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PNEUMATIC SHIFTING DEVICE FOR MOVABLE MEMBERS OF AN AUTOMATIC MUSICAL INSTRUMENT.

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1,005,771. Patented Oct. 10, 1911.

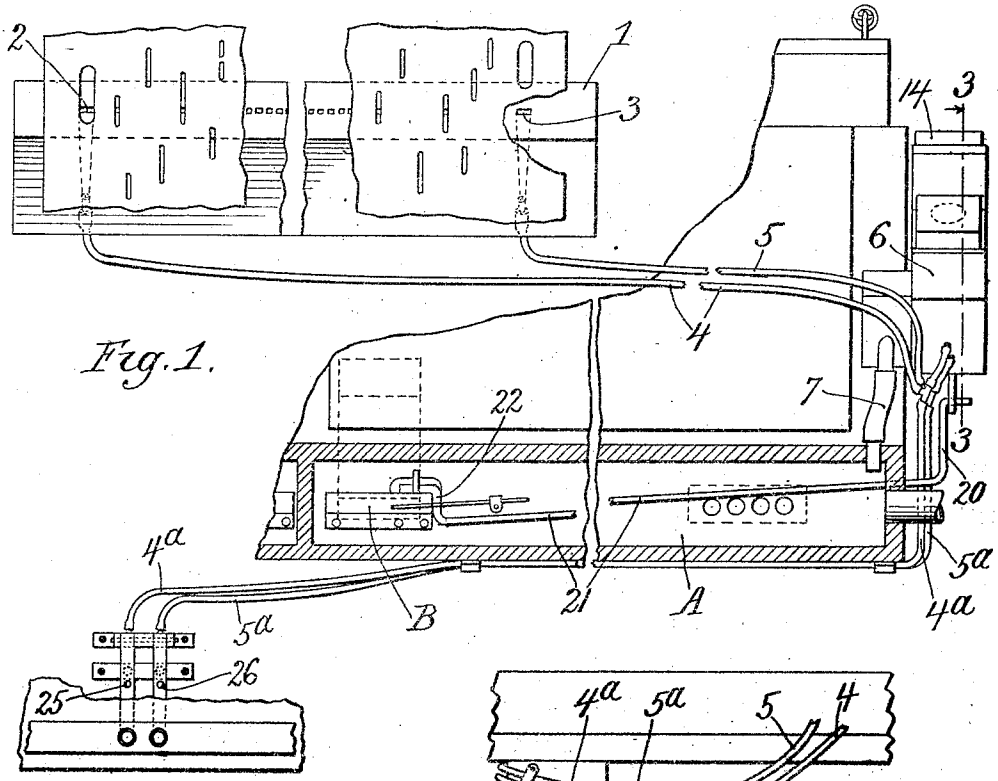

Fig. 1.

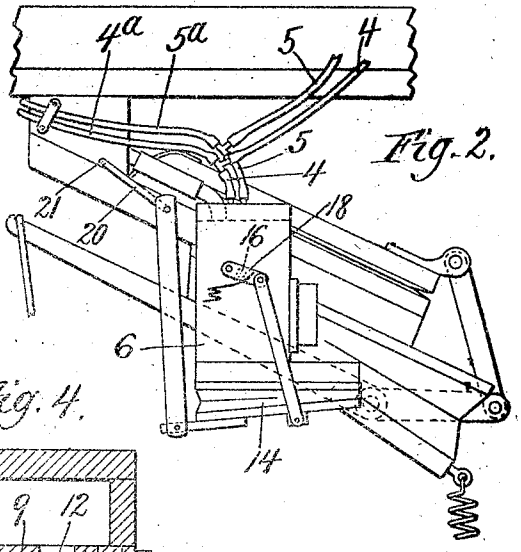

Fig. 2.

