No. 810,057. PATENTED JAN. 16, 1906.

L. U. JOBES.

MECHANICAL MUSICAL INSTRUMENT PLAYER.

APPLICATION FILED JULY 6, 1903.

4 SHEETS—SHEET 1.

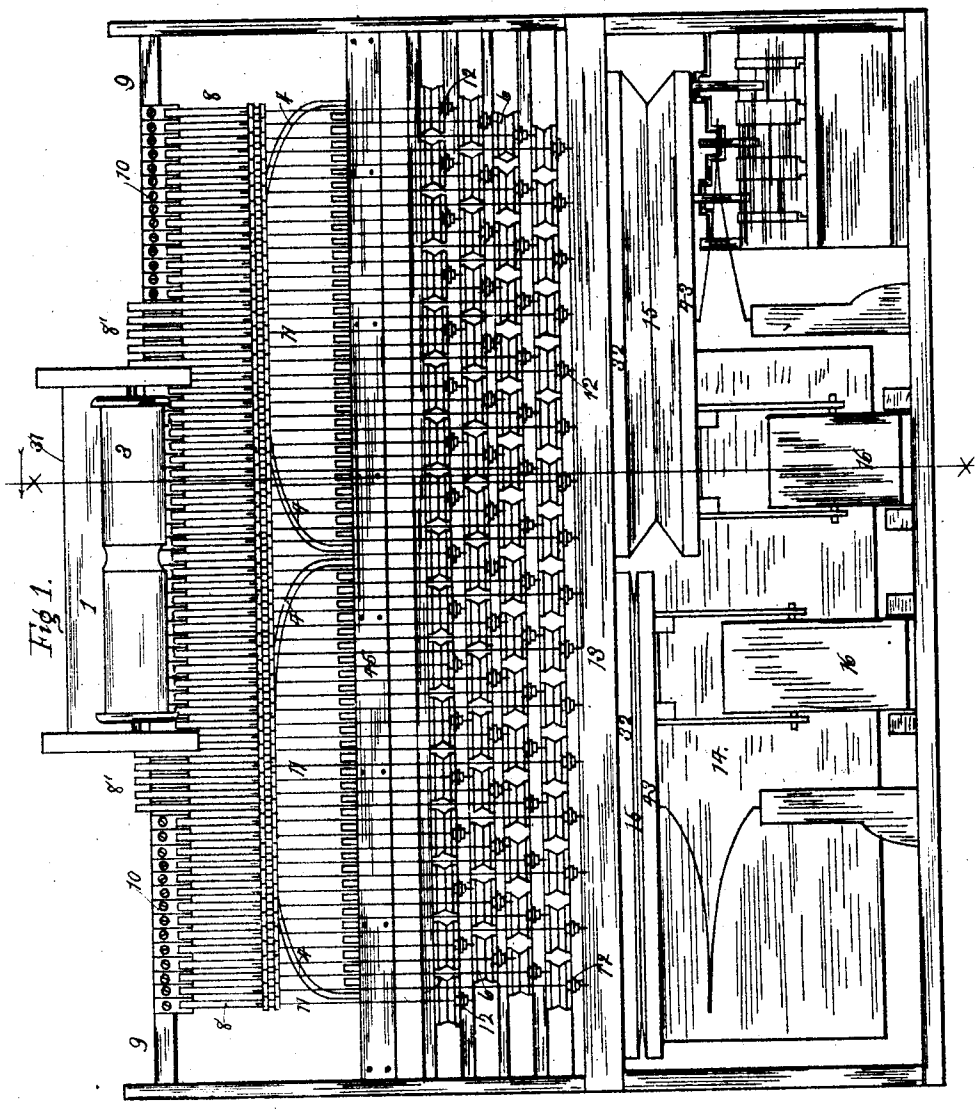

Fig. 1.

