

998,313.

Fig. 1.

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UNITED STATES PATENT OFFICE.

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PNEUMATIC-ACTION FOR PIANOS.

998,313.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, PETER WIGGEN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Pneumatic-Actions for Pianos, of which the following is a specification.

This invention relates to improvements in the construction of pneumatic actions used in that type of musical instruments which are operated pneumatically, and particularly pianos, and in the present instance is shown in conjunction with a part of a piano action of the ordinary or well known construction, and it consists in certain peculiarities of the construction novel arrangement and operation of the various parts thereof, as will be hereinafter more fully set forth and specifically claimed.

The principal object of the invention is to provide the pneumatics of the action with valves of such novel and peculiar construction that they will be supported in such a manner as to be practically without friction in their operation, and consequently very sensitive and easily and accurately actuated by the slightest as well as greater air-pressure.

Another object of the invention is to provide a pneumatic action which shall be simple and inexpensive in construction, compact in form, so as to be readily positioned above the key-board of the piano, and effective in operation.

Other objects and advantages of the invention, will be disclosed in the subjoined description and explanation.

In order to enable others skilled in the art to which my invention pertains, to make and use the same, I will now proceed to describe it, referring to the accompanying drawings, in which—

Figure 1, is a view partly in section and partly in elevation of a pneumatic action embodying the invention, the sectional portion being taken on line *a—a* of Fig. 3, looking in the direction indicated by the arrows. Fig. 2, is an enlarged plan sectional view taken on line 2—2 of Fig. 1, looking in the direction indicated by the arrows. Fig. 3, is a vertical sectional view taken on line 3—3 of Fig. 1, looking in the direction in-

dicated by the arrows. And Fig. 4, is an enlarged view of one of the valves of the pneumatics and a portion of the support therefor.

Like numerals of reference, refer to corresponding parts throughout the different views of the drawing.

The power pneumatics are designated by the reference numeral 9, and are usually arranged one above the other as shown in Fig. 1, and located within the piano casing just above the key-board. The pneumatics are the same in construction, and a description of the construction of one, will suffice. Each pneumatic consists of an upper board 10, and a lower board 11, hinged thereto, and said boards are connected along their edges by a collapsible diaphragm 12, of any suitable material, and in the ordinary manner. The upper boards 10, of the pneumatics are secured to horizontally disposed supports or partitions 13, which are secured at one of their edges to an upright valve board 14, which is provided with seats and ports for the valves and passage of air respectively. The lower board 11, is connected by a rod 15, to the wippen 16, of the piano action, which may be of the ordinary or any well known construction, which will not herein be necessary to describe, a portion of the same, however, being illustrated in order to show the connections between it and the pneumatics. The valve-board 14, is provided with a valve chamber 17, which communicates through a port 18, with a channel 19, in the support or partition 13, which leads through the upper board 10, into the pneumatic. The valve chamber 17, is furnished with opposing valve seats 20, and 21, the latter seat or opening being formed in a piece 22, secured to the front surface of the valve board, and communicates with the suction chamber 23, while the former seat or opening communicates through an opening 24, in the partition 13, with the atmosphere.

Vertically supported in front of the valve board 14, and piece 22, thereon, and at a suitable distance therefrom, to form the suction chamber 23, is a board 25, which has a channel 26, communicating at its upper end with a channel 27, formed in a horizontally disposed board or piece 28, which

is supported on the upper partition or support 13, and at a distance therefrom as shown, to form a part of the suction chamber 23, which extends over the upper portion of the valve board. The lower end of the channel 26, communicates with a recess or seat 29, formed on the inner portion of the board 25, opposite the valve seat 21. The seat 29, is covered, by means of a diaphragm 30, to which is connected a double valve 31, and 32, which valves are located in the chamber 17, and are mounted on a stem 33, which rests at one of its ends against the diaphragm 30, and is supported by an arm 34, which is hinged or flexibly secured at its upper end by means of a piece of leather 35, or other suitable material, to the strip 22 or other suitable support. By thus supporting the double valve 31, and 32, it is apparent that a pendulum like, or vibratory support is afforded, which will permit the valves to be actuated by the slightest air-pressure.

