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PNEUMATIC ACTION FOR PIANO PLAYERS, &c.

APPLICATION FILED MAR. 12, 1910. RENEWED DEC. 16, 1912.

1,067,969. **Patented July 22, 1913.**

2 SHEETS—SHEET 1.

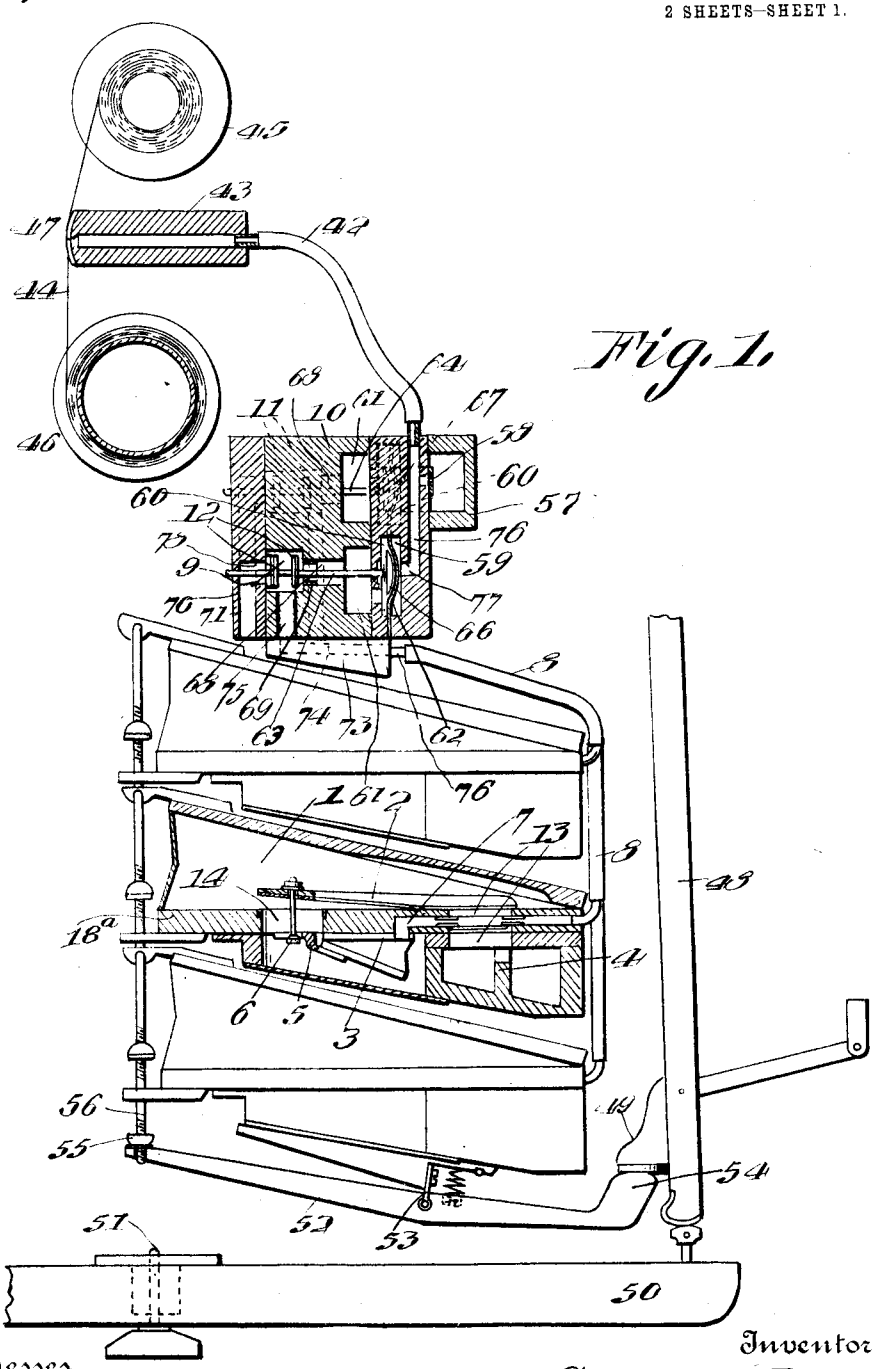


Fig. 1.

Witnesses

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2 SHEETS—SHEET 2.

