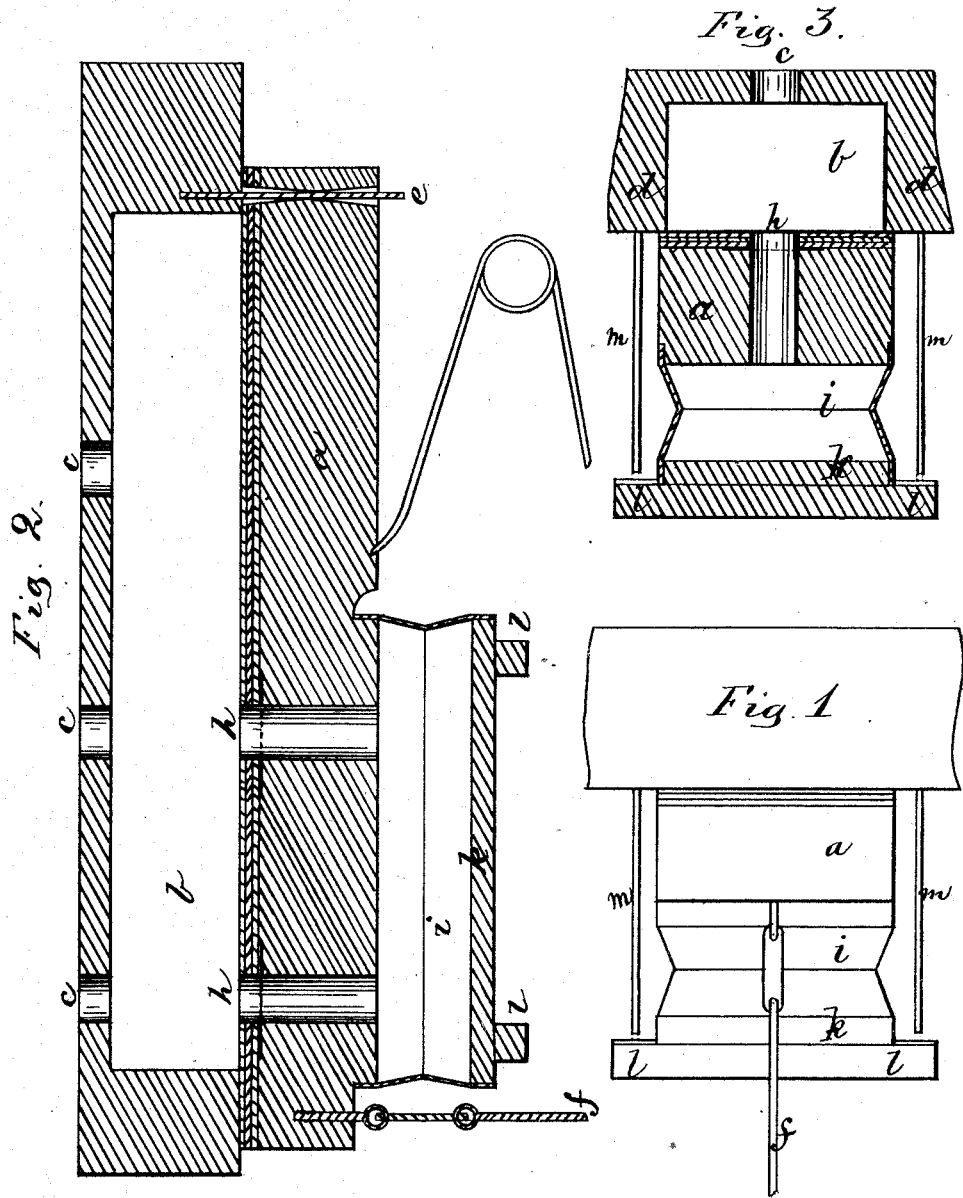


G. V. NORDSTROM & G. S. HUTCHINGS.  
Organ-Valve.

No. 164,585.

Patented June 15, 1875.



Witnesses:  
John R. Heard.  
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# UNITED STATES PATENT OFFICE.

GUSTAVUS V. NORDSTROM AND GEORGE S. HUTCHINGS, OF BOSTON, MASS.

## IMPROVEMENT IN ORGAN-VALVES.

Specification forming part of Letters Patent No. **164,585**, dated June 15, 1875; application filed March 22, 1875.

*To all whom it may concern:*

Be it known that we, GUSTAVUS V. NORDSTROM and GEORGE S. HUTCHINGS, both of Boston, in the county of Suffolk and State of Massachusetts, have jointly invented certain new and useful Improvements in Organ-Valves; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

Our invention relates to improvements in organ-valves, and consists in attaching to the underside of the valve a flexible bag that is provided with a bottom having projecting parts that are forced against stationary rods or projections secured to the partitions or other stationary part of the wind-chest, as soon as the pressure of the air is conveyed to the said wind-chest, by which arrangement the external pressure on the valve is greatly relieved, thereby facilitating the operation of the keys and pedals.

The aforesaid flexible bag is located beneath the valve, and communication is made from the bag to the channel above by the employment of suitable perforations through the valve, for the purpose of allowing the said flexible bag to expand and contract freely during the operation of the valve.

By this, our invention, we are able to operate the valves with a great deal less pressure on the keys and pedals than could be done if the ordinary solid valves were used.

On the accompanying drawing, Figure 1 represents an end view of our improvement. Fig. 2 represents a central longitudinal section, and Fig. 3 represents a cross-section, of the same.

Similar letters refer to similar parts wherever they occur on the different parts of the drawing.

*a* represents the valve, *b* the channel, *c c c* the openings to the organ-pipes, *d d* the partitions, *e* the fulcrum, and *f* the connection to the key or pedal in the usual manner.

The valve *a* is covered on the under side by a flexible bag, *i*, and its bottom *k*, the whole forming a perfectly air-tight connection to the

valve *a*. The flexible bag *i* is in open communication with the channel *b* by means of the perforations *h h* made through the upper part of the valve. The bag *i* is creased or folded on its sides and ends, as shown, so as to allow it to expand and contract laterally, as well as vertically, when subjected to internal or external pressure. The lateral contraction of the creased bag assists very materially in the opening of the valve. The bottom *k* of the flexible bag *i* is provided with projections *l l* that are brought in contact with the stationary rods *m m* when the bag is subjected to external pressure in the wind-chest, thereby tending to relieve the pressure on the valve with a force equal to the area of the bottom *k*, multiplied by the pressure per unit of such area. The projecting rods *m m* may to equal advantage be attached to the bottom *k*, or to the projections *l l*, and be forced against the partitions *d d*, or other stationary part, without departing from the spirit of our invention. We have found by practical tests that organ-valves made with our improvement are a great deal easier to operate than the ordinary ones, and this advantage is especially perceived when a number of keys and pedals are simultaneously operated. When the bag *i* is compressed, the air inside of it can freely escape through the perforations *h h* into the channel *b* above, and as soon as the valve is opened, the air is forced from the channel into the flexible bag *i*, by which the latter is expanded to its original position.

Having thus fully described our invention, we wish to secure by Letters Patent, and claim—

The improvement in organ-valves, as herein described and shown, consisting of the valve *a*, perforations *h h*, flexible bag *i*, bottom *k*, and the operating rods *m m*, as and for the purpose set forth.

In testimony that we claim the foregoing, we have hereunto set our hands this 15th day of March, 1875.

GUSTAVUS V. NORDSTROM.  
GEORGE S. HUTCHINGS.

Witnesses:

ALBAN ANDRÉN,  
JOHN R. HEARD.