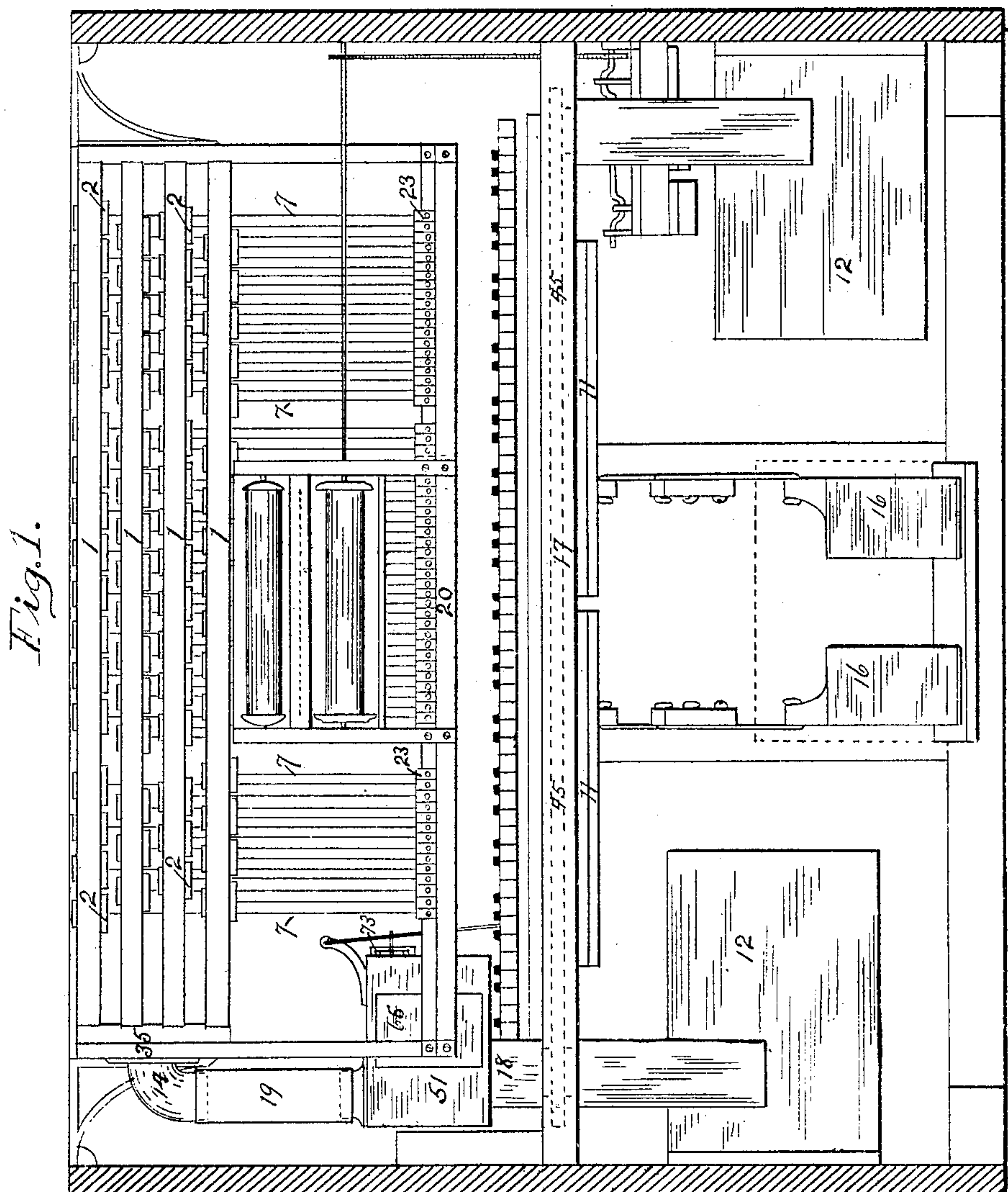


No. 806,148.

PATENTED DEC. 5, 1905.

