(No Model.)

H. C. REICHARDT.

PNEUMATIC ACTION FOR MUSICAL INSTRUMENTS.

No. 568,278. Patented Sept. 22, 1896.

Fig. 1.

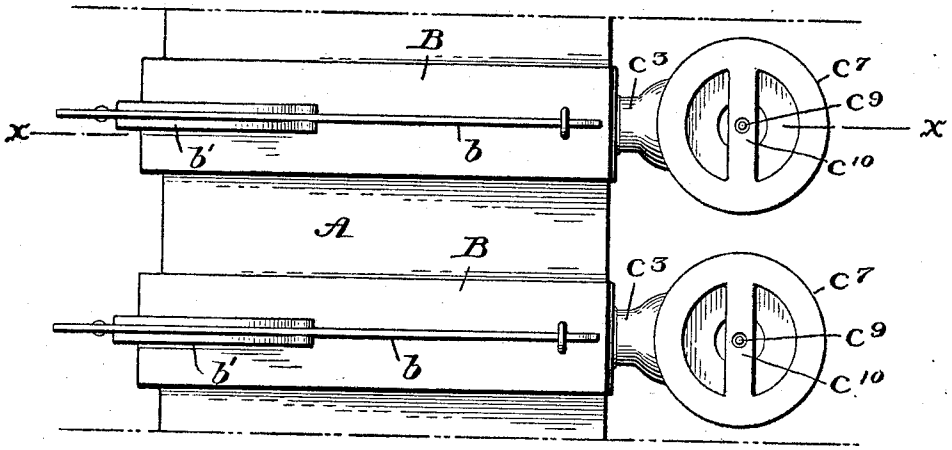
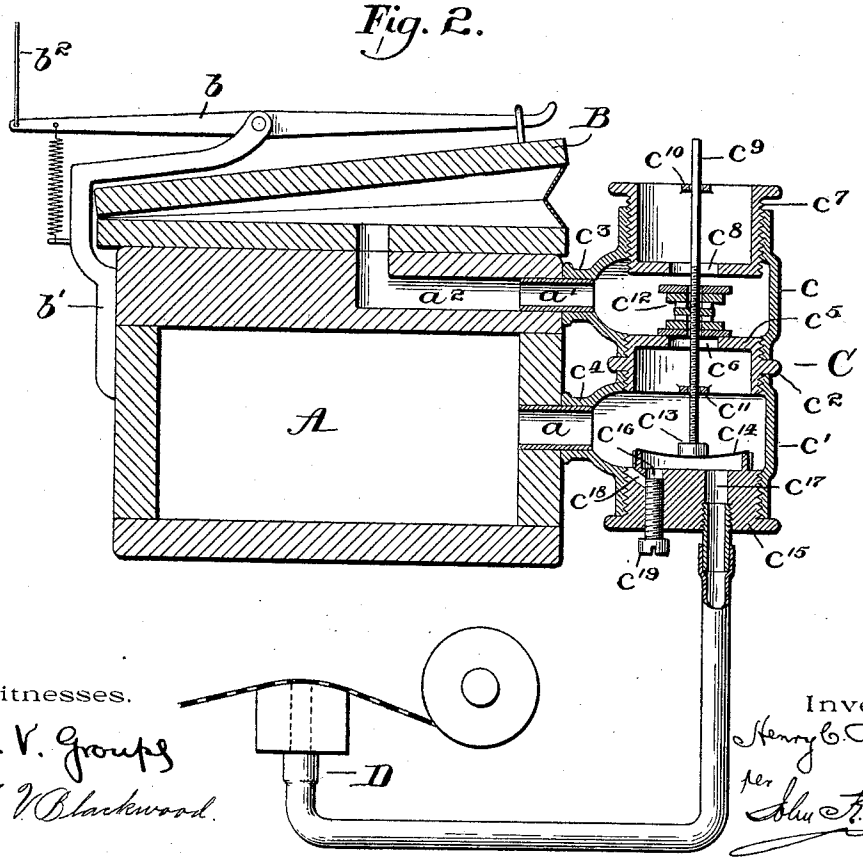


Fig. 2.



Witnesses.

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PNEUMATIC ACTION FOR MUSICAL INSTRUMENTS.

SPECIFICATION forming part of Letters Patent No. 568,278, dated September 22, 1896.

Application filed February 8, 1896. Serial No. 578,481. (No model.)

To all whom it may concern:

Be it known that I, HENRY C. REICHARDT, a citizen of the United States, residing at Pottsville, in the county of Schuylkill and State of Pennsylvania, have invented certain new and useful Improvements in Pneumatic Actions for Musical Instruments, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

This invention relates to pneumatic actions for musical instruments, having especial reference to those actions which are controlled by an appropriately-perforated music-sheet, such, for example, as illustrated in my application for Letters Patent of the United States, Serial No. 550,076, filed May 21, 1895, and allowed October 7, 1895.

The present improvements comprehend various novel features of construction and arrangement of parts whereby advantages are gained, as will be hereinafter particularly described and claimed.

In the drawings, Figure 1 is a plan of a pneumatic valve-action embodying my invention. Fig. 2 is a vertical section as on the line $x\ x$ of Fig. 1.

A is a longitudinally-disposed chest, from which the air is exhausted in the usual manner, and B a series of bellows mounted on said chest and operatively connected therewith through the medium of diaphragm and valve containing cases C of novel construction. There is one of these cases for each bellows, to the end that the actions of the several bellows will be separate and distinct from each other. Each bellows is connected with one arm of an overhanging lever b, which is fulcrumed to a suitable bracket b' on the wall of the exhaust-chest, the other arm of the lever having connected thereto a rod b^2, that controls music-pipes, reeds, or other tone-producing devices.

