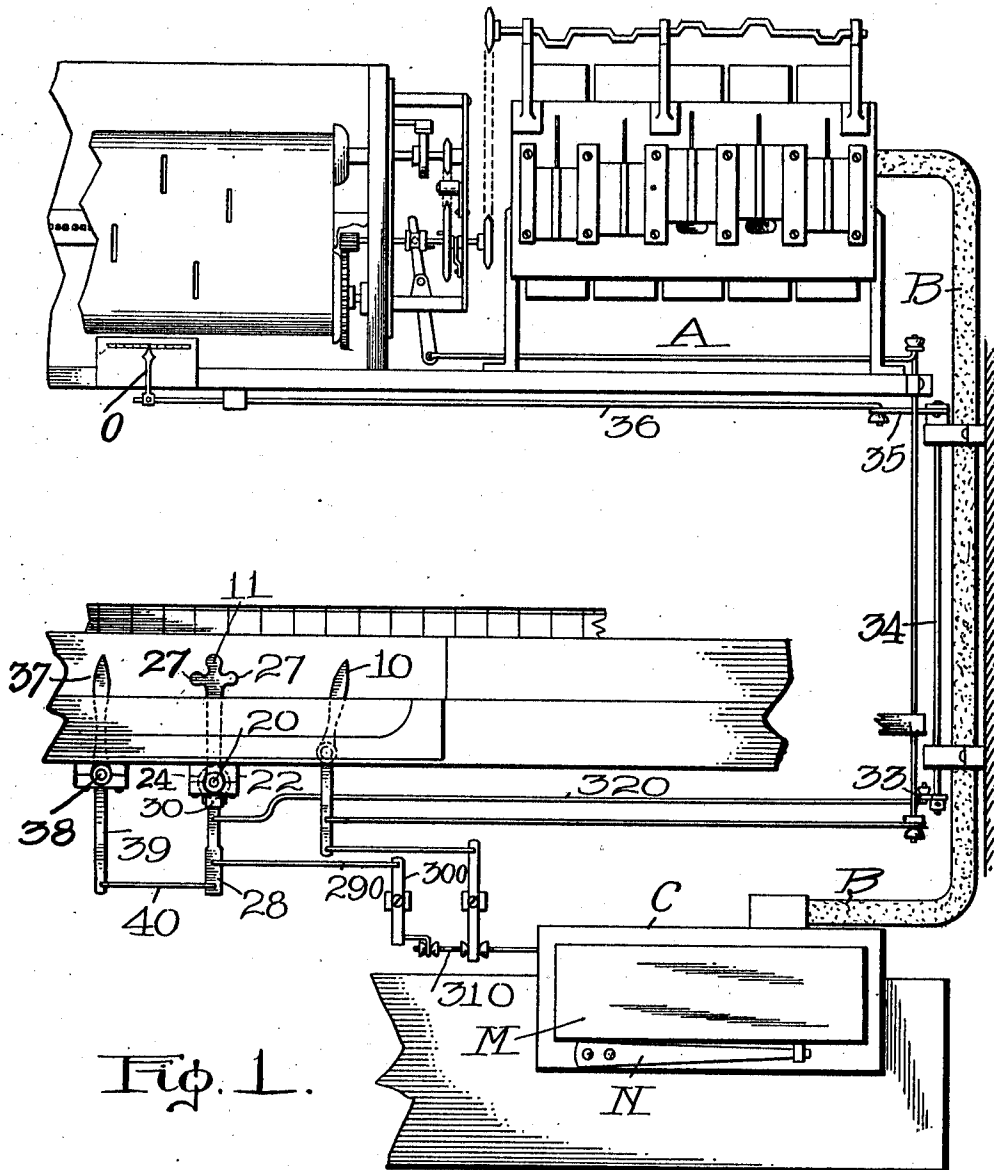


L. W. SOUTHGATE.
 DEVICE FOR REGULATING THE SPEED OF PNEUMATIC MOTORS.
 APPLICATION FILED JUNE 8, 1911.

1,004,213.

Patented Sept. 26, 1911.

2 SHEETS-SHEET 1.



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Fig. 2.

