

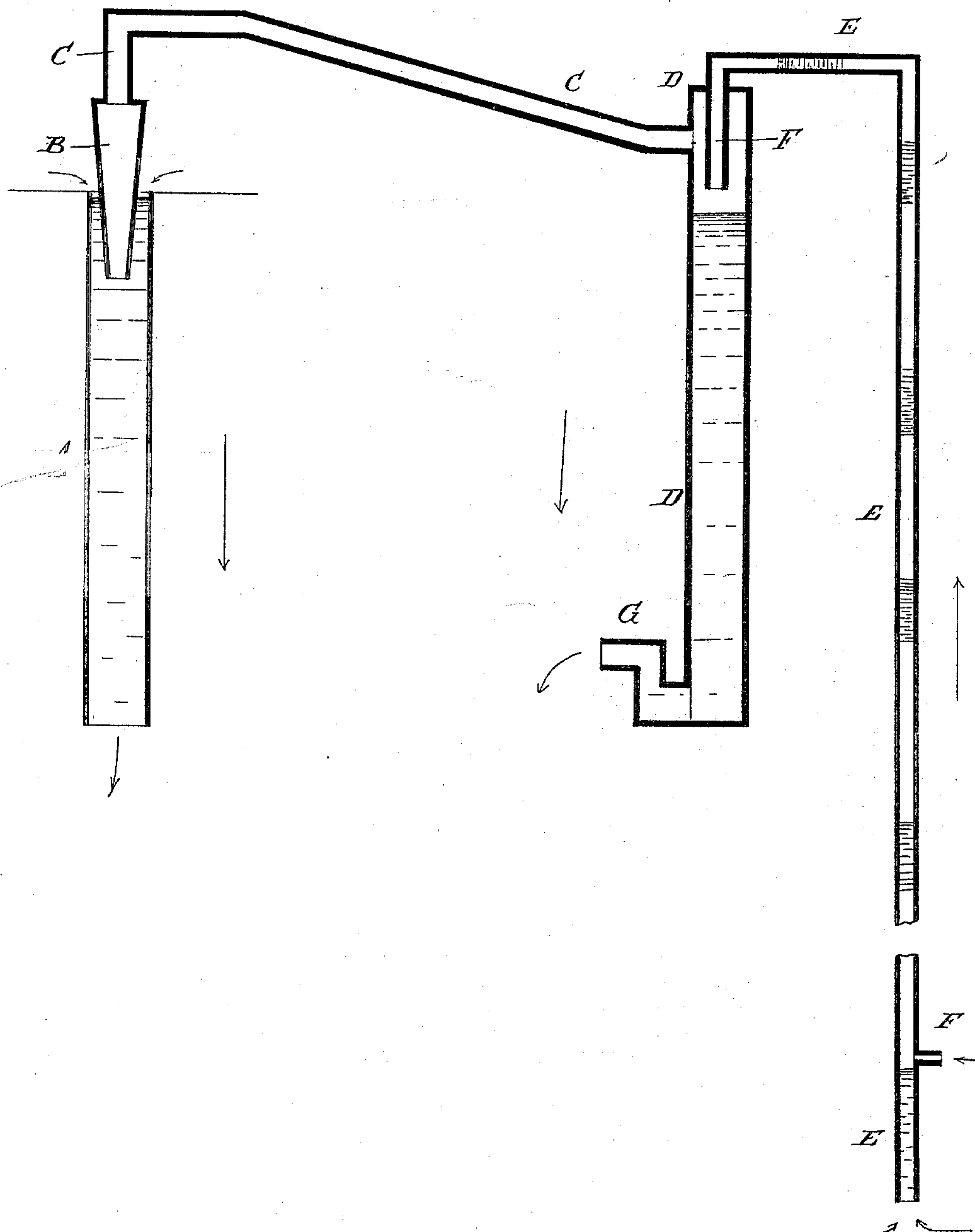
(No Model.)

T. ARTHUR.

COMBINED AIR EXHAUSTER AND WATER ELEVATOR.

No. 330,366.

Patented Nov. 17, 1885.



WITNESSES:

*Chas. N. A. A.*  
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INVENTOR:

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# UNITED STATES PATENT OFFICE.