The cases, in their preferred construction, comprise two cylindrical sections $c\ c'$, connected by a screw-coupling c^2 and provided with laterally-extending necks $c^3\ c^4$, respectively. The lower neck is adapted to be fitted to a tube a, extending outwardly from the interior of the valve-chest, while the upper neck is adapted to be fitted to a corresponding tube a', extending from a horizontal port a^2 in the top plate of said chest. This port leads to the bellows, to the end that when the case C is applied communication will be effected thereby between the exhaust-chest and the bellows.

The coupling c^2 is provided with an internal flange c^5, so as to afford a central port c^6 of appropriate diameter. The upper end of the section c is internally screw-threaded for the reception of a screw-cap c^7, in which is formed immediately above the port c^6 an air-inlet port c^8. Extending through these ports is a vertically-movable valve-stem c^9, which is guided in cross-pieces $c^{10}\ c^{11}$ on the cap and coupling, respectively. On this stem, intermediate the ports $c^6\ c^8$, is a valve-head c^{12}, which is so disposed that during the reciprocation of the stem said ports are alternately opened and closed. The valve-head is preferably screwed on the stem, so that the valve may be nicely adjusted at the outset in respect to the port. If, however, it be desired at any time to regulate the range of vertical movement of the valve relatively to the ports for the purpose of effecting various modifications of expression or tone, it is merely necessary to screw or unscrew the cap c^7, thereby adjusting its port toward or from the valve. The cap is provided with a milled flange to facilitate its adjustment.

On the lower end of the valve-stem is a head c^{13}, that rests upon a diaphragm c^{14} in the lower end of the section c', which diaphragm is supported upon a chambered head c^{15}, that is screwed into said section. In this head are two vertical ports $c^{16}\ c^{17}$, that lead from the diaphragm-chamber, one port having communication by way of a lateral duct c^{18} with the interior of the section and the other port communicating with a suitable tracker. In this port c^{16} is a screw-valve c^{19}, that may be adjusted therein so as to open or close the duct and thereby regulate to a nicety the operation of exhausting the air from the diaphragm-chamber during the movement of the perforated sheet on the tracker. Thus the action of the diaphragm

upon the valve-stem may be nicely regulated to effect various modifications of expression or tone.

In operation, the periodical exhaust from the diaphragm-chambers is controlled by the perforated sheet on the tracker in the usual manner, the diaphragm being thereby actuated and the valve c^{12} operated to control the action of the bellows and thereby the tone-producing devices.

An important feature of my invention is that the diaphragm and valve chambers are separate and independent of the exhaust-chest and may thus be readily disconnected therefrom, and further that such chambers, being structurally separate from the exhaust-chest, may be arranged at points distant therefrom and be connected therewith by means of pipes or tubes.

Another feature resides in the construction of the cases whereby the several ports may be readily disconnected from each other and be as readily assembled; and another feature to which attention is particularly directed is the ease by which the throw or movement of the valve may be regulated without the necessity of arresting the operation of the instrument.

I claim as my invention--

1. In a pneumatic action, the combination with the exhaust-chest and bellows, of an exteriorly-located valve and diaphragm containing case, a passage or duct leading from the exhaust-chest to the diaphragm-containing chamber of said case, a second passage or duct leading from the bellows to the valve-containing chamber of said case, the valve arranged to control communication between the diaphragm-chamber and the valve-chamber and also between the valve-chamber and the outer air, means whereby the distance between the point of communication between the valve and diaphragm chambers, and that between the valve-chamber and the outer air may be varied and the diaphragm-support for said valve, substantially as specified.

2. In a pneumatic action, the combination with an exhaust-chest, and with a series of bellows, of a series of structurally-independent valve and diaphragm containing cases separately and detachably connected with the said chest, a communicating passage between the diaphragm-chamber of each of said cases and the chest, a second passage connecting the valve-chamber of each case with the corresponding bellows, the cap adjustably secured in the upper wall of the valve-case, and having a port therethrough and the valve in each case for controlling the communication between the two passages and also the port of said cap, substantially as specified.

3. In a pneumatic action, the combination of the exhaust-chest, the valve-chamber communicating therewith provided with oppositely-disposed ports, the valve in said chamber, the diaphragm-support for said valve, and means for varying the distance between said ports, substantially as described.

4. In a pneumatic action, the combination of the exhaust-chest, the valve-chamber, the vertically-adjustable cap therefor provided with an air-inlet port, the valve, and the diaphragm-support therefor, substantially as described.

5. In a pneumatic action, the combination, with the exhaust-chest and the bellows, of the exteriorly-arranged case divided into two communicating chambers, a connection between one of said chambers and the bellows, a connection between the other chamber and the chest, a valve in the first-named chamber, and an attachable and detachable diaphragm-support therefor in the other chamber, substantially as described.

6. In a pneumatic action, the combination of the exhaust-chest and the bellows, of a diaphragm and valve containing case operatively connected with said chest and bellows, said case comprising two hollow sections, a coupling therefor, a valve in one section and a diaphragm valve-support in the other section, substantially as described.

7. In a pneumatic action, the combination of the exhaust-chest and the bellows, of a diaphragm and valve containing case operatively connected with said chest and bellows, said case comprising two hollow sections, a coupling therefor, a screw-cap provided with a port in the upper section, a chambered diaphragm-head in the lower section, and a valve in the upper section supported upon the diaphragm, substantially as described.

In testimony whereof I have hereunto affixed my signature in the presence of two subscribing witnesses.

HENRY C. REICHARDT.

Witnesses:
JOHN R. NOLAN,
ANDREW V. GROUPE.