No. 648,277. Patented Apr. 24, 1900.

B. MILLER.

PNEUMATIC ACTION FOR MUSICAL INSTRUMENTS.

(Application filed Oct. 24, 1898.)

(No Model.)

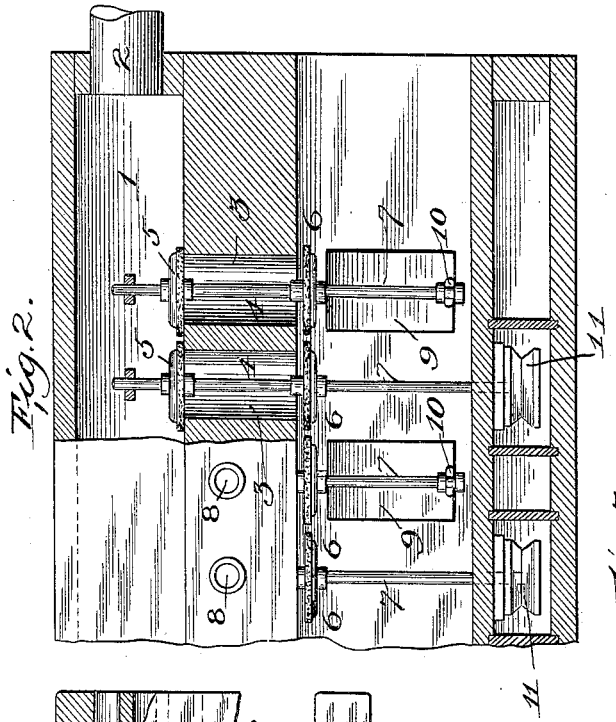

Fig. 2.

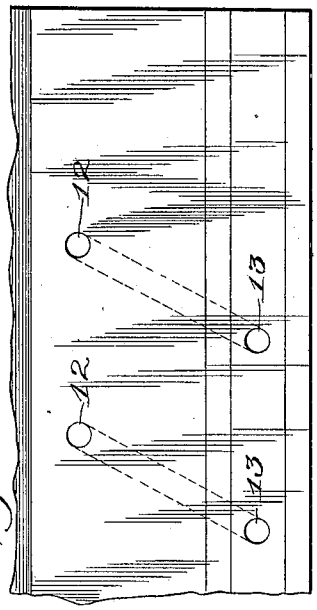

Fig. 3.

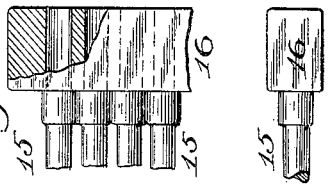

Fig. 5.

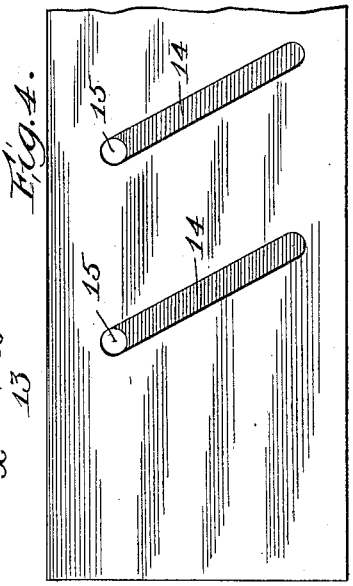

Fig. 4.

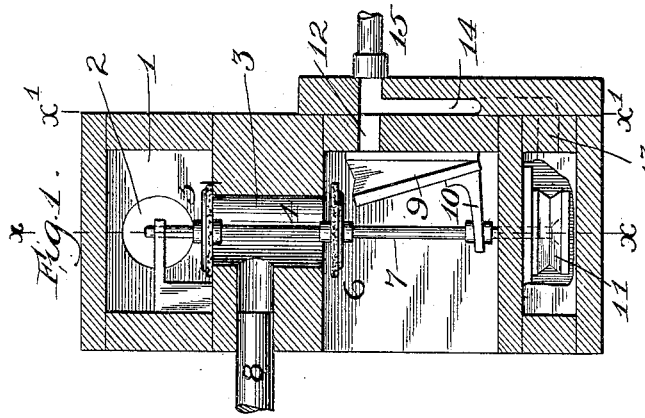

Fig. 1.

Witnesses:
Harry D. L. White,
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Inventor:
Bruce Miller,
By Robert Burns Atty.

UNITED STATES PATENT OFFICE.

BRUCE MILLER, OF CHICAGO, ILLINOIS.

PNEUMATIC ACTION FOR MUSICAL INSTRUMENTS.

SPECIFICATION forming part of Letters Patent No. 648,277, dated April 24, 1900.

Application filed October 24, 1898. Serial No. 694,369. (No model.)

To all whom it may concern:

Be it known that I, BRUCE MILLER, 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 Musical Instruments; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification.

The present invention relates to that type of musical instruments in which the series of valves controlling the individual conducting ducts or passages of the series of note-producing means of the musical instrument are individually operated by pneumatic means to produce the desired harmony.

