

E. T. TURNEY.
EQUALIZER FOR PNEUMATIC ACTIONS.
APPLICATION FILED NOV. 27, 1907.

988,409.

Patented Apr. 4, 1911.

2 SHEETS—SHEET 1.

Fig. 1.

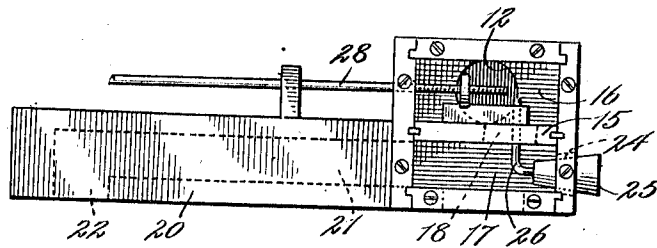


Fig. 2.

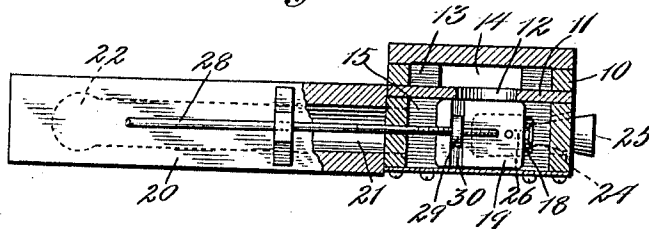


Fig. 3.

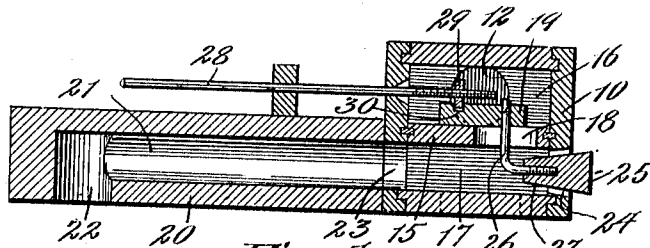
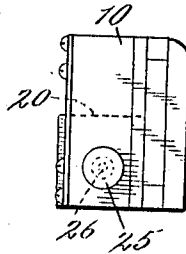


Fig. 4.



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H. D. Perry
J. P. Gochum Jr.

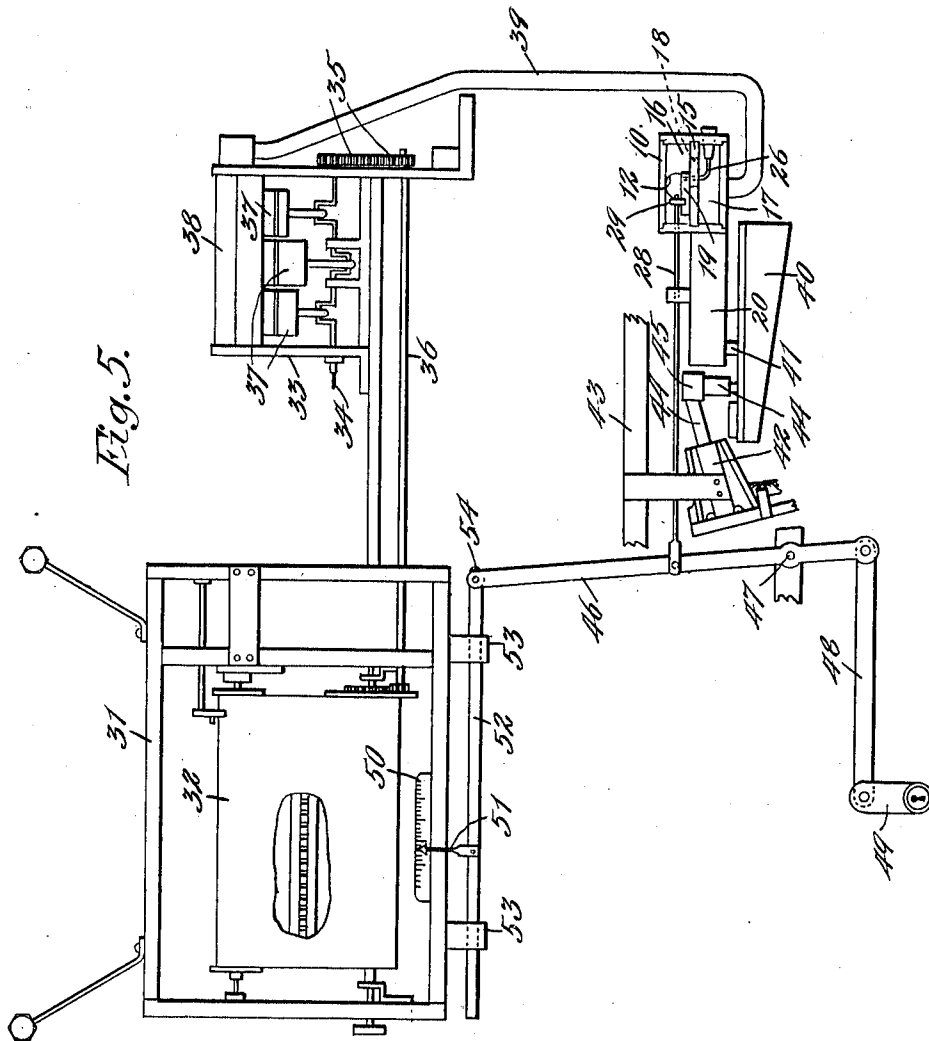
Inventor:
Eugene T. Turney
By [Signature] Attorney

