

No. 728,462.

PATENTED MAY 19, 1903.

• F. W. HEDGELAND.
GOVERNOR FOR WIND MOTORS.
APPLICATION FILED OCT. 11, 1902.

NO MODEL.

Fig. 1

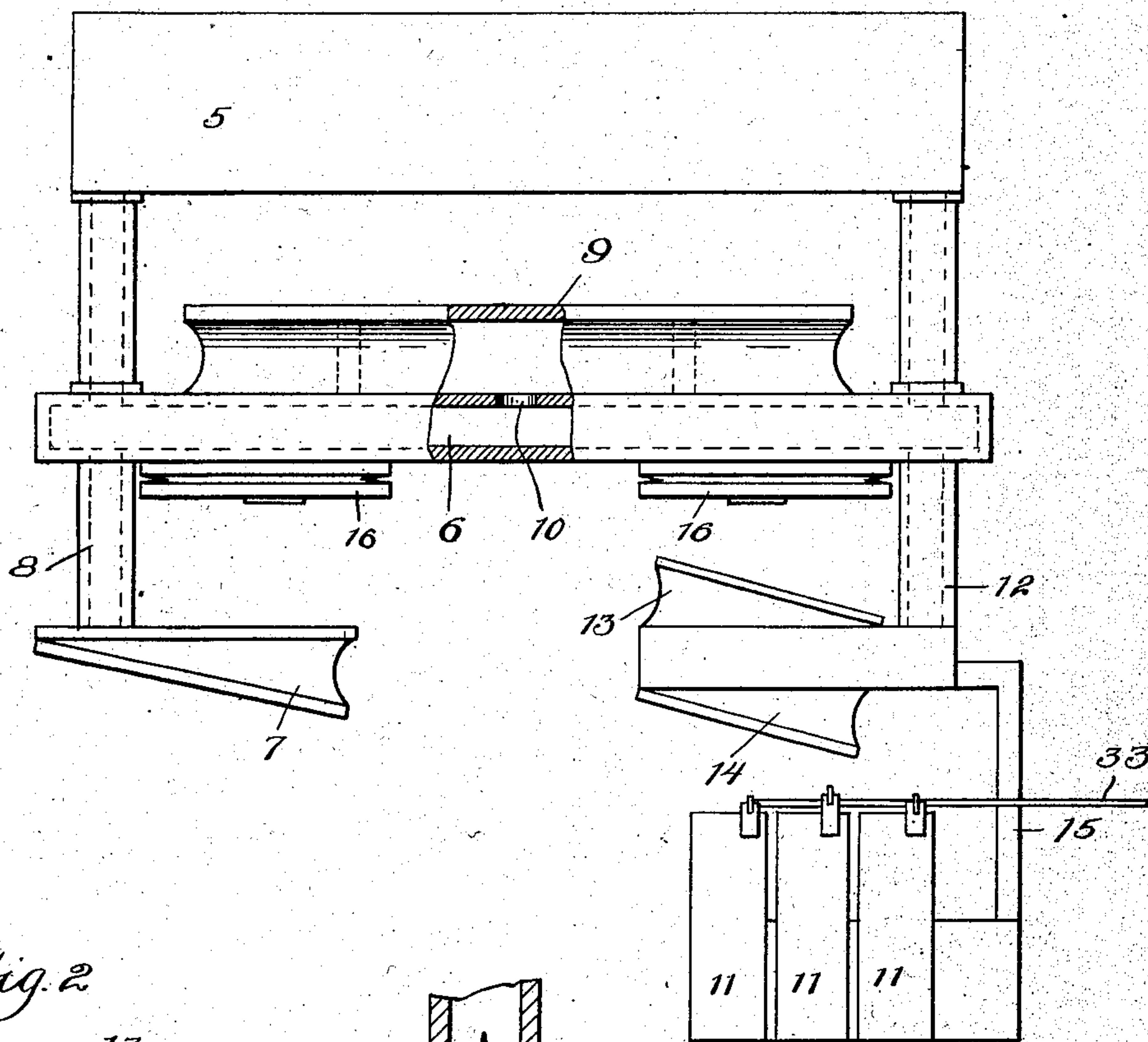
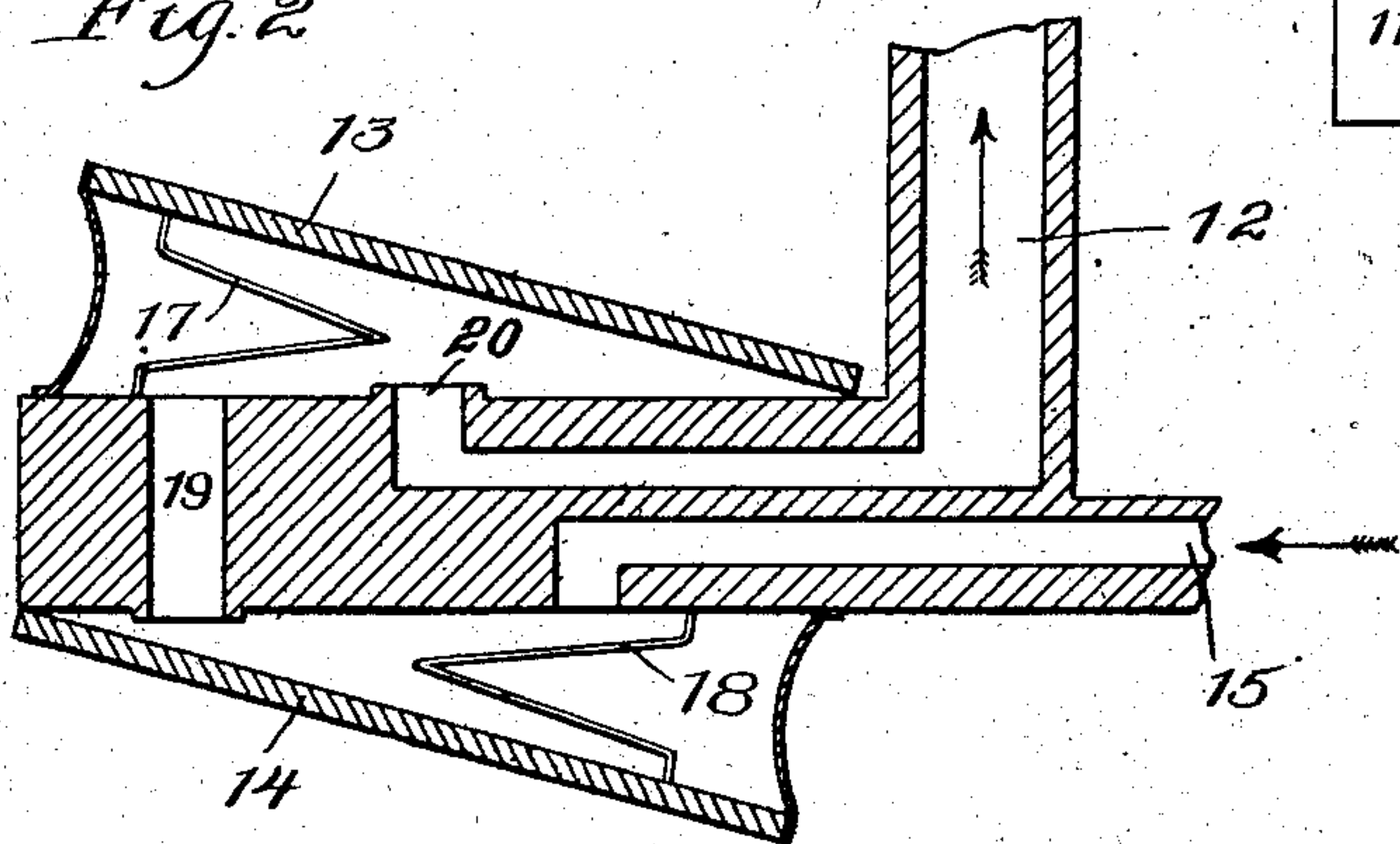