WITNESSES:

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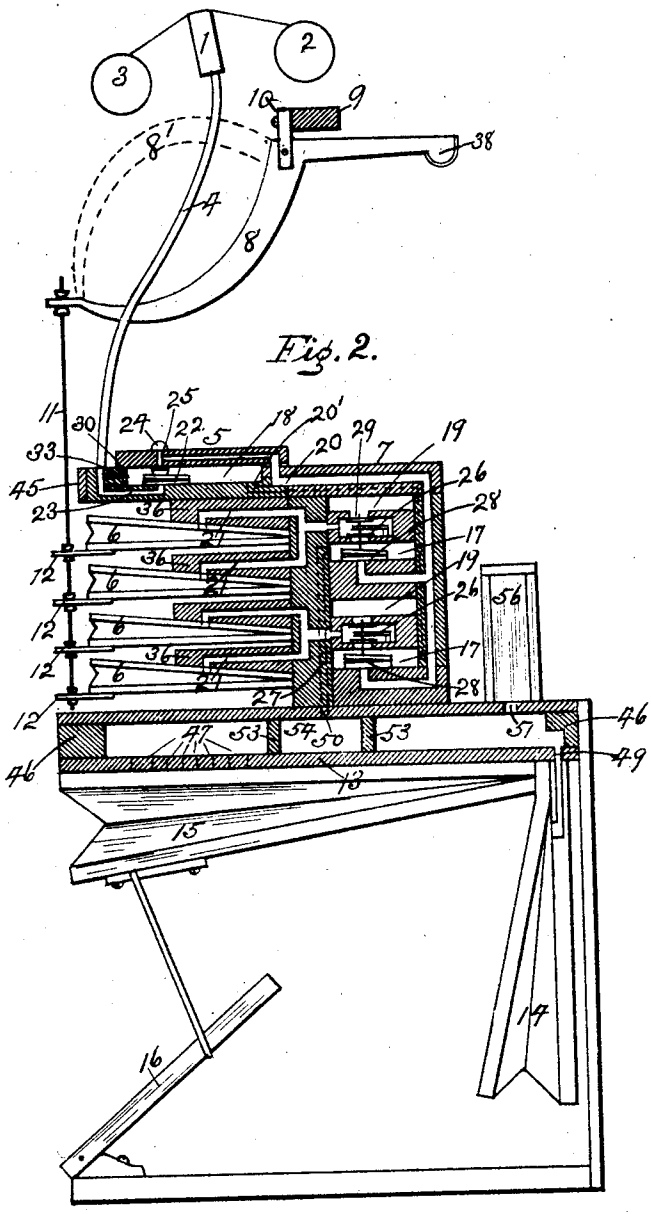

Fig. 2.

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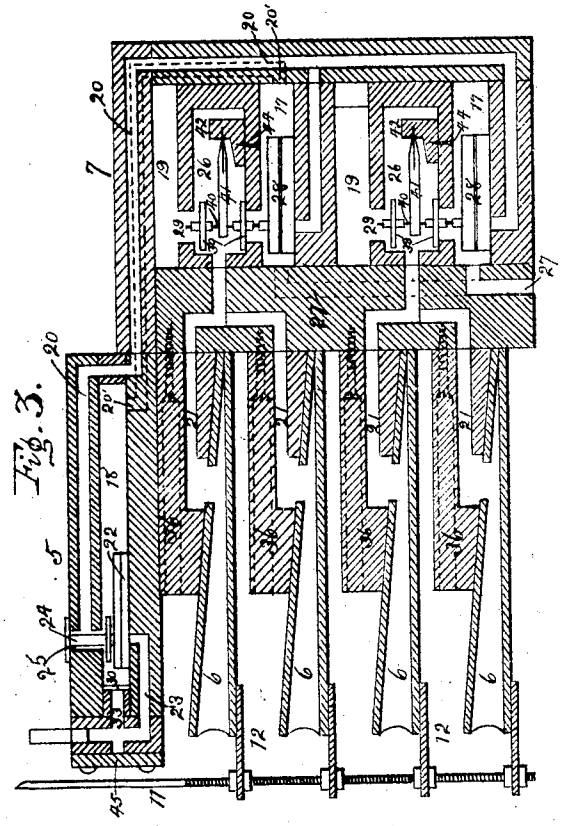

Fig. 3.

