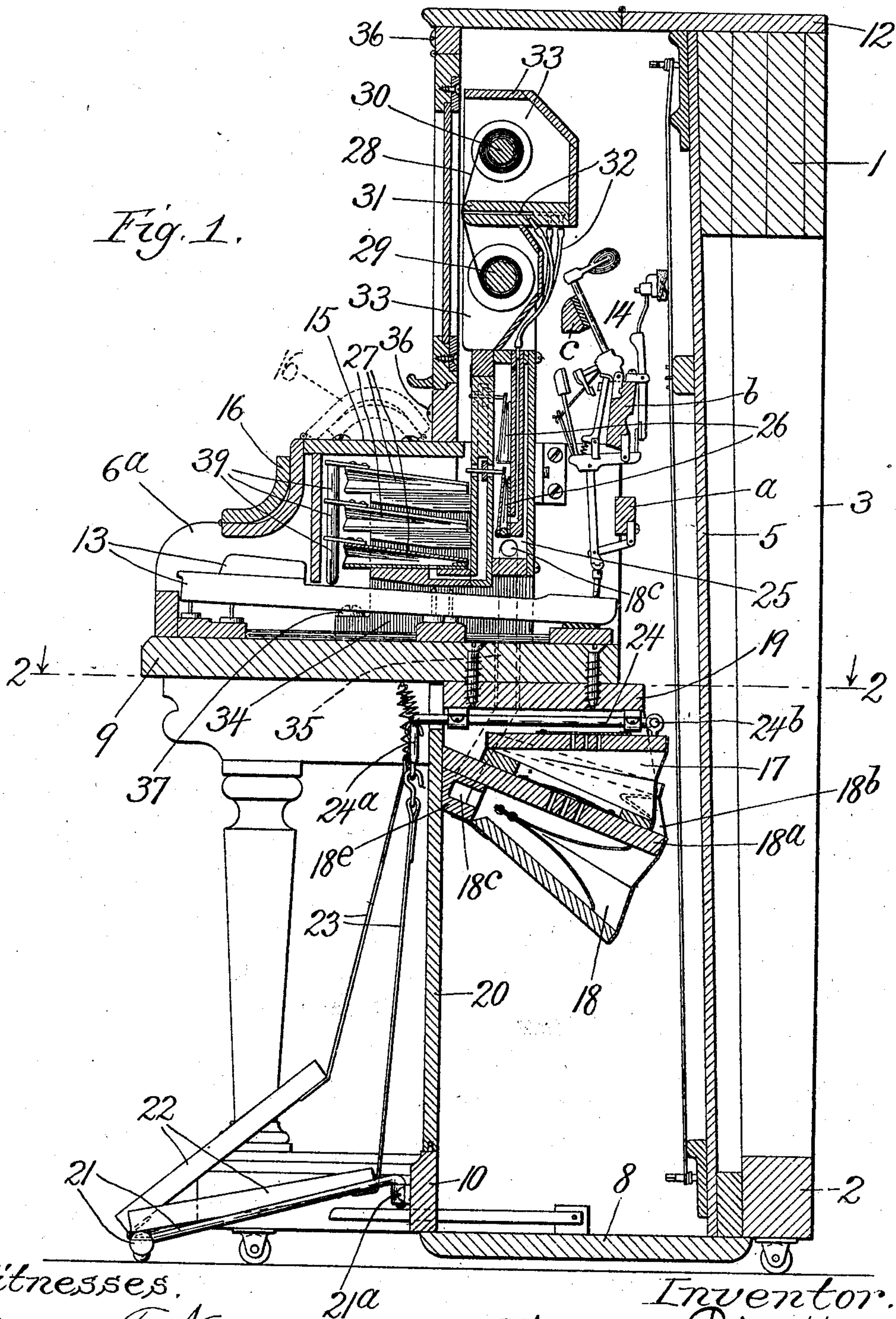


No. 795,817.

PATENTED AUG. 1, 1905.

M. CLARK.
AUTOMATIC PIANO.
APPLICATION FILED FEB. 6, 1905.

3 SHEETS—SHEET 1.



Witnesses.
Edward T. Wray.
Fred G. Fischer

Inventor.
Melville Clark
by Burton Burton
his Attys.

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3 SHEETS—SHEET 2.

