

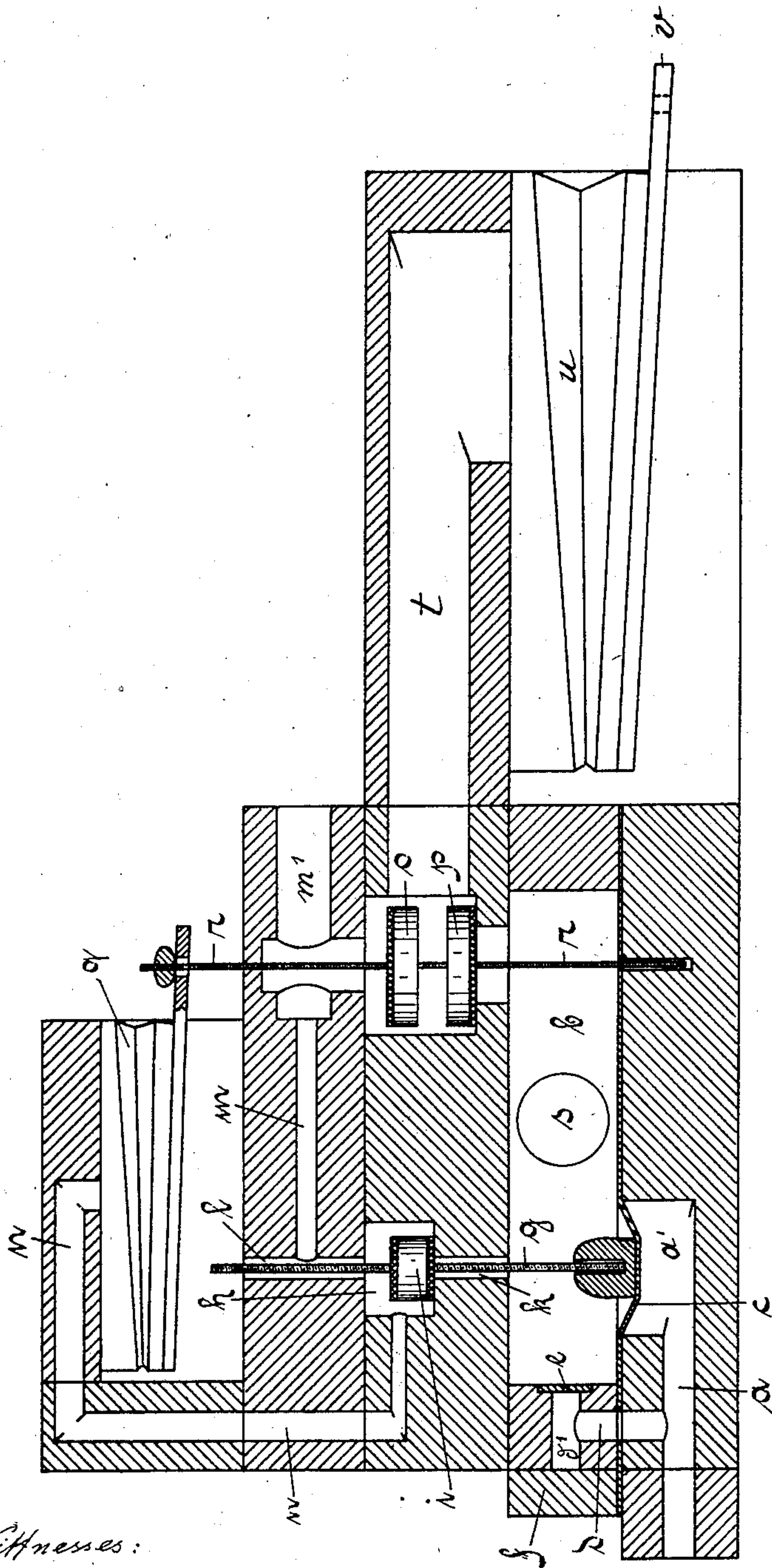
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J. D. PHILIPPS.
PNEUMATIC ACTION FOR MUSICAL INSTRUMENTS.

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NO MODEL.



Witnesses:

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UNITED STATES PATENT OFFICE.

JOHANN DANIEL PHILIPPS, OF FRANKFORT-ON-THE-MAIN, GERMANY.

PNEUMATIC-ACTION FOR MUSICAL INSTRUMENTS.

SPECIFICATION forming part of Letters Patent No. 730,565, dated June 9, 1903.

Application filed November 28, 1902. Serial No. 133,128. (No model.)

To all whom it may concern:

Be it known that I, JOHANN DANIEL PHILIPPS, manager, a subject of the King of Prussia, German Emperor, residing at No. 9 Solms-street, Frankfort-on-the-Main, in the Kingdom of Prussia, German Empire, have invented new and useful Improvements in Pneumatic-Actions for Musical Instruments, of which the following is a specification.

This invention relates to an improvement in pneumatic-actions for mechanically-actuated organs and the like; and the object of my improvement is to so arrange the bellows actuating the double valve for controlling the pneumatic-lever not within the suction-chamber, as usual, but without the same, whereby a greater exactitude in the working of the whole pneumatic-action is secured, and, moreover, the mounting or composition of the pneumatic-action is rendered far simpler and easier than that of all the hitherto-known pneumatic-actions. This will be readily understood when taking into consideration that the bellows arranged within the suction-chamber remained subjected on its external comparatively large surface to the action of the rarefied air, even when the communication between its interior and the suction-chamber had been interrupted, which caused a perpetual slight vibration of the movable board of the bellows, and hence also of the double valve, whereby the exactitude of the pneumatic-action was impaired.

