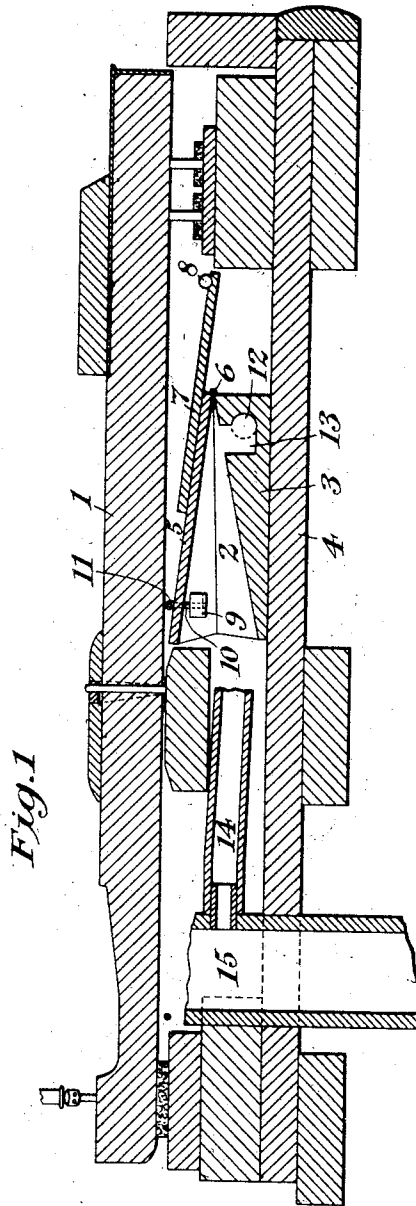
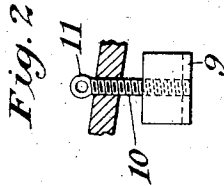


J. P. HULDER.
 KEY HOLDING DEVICE.
 APPLICATION FILED MAY 6, 1909.

944,037.

Patented Dec. 21, 1909.



Witnesses:
Willard Schwartz
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UNITED STATES PATENT OFFICE.

JOSEPH P. HULDER, OF NEW YORK, N. Y., ASSIGNOR TO LUDWIG & COMPANY, A CORPORATION OF NEW YORK.

KEY-HOLDING DEVICE.

944,037.

Specification of Letters Patent. Patented Dec. 21, 1909.

Original application filed March 20, 1909, Serial No. 484,628. Divided and this application filed May 6, 1909. Serial No. 494,297.

To all whom it may concern:

Be it known that I, JOSEPH P. HULDER, a citizen of the United States, and a resident of New York, county of New York, and State of New York, have invented certain new and useful Improvements in Key-Holding Devices, of which the following is a full, clear, and exact specification, being a division of my original application, Serial No. 484,628, filed March 20, 1909.

My invention relates to improvements in key-holding devices for self-playing keyboard instruments, particularly for that type of musical instrument known as the player piano.

The object of my invention is to provide a keyboard musical instrument with simple and efficient pneumatically actuated means for automatically sustaining the manual keys so as to hold them immovable during the mechanical playing of such instrument.

I attain the object specified, as well as others which I have not enumerated, by means of the construction and arrangement of parts hereinafter described and shown in the accompanying drawings in which—

Figure 1 is an elevation in section through one of the manual keys to show my improved key sustaining device; and Fig. 2 is a detailed view of the regulating check.

Beneath the manual keys (1) of the instrument I place the sustaining pneumatics (2). I prefer to use three sustaining pneumatics spaced apart and arranged in a horizontal row under the keys, with their opening ends toward the rear of the instrument in which they are placed. The lower or immovable wall (3) of each of said pneumatics is fastened to the horizontal member (4), or to any other suitable part of the framework. The upper or movable wall (5) is suitably secured by means of a hinge (6) to the front end of the lower wall. Each of the pneumatics has a lever arm (7) suitably fastened to its movable wall, extending forwardly beyond its hinge.

To hold the keys immovably in position when the air is exhausted from the sustaining pneumatics, I provide a supporting rod (8) which is suitably fastened to the forward ends of the lever arms transversely thereof. This rod (8) extends longitudinally

beneath all of the keys (1) near their forward ends and substantially parallel to the lower surfaces thereof.

A regulating check (9) is placed in each of the sustaining pneumatics. Each of these checks is provided with a threaded shank (10) which is screwed in the movable wall (5). By turning the heads (11) of these checks the action of the sustaining pneumatics can be adjusted to the exact rise of the rod (8) required to support and hold the keys in alinement when the instrument is being pneumatically played.

Air connection is established between the sustaining pneumatics and the air exhaust mechanism (not shown in the drawing) by means of the tube (12) which extends through the sustaining pneumatics and communicates with the aperture (13) formed in the lower wall of each of the pneumatics. This tube is connected, by means of any suitable airtight coupling (not shown in the drawing), with a branch pipe (14) of the main exhaust pipe (15).

It will be understood from the foregoing description that the key-holding device does not interfere with the manual playing of the keys, from the fact that there is no physical connection between any part of said device and the keys. Normally the device is entirely independent of the keys, but when the instrument is being pneumatically played the air in the sustaining pneumatic will be automatically exhausted thereby causing the rod (8) carried on the lever arms (7) to rise so as to abut against the under surface of the keys and hold them immovably in position during such playing of the instrument.

The construction and arrangement of the various parts may be modified and varied from that illustrated in the accompanying drawings without departing from the essential features of this invention.

What I claim as my invention and desire to secure by Letters Patent is:

1. In a pneumatic action for musical instruments the combination with the manual keys of two or more pneumatics placed under the keys and provided with air connection with the exhaust bellows, lever arms fastened to the movable walls of said pneu-

5 matics and extending beyond them, and a rod carried by said lever arms extending longitudinally under the keys, adapted to support said keys and to hold them immovable when the air is exhausted from said pneumatics.

10 2. In a pneumatic action for musical instruments the combination with the manual keys of two or more pneumatics having hinged movable and immovable walls, placed under said keys and provided with air connection with the exhaust bellows, lever arms fastened to the movable walls of said pneumatics extending forwardly beyond the hinges, and carrying near their
15 free ends a rod which extends longitudinally below the keys and is adapted to support

said keys and to hold them immovable when the air is exhausted from said pneumatics.

3. In a pneumatic action for musical instruments the combination with the manual keys of two or more pneumatics having hinged movable and immovable walls, placed under the keys, and provided with air connection with the exhaust bellows, lever arms fastened to the movable walls and extending beyond the hinges, regulating checks adjustable in the movable walls, and a rod carried on said lever arms and extending longitudinally under all the keys.

JOSEPH P. HULDER.

Witnesses:

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