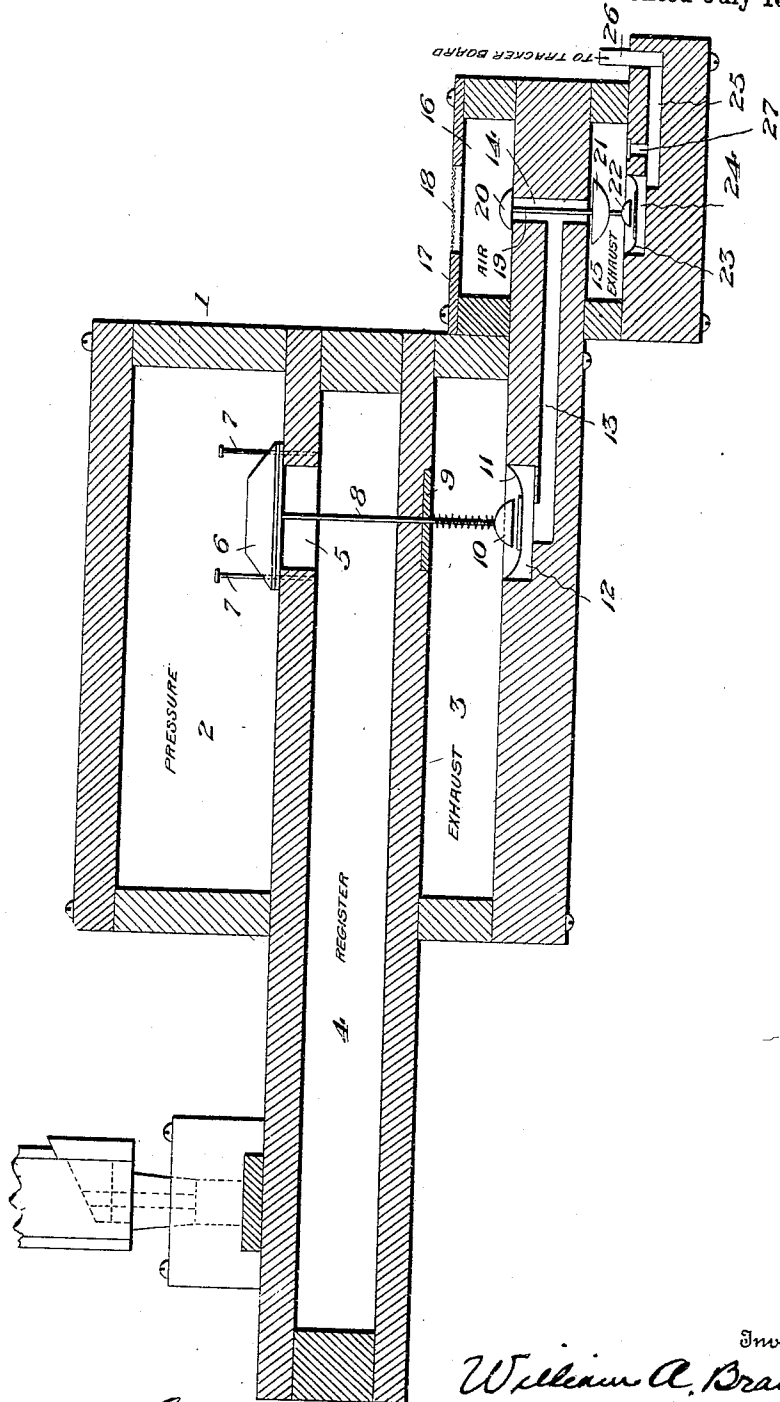


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 SUCTION WIND CHEST FOR SELF PLAYING ORGANS AND OTHER MUSICAL INSTRUMENTS.
 APPLICATION FILED APR. 22, 1909.
 964,607. Patented July 19, 1910.



Witnesses

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By

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SUCTION WIND-CHEST FOR SELF-PLAYING ORGANS AND OTHER MUSICAL INSTRUMENTS.

964,607.

Specification of Letters Patent.

Patented July 19, 1910.

Application filed April 22, 1909. Serial No. 491,615.

