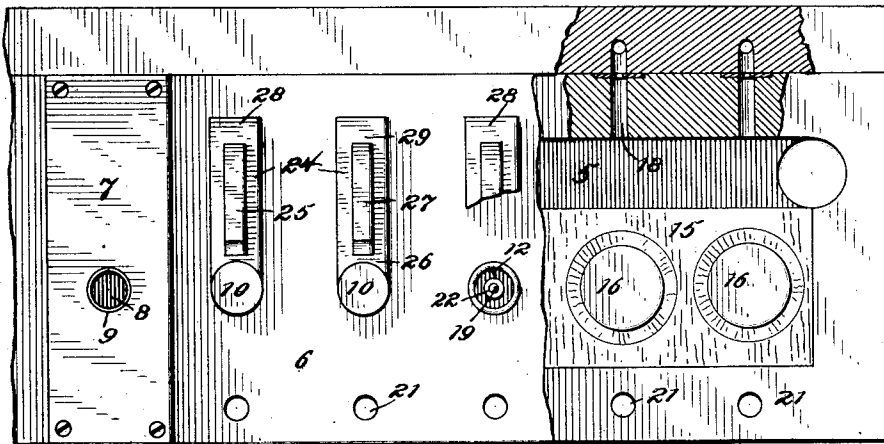
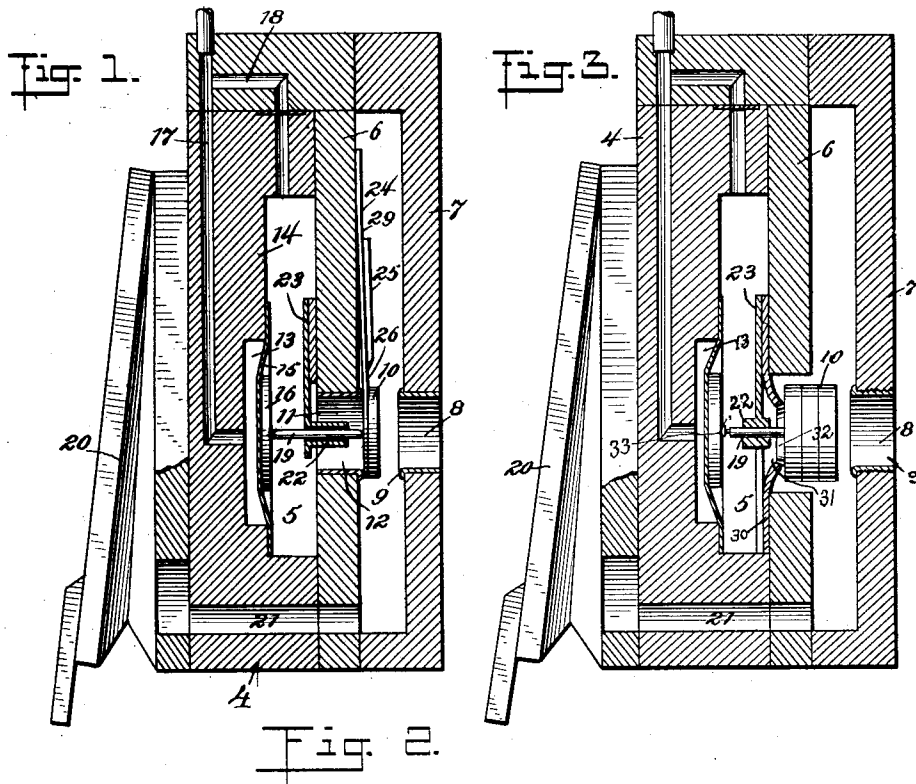


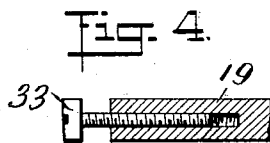
F. G. LYNDE.
PNEUMATIC VALVE.
APPLICATION FILED MAY 31, 1912.

1,087,674.

Patented Feb. 17, 1914.



WITNESSES:
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UNITED STATES PATENT OFFICE.

FRANK G. LYNDE, OF NEW YORK, N. Y., ASSIGNOR TO LAUTER CO., OF NEWARK, NEW JERSEY, A CORPORATION OF NEW JERSEY.

PNEUMATIC VALVE.

1,087,674.

Specification of Letters Patent.

Patented Feb. 17, 1914.

Application filed May 31, 1912. Serial No. 700,554.

To all whom it may concern:

Be it known that I, FRANK G. LYNDE, a citizen of the United States, residing in the city of New York, borough of Manhattan, county and State of New York, have invented a new and useful Pneumatic Valve, of which the following is a specification.

My invention relates in general to the pneumatic actions of player pianos and more particularly relates to the valve mechanism incidental to devices of this character.

In player pneumatics it is desirable to have a quick positive actuation of the valves controlling the different air passages and at the same time to have the valves and their coacting parts of a simple, inexpensive construction which may be readily dismounted, replaced and adjusted.

It is an object of my invention to attain the above outlined desideratum and at the same time to reduce the number of parts to a minimum and to provide a simple, compact light and readily actuated form of pneumatic valve.

A physical embodiment of the invention is illustrated in the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a vertical sectional view through a player pneumatic action showing a preferred embodiment of my invention in position therein; Fig. 2 is an elevation of the side of the action showing certain parts broken away in succession to show internal constructions; and Fig. 3 is a view similar to Fig. 1 but showing a modified form of valve. Fig. 4 is a detail view of the adjusting rod.

In order to disclose a setting for my improved valve I have illustrated the same in position to control the pressures in a player pneumatic action but it is of course to be understood that my valve may be used wherever a valve of such a character may be useful.

