

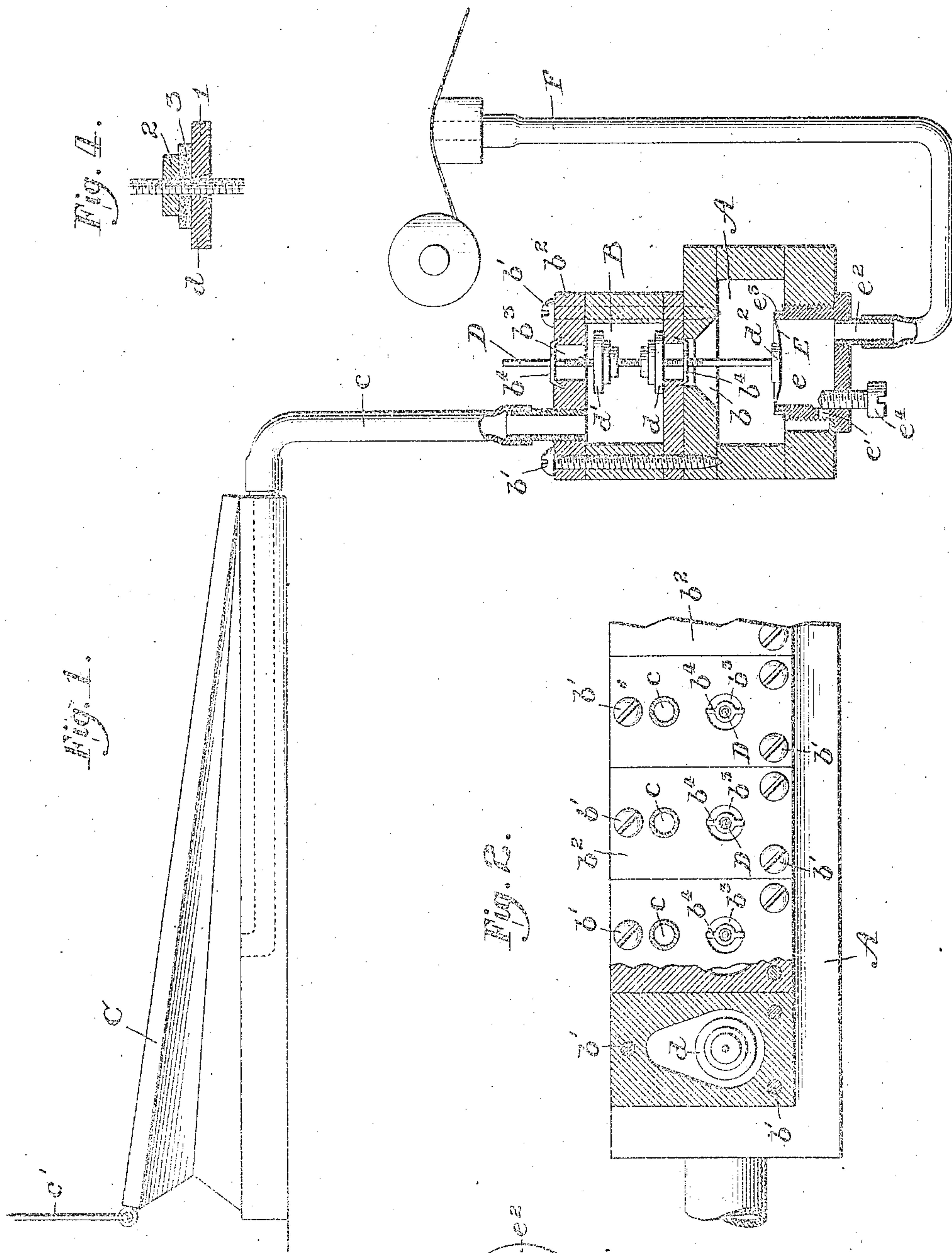
(No Model.)

H. C. REICHARDT.

PNEUMATIC ACTION FOR MUSICAL INSTRUMENTS.

No. 558,985.

