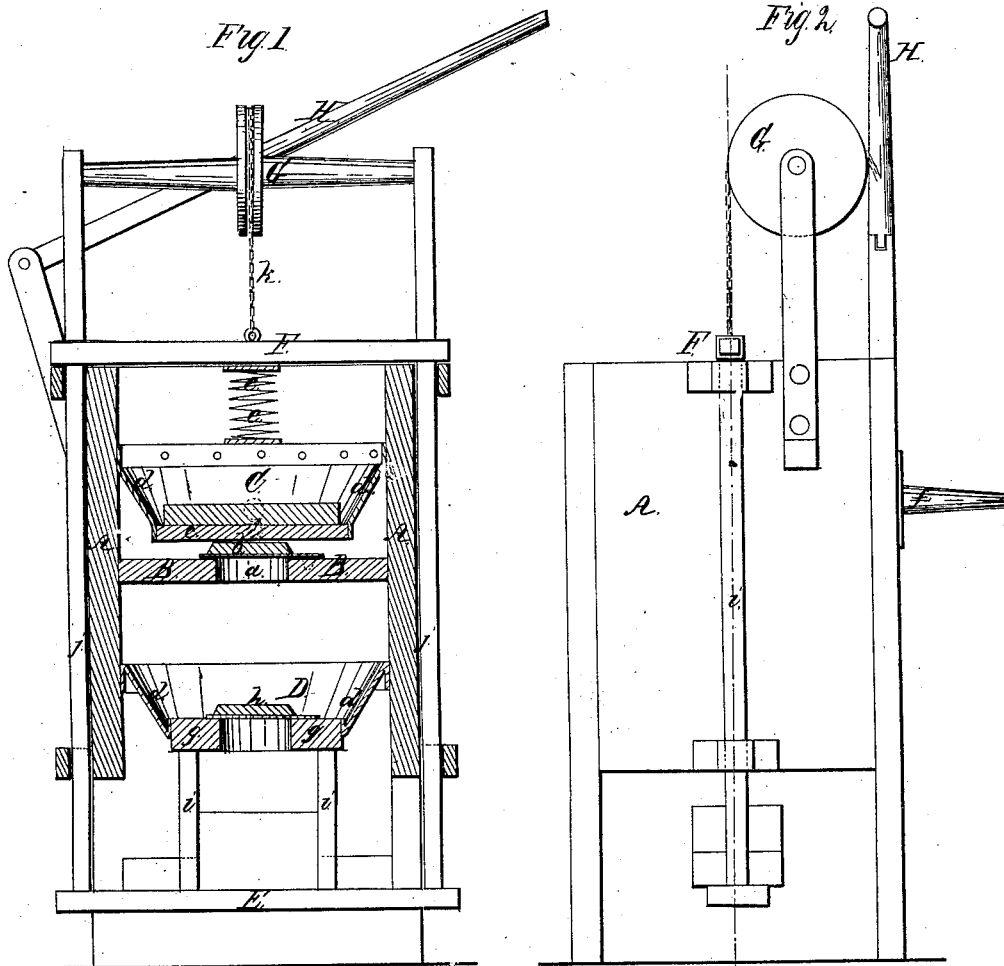


*G. W. Dalbey,*

*Bellows.*

*N<sup>o</sup> 50912.*

*Patented Nov. 14, 1865.*



*Witnesses;*

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# UNITED STATES PATENT OFFICE.

GEO. W. DALBEY, OF WHEELING, WEST VIRGINIA.

## IMPROVEMENT IN BELLOWS.

Specification forming part of Letters Patent No. 50,912, dated November 14, 1865.

*To all whom it may concern:*

Be it known that I, GEO. W. DALBEY, of Wheeling, in the county of Ohio and State of West Virginia, have invented a new and useful Improvement in Bellows; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical central section of my invention, taken in the line *x x*, Fig. 2. Fig. 2 is a side elevation of the same.

Similar letters of reference indicate corresponding parts.

