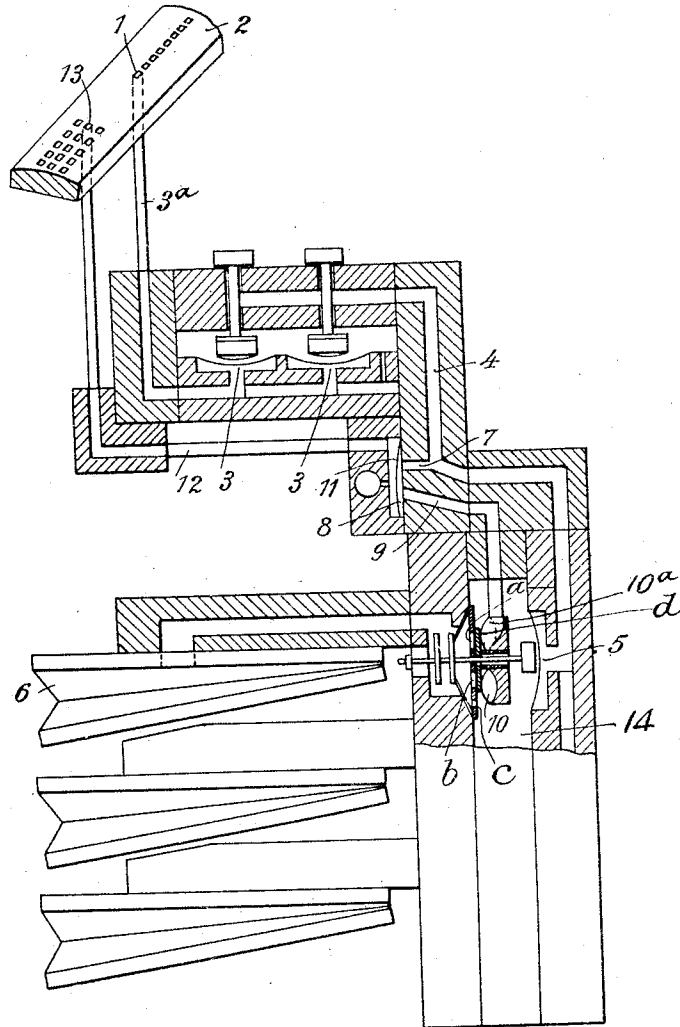


M. M. KASTNER & C. KATZ.
PNEUMATIC PIANO PLAYER AND THE LIKE.
APPLICATION FILED JUNE 21, 1911.

1,038,761.

Patented Sept. 17, 1912.



Witnesses:
Katherine Koch
Daniel Holmgren.

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UNITED STATES PATENT OFFICE.

MACARIUS MAXIMILIAN KASTNER AND CONRAD KATZ, OF LONDON, ENGLAND; SAID
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PNEUMATIC PIANO-PLAYER AND THE LIKE.

1,038,761.

Specification of Letters Patent. Patented Sept. 17, 1912.

Application filed June 21, 1911. Serial No. 634,528.

To all whom it may concern:

Be it known that we, MACARIUS MAXIMILIAN KASTNER, a subject of the King of Saxony, and CONRAD KATZ, a subject of the King of Prussia, both residing at 34-36 Margaret street, London, England, have invented certain new and useful Improvements in Pneumatic Piano-Players and the Like, of which the following is a specification, reference being had to the accompanying drawing.

This invention relates to an improvement in pneumatic piano players and the like and especially to the arrangement fully described and shown in the specification of the pending application for U. S. Letters Patent filed August 2, 1910 Ser. No. 575076.

The object of this invention is to provide means whereby the air ducts leading from the playing and accentuation holes of the tracker board are easily connected and disconnected respectively and the primary pneumatic of any well known form mostly in practice inserted between each playing hole in the tracker board and the corresponding striking pneumatic valve diaphragm may be omitted. Otherwise there would be two primary pneumatics for each note, one situated between the playing hole in the tracker board and the diaphragm actuating the striking pneumatic valve, and the other situated between the accentuation hole in the tracker board and the accentuation controlling diaphragm.

