

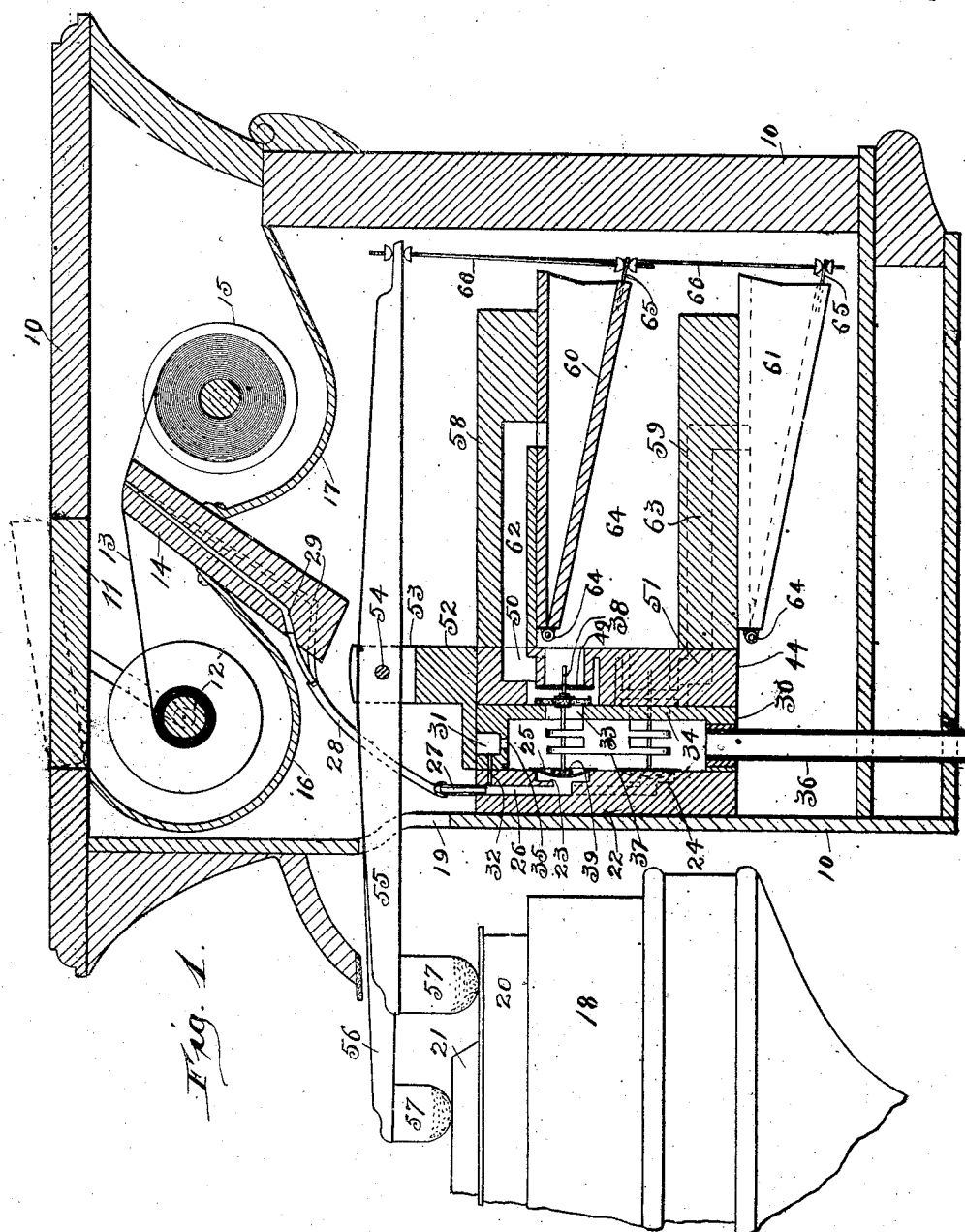
No. 821,917.

PATENTED MAY 29, 1906.

A. ANDERSON.
PNEUMATIC ACTION FOR PIANOS.

APPLICATION FILED AUG. 24, 1904.

3 SHEETS—SHEET 1.



Witnesses:

Chas. E. Gorton.
A. Gustafson.

Inventor:

Alfred Anderson.
By Chas. C. Villman Atty.