WITNESSES:

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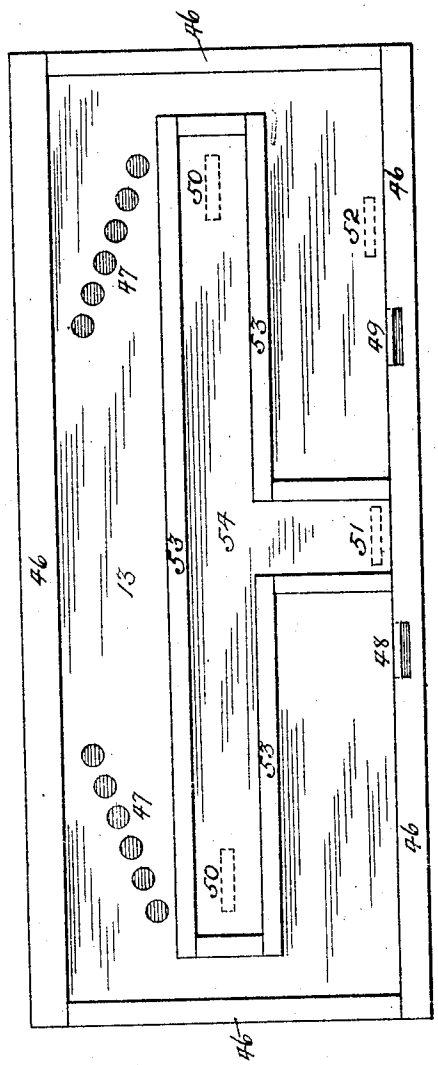
4 SHEETS—SHEET 4.

Fig. 4.



WITNESSES:

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INVENTOR.

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UNITED STATES PATENT OFFICE.

LAWRENCE U. JOBES, OF CINCINNATI, OHIO, ASSIGNOR TO THE BALDWIN COMPANY, OF HAMILTON, OHIO.

MECHANICAL MUSICAL-INSTRUMENT PLAYER.

No. 810,057. Specification of Letters Patent. Patented Jan. 16, 1906.

Application filed July 6, 1903. Serial No. 164,390.

To all whom it may concern:

Be it known that I, LAWRENCE U. JOBES, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Mechanical Musical-Instrument Players, of which the following is a clear and full description.

This invention relates to that class of musical-instrument players wherein the action thereof consists of a series of primary, intermediate, and striking pneumatics combined with an exhaust-bellows and operated by a perforated note-sheet, commonly called a "music-sheet."

The object of my invention is to improve upon the construction of the class of musical-instrument players above referred to and to provide a mechanism simple in construction, sensitive in operation, having a greater accessibility for adjustment and repair, and greater capacity for musical expression; and my invention consists of certain novel features of construction and combination of parts, as will be herein fully described.

Referring to the drawings, Figure 1 is a front view of a mechanical musical-instrument player, in this instance a piano-player, embodying my improvements. It shows the case removed to expose the parts which would be concealed thereby. Fig. 2 is a section through the instrument shown in Fig. 1, taken at a point indicated by the lines X X in Fig. 1 looking in the direction of the arrow, same figure. Fig. 3 shows the primary and intermediate pneumatics, together with the striking-pneumatics, on an enlarged scale. Fig. 4 is a view of the wind-chest, showing the arrangement of the air-passages.

In the description and drawings corresponding numerals indicate corresponding parts.

1 is the tracker-range over which the music-sheet passes from the roll 2 to the roll 3.

4 represents the pipes connecting the tracker-range with the primary-pneumatic box 5.

6 shows the striking-pneumatics framed together in four staggered rows, to the rear of which is placed the intermediate-pneumatic box 7.

The key-levers 8 and 8′ are attached to the lever-rail 9 by means of the flanges 10.

The key-levers 8 and 8′ consist of a straight portion extending from the flange 10 to the striking-point 38. The front portion of the levers 8 extend from the flange 10 to the lifter-rod 11 and are curved with a downward sweep, while the levers 8′, placed on each side of the tracker-range, are curved with an upward sweep, thus making room on each side of the tracker-range for the pipes 4, which are carried through the openings thus formed to the treble and bass sections of the instrument. The key-levers are connected with the pneumatics 6 by the lifter-rod 11 and wood extensions 12. The lifter-rods 11 are metal, threaded at each end and provided with leather nuts for the purpose of regulating the stroke of the striking-levers 8 and 8′.

