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C. E. PETERSON

PNEUMATIC PIANO CONSTRUCTION

Filed Aug. 25, 1922

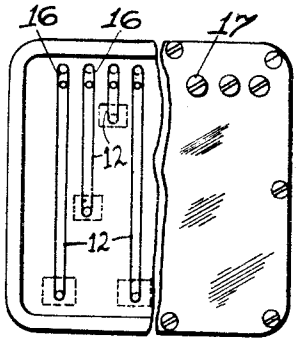

Fig. 2.

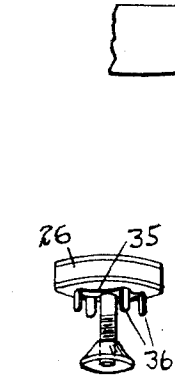

Fig. 4.

Fig. 1.

Fig. 3.

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PNEUMATIC-PIANO CONSTRUCTION.

Application filed August 25, 1922. Serial No. 584,237.

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 Commonwealth of Massachusetts, have invented a new and useful Improvement in a Pneumatic-Piano Construction, of which the following, together with the accompanying drawings, is a specification.

The present invention relates to improvements in the construction of pneumatic pianos, adapted to simplify and render compact the assemblage of operating parts therein, while at the same time insuring the maintenance at all times of the full operating suction, in spite of atmospheric changes tending to produce leakage in the connections between the parts. The above and other objects are attained by the construction hereinafter described in detail, reference being had to the accompanying drawings, wherein—

Fig. 1 is a side view, partly in section, of a pneumatic player action embodying the invention.

Fig. 2 is a front view, on a smaller scale, of the vacuum chamber of such an action, with a part of the cover removed.

Fig. 3 is a top plan view of the valve mechanism.

Fig. 4 is a perspective view of the valve.

Like reference characters refer to like parts in both figures.

In Fig. 1 is shown the usual tracker bar 1, over which passes the travelling perforated note sheet 2 which is wound up on a spool 3, as is customary in mechanism of this class. Each tracker bar aperture 4 has associated therewith an actuating pneumatic, of the general type illustrated at 5, 5, Fig. 1; these pneumatics, all under the action of a common suction, operate through their movable leaves 6 on the wippen 7, to cause the striking of notes in conformity to the registration of the note sheet and tracker bar apertures.

According to the invention, all of the pneumatics 5, 5 are connected to and supported by the inner wall 8 of a common vacuum chamber 9, the latter extending the full length of the action. As shown in Fig. 2, the pneumatics carried by said wall 8 are arranged in staggered relation to economize space, and the attachment of each is by a pair of screws 10, 10, passing through said wall and projecting into the end of each pneumatic block. Each tracker bar aperture has communication with its respective pneumatic 5 by a connection 11 and a rigidly mounted tube 12; each tube 12 is disposed interiorly of the vacuum chamber 9, with its upper end 13 bent at right angles and passing through the wall 8 for attachment to the connection 11, and its lower end 14 similarly disposed and received in a passage 15 of the pneumatic. In this way, the tracker bar connections for all of the pneumatics 5, 5 are carried directly by and within the vacuum chamber 9 which supports said pneuamtics,—it being understood that the rear wall 8 of said chamber is rendered imperforate and leak proof at the various points of insertion of the portions 13 and 14 of tubes 12 by soldering or the like.

In common with the usual practice in mechanism of this class, each actuating pneuamtic has associated therewith a bleed opening; the arrangement of the apparatus, as above described, lends itself to the disposal of the bleed opening for each pneumatic in its associated tube 12, as shown at 16, 16. In this position, each bleed opening is readily accessible, simply by the removal of a screw or plug 17 appropriately disposed in the cover plate 18 of vacuum chamber 9, which cover plate is attached by suitable screws 19 to a flange of rear wall 8. Upon the removal of any screw or plug 17, a wire may be inserted through the opening of the cover plate to clean out the associated bleed opening 16, without otherwise disturbing the arrangement and assemblage of the parts.