L. U. JOBES.
AUTOMATIC PIANO.
APPLICATION FILED FEB. 23, 1905.

3 SHEETS—SHEET 1.



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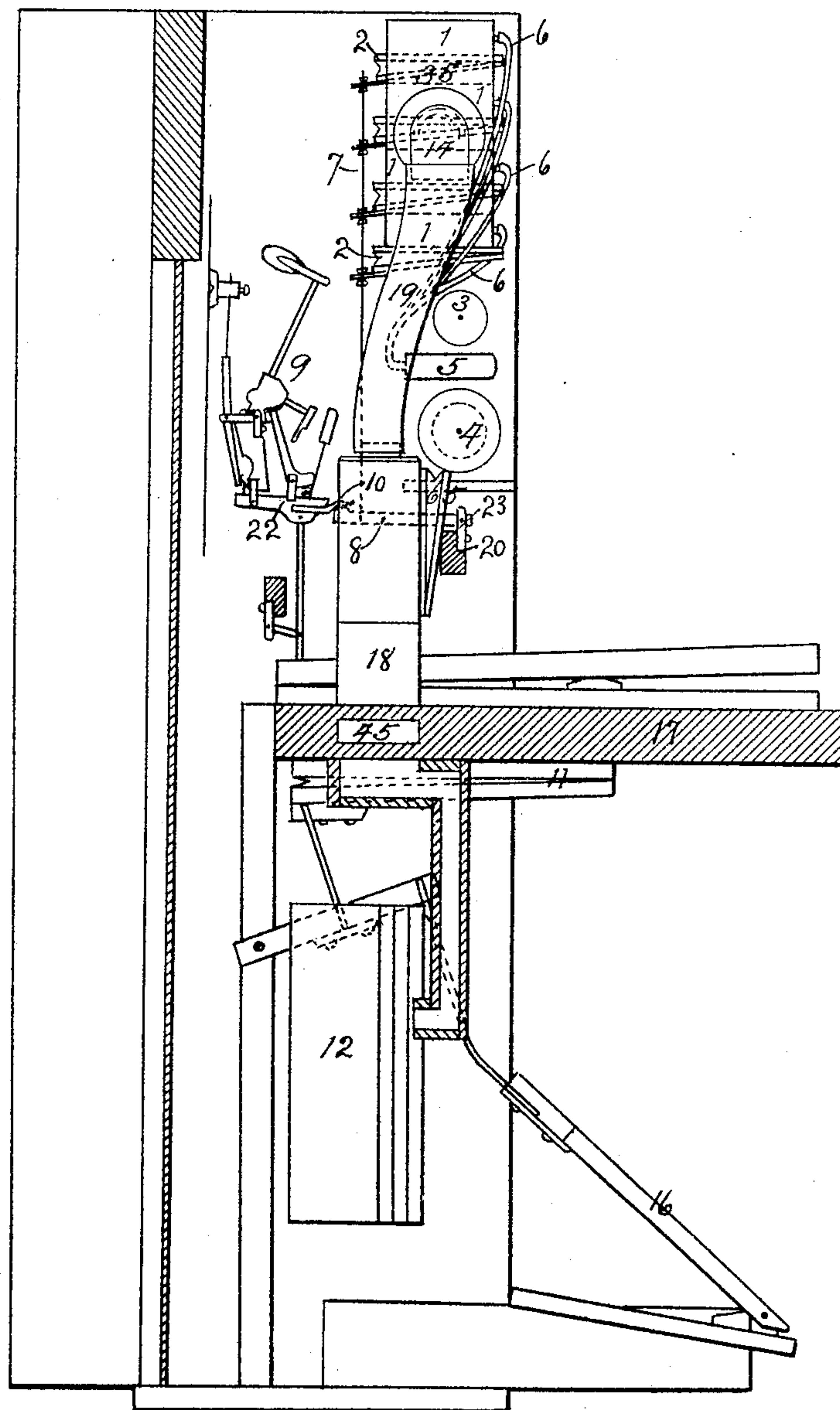
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3 SHEETS—SHEET 2.

Fig. 2.

