No. 712,844. Patented Nov. 4, 1902.

C. E. PETERSON.

AUTOMATIC PLAYING ATTACHMENT FOR MUSICAL INSTRUMENTS

(Application filed Sept. 12, 1901.)

(No Model.)

2 Sheets—Sheet 1.

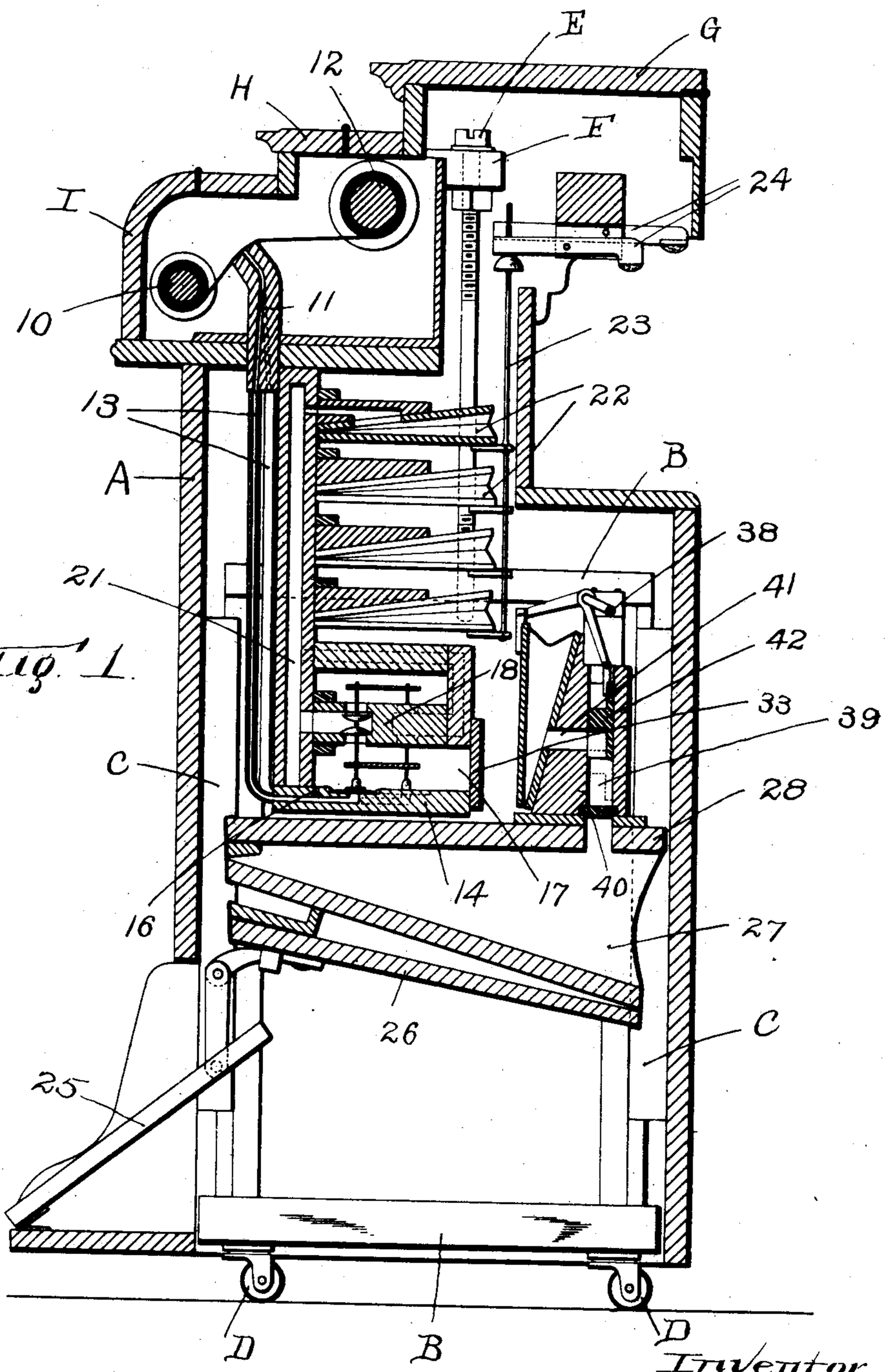

Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

Fig. 2.

