L. U. Stuart,

Bellows

No. 34,380. Patented Feb. 11, 1862.

Fig. 2.

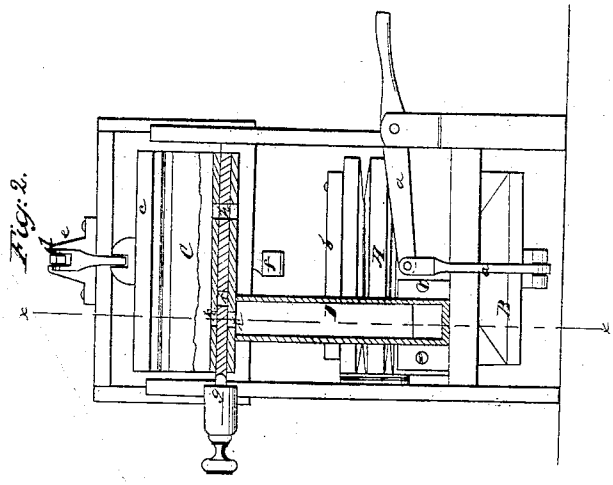
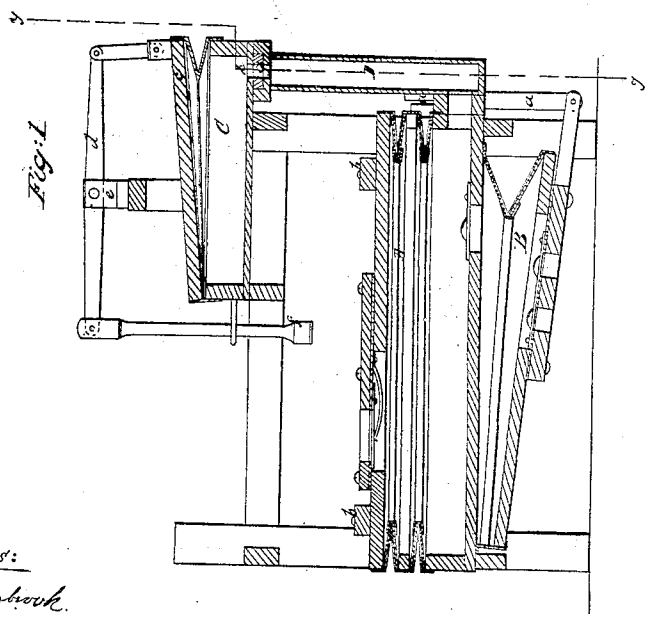


Fig. 1.



Witnesses:
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LEVI U. STUART, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN BELLOWS.

Specification forming part of Letters Patent No. **34,380**, dated February 11, 1862.

To all whom it may concern:

Be it known that I, LEVI U. STUART, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improved Attachment to Bellows; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 represents a longitudinal vertical section of my invention as applied to a bellows, taken in the plane indicated by the line *x x*, Fig. 2. Fig. 2 is a transverse vertical section of the same, the line *y y*, Fig. 1, indicating the plane of section.

Similar letters of reference indicate corresponding parts in the two figures.

The object of this invention, which is particularly applicable to organ-bellows, is to get a pressure upon the same by the use of a portion of the power of its own wind.

The invention consists in providing an additional reservoir of wind, with a movable part to be added to the ordinary bellows and connected with the same by a suitable tube or air-trunk in such manner that the wind from the bellows is admitted by the air-trunk into the interior of said reservoir, and so arranged that the pressure of the air acting on said movable part of the additional reservoir is transmitted to and made to act upon the top of the bellows, producing an additional pressure thereon.

To enable others skilled in the art to make and use my invention, I will proceed to describe it with reference to the drawings.

The bellows A and its feeder B are constructed in the ordinary manner, as is clearly shown in Fig. 1, the feeder being operated by a rocker or handle *a*, and the bellows being loaded with weights *b*, intended to produce a certain pressure on the air within the bellows. It is obvious that while the weights remain unchanged and the consumption of wind uniform the tension or pressure of the wind would likewise remain uniform, except so far as in bellows constructed on the plan in common use it may be varied by the greater inward pressure of the ribs as the bellows becomes more nearly closed. In cases, however, where the bellows is used to supply a blast of wind the consumption of which is variable, it becomes desirable to provide a means by which an additional pressure can be put upon the top of the bellows and removed again at pleasure. This purpose is effected by the additional reservoir C, which connects with the interior of the bellows A by the conductor or air-trunk D. This reservoir is provided with a movable part *c*, either in the manner shown in the drawings or in any other desirable way, said movable part being connected with the stationary portion of the reservoir by means of leather or other flexible material, or otherwise arranged in such a manner that the pressure of the air passing from the bellows through the air-trunk D into the reservoir shall act upon and produce a motion of the same.

