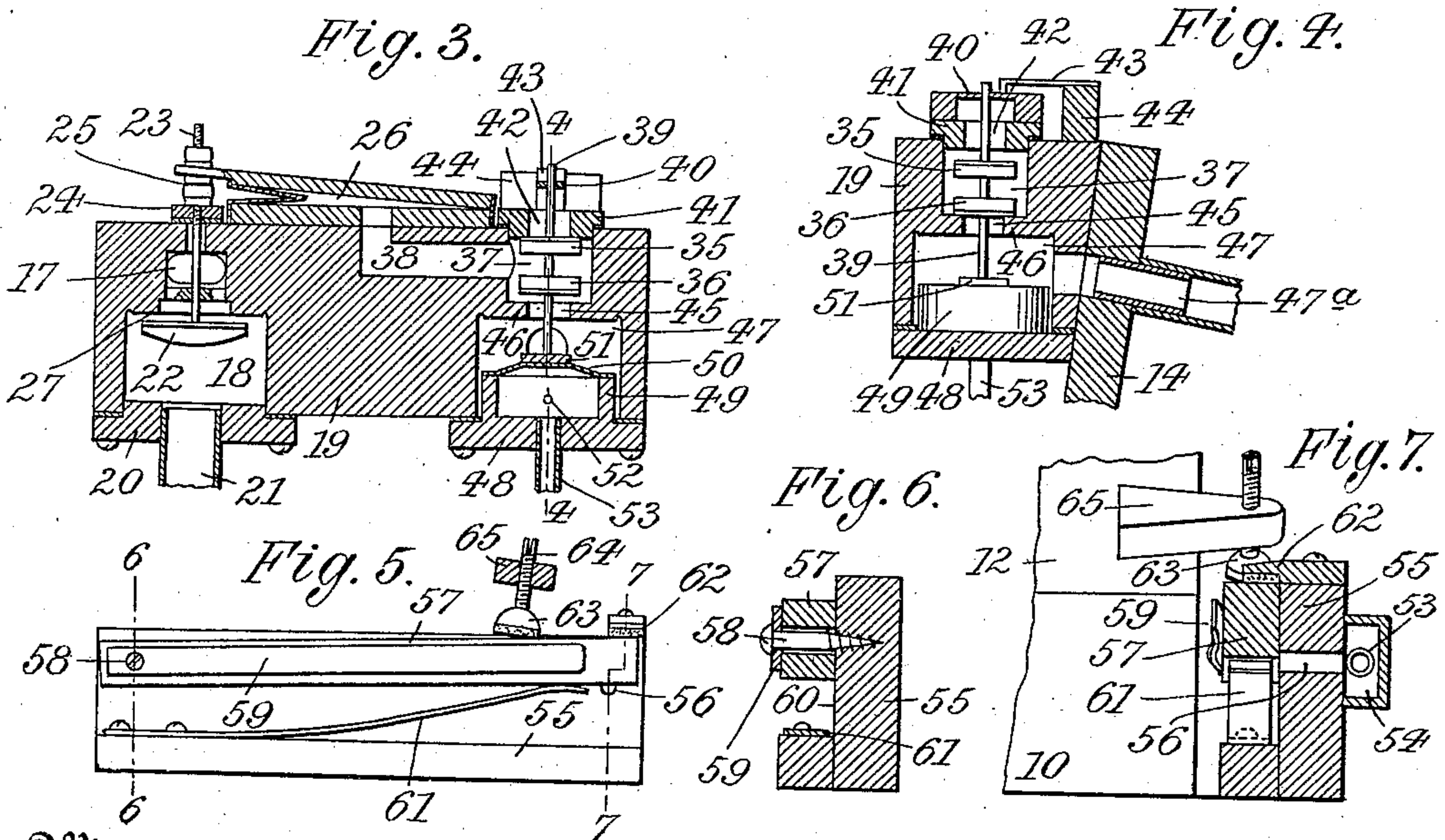
