

J. T. OLINGER.
SMITHS' BELLOWS, &c.

No. 173,235.

Patented Feb. 8, 1876.

Fig. 1.

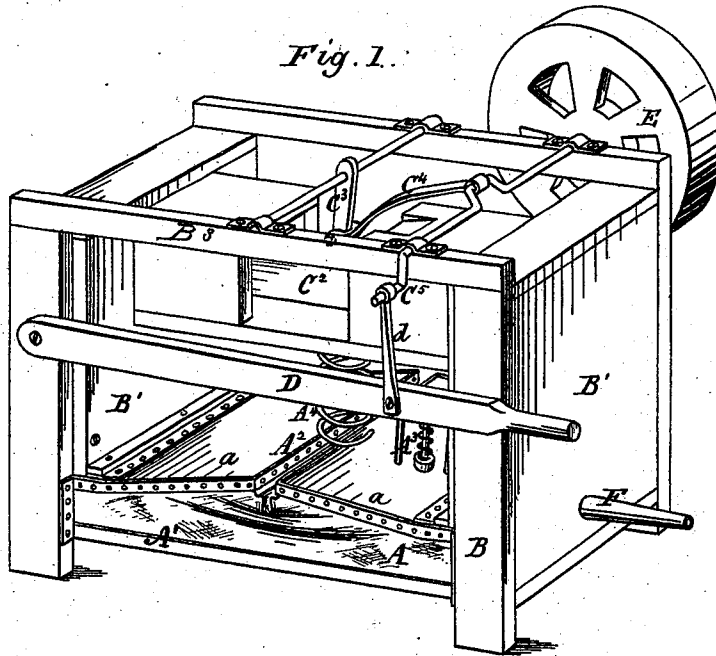
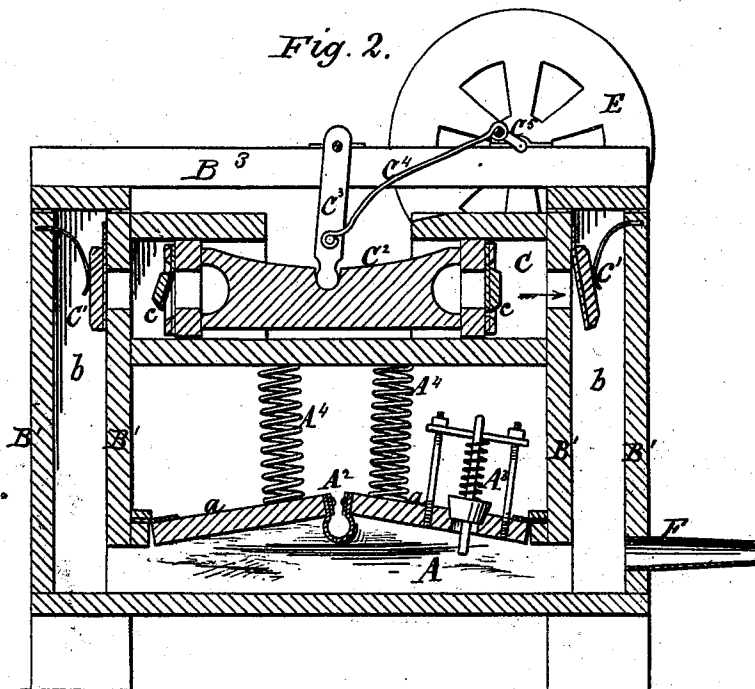


Fig. 2.



Witnesses:

A. Hart,
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Inventor:

James T. Olinger,
by J. S. Slater, Atty.

UNITED STATES PATENT OFFICE

JAMES T. OLINGER, OF AUBURN, VIRGINIA.

IMPROVEMENT IN SMITHS' BELLOWS, &c.

Specification forming part of Letters Patent No. **173,235**, dated February 8, 1876; application filed August 9, 1875.

To all whom it may concern:

Be it known that I, JAMES T. OLINGER, of Auburn, in the county of Montgomery and State of Virginia, have invented certain new and useful Improvements in Bellows for Smiths' Forges and similar uses; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawing, and to the letters of reference marked thereon, which form a part of this specification.

My invention consists in a bellows for smiths' forges and similar uses, designed to be operated either by hand-power or machinery, and so constructed and arranged as to be capable of supplying a steady blast of air of any required degree of force to one or more fires, and at the same time be free from all danger of bursting.

A more particular description of my invention is as follows:

In the drawing, Figure 1 represents a view in perspective of my improved bellows; Fig. 2, an upright longitudinal section of the same, showing its interior arrangement; and like letters of reference designate similar parts in each.