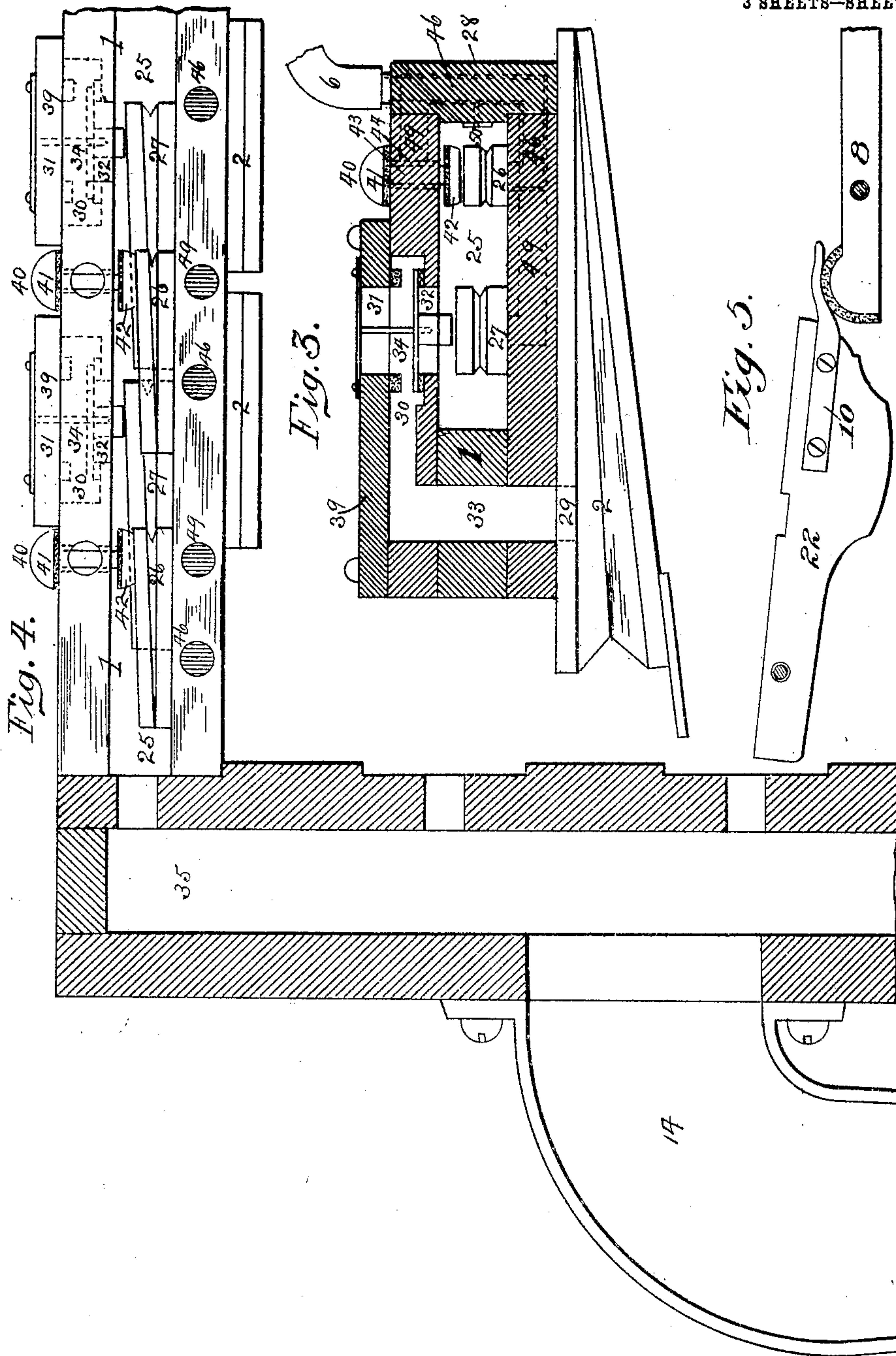


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UNITED STATES PATENT OFFICE.

LAWRENCE U. JOBES, OF CINCINNATI, OHIO.

AUTOMATIC PIANO.

No. 806,148.

Specification of Letters Patent.

Patented Dec. 5, 1905.

Application filed February 23, 1905. Serial No. 246,836.

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 Automatic Pianos, of which the following is a specification.

The object of my invention is to combine in a practical and efficient manner a piano having the usual strings, action mechanism, and manual keyboard with an automatic pneumatic playing mechanism controlled by a traveling music-sheet and operated by a pneumatic motor, the same being adapted to operate the action mechanism of the piano independently of the manual keyboard.

A further object is to improve the construction of such automatic pianos and enable them to be more easily played and controlled with the least complication of parts and most efficient arrangement; and to these ends my invention consists in an automatic piano for carrying out the above objects, constructed and arranged and having the general mode of operation substantially as hereinafter fully described and shown.