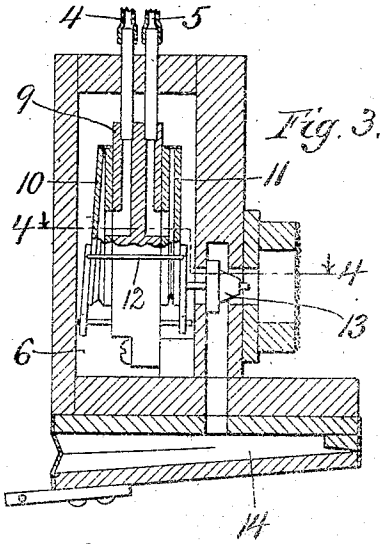

Fig. 3.

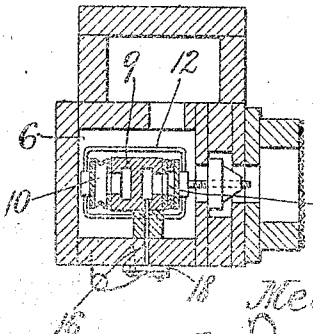

Fig. 4.

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UNITED STATES PATENT OFFICE.

MELVILLE CLARK, OF CHICAGO, ILLINOIS.

PNEUMATIC SHIFTING DEVICE FOR MOVABLE MEMBERS OF AN AUTOMATIC MUSICAL INSTRUMENT.

1,005,771. Specification of Letters Patent. **Patented Oct. 10, 1911.**

Original application filed April 8, 1909, Serial No. 488,625. Divided and this application filed December 6, 1909, Serial No. 531,475. Renewed September 8, 1911. Serial No. 648,399.

To all whom it may concern:

Be it known that I, MELVILLE CLARK, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Pneumatic Shifting Devices for Movable Members of an Automatic Musical Instrument of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

This application is a division of my application #488,625, filed April 8, 1909.

It relates to automatic devices for shifting movable members in an automatic musical instrument.

It consists of the features of construction shown and described as indicated in the claims.

In the drawings:—Figure 1, is a partly diagrammatic view representing a portion of a tracker-board of a pneumatic musical instrument, and ducts leading from apertures thereof to a valve-controlling device, the latter being shown in plan view. Fig. 2 is a side elevation of the valve-controlling device and adjacent portions of the wind mechanism of an auto-pneumatic musical instrument with which said device is associated. Fig. 3 is a fore-and-aft vertical section to the line 3—3 of Fig. 1 through said valve-controlling device. Fig. 4 is a section at the line 4—4 on Fig. 3.

In the drawings, this invention is illustrated as applied to the purpose of operating the valve which controls connection of the main air chamber with exhaust air devices, the latter not being specifically illustrated, but it should be understood that it is not limited to merely operating the said valve, but it is applicable to any part of a musical instrument which requires to be shifted back and forth for different results in the operation of the instrument.

Only such parts of a musical instrument are shown, as are necessary to illustrate the operation of the invention.

The tracker-board, 1, may be understood to be of usual construction for the usual purpose of such tracker-boards, viz.: cooperating with a perforated music sheet for controlling the pneumatic action of the instrument with which it is associated. For the purposes of this invention it has, in addition to the ordinary ducts for controlling sounding devices, additional ducts, 2 and 3, preferably one to each end of the tracker-board, which are connected by tubes, 4 and 5, with the valve-governing device. This valve-governing device comprises a small exhaust or rarefied air chamber, 6, which is connected by a trunk tube, 7, with the main exhaust air chamber, A of the pneumatic action. In this small exhaust chamber they are mounted on a support, 9, two primary pneumatics, 10 and 11, with which are connected the tubes, 4 and 5, above mentioned. The two primary pneumatics have their moving walls connected by a loop, 12, so that they move together, and each of said pneumatics is collapsed when the other expands. The primary pneumatic, 10, carries a valve, 13, which operates in the usual manner of a primary pneumatic to control a motor pneumatic, 14, which is mounted outside such chamber, 6.