To all whom it may concern:

Be it known that I, WILLIAM A. BRAUER, a citizen of the United States, residing at North Tonawanda, county of Niagara, and State of New York, have invented certain new and useful Improvements in Suction Wind-Chests for Self-Playing Organs and other Musical Instruments, of which the following is a specification.

This invention relates to suction wind chests for self-playing organs and other musical instruments.

The present invention has for its object the provision of a novel wind chest, in a self-playing organ or other musical instrument, which will be provided with a novel arrangement of valves and diaphragms whereby suction alone, controlled by the admission or cut-off of the atmosphere through the perforations of the music sheet, will be utilized to cause the admission or cut-off of air to or from the registers for the pipes, and by which the pipes may be sounded instantly when the music requires that they be voiced.

In carrying out the present invention, I utilize an air pressure chamber, valves to admit the air pressure from the chamber aforesaid to the registers, a suction chamber, diaphragms for operating the respective valves which are subject to the exhaust action of the suction chamber, and a novel valve arrangement for controlling the admission of air to the diaphragms aforesaid and which is subject to suction control and to the unbalancing of the suction by the admission of air through the perforations of the music sheet, as will more fully appear from the following specification, while the novel features of the invention are recited in the claims hereto appended.

The accompanying drawing shows so much of a suction wind chest embodying the present invention as is necessary to a complete understanding thereof.

The wind-chest 1 is of a suitable length and size as is requisite to accommodate the different valves and pipes employed in the organ or instrument, the same having a pressure chamber 2 and an exhaust chamber 3 which are respectively in communication with a suitable source of pressure supply

and a suitable source of air exhaustion. There are as many registers 4 as are necessary to control the various pipes, these registers being independent air conduits which are in communication with the chamber 2 by openings 5.

The various openings 5 are covered by valves 6 slidable on suitable guide pins 7 and provided with stems 8 which pass through washers 9 of metal or fiber which snugly fit the stems 8, permitting free reciprocation thereof without permitting the exhausted condition of chamber 3 from being communicated to the registers 4. The valve stems 8 carry buttons 10 which are in position to be engaged by diaphragms 11. Each diaphragm 11 is adapted to collapse into a chamber 12 which is in communication with a passage 13 of sufficient size to admit the requisite volume of air to quickly bring about an unbalanced condition of the diaphragm 12 so that the exhausted condition of the chamber 3 causes it to be moved upwardly into the chamber to open the valve 6 when a perforation of the music sheet is opened through the tracker board admitting atmospheric pressure to the under side of diaphragm 11, as will presently appear. Each passage 13 communicates with a passage 14 which opens at one end into a supplemental suction or exhaust chamber 15 and at its other end into a chamber 16 which is in communication with the air so that it will receive the ordinary atmospheric pressure. To exclude dust, the chamber 16 is provided with a plate 17 having a wire covered opening 18. Located in each passage 14 is a valve stem 19 which carries on one end a valve button 20 to close the mouth of the passage which opens into the air chamber 16, while the opposite end of the stem carries a larger valve 21 adapted to close the passage 14 where it opens into the chamber 15. The stem 19 carries another button 22 positioned to be engaged by a diaphragm 23 adapted to collapse into a chamber 24 which is in communication by a passage 25 with a pipe 26 leading to a perforation in the tracker board. The pipe 25 has a by-pass passage 27 leading to the chamber 15.

Under normal conditions, the atmospheric pressure being greater than in the exhaust

