J. G. RIMMER.

CONTROLLER MECHANISM FOR ORGAN BLOWERS AND THE LIKE.

APPLICATION FILED MAR. 12, 1913.

1,177,898.

Patented Apr. 4, 1916.

2 SHEETS—SHEET 1.

Fig. 5

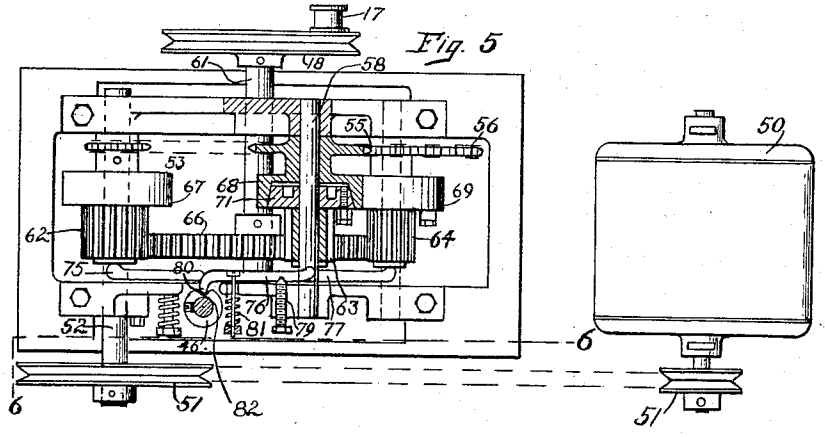
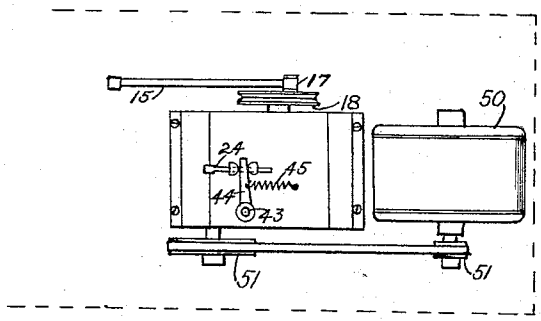


Fig. 2



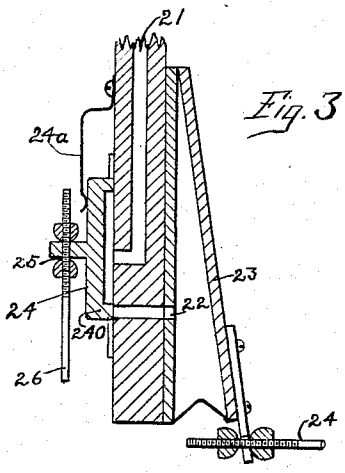


Fig. 3

Fig. 1.

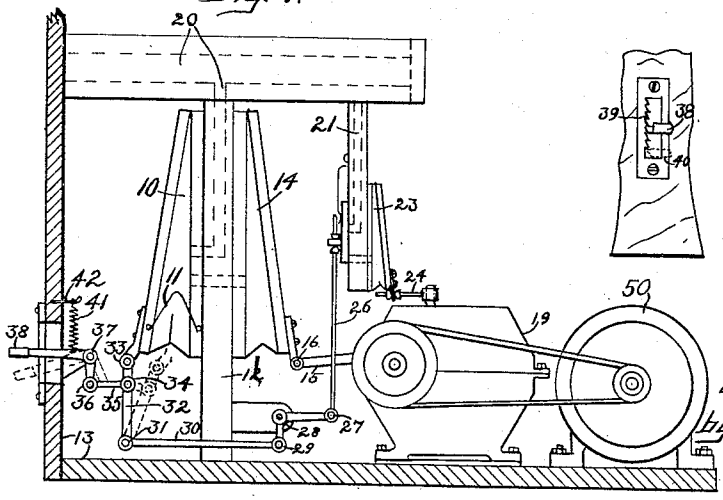


Fig. 4

Inventor:
James C. Rimmer,
by Clyde L. Rogers
his Atty.

J. G. RIMMER.

CONTROLLER MECHANISM FOR ORGAN BLOWERS AND THE LIKE.

APPLICATION FILED MAR. 12, 1913.

1,177,898.

Patented Apr. 4, 1916.