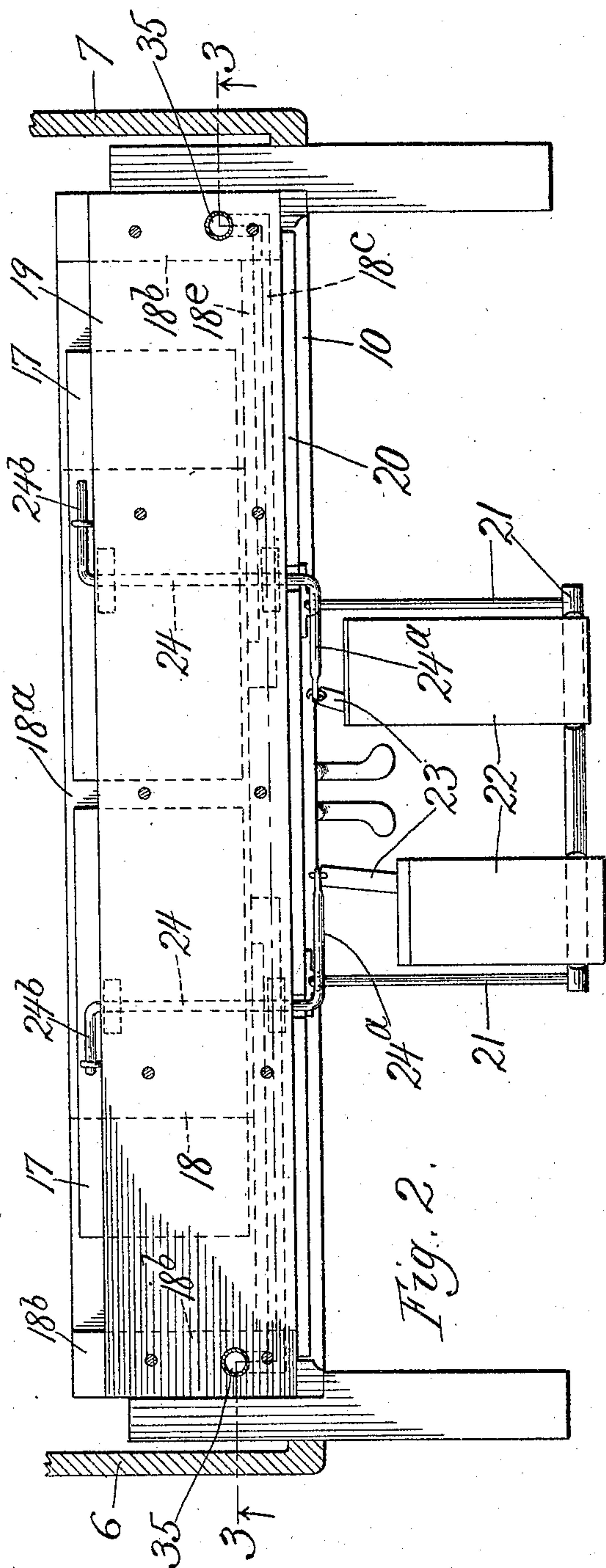


Fig. 2.