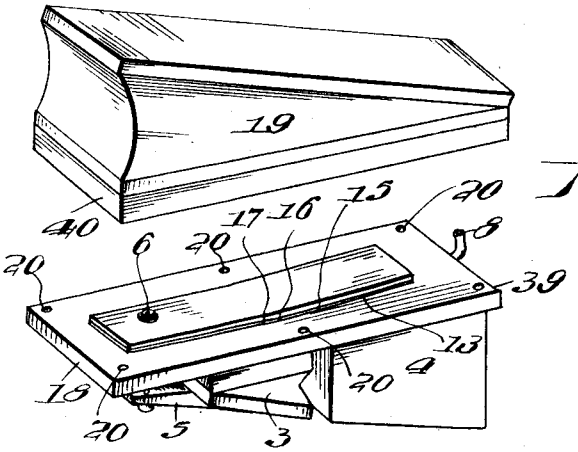


Fig. 2.

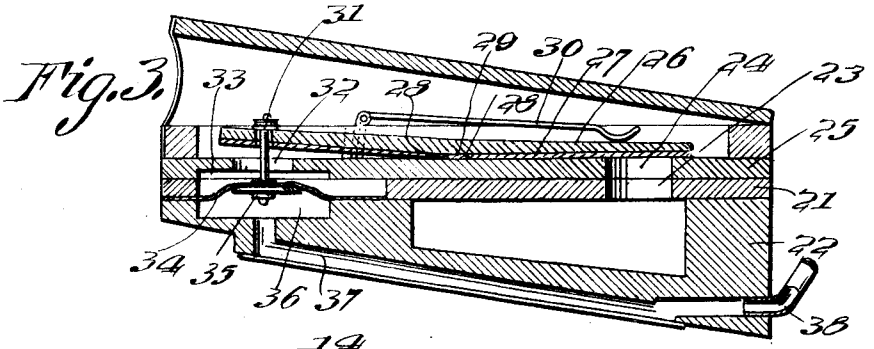


Fig. 3.

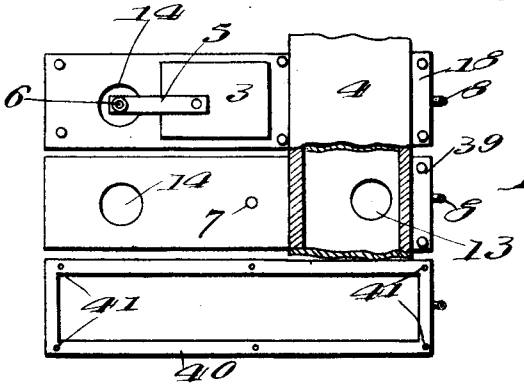


Fig 4.

Witnesses

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PNEUMATIC ACTION FOR PIANO-PLAYERS, &c.

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To all whom it may concern:

Be it known that I, GEORGE P. BRAND, a citizen of the United States of America, and resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Pneumatic Actions for Piano-Players, &c., of which the following is a specification.

This invention relates to certain new and useful improvements in pneumatic actions for piano players, automatic pianos and the like, and it has for its objects among others to provide a simplified construction, with ease of operation insuring rapidity of movement so as to obtain quick repetition.

Another object is to provide a separable power pneumatic with a valve within the same but easy of access by reason of the separation of the pneumatic.

A further object is to provide a pneumatic or diaphragm situated outside the pneumatic and outside the tension chest, being in the atmosphere.

Other objects and advantages of the invention will hereinafter appear and the novel features thereof will be particularly pointed out in the appended claims.

The invention is clearly illustrated in the accompanying drawings, which, with the numerals of reference marked thereon, form a part of this specification, and in which—

Figure 1 is a vertical transverse section of a part of an action embodying my invention, portions being shown in elevation. Fig. 2 is a perspective view showing a modified form of pneumatic in its separated condition. Fig. 3 is a vertical longitudinal section through another modified form of pneumatic. Fig. 4 is a bottom plan with portions removed and parts in section and broken away, showing a plurality of pneumatics and a common tension chest.

Like numerals of reference indicate like parts throughout the different views.

Referring to the drawings, 1 designates a power pneumatic, 2 a valve within the same, 3 a small pneumatic arranged outside of the same and in the atmosphere. This pneumatic 3 is independent of the tension chest 4.

