



# UNITED STATES PATENT OFFICE.

ANDREW H. FOSS, OF CHICAGO, ILLINOIS, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, OF ONE-THIRD TO WILLIAM C. P. COLLIGNON AND ONE-THIRD TO ALBERT McCAUSLAND, BOTH OF CHICAGO, ILLINOIS.

ACTION FOR PLAYER-PIANOS AND THE LIKE.

1.065,677.

Specification of Letters Patent.

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*To all whom it may concern:*

Be it known that I, ANDREW H. FOSS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Actions for Player-Pianos and the Like, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to a new and improved form of action for automatic musical instruments, and has as its particular object the provision of an action which will have a greater efficiency than those in use whereby the size of the pneumatic may be lessened and consequently the space occupied in an instrument by the operating pneumatics will be decreased.

A further object resides in the particular arrangement and combination of parts hereinafter described.

Referring to the accompanying drawings, Figure 1 is an elevational view partly in section showing two sets or banks of striking pneumatics and the cooperating sticker rods; Fig. 2 is a top plan view of a portion of the banks shown in Fig. 1, the sticker rods being shown in section.

Throughout the separate views the same element is designated by the same reference numeral.

Referring more particularly to the drawings, 1 is a base member or board which is separated from a second board or member 2 by means of strips 3, leaving a wind way 4 between the two members. Above the board 2 is a stationary side 5 of one of my improved pneumatics, the entire pneumatic being designated as 6. Pneumatic 6 has a movable side 7 which has attached thereto a fulcrum member 8. A resilient stop 19 of felt or similar material is placed in the pneumatic on the upper surface of the board 5 to prevent the complete collapse of the pneumatic. The member 8 is attached to the stationary piece 5 by means of a flexible hinge as 9. The stationary plate 5 is separated from the piece 2 by means of distance pieces 10-11, leaving a space 12, between the members 5 and 2 into which atmospheric air may enter.

13 is a passageway connecting with the

interior of the pneumatic 6 and running through members 5, 10 and 2, to a connection with the passage 14 which connects in turn with the valve chamber 15. Chamber 15 connects by a port 16 with the wind chest 4 above mentioned.

Mounted in the chest 15 is a valve 17 which is operated by a diaphragm 18 which is mounted on the upper surface of the board 1 and serves to separate the wind chest 4 from the pouch 20. Connecting with the pouch 20 is a passage 21 connected in turn to one of a series of tubes 22 leading to the usual tracker board. The pouches 20 and passages 21 are normally exhausted by means of a connection with the wind chest 4 which is furnished by bleed holes in the timbles 21\*.

Covering the valve chest 15 is a plate 23 provided with a port for admitting atmospheric air to the valve chest 15.

It will be understood that the chest 4 is connected to a suitable source of tension.

From the foregoing the operation of my pneumatic will be clear to those skilled in the art.

The member 7 is extended beyond the fulcrum member 8 for some distance and normally engages a tappet piece 24 adjustably mounted on a block 25, which in turn is carried by one of a series of stickers 26. The extension of the member 7 just mentioned is cut away a short distance beyond the fulcrum point, leaving fingers 27 which are the parts actually in contact with the tappet blocks 24. In this way sufficient room is obtained between the successive fingers 27 of the pneumatics in the top row or tier so that the fingers of the second or lower tier of pneumatics may be placed vertically below the line of division between the pneumatics of the top tier and still leave room for the tubes 22 between the fingers 27 of the upper and lower tiers. As shown in Fig. 1, the member 11 of the top tier of the pneumatics projects sufficiently so as to form a support for the tracker tubes 22 which pass through apertures not shown in the member 11. This arrangement of the member 11 and the tubes 22 is not shown in Fig. 2 in order to show the relative position of the tubes and fingers 27 in the two tiers of pneumatics.

By the arrangement just described, but

principally owing to the construction of the pneumatic 6 with a movable top member fulcrumed to the fixed member and acting directly on the sticker, I am able to  
 5 eliminate one row of pneumatics entirely and place all the striking pneumatics for a player piano in two rows, whereas ordinarily three are necessary. The efficiency of this combination will be appreciated by  
 10 those skilled in the art, when I state that I find it unnecessary to use any springs with my pneumatics to open them after they have been collapsed and no such spring is shown in the drawing.

15 In the operation of my device the pneumatics 6 stand normally in the position shown in Fig. 1. When, however, the music sheet uncovers a port corresponding to one of the tubes 22, a puff of air is admitted  
 20 under the corresponding diaphragm 18. Owing to the partial vacuum existing in the wind chest 4, the atmospheric pressure thus admitted raises the valve 17, closing the port in the member 23 and connecting the interior of the pneumatic 6 with the wind chest  
 25 through the channels 13 and 14, the chest 15, and the port 16. The vacuum thus introduced into the pneumatic collapses the same, at the same time elevating the end 27 of the  
 30 movable port of the pneumatic and raising the sticker 26 to operate the remainder of the piano action and sound a note. During the movement of the upper board of the pneumatic, it rocks around the lower edge of  
 35 the fulcrum piece 8, thus having not only an up and down movement, but also a certain amount of motion longitudinally of itself. This longitudinal action, I consider especially important, since it lessens slippage  
 40 at the point of contact between the extension piece 27 and the member 24. This is because the stickers 26, as is well known in the art, have not only a longitudinal movement, but also a lateral movement, due to  
 45 the effect of the supporting levers. This lateral or horizontal movement of the sticker produces lost motion or slippage in the ordinary pneumatic action, and consequently wastes power. Since space in the  
 50 piano is limited any gain in efficiency in the transmission between the pneumatic and the hammer is greatly to be desired.

It will be understood that while the device shown and described is the preferred form

of my invention, that various modifications 55 thereof may be made without departing from the spirit of my invention, and

What I claim is:

1. In a device of the class described in combination, a pneumatic comprising a 60 movable board provided with a finger projecting longitudinally of said board, a fulcrum member attached to said board and projecting laterally therefrom, said board being adapted to rock on said member, and 65 a sticker rod extending substantially at right angles to said board provided with a contact member cooperating with said finger whereby said sticker rod is given a longitudinal movement, said sticker rod being 70 adapted to move laterally when operated by said finger, whereby the slip between said finger and said contact member is reduced.

2. In a device of the class described, a pneumatic comprising in combination, a 75 fixed bottom board, a movable top board, a fulcrum member rigidly attached to said top board for contacting with said bottom board, a flexible hinge for attaching said fulcrum to said bottom board, said top 80 board having a finger projecting beyond said fulcrum, and a sticker rod contacting directly with said finger.

3. In a device of the class described in combination, a pneumatic having a fixed 85 board, a movable board, a fulcrum attached to said movable board near one edge of said fixed board upon which said movable board rocks, said movable board having a projection extending beyond said fulcrum, and a 90 sticker rod having a contact member thereon contacting directly with said projection.

4. In a pneumatic instrument in combination, an upper and a lower wind chest, striking pneumatics mounted on top of said wind 95 chests, boards mounted on said wind chests along the edges thereof spacing said pneumatics from said wind chests, the boards on the upper wind chest projecting beyond the edge thereof and having apertures, and 100 tracker tubes mounted in said apertures.

In witness whereof, I hereunto subscribe my name this 24th day of February A. D. 1912.

ANDREW H. FOSS.

Witnesses:

A. L. JONES,  
 O. M. WERMICH.