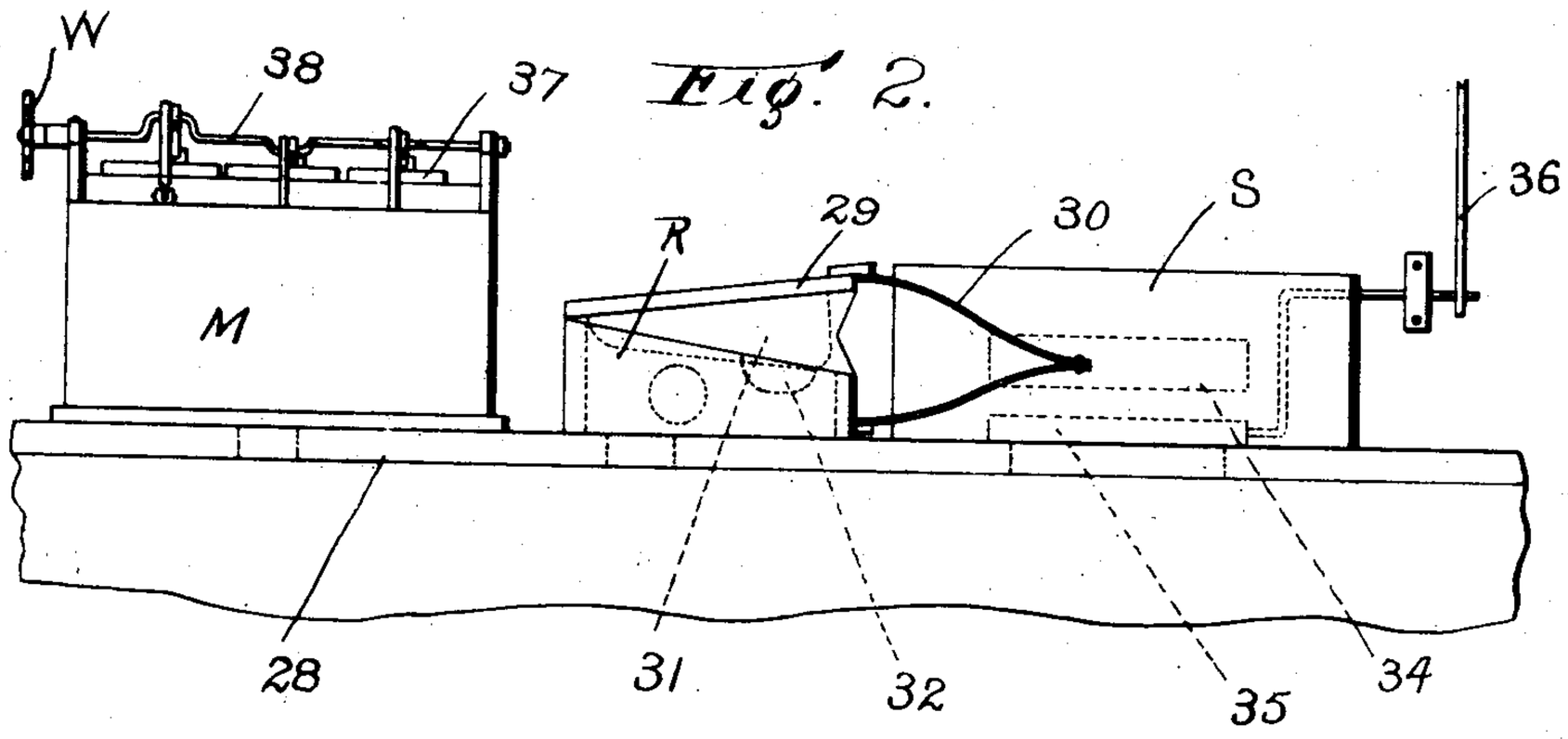


Fig. 3.

