

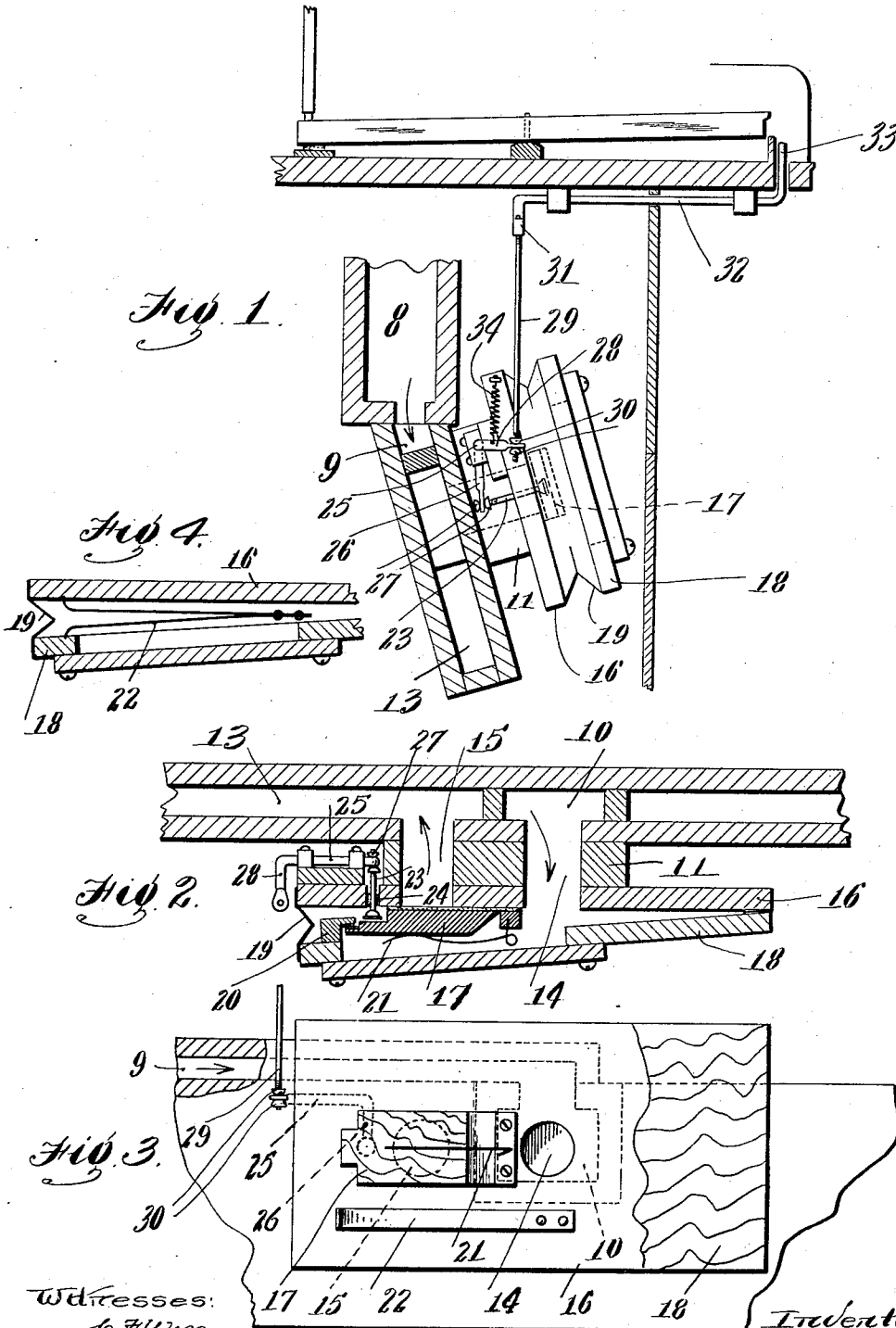
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REGULATOR FOR PNEUMATICALLY OPERATED MUSICAL INSTRUMENTS.

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1,006,728.

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UNITED STATES PATENT OFFICE.

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REGULATOR FOR PNEUMATICALLY-OPERATED MUSICAL INSTRUMENTS.

1,006,728.

Specification of Letters Patent.

Patented Oct. 24, 1911.

Application filed February 24, 1906, Serial No. 302,755. Renewed September 1, 1911. Serial No. 647,224.

To all whom it may concern:

Be it known that I, THOMAS DANQUARD, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a new and useful Regulator for Pneumatically-Operated Musical Instruments, of which the following is a specification.

The object of this invention is to provide a new and improved regulator for pneumatically operated musical instruments by which the force or action of the striking pneumatics can be regulated.