The striking-pneumatics 6, primary box 5, and intermediate box 7 are framed together in such a manner that the primary box is placed directly over the striking-pneumatics and connects with the intermediate box in its position behind the striking-pneumatics. The whole rests on the wind-chest 13, which is connected with the bellows 14, which works on the exhaust or suction plan.

The wind-chest 13 consists of a box having top and bottom boards glued to a rim 46, the same being provided with air channels and vents for the passage of air from the system of pneumatics to the exhaust-bellows. The valve-holes 47 connect the wind-chest with the exhaust-bellows 15. The vents 48 and 49 at the rear of the wind-chest open from the under side of the same into the equalizing-bellows 14, which maintains and equalizes the partial vacuum of the entire pneumatic system. The vents 51 and 52 in the upper surface of the wind-chest lead into a pneumatic expression-box 56, fully described in a subsequent application. Said expression-box is placed on the upper surface of the wind-chest to the rear of the intermediate valve-box. The air passing through the intermediate box under suction enters the channel 54 of the wind-chest through the vents 50, said channel being separated from the main portion of the wind-chest by the walls 53. The air then enters the expression-box through the vent 51, where by proper means under the control of the operator the degree of vacuum-pressure is modified to the end that the force of the striking-pneumatics is regulated according to the requirements of the music. The air is then returned to the

main portion of the wind-chest through the vent 52 and through the valve-holes 47 into the exhaust-bellows 15.

The bellows and wind-chest system is in direct connection with the pneumatic-chamber 17 in the intermediate box, and the pneumatic-chamber 18 in the primary box, and the air-channels 20 and 20′, connecting the intermediate box with the primary box. The striking-pneumatics 6 and the air-channels 21 connecting them with the intermediate box are acted upon by both the bellows-exhaust and the outside air.

In the primary box 5 are placed a series of pneumatics 22, which separate the pneumatic-chamber 18 from the air-channel 23, leading to the tracker-range 1. Over the pneumatic 22 rests the valve 24, which alternately brings the channel 20 in connection with the air in the exhaust-chamber 18 and the outer air through the port 25. The vent 30, which equalizes the degree of vacuum between the pneumatic-chamber 18 and the air-channel 23, is provided with a channel 33, which runs to the front of the primary box and is covered by a vent-strip 45.

The intermediate box 7 contains two series of valve-chambers 26, one placed above the other. The valves of each series control a double series of striking-pneumatics 6, since there are four series of striking-pneumatics operated by two series of valves, as shown in Fig. 3. The intermediate box 7 also contains two pneumatic-chambers 17, connected with the wind-chest 13 by the channels 27, also two vent-chambers 19, open to the outside air. In the pneumatic-chamber 17 is placed a pneumatic 28, directly under each puppet-valve 29, which controls the action of the same, the pneumatic 28 being under the influence of the exhaust in the primary air-chamber 18 through the channel 20, leading to the same.

The striking-pneumatics are arranged in four rows under the primary box 5. The pneumatics of each row are attached to a shelf 36, which is secured by screws to the intermediate box 7, the screws for this purpose being reached from the front through holes leading to them through the shelf. It will be seen that by this improvement the striking-pneumatics become accessible for repairs by removing the screws, which hold the shelves in position.

Under normal conditions there is a partial vacuum in the wind-chest 13 and exhaust-chambers 17 and 18, also in the channel to the tracker-range 1, when the hole 31 in the tracker-range is covered with an unperforated portion of the music-sheet, said partial vacuum being maintained by the small vent 30. When a perforation of the music-sheet registers with an opening in the tracker-range and admits air thereto, the partial vacuum therein is destroyed. The pneumatic 22 is raised, causing the valve 24, which rests thereon, to close the connection between the duct 20 and the chamber 18 and open the same to the outer air through the ports 25. This destroys the partial vacuum in the duct 20 and causes the pneumatic 28 to raise the puppet-valve 29, thus closing the valve-chamber 26 to the outer air. This causes the striking-pneumatics 6 to collapse by establishing a connection between them and the pneumatic-chamber 17 through the channel 21. This action of the striking-pneumatic causes an upward movement of the lifter-rod 11 and causes the key-levers 8 to strike the keys of the piano.