A rocking lever *d*, which is fulcrated in a standard *e* over the reservoir C, connects at one end with the movable part *c*, and a rod passes down from its other end, terminating in a foot *f*. A draw-stop *g* enables the performer to admit the wind into the reservoir C, or cut it off from the same by means of the slider and aperture *k*, and another aperture *h*, which opens by the same draw-stop when *k* closes, and vice versa lets the wind escape from the reservoir as soon as the stop *g* is pushed in. Instead of the apertures *k* and *h* valves of any desired construction producing the same effect may be used.

The length of the foot *f* and the rise and fall of the bellows are so adjusted that when the draw-stop *g* is closed, and consequently no wind enters the reservoir C, the bellows rises and falls beneath the foot *f*, and when the bellows is full its top just reaches said foot. The rise and fall of the movable part of the reservoir is also so adjusted to the rise and fall of the bellows that the foot *f* will reach the top of the bellows when the reservoir is full and the bellows is empty.

The operation of my invention will be best understood by describing its application to the bellows of an organ. When the organist employs only a few stops, the action of the reservoir C is not required for the purpose of giving an extra pressure to the bellows additional to that given by the weights, and he then keeps the draw-stop *g* closed, and the pressure of the wind is due only to the weights

on the bellows; but when the organist employs many stops, particularly those that consume much wind, and especially when he uses the full organ, the wind is consumed so rapidly that a higher pressure is desirable, and he then draws the stop *g*. The first puff of wind rushes through the conductor D and fills the reservoir C. This will take place before the top of the bellows begins to rise, because the movable part *c* of the reservoir is not weighted, or, if at all, not nearly so much as the top of the bellows. The wind has only to overcome the weight and resistance of the materials of which the movable part of the reservoir is constructed and it will fly up with the greatest ease. This will act upon the rocking lever *d* and drive the foot *f* down upon the top of the bellows. If the blower further blows, the next portions of wind will raise the top of the bellows, carrying with it the foot *f*, and acting through the lever *d* upon the movable part of the reservoir, tending to close the same. Thereby the air in the reservoir is compressed, and as there is a free communication between the interior of the reservoir and of the bellows, the pressure of the air in the bellows, and consequently the force of the wind emanating from the same, is increased. The pressure exerted by the movable part of the reservoir on the top of the bellows is the same as the pressure of the air on said movable part, and will be in direct proportion to the size of said movable part. By drawing the stop *g* when the bellows is full of wind, the reservoir C can be brought instantaneously into action, and by pushing in said stop and opening the aperture *h* the wind escapes from the reservoir, and its action on the bellows immediately ceases.

It is obvious that this improvement is equally applicable to bellows of any other construction than that represented in the drawings; and the reservoir itself may be constructed in any desirable form, either square, polygonal, or cylindrical, and it may be located on the top of the bellows, as represented, or in any other convenient place, and the power from its movable part may be transmitted to the bellows and made to act upon the same in the manner described or in any other desirable manner. In all cases by the application of my invention a portion of the power of the bellows-blower, which is accumulated in the inside of the bellows in the shape of compressed air, is transferred to the outside of the bellows, so as to act on the top of the same as an additional weight to produce further and more powerful compression.

It will be observed that when in action the reservoir closes as the bellows opens, and vice versa. The action of its ribs, therefore, intending to compress the air more powerfully the nearer it is closed, will be in the inverse order of the like action of the ribs of the bellows, and in this way will tend to compensate for that action of the ribs of the bellows. In some cases it may be desirable to use my invention for the purpose of securing this compensation alone, in which case the draw-stop action may be dispensed with and the reservoir arranged to act whenever the bellows is inflated.

Having thus fully described my invention, I now declare that I do not claim anything as new in the bellows itself or in the draw-stop action, nor do I claim wind-reservoirs, except when arranged as I have described, nor any of the accompanying parts of bellows which have heretofore been in common use.

What I claim as new, and desire to secure by Letters Patent, is—

The arrangement of a reservoir C, or its equivalent, with a movable part *c*, in combination with an ordinary bellows A and connecting with the same by an air-trunk D or its equivalent, as hereinbefore described, and so arranged that the force or power of the said movable part *c* is transmitted to the bellows and made to act upon the same as an additional pressure.

LEVI U. STUART.

Witnesses:
WM. A. HARDENBROOK,
JAMES LAIRD.