To this end, the invention consists in interposing in the wind-way or passage between the striking pneumatics and wind-chest, a valve arranged to close with the flow toward its seat and a regulator engaging the valve to limit its motion toward the seat but so as to leave the valve free so that the same can be moved away from its seat to permit a flow. The valve is held open by mechanical means.

The advantages of this construction will be hereinafter more fully pointed out.

The apparatus is illustrated in the accompanying drawing which shows enough of an inside piano player to illustrate the use and operation of my improvement.

Referring to said drawing and in detail, Figure 1 is a cross-sectional elevation partly in section. Fig. 2 is a sectional elevation. Fig. 3 is a front elevation partly in section, and Fig. 4 is a partial sectional elevation illustrating the construction of the spring used inside of the regulator.

Referring to the drawing and in detail, it will be noticed that I have shown my invention applied to a musical instrument known as an inside piano player and more particularly to the instrument shown, described and claimed in Letters-Patent granted to me August 15, 1905, No. 797,182, to which reference is made for a fuller explanation of the arrangement of the parts of the instrument, but the invention obviously is applicable to other kinds of pneumatically operated devices.

Referring to the drawing and in detail, 8 designates an air trunk which leads from the striking pneumatics. This trunk connects with an air passage 9 in the top of a wind-chest 13. These parts or passages are ar-

ranged substantially as shown in my previous patent and form a passage-way between the operating pneumatics and the wind-chest and suction bellows. The passage 9 extends into a chamber 10 which is partitioned off in the wind-chest, as indicated by dotted lines in Fig. 3. A block 11 is arranged on the front of the wind-chest as shown. A hole 14 is bored through the block and into the chamber 10 and a hole 15 is bored through the block 11 into the wind-chest 13. Secured on this block is the pneumatic regulator. This comprises a board 16 which is secured to the block 11, holes being bored through the board 16 to coincide with the holes 14 and 15. The hole in the board 16 which registers with the hole 15 forms a valve seat for a valve 17 which is pivoted to the board 16 so as to close with the flow. A board 18 is hinged to the board 16 and connected therewith by a flexible diaphragm 19 in a manner so as to form a pneumatic or bellows.

Arranged in the front of this pneumatic is a finger 20 which can engage the projecting end of the valve 17. A light spring or piece of wire 21 is used to force the valve 17 normally toward its seat. It will be noticed that by this engagement, the pneumatic regulator will act to limit the motion of the valve toward its seat but will leave the valve free to be moved away from its seat, independently of the regulator or the board 18.

A spring 22 is arranged in the regulator pneumatic so as to keep the same normally open. A hole is bored in the board 16 and projecting in through the same is a plunger 23, which plunger is fitted into packing 24 arranged in said hole so as to leave the regulating pneumatic air-tight. This plunger is arranged to engage the projecting end of the valve.

Secured in boxes or bearing pieces arranged on the board 16, is a wire rod 25 which has a downwardly extending arm 26 which engages between nuts 27 arranged on the plunger 23. The other end of the rod is bent to form an arm 28 engaging which is a link 29 which has nuts 30—30 arranged thereon, the other end of said link being connected to an arm 31 bent from a rod 32 journaled in suitable bearings and

having an operating piece or arm extending up in position to be manipulated by the operator.

The operation of this device is as follows:

5 When the operating piece 33 is moved so as to draw the plunger 23 out of the way of the valve, the regulating pneumatic, in connection with its spring, will allow the valve 17 to come up to its seat in such degree as to
10 form substantially a pressure regulator, whereby the flow through the passage 9 will be substantially constant or in other words, the valve will act so that there will only be a constant diminution of pressure in the
15 passage 9, irrespective of the variations of pressure in the wind-chest 13. In other words, the device will operate to maintain the desired soft-tone expression, irrespective of the number of striking pneumatics
20 which may be operated at any one time and substantially irrespective of the action of the suction bellows. If the operator desires to accentuate or emphasize any particular note or chord, the operating piece 33 is
25 moved so as to push the valve 17 away from its seat and thus to allow a free or unrestricted flow of air from the passage 9 out into the wind-chest. If accentuation for only one note or chord is desired, the operating
30 piece 33 is moved back to allow the pneumatic regulator to control the valve 17 after the chord or note has passed the tracker board. If continued loud playing is desired or if it is desired to put the instrument under the
35 direct action of the suction bellows, the valve 17 is held away from its seat and out of the control of the regulator. It also will be noted that an adjusting action can be obtained. For instance; if it is desired to
40 play the instrument with a certain degree of loudness between the two extremes, the operating piece 33 is set so that the valve 17 will be under the control of the regulator until a certain degree of exhaust is reached
45 in the wind-chest when the further collapse of the regulating pneumatic will not operate the valve which will be held from moving closer to its seat by the plunger. By manipulating the mechanism in this way, it is possible
50 to regulate the instrument so that the pneumatic regulator will operate to adjust the valve 17 automatically.

