No. 814,678. PATENTED MAR. 13, 1906.

L. B. DOMAN.

SELF PLAYING MUSICAL INSTRUMENT.

APPLICATION FILED AUG. 24, 1904.

Fig. 1

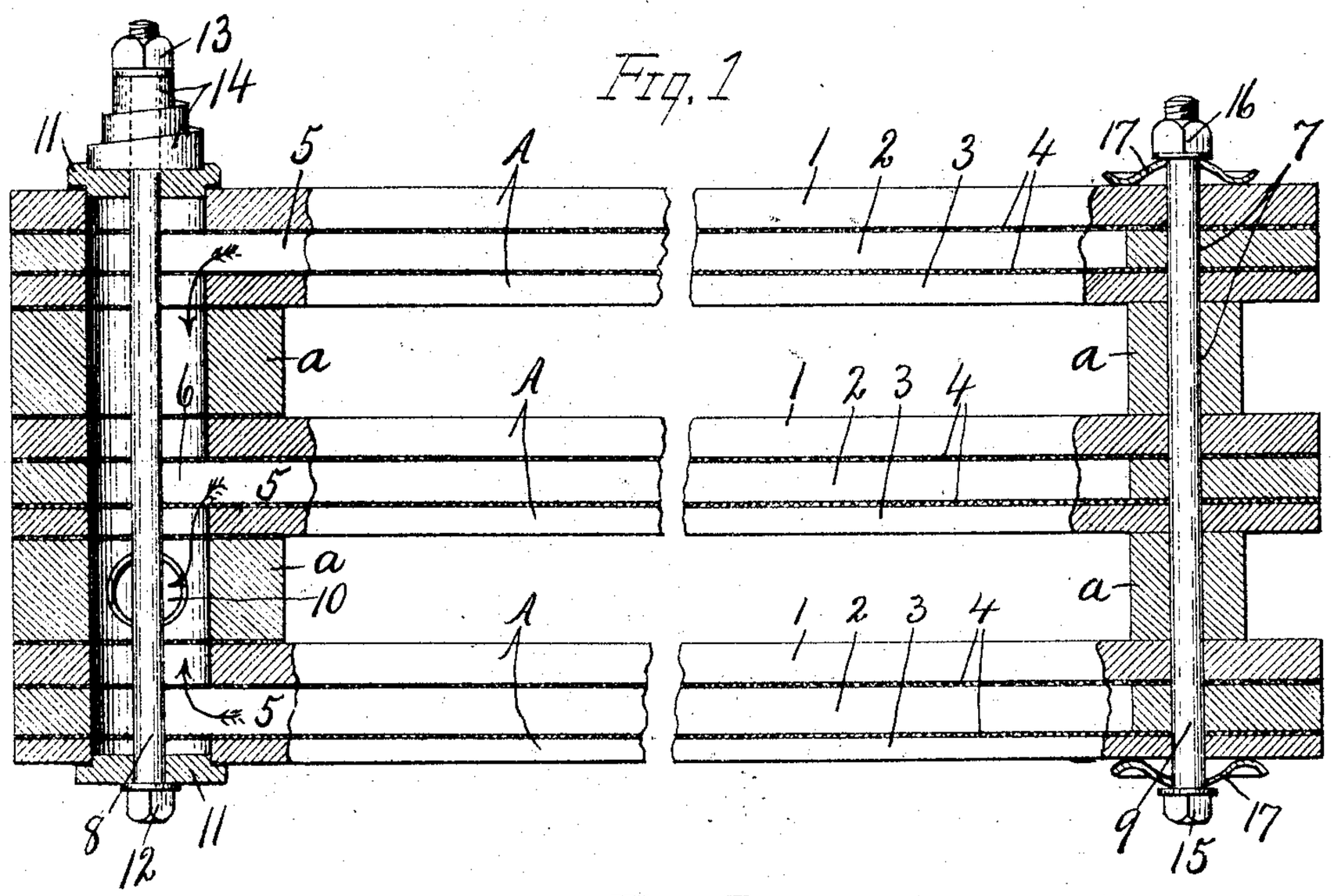
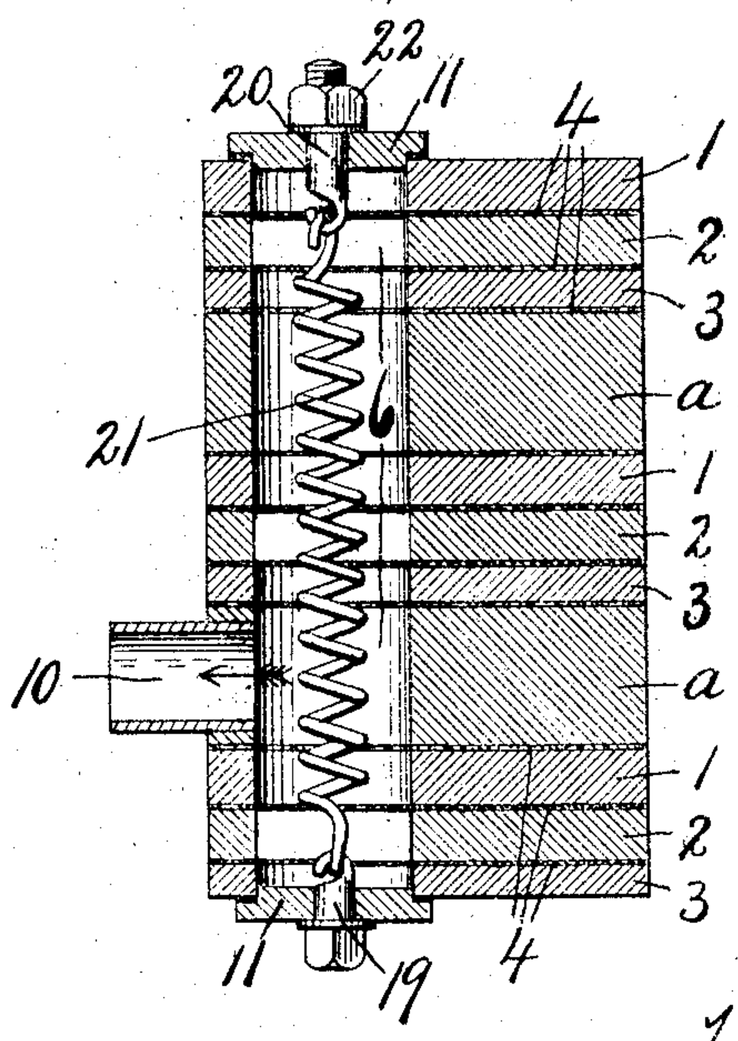


