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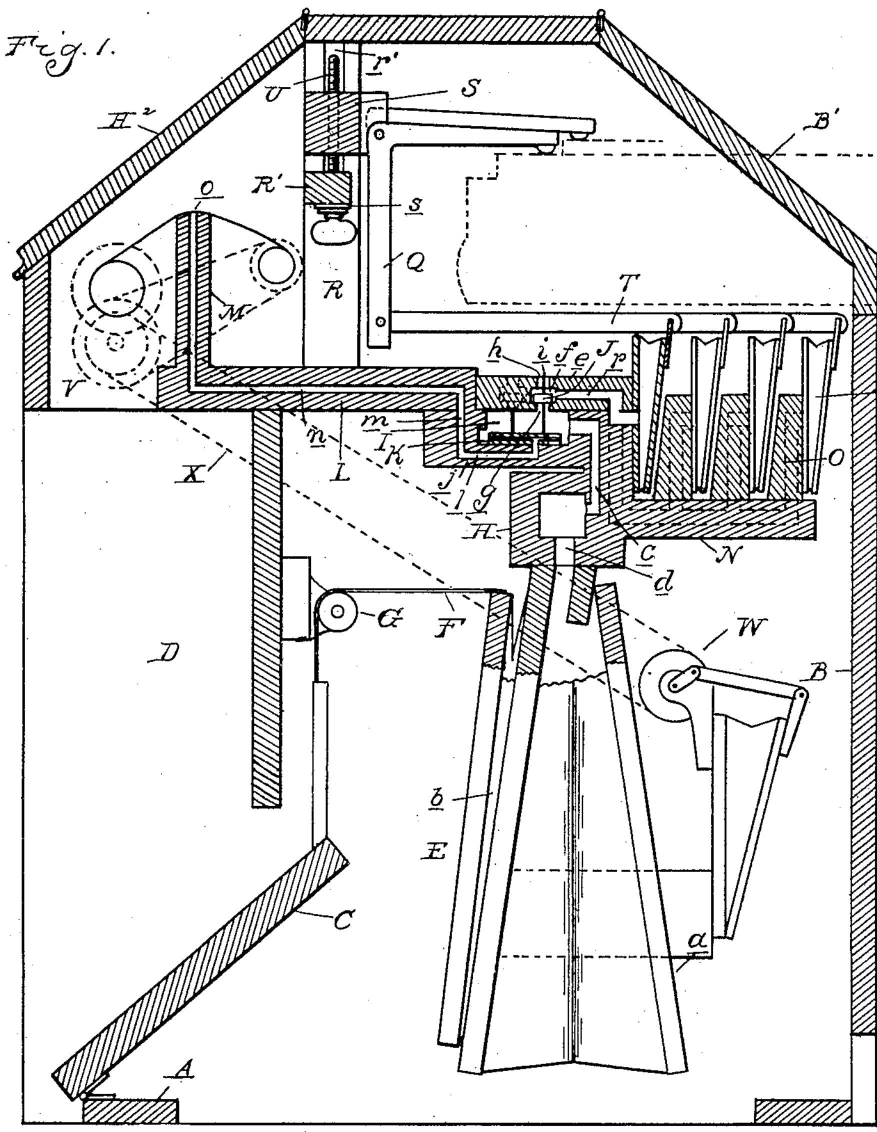
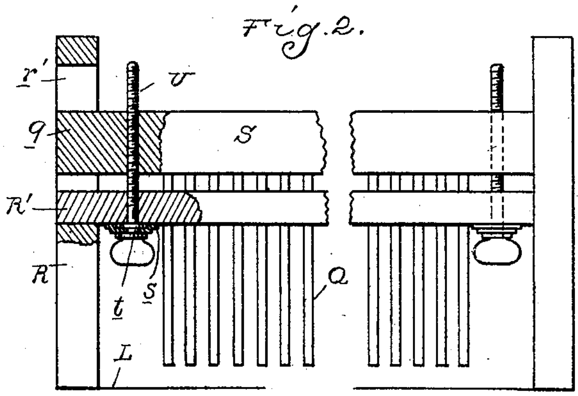
J. COURVILLE.

SELF PLAYING ATTACHMENT FOR MUSICAL INSTRUMENTS.

(Application filed May 31, 1901.)

(No Model.)