THOMAS ARTHUR, OF BANGOR, PENNSYLVANIA, ASSIGNOR TO HIMSELF  
AND ROBERT J. NAGLE, OF SAME PLACE.

## COMBINED AIR-EXHAUSTER AND WATER-ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 330,366, dated November 17, 1885.

Application filed March 31, 1885. Serial No. 160,787. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS ARTHUR, of Bangor, in the county of Northampton and State of Pennsylvania, have invented certain  
5 new and useful Improvements in a Combined Air-Exhauster and Water-Elevator, of which the following is a full, clear, and exact description.

Reference is to be had to the accompanying  
10 drawings, forming part of this specification, and which is a sectional side elevation of my improvement.

The object of this invention is to provide a  
15 simple and reliable mechanism for elevating water or drawing air from mines and other places.

The invention relates to a combined air-exhauster and water-elevator constructed with a conical tube inserted in a water-pipe and  
20 connected by an air-pipe with the upper part of the short arm of an elevator, the lower end of the said short arm being provided with a water-seal, and the upper end of the long arm of the elevator being extended downward past  
25 the end of the air-pipe, and its lower part being provided with an air-inlet, whereby water and air can be readily withdrawn from mines and other places, as will be hereinafter described and claimed.

30 A is a pipe open at both ends, and connected at its upper end with a water-supply by a spout or other suitable means. Within the upper end of the pipe A, and not in contact with it, is suspended a conical tube, B, with  
35 its smaller end downward. The larger upper end of the conical tube B is connected with one end of an air-pipe, C. The other end of the air-pipe C is connected with the top part of the pipe D.

40 E is an inverted-L-shaped tube, the upper end of which is secured air and water tight in the upper end of the pipe D, and is extended a little below the end of the air-pipe C. The lower end of the tube E extends down to the  
45 place from which the water or air is to be withdrawn.

In one side of the lower part of the pipe D E is secured a small air-inlet tube or nipple, F. With the lower end of the pipe D is con-

nected a short elbow-pipe, G, to form a wa- 50  
ter-seal for the said lower end, to prevent air from entering the said pipe D from its lower end.

The construction at the lower end of the pipe D is immaterial so long as air is pre- 55  
vented from entering the said end and water allowed to flow out freely.

With this construction, as the water flows into the pipe A past the conical tube B its tendency to form a vacuum in front of the 60  
said tube B draws the air from the said tube B and from the pipe C and the pipe and tube D E connected with it. When the lower-end of the pipe D is closed so as not to admit air, or when the said pipe contains so much wa- 65  
ter that its weight equals the suction-power of the exhauster A B, and the lower end of the tube E is immersed in water with the nipple F above the surface of the said water, wa- 70  
ter and air will flow through the said tube E into the pipe D, where they will separate, the water flowing out through the said pipe D and the air flowing through the pipe C and the conical tube B into the pipe A, so that as long as the said pipe A is supplied with water and 75  
the end of the tube E is immersed in water there will be a continuous outflow of water at the siphon G at the lower end of the pipe D. In case there be no water at the lower end of the tube E, air will be drawn up through the 80  
said tube E so long as the pipe A is kept supplied with water.

Having thus fully described my invention, I claim as new and desire to secure by Letters 85  
Patent—

1. A combined air-exhauster and water-elevator constructed substantially as herein shown and described, and consisting of the conical tube B, inserted in the water-pipe A and connected by the air-pipe C with the up- 90  
per part of the pipe D, the lower end of the said pipe being provided with a water-seal, and the upper end of the tube E being extended downward past the air-pipe C, and its lower part being provided with an air-inlet, F, as set 95  
forth.

2. In a combined air-exhauster and water-elevator, the combination, with the upper part

of the pipe D, having its lower end provided with a water-seal, and having the upper end of the tube E extended into the upper part of the said pipe, and provided near its lower end  
5 with an air-inlet, F, of the pipe C, the conical tube B, and the water-pipe A, substantially as herein shown and described, whereby water and air can be readily withdrawn from mines and other places, as set forth.

THOMAS ARTHUR.

Witnesses:

CHESTER M. BUTZ,  
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