In the accompanying drawings, Figure 1 is a front elevation of an upright piano embodying my invention. Fig. 2 is a vertical section of the same. Fig. 3 is a sectional view of my improved valve-box. Fig. 4 is a front view of my improved valve-box with front wall removed. Fig. 5 shows the action-wippen with bracket attached.

Similar numerals of reference indicate corresponding parts.

The pneumatic mechanism, consisting of the valve-boxes 1, each carrying a series of striking-pneumatics 2, arranged as a plurality of units, a group of four being shown in this application, the music-rolls 3 and 4, the tracker-range 5, the pipes 6, connecting the tracker-board with the valve-boxes, the tracker-wires 7, and the operating-levers 8, is placed in the upper portion of the instrument in the space between the action 9 and the front frame of the case.

The vacuum-producing mechanism described in my application filed December 23, 1904, Serial No. 237,880, consisting of the bellows 11, equalizer 12, and pedals 16, is located in that part of the piano situated below the manual keyboard-bed 17. These two general divisions of my player are thus separated and are connected by the air-trunk 18,

the passage through the expression-box 51, and a separable elastic tube 19, extending from the expression-box to the elbow-flange 14 of the exhaust-head 35. The removal of this tube allows the pneumatic mechanism of the player to be removed or replaced at will. It will thus be seen that the upper section can be readily removed from the piano for tuning the same or regulating the action.

The air-trunk 18 rests on the key-bed 17 and is connected with an exhaust-passage 45, extending horizontally through the same. The exhaust-bellows 11 are attached to the under side of said key-bed and are directly connected with the exhaust-passage 45.

The valve-boxes 1 contain both the primary and puppet valves, which control the striking-pneumatics 2, as will be hereinafter described. Each valve-box carries a series of striking-pneumatics, the number in the series depending upon the width of the striking-pneumatics and the power required to operate the instrument.

The valve-boxes and striking-pneumatics are arranged in tiers or ranks one above the other, the number of valve-boxes likewise depending upon the width of the striking-pneumatics and the power required. In this instance I show a group of four valve-boxes and four series of striking-pneumatics. The valve-boxes and their pneumatics are framed together and attached to the upper part of the case above and in front of the action and are united at one end by the exhaust-head 35, through which a partial vacuum is maintained. Immediately below the valve-boxes 1 I place the mechanism operating the music-sheet, which may be of any approved form. I show the tracker-range 5 placed horizontally between the two music-rolls 3 and 4, with the tracker-holes to the front. The pipes 6 connect the tracker-range with the various valve-boxes 1.

Each series of striking-pneumatics 2 is attached to the under side of the valve-box 1, with the hinged end of the pneumatic to the front of the box. The tracker-wires 7 are attached to the opposite end of the pneumatics in the usual way and are carried down behind the tracker-range and music-rolls to the striking-levers 8, to which they are connected and held in position by leather nuts in the ordinary manner.

The levers 8 are attached at one end to the lever-rail 20 by means of the flanges 23. The opposite ends of the levers 8 are adapted to

engage with a bracket 10, secured to the wip-pens 22 of the action 9, and by means of this contact motion is imparted to the action.

Automatic pianos of this type are operated
5 on the suction or vacuum plan, and a partial vacuum is maintained in the valve-boxes 1 by means of the air-trunk 18 and elastic tube 19, with which each valve-box is connected by the exhaust-head 35.

10 The valve-boxes 1, striking-pneumatics 2, roll mechanism, and lever-rail 20 are framed together in one unit of construction, which can readily be removed from the case for the purpose of tuning or regulating the piano
15 or for the purpose of adjusting the player mechanism. When the same is returned to its place in the instrument, the levers 8 assume their proper position in contact with the brackets 10 of the action 9, and when the
20 elastic tube 19 is replaced the mechanism is ready for use.

The valve-box 1 is provided with a pneumatic-chamber 25, running its entire length and communicating with the exhaust-head at
25 one end. It is adapted to contain both the primary pneumatics 26 and the intermediate pneumatics 27. The front wall 28 of the chamber 25 is detachable for the purpose of placing the valve-pneumatics in position.

30 The striking-pneumatics 2 are attached in a series to the under side of the valve-box 1 and communicate with the valve-box through the opening 29 in the stationary leaf thereof.

