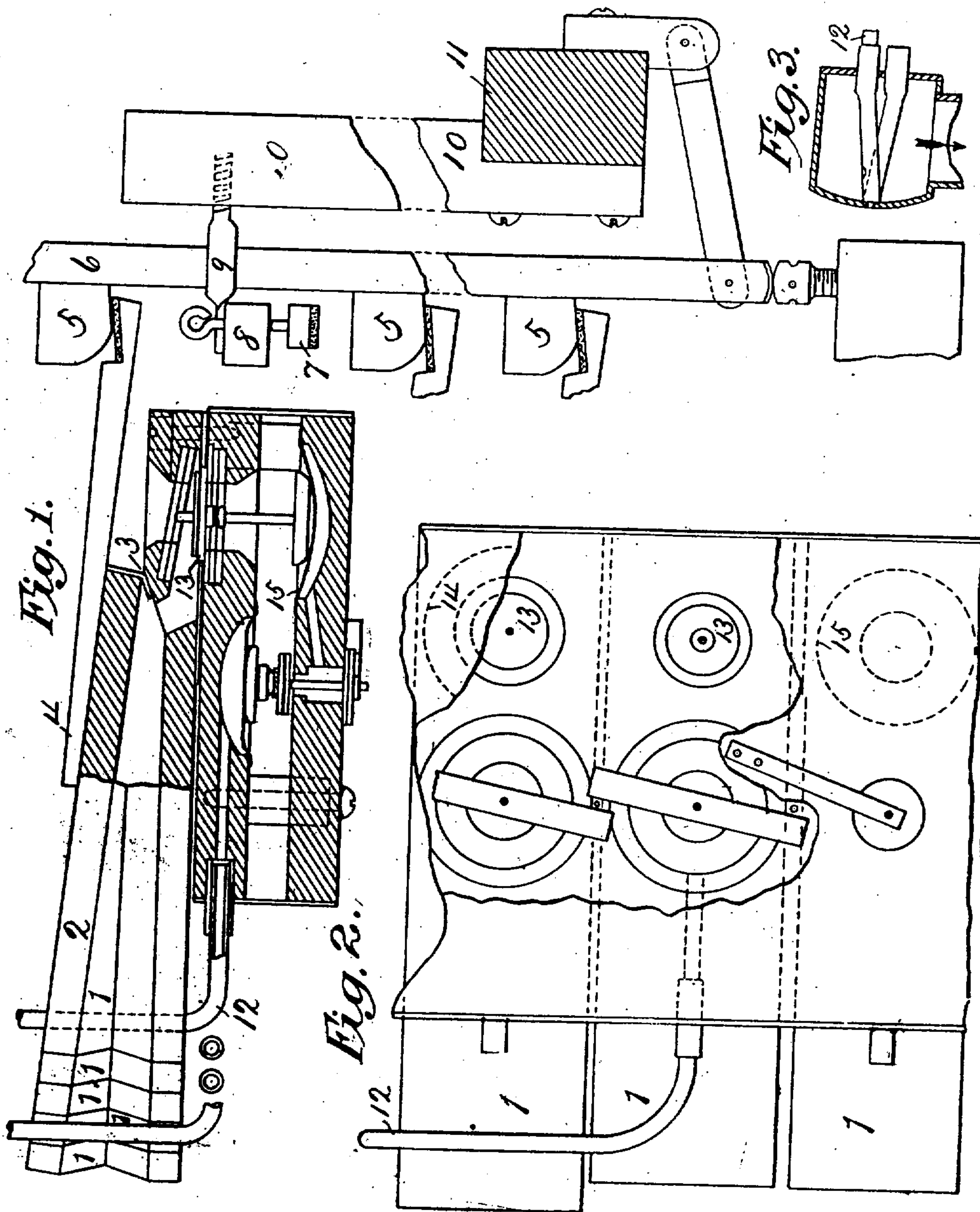


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R. A. GALLY.
MUSICAL DEVICE PNEUMATIC APPARATUS.
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MUSICAL-DEVICE PNEUMATIC APPARATUS.

No. 891,801.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ROBERT A. GALLY, a citizen of the United States, residing at Brooklyn, New York, have invented certain new and useful Improvements in Musical-Device Pneumatic Apparatus, of which the following is a specification, this application being a division of my original application No. 411,118, filed January 16, 1908.