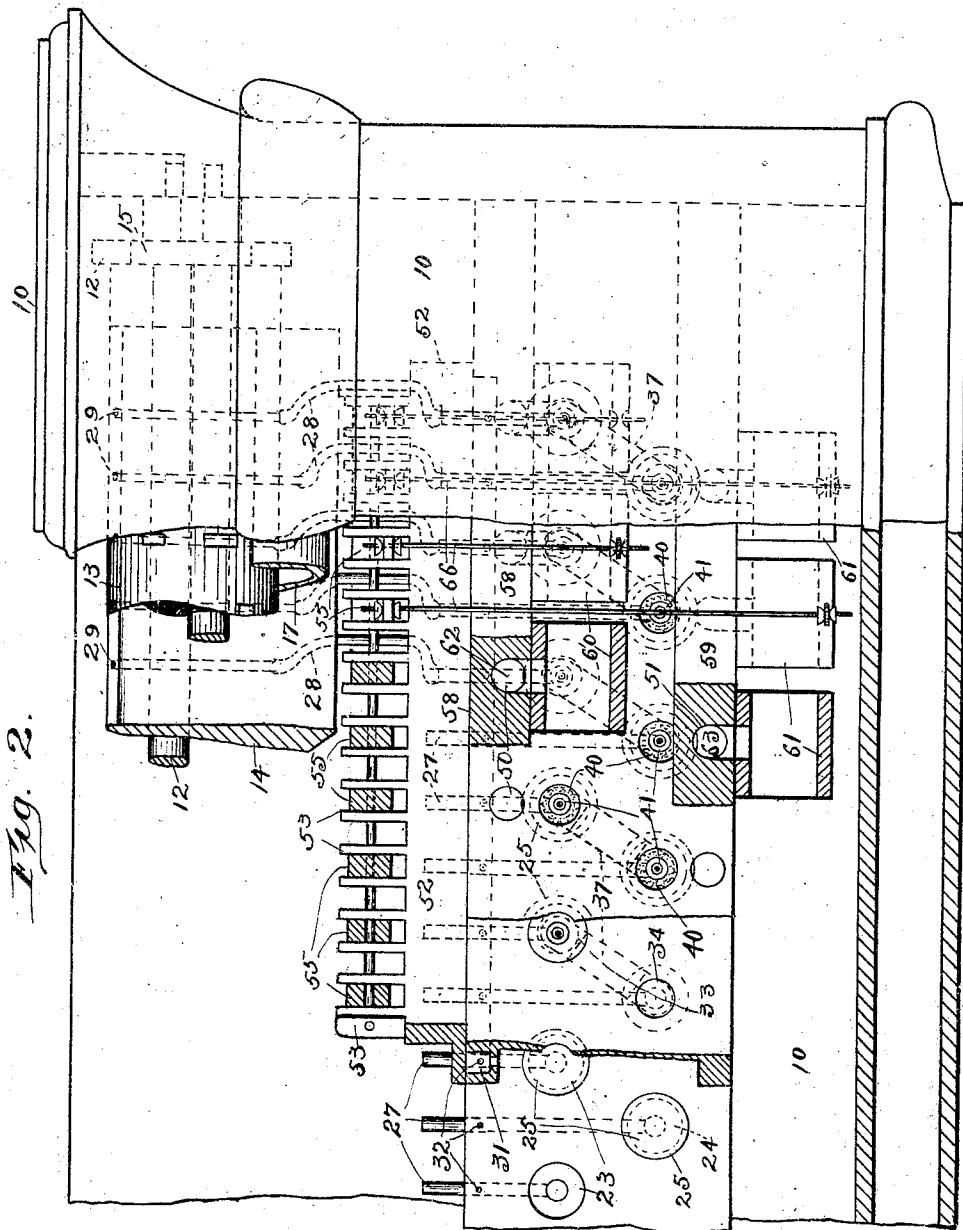
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