The valve-box 1 is provided with a series
35 of valve-passages 30 in the upper wall thereof, said passages having two opposing ports 31 and 32, the port 31 leading to the outer air and the port 32 leading to the pneumatic-channel 25. The connecting-passages 33 connect the valve-passages 30 with the striking-
40 pneumatics 2. The ports 31 and 32 are controlled by the puppet-valves 34, which rest on the upper leaf of the valve-pneumatics 27. The outer wall 39 of the passages 30 is made
45 detachable for the purpose of placing the said valves in position. Around the inner surface of the ports 31 and 32 I place a washer of leather or other soft material, which renders the action of the valve noiseless and prevents
50 the passage of air when the same is closed.

The primary valve 40, consisting of the buttons 41 and 42, connected by the stem 43, is set loosely in the primary-valve passage 44 in the upper wall of the valve-box. The pri-
55 mary valve is seated upon the upper and lower surface of the wall. The primary pneumatic 26 is placed immediately under the primary valve, which it operates, the movable leaf of the pneumatic being almost in contact with
60 the button 42. The passage 46 leads from the pneumatic 26 through the bottom wall of the valve-box and the front wall 28 to the pipe 6, which is connected with the tracker-range 5.

65 An air-passage 49 leads from the primary-

valve passage 44 through the upper wall of the valve-box, the front wall 28, and the bottom wall of the valve-box to the puppet-valve pneumatic 27, the position of said air-passage being behind the passage 46. 70

The operation of my improved valve and pneumatic system is as follows: When the instrument is in use, a partial vacuum is formed and maintained in the pneumatic-chamber 25. When the tracker-range is covered by the
75 music-sheet, the pneumatics 26 and 27 are closed and the striking-pneumatics 2 are open. A perforation in the music-sheet coming in contact with an opening in the tracker-range
5 allows the outside air to enter the pneu- 80 matic 26 through the passage 46 and the pipe 6. This expands the pneumatic and raises the primary valve 40, which allows the outside air to enter the puppet-valve pneumatic 27 through the passage 49 and the primary-
85 valve passage 44 in the upper wall. This expands the pneumatic 27 and raises the puppet-valve 34 from its seat, which closes the port 31 to the outside air and opens the
90 port 32. The partial vacuum in the valve-chamber 25 is thus extended through the valve-passage 30 and the connecting-passage 33 to the striking-pneumatic 2, which instantly collapses and imparts the energy of its mo-
95 tion to the piano-hammer through the tracker-wires 7, the levers 8, the brackets 10, and the action 9. When the opening in the tracker-range is closed, the air in the channel 46 is brought under the influence of the partial vacu-
100 um in the pneumatic-chamber 25 through the vent 50, and the primary pneumatic 26 collapses. The primary valve 40 resumes its normal position and the outside air is cut off from the puppet-valve pneumatic 27. The
105 valve 34 closes the port 32 and the striking-pneumatic 2 expands with air entering through the port 31, valve-passage 30, and connecting-passage 33:

In my expression-cut-off box interposed between the upper and lower portions of the
110 air-trunk 18 means are provided for maintaining a relatively weaker degree of suction than that in the bellows and exhaust system, by means of which the striking force of the striking-pneumatics is controlled. Any de-
115 gree of suction may thus be maintained at the will of the operator by means of the stops and connections in ordinary use, by means of which the tone produced is either loud or soft as demanded by the expression-marks on
120 the music-sheet or the personal taste of the operator.

The advantages possessed by the improved arrangement of my mechanism are simplicity and accessibility of the parts, the ease with
125 which they can be removed from the case for regulating or adjustment, and the compact arrangement of the parts, which enables me to place the entire pneumatic mechanism in the upper part of the case above the manual key- 130

board without increasing the height of the piano.

The vacuum-producing mechanism is separated from the pneumatic mechanism and is placed in the lower part of the instrument under the manual keyboard, the only connection between the two systems being through the air-trunk 18, expression-box passage, and elastic tube 19.

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

1. A manually and pneumatically operative piano having valves and their actuating-pneumatics, and striking-pneumatics grouped above the hammers of the action; a lever-rail carrying a series of striking-levers disposed below the striking-pneumatics and in front of the action on a line with the wippens, said levers being actuated by the striking-pneumatics, substantially as described.