It will be seen that for collapse of the motor pneumatic, 14, the primary pneumatic, 11, will be inflated, and for inflation of said motor pneumatic, 14, the primary pneumatic, 10, will be inflated. The inflation of the primary pneumatic, 11, which occurs when atmospheric air is admitted to said primary pneumatic by the registration of a proper aperture of the perforated roll with the tracker duct mouth, 3, at the right hand end of the tracker, will collapse the primary pneumatic, 10, (the usual bleeder not visible in the drawings being present) by reason of the rigid loop connecting them, but by reason of unpreventable leakage of the pneumatic 11 the two pneumatics would resume their normal position upon the passing of the aperture in the perforated roll away from the duct-mouth, 3, unless some provision were made to the contrary. Such provision consists in providing a duct, 16, leading out through the partition bar or rib, 9, on the inner wall of the chamber, 6, on which rib the two primary pneumatics are both mounted, such duct leading out by way of said rib through the side of the chamber, 6, a valve, 18, being mounted upon the outer side of said chamber for closing the end of the duct, the motor pneumatic, 14, being connected with such valve, 19, so as to move the valve for closing the duct when the motor pneumatic is inflated, and

to open the valve when the motor pneumatic is collapsed, such collapse occurring, it will be understood, when the primary pneumatic, 11, is inflated by registration of the proper aperture of the controlling sheet with the tracker-duct-mouth, 3. It thus results that when such registration has occurred and passed, the air supply to the primary pneumatic, 11, which is provided first by the registration of the controller sheet aperture with the tracker-board duct mouth, 3, is maintained afterward through the duct, 16, and the motor pneumatic, 14, is thereby held in collapsed position until an aperture at the other side of the perforated sheet registers with the tracker-board duct mouth, 2, causing the inflation of the primary pneumatic, 10, which reverses the valve, 13, admitting atmospheric air to the motor pneumatic, 14, causing the latter to be inflated and close the valve, 16. The motor pneumatic, 14, has its moving wall connected with the lever arm, 20, of rock shaft, 21, which, extending in through the end wall of the exhaust chamber, A, operates by means of a second lever arm, 22, the valve, B, which controls the communication of said chamber, A, with the exhaust devices for producing a different tension in said chamber from that which would be obtained therein if the valve remained closed. The particular construction of the exhaust devices and the connections leading to said valve, are not particularly illustrated any customary form of such devices, and connection being suitable for combination with the features of the invention already described, for producing the result which follows from the opening and closing of said valve, B, as stated. For effecting the same result at will instead of by perforations in the controller sheet, the tubes, 4 and 5, are branched intermediate the tracker-board and the connection of said tubes with the chamber, 6, the branches, 4^a and 5^a, being extended to valves, 25 and 26, mounted in any convenient position, as, for example, at the edge of the instrument, in front of the manual, as illustrated, so that the operator can open one or the other of such valves with the same effect upon the action of the two primary pneumatics in the chamber, 6, as when said primaries are vented through the perforations of the controller sheet.

I claim:—

1. In an automatic playing device for musical instruments having a motor pneumatic for operating the movable part of the mechanism, in combination with such motor pneumatic and such movable part two primaries and a valve, to which they are both connected for controlling the motor pneumatic, separate connections for air to such primaries and means for controlling the admission of air thereto; mechanical connection between the moving members of the two primaries for collapsing each when the other is expanded; the primary whose expansion operates the motor pneumatic controller valve for collapse of said motor pneumatic, having a supplementary air supply port and valve controlling such port and connections from the moving wall of the motor pneumatic for opening such valve by the collapsing movement of the motor pneumatic.

2. In an automatic playing device for musical instruments having a motor pneumatic for operating a movable part of the mechanism, in combination with such movable part and motor pneumatic, an exhaust air chamber and primary pneumatics therein, and a valve to which both said primaries are connected for controlling the motor pneumatic; separate air connections for such primary pneumatics and means for controlling the admission of air thereto; said primary pneumatics having their moving members connected for the collapse of each when the other is expanded, the motor pneumatic having its moving wall exteriorly exposed to atmospheric pressure; a duct leading from the exterior of the exhaust air chamber into the primary pneumatic whose expansion operates the motor-pneumatic-controlling valve for collapse of the motor pneumatic, and a valve controlling said duct and operating connections to said valve from the motor pneumatic for opening the valve when said motor pneumatic is collapsed.

In testimony whereof, I have hereunto set my hand, at Chicago, Illinois, this second day of December, 1909.

MELVILLE CLARK.

Witnesses:
CHAS. S. BURTON,
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