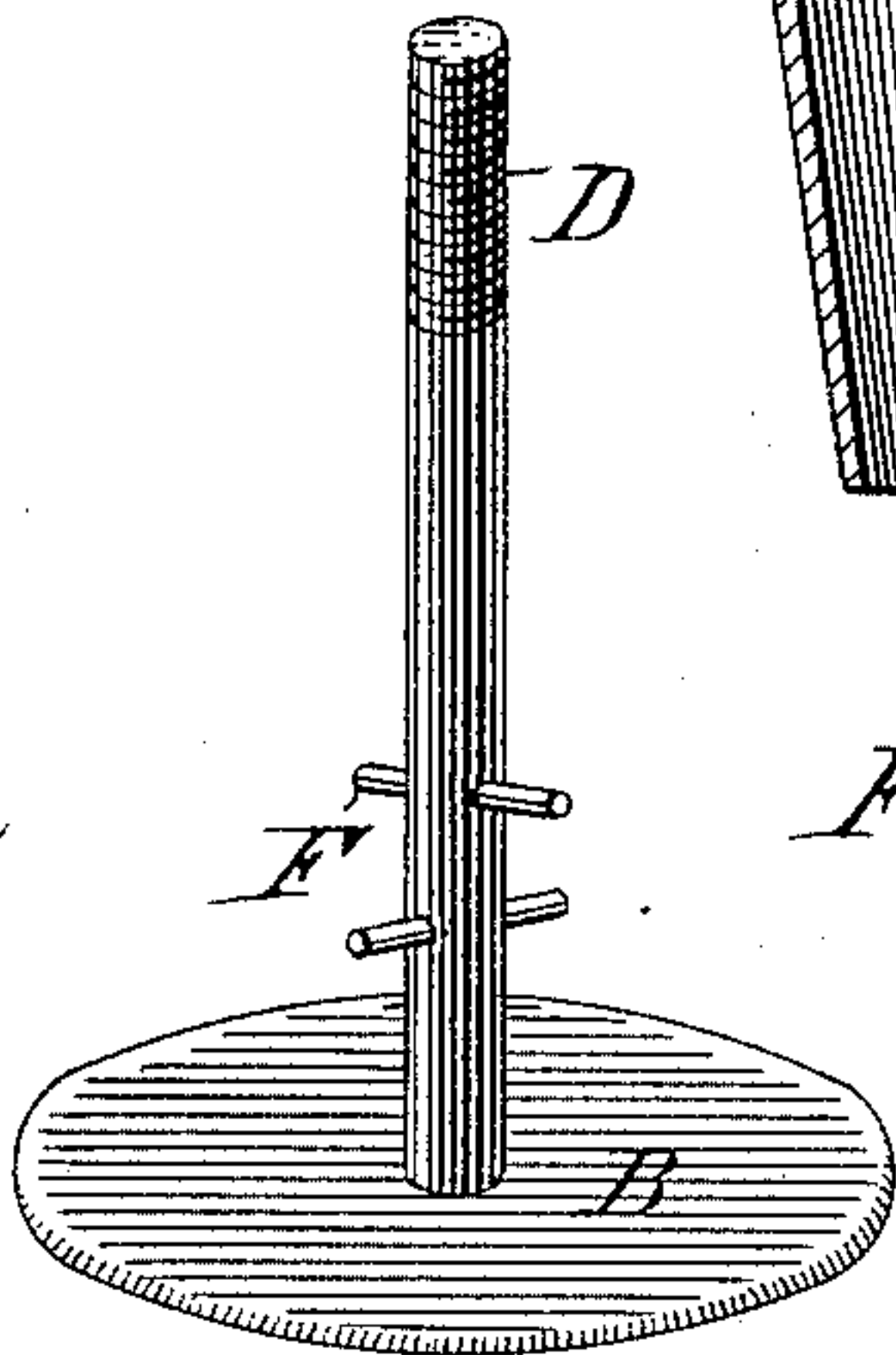
*Fig. 4.*



*Fig. 2.*



*Fig. 3.*



Witnesses:  
Charles V. Hall.  
Lawrence Buckley

Inventor:  
Cornelius Birkery



# UNITED STATES PATENT OFFICE.

CORNELIUS BIRKERY, OF HARTFORD, CONNECTICUT, ASSIGNOR OF ONE-HALF TO GEORGE R. CASE, OF SAME PLACE.