My invention relates to certain improvements in that class of bellows used by smiths and in smelting-houses, &c.; and it consists, first, in the employment or use, in a suitable-shaped box, of two diaphragms or plungers, which are composed of a center-piece of wood or metal, attached to the sides of the box by gutta-percha or leather; second, in the use of a spiral spring applied to the upper plunger in such a manner as to give it a reacting force after the upper chamber has been filled with air; third, in the arrangement of a wheel suitably mounted on the box, over which passes a chain or rope having one end secured to the piston and the other to a suitable hand-lever for the purpose of rendering the operation of inflating the bellows easy; fourth, in the use of gutta-percha for a packing around the partition between the receiving and expelling chambers of the bellows; fifth, in the employment of a weighted piston for operating the lower plunger of the bellows, in combination with the wheel and hand-lever.

To enable others to understand my invention, I will proceed to describe it.

A represents the box or casing of the bellows, which may be of any desirable or proper shape. This box is divided into two compartments by a partition, B, as shown in Fig. 1. This partition is packed around its edges with india-rubber or gutta-percha, so as to be perfectly air-tight where it connects or is secured to the sides of the box. Through this partition there is made a hole, *a*, over or on the top of which there is arranged a valve, *b*, for clos-

ing the same to prevent any of the air passing from the upper chamber back into the lower one, but to admit air to the said upper chamber from that below.

At a suitable distance from the top of the box I secure the upper diaphragm or plunger, C. The said diaphragm consists of a weighted center-piece, *c*, having pieces of gutta-percha, india-rubber, leather, or other suitable material, *d*, attached to it all around and to the box all around, the depth of the said pieces being enough to allow the plunger a sufficient play up and down to perform its work.

Above the plunger C there are arranged spiral springs *e*, (two or more,) which bear against the said plunger and against a cross-piece on top of the box after the upper chamber has been filled with air, thereby forcing the air out through the nozzle or tuyere *f* (see Fig. 2) in a steady and equal current. This is the mechanism for expelling the air.

In the lower part of the box A, I arrange the plunger D, for drawing the air into the lower or receiving chamber and forcing it up into the upper or expelling chamber. It consists of a center piece, *g*, connected with the sides of the box in the same manner as the plunger C. The center portion of this plunger has a hole made through it and a valve, *h*, placed over or on top of it for closing it, so as to prevent the egress of any air received from the lower or receiving chamber through the said hole.

E *i i j j* F represent the device I denominate the "piston." Its office is to operate the lower plunger, D, of the bellows. This piston consists of two upright pieces, *i i*, connected to the plunger and secured to a cross-piece, E, which has attached to it two sliding rods, *j j*, one on each side, which are connected together by a cross-piece, F, at the top of the box. A chain or rope, *k*, is attached to the cross-piece F and passed over a wheel, G, which is arranged to work in suitable bearings in or above the box A, and connected to a lever, H, suitably arranged for operating the whole contrivance. The lower part of the piston arrangement is heavily loaded, so that it will descend as soon as released after being drawn up.

The operation is as follows: The lever H is grasped by the hands and moved up and down, which gives an oscillating motion to the piston

arrangement. The piston forces up the plunger D, and as the latter descends the valve *h* opens and permits the lower or receiving chamber to be filled with air. Now it ascends again, and the air thus compressed in the receiving-chamber opens the valve *b* of the partition and allows the air to rush into and fill the upper or expelling chamber and to force upward the plunger C. So soon as the plunger D descends again the valve *b* closes, and the plunger C, which is weighted, and which is caused to press down upon the air inside the upper chamber by the spiral springs *e*, forces the air out through the tuyere *f* in a steady and continuous stream.

Bellows made according to my invention can be cheaply constructed and easily operated, and they give a constant and continuous blast,

which is of essential importance in smelting-houses.

Having described my invention, what I claim therein as new, and desire to secure by Letters Patent, is—

The combination and arrangement of the parts, consisting of the box A, with its perforated and valved partition, the valve-plunger D, weighted plunger C, and springs *e*, the motion being derived through the lever H and frame E F *i j*, substantially as described and represented.

The above specification of my invention signed by me.

GEO. W. DALBEY.

Witnesses:

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