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2 SHEETS—SHEET 2.



Witnesses:
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UNITED STATES PATENT OFFICE.

EUGENE T. TURNEY, OF ROCK ISLAND, ILLINOIS, ASSIGNOR TO ARTISTA PIANO PLAYER CO., OF ROCK ISLAND, ILLINOIS, A CORPORATION OF ILLINOIS.

EQUALIZER FOR PNEUMATIC ACTIONS.

988,409.

Specification of Letters Patent.

Patented Apr. 4, 1911.

Application filed November 27, 1907. Serial No. 404,025.

To all whom it may concern:

Be it known that I, EUGENE T. TURNEY, a citizen of the United States, residing at Rock Island, in the county of Rock Island and State of Illinois, have invented certain new and useful Improvements in Equalizers for Pneumatic Actions, of which the following is a specification.

In my application, Serial No. 331,740, filed in the United States Patent Office August 23, 1906, there is shown and described a pneumatic playing attachment for musical instruments employing a pneumatic motor comprising a plurality of pneumatics for shifting the record or music sheet, the motor being operated by exhausting the air from the pneumatics and the speed of the motor being regulated by controlling the exhaust or suction therefrom.

The present invention is particularly adapted for use in connection with an attachment of this character, and the primary object of the same is to provide improved means for equalizing the exhaust from the motor, whereby the speed thereof may be varied without interfering with the operation of the other parts of the mechanism.

A further object is to provide improved means for varying the exhaust or suction from the motor and for permitting outside air to be supplied to the exhaust mechanism to compensate for the amount cut off from the motor, and to cut off the outside air when the exhaust passage from the motor is fully opened.

A further object is to provide an improved device of this character which will be simple, cheap and durable in construction and effective and efficient in operation.

To the attainment of these ends and the accomplishment of other new and useful objects, as will appear, the invention consists in the features of novelty in the construction, combination and arrangement of the several parts hereinafter more fully described, and claimed, and shown in the accompanying drawings, illustrating an exemplification of the invention, and in which—

Figure 1 is a side elevation of an improved device of this character constructed in accordance with the principles of this invention. Fig. 2 is a top plan view partly

in section of Fig. 1. Fig. 3 is a longitudinal sectional view of Fig. 1. Fig. 4 is a right hand end elevation of Fig. 1. Fig. 5 is a diagrammatic view showing this improved equalizing mechanism connected to the motor.