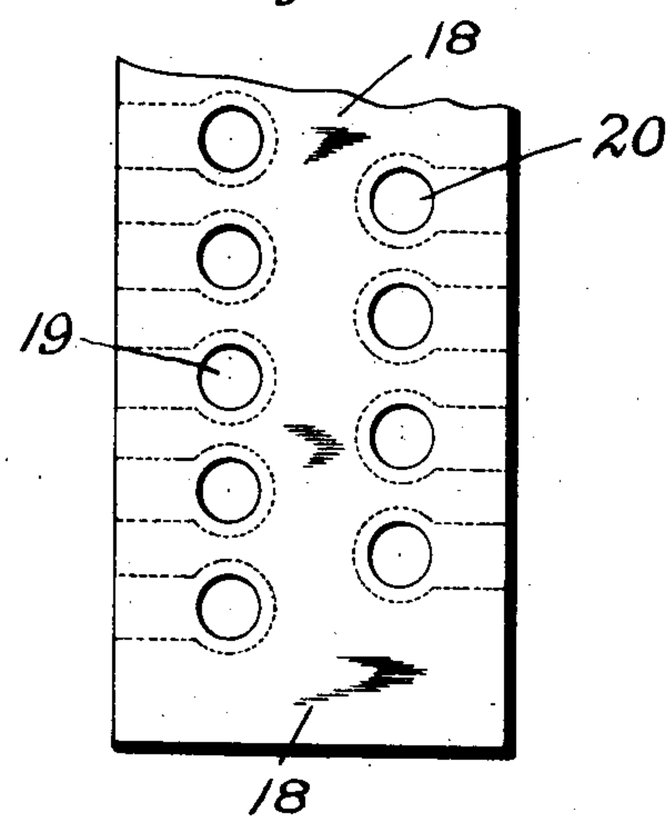


Fig. 5.

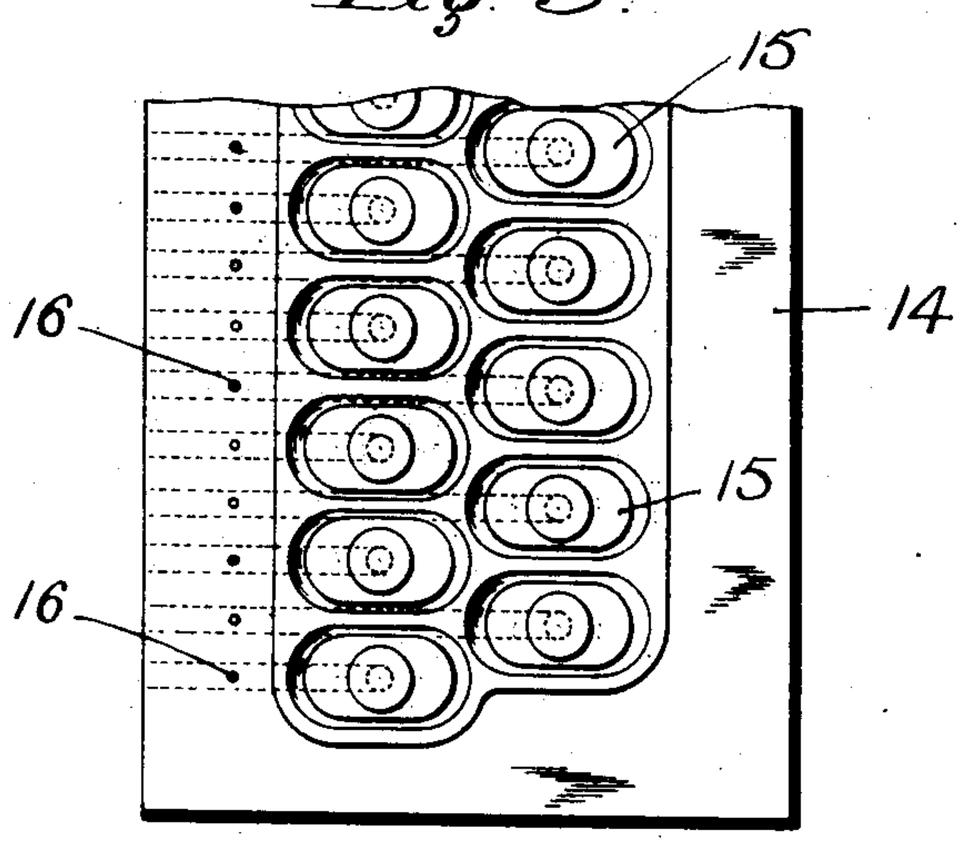


Fig. 4.

