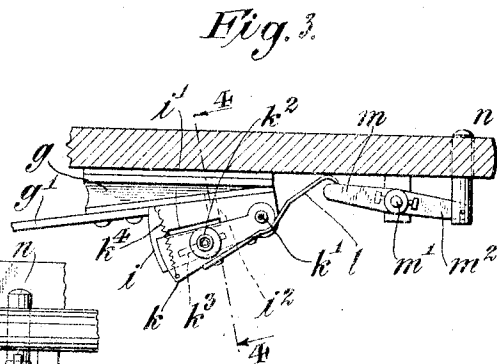
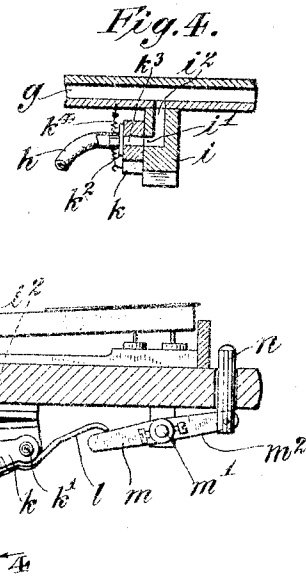
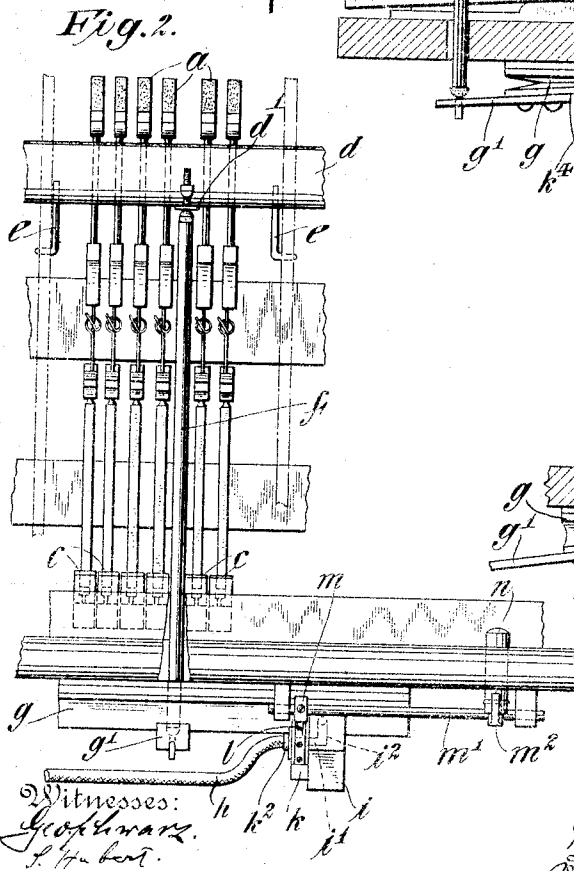
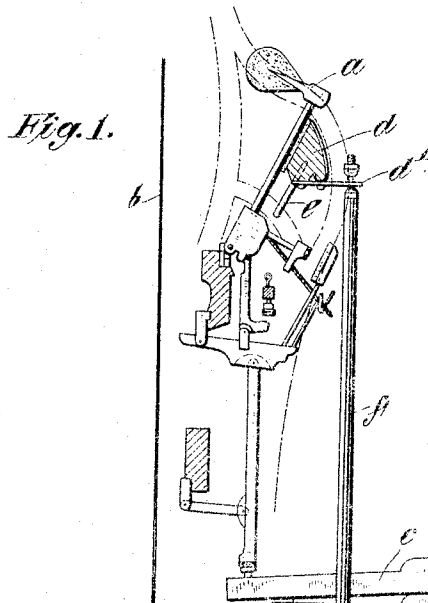


H. S. HORNBECK.
CONTROLLING DEVICE FOR PNEUMATIC PIANO PLAYERS.
APPLICATION FILED MAR. 23, 1910. RENEWED JAN. 19, 1911.

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CONTROLLING DEVICE FOR PNEUMATIC PIANO-PLAYERS.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, HENRY S. HORNBECK, a citizen of the United States, residing in the city of Elizabeth, in the State of New Jersey, have invented certain new and useful Improvements in Controlling Devices for Pneumatic Piano-Players, of which the following is a specification, reference being had to the accompanying drawing, forming a part hereof.