10 The object of my invention is the construction of a simpler and more direct acting and effective pneumatic action for musical apparatus, it being especially adapted in its general arrangement for use in player-pianos.

15 In the accompanying drawings Figure 1 is a sectional view from the treble end of my pneumatic action, showing its co-action with the piano action; Fig. 2, is a plan of the pneumatic chest from the under side near the treble end, the bottom board of said action being partly cut away to show inside detail on under side of upper board; and Fig. 3 an end section of the tracker bar and its vents for controlling the pneumatic valves.

25 Most player-pianos have used various levers, stickers, etc., between their striker-pneumatics and the keys, abstracts or wippen, causing loss of power by friction, liability of rattling or sticking from wear and weather changes, and much bother of getting out of regulation, even to the extent of interfering with the correct regulation for manual performance, while the few designs avoiding the complicated connections have had their power-pneumatics directly engaging the abstracts at the opening ends of the pneumatics, thereby failing to obtain any increase of leverage such as is requisite for a firm "touch" of the notes and a reasonably low air tension for operation. Also, the windways connecting the valves and pneumatics have usually been somewhat tortuous, causing frictional loss of power, and, slowness of speech, except when an undesirably high air tension was employed. I overcome these faults in the following simple, easy working, and economical manner:

30 I place my striker-pneumatics 1 in horizontal rows (preferably three) with their open ends facing to the front of the piano or other instrument, the moving-board 2 of each pneumatic being at the top of each with its hinge 3 at the rear, and on top of the moving-board 2 is fastened an extension or

heel-lever 4 extending to the rear of the pneumatic and having its rear end felted and resting up against a lug 5 fast on the abstract 6 of that particular tone-producing action, the heel-lever 4 reversing the downward stroke of pneumatic 1 to an upward lift on the lug 5 and abstract 6 to actuate it. The lugs 5 are preferably upwardly curved at their front lower corners to facilitate replacing of the pneumatic-action. As the abstracts of pianos usually have a small forward movement when they rise, I position above that right angle-line from the abstract 6 which would coincide with the hinge 3, thereby securing a small forward movement of the contact end of lever 4 approximating that of lug 5 of abstract 6, thereby avoiding any friction.

The weight of a pneumatic of the present structure always causes the contact end of its lever 4 to rise to contact with lug 5, thereby preventing any racing or thumping during operation.

To insure an exact and permanent limitation of the rise of the abstract 6 at the correct point required by the tone-producing action, I place a regulating check 7 above each lug 5 of the middle row of lugs, that row having lugs to every abstract, although the other rows need only have lugs to every third note to which the pneumatics of that row correspond. These checks 7 are held by a rail 8 carried by props 9 screwed into uprights 10 which rise at the rear of the abstracts from the swing-rail 11. The checks 7 can be accurately adjusted to the exact rise of the abstracts when the keys and action are regulated while the pneumatic action is out of the instrument, and the pneumatic levers 4 will self-level themselves thereto as already described, and the pneumatics 1 having a possible surplus movement in both directions, an exact operation of the abstract and its action will always be certain, and no danger of the pneumatics and their levers ever crowding to, or having lost motion to the abstracts.

The tubes 12 are carried longitudinally between the horizontal rows of pneumatics and upwardly to the tracker-bar through the open spaces where the "breaks" of the scale occur.

A piano action has its hammers carefully graded in weight from heavy ones at the bass

up to much smaller ones at the high treble, to insure a proper stroke on the strings of varied sizes and tensions to secure desirable tones throughout the scale.

5 Piano self-playing devices have heretofore had all the striker pneumatics of the scale of one size and similar leverage, producing an unbalanced musical effect, the treble notes overloud for soft basses and the basses lost
10 when the treble is very soft. The pneumatics herein shown are graded down from bass to treble as to their length, width, and leverage, thus effecting a perfectly balanced musical result, even to a great extent pro-
15 ducing a selection of melody from accompaniment in any part of the scale without any special melody selecting devices or divisions of scale. As the chamber at the heel of the pneumatic requires to be wider at the
20 treble than it is possible to have the bellows portion, the latter is made narrower than its heel for the treble notes. The controlling valves as 13 are also graded in size to aid proper stroke and their controlling pneu-
25 matics 14, 15, are similarly graded to economize space and wind.