According to the invention, each actuating pneumatic 5 is constructed as shown in section at the bottom of Fig. 1 with the pneumatic block 20, which supports and contains the valve mechanism and which serves for the attachment of the device by the screws 10, 10, of unitary one-piece construction, without any gluing or joints. To this end, each block 20 is formed with two recesses 21 and 22, the latter communicating by a pasage 23 with the vacuum chamber 9 and having therein a shoulder 24 for the attachment of the usual pulsating diaphragm 25, below which enters the passage 15 from the associated tube 12. The block or stationary portion 20 of the pneumatic 5, preferably of wood, is thus so constructed as to be unaffected by atmospheric or moisture

conditions, since there are no glued joints or screw attachments to be adversely affected either by shrinkage or swelling of the material.

The recess 21 serves, as usual, for communication to the atmosphere, and the recess 22 for the operation of a valve device 26, under the influence of diaphragm 25. To this end, the block 20 is surmounted by a suitable valve chamber, composed preferably entirely of metal, and here shown as consisting of a flanged bottom member 27 and a top or cover member 28, the latter inclosing between them a space 29 which is enlarged at 30 to accommodate valve 26. The member 27 has two bottom apertures in registration with apertures of the same size in block 20, and connecting respectively with the recesses 21 and 22; these registering apertures are adapted to receive the short metallic tubular connecting members 31 and 32, respectively, whose edges are flanged over and clinched, as shown at 33, to secure the member 27 rigidly to the block and to furnish permanent leak proof communication, unaffected by shrinkage or swelling of the material between the valve space and the respective recesses 21 and 22. In this way, the necessity for providing a metallic seat for the valve 26 is avoided; the tubular connecting member 32 itself forms the valve seat, besides serving to hold the valve casing in substantially integral relationship to the pneumatic block 20. The bottom plate member 27 provides ears or lugs 34 projecting from its edge or flange, which are adapted to be turned down upon the top plate 28 to hold the latter, and its usual gasket, in place.

The mechanism operates and functions in the usual way, with the position of valve 26 directly responsive to the pulsation of diaphragm 25, the latter being actuated whenever a note sheet perforation comes into registration with the associated tracker bar opening; this causes a movement of leaf 6 to actuate the wippen 7. The valve member proper has secured to its under side a plate 35, which provides a circular series of projecting ears 36 disposed within the member 32 and operating as guides for the up and down movement of said valve.

I claim,

1. In a pneumatic player action, a rear wall and cover plate comprising a vacuum chamber, a plurality of actuating pneumatics having tracker-bar connections, said tracker-bar connections inclosed in said vacuum chamber, bleeds in said connections, and individual means of access in the cover plate of said vacuum chamber to said bleeds.

2. An actuating pneumatic, providing a stationary section with recesses, and a superimposed valve casing, with flanged-over tubular members connecting said parts and affording communications between the valve casing and the said recesses.

3. An actuating pneumatic, comprising a stationary one piece member with a recess in the under side, a valve casing above said member and a tubular connection through said member having flanges, with one flange projecting into said recess and another flange projecting into said casing, securing the casing to the one piece member and affording communication between them.

4. An actuating pneumatic for player actions, comprising a wooden stationary block, a recess in the under side of said block, a valve casing above said block and a tubular connection through said member having flanges, with one flange projecting into said casing, securing the casing to the block and affording communication between the recess in said block and the casing.

5. An actuating pneumatic for player actions, comprising a stationary wooden block, a recess on the under side of said block to contain a diaphragm, said recess extending entirely through said block, another recess through said block connecting with the bellows chamber, a valve casing above said block connecting with both recesses, said valve chamber being made of pressed metal, and flanged over tubular members connecting both of said recesses to said valve casing.

6. A valve casing for an actuating pneumatic unit made from two pieces of sheet metal generally oblong in shape, one member having flanges to be turned over upon the other members securing a gasket therebetween, the top piece having a pressed out portion to receive a valve, and the bottom piece having two apertures therein for pneumatic connection with two recesses in the said unit.

7. In an actuating pneumatic unit, a valve casing made from two generally oblong pieces of sheet metal, a pair of flanged over tubular members connecting one of said pieces to a pair of recesses in said unit by cooperation with holes made in said piece, and ears on one of sad pieces to connect the said pieces with a gasket therebetween.

CLAUS E. PETERSON.