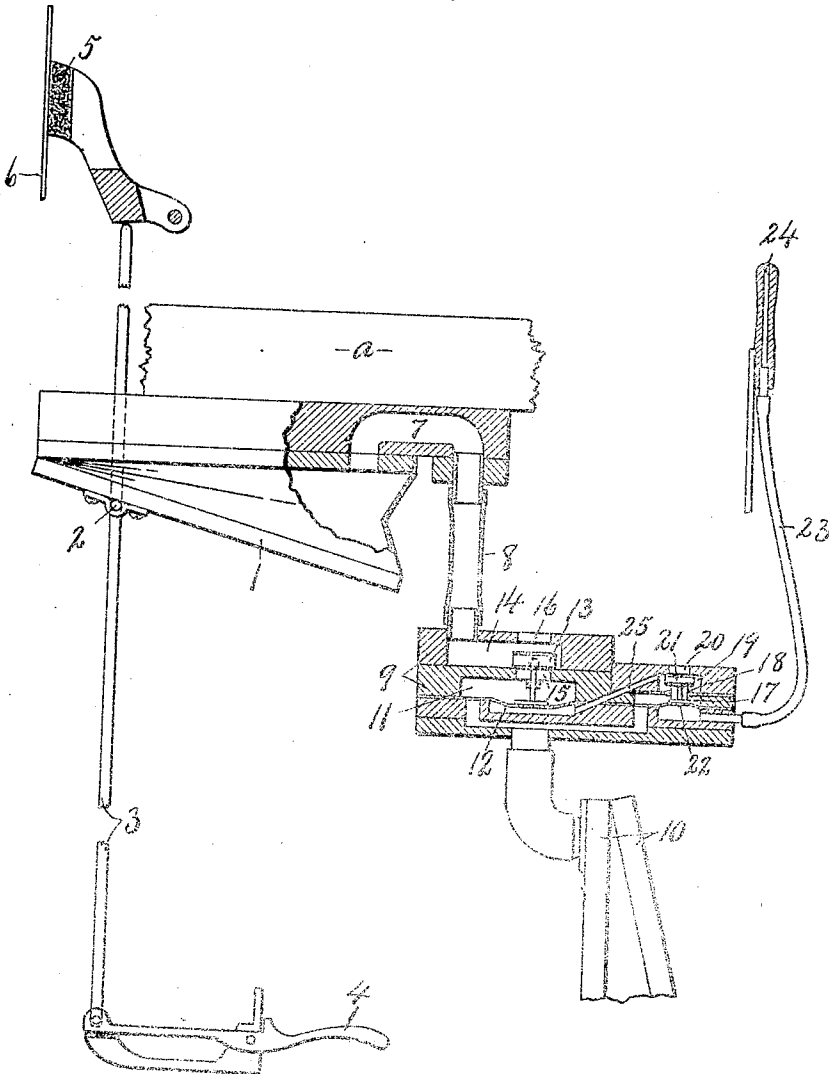


L. B. DOMAN.
PNEUMATIC DAMPER OPERATING MECHANISM.
APPLICATION FILED MAR. 13, 1906.

1,000,381.

Patented Aug. 15, 1911.



WITNESSES:

A. C. Thomas
W. B. Chase

INVENTOR:

L. B. Doman

BY:

Howard P. Dorman
ATTORNEY

UNITED STATES PATENT OFFICE.

LEWIS B. DOMAN, OF ELBRIDGE, NEW YORK.

PNEUMATIC DAMPER-OPERATING MECHANISM.

1,000,381.

Specification of Letters Patent. Patented Aug. 15, 1911.

Application filed March 13, 1906. Serial No. 305,762.

To all whom it may concern:

Be it known that I, LEWIS B. DOMAN, of Elbridge, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Pneumatic Damper-Operating Mechanism, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

10 This invention relates to improvements in self-playing musical instruments, having particular reference to a pneumatic damper-operating mechanism whereby the damper operating pedal, and in fact, either of the other pedals of a piano may be held in its active position for any period of time independently of the foot.

My object is to provide pneumatic means controlled by the finger of the operator for operating a damper or other pedal-operated device used in connection with a musical instrument, such as a piano, and holding such damper in operating position.

25 In the drawings—I have shown a portion of a pneumatic self-playing musical instrument embodying the various features of my invention, which consists essentially of a damper sustaining pneumatic —1— having its movable side attached or pivotally connected by a pin —2— to a reciprocatory rod —3—, which latter is connected to and usually actuated by a pedal —4— for operating a damper —5— or equivalent device used in connection with the strings, as —6—, of a piano or similar instrument.