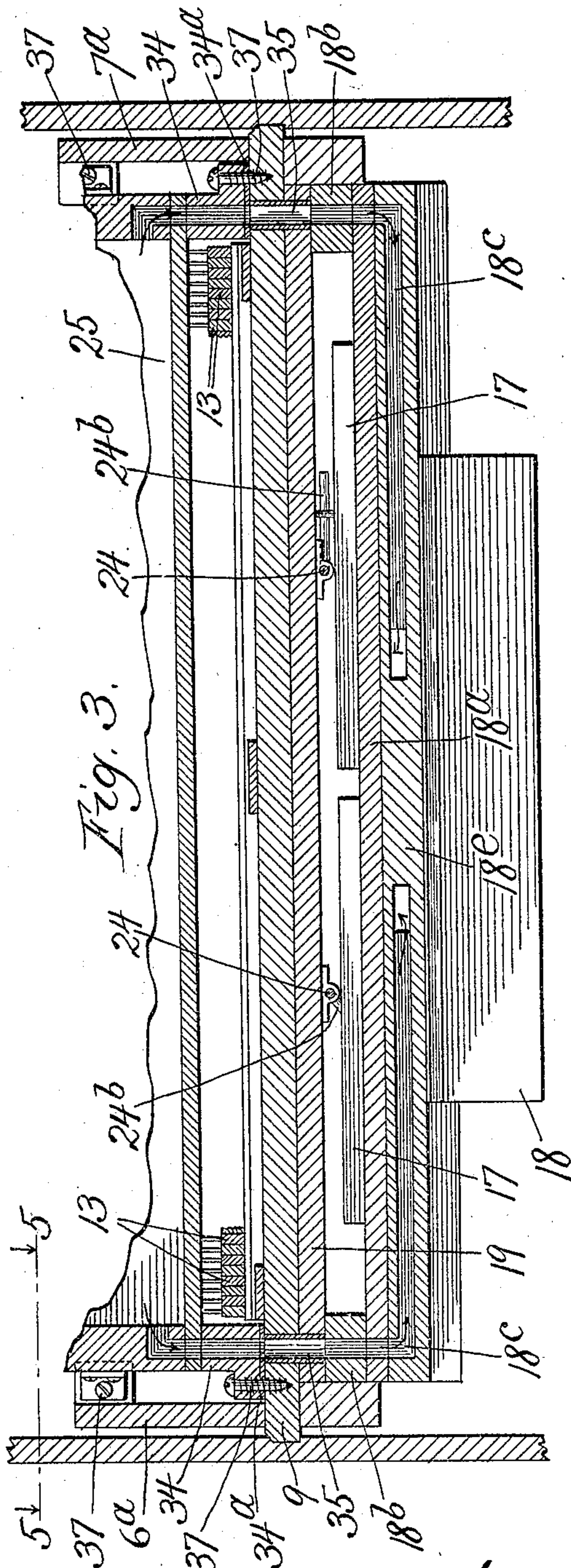


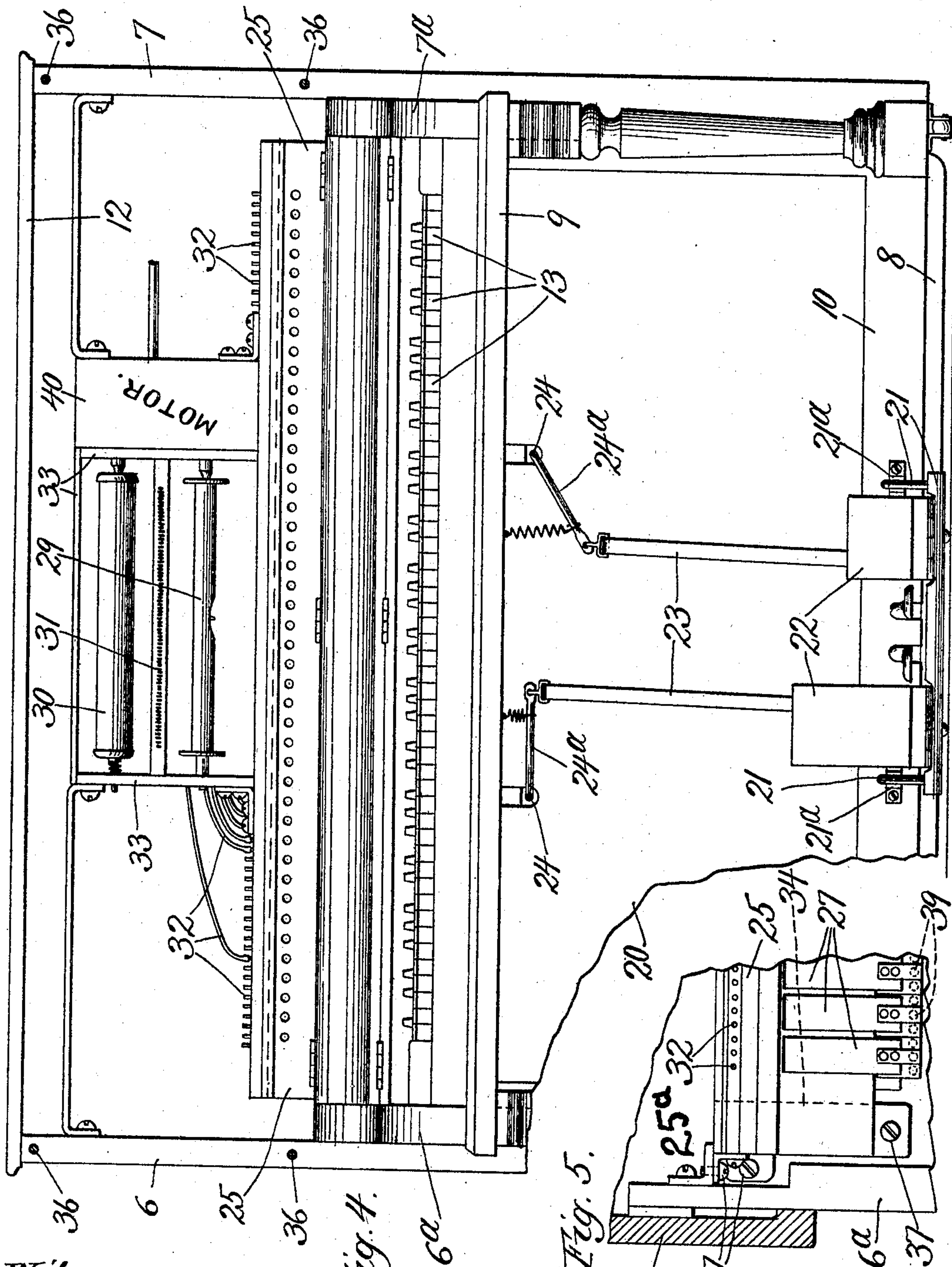
Fig. 3.