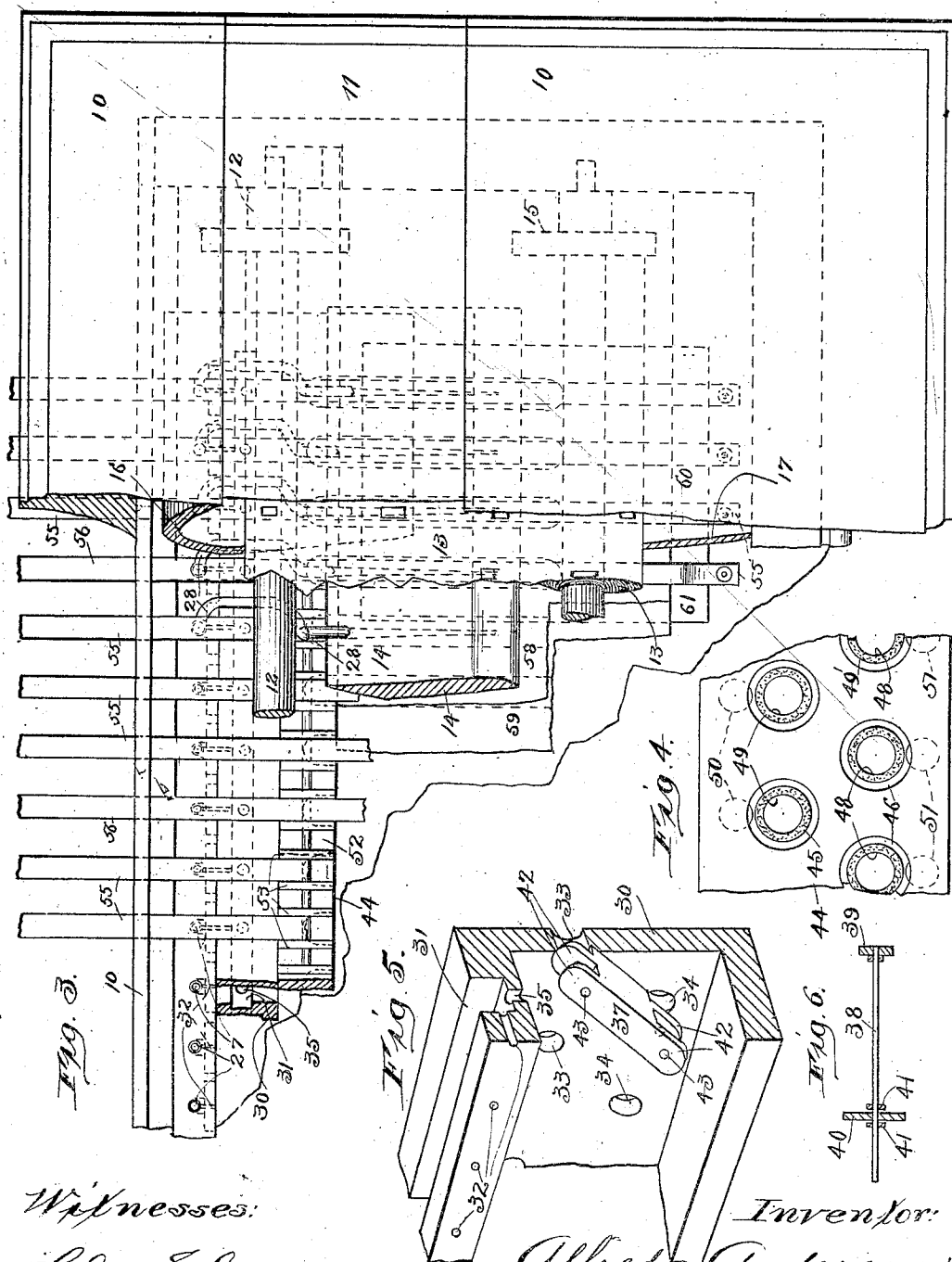
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3 SHEETS—SHEET 3.



