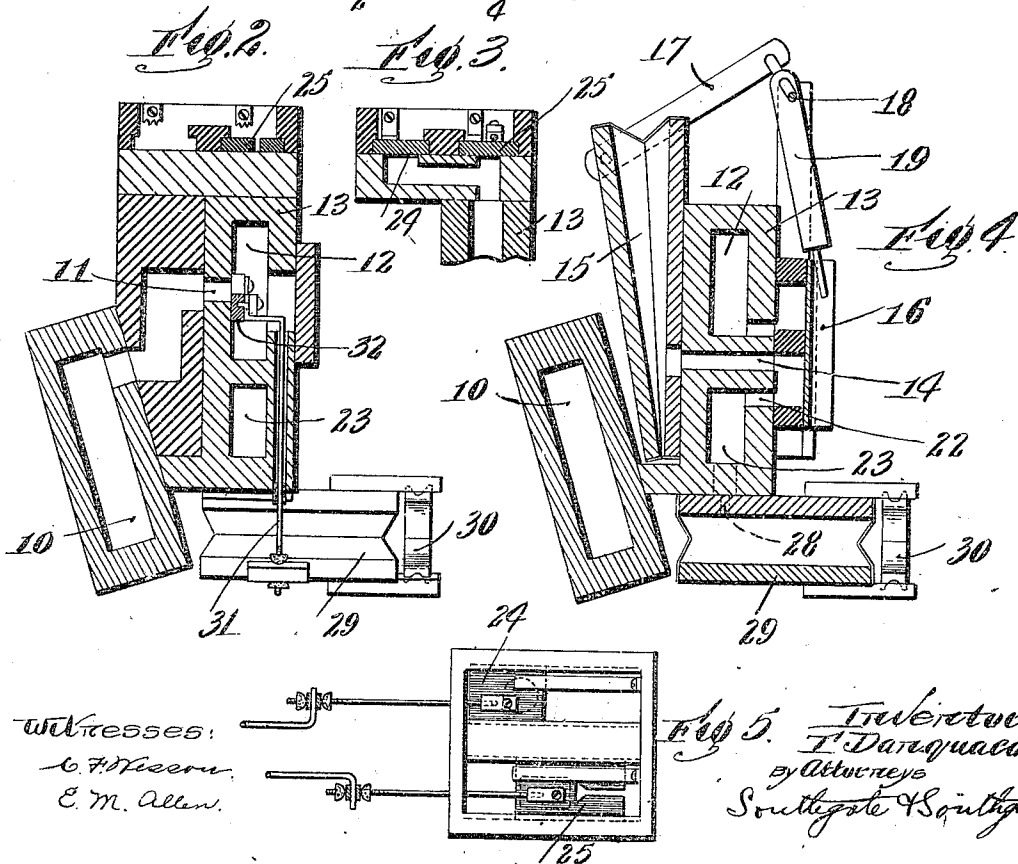
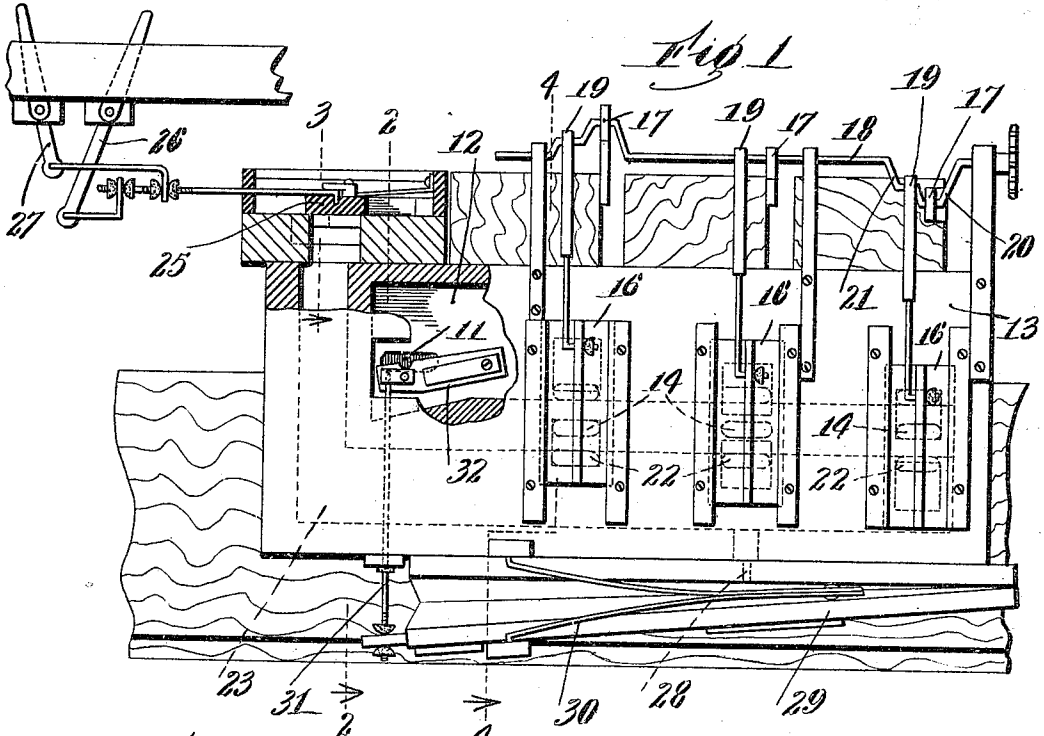