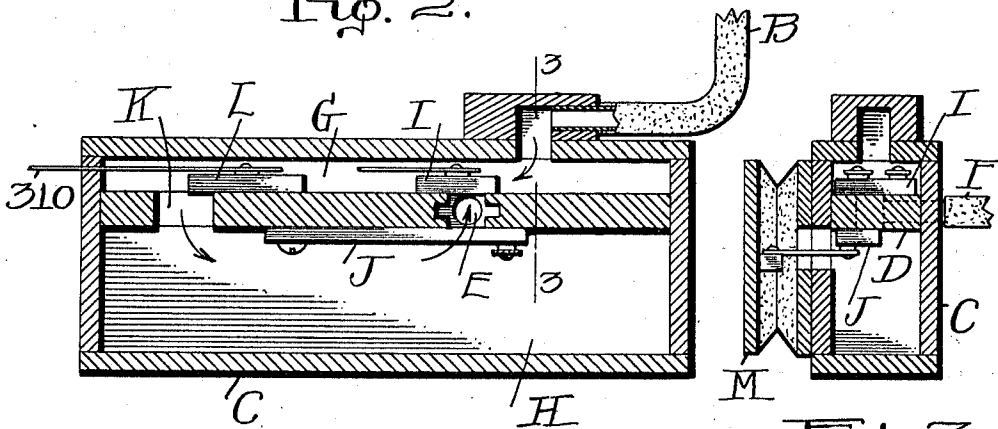


Fig. 3.

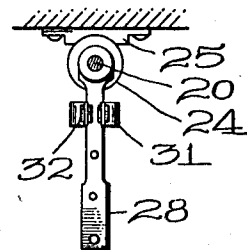
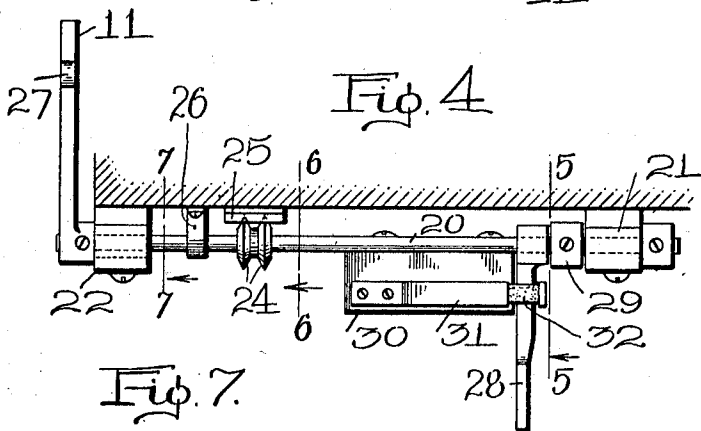


Fig. 5.

Fig. 7.

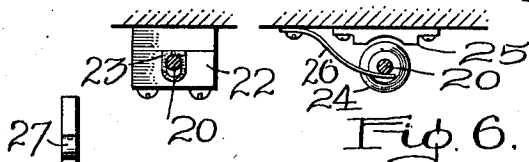


Fig. 6.

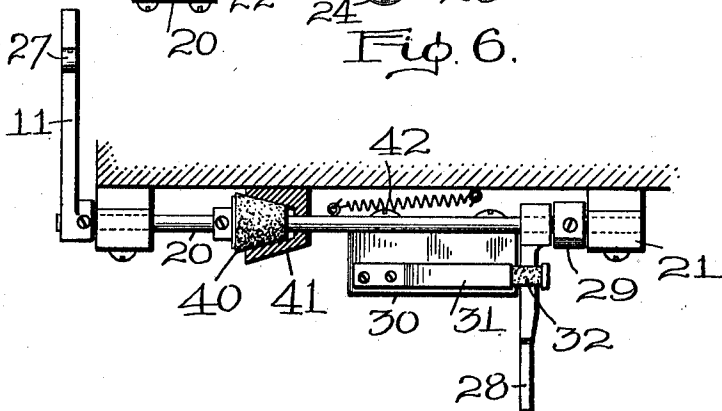


Fig. 8.

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UNITED STATES PATENT OFFICE.

LOUIS W. SOUTHGATE, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO THE AUTO PNEUMATIC ACTION COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

DEVICE FOR REGULATING THE SPEED OF PNEUMATIC MOTORS.

1,004,213.

Specification of Letters Patent. Patented Sept. 26, 1911.

Application filed June 8, 1911. Serial No. 632,001.

To all whom it may concern:

Be it known that I, LOUIS W. SOUTHGATE, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Device for Regulating the Speed of Pneumatic Motors, of which the following is a specification.

This invention relates to a device for controlling the speed of pneumatically operating motors, particularly of that class which are employed in musical instruments to draw a perforated note sheet over a tracker.

The invention consists of an improved mechanism by which the speed of the motor can be adjusted at a constant and then the same temporarily varied to run either faster or slower and so that when this temporary variation is determined, the motor will return to its originally adjusted constant speed.