5 is an arm on the pneumatic 3, through an opening in which passes the rod or pin 6, the other end of which is connected with the valve 2 near one end thereof.

7 is a passage leading from the pneumatic 3 connected by the pipe 8 with the primary valve chamber 9 of the primary valve chest 10, of any well-known or approved form of construction, the valves 11 and 12 thereof being the reverse of those ordinarily employed in the primaries, being arranged inside, instead of outside, allowing normally atmospheric pressure within the pneumatic 3.

The valve 2 controls the exhaust port 13 and the atmospheric port 14. The passage 7 extends to the exhaust port, as seen clearly in Fig. 1. The valve 2 is leather faced upon its acting face and in order to permit of the necessary movement of the valve, this leather 15 is slit, as at 16 and 17, the intermediate portion, that is the portion between said slits, being glued or cemented to the stationary board 18^a of the power pneumatic. The stationary board or member 18, in the form shown in Fig. 2 which is a modification of that shown in Fig. 1 in certain particulars, is designed to have detachably secured thereto the frame of the movable member 19 of the power pneumatic, by suitable means, as for instance screws passed through openings 20 in the said stationary board, thus permitting of ready removal of the removable member 19 to permit access to the valve when necessary for repairs or other purposes. In Fig. 3 I have shown a still further form in which the board 21, forming the top of the tension chest 22, is provided with an opening 23 coincident with an opening 24 in the board 25. On this board 25 is mounted the valve 26, the leather facing 27 of which is slit, as at 28, the intermediate portion 29 being glued or otherwise affixed to the board 25, as seen clearly in said Fig. 3. 30 is a spring acting upon this valve to keep it normally down, so as to close the exhaust port 24. To the other end of this valve is attached a pin or the like 31, which extends through the atmospheric port 32, enlarged as at 33. This pin or rod 31 passes through a diaphragm 34 and carries upon the opposite side of said diaphragm, the diaphragm button or abutment 35. 36 is the diaphragm chamber from which leads the conduit or passage 37 in the under side of the tension chest 22, for connection by a tube or the like 38 with the primary chest, in a manner similar to the connection of the tube 8 heretofore described in connection with Fig. 1.

Each power pneumatic is complete in itself and removable as a unit. Fig. 4 shows

how they are disposed in series mounted on a tension chest 4 common to all of said pneumatics, by means of the bottom boards 18. These project at one end beyond the edges, as seen at 39, for the application of the securing screws by which the removable portions 19 of the pneumatics are secured in place. The removable portion 19 comprises the fixed frame 40, as seen best in Fig. 4, where the bottom board is shown removed and the tension chest broken away, the openings 41 for the reception of the screws which secure the same to the bottom board 18 being there shown.

Fig. 4 shows at the top a bottom plan of the construction seen in Fig. 2 with the parts in position; the next lower showing illustrates the tension chest broken away, disclosing the exhaust port 13, the smaller pneumatic 3 being removed, showing the opening 7 and the atmospheric port 14. In the bottom showing of said figure, all of the parts are removed but the frame of the pneumatic, the tension chest at this part being broken away.

42 is a tube connecting the tracker 43 with the primary chest 10. 44 is the music sheet, 45 the music roll and 46 the take-up roll, these parts being arranged in the ordinary manner, the music sheet passing over the acting face 47 of the tracker bar, as illustrated in Fig. 1.

48 is the sticker, 49 the shoe, 50 the piano key lever, and 51 its fulcrum.

52 is a lever fulcrumed at 53 having one end 54 designed for contact with the under face of the shoe 49, the other end of this lever bearing against the abutment 55 on the rod 56, the other end of which is connected with the movable board of the pneumatic.

57 is the exhaust chest for the bleeds 58.

59 and 60 are the diaphragm chambers, the latter having communication with the exhaust chest 61, 62 being the diaphragm.

63 and 64 are the stems carrying the valves 11 and 12 respectively, as seen in the upper portion of Fig. 1. 66 and 67 are abutments carried by these stems and resting against the diaphragms. These stems work through ports 68 as indicated in Fig. 1. These stems are guided at the inner end by a partition, as seen in Fig. 1, and at the other end in the outer wall of the valve chest. Intermediate its ends, the stem passes through a bushing or the like 69 held in the port 68, as shown.