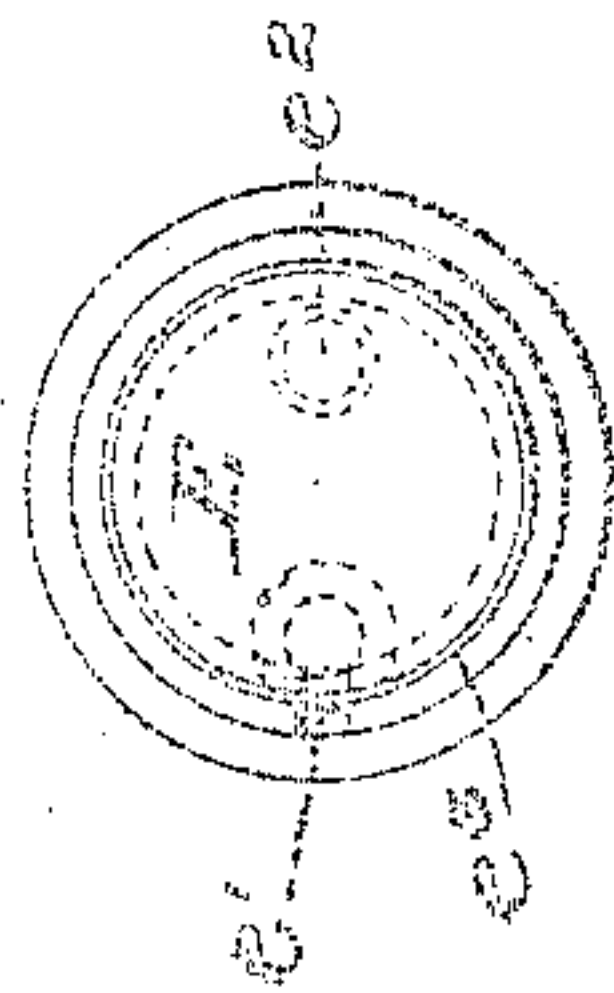
Patented Apr. 28, 1896.



Witnesses.

Andrew H. Brown  
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Fig. 3.



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per

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# UNITED STATES PATENT OFFICE.

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## PNEUMATIC ACTION FOR MUSICAL INSTRUMENTS.

SPECIFICATION forming part of Letters Patent No. 553,985, dated April 28, 1896.

Application filed May 21, 1895. Serial No. 550,076. (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 that class of automatic musical instruments in which are employed pneumatic operating devices under the control of a perforated music-sheet. Such operating devices comprise a series of bellows which are connected with pipes, reeds, or other sounders, a corresponding series of valve-chambers having communication with said bellows and with a common exhaust-chest, and a corresponding series of supplementary chambers provided with flexible or yielding diaphragms upon which rest the respective valve-stems, these latter chambers having communication with the exhaust-chamber and with the tracker. Upon the latter runs the perforated sheet or strip that determines the periodical ingress of the external atmosphere to the diaphragm-chambers for the purpose of effecting the vibration of the diaphragms and the requisite action of the valves to make and break the communication of the exhaust-chamber with the bellows or sounding devices. Heretofore the valve-chambers and the diaphragm-chambers have been integral with the exhaust-chest, and in order to secure access to the valve or the diaphragm of any chamber it has been necessary to dismantle all the chambers. There has been no provision for readily attaching the diaphragms to or detaching them from their respective chambers, and there has been no provision for adjusting the ports from the exhaust-chamber to the diaphragm-chambers for the purpose of regulating to a nicety the action of the valves.

With the view of overcoming, among other things, the defects just stated my invention consists in a novel construction and arrangement of parts which will be hereinafter fully described and claimed.

In the annexed drawings, Figure 1 is a sectional elevation of a pneumatic valve-action

embodying my invention. Fig. 2 is a sectional plan of the exhaust and valve chambers. Fig. 3 is a plan of the diaphragm-head detached. Fig. 4 is an enlarged section of one of the yielding valve-heads.