In the several figures I have shown a valve board 4 extending along one side face of which is a recess 5 upon which face is removably positioned a valve board 6 covering the recess 5 to form a vacuum chamber in which a negative pressure is maintained by any suitable means as by the main bellows or wind chest of the player piano.

Disposed along the outside of the valve

board 6 is a series of hollow conduit boxes 7 adapted to contain the valves hereinafter described. Extending through each of the boxes 7 is an outlet 8 to the atmosphere said outlet being outlined by a nipple 9 the inner end of which forms a valve seat for the valve head 10 hereinafter more fully described. Extending through the board 6 in alinement with the outlet 8 is a port 11 placing the vacuum chamber 5 in communication with the interior of the box 7. The port 11 is outlined by a nipple 12 similar to the nipple 9 one end of which nipple 12 forms a valve seat spaced from the valve seat at 9 and on the opposite side of the valve head 10. Concentrically disposed relative to the axis of the nipples 8 and 12 is a pocket 13 recessed into the bottom 14 of the valve chamber 5 which pocket is bridged by a diaphragm 15 centrally positioned on one face of which is an abutting plate 16. A conduit 17 extends from the pocket 13 to a corresponding duct in the trackerbar (not shown) and a conduit 18 leads from the vacuum chamber 5 to the conduit 17. By this construction it will be understood that normally there is a vacuum in the conduits 17 and 18 and in the pocket 13, but when atmospheric pressure is admitted through the ducts in the trackerbar it bellies the diaphragm 15 into the chamber 5 thereby acting on the valve pin 19 to change the position of the valve head 10.

For each of the valves and coacting parts hereinbefore described there is positioned on the rear of the board 4 a player pneumatic the actuation of which in turn moves the hammer abstract (not shown). A passageway 21 extends from the pneumatic to the interior of the box 7. The pneumatic is normally open to the atmosphere through the passageway 21 and outlet 8 but when the diagram 15 and pin 19 is actuated the valve cap 10 closes the outlet 8 and at the same time opens the pneumatic to the vacuum chamber 5 through the port 11. Withdrawing the air from the pneumatic permits the external air pressure to collapse the pneumatic as is usual with devices of this character.

This invention relates more particularly to the valve including the head 10 and the pin 19 hereinbefore mentioned. The valve head 10 oscillating between the seats formed by the nipples 8 and 12 may be made of any

suitable material preferably a prepared leather, disposed between which head and the plate 16 on the diaphragm 15 is the pin 19 of wood or other light material. This
 5 pin is guided in position in alinement with the direction of movement of the head 10 and plate 16 and centrally of these members by a sleeve 22 disposed axially in the port 12 which sleeve is suitably supported by a
 10 bracket 23 fastened to the board 6 within the valve chamber 5.

Preferably the head 10 is attached to one end of a flexible pendant 24 to form the valve, the end of which opposite the head
 15 10 is suitably fastened to the board 6 within the boxes 7 at a point some distance removed from the nipple 12. In order to prevent buckling of this flexible pendant 24 and at the same time to retain the quick actuation
 20 of this valve a long narrow reinforcing or stiffening strip 25 is glued or otherwise affixed to the outer face of the pendant. The strip 25 is preferably of wood and terminates short of the head 10 to form a hinge
 25 portion 26 between the head 10 and the stiff portion 27 of the valve and terminates short of the end portion 28 attached to the board 6 to form a secondary hinge 29 between the stiff portion 27 and the part attached to the
 30 board 6. By this construction it is noted that the valve operates with a compound movement, first by raising the cap 10, which movement is succeeded by a movement of the stiff portion 27 as well as a further
 35 movement of the cap 10 thereby attaining a rapid pulsation of this member.

Referring more particularly to the modification disclosed in Fig. 3, the inner valve-seat forming nipple 12 is omitted to bring
 40 the cap 10 nearer to the actuating diaphragm 15 and in order to form a valve seat to take the place of the nipple 12, a spacing plate 30 is fastened to the board 6 within the chamber 5 and in rear of the bracket 23,
 45 bridging the enlarged port 11. The plate 30

has a throat 31 formed by pressing the central part of the plate 30 into the port 11; disposed in which throat is the pin 19 projecting centrally, in this case, from a boss 32 on the back of the head 10 and flexibly and piv- 50
 otally fastened thereto by means of a cord or catgut 34, which boss forms a closure for the throat.

In order to adjust the length of the pin 19 there is disposed in the end adjacent the
 55 plate 16 a set screw 33 by means of which the distance between the cap 10 and plate 16 may be varied and regulated. If desired the nipple 9 may be adjustably mounted in the box 7 as by the screw threaded connection shown in Fig. 3, so that the position
 60 of the outer valve seat may be varied and adjusted relative to the cap 10.

Having thus described my invention what I claim and desire to secure by Letters Pat- 65
 ent is:

1. In a pneumatic action, a member having an opening therein, a valve head disposed substantially in said opening, a valve seat adjacent one side of said head, a plate 70
 bridging said opening and having a throat forming a valve seat for the opposite side of said valve, a diaphragm on the throat side of said head, a valve pin disposed entirely between said head and diaphragm, 75
 said pin including means for adjusting its length and means for slidably mounting said pin.

2. A pneumatic valve comprising a member having an opening therein, a valve head 80
 having a frusto-conical boss thereon disposed substantially in said opening, a valve seat having a configuration to fit about said boss, a diaphragm, and a valve pin disposed between said boss and said diaphragm.

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Witnesses:

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