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UNITED STATES PATENT OFFICE.

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SELF-PLAYING ATTACHMENT FOR MUSICAL INSTRUMENTS.

SPECIFICATION forming part of Letters Patent No. 700,677, dated May 20, 1902.

Application filed May 31, 1901. Serial No. 62,618. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH COURVILLE, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Self-Playing Attachments for Musical Instruments, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to self-playing attachments for musical instruments, and more particularly to an autopneumatic-action for operating the keys of a musical instrument, such as a piano.

It is the object of the invention to obtain a mechanism which is adapted to be adjusted to keyboards varying, in height and, further, to obtain a simple construction of pneumatic-action for operating the key-actuating devices.

With these objects in view the invention consists in the construction as hereinafter described and claimed.

In the drawings, Figure 1 is a vertical cross-section through the instrument. Fig. 2 is a longitudinal sectional elevation illustrating the fulcrum-bar for the key-actuating levers and means for vertically adjusting the same.

A is a base for supporting the operating mechanism, and B is a case extending upward from said base and inclosing said mechanism.

Mounted upon the base A and hinged near the forward edge thereof are suitable footboards or pedals C, which, as shown, are arranged within a recess D, formed in the front wall of the case.

E is a bellows comprising the usual storebellows *a* and the feeder or pumping bellows *b*. The latter is connected by a suitable strap or flexible connection F, passing over a sheave G, with the footboard.

Above the bellows E is arranged a chest H, which contains a vacuum-chamber I, connected by passages *c* and *d* with the storebellows *a*. The upper wall *e* of this chest forms a valve-board, which is provided with a series of valve-cells *f*, formed therein, each having the oppositely-arranged ports *g* and *h*, respectively, communicating with the chamber I and the external atmosphere.

J represents valves arranged within the cells *f* and adapted to alternatively seat to close the ports *g* and *h*.

K represents primary-pneumatic motors arranged in series within the chamber I and in operative relation to the stems *i* of the valves J. These primary pneumatics are supported upon the wall *j* of the chest, which is provided with a series of channels *l*, respectively connecting with the pneumatics. These channels *l* connect with registering channels *m* in the vertical wall of the chest, and the latter connect with channels *n*, formed in a horizontal board L.

M is a tracker-board arranged at the forward end of the board L and having its channels *o* respectively connecting with the channels *n*.

In rear of the chest H is arranged a horizontal shelf N, having secured thereto a series of vertically-arranged boards O. Each of these boards O forms a support for a series of key-actuating pneumatic-motors P, which are respectively connected by channels formed in the boards O, shelf N, and the rear wall of the chest H with channels *p* formed in the valve-board *e*, which channels respectively connect with the valve-cells *f*. The pneumatics P are so arranged upon the boards O that the corresponding pneumatics in the different series are slightly out of line with each other. This is for the purpose of arranging their respective feed-channels adjacent to each other in the walls of the chest and also providing a clearance for the connections between the pneumatics and the key-actuating levers Q. The latter, as shown, are in the form of bell-cranks, which are pivotally secured to the bar S, extending longitudinally of the casing above the board L. The downwardly-projecting arms of the bell-crank are connected by horizontally-extending links T with the respective pneumatics, while the forwardly-extending arms of said bell-cranks are adapted to extend over the keyboard of the musical instrument.

In order to permit of arranging the key-ac-

tuating levers Q above the keyboard of the instrument, the case B is provided with a hinged rear section B′ above the pneumatics P and links T, and this section when folded outward will leave a space for receiving the keyboard of the instrument. Thus in arranging the playing attachment in proper relation to the piano it may be moved inward until the lower part of the case containing the pneumatic-action is arranged beneath the keyboard of the piano and the key-actuating levers Q extend above the keys, as indicated in dotted lines in Fig. 1.