Referring more particularly to the drawings, the numeral 10 designates generally a chamber which may be of any desired size and arranged within the chamber is a vertical partition or wall 11 for dividing the chamber into two compartments, one of which is located in advance of the other, and said wall or partition is provided with an aperture 12 preferably located adjacent the top of the chamber to form a communication between the two compartments. One of the compartments 13 is provided with an aperture or opening 14 opening through the bottom thereof and the other compartment is preferably somewhat larger than the compartment 13 and is provided with a horizontal partition 15 to divide the compartment into an upper and lower chamber 16, 17, the aperture or opening 12 in the partition or wall 11 being so located as to form a communication between the compartment 13 and the upper chamber 16. The partition 15 is provided with an elongated opening or slot 18 which forms communication between the upper and lower chambers 16 and 17. Arranged within the chamber 16 and resting upon the partition 15 is a slide valve 19, which is adapted to control the elongated slot or opening 18 and is of a length to completely close the slot or opening 18 and of a width to extend substantially across the chamber 16 so that the side walls thereof will form guides for the valve 19 when the latter is reciprocated.

The chamber 10 is provided with an extension 20 having a passage 21 extending longitudinally therein, one end of which opens through the wall of the extension and the other end has communication with the chamber 17 through an opening 23 in one wall thereof below the partition 15. The diametrically opposite wall of the chamber 17 is also provided with an aperture or opening 24 which opens to the outside air.

A valve or plug 25 is provided for controlling the opening 24 and is preferably of

a conical shape, so that the valve may be adjusted to vary the size of the opening 24. This valve or plug 25 is preferably supported by the valve 19 by means of a suitable rigid connection 26 to one end of which the valve or plug 25 may be adjustably secured in any suitable manner, such as by means of screw threads 27, and the other end of the connection extends through the elongated slot or opening 18 in the partition 15 and is secured to the valve 19 so that when the valve 19 is adjusted with relation to the slot or opening 18, the valve or plug 25 will be simultaneously adjusted. The valve 19 and the plug 25 are so disposed with relation to each other that when the valve 19 is moved to restrict or close the slot or opening 18, the plug 25 will be adjusted to open the aperture 24 and when the valve is moved to open the slot 18, the plug 25 will be adjusted to restrict the opening 24.

Any suitable means may be provided for adjusting the valve 19. A suitable and efficient means for accomplishing this purpose comprises a rod or bar 28, which passes through one wall of the chamber 16 and is connected to the valve 19 in any desired manner, such as by means of a nut 29, which is adjustably secured to the end of the rod or bar 28 and which rests in a suitable groove 30 in the face of the valve 19.

Referring to the diagrammatic illustration of Fig. 5 the numeral 31 designates generally the music sheet or record supporting frame for holding the record 32, and 33 designates the motor for operating the record through the medium of the shaft 34, gearing 35 and shaft 36, in the manner as set forth in the above referred to application. The pneumatics 37 of the motor are supported by and have communication with the suction chamber or chest 38 as set forth in the said application, and leading from and having communication with the suction chest 38 is a flexible member or tube 39, the free end of which has communication with the compartment 13 through the opening 14 of the equalizer, which latter may be supported in any desired or suitable manner. A bellows or pneumatic 40 has communication with the equalizer through the medium of a tubular connection 41, which has communication with the passage 21 through the opening 22 thereof. A double bellows or pneumatic 42 is supported adjacent the pneumatic 40 by means of any suitable portion 43 of the frame work of the instrument and preferably has connection with the bellows or pneumatic 40 through the medium of the tubular members 44 and intermediate chamber 45. This double bellows or pneumatic may be operated in any desired or suitable manner, preferably in the manner as set forth in the above referred to application and

which it is not necessary to illustrate, suffice it to say that when the bellows 42 is operated the air will be sucked from the bellows or pneumatic 40 which latter will exhaust the chest 38 through the equalizer.

Pivotally supported within the casing of the instrument is an arm or lever 46 which is preferably pivoted intermediate its ends as at 47 to any suitable support and connected at one end thereof by means of an intermediate link 48, is a crank or arm 49, which is located at the front of the machine and is adapted to be oscillated in any desired or suitable manner, preferably by means of a suitable key, and connected to the arm or lever 46, preferably on the other side of the pivot thereof, is one extremity of the bar or rod 28 which oscillates the valve 19 so that when the crank 49 is moved, the valve 19 will be adjusted. If desired, an indicator for designating the position of the valve 19 with respect to the elongated slot or opening 18 may be employed. A suitable and efficient form of indicator comprises a gage 50 which may be supported in view of the operator by any portion of the mechanism preferably the record holding frame 31 and a suitable index or pointer 51 may be provided which is adapted to move over the gage 50. This pointer may be supported by a suitable bar or rod 52 movable in suitable supporting guides 53 and one extremity thereof may be connected to the free extremity of the arm or lever 46 as at 54, so that when the crank 49 is moved to adjust the valve 19, the arm or lever 46 will simultaneously move the pointer or index 51 over the gage 50.