The invention is illustrated in the accompanying two sheets of drawings in which,

Figure 1 is a front elevation of enough of an automatic piano player to illustrate the application of my invention thereto. Fig. 2 is a cross section of the valve box on an enlarged scale. Fig. 3 is a section taken on the line 3—3 of Fig. 2. Fig. 4 is an end elevation of the shaft of one of the tempo levers. Figs. 5, 6 and 7 are cross sectional views taken on the lines 5—5; 6—6 and 7—7 of Fig. 4, respectively, and Fig. 8 is a view similar to Fig. 4 illustrating a modification.

The invention will be best understood by considering a detailed description of the mechanism shown in the drawings.

Referring to the drawings and in detail, A designates a pneumatically operated motor which is connected by gearing in the ordinary manner to draw the note sheet over the tracker of a musical instrument. This consists of mechanism such as a pinion and a gear arranged so that the note sheet will be drawn slowly forward over the tracker when the instrument is to be played, and of a clutch and additional gearing arranged so that the pinion will be disconnected from its gear and the clutch engaged and the note sheet drawn rapidly over the tracker in the reverse direction when the note sheet is to be rerolled.

Extending from the motor is a pipe B which is connected to a valve box C. The

valve box C is provided with a partition D in which is arranged a passage E connected to which is a pipe F which extends to the exhaust bellows or pumping apparatus. It will be noted that the partition D divides the valve box into an upper compartment G and a lower compartment H. The passage E has an opening communicating with the upper compartment, which opening is controlled by a reroll valve I and an opening communicating with the lower compartment which is controlled by a governing valve J. The partition D has a passage K formed through the same, which passage is controlled by a tempo valve L. A governing valve J is pivoted to the partition D, 70 as shown.

A regulator pneumatic M is arranged on the side of the valve box and communicates to the lower compartment H by a passage cut in the side of the valve box and the movable leaf of the regulator pneumatic is connected by a suitable link to the governing valve, as illustrated in Fig. 3. A spring N presses outwardly on the regulator pneumatic and tends normally to tension the regulator pneumatic to move the governing valve J to uncover the passage which it controls.

A reroll lever 10 is mounted in the frame of the instrument and is connected by shafts, levers and links to control the position of the reroll valve I and the position of the driving pinion and clutch between the motor and rolls which carry the music sheet.

A tempo lever 11 is mounted in the frame of the instrument and is connected by shafts, levers and links to control the tempo valve L and also to operate an indicator O.

All the parts previously described are of ordinary construction except the connections between the lever 10 and the tempo lever which will be hereinafter described. By the arrangements described the speed of the motor in drawing the note sheet forward over the tracker bar can be regulated by the adjustment of the tempo valve L and whatever adjustment is made thereof will be indicated by the indicator O.

The tempo lever 11 is mounted on a shaft 20 which is journaled in bearings 21 and 22 secured to the frame. The hole in the bearing 22 is made oblong, as shown in Fig. 7, so that the left-hand end of the shaft 20

shown in Fig. 4 can be moved up and down therein and the hole is lined with felt 23 so that the shaft can not rattle therein. On the shaft 20 is arranged one member 24 of a friction clamp which engages a stationary member 25 of the friction clamp, which latter is secured to the frame. The friction clamp specifically illustrated consists of two pointed disks which fit into grooves formed in the stationary member. A spring 26 is secured to the framing and engages the shaft 20 so as normally to keep the friction clamp 24—25 in engagement.

The top of the tempo lever 11 preferably is provided with additional finger-pieces 27—27 so that the operator in adjusting the lever 11 naturally pushes down thereon to lower the free end of the shaft 20 and release the friction clamp. The shaft may be kept in place axially in its bearings by a collar engaging the bearing 21.

A lever 28 is loosely mounted on the shaft 20 between a collar 29 and a block 30 secured thereto. On each of the long sides of the block 30 is secured a spring 31, which springs have pieces of felt 32 wound around the ends of the same in position to engage the lever 28. By this arrangement, a yielding spring action is provided between the shaft 20 and the lever 28. The lever 28 is connected by a link 290, lever 300 and connection 310 to the tempo valve, and also by link 320, lever 33, shaft 34, lever 35, link 36 to the indicator O. A supplemental controlling lever 37 is mounted on a shaft 38 journaled in bearings secured to the frame, which shaft 38 also carries a lever 39 which connects by a link 40 to the lever 28.