In the present invention one primary is employed to admit atmospheric pressure to the accentuation controlling diaphragm as well as to the diaphragm actuating the striking pneumatic valve, means being provided whereby the passage to the accentuation controlling diaphragm shall be opened or closed according as the corresponding accentuation hole is covered or uncovered.

In the accompanying drawing which illustrates in cross section a preferred form of our improved pneumatic action, each tone producing opening 1 of a tracker bar 2 is by tube 3^a connected to a primary 3, from which a duct 4 leads to a diaphragm 5 that controls the hammer actuating bellows 6. The air is withdrawn from the latter through openings *a*, *b*, *c* of which openings *a* and *b* are adapted to be closed by a disk *d* controlled by a diaphragm 10^a, while opening *c* is permanently open. Duct 4 communicates

through branch 7 with a small junction chamber 8, while the latter is in turn, by a duct 9, connected to the hollow space 10 formed behind the accentuation controlling diaphragm 10^a, which is located within a vacuum chamber 14. Ducts 7 and 9 are adapted to be closed by a diaphragm 11, which divides the chamber into two parts, both the openings being in one part of the chamber. The part of the chamber on the other side of the diaphragm is connected by way of a duct 12 with the accentuation hole 13 in the tracker board 2 and is normally exhausted so that when the playing hole in the tracker board is uncovered the atmospheric air pressure forces the diaphragm away from the openings 7 and 9 and air passes to the accentuation controlling diaphragm as well as to the striking pneumatic diaphragm so that the normal or soft blow is struck. This is if the accentuation hole in the tracker board is covered. Should it be open, then the air pressure admitted to the back of the diaphragm 11 in the junction chamber, forces the said diaphragm down upon the openings mentioned above so that the passage from the primary to the accentuation controlling diaphragm is closed. The latter therefore is deflated, and the vacuum existing within chamber 14 retracts disk *d* so as to open ports *a* and *b* and effect a powerful collapse of the bellows, whereby the desired emphasis of the tone is obtained.

Having fully described the features of the invention what we claim is:

1. In an expression device for pneumatic pianos and similar musical instruments, a tracker bar having a tone producing perforation and a tone accentuating perforation, a vacuum chamber, hammer actuating bellows, a diaphragm controlling communication between said chamber and bellows, a first duct coöperating with the tone producing perforation and controlling said diaphragm, a tone accentuating diaphragm, means controlled thereby for establishing additional communication between the chamber and bellows, a second duct controlling said last named diaphragm, and means controlled by the tone accentuating perforation for establishing communication between both of said ducts.

2. In an expression device for pneumatic pianos and similar musical instruments, a

5 tracker bar having a tone producing perforation and a tone accentuating perforation, a vacuum chamber, hammer actuating bellows, a first diaphragm controlling communication between said chamber and bellows, a first duct cooperating with the tone producing perforation and controlling said first diaphragm, a tone accentuating second diaphragm, means controlled thereby for establishing additional communication between the chamber and hollows, a second duct controlling said second diaphragm, and a third diaphragm controlled by the tone accentuating perforation for establishing communication between both of said ducts.
 10 3. In an expression device for pneumatic pianos and similar musical instruments, a tracker bar having a tone producing perforation, and a tone accentuating perforation, a vacuum chamber, a first duct cooperating with the tone producing perfora-
 15 20

tion, a first diaphragm intermediate said chamber and duct, hammer actuating bellows, means controlled by said first diaphragm for establishing communication between said chamber and bellows, a tone-accentuating second diaphragm, means controlled by said second diaphragm for establishing additional communication between the chamber and bellows, a second duct controlling said second diaphragm, and a third diaphragm controlled by the tone accentuating perforation for establishing communication between both of said ducts.

In testimony whereof we have affixed our signatures in the presence of two subscribing witnesses this 8th day of June 1911.

MACARIUS MAXIMILIAN KASTNER.
 CONRAD KATZ.

Witnesses:

R. WESTACOTT,
 H. D. JAMESON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."