From the above description, it is thought that the operation of this improved equalizer will be fully understood but briefly stated it is as follows: Assuming the valve to be in a position to permit the slot 18 to be wide open, the opening 24 in the chamber 17 will be closed, the entire exhaust through the equalizer will be from the chest 38 which will permit the motor to operate at full speed. When it is desired to vary the speed of the motor, the valve 19 is adjusted to restrict the slot or opening 18 and as the valve is moved to close the slot the plug or valve 25 will be moved to open the aperture 24 thereby permitting an amount of air to enter the equalizer through the aperture 24 equal to the amount of air which is cut off from the suction chest 38, thereby permitting the requisite and the necessary amount of air to be supplied to the suction mechanism to permit the same to act uniformly, regardless of the amount shut off from the motor. When the slot or opening 18 is wide open, the aperture 24 will be closed and the requisite amount of air will be supplied to the exhaust mechanism directly from the chest 38 of the motor.

In order that the invention might be fully understood by those skilled in the art, the details of the foregoing embodiment thereof have been thus specifically described, but

5 What I claim as new and desire to secure by Letters Patent is—

1. An equalizer for pneumatic motors comprising a suction chamber having a plurality of compartments, one of which is provided with an inlet and another with an outlet opening, said compartments having a communicating passage, means for controlling said passage, one of the compartments being also provided with an opening to the outside air, means for controlling the last said opening and means common to both of said controlling means for operating the latter.

2. An equalizer for pneumatic motors, comprising a suction chamber having a plurality of compartments, one of which is provided with an inlet and the other with an outlet opening, said compartments having a communicating passage, means for controlling said passage, one of the compartments being also provided with an opening to the outside air, means for controlling the last said opening, and means for simultaneously operating both of said controlling means.

3. An equalizer for pneumatic motors comprising a suction chamber having a plurality of compartments, one of which is provided with an inlet and the other with an outlet opening, said compartments having a communicating passage, means for controlling said passage, one of the compartments being also provided with an opening to the outside air, means for controlling the last said opening, and a single means for simultaneously adjusting both of said controlling means.

4. An equalizer for pneumatic motors comprising a suction chamber having a plurality of compartments, one of which is provided with an inlet and the other with an outlet opening, said compartments having a communicating passage, means for controlling said passage, one of the compartments being also provided with an opening to the outside air, means for controlling the last said opening, a connection between the said controlling means, and means for adjusting one of the controlling means whereby the other controlling means will be simultaneously and correspondingly adjusted.

5. An equalizer for pneumatic motors comprising a suction chamber having a plurality of compartments, one of which is provided with an inlet opening and the other with an outlet opening, said compartments having a communicating passage, a valve for controlling the passage, one of the compartments being also provided with an opening to the outside air, a valve supported by

the first said valve for controlling the last said opening and means for adjusting one of the valves to correspondingly adjust the other valve.

6. An equalizer for pneumatic motors comprising a suction chamber having a plurality of compartments, one of which is provided with an inlet and the other with an outlet opening, said compartments having a communicating passage, a valve for controlling the passage, one of the compartments being also provided with an opening to the outside air, means for operating the valve, and means operatively related to the valve for controlling the last said opening whereby the said opening may be varied proportionately with the size of the said communicating passage between the chamber.

7. An equalizer for pneumatic motors comprising a suction chamber having a plurality of compartments, one of which is provided with an inlet and the other with an outlet opening, said compartments having a communicating passage, a valve for controlling the passage, one of the compartments being also provided with an opening to the outside air, means for operating the valve, a tapering plug for controlling the last said opening, and an operative connection between the valve and plug whereby the plug will be simultaneously adjusted with the valve to vary the size of the last said opening proportionately with the size of the said communicating passage between the chambers.

