J. LEISCH.

PLAYER PIANO.

APPLICATION FILED NOV. 16, 1911.

1,166,609.

Patented Jan. 4, 1916.

2 SHEETS—SHEET 1.

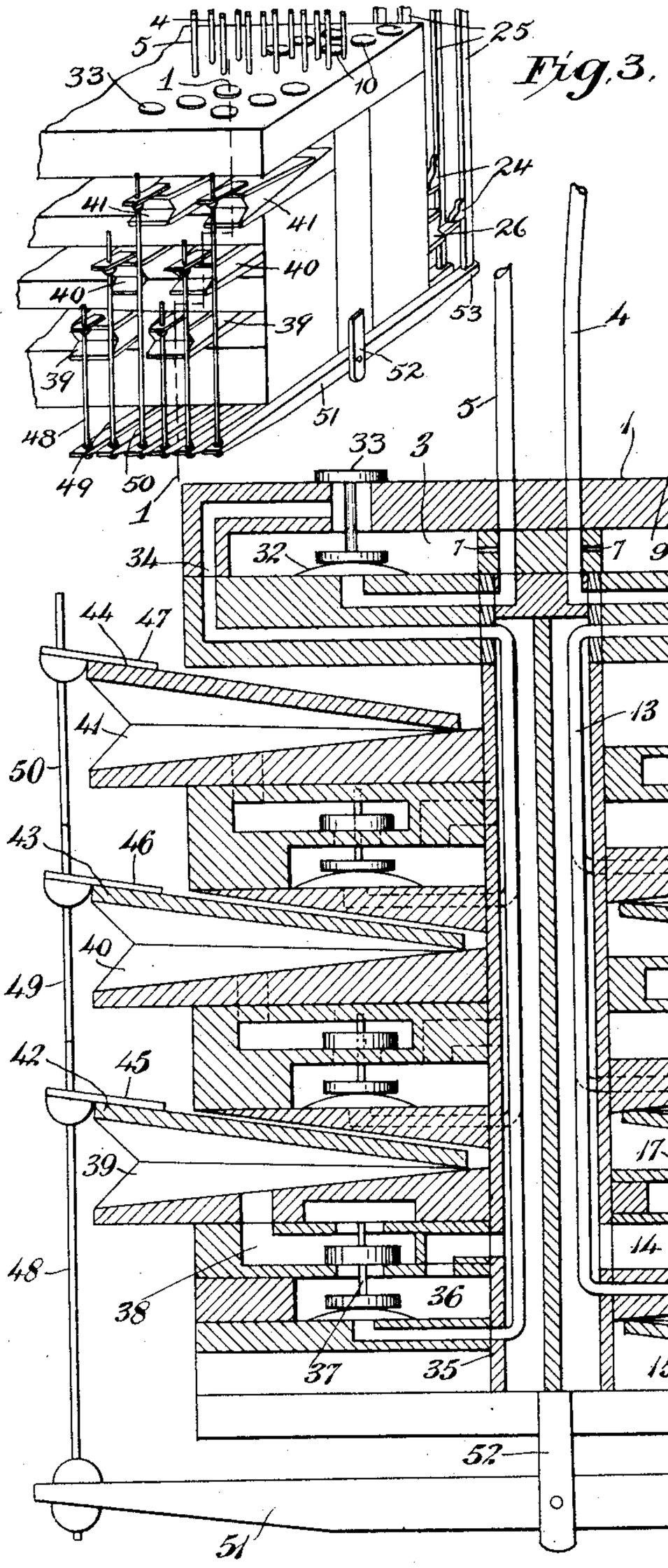

Fig. 1.