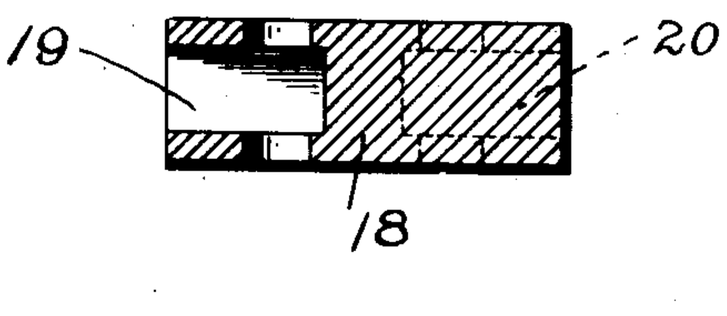
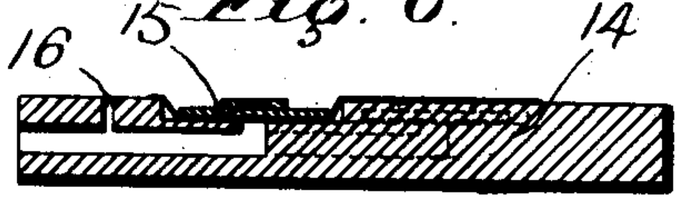


Fig. 6.



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UNITED STATES PATENT OFFICE.

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AUTOMATIC PLAYING ATTACHMENT FOR MUSICAL INSTRUMENTS.

SPECIFICATION forming part of Letters Patent No. 712,844, dated November 4, 1902.

Application filed September 12, 1901. Serial No. 75,131. (No model.)

To all whom it may concern:

Be it known that I, CLAUS E. PETERSON, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Automatic Playing Attachment for Musical Instruments, of which the following is a specification.

This invention relates to that class of attachments which are primarily designed for use in connection with pianos or which may be employed for playing organs or other keyed instruments.

The especial object of this invention is to provide a strong, simple, durable, and inexpensive construction in which the air-passages are located in the front part of the casing, while the moving parts are all located at the rear thereof and entirely out of the way of the air-passages, so that they will have ample room for operation and the movement of the working parts will not be liable to cause air-leaks.

To these ends this invention consists of the automatic playing attachment for musical instruments and of the combinations of parts therein, as hereinafter described, and more particularly pointed out in the claims at the end of this specification.

In the accompanying two sheets of drawings, Figure 1 is a transverse sectional view of an automatic playing attachment for musical instruments constructed according to my invention. Fig. 2 is a fragmentary rear view inside of the casing thereof. Fig. 3 is an enlarged fragmentary view of the valve casing or board in which the controlling-valves are mounted. Fig. 4 is a transverse sectional view of the same. Fig. 5 is an enlarged detail view of the bank or board in which the primary pneumatics are located, and Fig. 6 is a transverse sectional view of the same.

In that class of automatic playing attachments for pianos or similar instruments to which this invention relates the operating instrumentalities usually comprise the main pneumatics, the key-striking connections operating from the main pneumatics, controlling-valves for the main pneumatics, and the primary pneumatics, which are controlled from the tracker-board and operate the valves. These instrumentalities have been variously arranged in the different machines which have been placed upon the market.

The especial object of my present invention is to combine these operating instrumentalities in a simple, compact, and efficient arrangement of parts which will occupy comparatively little space and will produce direct and powerful effects.