As the keyboards of different makes of pianos and other musical instruments vary in height, it is necessary to provide means for adjusting the elevation of the key-actuating levers Q so that in normal position they will just clear the keys. This might be accomplished by raising or lowering the entire case and mechanism contained therein above the floor-supports; but such an adjustment would also change the position of the footboards C, which is objectionable. To overcome this objection, I have provided means for raising or lowering the key-actuating levers in relation to the base A, upon which the footboards are mounted, thus leaving the latter always in the same relation to the floor. As shown, this adjustment is effected by providing uprights R at opposite ends of the case and preferably secured to the board L. These uprights form ways in which the opposite ends of the bar S are slidingly secured, preferably, by forming grooves r' in the uprights and tenons q at the ends of the bar engaging with said grooves. The uprights are preferably braced by a connecting-bar R′, and the bar S is raised or lowered by means of screws U, engaging with threaded apertures at the opposite ends of the bar S and swiveled in the bar R′. To prevent longitudinal movement of the screws U in their bearings in the bar R′, a flange s is secured to said bar and is arranged to engage with the groove t, formed in the screw.

With the arrangement as above described it will be observed that the elevation of the bar S may be changed by adjusting the screws U and that this adjustment will not interfere with the actuating connection between the key-actuating levers and the pneumatics P. This is for the reason that the links T are arranged in a plane substantially perpendicular to the planes of the pneumatics and the actuating-arms of the key-levers. Thus the raising or lowering of the latter would only slightly change the angle of said links without materially affecting the distance between the key-actuating levers and the pneumatics.

The instrument is provided with suitable mechanism for driving the music-sheet and drawing the same across the tracker-board. This mechanism is indicated diagrammatically at V in the forward portion of the case, which is provided with a hinged lid H^2 for obtaining access to the mechanism. The driving-motor is also indicated diagrammatically and is arranged in rear of the store-bellows a at W, being connected with the mechanism at V by a suitable chain or belt, such as X, (indicated in dotted lines.)

In the operation of the device after the key-actuating levers have been adjusted to the keyboard of the instrument in the manner before described and the music-sheet placed in position the operation of the footboard C will exhaust the air from the bellows a, thereby establishing a partial vacuum in the chamber I. The music-sheet is then set in motion by means of the motor W and connection X. Thus whenever one of the channels in the tracker-board is uncovered the air will pass through the channels o, n, m, and l to the corresponding primary pneumatic within the chamber I. This will be expanded and will thereby raise the stem i of the corresponding valve J, so as to close the port h and open the port g. This will establish communication between the vacuum-chamber and the key-actuating pneumatic corresponding to the primary pneumatic operated, causing the former to collapse and through the connecting-link T to actuate the bell-crank lever Q. When the channel in the tracker-board is again covered, a small port or bleed in the primary pneumatic will permit the air-pressure within and without said pneumatic to equalize, thereby causing it to collapse and returning the valve J to its normal position. This in turn will allow the key-actuating pneumatic to expand and the bell-crank key-actuating lever to return to its normal position.

What I claim as my invention is—

1. In a self-playing attachment for musical instruments, the combination of a base and wind-pumping devices mounted thereon, of an action above said base, a series of key-actuating levers, and a common means for adjusting said levers to different horizontal planes for pianos of any height within the range of the adjustment thereof, and maintaining at all points of adjustment their operative connection to the action.

2. In a self-playing attachment for musical instruments the combination of a base and wind-pumping devices mounted thereon, of a pneumatic-action above said base, the series of key-actuating levers or strikers, a bar to which said levers are fulcrumed, a common means for vertically adjusting said bar to any height above the base within the range of adjustability, while maintaining the strikers in operating position and in operative connection with the action.

3. In a self-playing attachment for musical instruments the combination of a base, wind-pumping pedals mounted thereon, a casing extending upward from said base, a pneumatic-action inclosed therein, a series of key-actuating strikers in operative relation to said action, and a common means for adjusting

said strikers to any operating heights from the base, within the range of adjustability, such adjusting means holding the parts at every point of adjustment.

4. In a self-playing attachment for musical instruments the combination of a base, a wind-pumping device thereon, a casing, an action in the casing, a series of key-strikers adapted to be operated by the action and a common support for said strikers adjustable to any operating height above the base within the range of the adjustability thereof.

5. In a self-playing attachment for musical instruments, the combination of a casing, an action therein and wind-pumping devices, of a series of key-actuating levers, a common fulcrum-bar upon which said levers are supported and means for adjusting said fulcrum-bar and thereby the levers to any height within the range of the adjustability thereof, and a connection between the levers and the operating devices of the action which is maintained at all points of adjustment.

In testimony whereof I affix my signature in presence of two witnesses.

JOSEPH COURVILLE.

Witnesses:
M. B. O'DOGHERTY,
H. C. SMITH.