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3 SHEETS—SHEET 3.



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Fig. 4.

Fig. 5.

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UNITED STATES PATENT OFFICE.

MELVILLE CLARK, OF CHICAGO, ILLINOIS.

AUTOMATIC PIANO.

No. 795,817.

Specification of Letters Patent.

Patented Aug. 1, 1905.

Application filed February 6, 1905. Serial No. 244,326.

To all whom it may concern:

Be it known that I, MELVILLE CLARK, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Automatic Pianos, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

The purpose of this invention is to provide, in an automatic piano, a construction of the automatic operating devices with relation to the piano action and case, adapted to be applied to the more common and familiar types of construction of pianos and cases with the least change in the cases and with the least scattering of the parts of the pneumatic action, and particularly to provide a construction and arrangement which shall permit the most direct action of the motor-pneumatics upon the keys.

It consists of the features of construction set out in the claims.

In the drawings, Figure 1 is a fore-and-aft vertical section of a piano having my improved construction. Fig. 2 is a section at the line 2 2 on Fig. 1. Fig. 3 is a section at the line 3 3 on Fig. 2. Fig. 4 is a front elevation with the desk-front removed and the piano-action not shown. Fig. 5 is a detail section at the line 5 5 on Fig. 3.

In the drawings the piano-case is shown constructed in substantially a usual manner, comprising the upper and lower sills 1 and 2 and vertical posts 3, (only one of which appears in the drawings,) constituting the rear frame, on which the sound-board 5 is mounted in the customary manner, the end frames 6 and 7, rigid with the sound-board and rigidly connected also by the bottom board 8 and front base-molding 10 at the lower part, by the key-table 9 at the middle part, and by the cap 12 at the top. The manual-keys 13 are mounted in the customary manner on the key-table 9, and the several parts of the action 14 are also mounted in the customary position and supported in the customary manner on the traverse-bars *a b c*, extending between the end frames 6 and 7, located so as to place the action wholly above the level of the manual and within a space directly in front of the sound-board, extending not more than half-way forward therefrom toward the desk-front. Below the desk-front the case projects forward in a shelf or shoulder 15, which curves downward to the manual, and the fall-board

16 is adapted to be reversed on this shoulder, as shown in Fig. 1 in dotted lines.

The pumpers 17 17 and the exhaust-air chamber or receiver 18 are mounted on a board 19, which is secured to the under side of the key-table, so that it may be removed, taking with it the pumpers and receiving-chamber, and may be applied to any piano of ordinary construction without interfering with any of the operating parts, the pumpers and receiving-chamber being preferably entirely at the rear of the screen-board 20. The detail construction shown is that the foundation-board 18^a, below which is the receiver and above which are the pumpers, is connected at the ends with the board 19 by the hanger-boards 18^b, whose vertical dimensions afford space for the pumpers between the foundation-board and the board 19. The pumpers are operated by the pedals 22 22, removably supported at the forward side of the screen-board on a three-sided frame 21, the rear ends of whose side bars are hooked into eyes 21^a on the base-molding 10 and connected with the pumpers for operation of the latter by links 23 23, each attached at the upper end to a lever-arm 24^a of a rock-shaft 24, extending fore and aft and mounted on the board 19 and having behind the screen-board 20 an oppositely-extending lever-arm 24^b, connected with the pumper for operating the latter.