Fig. 2



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UNITED STATES PATENT OFFICE.

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SELF-PLAYING MUSICAL INSTRUMENT.

No. 814,678. Specification of Letters Patent. Patented March 13, 1906.

Application filed August 24, 1904. Serial No. 221,996.

To all whom it may concern:

Be it known that I, LEWIS B. DOMAN, of Elbridge, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Self-Playing Musical Instruments, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to improvements in pneumatic self-playing musical instruments, and refers more particularly to the means for clamping separate valve-shelves or wind-chests together.

In my pending application, Serial No. 109,692, filed May 31, 1902, I have shown a plurality of separable valve-shelves superimposed one above the other and each containing a series of valves in operative relation with corresponding finger-levers for controlling the action of the keys of a musical instrument. These shelves are built up in sections, and each incloses an exhaust-chamber, which is common to all of the valves and key-operating pneumatics of that particular shelf, and these exhaust-chambers are connected to each other by an air-passage passing vertically through the shelves, said air-passage being in communication with the power pneumatic or main bellows, whereby a partial vacuum is maintained in the exhaust-chambers. The action of the valves is controlled by a perforated music-sheet passing over a suitable tracker-board having its ducts in communication with the primary pneumatics. These shelves are usually formed of wood composed of layers of boards, and in order to make the joints air-tight suitable packings of paper or leather are interposed; but I have found that no matter how well seasoned the wood is there is always more or less contraction and expansion under varying climatic conditions, which is more or less liable to cause leaks, and thereby interfere with the instantaneity of action of the pneumatics. I have also found that it is quite impossible to provide a rigid clamping means to hold these valve-shelves and their parts closely together to avoid leaks; and the object of my present invention is to provide yielding clamping means which operate automatically to hold the parts firmly together and to compensate for any shrinkage or expansion of the wood. This may be accomplished by various forms of yielding washers or connections between opposite faces of the combined shelves.