T. DANQUARD.
PNEUMATIC MOTOR.
APPLICATION FILED JULY 14, 1906.

957,751.

Patented May 10, 1910.



UNITED STATES PATENT OFFICE.

THOMAS DANQUARD, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO
AUTO PNEUMATIC ACTION CO., OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

PNEUMATIC MOTOR.

957,751.

Specification of Letters Patent.

Patented May 10, 1910.

Application filed July 14, 1906. Serial No. 326,163.

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 Pneumatic Motor, of which the following is a specification.

My invention relates to pneumatic motors and is especially adapted for use in that class thereof which is ordinarily employed to propel the music sheet in ordinary mechanical pianos or playing attachments therefor and to operate other parts of the same.

The principal objects of the invention are to provide simple, efficient and durable means for governing the speed of the motor and music sheet at the will of the performer so as to secure any desired speed and to secure these results with the location of the several parts in a convenient position with respect to each other so that the entire structure shall be compact. For these purposes the motor is located between the bellows and the governor, and the latter is connected with a passage to the tempo and re-roll valves.

Further features and advantages of the invention will appear below.

Reference is to be had to the accompanying drawing in which,

Figure 1 is an elevation partly in section of a structure embodying the principles of my invention. Fig. 2 is a sectional view on a line 2—2 thereof. Fig. 3 is a sectional view on the line 3—3. Fig. 4 is a sectional view on the line 4—4, and Fig. 5 is a plan of the re-roll and tempo valves.

In the usual, or any desired way, the bellows is connected through a chest 10 and passage 11 with the main wind passage 12 in the body 13 of the motor. The latter passage communicates with a plurality of passages 14 which in turn, communicate with a corresponding series of motor pneumatics 15. The communication between the passages 12 and 14 is controlled in each case by a slide or other valve 16. The operation of this valve is in each case controlled by the operation of the corresponding motor pneumatic and the connections between them are in the present instance, illustrated as comprising a link 17 connected to the shaft 18 and a link 19 from the shaft to the valve, the shaft being provided with two off-sets 20

and 21 of different radius from the center of the shaft, the off-set 20 connected with the link 17 being the greater. In the present instance, three of these pneumatics and valves are shown and in addition to the two passages 12 and 14 which each valve is ordinarily designed to control, a third opening 22 is provided adjacent to the passage 14. This passage communicates with a passage 23 which leads to the open air through the re-roll valve 24 and the tempo valve 25. These two valves may be operated in the usual or desired manner as for example, by means of levers 26 and 27, respectively. Communicating also with the passage 23 through a restricted opening 28, is a governor pneumatic 29. This pneumatic is provided with a spring 30 if desired, and it operates a rod 31 connected through a passage in the motor casing with the valve 32 which controls the passage 11 and governs the speed of the instrument. The governor pneumatic being in constant communication with the passage 23 is controlled by the tension therein and consequently when the motor is operating too fast, the valve 32 will be moved inwardly so as partially to close the passage 11 and restrict the flow of air through the motor, thus retarding the motion thereof.

The passage which the re-roll valve covers has a greater area than the passage 11 and consequently when a high speed is desired as for re-rolling the music sheet, this valve is opened and then the position of the valve 32 is immaterial because sufficient air can flow through the passage from the re-roll valve to permit the motor to operate at a high speed.

In operation, the tempo valve is first opened in the usual way to permit the passage of air to the motor and as the three valves 16 are set at different angles on the shaft 18, there will at all times be a communication between the passage 23 and the passage 14 through at least, one of the valves which will enable the motor to be started. Some one of the valves also always permits flow of air between the passages 12 and 14 in the usual manner.

The way in which the flow of air is controlled by the governor valve 32 has been described. It has been found in practice that the restriction of the orifice 28 improves

the working and gives an even and steady motion to the motor, but the size of this orifice is of course regulated by the size of the governor pneumatic itself. It is to be observed that these actions are secured by a construction in which the motor pneumatic is located in a convenient place where the flow of air does not have to pass directly through it and without a separate wind-way between the motor and the bellows, the governor pneumatic not being directly connected with the main bellows.