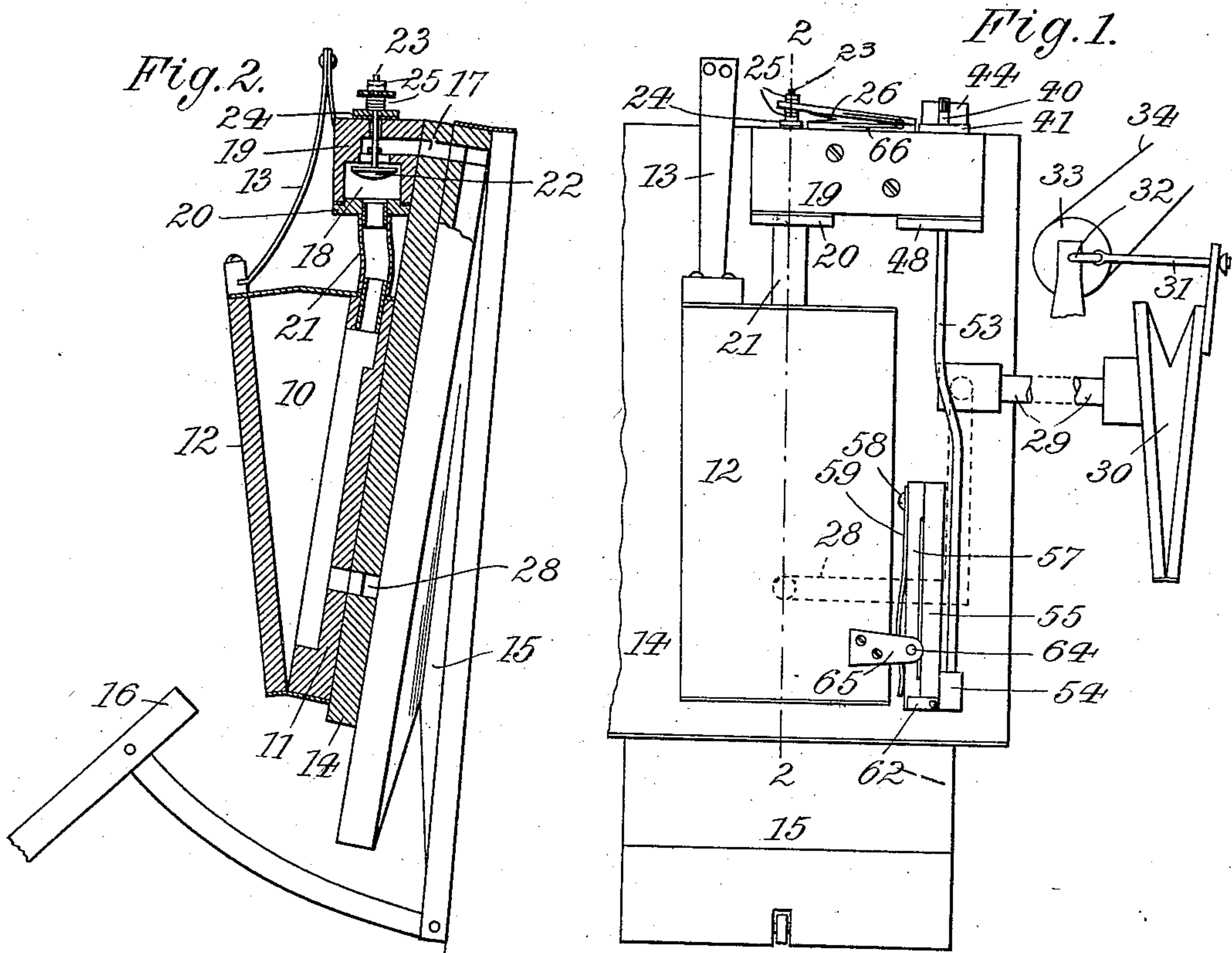