The improved pneumatic-action according to my invention is diagrammatically represented in the accompanying drawings, it being shown in a vertical longitudinal section.

a denotes a duct leading from the tracker-range, over which the perforated musical note-sheet is moved. The duct a terminates in a chamber a' , which is covered by a diaphragm c . The duct a is further placed in constant communication with the suction-chamber b by means of a channel d and a narrow opening e . For the purpose of easily cleaning this narrow opening e the channel d is bifurcated at d' , and the horizontal arm of the channel d' , leading to the outside, can be readily opened by taking off the removable plate f .

The air is sucked from the suction-chamber

b through a pipe s by any of the known apparatus.

The bellows u of the pneumatic-lever v can be put into communication either with the suction-chamber b or with the free atmosphere through the channels t and m' by means of the double valve $o p$, as usual. The bellows q for actuating this double valve $o p$ is not arranged within the suction-chamber, as usual, but without it. The double valve $o p$ is secured on a vertical rod r , which is adjustably suspended from the movable board of the bellows q . The bellows q can be put into communication with the suction-chamber through the channels n and k and the chamber h by means of a second double valve i . The latter is adjustably secured on a vertical rod g , the lower end of which rests on the diaphragm c . The chamber h of the double valve i can be put into communication with the atmosphere through the channels l and $m m'$.

The pneumatic-action is worked in the following manner: Supposing the respective hole in the tracker-range belonging to the conduit a to be covered by the musical note-sheet, it will be evident that the air in the conduit a , the chamber a' , and the channels $d d'$ will be rarefied from the suction-chamber b , so that the diaphragm c is bent downward under the weight of the rod g and the double valve i , and hence the communication between the suction-chamber b and the bellows q is interrupted by the double valve i resting on its seat, as is shown. In consequence of this the interior of the bellows q is put into communication with the atmosphere through the channel n , the chamber h , and the channels $l m m'$, so that the movable board of the bellows q goes down by reason of its own weight and that of the rod r and the double valve $o p$. The bottom valve p will rest on its seat and interrupt the communication between the suction-chamber b and the bellows u , while the upper valve o opens and puts the interior of the bellows u into communication with the atmosphere, so that the movable board of the bellows u goes down and the pneumatic-lever v occupies its normal position shown. When during the movement of the musical note-sheet the respective hole in the tracker-range

is uncovered by a hole in that sheet, air will at once enter the conduit *a* and the chamber *a'* and force upward the diaphragm *c*, so that the double valve *i* rises and opens the communication between the suction-chamber *b* and the bellows *q*, while shutting off the atmosphere by the upper part of the valve *i* closing the channel *h*. Then the air in the bellows *q*, the channels *n* *k*, and the chamber *h* will be rarefied from the suction-chamber *b*, so that the bellows *q* collapses and raises the double valve *o* *p* to open the communication between the suction-chamber *b* and the interior of the bellows *u* and shut off the atmosphere. The air in the bellows *u* being rarefied, the latter will collapse, and the pneumatic-lever *v* will raise its rod, (not shown,) as usual, to actuate the respective part of the organ mechanism.

The bellows *q* and *u* can be replaced by their equivalents, such as diaphragms, and so on.

Having now described my invention, what I wish to secure by Letters Patent of the United States is—

1. In a pneumatic-action for mechanically-actuated organs and the like, the combination with a pneumatic-lever, of a first double-seated valve-chamber above the suction-chamber and communicating therewith and with the atmosphere, a channel leading from the bellows of said pneumatic-lever to said first double-seated valve-chamber, a first double valve in said first double-seated valve-chamber, a bellows placed above and outside the suction-chamber, the movable board of said bellows being on the under side and pivotally connected by a rod with said first double valve, a diaphragm in the bottom of the suction-chamber, a diaphragm-chamber beneath said diaphragm, a conduit leading from the tracker-range to said diaphragm-chamber and being in constant communication with the suction-chamber by a narrow opening, a second double-seated valve-chamber above the suction-chamber and communicating therewith and with the atmosphere, a channel leading from the interior of said bellows to said second double-seated valve-chamber, a vertical rod supported by said diaphragm, a second double valve in said second double-seated valve-chamber and carried by said vertical

rod, so that on air being admitted through a hole in the musical note-sheet into said conduit it will force upward said diaphragm and raise by said vertical rod said second double valve to open the communication between the suction-chamber and said bellows while shutting off the atmosphere, whereby said bellows is collapsed and its movable board is raised to actuate said first double valve, substantially as set forth.

2. In a pneumatic-action for mechanically-actuated organs and the like, the combination with a pneumatic-lever of a first double-seated valve-chamber above the suction-chamber and communicating therewith and with the atmosphere, a channel leading from the bellows of said pneumatic-lever to said first double-seated valve-chamber, a first double valve in said first double-seated valve-chamber, a pneumatic placed above and outside the suction-chamber, the movable board of said pneumatic being on the under side and pivotally connected by a rod with said first double valve, a diaphragm in the bottom of the suction-chamber, a diaphragm-chamber beneath said diaphragm, a conduit leading from the tracker-range to said diaphragm-chamber and being in constant communication with the suction-chamber by a narrow opening, a second double-seated valve-chamber above the suction-chamber and communicating therewith and with the atmosphere, a channel leading from the interior of said pneumatic to said second double-seated valve-chamber, a vertical rod supported by said diaphragm, a second double valve in said second double-seated valve-chamber and carried by said vertical rod, so that on air being admitted through a hole in the musical note-sheet into said conduit it will force upward said diaphragm and raise by said vertical rod said second double valve to open the communication between the suction-chamber and said pneumatic while shutting off the atmosphere, substantially as set forth.

In witness whereof I have hereunto set my hand in presence of two witnesses.

JOHANN DANIEL PHILIPPS.

Witnesses:

CHRISTIAN GEIPO,
JEAN GRUND.