The operation is as follows:—The operator sets the tempo lever 11 and thereby the tempo valve L to operate the motor at the speed for which the principal part of the selection or piece of music is to be played. This the operator can easily do by pressing down upon the lever 11 and adjusting the same sidewise. When the tempo lever 11 is pressed down the friction clamp 24—25 is released and when the adjustment is made and the hand taken off the tempo lever 11, the spring 26 will lock the friction clamp and thereby the shaft 20 in a fixed position. By use of the friction clamp, the tempo lever can be adjusted to any position. The adjustment of the tempo lever is usually very minute and by using the friction clamp, the finest adjustment desired can be made and retained. Then the operator manipulates the supplemental tempo lever 37 for temporary acceleration or diminution of the speed of the motor. By manipulating this supplemental lever 37 the lever 28 will be moved against the tension of one of the other springs 31 and the tempo valve will be adjusted. When the supplemental lever 37 is released, the valve L will be returned to

the position determined by the adjustment of the lever 11. The manipulation of the supplemental tempo lever 37 will not disturb the adjustment of the tempo lever 11 which is held in its adjusted position by the tension of the spring 26 locking the friction clamp. It also will be noted that all adjustments of the tempo valve L will operate the indicator O, no matter whether they are made through the tempo lever 11 or the supplemental tempo lever 37. This is a particular advantage, because the operator in manipulating the supplemental tempo lever 37 can determine just exactly how much he has speeded up or slowed down the pneumatic motor.

In the modification shown in Fig. 8, the shaft 20 is arranged to slide axially in its bearings and the friction clamp is made in the form of a male cone 40 secured on the shaft 20, cooperating with a female cone 41 secured to the frame. A spring 42 is arranged between the shaft 20 and the frame so as normally to pull the shaft 20 to the right, as shown in Fig. 8 to lock the parts of the friction clamp together. This mechanism operates the same as the mechanism previously described, with the exception that to release the members of the friction clamp the lever 11 is pulled outwardly and then adjusted.

Many other arrangements may be devised by a skilled mechanic for practicing the invention without departing from the scope of the claims appended hereto.

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

1. The combination of a pneumatic motor, a tempo valve for controlling the speed thereof, a tempo lever, connections therefrom to the tempo valve having a yielding spring action, a friction holding device for holding the tempo lever in any adjusted position, and a supplemental tempo lever and connections therefrom to operate the tempo valve.

2. The combination of a pneumatic motor, a tempo valve for controlling the speed thereof, a tempo lever, connections from the tempo lever to the tempo valve having a yielding spring action, a friction clamp for holding the tempo lever in any adjusted position, a spring for normally holding the friction clamp in engagement, and a supplemental tempo lever and connections therefrom to the tempo valve.

3. The combination of a pneumatic motor, a tempo valve for controlling the speed thereof, a tempo lever, a movable shaft on which the tempo lever is mounted, connections to the tempo valve from the shaft having a yielding spring action, a friction clamp having one member on said shaft and a stationary member, a spring normally keeping

the friction clamp in engagement, a supplemental tempo lever, and connections therefrom to the tempo valve.

5 4. The combination of a pneumatic motor, a tempo valve for controlling the speed thereof, a tempo lever, a movable shaft on which said lever is mounted, bearings for said shaft arranged so that the end of the same on which the tempo lever is secured
10 can be depressed, connections from said shaft to the tempo valve having a yielding spring action, a friction member carried by said shaft, a stationary friction member with which the same engages, a spring holding the said shaft up and said friction members in engagement, a supplemental tempo
15 lever, and connections therefrom to the tempo valve.

20 5. The combination of a pneumatic motor, a tempo valve for controlling the speed thereof, a tempo lever, a shaft on which the same is arranged, a block carried by said shaft, a lever loosely arranged on said shaft, spring arms extending from said block
25 and engaging said lever, connections from said lever to the tempo valve, means for holding the shaft in an adjusted position, a supplemental tempo lever, and connections therefrom to the lever loosely mounted on
30 said shaft.

35 6. The combination of a pneumatic motor, a tempo valve for controlling the speed thereof, an indicator for showing the position of the tempo valve, a tempo lever connected to adjust the tempo valve, a supple-

mental tempo lever also connected to adjust the tempo valve independently of the tempo lever, and connections to the indicator whereby the position of the tempo valve will be indicated, irrespective of whether
40 the adjustments are made by the tempo lever or by the supplemental tempo lever.

7. The combination of a pneumatic motor, a tempo valve for controlling the speed thereof, a tempo lever, connections there-
45 from to the tempo valve having a yielding spring action, a friction holding device for holding the tempo lever in any adjusted position, a supplemental tempo lever, connections therefrom to the tempo valve, and an
50 indicator connected to show the position of the tempo valve when adjusted either by the tempo lever or supplemental tempo lever.

8. The combination of a pneumatic motor, a tempo valve for controlling the speed
55 thereof, a tempo lever connected to the supplemental valve, a holding device for holding the tempo lever in adjusted position, the end of said tempo lever being shaped so that the same can be moved to release the holding
60 device and so that the same can be adjusted sidewise.

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

LOUIS W. SOUTHGATE.

Witnesses:

C. FORREST WESSON,
E. M. ALLEN.