While I have illustrated and described a particular form in which I at present prefer to embody my invention, I am aware that many modifications may be made therein without departing from the scope of the invention as expressed in the claims. Therefore, I do not wish to be limited to the exact construction shown and described, but

What I do claim and desire to secure by Letters-Patent is:—

1. In a music playing device, the combination of a casing having a main wind passage, a series of passages for communication with motor pneumatics, and a passage connected with the atmospheric air, with a series of valves, each covering one of the passages for communication with a motor pneumatic and a passage connected with the atmospheric air, whereby said valves can connect either the main wind passage or the passage to the atmospheric air with the corresponding motor pneumatic.

2. In a music playing device, the combination of a motor having a main wind passage, a series of passages for communication with motor pneumatics, and a passage connected with the atmospheric air, with a series of valves, each located outside the motor and in the air, and each covering one of the passages for communication with a motor pneumatic and a passage connected with the atmospheric air, whereby said valves can connect either the main wind passage or the passage to the atmospheric air with the corresponding motor pneumatic.

3. In a music playing device, the combination of a main casing having a main wind passage, a motor pneumatic arranged outside the casing, said casing having a passage communicating with the motor pneumatic, a passage communicating with the atmospheric air, and a passage communicating with the main wind passage, said three passages opening on the outside of the main motor casing, and a valve controlled by the motor pneumatic adapted to cover the ends of said three passages.

4. In a music playing device, the combination of a motor pneumatic, a casing having a main wind passage, a passage communicating with the motor pneumatic, a passage communicating with the atmospheric air, and a passage communicating

with the main wind passage, and a valve controlled by the motor pneumatic adapted to cover the ends of said three passages.

5. In a music playing device, the combination of a casing having a main wind passage, a series of passages for communication with motor pneumatics, and a passage in the walls of the casing connected with the atmospheric air, said series of passages being located between the other passages, with a series of valves, each having means for connecting either the main wind passage or the passage to the atmospheric air with the corresponding motor pneumatic.

6. In a music playing device, the combination of a motor having a main wind passage, a series of passages for communication with motor pneumatics, a passage connected with the atmospheric air said series of passages being located between the other two passages, with a series of valves each having means for connecting either the main wind passage or the passage to the atmospheric air with the corresponding motor pneumatic, a governor pneumatic communicating with said passage to the atmospheric air, and a tempo valve for controlling said last named passage.

7. In a music playing device, the combination of a motor casing having through one wall thereof a main wind passage, a passage to the atmospheric air, and a series of passages located between the main wind passage and an atmospheric air passage, each communicating with the motor pneumatic, with a series of valves each adapted to be moved into two positions in each of which it permits communication between one of said series of passages and one of the other two passages through the motor casing, a tempo valve and a re-roll valve for controlling the inlet to said atmospheric air passage, the inlet controlled by the re-roll valve being of greater area than the smallest part of the main wind passage of the motor, and a governor pneumatic connected with the atmospheric air passage of the motor casing by a restricted orifice, said governor pneumatic having means for controlling the effective area of the main wind passage when the re-roll valve is closed, whereby the air enters at the tempo or re-roll valve, passes along the atmospheric air passage, operates the governor pneumatic, and expands the motor pneumatics, and is then drawn therefrom into the main wind passage.

8. In a music playing device, the combination of a motor casing having a main wind passage, and a passage to the atmospheric air, a series of motor pneumatics, a crank shaft having two sets of offsets or different lengths from the axis of the shaft, each of the offsets having a greater length being connected with one of the motor pneumatics, a link connected with each of the other off-

sets, a valve connected to each of the links, said motor casing having sets of passages, constituting respectively a passage to the main wind passage, a passage to the atmospheric air passage, and a passage to a motor pneumatic between the other passages, all of said passages being adapted to be covered by said valves.

9. In a music playing device, the combination of a motor casing having through one wall thereof a main wind passage, a passage to the atmospheric air, and a series of passages located between the main wind passage and the atmospheric air passage, each communicating with a motor pneumatic, with a series of valves each adapted to be moved into two positions in each of which it permits communication between one of said series of passages and one of the other two passages through the motor

casing, a tempo valve for controlling the inlet to said atmospheric air passage, and a governor pneumatic connected with the atmospheric air passage of the motor casing by a restricted orifice, said governor pneumatic having means for controlling the effective area of the main wind passage, whereby the air enters at the tempo valve, passes along the atmospheric air passage, operates the governor pneumatic, and expands the motor pneumatics, and is then drawn therefrom into the main wind passage.

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

THOMAS DANQUARD. [L. S.]

Witnesses:

CHAS. KOHLER,
WM. J. KEELEY.