A further advantage of my structure resides in the fact that the operator in adjusting
55 the plunger to limit the closing movement of the valve or to positively open the same, does not have to work against the bellows regulator but only against the tendency of the valve to move toward its seat and
60 against the small wire spring 21, if that is used.

A spring 34 is usually arranged between the arm 28 and a fixed part so as to hold the plunger in to keep the valve from its seat
65 when the hand of the player is not on the

handle 33. Thus loud playing is obtained when the parts are in their normal position.

Having thus fully described my invention, what I claim and desire to secure by Letters-Patent is:—

1. A pneumatically operated instrument, having a wind-way or passage, a valve controlling the flow through the same, a pneumatic regulator for limiting the motion of the valve in one direction only, and mechanically operated means for positively holding the valve open.

2. In a pneumatically operated musical instrument, the combination of a wind-way or passage, a valve controlling the flow through the same, a pneumatic regulator for controlling the valve, and mechanically operating means for positively holding the valve open independent of the regulator.

3. In a pneumatically operated musical instrument, the combination of a wind-way or passage, a valve seat therein, a valve closing with the flow, a regulator engaging the valve to limit its motion toward the seat but so as to leave the valve free to move away from its seat independently of the regulator, and mechanically operating means for positively holding the valve open.

4. In a pneumatically operated musical instrument, the combination of a wind-way or passage, a valve seat therein, a valve closing with the flow, a regulator engaging the valve to limit its motion toward the seat, but so as to leave the valve free to move away from its seat, and mechanically operating means for positively holding the valve open independent of the regulator.

5. In a pneumatically operated musical instrument, the combination of a wind-way or passage, a valve controlling the flow through the same, a regulator comprising a spring and a movable wall, a finger on the wall arranged to engage the valve so as to limit its closing movement, and mechanically operating means for holding the valve open independently of the regulator.

6. In a pneumatically operated musical instrument, the combination of a wind-way or passage, a valve controlling the flow through the same, a bellows pneumatic for the valve, the engagement between the bellows pneumatic and the valve being arranged so that the bellows pneumatic will limit the closing motion of the valve, a plunger engaging the valve, and means for mechanically adjusting the plunger so that the extent of the closing movement of the valve can be regulated.

7. In a pneumatically operated musical instrument, the combination of a wind-way or passage, a valve controlling the flow, a pneumatic regulator operating said valve so as to limit its closing movement but so as not to interfere with its opening movement, a plunger extending into the bellows pneu-

matic and limiting the closing movement of the valve, and means for operating the plunger.

8. In a pneumatically operated musical instrument, the combination of a wind-way or passage, a valve controlling the flow through the same, a pneumatic regulator operating the valve so as to limit the closing movement thereof but so as not to interfere with the opening movement thereof, a spring tending normally to force the valve to close, and mechanically operating means for opening the valve.

9. In a pneumatically operated musical instrument, a wind-way or passage, a valve controlling the flow through the same, a pneumatic regulator for controlling the valve, mechanically operating means for positively holding the valve open, and a spring arranged in said means so that the valve will normally be held open.

10. A pneumatically operated instrument having a wind-way or passage, a valve for controlling the flow through the same, and movable means for limiting the motion of the valve in one direction only.

11. A pneumatically operated instrument having a wind-way or passage, a valve for controlling the flow through the same, and means movable by changes in air tension or pressure in said passage for limiting the motion of the valve in one direction, said valve being free to move in the opposite di-

rection irrespective of the position of said means.

12. The combination with a pneumatic or bellows having a passage in one member thereof, and a finger on the other member, of a valve for said passage the closing motion of which is limited by the position of said finger.

13. The combination with a pneumatic or bellows, comprising two relatively movable members having a passage, of a valve for said passage, and a finger fixed with respect to the other of said members and adapted to limit the motion of the valve toward its seat, the valve being free to move away from its seat irrespective of the position of said finger.

14. The combination with a pneumatic or bellows, comprising two relatively movable members, one of said members having a passage, of a valve for said passage which is free to open independently of the relative position of said members, and means operable by the opening and closing of said members for limiting the motion of the valve toward its seat.

In testimony whereof I have hereunto set my hand, in the presence of two subscribing witnesses.

THOMAS DANQUARD.

Witnesses:

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E. A. PHILLIPS.