chamber 15, valve 20 will be closed and the suction prevailing in the chamber 15 extends through the passages 14 and 13 to the chamber 12 so that the diaphragm 11 will remain collapsed in said chamber 12. The suction in chamber 15 is also communicated via the passages 27 and 25 to the chamber 24 and hence diaphragm 23 remains collapsed into chamber 24. When, however, the pipe 26 is opened to the atmosphere by the registering of a perforation in the music with the port in the tracker board which controls said pipe, the atmospheric pressure is admitted to the chamber 24 causing the valve 21 to close and opening the valve 20, thereby admitting the air pressure by way of the ports 14 and 13 to the chamber 12, which atmospheric pressure, aided by the suction in the chamber 3, causes the diaphragm 11 to be instantly drawn upwardly thus lifting the valve 6 against the pressure in chamber 2 and admitting the air pressure from chamber 2 to the register pipe 4 and causing the organ pipe to sound. As soon as the port in the tracker board controlling the pipe 26 is closed by the music sheet covering it, the suction in the chamber 15 and passages 27, 25, and chamber 24 immediately causes the diaphragm 23 to collapse into chamber 24 by reason of the pressure of the air on the valve 20 and the suction then extends into passage 13 and chamber 12 and because of the pressure on the valve 6 and the aid of a suitable spring adapted to close valve 6 the diaphragm 11 collapses into the chamber 12 and valve 6 closes port 5.

It will be seen that in the present invention, instead of causing the outer air admitted through the perforation in the music sheet to be the prime means for operating the diaphragm 11, I utilize the said admission of air through the music sheet to close a valve which is otherwise maintained in open condition by the use of suction and to admit the outer air through a port which can be made sufficiently large so that it will admit a large enough volume of air to instantly operate the diaphragm and valve which control the given organ pipe as it has been found that in some instances there is not sufficient air passing through the opening in the tracker board to cause proper actuation of a valve controlling the admission of air to an organ pipe. Also, in the present invention, the control of the valves for the registers is solely by suction, influenced, at the desired times, by the access of outer air pressure to the diaphragms controlling said valves.

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

1. In a suction windchest for organs and other air operated musical instruments, the

combination with a register, of an air pressure chamber having an opening in communication with the register, and an exhaust or suction chamber, of a valve controlling the opening aforesaid, a diaphragm subject to the action of the exhaust chamber and adapted for operating the valve, a passage for admitting air to the diaphragm, a valve controlling said passage, a second suction chamber, with which the passage aforesaid is in communication, a valve controlling such communication which is adapted for cooperation with the controlling valve aforesaid, a diaphragm subject to the action of the suction chamber last-named and adapted for operating the last-named valves, controlling means for the instrument, and an air conduit controlled by said controlling means and in communication with both sides of the diaphragm last-named.

2. In a suction wind chest for organs and other air operated musical instruments, the combination with a pressure chamber, a register in communication therewith, a suction chamber, a valve controlling the admission of the air to the register, a diaphragm for operating the valve which has but one side in communication with the suction chamber aforesaid, another suction chamber in communication with the other side of said diaphragm, and means for cutting off the exhaust or suction from the said other side of the diaphragm and for admitting air thereto.

3. In a suction wind chest for organs and other air operated musical instruments, the combination with a pressure chamber, of a register in communication therewith, a suction chamber, a valve controlling the admission of air to the register, a diaphragm for operating the valve which has but one side exposed to the suction chamber aforesaid, another suction chamber in communication with the other side of the aforesaid diaphragm, an air chamber in communication with the diaphragm aforesaid, a double valve, one of whose parts controls the passage from the air chamber to the diaphragm, and the other part controlling the passage from the last-named exhaust chamber to the aforesaid diaphragm, a diaphragm exposed to the exhaust chamber last-named and cooperating with the valves last-named, and a conduit for supplying air to the diaphragm last-named and to the exhaust chamber last-named.

4. In a suction wind chest for musical instruments, the combination with a suction chamber, of a stem, means controlled by said stem for controlling the operation of the musical instrument, a diaphragm cooperating with the stem and having but one side exposed to the suction chamber aforesaid, another suction chamber in communication with the other side of the aforesaid diaphragm, an air chamber in communication

with the diaphragm aforesaid, a double
valve, one of whose parts controls the pas-
sage from the air chamber to the diaphragm,
and the other part controlling the passage
5 from the last-named suction chamber to the
aforesaid diaphragm, a diaphragm exposed
to the exhaust chamber last-named and co-
operating with the valves last-named, and
a conduit for supplying air to the diaphragm

last-named and to the exhaust chamber last- 10
named.

In testimony whereof, I hereunto affix my
signature in presence of two witnesses:

WM. A. BRAUER.

Witnesses:

W. D. TRIMBLE,
C. S. ORTON.