71 is the atmospheric port open to the atmosphere and communicating with the chamber 9 in which are arranged the valves 12.

73 is the conductor board extending crosswise of the action and provided with the passages with which the tubes 8 connect, as seen in said Fig. 1, and the passages 74 in said conductor board communicate by the passages 75 (which are alternately connected by chamber 72 with the atmosphere and the exhaust through the action of the valves).

The operation is as follows: When atmosphere is admitted to the tracker bar in the usual manner, it passes through the tubes 42 into the passage 76, thence through the transverse passage 77 behind the diaphragm 62, forcing its abutment outward, actuating the valves, closing the atmosphere port 78 which communicates with the atmosphere through the passage 71, opening the exhaust port, putting the pneumatic 3 in communication with the exhaust through the passage 74 and connections above described. This closes the port 14 in the pneumatic 1, putting said pneumatic in communication with the tension chest 4, through the exhaust port 13, thereby collapsing the pneumatic and operating the parts used to sound the note. When the tracker bar is closed by the note sheet, the air is exhausted from the tubes 42 and passages 76, by the bleeds 58, thereby returning the valves and other parts to their normal position.

The action above described dispenses with valve seats for the valve in the power pneumatics, the valve being made of rigid material and faced with leather seating directly on the face of the board in which the ports are formed, both ports being on the same plane. The valve being rigid, there is not the loss of motion that is present where yielding valves are employed, and furthermore there is less noise than where reciprocating valves are employed, my valve seating itself more quietly.

Modifications in details may be resorted to without departing from the spirit of the invention or sacrificing any of its advantages.

What is claimed as new is;—

1. In a pneumatic action, a power pneumatic, a plurality of ports therefor one of which is open to the atmosphere, a plurality of valve seats, simultaneously operated rocking valves therefor, a tension chest, said pneumatic being in communication therewith through one of said ports, a pneumatic outside said power pneumatic and independent of the tension chest for actuating one of said valves, a valve chest and means therein allowing normally atmospheric pressure within the last-named pneumatic.

2. In a pneumatic action, a rocking valve, a fixed support, a leather facing thereon with the portion near the center of the valve affixed to said fixed support forming a fulcrum and slit adjacent said center portion upon opposite sides of its affixed portion, a pneumatic having ports controlled by said valve, and means acting upon opposite ends of the valve.

3. In a pneumatic action, a pneumatic, a rocking valve within the same, a leather facing thereon with the portion near the center attached to a fixed member of said pneu-

matic forming a fulcrum, said leather facing being slit adjacent said center portion with the slits extending upon opposite sides of said affixed portion and inclinedly in opposite directions therefrom.

4. In a pneumatic action, a pneumatic, a rocking valve within the same, a leather facing thereon with the portion near the center attached to a fixed member of said pneumatic forming a fulcrum, said leather facing being slit adjacent said center portion with the slits extending upon opposite sides of said affixed portion and inclinedly in opposite directions therefrom, a tension chest on which said pneumatic is mounted, and means acting upon opposite ends of said valve.

5. In a pneumatic action, a tension chest, a plurality of valve boards secured thereto with a plurality of valve seats and ports, one of said ports being connected with the tension chest and another open to the atmosphere, a pneumatic on said chest for each valve board and a valve within said pneumatic common to said seats and ports, said valve being rockingly mounted between its ends between said ports, and a device outside said pneumatic connected with said valve through the atmospheric port.

6. In a pneumatic action, a tension chest, a pneumatic having an atmospheric port, a valve for said port within said pneumatic, and a small pneumatic outside said pneumatic connected with said valve through said atmospheric port and always exposed to the atmosphere.

7. In a pneumatic action, a plurality of power pneumatics, each complete in itself and removable as a unit, a tension chest common to all of said pneumatics, valve seats and ports, and a valve rockingly mounted between its ends for controlling said ports, and means controlled by the exhausted air for returning the valve to its normal position.

8. In a pneumatic action, a power pneumatic, a valve within the same, a tension chest, a pneumatic outside said pneumatic and independent of the tension chest, a valve chest connected with said outside pneumatic, and means in said valve chest allowing normally atmospheric pressure within said outside pneumatic.

Signed by me at Washington, D. C., this 11th day of March 1910.

GEORGE P. BRAND.

Witnesses:
E. H. BOND,
JOHN SCRIVENER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."