Fig. 2



Witnesses:

Wm. Geiger
A. W. Munday,

Inventor:

Frederick W. Hedgeland.

By Munday, Ewart & Hedgeland.

Attorneys

UNITED STATES PATENT OFFICE.

FREDERICK W. HEDGELAND, OF CHICAGO, ILLINOIS.

GOVERNOR FOR WIND-MOTORS.

SPECIFICATION forming part of Letters Patent No. 728,462, dated May 19, 1903.

Application filed October 11, 1902. Serial No. 126,878. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK W. HEDGELAND, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Governors for Wind-Motors, of which the following is a specification.

The object of this invention is to furnish an absolutely steady wind-supply to the motor which operates the music-sheet in piano-players and self-playing instruments, so that there will be no variation in the speed of the music-sheet when variations in the air-pressure occur, even when the variations in the pressure are sudden and violent. With the prevailing types of devices for regulating the wind-supply of the motors a sudden forcing of the wind for the production of forte effects will cause the pulling down of the movable wall of the regulating chamber or bellows, so as to partially shut off for the time being the wind-supply of the motor, and this of course disturbs the even movement of the music-sheet. To obviate this evil more perfectly than it has been done heretofore, I employ between the wind-chest and the motor two governing or regulating air-chambers, one set for heavier pressure than the other. Of these chambers the one set for the heavier pressure communicates with the power-creating bellows, while the lighter-tension chamber communicates with the motor, and the two chambers also communicate with each other. With this construction the heavier-tension chamber is first affected by the sudden impulses from the bellows, and if they are heavy it deflates, and thereby absorbs the increased power, and in this result the lighter-tension chamber comes to the aid of the heavier-tension chamber, so that the force of the suction at the motor will remain normal notwithstanding the sudden impulse from the power-creating bellows. Should the increased suction be light and insufficient to overcome the tension of the first or heavier-tension chamber, it will be absorbed by the second or light-tension chamber and the motor remain unaffected.

The nature of my invention is fully disclosed and will be understood from the subjoined description and the accompanying drawings, in which latter—

Figure 1 is an elevation of that portion of an instrument to which my invention relates. Fig. 2 is a longitudinal vertical section of the regulating-chambers.

In said drawings, 5 represents the pneumatic or action-box of the player or instrument, and 6 is a wind-chest communicating with the heavy-pressure reservoir 7 by the trunk 8 with the light-pressure reservoir 9 by the opening 10 and with the first or heavy-tension chamber of the governor by the trunk 12. The governing-chambers are shown at 13 and 14, and the latter communicates with the motor, which is composed of the power-pneumatics 11, by the passage 15. The bellows whereby the suction in the wind-chest is caused are shown at 16 16, and the same wind-chest may be connected to the action-box 5 of the instrument or player by the trunks (indicated in dotted lines) extending upward from the ends of the chest.

The governing-chambers are both collapsible and are normally distended by springs 17 and 18, the spring 17 in chamber 13 being strong as compared with spring 18, so that it will resist the collapse of chamber 13, except when the suction is strong, and the spring 18 in chamber 14 being comparatively light and adapted to yield under light pressures. The passage 19 establishes communication between the two chambers. The port 20 at the entrance of trunk 12 to chamber 13 is adapted to be more or less nearly closed by the movable side of that chamber when it becomes wholly deflated. When this occurs, as it does sometimes in cases when the spasmodic impulse is very strong, it proportionately diminishes communication between the suction-creating bellows and the motor, but usually for short periods of time.

In the use of the invention the chamber 13 deflates and governs the pulsations whenever the suction is strong enough to deflate the reservoir 7, and the chamber 14 deflates with every increase in the suction-power, and it governs the pulsations without assistance from chamber 13 when the suction is light and the reservoir 9 is partially deflated. The exhaust-current is first met by the chamber 13, which, being set to the heavier tension, takes up and absorbs such of the sudden or spasmodic pulsations as are strong enough to

overcome its tension. If the pulsations are too light to overcome the tension of chamber 13, then chamber 14 absorbs them and chamber 13 remains unaffected. In practice chamber 14 deflates more or less with every variation in the blast, being sensitive and therefore quicker to act than chamber 13, and when it deflates its movable side partially closes the mouth of passage 19.

- 10 The two chambers combined in the manner set forth form a compound governor or regulator well adapted to take care of both the light and the heavy spasmodic impulses employed to produce forte effects and to prevent disturbances or unevenness in the movement of the motor at such times.

It will be noticed that the governor employs no "valve," so called, the movable walls of chambers 13 and 14 being the only devices in the apparatus which can be said to serve a purpose having any analogy to that of a valve.

It will be understood without further description that the shaft 33 is suitably connected to the music-rolls of the instrument or player in such manner that it may actuate the same, and thereby cause the movement of the music-sheet.