In Figure 1 I have shown a series of shelves with interposed separators or spacing-blocks and yielding clamping-washers at one or both ends of the clamping-bolts. In Fig. 2 I have shown a transverse sectional view through one end of the shelves, having the vertical air-passage and a spring connected to suitable anchors on the upper and lower shelves.

A represents a series of horizontally-disposed valve-shelves arranged one above the other and spaced apart by suitable separating-blocks *a*, which are located near the ends of the shelves. Each of these shelves is composed of horizontal layers 1, 2, and 3 of wood or other suitable material, and between each layer is interposed a packing 4, of paper, leather, or equivalent substance, for the purpose of forming an air-tight joint. These layers 1, 2, and 3 are constructed and united to form and inclose an interior exhaust-chamber 5, and these shelves and separator-blocks are formed with alined vertical openings 6 and 7 near the ends of the shelves through which pass vertical clamping-bolts 8 and 9, Fig. 1. The vertical opening 6 is formed by registering wind-ports in contiguous sides of the shelves and constitutes an air-passage which communicates with all of the exhaust-chambers 5 and is provided with a branch conduit 10, which is adapted to be connected in any desired manner to the air-exhausting device or main bellows. (Not shown.)

The lower and upper ends of the air-passage 6 are closed by suitable caps 11, which are provided with central bolt-openings, through which the opposite ends of the bolt 8 pass. One end of this bolt, as the lower end, is provided with a suitable head 12, which engages the lower face of the lower cap 11 and closes the bolt-opening therein. The opposite or upper end extends some distance above the upper cap 11 and is provided with an adjusting-nut 13, between which and the upper cap 11 is interposed a stiff spiral spring 14, so that by screwing the nut 13 down firmly the spring 14 is compressed against its own tension, thereby drawing the interposed parts, such as the shelves A and separator-blocks *a* firmly together under a

yielding tension and enabling these parts to expand or shrink slightly, the spring serving to prevent opening of the joints. At the opposite end of these shelves the bolt 9 passes through and substantially fills the opening 7 and has its opposite ends provided with suitable heads or shoulders 15 and 16, one of which, as 16, consists of an adjustable nut. Interposed between these heads 15 and 16 and the adjacent faces of the upper and lower shelves are yielding spring-washers 17, which operate for the same purpose as the spiral spring 14, so that when the nut 16 is tightened the shelves and separating-blocks are additionally drawn together under a yielding pressure, whereby any shrinkage or expansion may take place and still the washers 17 serve to prevent opening of the joints.

In Fig. 2 I have shown a section of the shelves and separating-blocks through the air-passage 6; but instead of using a rigid bolt, as seen in Fig. 1, I provide the upper and lower caps 11 with suitable anchors 19 and 20, to which is connected a tensioned spring 21, extending vertically through the air-passage 6. The anchor 20 at the upper end is adjustable by a nut 22, which enables the spring to be drawn to any desired tension for clamping the interposed parts, as the shelves and their supporting-blocks, firmly together to prevent opening of the joints in case of any shrinkage or expansion.

It will be apparent that various other modifications might be shown to carry out the object of my invention, the underlying principle of which is to provide means for automatically compensating for any shrinkage or expansion of the material from which the shelves are formed to prevent opening of the joints between the parts of said shelves which inclose the exhaust-chamber or air-passage. Therefore I do not limit myself to the constructions shown and described.

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

1. In a self-playing musical instrument, a plurality of separable valve-shelves disposed one above the other and having registering wind-ports for direct communication with the interiors of the shelves, and clamping means passed through the registering ports for drawing the shelves together and including a spring whereby the shelves are held together under yielding pressure.

2. In a self-playing musical instrument, a plurality of separable valve-shelves spaced apart, and intervening spacing-blocks, said shelves and blocks having registering wind-ports for direct communication between the shelves, a bolt passed through the wind-ports and attached to one of the outside shelves, and a yielding connection between the other end of the bolt and the other outside shelf, whereby said shelves are yieldingly clamped together.

In witness whereof I have hereunto set my hand this 19th day of August, 1904.

LEWIS B. DOMAN.

Witnesses:

NETTIE A. BIBBENS,

MRS. THOMAS ELLIOTT.