## AIR-PUMP.

SPECIFICATION forming part of Letters Patent No. 435,008, dated August 26, 1890.

Application filed May 22, 1889. Serial No. 311,763. (No model.)

*To all whom it may concern:*

Be it known that I, CORNELIUS BIRKERY, of Hartford, Connecticut, have invented certain new and useful Improvements in Air-Pumps, of which the following is a specification.

The invention relates to the class of air-pumps that utilize flowing liquid to produce a vacuum; and the object is to provide a simple apparatus of this class which can be conveniently attached to a liquid-supply pipe, and that will produce a vacuum quickly with an economic expenditure of liquid.

Referring to the accompanying drawings, Figure 1 is a view in vertical section of the apparatus. Fig. 2 is a plan view of the air-drum. Fig. 3 is a perspective view of the water-deflecting disk. Fig. 4 is a side view of the apparatus, the discharge-funnel being in vertical section.

In the drawings, the letter A denotes an annular air-drum, which is provided with an air-inlet opening through the hub *d*, to which is connected a tube C, that is adapted to be joined with the chamber from which air is to be exhausted. The air-outlet L, which is made through the bottom of this drum, is a very narrow circular slit. A tube H extends through the drum, its lower end preferably projecting very slightly below the bottom of the drum, while its upper end is adapted to be connected to the supply-pipe from the liquid which is to be utilized to produce the vacuum. The stem D of the disk B passes up through the center of the tube H, and is threaded and screwed into a supporting-spider E, so that the disk may be adjusted with relation to the bottom of the air-drum A. Arms F project from the lower end of the stem to the walls of the passage to prevent any vibration of the stem. This is a desirable method of attaching the disk; but the spider may be secured directly to the bottom of the drum and there support the disk, if desired. The periphery of the drum is preferably threaded and screwed into the top of a discharge-funnel K, which fills with liquid and packs the parts after the device has commenced to operate to prevent the back-pressure of air. The disk B is first adjusted quite

closely to the bottom of the drum A. The upper end of the tube H is attached to the liquid-supply pipe and the tube C connected with the chamber from which air is to be exhausted. The liquid after flowing through the tube H strikes the disk B, and is deflected upward against the bottom of the drum, and then passes out between the drum and the disk in a thin strata of water having a great velocity. The disk is so adjusted with relation to the drum that the water as it is deflected upward strikes the bottom of the drum just outside of the air-outlet slit L, and in rushing past this outlet-slit in this manner an initial vacuum is formed, the continuation of which exhausts the drum and the chamber with which it is connected of air.

When the apparatus is provided with a discharge-funnel K, which is provided with a small outlet, the water, which soon fills the funnel, prevents the backward pressure of air from breaking the vacuum which is being formed.

The apparatus is simple, cheap, can be conveniently attached to any liquid-supply pipe, and will quickly exhaust air from any chamber with which it is connected.

I claim as my invention—

1. An air-pump consisting of an annular air-drum having an inlet adapted to be connected with the chamber which is to be exhausted, and an air-outlet encircling the liquid-passage through the drum, and a disk located below the drum to deflect the liquid against the bottom of the drum as it emerges from the outlet, substantially as specified.

2. An air-pump consisting of an annular air-drum having an inlet adapted to be connected with the chamber which is to be exhausted, and an air-outlet encircling the liquid-passage through the drum, and an adjustable disk located below the drum to deflect the liquid against the bottom of the drum as it emerges from the outlet, substantially as specified.

3. An air-pump consisting of an annular air-drum having an inlet adapted to be connected with the chamber which is to be exhausted, and an air-outlet encircling the liquid-passage through the drum, and a disk ad-

justably supported below the drum by a stem which passes up through the liquid-passage, substantially as specified.

4. An air - pump consisting of an annular  
5 air-drum having an inlet adapted to be connected with the chamber which is to be exhausted, an air-outlet encircling the liquid-passage through the drum, an adjustable disk

located below the drum, and a shell secured to the exterior of the drum, substantially as specified.

CORNELIUS BIRKERY.

Witnesses:

CHARLES W. HALL,  
LAWRENCE BUCKLEY.