This invention relates to controlling devices through which the performer controls the action of various parts of the mechanism of pneumatic piano players (whether the same be included in the same casing with the piano or otherwise) and other instruments or apparatus of like general character. Such controlling devices are usually so constructed and arranged that while they operate to permit the full movement of the mechanism controlled thereby, they do not permit such movement to be checked at any intermediate point. Gradations of tone effect between the extremes represented by the full movement of the mechanism is therefore impossible except so far as it may be accomplished by other means. Thus, the movable hammer rest rail, by which the throw of the hammers is varied, is usually thrown from one extreme position to the other extreme position by the complete collapsing or complete expansion of the bellows which moves such rail.

It is the object of this invention to so construct and arrange the controlling devices that the performer may be able to check the movement of the mechanism, such as the movement of the movable hammer rest rail, at any point between the extremes of its movement, thereby enabling the performer to produce such gradations of tone as he may desire to produce without resort to other expedients.

The invention will be explained herein after with reference to its application to the operation of the hammer rest rail as a concrete example, but it will be understood that the invention is also capable of application to any part of the mechanism which is actu-

ated by the collapsing or expanding of a 50 bellows.

In the drawing, in which the invention is illustrated, Figure 1 is a view partly in section and partly in side elevation showing so much of the playing mechanism of a player piano as is necessary to enable the application of the invention thereto to be understood. Fig. 2 is a view in front elevation of the parts shown in Fig. 1. Fig. 3 is a detail view showing the controlling devices in different positions from those which are represented in Fig. 1. Fig. 4 is a detail view in section on the plane indicated by the line 4-4 of Figs. 1 and 3.

In the embodiment of the invention represented in the drawings the hammers *a* cooperate with the piano strings *b* and are actuated by the finger keys *c* in the usual manner, through the usual jacks and other devices not necessary to be explained herein. The automatic playing devices, not shown, act upon the hammers through the finger keys *c* or otherwise in the usual manner. The movable hammer rest rail *d*, which in the present instance is the part whose movement is to be controlled, is shown as carried by pivoted supporting arms *e* and as having extended therefrom an arm *d'* which is connected by a link *f* with an arm *g'* extended from the movable member of the bellows *g*. These parts are also constructed and arranged substantially as usual and the invention is concerned particularly with the devices for controlling the connection between the bellows and the vacuum system, represented by the flexible tube *h*, or the atmosphere.

Connected with the movable member *g'* of the bellows, so as to move therewith, and located either on the bellows or elsewhere, is a block *i* which has in its face a port *i'* which communicates through a conduit *i''* with the interior of the bellows *g*. On the face of the block *i* in which is formed the port *i'* is mounted, so as to move with the block and also to be movable independently thereof, a valve body or terminal block *k*, the same being shown as pivoted at *k'* upon

the block i . The valve body or independently movable terminal block k has a connection, as at k^2 , for the tube h , which, as before stated, communicates with the vacuum system, and is formed in its face adjacent to the face of the block i with a chamber or recess k^3 , which is adapted to register with the port i' , to place the bellows in communication with the vacuum system, so that the bellows may be collapsed. The chamber or recess k^3 is placed at a sufficient distance from the edge of the valve body or terminal block k so that there shall be between the recess or the chamber and the edge of the valve body or terminal block a sufficient portion of the face of the valve body or terminal block to completely cover the port i' and thereby shut off the bellows g from communication either with the vacuum system or with the atmosphere. The valve body or terminal block k is also capable of relative movement on the face of the block i sufficient to completely uncover the port i' and thereby place the bellows in communication with the atmosphere to permit the same to expand. A light spring k^4 acts to hold the block normally in the relative position shown in Fig. 1, with the port k^3 in registration with the port i' . The valve body or terminal block k may be shifted with reference to the block i by any suitable means. As shown, the valve body or terminal block k has secured thereto an arm l with which coöperates an arm m on a rock shaft m' , mounted in suitable bearings and having an arm m^2 which carries a push button n in convenient position for operation by the performer.