The pneumatic action is mounted entirely above the key-table, comprising the exhaust-air chamber 25, which contains the primary pneumatics 26, the motor-pneumatics 27, having their fixed members mounted rigidly on the forward side of the exhaust-air chamber and projecting forwardly therefrom, occupying the space under the shoulder 15 of the case above the manual-keys. The controlling-sheet 28, take-up and rewind rolls 29 and 30, and the operating mechanism for the rolls, together with the tracker-board 31, are mounted in their customary relation to each other at the upper part of the case directly above the air-chamber 25, and the ducts 32 32 from the tracker-board extend to the several primary pneumatics in the air-chamber 25, the construction of this pneumatic action as a whole being substantially as employed in certain familiar constructions of piano-players made for exterior action upon the manual keys. The entire pneumatic action above the manual-keys is mounted so as to be handled

integrally, this being accomplished by providing the frame 33, in which the tracker-board 31 is mounted rigidly and the rolls 29 and 30 are journaled and on which the case 40 of the motor mechanism of whatever sort may be employed for operating the rolls is also mounted, this frame 33 being itself mounted rigidly upon the top of the air-chamber 25 and said air-chamber being in turn supported at its ends upon the top of the key-table and further independently supported by attachment to brackets 25^a on cheeks 6^a and 7^a, rigid with and substantially part of the ends 6 and 7 of the case. The air-chamber 25 is connected with the receiver 18 by pipes 35, inserted through the key-table and through the board 19, connecting with the air-passages 18^c, which lead from the receiver head-bar 18^e through the foundation-board 18^a and through the hanger-boards 18^b to the lower ends of said pipes. These pipes register at their upper ends with the lower ends of the hollow feet 34 34, by which the air-chamber is supported on the key-table, packing-washers 34^a interposed between the table and the ends of the feet rendering the connection air-tight.

The front portion of the piano-case comprising the parts forming the shelf or shoulder 15 and the desk-front are made removable, being secured in place by screws 36 36, taking into the ends of the piano-case, and when said parts are removed the entire pneumatic action can be removed through the front of the case upon withdrawing the screws 37, which secure the air-chamber 25 to the key-table and to the cheeks 6^a and 7^a of the piano-case ends. As above stated, also the pumpers and receiver can be separated entirely from the piano-case by detaching the foundation-board 19, and the pedals can in like manner be lifted from their supports for detachment, so that the piano can be entirely relieved of all the parts pertaining to the automatic action, and the elements of the case being restored to place no evidence of the change will appear. Conversely, all the parts of the automatic structure can be applied to a piano of ordinary construction, for which removable front and fall board have been provided adapted, by means of a shoulder or shelf, such as 15, to afford space over the manual-keys for the motor-pneumatics, as illustrated.

The motor-pneumatics operate by the rigidly-connected buttons or hammers 39 39 at the forward end of their movable elements directly upon the upper side of the respective keys at a distance sufficiently forward of the fulcrums of the keys to give proper stroke to the latter, and by thus locating the pneumatics so that they have opportunity for a direct downstroke upon the keys similar to that which they receive when the instrument is being played by hand and similar also to that which they receive when it is being operated by the playing-fingers of an exterior

automatic player I have reduced the mechanism to the minimum, there being absolutely no parts intervening between the motor-pneumatics and the keys, and I also avoid the objections to acting upwardly upon the rear end of the keys instead of downwardly forward of the fulcrum. I am also by this means able to reduce to the minimum the distance between the air-chamber and the tracker-board, making the connections as nearly equal as they can be made by any arrangement and with the minimum turns or bends in the pipes, which increase the friction of air in its passage and increase the liability to kinking or short-folding, causing total obstruction to the passage of the air.

This construction makes it possible to furnish the pneumatic action, together with the removable front elements of the case, for converting any ordinary piano into an automatic piano without in any respect interfering with its effectiveness when played by hand and without preventing perfect access to the action and strings for tuning, since such access is obtained readily by removing the automatic action bodily, as described.

I claim—

1. In an automatic piano in combination with the piano-case and the manual-keys, a pneumatic action comprising motor-pneumatics and their controlling and operating devices contained within the piano-case, such motor-pneumatics exteriorly exposed to atmospheric pressure being lodged directly above the manual-keys and having their moving members acting by collapse of the pneumatic downwardly on the respective keys forward of the fulcrums of the latter and rearward of the entire portion of such keys exposed for manual playing.