The object of the present invention is to provide in connection with such type of pneumatic action a simple, durable, and efficient pneumatically-actuated means for opening the series of individual valves of a musical instrument and in which the series of individual controlling-valves are arranged in connected pairs, and each pair in turn comprising a valve mechanism operating to open its valve by exhaust or suction, and another valve mechanism operating to open its valve by pressure. Both of said valve mechanisms have a communication in common with a single flexible or other tubular connection that extends to a point convenient to the operator, so that by blowing into said connection in a manner similar to an ordinary mouth-harmonica one of said valves will be opened to produce a musical note, while by a sucking or exhaust on said tubular connection the other valve will be opened to produce another and different musical note. In either case one valve mechanism will be dormant while the other is active, and vica versa. Usually the above-described series of single flexible or other tubular connections will be attached to a bar-shaped mouthpiece having a corresponding series of orifices or passages communicating with the bore of such tubular connections. Said mouthpiece is adapted to be held in the mouth of the operator, who by blowing or sucking upon the passages or orifices in proper succession and in manner similar to playing upon an ordinary mouth-harmonica will open in corresponding sequence the series of valves of a musical instrument of any desired nature to produce therefrom the desired tune or harmony, all as will hereinafter more fully appear, and be more particularly pointed out in the claims. I attain such objects by a construction and arrangement of parts substantially as shown in the accompanying drawings, in which—

Figure 1 is a transverse sectional elevation of a valve-box and connections, illustrating the present invention; Fig. 2, a detail longitudinal section at line $x\,x$, Fig. 1, with a portion in rear elevation; Fig. 3, a detail front elevation of the valve-box with the attaching-board of the flexible tubular connections removed, such view being along the division-line $x'\,x'$, Fig. 1; Fig. 4, a detail rear elevation of said attaching-board, illustrating the oblique connecting-passages of the present invention, and Fig. 5 a detail sectional plan of the mouthpiece.

Similar numerals of reference indicate like parts in the several views.

Referring to the drawings, 1 represents the main longitudinal supply-chamber of the valve-box, preferably arranged in the top portion of said box; 2, the induction or supply connection, by which air under pressure is introduced into the main supply-chamber 1 from a main bellows or other suitable source of pressure-supply; 3, a series of vertical outlet-passages from the main supply-chamber 1; 4, a series of valves controlling the outlet-passage 3, each valve comprising an upper and lower valve-head 5 and 6, connected together by a valve-stem 7, as usual in pneumatic organ-actions; 8, the series of individual tubular connections that extend from the outlet-passages 3 to the reeds of a pipe-organ or to the note-producing means of any other suitable musical instrument.

9 represents a series of individual suction or exhaust pneumatic engines or bellows that have operative connection by a finger 10 with alternate valve-stems of the series of valve-stems 7.

11 represents a series of individual pressure-pneumatic engines or bellows that have operative connection in a direct manner with

the other alternate valve-stems of the series of valve-stems 7.

12 represents a series of passages communicating with the series of suction or exhaust bellows 9. 13 represents a similar series of passages communicating with the series of individual chests that incloses the series of pressure-bellows 11, so that with a pressure of air within any one of said chests the pressure-bellows 11 inclosed therein will collapse, and therefore lift the valve-spindle 7, the end of which is seated in the lower or movable board of said bellows.

14 represents a series of passages, preferably of an oblique arrangement, as shown, connecting the adjacent passage 12 and passage 13 together to couple the series into pairs throughout the whole system.

15 represents a series of flexible or other tubular connections communicating at one end with the connecting or coupling passage 14.

16 is a mouthpiece secured at the other end of the connections 15 and formed with a series of orifices or passages corresponding with the series of tubular connections 15 and communicating therewith.

With the construction as above described the operator can by suction or blowing into any one tubular connection independently actuate two distinct valves and produce two distinct musical notes, which is a feature of great merit in the present improvement in simplifying and reducing the number of parts required.

It is within the province of the present invention to employ the within-described pairs of suction and pressure bellows and connections to operate circuit-closers that in turn control the operating electromagnets of electrically-operated musical instruments.

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

1. The combination in a musical instrument, of separate actuating mechanisms for the different notes of the scale, said mechanisms being coupled in pairs, and each pair comprising a pneumatic engine that operates under suction, a pneumatic engine that operates under pressure, a passage common to the two engines, and means for effecting a suction or pressure in said passage, substantially as set forth.

2. The combination in a musical instrument, of separate actuating mechanisms, for the different notes of the scale, said mechanisms being coupled in pairs, and each pair comprising a pneumatic engine that operates under suction, a pneumatic engine that operates under pressure, a passage common to the two engines, and means for effecting a suction or pressure in said passage, the same comprising a tubular connection and a mouthpiece, substantially as set forth.

3. The combination with the pneumatic action of a musical instrument and the individual valves thereof, of individual actuating mechanisms for said valves, said mechanisms being coupled in pairs, and each pair comprising a pneumatic engine that operates under suction, a pneumatic engine that operates under pressure, and a tubular connection or passage common to each pair of engines, substantially as set forth.

4. The combination with the pneumatic action of a musical instrument and the individual valves thereof, of individual actuating mechanisms for said valves, said mechanisms being coupled in pairs, and each comprising a pneumatic engine that operates under suction, a pneumatic engine that operates under pressure, a series of tubular connections or passages, each one common to a pair of engines and a mouthpiece connected to the series of tubular connections, substantially as set forth.

5. In a musical instrument, the combination with a mouthpiece having a given number of openings, of two valves connected with pneumatic operating devices connected with one of said openings of said mouthpiece, one of said valve-operating devices being operated by pressure and the other thereof by suction, whereby two different notes can be sounded from each of said openings of said mouthpiece, substantially as described.

In testimony whereof witness my hand this 22d day of October, 1898.

BRUCE MILLER.

In presence of—
ROBERT BURNS,
JAMES LAVALLIN.