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AUTOMATIC SPEED REGULATOR FOR PNEUMATIC MOTORS.
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929,264.

Patented July 27, 1909.



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UNITED STATES PATENT OFFICE.

JOSEPH WIESER, OF ST. JOHNSVILLE, NEW YORK.

AUTOMATIC SPEED-REGULATOR FOR PNEUMATIC MOTORS.

No. 929,264.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JOSEPH WIESER, a citizen of the United States, residing at St. Johnsville, Montgomery county, State of New York, have invented new and useful Improvements in Automatic Speed-Regulators for Pneumatic Motors, of which the following is a specification.

The invention relates to an automatic speed regulator for pneumatic motors particularly designed for operating the music sheet feed roller in auto-pneumatic pianos or piano players. By my invention novel and effective means are provided for obtaining a uniform action of the motor in spite of an irregular movement of the pedal bellows, the latter being due to a more or less forceful use of the feet on the pedals gaged to obtain variations in the expression of the music to be rendered.

In the accompanying drawing: Figure 1 is a front view of my improved speed regulator; Fig. 2 a vertical section on line 2—2, Fig. 1; Fig. 3 a vertical longitudinal section through the valve-block; Fig. 4 a cross section on line 4—4, Fig. 3, showing the parts in a different position; Fig. 5 a side view of the air inlet valve and cooperating parts; Fig. 6 an enlarged cross section on line 6—6, Fig. 5, and Fig. 7 a similar section on line 7—7, Fig. 5, showing part of the pneumatic.

My improved speed regulator comprises essentially a collapsible pneumatic or compensator 10, having a fixed board 11 and a movable board 12, which are normally spread by a spring 13. Fixed board 11 is preferably secured to the front of a plate 14 that constitutes part of the wind chest of a pneumatic musical instrument. To the back of plate 14 are secured a pair of main bellows 15 operated by pedals 16, as usual, one of said bellows and pedals being shown in the drawing.

Bellows 15 communicate by duct 17 with a valve chamber 18 formed in a block 19 which is secured to plate 14. Chamber 18 is closed by a cover 20 and communicates by pipe 21 with the interior of pneumatic 10. The exhaust of the air from the latter by bellows 15 is regulated by a disk-valve 22 controlling duct 17. The threaded stem 23 of valve 22 passes, through a suitable stuffing box 24, out of block 19, and is by cushioned nuts 25 connected to the movable board of an auxiliary bellows 26 mounted on the top of block 19. Nuts 25 are so adjusted on stem 23,

that when bellows 26 are collapsed, valve disk 22 is lowered off its seat 27, so as to permit the withdrawal of the air from pneumatic 10 through duct 17. Pneumatic 10 is, by a suitable wind-way 28 and pipe 29, connected to a plurality of bellows 30 constituting a pneumatic motor which is but diagrammatically shown in Fig. 1, said motor not forming part of the present invention. Bellows 30 operate, through links 31, a cranked shaft 32 which is, in turn, by pulley 33 and belt 34, connected to the music-sheet propelling rollers, (not shown), or to other devices to be controlled by my improved speed regulator.

The withdrawal of air from auxiliary pneumatic 26 is controlled by a pair of valve-disks 35 and 36 playing within a valve chamber 37 which is formed in block 19 and communicates through duct 38 with pneumatic 26. Disks 35 and 36 are mounted upon a stem 39, the upper end of which is guided in a bearing 40. The latter is secured to a cover 41 of chamber 37, said cover being provided with a central opening 42 which is adapted to be closed by upper valve-disk 35. Cover 41 and bearing 40 are held in position by a resilient arm 43 secured to a post 44 of block 19, which arm may be swung aside when it is desired to open cover 41. Lower disk 36 is adapted to close a port 45 formed in a partition 46 between chamber 37 and a lower recess 47 of block 19. Recess 47 is closed by a cover 48 which is provided with an upwardly extending annular flange 49. To the latter is secured a diaphragm 50 carrying a recessed disk 51 that supports the lower end of stem 39. Flange 49 is provided with a bleed hole 52 for establishing communication between the interior of said flange and recess 47. The air is continuously withdrawn from recess 47 through an exhaust pipe 47^a, which is connected to bellows 15, or to any suitable vacuum chamber, (not shown).