2. In an automatic piano in combination with the piano-case and the manual-keys, an exhaust-air chamber, motor-pneumatics outside such chamber and the primary pneumatics and valves for controlling them contained within the piano-case above the manual-table, the motor-pneumatics being located in position to overhang the keys respectively and having their moving members acting downwardly on the keys forward of the fulcrums of the latter and rearward of the entire portion of such keys exposed for manual playing.

3. In an automatic piano in combination with the piano-case and the manual-keys, an exhaust-air chamber, motor-pneumatics outside such chamber and projecting forwardly therefrom and the primary pneumatics and valves for controlling them contained in the piano-case above the manual-table, the tracker-board-controlling sheet and the rolls and mechanism for operating the same also mounted together in a fixed frame above the pneumatic action, and ducts connecting the tracker-board with the latter, the motor-pneumatics being located in position to over-

hang the keys respectively and having their moving members acting downwardly on the said keys forward of the fulcrums of the latter and rearward of the entire portion of such keys exposed for manual playing.

4. In an automatic piano in combination with the piano-case and the key-table therein, a pneumatic action comprising an exhaust-air chamber, and primary pneumatics therein, motor-pneumatics mounted thereon and projecting forwardly therefrom, said air-chamber being supported on the piano-case above the key-table, and the motor-pneumatics overhanging the keys respectively and having their moving members acting downwardly upon the latter forward of their fulcrums and rearward of the entire portion exposed for manual playing.

5. In an automatic piano in combination with the piano-case and the key-table therein, a pneumatic action comprising an exhaust-air chamber and primary pneumatics therein, said air-chamber being supported on the key-table at the end portions thereof beyond the manual-keys and extending above the latter, and motor-pneumatics projecting forwardly from said air-chamber overhanging the keys respectively and having their moving members acting downwardly upon the latter forward of their fulcrums and rearward of the entire portion exposed for manual playing.

6. In an automatic piano in combination with the piano-case and the key-table supported therein, a pneumatic action comprising an air-chamber; motor-pneumatics communicating therewith and primary pneumatics and valves for controlling the action of the motor-pneumatics, the air-chamber being supported on the key-table and extending above the manual-keys, the motor-pneumatics being supported rigidly on the air-chamber overhanging the keys respectively and having their moving members acting downwardly upon the latter forward of their fulcrums and rearward of the entire portion exposed for manual playing, and air-supplying devices mounted below the key-table comprising an air reservoir or receiver communicating with the air-chamber through the supports of the latter on the key-table.

7. In an upright piano, in combination with the piano-case and the manual-keys, an automatic pneumatic action comprising an exhaust-air chamber and motor-pneumatics and their controlling and operating devices and means for striking the keys contained within the

piano-case, the motor-pneumatics being exterior to the exhaust-chamber and operating by collapse for striking the keys, their moving walls being in position directly overhanging the points at which they give the stroke to the keys respectively and acting downwardly thereon forward of the fulcrums of the latter and rearward of the entire portion of such keys exposed for manual playing.

8. In an upright piano, in combination with the piano-case and the manual-keys, an exhaust-air chamber; motor-pneumatics outside such air-chamber and valves controlling them, all contained within the piano-case above the manual-table, the motor-pneumatics having their moving walls acting downwardly on the keys forward of the fulcrums of the latter and directly overhanging the points on the respective keys at which they thus act thereon.

9. In an upright piano, in combination with the piano-case and the manual-keys, an exhaust-air chamber; motor-pneumatics outside such chamber and the primary pneumatics and valves for controlling them all contained in the piano-case above the manual-table, the tracker-board-controlling sheet and the rolls and mechanism for operating same also mounted together in a fixed frame above the pneumatic action, and ducts connecting the tracker-board with the latter, the motor-pneumatics having their moving members acting by collapse of the pneumatics downwardly on the keys forward of the fulcrums of the latter and directly overhanging the points on the respective keys at which they thus act thereon.

10. In an upright piano, in combination with the piano-case and the key-table thereof, a pneumatic action comprising an exhaust-air chamber and primary pneumatics therein, motor-pneumatics mounted on such chamber exterior thereto and projecting forwardly therefrom, said air-chamber being supported on the piano-case above the key-table, the motor-pneumatics having their moving walls operating downwardly upon the keys forward of the fulcrums of the latter and overhanging the points on the respective keys at which they thus act thereon.

In testimony whereof I have hereunto set my hand, in the presence of two witnesses, at Chicago, Illinois, this 26th day of January, A. D. 1905.

MELVILLE CLARK.

In presence of—

CHAS. S. BURTON,
FREDK. G. FISCHER.