The advantages of my improvement will be readily appreciated by those skilled in the art.

The primary valve-box, intermediate valve-box and striking-pneumatics are framed together in the most compact manner. All parts are easily accessible for regulation or repair as soon as the upper portion of the case is removed.

By placing the striking-pneumatics as shown I am enabled to use a greater leverage in the key-levers, and thus secure greater power. Also by the use of longer lifter-rods greater elasticity in the touch of the instrument is attained.

The wind-chest 13 as ordinarily constructed is made in two halves, held together by screws. My experience with this form of construction shows there is apt to be a leakage of air and sliding of parts. This is obviated in my improved wind-chest and the construction rendered more rigid by gluing the various parts together, as the arrangement of the air-channel and the various vents is such that it never becomes necessary to open the wind-chest for any purpose whatever.

Having described my invention, what I desire to secure by Letters Patent is—

1. In a mechanical musical-instrument player the key-levers 8 having a straight portion extending from the flange 10 to the striking-point 38, and a curved portion extending with a downward sweep from the flange 10 to the point of contact with the lifter-rods 11, substantially as described.

2. In a mechanical musical-instrument player the key-levers 8′ having a straight portion extending from the flange 10 to the striking-point 38 and a curved portion extending with an upward sweep from the flange 10 to the point of contact with the lifter-rods 11, substantially as described.

3. In a mechanical musical-instrument player, the combination of the key-levers 8 having a straight portion extending from the flange 10 to the striking-point 38 and a curved portion extending with a downward sweep from the flange 10 to the point of contact with the lifter-rods 11 with the key-levers 8′ having a straight portion extending

from the flange 10 to the striking-point 38 and a curved portion with an upward sweep from the flange 10 to the point of contact with the lifter-rods 11, substantially as described.

4. In a mechanical musical-instrument player the combination of the primary valve-box 5, the intermediate valve-box 7 placed below and at the rear of the primary valve-box, and the striking-pneumatic 6 placed directly under the primary valve-box and in the front of the intermediate valve-box 7, the whole being under the action of the exhaust by means of the channels 20 leading from the intermediate valve-box to the primary valve-box, and the passages 21 leading from the intermediate valve-box to the striking-pneumatic, substantially as described.

5. In a mechanical musical-instrument player the combination of the primary valve-box 5, the intermediate valve-box 7 placed below and at the rear of the primary valve-box, the striking-pneumatics 6 placed directly under the primary valve-box and in front of the intermediate valve-box, and the attachable and detachable valve-shelf 36, secured to the front wall of the intermediate valve-box, said valve-shelf having the striking-pneumatics attached to the same, the primary valve-box, the intermediate valve-box and the striking-pneumatics being under the action of the exhaust by means of the channels 20 leading from the intermediate valve-box, and the passages 21 leading from the intermediate valve-box to the striking-pneumatics, substantially as described.

6. In a mechanica lmusical-instrument player, the combination of a wind-chest, with an expression-box and an equalizing-bellows connected therewith; said wind-chest consisting of a box in which the top and bottom boards thereof are attached continuously to a rim; said wind-chest having an air-channel within the same separated by walls from the main air-space of the chest, and vents adapted to lead from said channel to the outside of said wind-chest, also vents connecting said channel and said main air-space with said expression-box; and passages leading from said main air-space to said equalizing-bellows, substantially as described.

7. In a mechanical musical-instrument player the combination of a wind-chest 13, consisting of a box in which the top and bottom boards thereof are attached continuously to a rim 46, and having a channel 54 within the same separated by walls 53 from the main air-space of said chest; with an intermediate valve-box 7 connected with the channel 54 by the vents 50; an expression-box 56 connected with said channel by the vent 51 and with the main air-space of said chest by the vent 52; an equalizing-bellows 14 connected with said main air-space by the vents 48 and 49; and the exhaust-bellows 15 connected with said main air-space by the valve-holes 47, substantially as described.

LAWRENCE U. JOBES.

Witnesses:
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