Normally, air is admitted into the chamber formed below diaphragm 50 by means of a pipe 53 passing through cover 48. Pipe 53 enters a cap 54 fast on a rail 55 which is secured to board 14 in close proximity to pneumatic 10. Rail 55 has a transverse duct 56 communicating by cap 54 with pipe 53 and adapted to be entirely or partly closed by a valve 57. The latter is pivoted by screw 58 to rail 55, a suitable spring 59 forcing the valve against the inner side 60 of the rail,

which inner side thus constitutes the valve seat. Valve 57 is normally tilted upward by means of a spring 61 secured to rail 55 and engaging the lower side of the valve, an excessive upward movement of the latter being prevented by a cushioned stop 62 of rail 55. The upper side of valve 57 is adapted to be engaged by a cushioned button 63 carried by a screw stem 64 which is tapped into an arm 65 that projects laterally from the movable board 12 of compensator 10. The relative position and arrangement of the parts is such that when pneumatic 10 is fully expanded, button 63 is raised to such an extent that valve 57 rests against stop 62, whereby duct 56 is almost completely opened, (Fig. 5).

For actuating pneumatic motor 30, main bellows 15 are operated by pedals 16 to produce the desired vacuum, whereby the air is withdrawn from pneumatics 30 through pipe 29, wind-way 28, compensator 10, pipe 21, valve chamber 18 and duct 17.

It may here be stated that usually a vacuum chest will be interpolated between bellows 15 and chamber 18, which vacuum chest also serves for withdrawing the air from the various pneumatics, besides those of the motor, which are generally used in pneumatic musical instruments. For the sake of greater clearness this vacuum chest has been omitted in the drawing and valve chamber 18 has been shown to be directly connected to the exhaust bellows 15. It may further be stated that the power of spring 13 is such that compensator 10 remains fully expanded as long as a normal vacuum is created, while it will be compressed upon the formation of an excessive vacuum. To permit the above described flow of the air, valve 22 must be opened, for which purpose auxiliary pneumatic 26 must be collapsed by withdrawing the air therefrom. This is effected in the following manner: As upon the full expansion of compensator 10, valve 57 is permitted to rise, thereby uncovering duct 56, air will be admitted to the chamber below diaphragm 50 through duct 56 and pipe 53. As furthermore air is continuously withdrawn from recess 47, diaphragm 50 will be raised into the

position shown in Fig. 3. In this way port 42 is closed, while port 45 is opened to connect pneumatic 26 with recess 47 through duct 38, chamber 37 and port 45, thus effecting the collapse of pneumatic 26.

If an excessive vacuum should be created in compensator 10 by rapidly operating pedals 16, compensator 10 will partly collapse. Button 63 will thus cause valve 57 to close duct 56, whereupon the air will be immediately withdrawn from below diaphragm 50 through bleed hole 52 to cause the descent of stem 39. Disks 35, 36, in descending, will close port 45, while port 42 is simultaneously opened to permit the inflow of atmospheric air into pneumatic 26, so that the latter will expand owing to the action of its spring 66. This expansion will cause the closing of valve 22, thereby checking the creation of an excessive vacuum in compensator 10. After the latter has again expanded, duct 56 will be opened to return disks 35, 36 to their previous position and to thus again open valve 22.

It will be seen that by my invention effective and simple means are provided for rendering uniform the speed of the music sheet propelling motor, regardless of the variation in the vacuum produced by an irregular operation of the pedals.

I claim:

A device of the character described, comprising bellows, a compensator, a rail arranged in proximity to the bellows and having a duct, a spring-influenced first valve pivoted to the rail and adapted to close said duct, an adjustable button carried by the compensator and adapted to operate the valve, a second valve controlled by the first valve, a pneumatic controlled by the second valve, and a third valve actuated by the pneumatic and controlling communication between the bellows and compensator.

Signed by me at St. Johnsville, N. Y., this 13th day of January, 1909.

JOSEPH WIESER.

Witnesses:

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