A represents the bellows proper, the bottom A¹ of which is formed of the floor of the frame B, upon which it rests. A² represents the diaphragm of the bellows, which is constructed of the two leaves or sections *a a*, hinged at their outer ends to the frame B at any proper distance above the bottom A¹ to give the requisite depth, thus forming the outer ends of the bellows, their inner ends being joined to each other by means of a strip of some flexible substance, such as leather or rubber, of a sufficient width to allow of a proper expansion of the bellows when inflated. This diaphragm is united to the bottom A¹ by means of sides, composed of leather or other suitable material, the same as in the case of an ordinary bellows.

A³ shows a spring-valve placed in the diaphragm A², designed to open when the air within has attained to a certain pressure, and thus prevent the bursting of the bellows by

allowing the surplus air to escape. A⁴ represents one or more springs, so arranged as to increase the force of the blast by pressure upon the diaphragm of the bellows, and to more readily exhaust the air when the motive power ceases. Weights may be substituted for these springs, as well as in place of the spring shown in connection with the safety-valve A³, if desired.

The frame B, which supports and forms a part of my improved bellows, consists of the ends B¹ B¹, which are so constructed as to leave a space, *b*, for the passage of air between the outer and inner surface of each, the bed or bottom A¹, the upright pieces B², and the cross-pieces B³, the whole so joined together as to render the frame capable of sustaining the machinery and strain necessary to the operation of the bellows. The frame may be made either movable or stationary, and out of any suitable material, and the form of its construction may be varied, according to its intended location or the fancy of the builder. I prefer to construct it of wood, and as shown in the drawing, as the cheaper and simpler method. The width of the frame may correspond with the width of the bellows, and the air-passages *b b* with the openings in the outer ends of the bellows A; or, if desired, the double ends B¹ B¹ may be dispensed with altogether, the outer ends of the bellows being closed, and pipes substituted to convey the air into it from the cylinders.

C C are cylinders resting upon the frame B above the bellows A, placed parallel and opposite to each other. They are supplied with spring-valves C¹ C¹, covering the openings by means of which the air passes into the passages *b b*, and thence into the bellows A. C² is a double-headed piston, also supplied with valves *cc*, working in the cylinders C C with a reciprocating motion, communicated to it by means of the bar C³, and the attachment C⁴ to the center of the crank-shaft C⁵. D is a lever, made fast to the frame at one end, and attached near the center to the outer end of the crank-shaft C⁵ by the rod *d*, and by means of the depression and elevation of which the machinery is set in motion.

When any other than hand-power is used

to work the bellows, the connection may be made with any of the appropriate and well-known mechanical attachments.

E is a balance-wheel fixed upon the shaft C⁵ to carry the crank past the center, and also communicate additional force by its impetus to aid in driving it.

By a simple piece of mechanism, well known among machinists, the balance-wheel may be so arranged as to be instantly thrown loose upon the shaft at the will of the operator, and thus immediately stop further inflation of the bellows until desired.

F is a tuyere, which may be placed at either end of the bellows and duplicated as often as is desirable, through which the air is driven into the forge; and by placing the tuyere at the end of a pipe, the air may be conducted to a forge placed at any reasonable distance from the bellows.

The mode of operation of my bellows is obvious. Upon setting the machinery in motion by means of the lever D or its mechanical equivalent, the piston C² moves in the direction of the arrow, Fig. 2, forcing open the valve in front, while the corresponding one at the opposite end is closed by its spring, thus driving the air into the passage *b*, whence it finds its way into the bellows A. On return of the piston the position of the valves is re-

versed, the air entering the bellows at the opposite end.

I am aware that the application of a cylinder and piston to the supplying of a smith's or other bellows with air has been before made, and therefore I do not claim it as new; but

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. A bellows consisting of the bed A¹, the double-hinged diaphragm A², composed of the leaves *a a*, the safety-valve A³, the springs A⁴, the air-passages *b b*, the cylinders C C, supplied with the valves C¹ C¹, the double-headed reciprocating piston C², supplied with the valves *c c*, and driven by the attachments C³ C⁴ to the crank-shaft C⁵, when the same are constructed and combined to operate substantially as and for the purposes set forth.

2. The combination, with a bellows for smiths' forges and similar uses, of the safety-valve A³ and the springs A⁴, when constructed and arranged to operate substantially as set forth.

In testimony that I claim the foregoing as my own invention, I have affixed my signature in presence of two witnesses.

JAMES T. OLINGER.

Witnesses:

W. S. SURFACE,
S. W. CROMER.