A designates the longitudinally-disposed chest, from which the air is exhausted in the usual manner, and B a series of valve-chambers superimposed on the chest and connected therewith by a port *b*. These valve-chambers are constructed separately and independently of each other, and they are detachably secured to the chest by means of vertical screws *b'*, whereby they or any of them may be readily disconnected from the exhaust-chest. The tops of the valve-chambers comprise separate plates *b<sup>2</sup>*, which are held in place by means of the screws *b'*, whereby access to any of the chambers may be readily had for the purpose of adjusting the valve-heads therein, as occasion may require. Each of the valve-chambers communicates with a bellows C by means of a tube *c*, the bellows having connected thereto a rod *c'*, that controls music-pipes, reeds, or other tone-producing devices. In the top plate of each of the chambers, immediately above the port *b*, is an air-inlet port *b<sup>3</sup>*. In each of these ports is a centrally-disposed cross-piece *b<sup>4</sup>*, to which is fitted a vertical valve-stem D, that extends into the exhaust-chest. On this stem, within the valve-chamber, are two valve-heads *d d'*, so disposed that during the reciprocation of the stem the respective ports *b* and *b<sup>3</sup>* are alternately opened and closed. These heads are screwed to the stem, so that they may be nicely adjusted thereon in respect to the ports.

In order that the valves shall be closely seated against the opposed walls of the valve-chambers, so as to insure a tight sealing of the respective ports, I construct the head in three parts, as follows: A centrally-perforated disk 1, being the valve proper, through which the stem freely extends; a disk 2, that is screwed on the stem, and an interposed disk 3, of soft yielding material, such as sheep-skin, cemented to the outer disks. Thus while the head may be minutely adjusted on the stem, yet it will be laterally-yielding for the purpose stated.

The lower end of the valve-stem has secured thereto a head *d<sup>2</sup>*, that rests upon a thin yield-



ing diaphragm E in the bottom of the exhaust-chest. Below this diaphragm is a chamber  $e$ , which communicates by means of a lateral port  $e'$  with a duct leading to said chest and by means of a port  $e^2$  with the tracker F. This diaphragm-chamber I construct in the form of a flanged screw-threaded cylinder that is screwed into the bottom of the exhaust-chest, the diaphragm being detachably held on the inner or open end of the cylinder by means of an encircling band  $e^3$ . By this construction the diaphragm-chamber may be readily removed from or applied to the exhaust-chest, and the diaphragm may be readily removed and replaced, as required.

In the diaphragm-chamber is a screw-valve  $e^4$ , so fitted and arranged that it may be manipulated to close or open the port  $e'$  and thereby regulate to a nicety the operation of exhausting the air from the diaphragm-chamber during the movement of the perforated sheet. In this way I am enabled to control the action of the valve, and thereby effect various modifications of expression or tone.

I claim—

1. In a pneumatic action for musical instruments, the combination, with the exhaust-chest, of a series of separate and independent valve-chambers detachably and separately connected with said chest and communicating therewith, valves in said chambers, and diaphragm-supports for said valves, the space or chamber below each diaphragm having communication with the exhaust-chest and with a suitable tracker, substantially as described.

2. In a pneumatic action for musical instruments, the combination, with the exhaust-chest, of a series of separate and independent valve-chambers detachably connected with said chest and communicating therewith, each of said chambers having a detachable cover-plate, valves in said chambers, and diaphragm-supports for said valves, the space or cham-

ber below each diaphragm having communication with the exhaust-chest and with a suitable tracker, substantially as described.

3. In a pneumatic action for musical instruments, the combination of the exhaust-chest, the series of separate and independent valve-chambers detachably secured to the said chest and capable each of being removed without disturbing the other chambers of the series, the valves in the said chambers, the diaphragms which support the said valves, and the separately attachable and detachable diaphragm-chambers communicating with the exhaust-chest and with a suitable tracker, substantially as specified.

4. In a pneumatic action for musical instruments, the combination with the exhaust-chest, the series of valve-chambers connected to said chest and communicating therewith, valves in said chambers, diaphragm-supports for said valves, the separately attachable and detachable diaphragm-chambers communicating with the exhaust-chest and with a suitable tracker, means for detachably securing the diaphragms to the walls of said chambers, and an adjustable screw-valve for the exhaust-port of each of said diaphragm-chambers, substantially as specified.

5. In an instrument of the class recited, the valve and its supporting and operating parts, said valve comprising a screw-threaded stem, a perforated head loosely supported thereon, a tapped disk fitted to said stem, and an interposed flexible connection for said head and disk, substantially as described.

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

HENRY C. REICHARDT.

Witnesses:

ANDREW V. GROUPE,  
JOHN R. NOLAN.