

UNITED STATES PATENT OFFICE.

FREDERICK SUMNER BRASOR, OF MARIETTA, OHIO, ASSIGNOR OF ONE-THIRD TO FRANK ASHLEY PILCHER AND ONE-THIRD TO SAMUEL S. PORTER, OF MARIETTA, OHIO.

MUSICAL INSTRUMENT.

No. 829,383.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, FREDERICK SUMNER BRASOR, a citizen of the United States, residing at Marietta, in the county of Washington and State of Ohio, have invented certain new and useful Improvements in Musical Instruments, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to musical instruments, and particularly to those which are operated through the medium of air, known in the art as "pneumatic" devices. My invention relates particularly to positive control and preferably is applied throughout the whole range of instruments which are in any wise mechanically struck or exposed to pressure in order to produce tones. In using the principle in a piano-player operated by a perforated roll I have a box with a middle board down its length, a valve in this middle board for every note that is to be played, and a tube to the corresponding pneumatic from every valve. Upon the middle board I provide suction and below the middle board I provide blast. I then run tubes one way to the tracker-board to control the valves and, as already stated, from the valves to the pneumatics to control the key-strikers. By this means I am enabled to dispense with all the primaries and their accompanying complications which are found in many of the piano and organ players in use prior to my application. It is my intention to have high and low pressure in the suction-box of my main movement all the time, providing a stop action and valves controlled thereby to let one or the other pressure into the said box.

My invention will be fully understood from the accompanying specific description and drawing, in which the figure shown is a sectional view through the suction and blast boxes and showing in full lines the valve in normal or unvented position and in dotted lines the valve in the opposite or vented position.

Referring to the drawing, which illustrates the principles of my invention, 1 represents a rectangular box divided into two compartments 2 and 3, which will be designated hereinafter as the "suction" and "blast" boxes. These boxes or compartments are separated by a partition 4, which is provided with a

recess 5, which connects by narrow openings 6 and 7, respectively, with the suction and blast boxes and in which a two-part valve 8 is adapted to operate, one part to close the exit from the suction-box and the other part to close the exit from the blast-box. Communicating with the recess 5, and consequently with the blast and suction boxes, according to the position of the valve 8, is a tube 9, held with one end securely fastened in a conduit 10, which connects the aperture 5 and tube 9. At the opposite end of the tube 9 is a pneumatic 11 of any suitable type which is adapted to operate upon the pipe, reed, or striker, as the case may be.

The blast-box is provided on its inside with a diaphragm 12, to which is connected a rod 13 and which in turn is connected to the valve 8. The compartment 14, which is made by this diaphragm, has communication with the blast-box 3 by bleeding-duct 15 and is connected to the key or tracker board 16 by a tube 17, the function of which will be described later on.

The numerals 18 and 19 represent, respectively, the suction and blast pipes which make communication with the suction and blast boxes 2 and 3 from the suction and blast bellows.

It will be clearly understood that I may use the diaphragm 12 on the outside of the suction-boxes and have the suction and blast box transposed. This construction would make the operation the reverse of that shown and the diaphragm 12 would be normally collapsed instead of expanded.

In the operation of the device, the valve 8 is normally made to close the opening 6 by reason of the blast of air from the pipe 19 working back of diaphragm 12 through bleeding-duct 15. Now when the tube 17 and the compartment 14 are vented at the key or tracker board the blast in compartment against the diaphragm more than equals the pressure exerted on the valve and the diaphragm is depressed, carrying with it the valve-rod 13 and valve 8, thus closing the opening 7, and cutting off the blast to the pneumatic 11 and allowing the air therein to be sucked out. This action is very rapid, and the pneumatic is closed with a snap. When the diaphragm is returned its normal position, the blast in chamber 3, acting through the

bleeding-duct 15, restores the valve to its normal position.

The operation in an instance where the blast and suction boxes are reversed as to the position shown in the figure would be the same as regards pneumatic 11; but the normal position of diaphragm 12 would be the opposite to that shown in full lines in the figure. When the tracker-board is vented by reason of one of its ports coming in communication with an aperture in the note-sheet, the pressure of the outside atmosphere would pass through tube 17 into compartment 14, thus causing the diaphragm 12 to rise, carrying with it the rod 13 and valve 8, the latter being made to cover the port 6, thus shutting off blast from pneumatic 11 and allowing the suction from compartment 3 to collapse said pneumatic 11 through tube 9.

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

1. A device of the class described comprising a suitable source of pressure, suction means, a single pneumatic connected to said pressure and said suction means, means for controlling said pressure and said suction, and means for alternately releasing the pressure and suction whereby they can act successively on the pneumatic.

2. A device of the class described comprising a suitable source of pressure, suction means, a pneumatic having a single connection with said pressure and said suction, a pressure-operated device, and a valve controlled by said pressure-operated device whereby the pressure and suction are adapted to alternately act on said pneumatic.

3. A device of the class described comprising a suitable source of pressure, exhaust means, a single pneumatic directly connected

to said exhaust and said pressure, a pressure-operated diaphragm, and a double-acting valve connected to and operated by said diaphragm whereby it is alternately operated to admit pressure and allow exhaust.

4. In an automatic piano-player, the combination with a suitable receptacle, of pressure means connected to said receptacle, exhaust means connected to said receptacle, a hollow partition dividing said receptacle, exhaust and pressure ports in said partition, a valve adapted to alternately close each port, and means for automatically operating said valve.

5. In a device of the class described, the combination with a suitable receptacle, of pressure means connected to said receptacle, exhaust means connected to said receptacle, a hollow partition dividing said receptacle, exhaust and pressure ports in said partition, a valve adapted to alternately close each port, and a pressure-operated diaphragm connected to said valve and adapted to operate the same.

6. In a device of the class described, the combination with a suitable receptacle, of pressure means and exhaust means both connected to said receptacle, a partition dividing said receptacle, exhaust and pressure ports in said partition, a valve adapted to control the pressure and the exhaust, a pressure-operated diaphragm connected to said valve and adapted to operate same, and a single pneumatic operated by said pressure and said exhaust to alternately expand and contract as the valve is operated.

In testimony whereof I affix my signature in presence of two witnesses.

FREDERICK SUMNER BRASOR.

Witnesses:

A. D. FOLLETT,
S. B. HOOPER.