The novel general arrangement of the chests, pneumatics and levers relative to the abstracts and keys has been shown in my
30 prior application #409,473, but not being claimable therein was then reserved for future application, the present one being the one meant thereby.

What I claim as my invention is:—

35 1. A manual keyboard, vertical abstracts above the rear ends of the keys, and hinged horizontal striker-pneumatics above said keys, each pneumatic having its opening end facing to the front of the keys and with its
40 moving board striking downwardly, said moving-board having a hinge and an extension or lever fixed with said board and extending rearwardly of its hinge to the
45 abstract, and engaging means between said lever and abstract.

2. A manual keyboard, vertical abstracts above the rear ends of the keys, and hinged horizontal striker-pneumatics above said
50 keys, each pneumatic having its opening end facing to the front of the keys and with its moving board striking downwardly, said moving-board having a hinge and an extension or lever fixed with said board and
55 abstract, and a lug fixed to said abstract and engaged by said lever.

3. A manual keyboard, vertical abstracts above the rear ends of the keys, and hinged horizontal striker-pneumatics above said
60 keys, each pneumatic having its opening end facing to the front of the keys and with its moving board striking downwardly, said moving-board having a hinge and an extension or lever arm fixed with said board
65 and extending rearwardly of its hinge to the

abstract, and a lug fixed to said abstract and engaged by said lever, said lug curved upwardly and forwardly at its lower front corner.

4. A manual keyboard, vertical abstracts 70 above the rear ends of the keys and having a slightly forward movement during their upward stroke, horizontal downwardly striking striker-pneumatics with a rearward hinge, all above said keys, the moving-board 75 of each pneumatic having a rearward extension or lever arm, and engaging means between said lever arm and abstract, the said hinge being lower than the engagement point of the lever with the abstract. 80

5. An upwardly acting vertical abstract, a downwardly acting, horizontal, hinged striker-pneumatic with a rearwardly extending reverse lever arm, and engaging means 85 between the rear end of said lever and said abstract, the weight of the downwardly moving part of said pneumatic being greater than that of the lever arm to raise the lever in contact with the engaging means.

6. An upwardly acting vertical abstract, 90 a downwardly acting, horizontal, hinged striker-pneumatic with a rearwardly extending reverse lever arm, and engaging means between the rear end of said lever arm and said abstract. 95

7. A piano-actuating pneumatic action having several superimposed horizontal rows of pneumatics, and controlling tubes con-
100 nected therewith, said tubes carried lengthwise of and between said rows of pneumatics and passing upwards at the wide spaces corresponding to the breaks of the piano scale.

8. A player-piano pneumatic action having several superimposed horizontal rows of
105 pneumatics above the keys and with their open ends facing forwardly, a tracker, and controlling tubes carried lengthwise of and between said rows, one end of each tube connected to its corresponding pneumatic, and
110 the other end continued upwardly to the tracker.

9. An auto-pneumatic piano playing device having striker-pneumatics varied in
115 area from bass to treble of the scale.

10. An auto-pneumatic piano playing device having striker-pneumatics varied in
length from bass to treble of the scale.

11. An auto-pneumatic piano playing device having striker-pneumatics varied in
120 width from bass to treble of the scale.

12. An auto-pneumatic piano playing device having striker-pneumatics and striker-
levers, the leverage of the pneumatics and their levers permanently varied from bass
125 to treble of the scale.

13. A pneumatic action having a row of bellows shaped pneumatics each with a rear-
wardly extending heel part and all said heel-
130 parts of a similar width, the bellows parts of

the bass pneumatics being the same width as their heel parts, and the bellows parts of the treble pneumatics being narrower than their heels.

5 14. A bellows-shaped pneumatic having a rearwardly extending heel part wider than the bellows part.

15. An auto-pneumatic piano playing action having note controlling valves graded
10 in size from bass to treble of the scale.

16. An auto-pneumatic piano playing device having note-valves and controlling

pneumatics the said pneumatics varied in area from bass to treble of the scale.

17. An auto-pneumatic piano playing de- 15
vice having note controlling valves, and pneumatics actuating said valves, both valves and pneumatics varied in size from bass to treble of the scale.

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Witnesses:

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