UNITED STATES PATENT OFFICE.

ALFRED ANDERSON, OF CHICAGO, ILLINOIS.

PNEUMATIC ACTION FOR PIANOS.

No. 821,917.

Specification of Letters Patent.

Patented May 29, 1906.

Application filed August 24, 1904. Serial No. 221,941.

To all whom it may concern:

Be it known that I, ALFRED ANDERSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Pneumatic Actions for Pianos, of which the following is a specification.

This invention relates to improvements in that class of pneumatic actions used in what is known to the trade as "pianolas;" and it consists in certain novel features of the construction, combination, and arrangement of the several parts of the improved action whereby important advantages are attained and the device is made simpler, cheaper, and otherwise better adapted and more convenient for use, all as will be hereinafter fully set forth and specifically claimed.

In order to enable others skilled in the art to which my invention pertains to make and use the same, I will now proceed to describe it, referring to the accompanying drawings, in which—

Figure 1 is a cross-sectional view of a pneumatic action embodying my invention, showing a portion of a piano and illustrating the improved action in position for operating the keys of the piano. Fig. 2 is a front view, partly in section and partly in elevation, of the action, showing the casing therefor broken away to illustrate the operating mechanism. Fig. 3 is a plan view of like parts as shown in Fig. 2. Fig. 4 is a fragmental face view of the valve-seat board. Fig. 5 is a perspective view of a portion of the frame which carries the brackets which support the valve-stems; and Fig. 6 is a detail view of one of the valves, showing it detached.

Like numerals of reference refer to corresponding parts throughout the different views of the drawings.

The reference-numeral 10 represents the casing, which may be of any suitable size, form, and material, but preferably rectangular in shape, and is provided at its top with a hinged door 11, which may be raised so as to permit of the insertion of the roller 12, on which the perforated music-sheet 13 is wound. This roller is adapted to be journaled longitudinally in the upper portion of the casing on one side of the tracker board or bar 14, and the sheet 13 is adapted to be wound on a roller 15, mounted and driven in any well-known manner on the opposite side

of the tracker-board, which is preferably supported in an inclined position, as shown, by means of pieces 16 and 17, one of which is secured at one of its edges to the upper portion of the casing and at its other edge to the surface of the board 14, adjacent to the piano 18, while the other one is secured at one of its edges on the inner surface of the casing and at its other edge to the rear surface of the tracker-board. That side of the casing adjacent to the piano 18, and which portion will hereinafter be referred to as the "front" part of the device, is provided with a longitudinal opening 19, through which the striking-levers, which actuate the keys 20 and 21 of the piano, project. Horizontally mounted on the inner surface of the front part of the casing 10, just below the horizontal opening 19 therein, is a primary or pneumatic pouch-board 22, which has in its rear portion a series of seats 23 and 24, each of which is covered by means of a pouch or diaphragm 25, of leather or other suitable flexible material. The recesses or seats 23 are arranged in a row longitudinally above the recesses or seats 24, which are also arranged in a longitudinal row; but said recesses 23 and 24 are located out of vertical alinement with one another, as will be readily understood by reference to Figs. 1 and 2 of the drawings.

Leading from each of the recesses or seats 23 and 24 to the top of the board 22 is a channel 26, in the upper end of each of which is fitted a tube 27, to the upper end of each of which a reed or pipe 28 is connected at one of its ends, the other ends of which communicate with channels 29, which extend through the upper surface of the tracker-board. In order to prevent weakening of this board, these channels 29 may be made out of alinement with one another, as shown in Fig. 1 of the drawings.

Secured to the inner or rear surface of the board 22 is a valve-supporting frame 30, which is in cross-section in the form of three sides of a rectangular figure, having its side adjacent to the board 22 open. The upper portion of the valve-supporting frame 30 is provided with a longitudinal channel 31, which communicates with each of the channels 26 in the primary board through ports 32, which are located just below the lower ends of the tubes 27, as is clearly shown in Figs. 1, 2, and 5 of the drawings. The rear portion of the frame 30 is provided with two longitudinal rows of openings 33 and 34,

which are arranged out of vertical alinement with one another and so that the openings 33 and 34 will register, respectively, with the recesses or seats 23 and 24 in the primary board.

- 5 The channel 31 has communication through the openings 35 with the cavity of the frame 30, so that the air may be exhausted therefrom through the pipe 36, which communicates with the main or operating bellows.
10 (Not shown.)

Located in inclined positions on the inner surface of the frame 30 are a series of brackets 37, employed to support the valve-stems 38, each of which has on one of its ends a button 39, to rest against the inner surfaces of the pouches 25 of the primary board. Each of the valve-stems 38 has mounted on its rear portion a valve 40, which is held loosely between two collars 41 on the stem, which collars have their peripheries provided with felt to prevent rattling.