I claim—

- 30 1. The combination with the wind-motor for actuating the music-sheet, and the source of the exhaust, of means governing the motor consisting of two collapsible communicating air-chambers set to different tensions, substantially as specified.

2. The combination with the wind-motor for actuating the music-sheet, of means for producing the exhaust, and means for governing the motor consisting of two collapsible and communicating air-chambers of unequal tension, the chamber with the heavier tension being connected to the exhaust source and the chamber of the lighter tension being connected to the motor, substantially as specified.

3. The combination with the wind-motor for actuating the music-sheet, of means for producing the exhaust, and means for governing the motor consisting of two collapsible and communicating air-chambers of unequal tension adapted to control the passage between the exhaust source and the motor, and provided with means for shutting off the motor from the exhaust source, substantially as specified.

4. The combination with the wind-motor for actuating the music-sheet, of means for producing the exhaust, and means for governing the motor consisting of two collapsible and communicating air-chambers of unequal tension adapted to control the movement of the air from the motor to the source of the exhaust, the movable side of one of the chambers being adapted to shut off the communicating passage between the chambers, substantially as specified.

5. The combination with the wind-motor

for actuating the music-sheet and the exhaust-producing means, of means for controlling the motor consisting of two collapsible air-chambers through which the air from the motor moves to the exhaust-producing means, substantially as specified.

6. The combination with the wind-motor for actuating the music-sheet and the exhaust-producing means, of means for controlling the motor consisting of two collapsible air-chambers through which the air from the motor moves to the exhaust-producing means, one of said chambers feeding the air to the other, substantially as specified.

7. The combination with the wind-motor for actuating the music-sheet and the exhaust-producing means, of means for controlling the motor consisting of two collapsible air-chambers through which the air from the motor moves to the exhaust-producing means, one of said chambers receiving the impulses occurring in the suction-current before the other receives them, substantially as specified.

8. The combination with the wind-motor for actuating the music-sheet and the exhaust-producing means, of means for controlling the motor consisting of two collapsible air-chambers through which the air from the motor moves to the exhaust-producing means, one of said chambers being adapted to absorb heavy impulses occurring in the suction-current, and the other being adapted to absorb the lighter impulses therein, substantially as specified.

9. The combination with the wind-motor for actuating the music-sheet and the exhaust-producing means, of means for controlling the motor consisting of two collapsible air-chambers through which the air from the motor moves to the exhaust-producing means, one of said chambers receiving the impulses occurring in the suction-current before the other receives them, and being adapted to deflate only when the impulses are strong, and the other chamber being adapted to deflate when the impulses are light, substantially as specified.

10. The combination with the wind-motor for actuating the music-sheet and the exhaust-producing means, of means for controlling the motor consisting of two collapsible air-chambers through which the air from the motor moves to the exhaust-producing means, one of said chambers receiving the impulses occurring in the suction-current before the other receives them, and also acting to shut off the other chamber from the suction-producing means, substantially as specified.

11. The combination with the wind-motor for actuating the music-sheet and the exhaust-producing means, of means for controlling the motor consisting of two collapsible air-chambers through which the air from the motor moves to the exhaust-producing means, one of said chambers receiving the impulses occurring in the suction-current before the

other chamber receives them and deflating only when the impulses are strong, and also acting to shut off the other chamber from the suction-producing means, and said other
5 chamber deflating when the impulses are light, substantially as specified.

12. The combination with the source of motive power and the motor for operating the music-sheet, of a valveless governor located
10 between said source and motor, and having a collapsible chamber the movable wall whereof controls the movement of the wind from the motor to the source, substantially as specified.

13. The combination with the source of motive power and the motor for operating the music-sheet, of a governor located between

said source and said motor, and having a collapsible chamber the movable wall whereof controls the movement of the wind from the
20 motor to the source without the aid of a valve, substantially as specified.

14. The combination with the source of motive power and the motor for operating the music-sheet, of a valveless governor located
25 between said source and motor and having two collapsible chambers of unequal tension, the movable walls of said chambers controlling the movement of the wind from the motor to the source, substantially as specified. 30

FREDERICK W. HEDGELAND.

Witnesses:

H. M. MUNDAY,
EDW. S. EVARTS.