2. A manually and pneumatically operative piano having valves, their actuating-pneumatics, and striking-pneumatics controlled by said valves grouped above the hammers of the action; a lever-rail carrying a series of striking-levers disposed below the striking-pneumatics and in front of the action on a line with the wippens; said levers being actuated by the striking-pneumatics and adapted to operate the piano-action; the whole being adapted for removal together from the piano-case, substantially as described.

3. A manually and pneumatically operative piano having valves, their actuating-pneumatics, and striking-pneumatics controlled by said valves grouped above the hammers of the action; a lever-rail carrying a series of striking-levers disposed below the striking-pneumatics and in front of the action, said levers being connected with and actuated by said striking-pneumatics by vertical tracker-wires, substantially as described.

4. A manually and pneumatically operative piano having the pneumatic devices grouped above the hammers of the action; a lever-rail carrying a series of striking-levers disposed below said pneumatic devices and in front of the piano-action on a line with the wippens; a tracker-range disposed between the striking-levers and pneumatic devices and connected with the latter by a series of pipes; the whole being adapted for removal together from the piano-case, substantially as described.

5. In combination with the action of a pianoforte of a pneumatic-action consisting of primary and puppet valves, their actuating-pneumatics and striking-pneumatics placed above said pianoforte-action; a lever-rail disposed below said pneumatic-action, supporting a series of levers; a series of tracker-wires connecting said levers with said striking-pneumatics and means for operating the wippens of said pianoforte-action in conjunction with said levers, substantially as described.

6. In combination with the action of a piano-

forte of a valve-box placed above said action; said box containing both the primary and puppet valves in the upper wall thereof and having a pneumatic-chamber extending its entire length containing the primary and puppet valve pneumatics; said box having a series of striking-pneumatics attached to the bottom of the same and communicating therewith; a lever-rail disposed below said valve-box and in front of the action supporting a series of levers; a series of brackets secured to the wippens of said action with which said levers engage and a series of tracker-wires connecting said levers with said striking-pneumatics, substantially as described.

7. In combination with the action of a pianoforte of a valve-box placed above said action; said box containing both the primary and puppet valves in the upper wall thereof, and having a pneumatic-chamber extending its entire length containing the primary and puppet valve pneumatics; said box having a series of striking-pneumatics attached to the bottom of the same and communicating therewith; a lever-rail disposed below said valve-box supporting a series of levers; a series of brackets secured to the wippens of said action with which said levers engage; a series of tracker-wires connecting said levers with said striking-pneumatics; a tracker-range placed between said levers and said valve-box and connected with the latter by a series of pipes, and means for passing the music-sheet over said tracker-range, substantially as described.

8. In a pianoforte the combination of a pneumatic mechanism consisting of a valve-box containing both the primary and puppet valves in the upper wall thereof and having a pneumatic-chamber extending its entire length containing the primary and puppet valve pneumatics; said box having a series of striking-pneumatics attached to the bottom of the same and communicating therewith; a lever-rail disposed below said valve-box supporting a series of levers; a series of tracker-wires connecting said levers with said striking-pneumatics; a tracker-range placed between said levers and said valve-box and connected with the latter by a series of pipes; the whole being placed in the upper part of the instrument above the manual keyboard, with an exhaust consisting of bellows and pedals for operating the same, located in the lower part of the instrument under the manual keyboard and detachably connected with said pneumatic mechanism by an air-trunk, substantially as described.

9. In a manually and pneumatically operative piano a manual keyboard-bed having an exhaust-passage therein extending longitudinally from end to end connecting the bellows of the exhaust system, substantially as described.

10. In a manually and pneumatically oper-

active piano the combination of the pneumatic devices groupéd above the hammers of the action with a manual keyboard-bed having an exhaust-passage therein extending longitudinally from end to end connecting the bellows of the exhaust system; said exhaust-passage being connected with said pneumatic devices by an air-trunk, substantially as described.

10 11. In a manually and pneumatically operative piano the combination of the pneumatic devices groupéd above the hammers of the

action with the exhaust system disposed below the manual keyboard; a keyboard-bed having an exhaust-passage therein extending longitudinally from end to end connecting the bellows of the exhaust system, and an air-trunk connecting said exhaust-passage with said group of pneumatic devices, substantially as described. 15

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Witnesses:

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GEO. O. SHADAKER.