As shown in Figs. 1 and 5 of the drawings, the brackets 37 are provided with prongs 42 at each of their ends, which prongs have openings 43 to receive the valve-stems. It will also be apparent by reference to said figures that the openings in the upper ends of the brackets 37 will register with the openings 33 in the frame 30 and with the recesses 23, in the board 22, while the openings 43 in the lower ends of the brackets will register with the openings 34 in the board 30 and the recesses 24 in the primary board. Located on the rear surface of the valve-supporting frame 30 is the main valve-board 44, which has on its front surface, or that surface thereof adjacent to the frame 30, a series of openings 45 and 46, arranged in longitudinal parallel rows, but out of vertical alinement with each other. In each of the openings 46 and 45 are tubular portions 48 and 49, respectively, which have their free ends protected by means of felt or leather rings 49', against which the valves 40 will impinge. The rear surface of the board 44 is formed just above each of the openings 45, with an opening 50, which communicates with the openings 45, as shown in Figs. 1 and 4 of the drawings.

Below each of the openings 46 in the board 40 and on the rear surface thereof is an opening 51, each of which communicates with the openings 46, as will be readily understood by reference to the last-named figures. Mounted longitudinally on the upper surfaces of the boards 30 and 44, so as to cover the channel 31 in the board 30, is a supporting-strip 52, which has a series of upwardly-extending projections 53, through which is passed a rod 54, on which the striking-levers 55 and 56 are fulcrumed. Each of these levers has at its forward end a downward extension 57, which may be cushioned so as to strike the keys 20 and 21 of the piano softly. Horizontally located at the rear of the board 40 are two shelves 58 and 59, which support a

series of bellows 60 and 61, respectively. The bellows-shelf 58 has extending from its front edge rearwardly a series of channels 62, which register and communicate with the openings 50 in the rear surface of the board 44, and the shelf 59 has extending from its front edge a series of channels 63, which register and communicate with the openings 51 in the lower portion of the board 44, as is shown by dotted lines in Fig. 1 of the drawings. The rear ends of the channels 62 and 63 communicate with a series of bellows 60 and 61, respectively, which are secured to the lower surfaces of said shelves. Each of these bellows is provided at its front end with an expanding-spring 64, employed to assist in inflating or expanding the bellows. The rear end of each of the bellows is provided with a projection 65, to which is adjustably secured an upwardly-extending rod 66, which is adjustably secured at its other ends to the rear ends of the striking-levers 55 and 56, as shown in Fig. 1 of the drawings.

From the foregoing and by reference to the drawings it will be seen and clearly understood that by exhausting air through the conduit or pipe 36 equal tension or pressure will be exerted on both sides of the pouches 25, but when atmospheric air is admitted through the tracker-board it will pass through the channels 29, pipes 28, and tubes 27 and immediately inflate the pouches 25, and thereby open the valves of the ports 33 and 34, thus putting the bellows 60 and 61 in communication with the exhaust, whereby they will be deflated to operate the levers 55 and 56, thus causing them to actuate the keys of the piano.

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

In a pneumatic action for pianos, the combination with the casing, of a series of key-actuating levers fulcrumed therein, a tracker-board mounted near said levers and having a series of channels, a primary board located in the front part of the casing and having a series of recesses provided with channels having communication with the channels of the tracker-board, a diaphragm mounted over each of said recesses, a hollow supporting-board for the valves located on the inner surface of the primary board and having a series of openings registering with the diaphragm-recesses, the cavity of said valve-supporting board having communication with each of the channels leading from the diaphragm-recesses, a series of valve-supporting brackets each having its ends bifurcated and provided with apertures, said brackets being secured in an inclined position on the inner surface of the rear portion of said supporting-board, a main valve-seat board located on the rear surface of said supporting-board and having a series of openings each

provided with a tubular valve-seat therein, said main board having in its rear surface a series of openings communicating with the openings in the front surface thereof, the tubular valve-seats and the openings in the front surface of the main board registering with the openings in the supporting-board, a series of valves movably mounted on the brackets of the supporting-board to open and close the openings therein as well as to open and close the tubular valve-seats, the stems of said valves adapted to impinge at one of their ends the diaphragms, a series of bellows having communication with the openings on the rear surface of said main board, adjustable connections uniting the rear ends of the striking-levers to the bellows, and means to supply air to the cavity of the supporting-board, substantially as described.

ALFRED ANDERSON.

Witnesses:

CHAS. C. TELLMAN,

A. GUSTAFSON.