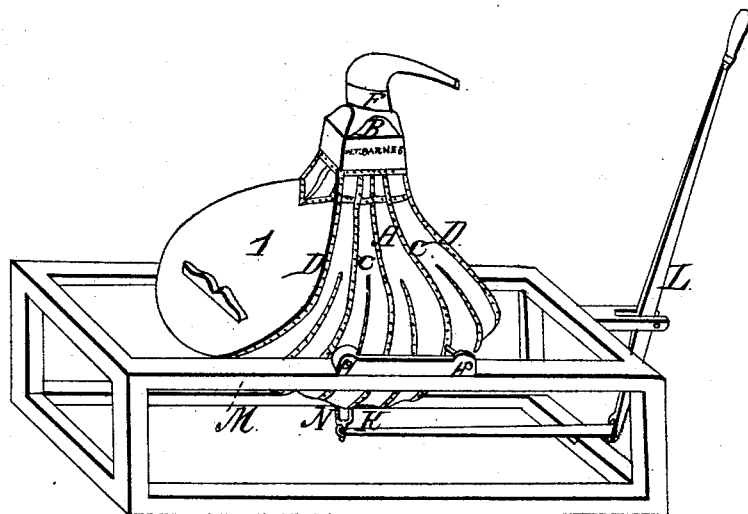
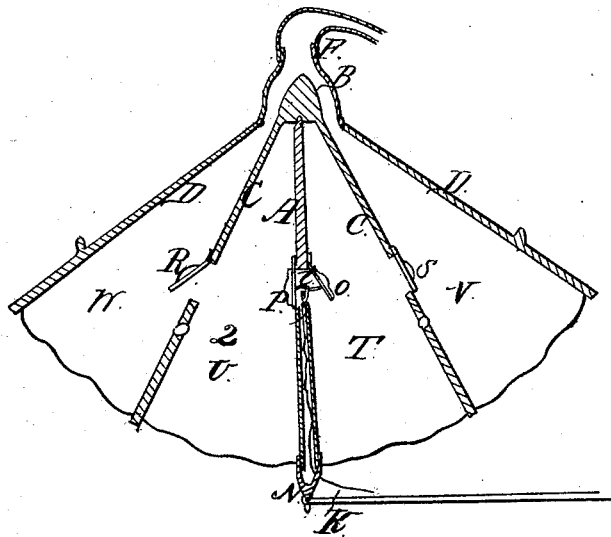


W. T. Barnes,

Bellows.

Nº 6,400.

Patented Apr. 24, 1849.



# UNITED STATES PATENT OFFICE.

WM. T. BARNES, OF BUFFALO, NEW YORK.

## BELLOWS.

Specification of Letters Patent No. 6,400, dated April 24, 1849.

*To all whom it may concern:*

Be it known that I, WILLIAM T. BARNES, of the city of Buffalo, county of Erie, and State of New York, have invented a new and improved bellows for forges, furnaces or any other purpose to which the bellows may be applied, which I term "William T. Barnes's double-acting vertical bellows;" and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 represents a perspective view. Fig. 2 represents a section of the bellows.

To enable others skilled in the art to make and use my bellows I will proceed with the description.

I make my head piece (marked in the drawings B) the common shape. The passages or holes in it through which the air must pass are made like a fork, the two holes meeting at the top or near the top. On the top of this head piece I place a movable cap-piece (marked in the drawings F) to which the conducting pipe may be attached. I attach to the said head piece four boards of the usual form, the two marked in the annexed drawings by C are made immovable by fastening them firmly in the head piece. In these stationary boards are valves of the usual form. These boards are secured by horizontal axletrees forming projections, which are secured in the frame work, (see letter H in the drawings).

The two external boards, marked in the drawing by letter D are fastened to the head piece by hinges in the usual way, and are movable. On each of these boards is a fender or cross piece of the usual form, by which, when necessary I secure the weights necessary to be placed upon these boards to regulate the blast. Between the two movable boards aforesaid is a space, in which I place the movable board (marked in the annexed drawing A) and fasten it to the head block with a hinge, permitting equal motion either way. Through this board is made a hole with a valve attached on each side to cover said hole, and these valves are fastened at a certain distance from each other by means of a fastening as shown at *i* and to this fastening is attached a regulating strap as shown at *j* which passes through the hole at the bottom of the board A and

there fastened. At the bottom of the center movable board A, commence holes, which continue till they reach the aforesaid hole in the center movable board A. The air passes through these holes or apertures into the bellows. An iron (N) is firmly secured at the bottom of this board on each side to which is attached the reach and lever (see drawings at K and L). I place between each pair of boards a rib, or hoop of the usual form. It is then covered with leather which between the boards C and D is put on and fastened in the usual way between the two immovable boards the leather is so put on as to allow the board A to move either way with freedom. The cap upon the head piece is made of copper (or may be of other metal).

The bellows to be used is placed and secured firmly on a frame, as described in the drawings annexed. The lever is fastened to the frame by a bolt.

By applying power to the lever L (which is continued by means of the reach K and the iron N) to the center movable board, the movable board is put in motion the air passing from the bottom of this board to the hole opening the valve O, and filling the chamber T, which grows larger and contains more air as the center movable board passes toward letter U, when this board moves back toward T, O closes and the valve P opens and the air fills the chamber V in the same manner as it did the chamber T. As the center board moves the valves R and S in the immovable boards open and shut alternately filling the chambers W and V from which it is forced through the head block and cap into a conductor.

The blast may be regulated by springs or weights attached to the outside boards. The air may be forced if desired from any part of the air chambers W and V. The air may also be received into the center chambers U and T through the immovable boards. This may be necessary when desirable to use the bellows for ventilation. The bellows may be operated upon by any of the known powers. Either of the internal movable boards may be dispensed with, by allowing the air to pass through a valve in the stationary board near the head piece into a chamber formed by leather or otherwise and from which it may be forced through the head piece. Both external movable boards may be dispensed with by forming

reservoir on the top. The bellows may also be covered with gutta percha properly prepared.

5 This double acting bellows can be operated upon with ease and when operated upon produces a steady blast. When used in the forge, the danger of fire by suction is obviated by the reaction of the center board.

What I claim and wish to secure by Letters Patent, is—

10 A double acting vertical bellows, acting on

the air by a center movable board, forcing it alternately each way through valves, and receiving wind through it at the same time—as herein described, using any combination 15 of movable boards, and arrangement of valves which will produce the desired effect.

WILLIAM T. BARNES.

Witnesses:

SELAH BARNARD,

WILLIAM B. OLDS.