It will now be seen that so long as the valve body or terminal block k is in the position represented in Fig. 1, with the recess k^3 or terminal of the tube h in registration with the port i' , the interior of the bellows g is in communication with the vacuum system and the bellows is therefore maintained in its collapsed condition and the rest rail d is therefore held in position to restrict the throw of the hammers. If the push button n is depressed so as to move the valve body or terminal block k with respect to the block i sufficiently to uncover the port i' , the interior of the bellows will be placed in communication with the atmosphere and the bellows will therefore expand at once. If the push button be maintained in the depressed position to which it has been moved (assuming that it has not been depressed to its full extent) the valve body or terminal block k remains stationary and the block i moves in relation thereto so that the port i becomes covered by the valve body or terminal block k . As soon as the port i is covered, the further expansion of the bellows g will cease and the rest rail will therefore be held in a position which is determined by the extent

of depression of the push button n . If the push button be released the bellows will be collapsed as soon as the chamber or terminal k^4 registers with the port i' and the collapsing movement will be checked as soon as, the valve body or terminal block k being held stationary, the block i moves relatively thereto to place the port i' out of registration with the terminal k^3 . The movement of the rest rail may, therefore, be checked with the rest rail in any position and the throw of the hammers may, therefore, be controlled by the performer so as to secure whatever gradations in tone are desired.

It will be obvious that the invention is capable of application to the control of other moving parts of instruments of the character referred to herein, and that various changes in details of construction and arrangement may be made according to the requirement of each particular case without departing from the spirit of the invention.

I claim as my invention:

1. In a device of the character described, the combination of a bellows, a block mounted to move with the movable member of the bellows and having a port and a conduit communicating with the bellows, a terminal block arranged to coöperate with said port and movable relatively thereto, a connection from the terminal block to the vacuum system and means to shift the terminal block.
2. In a device of the character described, the combination of a bellows, a block mounted to move with the movable member of the bellows and having a port and a conduit communicating with the bellows, a terminal block movable relatively to the first mentioned block and having in its face adjacent to the first mentioned block a recess or chamber to coöperate with the port in the first mentioned block, a connection from the recess or chamber to the vacuum system and means to shift the terminal block.
3. In a device of the character described, the combination of a bellows, a block mounted to move with the movable member of the bellows and having a port and a conduit communicating with the bellows, a terminal block pivoted upon the first mentioned block so as to move therewith and to move relatively thereto and arranged to coöperate with said port, a connection from the terminal block to the vacuum system and means to shift the terminal block.
4. In a device of the character described, the combination of a bellows, a block mounted to move with the movable member of the bellows and having a port and a conduit communicating with the bellows, a valve body or terminal block mounted to move with said block and to move relatively thereto in a parallel plane therewith and means to shift said valve body or terminal block.

5 In a device of the character described, the combination of a bellows, a block mounted to move with the movable member of the bellows and having a port and a conduit communicating with the bellows, a valve body or terminal block pivotally mounted on the block to move relatively thereto in a parallel plane therewith and to coöperate

with the port therein, and means to shift said valve body or terminal block.

This specification signed and witnessed
this 21st day of March, A. D., 1910.

HENRY S. HORNBECK.

Signed in the presence of—

W. B. GREELEY,
AMBROSE L. O'SHEA.

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