The upper surface of the upper support 13, is provided with a seat or recess 36, which is covered by a diaphragm 37, connected to a double valve 38, and 39, which control openings in the channel 27. Leading from the seat or recess 36, is a passage 40, which communicates through a tube 41, with a channel in the tracker board 42, over which channel is passed the perforated sheet 43, which is supported on rollers 44, therefor. Communicating with the passage 40, at one of its ends, and at its other end with the suction chamber 23, is an opening 45, which has at its upper end a strip 46, with a very small opening to act as a bleed for the device.

From the foregoing and by reference to the drawing, it will be readily understood and clearly seen that when the passage in the tracker board is opened by the passage of a perforation of the sheet 43, atmospheric pressure will be admitted under the diaphragm 37, and will raise the double valve 38, and 39, allowing atmospheric pressure to pass into the channel 27, and from thence into the channel 26, and against the diaphragm 30, against which the stem of the double valve 31, and 32, rests. The valve 31, controls the flow of air from the pneumatic through the passages 18, and 19, into the valve chamber 17. When atmospheric pressure is admitted into the channels 27, and 26, the valve 32, is opened and valve 31, is closed, which operation draws the air out of the pneumatic through the passages 18, and 19, into the suction chamber. When the opening in the tracker board is closed, the double valve 38, and 39, drops to the normal position shown, exhausting the pressure in the channels 27, and 26, which restores the double valves 31, and 32, to the normal position shown, cutting off the ex-

haust from the pneumatic, and connecting the same with the atmosphere, thus allowing the pneumatic to return to its normal position.

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

1. In a pneumatic action, the combination with a valve-board having a valve chamber in communication with an actuating pneumatic and also adapted to communicate with the atmosphere, of a pneumatically operated diaphragm located in alinement with the said valve chamber and at a distance therefrom, a horizontally disposed valve stem extended through the valve board and into the chamber thereof and adapted to rest at one of its ends against the diaphragm, an arm hinged at its upper end to a support above the valve chamber and connected at its other end to the valve stem near the end thereof adjacent to the diaphragm, and a valve located on said stem within the valve chamber and adapted to open and close the same at its end adjacent to the diaphragm.

2. In a pneumatic action, the combination with an actuating pneumatic, of a support therefor provided with an air-passage communicating at one of its ends with the pneumatic, a valve-board mounted near said support and having a valve chamber in communication with the air-passage of the support, and also in communication with the atmosphere, a suction chamber communicating with the valve chamber, a channel adapted to intermittently communicate with atmospheric pressure, a diaphragm constituting a part of the wall between the suction chamber and said channel and located in alinement with the valve chamber, a valve stem adapted to rest at one of its ends against the diaphragm and extended into the valve chamber, an arm hinged at one of its ends to a suitable support above the valve chamber and connected at its other end to said stem near the end thereof adjacent to the diaphragm and a double valve located on the valve stem within said chamber.

3. In a pneumatic action, the combination with a frame-like structure having a suction chamber, a valve chamber communicating therewith and a channel adapted to communicate with atmospheric pressure, a diaphragm constituting a part of the wall between the suction chamber and said channel and located in alinement with the valve chamber, a valve stem resting at one of its ends against the diaphragm and extended into the valve chamber, an arm hinged at one of its ends to a support and connected at its other end to the valve stem near the end thereof adjacent to the diaphragm, and a valve on the valve stem within the valve casing.

4. The combination with a pneumatically

operated diaphragm, of a valve stem resting at one of its ends against the same, an arm hinged at one of its ends to a support and connected at its other end to said stem
5 near the end thereof adjacent to the diaphragm, and a valve on said stem adapted to open and close a port or seat and in con-

junction with the valve stem to hold said arm normally out of plumb.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."