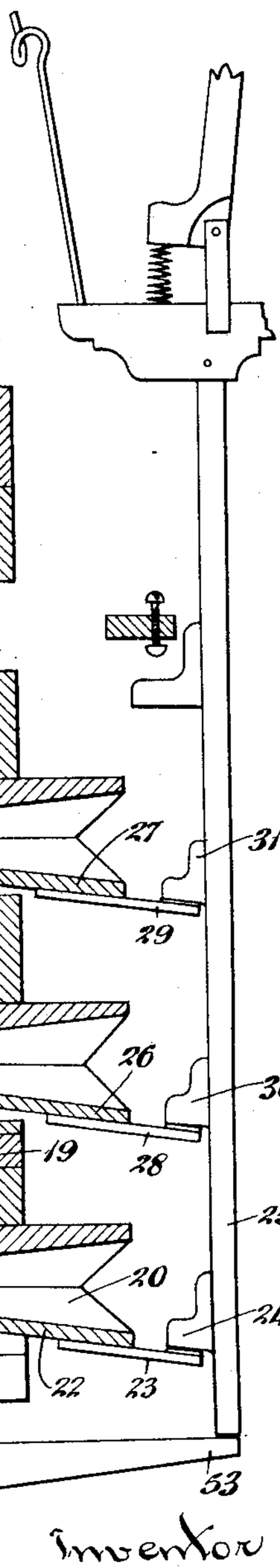

Fig. 3.

Witnesses

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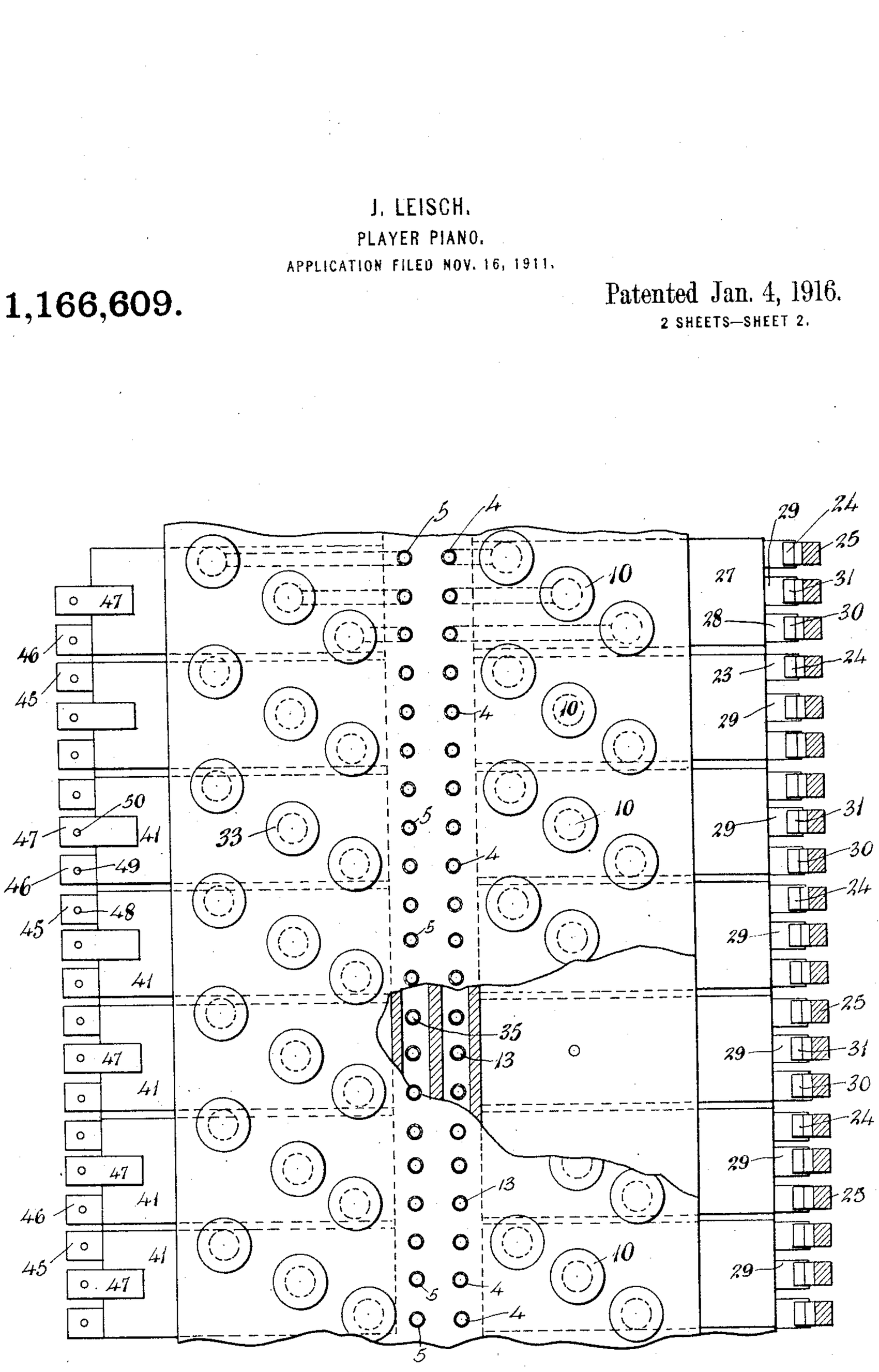