The connections for winding the perforated paper which controls the operation of my self-playing attachment for musical instruments may be of any ordinary or preferred construction. In this application for patent, however, I do not claim the particular form of wind-motor which I have herein shown and described, as such subject-matter may be claimed in a separate application for patent.

Referring to the drawings and in detail, an automatic playing attachment for musical instruments constructed according to my invention as herein illustrated comprises a casing A of any ordinary or approved construction. Movably mounted at each end of the casing A are frames B, the side bars of which are mounted in guides C. The frames B are provided at their lower ends with the supporting-casters D. Threaded into the upper cross-bar of each of the frames B is an adjusting-screw E, having its head fixed in a bracket F, connected with the frame of the machine. By means of this construction by adjusting the screws E the attachment can be raised to different heights to correspond with the keyboards of different makes of pianos or to compensate for the unevenness of the floor on which the attachment rests.

The top of the casing A is closed by a hinged cover G, which may be opened to permit access to the adjusting-screws E. At the front and near the center of the casing A are connected hinged sections H and I, forming a double hinged cover which may be turned back or opened for access to the tracker-board and paper-winding connections. As herein illustrated, the perforated paper which controls the operation of my attachment is wound from a roll 10 and passes up over a tracker-board 11 to a winding-roll 12. The channels of the tracker-board 11 are connected by

small pipes 13, which radiate or spread to channels in the front edge of the board or frame 14, in which the primary pneumatics are located.

As shown most clearly in Figs. 5 and 6, the board or frame 14 is provided with two series of cells or depressions, arranged one back of the other and which are staggered or placed out of line.

The cells or depressions in the board 14 are covered by a sheet of sheepskin or similar flexible material to form the primary pneumatics, and located over each of the cells or depressions is a follower or movable piece 15. Each of the channels leading to the primary pneumatics as thus constructed is provided with a capillary opening or exhausthole 16, which opens into the chamber 17, as shown in Fig. 1.

Controlled by each of the primary pneumatics is a valve-stem carrying two controlling-valves, which controlling-valves are located in cells in a frame or board.

As illustrated most clearly in Figs. 3 and 4, the frame or board 18 is provided along one edge with valve-cells, having passages 19 opening through one edge of the board, and a second row of valve-cells having passages 20, which extend to the rear edge of the board.

As shown most clearly in Fig. 1, the valve-cells at the front of the board 18 are directly connected with passages in the upright channel-board 21, while the rear row of valve-cells is connected to the channel-board 21 by passages formed in the channel-boards, extending from the rear of the board 18 to the upright channel-board 21. The passages in the upright channel-board 21 are connected to the main pneumatics 22. The main pneumatics 22 are horizontal and are arranged in banks over each other, four vertical rows of pneumatics being preferably employed.

In the construction herein illustrated the movable or lower section of each of the main pneumatics 22 is connected by a thrust-rod 23 to a key-operating lever 24.

The key-operating levers 24 are pivoted between their ends, and the parts are preferably so proportioned that they return to their normal position by gravity.

At the front of the casing A are the treadles 25, which are connected to operate bellows 26 to exhaust the air from a main vacuum-chamber 27.

The main vacuum-chamber 27 is connected with the chamber 17 through two sets of channels or passages. One set of channels or passages is controlled by an automatic valve to maintain a constant pressure in the chamber 17, while the second valve is preferably controlled from connections which permit the same to be opened when it is desired to diminish the pressure in the chamber 17 to produce louder effects.

As shown by rear view in Fig. 2, opening through the top board 28 of the main vacuum-chamber 27 are passages leading to the casing of the automatic regulator R and to the casing S, in which the hand-operated controlling-valve is located.

The automatic regulator R may be of ordinary construction. As herein illustrated, it is provided with a collapsible top 29, normally raised by a spring 30. The 29 top is provided with a shut-off blade or valve 31, controlling a passage 32, opening through the rear wall 33 of the chamber 17. (Shown in Fig. 1.) The manually-controlled regulating-valve may be of any of the ordinary or approved constructions.