35 The interior of the pneumatic —1— is connected by a passage —7— and conduit —8— to a wind-chest —9—, which in turn is connected either directly or indirectly to a wind-inducing device —10— for maintaining a partial vacuum in the exhaust chamber, as —11—, of the wind-chest —9—. This wind-chest —9— contains a secondary pneumatic —12— and a valve 45 13— playing in a valve-chamber —14— between opposite ports 15— and —16—. The port —15— serves to connect the exhaust-chamber —11— with the valve-chamber 14— and is normally closed by the valve 13—, while the port —16— opens to atmosphere and serves to admit atmospheric air through the conduit —8— and passage —7— into the pneumatic —1— to distend the latter when the valve 13— closes the 55 port 15. In the same wind-chest —9— is a second exhaust-chamber —17— which is

also connected directly or indirectly with the wind-inducing device —10— and communicates through the port —18— with a valve-chamber —19—, the latter chamber opening to atmosphere through a suitable port —20—.

A valve —21— plays between the ports 18— and —20— and is normally actuated to close the port —20— by a primary pneumatic —22— which is normally open to atmosphere through a conduit —23— and apertured finger-piece —24—.

It is now obvious that as long as the pneumatic —22— is open to atmosphere it will be distended to operate the valve —21— to open the port —18— and close the port —20—, thereby establishing communication between the exhaust device 10 and pneumatic 12— through a passage —25—, the pneumatic 12— being somewhat larger in area than the pneumatic —22— and by establishing communication between the exhaust-device 10 and pneumatic 12— the air tension in such pneumatic will be the same as that in the chamber —11—, and therefore, the inequality of pressure of atmosphere upon the valve 13— will operate to close the port 15— and to open the port —16— to allow atmospheric air to normally enter and distend the pedal operating pneumatics —1—. On the other hand, if the operator places his finger over the opening —24—, thereby cutting off atmospheric communication with the primary pneumatic —22— such pneumatic will be instantly deflated through a suitable bleed-hole therein, thereby allowing the valve —21— to open the port —20— and close the port —18— to allow atmospheric air to enter and distend the primary pneumatic —12—. This distention of the primary pneumatic 12— operates the valve 13— to close the port 16—, and to open the port —15— so as to establish communication between the exhaust-chamber —11— and the damper-operating pneumatic —1—, whereupon the latter pneumatic is immediately deflated, thereby elevating the damper-rod —3— to withdraw the damper —5 from the string —6—, which parts are held in inoperative position as long as the operator keeps his finger upon the air inlet —24—.

As soon as the finger is removed from the air inlet —24— the inrush of atmospheric air through the tube —23— causes the distention of the pneumatic —22— to re-

store the valve —21— to its normal position, closing the port —20— and again establishing communication between the exhaust-chamber —17— and primary pneumatic 5 12— to deflate the latter and allow the valve 13— to close the port 15— and open communication between the damper-operating pneumatic —1— and atmosphere, whereupon said damper-operating pneumatic is dis- 10 tended and operates the damper rod —3— to allow the damper —5— to again contact with the strings —6—.

The pneumatic —1— is mounted directly upon the under side of the key-board, as 15 —a—, of the piano, and is connected directly to the damper rod —3—, thereby avoiding the use of the intermediary levers, and affording direct action upon the damper.

20 It will be observed that the pneumatic —1— is controlled by the interruption of the current of air through the vent —24— and conduit —23— to the primary pneumatic —22—.

25 What I claim:

1. A device of the class described comprising in combination with a piano string, a damper, an operating pneumatic having a movable side and normally distended by 30 communication with the atmosphere, a vertical damper rod directly connected to said movable side and having the damper seated upon the upper end thereof, a horizontally positioned wind chest having a chamber therein, a secondary pneumatic in said 35 chamber at one side of said chest, opposite ports in the walls of said chamber, a valve operated by said secondary pneumatic between said ports, one side of said chest pro- 40 vided with a smaller chamber, a primary

pneumatic positioned therein, ports in said last named chamber, a valve operated by said latter pneumatic between said latter ports, an exhaust device communicating 45 with both of said chambers, an air conduit tapped into said smaller chamber, a finger piece positioned upon the free end of said conduit and having an opening therethrough and adapted to be closed by the finger of 50 the operator and said primary pneumatic brought into action by the closing of said opening for closing communication between the first named pneumatic and the atmosphere and establishing communication be- 55 tween such pneumatic and the exhaust device.

2. In combination with the strings, damper, pedal and damper operating rod connected to the pedal of a self-playing piano, a pneumatic normally distended by 60 communication with the atmosphere, a connection between the pneumatic and pedal for operating the latter when the pneumatic is deflated, an exhaust device, a movable 65 member having an air port therein normally open to the atmosphere and adapted to be closed by the finger of the operator and pneumatic means brought into action by the closing of said port for closing communication between the first named pneu- 70 matic and the atmosphere and establishing communication between such pneumatic and the exhaust device.

In witness whereof I have hereunto set my hand this 27th day of February 1906.

LEWIS B. DOMAN.

Witnesses:

M. E. ELLIOTT,
NETTIE A. BIBBINS.