Fig. 2.

Witnesses

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UNITED STATES PATENT OFFICE.

JOSEPH LEISCH, OF TRYON, NORTH CAROLINA, ASSIGNOR TO THE JOHN CHURCH COMPANY, OF CINCINNATI, OHIO, A CORPORATION OF OHIO.

PLAYER-PIANO.

1,166,609. Specification of Letters Patent. Patented Jan. 4, 1916.

Application filed November 16, 1911. Serial No. 660,588.

To all whom it may concern:

Be it known that I, JOSEPH LEISCH, a citizen of the United States, and a resident of Tryon, in the county of Polk and State of North Carolina, have invented certain new and useful improvements in Player-Pianos, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to player pianos in which the piano keys are connected with a series of power pneumatics, which are operated mechanically by pneumatic power, released by the exposure of openings in a tracker board by the movement of specially prepared slotted or perforated sheets of music, which are propelled over the tracker board to actuate the pneumatic devices.

The object of my present invention is to provide a construction whereby the operation of the pneumatics may be duplicated for the purpose of giving additional force to the stroke of the hammer of the piano action on the keys in order to accent any desired notes, and it consists of that certain novel construction and arrangement of parts to be hereinafter particularly pointed out and claimed whereby a duplicate series of power pneumatics are arranged in compact position in a single pneumatic chest, each pair of pneumatics for each note being so arranged and coupled together that one pneumatic of each pair may be operated by itself for ordinary strokes, or the pair of pneumatics may be operated simultaneously to double the force of the hammer stroke for all tones to be accented.

In the drawings, Figure 1 is a top plan view of a portion of the pneumatic chest with a portion thereof in horizontal section. Fig. 2 is a cross sectional view through the chest and pneumatics, taken in a vertical plane. Fig. 3 is a perspective view of one end of the player chest, Fig. 1 being on the line 1, 1, thereof.

The pneumatic chest is represented by 1, and is arranged in duplicate, with a vacuum chamber 2 for one half of the chest and a vacuum chamber 3 for the other half, and these two vacuum chambers are in communication with duplicate openings in the tracker board through separate tracker tubes 4, 5. The tracker tubes 4 are each connected to its primary pouch 6, located along the bottom of the vacuum chamber 2 common to all of the pouches, and each of these tracker tubes is provided with a bleed opening 7 from the vacuum chamber into its respective tube, so that the vacuum of the chest is maintained in the tracker tubes.