8. An equalizer for pneumatic motors comprising a suction chamber having a plurality of compartments, one of which is provided with an inlet and the other with an outlet opening, said compartments having a communicating opening in the wall thereof, a valve for varying the said opening, one of the compartments being also provided with an opening to the outside air, a tapering plug for controlling the last said opening, and a connection between the valve and plug extending through the communicating opening whereby the plug will be simultaneously adjusted with the valve to vary the size of the last said opening proportionately to the varying size of the said communicating passage.

9. The combination of an equalizer for pneumatic motors comprising a suction chamber having a plurality of compartments, one of which is provided with an inlet opening and the other with an outlet opening, said compartments having a communicating opening, a valve for controlling the opening, means for adjusting the valve, one of the compartments being also provided with an opening to the outside air, means operatively related to the valve for controlling the last said opening to vary the

opening proportionately to the size of the communicating passage when the valve is adjusted, means for adjusting the valve, and an index operatively related to the valve.

- 5 10. The combination of an equalizer for pneumatic motors comprising a suction chamber having a plurality of compartments, one of which is provided with an inlet opening and the other with an outlet
10 opening, said compartments having a communicating opening, a valve for controlling the opening, means for adjusting the valve, one of the compartments being also provided with an opening to the outside air,
15 means operatively related to the valve for controlling the last said opening, to vary the opening proportionately to the size of the communicating passage when the valve is adjusted, means for adjusting the valve, a
20 gage, and an index operatively related to the valve operating means and movable over the gage.
11. An equalizer for pneumatic motors comprising a casing divided into two cham-
25 bers, one of which is provided with an inlet opening, the other chamber being divided into two compartments having a communicating opening in the wall thereof, one of the compartments having communication
30 with the first said chamber, and the other compartment being provided with an outlet opening and an opening to the outside air, a valve for controlling the last said opening, a valve for controlling the communicating
35 opening between the said compartments, means for operating the last said valve to vary the said opening, and means whereby the operation of said valve will simultaneously operate the first said valve to vary the
40 respective opening proportionately with the size of the opening between the said compartments.
12. An equalizer for pneumatic motors comprising a casing divided into two cham-
45 bers, one of which is provided with an inlet opening, the other chamber being divided into two compartments having a communicating opening in the wall thereof, one of the compartments having communication
50 with the first said chamber, and the other compartment being provided with an outlet opening and an opening to the outside air, a valve for controlling the last said opening, a valve for controlling the communicating
55 opening between the said compartments, means for adjusting one of the valves to vary its respective opening, and a connec-

tion between the valves whereby the adjustment of one of the valves to vary the size of the respective opening will simultaneously adjust the other valve to vary its respective opening proportionately with the size of the other opening. 60

13. The combination with a pneumatic motor and means for exhausting the air from
65 said motor, of an equalizer comprising a suction chamber having a plurality of compartments, one of said compartments being connected to said motor and another of said compartments being connected to said ex-
70 hausting means, these compartments being provided with a communicating passage and one of said compartments being provided with an opening into the outside air, means for controlling said passage, and means for
75 controlling said opening.

14. The combination with a pneumatic motor and means for exhausting the air from said motor, of an equalizer comprising
80 a suction chamber having a plurality of compartments, one of said compartments being connected to said motor and another of said compartments being connected to said exhausting means, these compartments being
85 provided with a communicating passage and one of said compartments being provided with an opening into the outside air, means for controlling said passage, and means for controlling said opening, both of the last
90 said means being manually operable.

15. The combination with a pneumatic motor and means for exhausting the air from said motor, of an equalizer comprising
95 a suction chamber having a plurality of compartments, one of said compartments being connected to said motor and another of said compartments being connected to said exhausting means, these compartments being
100 provided with a communicating passage and one of said compartments being provided with an opening into the outside air, means for controlling said passage, and means for controlling said opening, both of the last said means being manually operable
105 and connected together.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 23rd day of November, A. D. 1907.

EUGENE T. TURNEY.

Witnesses:

C. A. LÜTT,
A. D. WALKER.