As illustrated in Fig. 2, the casing S is connected with an opening 34, leading through the rear wall 33 of the chamber 17, and in the casing S is a valve 35, which may be controlled by a connection 36 to open a direct connection between the main vacuum-chamber 27 and the chamber 17.

As illustrated in Figs. 1 and 2, the wind-motor which I preferably employ for winding the paper which controls a self-playing attachment for musical instruments constructed according to my invention comprises three or more pneumatics 37, connected by pitmen to the cranks of a main shaft 38.

As shown in Fig. 2, the main shaft 38 of the motor may be provided with a sprocket-wheel W, which drives any suitable arrangement of driving-chains for winding and rewinding the paper upon the spools 10 and 12 in the ordinary manner.

As illustrated most clearly in Fig. 1, each of the pneumatics is connected with a passage 39 at the rear of the motor by a single valve-port 41, and controlling the single valve-port 41 of each of the pneumatics is a slide-valve 42. The opening from the passage 39 to the main vacuum-chamber 27 is controlled by a slide-valve 40 in the ordinary manner to regulate the speed of the motor.

When the slide-valve 42 is above the port of any one of the pneumatics of the motor, such pneumatic will be connected by the passage 39 to the main vacuum-chamber 27, while when a slide-valve is moved down to the position illustrated by dotted lines in Fig. 1 the valve-port of the pneumatic will be opened so as to admit atmospheric pressure.

The operation of the device as a whole is substantially the same as that of other self-playing attachments for musical instruments of the class to which this invention relates—that is to say, when the parts are in their normal position, as illustrated in Fig. 1, the pressures on both sides of the diaphragm of each primary pneumatic will be the same and the controlling-valves will drop to their lowest normal position, permitting atmospheric pressure to be admitted to the operating-pneumatics. Whenever a perforation in the paper passes over one of the channels in the tracker-board atmospheric pressure will be admitted to said channel, so as to raise one of the primary pneumatics to lift the corresponding controlling-valves so as to cut off the supply

of atmospheric air from one of the main pneumatics while opening a passage between such pneumatic and the chamber 17, thus exhausting the air from a primary pneumatic to collapse the same, lifting its lower or movable section to act directly through one of the thrust-rods upon one of the key-operating levers.

I am aware that changes may be made in practicing my invention by those who are skilled in the art and that certain features of my self-playing attachment for musical instruments may be used in other locations, if desired. I do not wish, therefore, to be limited to the construction I have herein shown and described; but

What I do claim, and desire to secure by Letters Patent of the United States, is—

1. In an automatic playing attachment for the keyboards of musical instruments, the combination of a tracker-board, two sets of primary pneumatics arranged in a horizontal plane, pipes connecting the tracker-board with the primary pneumatics, a channel-board arranged immediately behind said pipes, a valve-board having two sets of valve-chambers in the same horizontal plane connected to the channel-board, main pneumatics arranged in tiers above the primary pneumatics and valve-casings, key-operating levers arranged entirely at the rear of the tracker-board and its connections, and a lifting-rod directly connecting the movable section of each main pneumatic with the front end of a key-operating lever.

2. In an automatic playing attachment for the keyboards of musical instruments, the combination of a casing, a tracker-board and paper-winding connections at the front of the casing, pipes leading down from the tracker-board inside the front of the casing, two sets of primary pneumatics offset with respect to each other and arranged in the same horizontal plane, a vacuum-chamber above the primary pneumatics, bellows connected to exhaust the air therefrom, a valve-board above the vacuum-chamber, having two sets of valve-chambers offset with respect to each other in the same horizontal plane, double valves located in the valve-chambers, a channel-board at the front of the casing, having one set of channels directly connected to one set of valve-chambers and a second set of channels connected by intermediate passages to the other set of valve-chambers, main pneumatics arranged in tiers over each other and connected to the channel-board, key-operating levers pivoted in the casing entirely at the rear of the tracker-board and the pipes which lead therefrom, and a lifting-rod directly connecting the movable section of each main pneumatic to the front end of the key-lever.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

CLAUS E. PETERSON.

Witnesses:
LOUIS W. SOUTHGATE,
M. E. REGAN.