Directly over each pouch 6 is located the primary valve 8, provided with the bottom disk 9 and the upper disk 10, with the two disks opening and closing the port 11 from the vacuum chamber to the outer air. In their normal position, the disks 9 of these valves rest on the deflated pouches 6, and the upper disks 10 close the ports 11. Connected to each port are a passageway 12 and tube 13 which extend to the secondary vacuum chamber 14 in which are located the secondary pouches 15, one for each tube 13. Directly over each of the pouches 15 is a secondary valve comprising a bottom disk 16 and an upper disk 17, the two disks opening and closing the port 18 from the vacuum chamber into the passageway 19 leading into the power pneumatic 20. The disk 17 also operates to open and close the port 21 from the passageway 19 into the outer air. In their normal position, the valve disks 16 rest on the deflated pouches 15 and the passageway 19 is open to the air, and the pneumatic is inactive.

The construction above described is the ordinary and usual construction for the double valve player piano action, and the operation will be evident.

When any of the tracker tubes 4 open to the atmosphere by reason of the perforations in the music sheet passing over the openings in the tracker board, the vacuum in the particular tube 4 is released, the primary valve is open, which releases the vacuum in the tubes 13, inflates the pouches 15 and opens the particular passageway 19 to the vacuum chamber 14, creating suction in the pneumatic 20 and causing the movable member 22 thereof to rise and with it the extension 23 in contact with the lug 24 on the abstract 25 of the piano action, and thus the hammer of the piano action will be operated.

It will be understood that there are as many power pneumatics as there are keys to be operated, and that in order to economize space, the pneumatics are not placed in line side by side, but are arranged in staggered relation in groups of three, as indi-

cated in the drawings. I have, therefore, only particularly described the parts with reference to the lower pneumatic of the group of three. The movable members 26 and 27 of the other sets of pneumatics are operated and controlled exactly as described with reference to the lowermost pneumatic, and the extensions 28, 29, from these pneumatics actuate their respective piano actions by raising their respective lugs 30 and 31 as hereinbefore described.

In order to double the force of the stroke of the hammer of the piano action, I provide a duplicate vacuum chest with a duplicate vacuum chamber 3 and tracker tubes 5, with primary pouches 32, valves 33, passageways 34 and tubes 35 leading to secondary vacuum chamber 36 controlled by secondary valves 37 to open up the passages 38 into the duplicate set of power pneumatics 39, which are arranged as heretofore described for the first set in staggered relation in groups of three, as indicated at 40 and 41. The only difference is that the pneumatics in the duplicate set are reversed, and the movable members 42, 43 and 44 of this series of pneumatics are uppermost. The extension arms 45, 46 and 47 from this series connect with their respective rods or wires 48, 49 and 50, and these rods are each coupled to one end of a corresponding rock lever 51, each pivoted midway of its length to a depending support 52. The opposite end 53 of each one of these levers extends directly under its corresponding abstract 25 of the piano action. These pneumatics are all arranged in pairs, one of each pair designed to contact with a lug as 24 on the abstract of the piano action operating its particular note upon the piano, while the corresponding pneumatic of the player is connected with the same abstract through the medium of the rock lever 51.

It will be evident from this construction, that when it is desired to accent any particular notes of the music score, duplicate slots will be provided for the perforated music sheet, whereby the corresponding pair of tracker tubes may be opened simultaneously. In this way, the force applied to the abstract of the piano action will be doubled.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:—

In an arrangement of parts in a player piano in combination with the piano action, a main system, comprising a series of primary pneumatics set in staggered relation in a horizontal plane, a series of power pneumatics, secondary pneumatics for each power pneumatic mounted together with and adjacent to the fixed members thereof, the power pneumatics set in staggered relation in a vertical plane, and a complete auxiliary system set back to back with the main system throughout and comprising primary pneumatics in like relation and back to back with those of the main set, secondary pneumatics, and power pneumatics mounted together in like relation to those of the main system and set in vertical staggered relation back to back with those of the main system, said auxiliary power pneumatics being positioned so that their movable members move in the opposite direction to those of the main system, whereby each main power pneumatic is back to back and parallel with an auxiliary power pneumatic, and operative connection from each power pneumatic of the main system and its parallel and back to back power pneumatic of the auxiliary system to a separate member of the piano action, whereby a compact and accessible player chest is provided.

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Attest:
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