2 SHEETS—SHEET 2.

Fig. 6

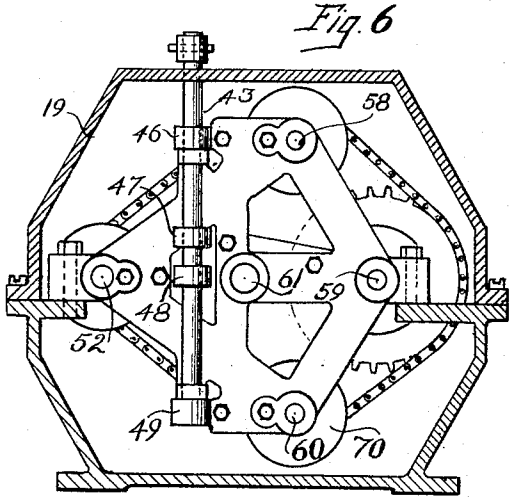


Fig. 7

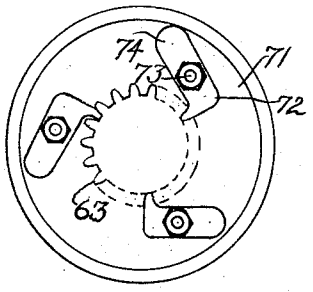


Fig. 9

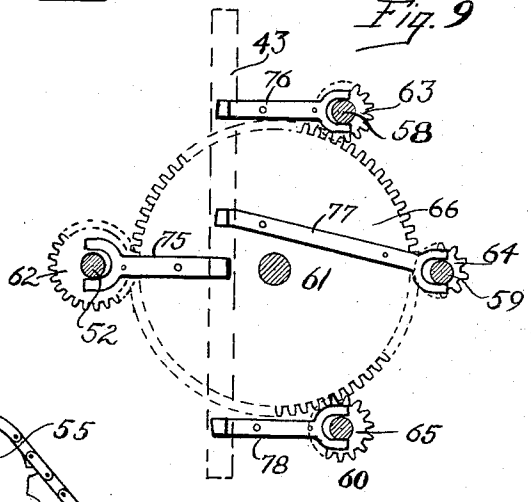
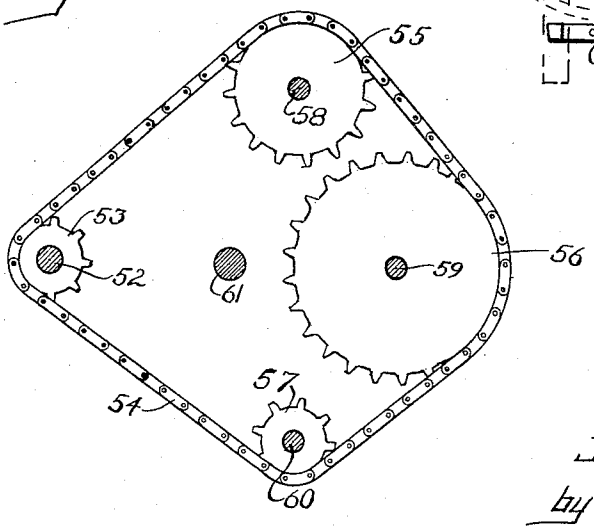


Fig. 8



Inventor:
James G. Rimmer.
by Clyde L. Rogers
his Atty.

THE COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JAMES G. RIMMER, OF QUINCY, MASSACHUSETTS.

CONTROLLER MECHANISM FOR ORGAN-BLOWERS AND THE LIKE.

1,177,898. Specification of Letters Patent. Patented Apr. 4, 1916.

Application filed March 12, 1913. Serial No. 753,747.

To all whom it may concern:

Be it known that I, JAMES G. RIMMER, a subject of the King of Great Britain and Ireland, and resident of Norfolk Downs, Quincy, county of Norfolk, State of Massachusetts, have invented an Improvement in Controller Mechanisms for Organ-Blowers and the like, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

It is well recognized that for the best operation of wind operated instruments particularly musical instruments, the wind reservoir chamber should be maintained under an even tension or compression as the case may be, regardless of the operative demands made thereon. It is also well known that in the case of the reservoirs used with reed organs and like instruments it is essential for the best tonal results that the tension of the reservoir chamber be capable of variation in a definite and controllable manner which may be readily changed for the different sets of reeds as they are brought into use. Since the wind reservoir for reed organs and piano players as well, is usually of a collapsing bellows type kept in tension by springs, which tend to exert a stronger action as the bellows opens, it follows that with this type of mechanism as usually constructed, the tension varies in an undesirable manner according to the condition of the reservoir.

A prime object of my invention is to provide controlling devices preferably operable by a manual pedal or lever to govern the action of a power actuated feeder for the reservoir so that the tension therein is kept uniform for any particular setting of the controlling device. In accordance with one feature of the invention I take advantage of the different positions of the reservoir bellows for different degrees of tension, to set the controlling device by means of the manual pedal or lever for coöperation with the movable part of the reservoir in position to hold it so that it keeps the desired tension on the wind connections therefrom.

A further object of the invention is to provide improved gearing mechanism in combination with the controlling device whereby the actuator for the power feeder can be shifted to different speeds easily and quickly or temporarily disconnected as required.

The above and other objects and features of the invention will be better understood from the following description taken in connection with the accompanying drawings and will be thereafter pointed out in the appended claims.

Referring to the drawings; Figure 1 is a side elevation showing an apparatus constructed in accordance with my invention, portions of an inclosing housing being shown broken away and in section; Fig. 2 is a plan view of the gear control box and motor; Fig. 3 is an enlarged sectional detail showing the controlling valve and the pneumatic which governs the gear box; Fig. 4 is a fragmentary elevation showing a controlling means for the manual governing pedal; Fig. 5 is a plan view of the gear box and motor, with the top case of the gear box removed, and certain gearing elements in section; Fig. 6 is a sectional view on line 6—6 of Fig. 5; Fig. 7 is an enlarged detail elevation of a ratchet and pinion driving connection which is inclosed in the gear box; Fig. 8 is a diagrammatic elevation showing the chain drive to the several shafts of the gear; and Fig. 9 is a diagrammatic elevation showing the controlling means for the clutches in the gear box.

A wind reservoir is shown at 10 of a usual collapsing bellows form with a V-spring 11 exerting its force to open the reservoir. This reservoir is shown as fixed to an upright backing 12 rigid with and forming part of the housing and support 13 in which the mechanism is fixed. The reservoir 10 is supplied from a feeder pneumatic 14 also shown as of bellows form and actuated by a link 15 pivoted thereto at 16 from a crank pin 17 carried by a disk 18 fixed on the shaft 61 which extends out of the gear box 19. Connections 20 to the wind chest and valves extend from the reservoir 10 and a branch connection 21 extends therefrom adapted to connect with a passage 22 to a controller pneumatic 23 shown as of bellows form and connected by means of a link 24 to govern the change gear connections in the gear box. It will be understood that the pneumatic 23 tends normally to open with a usual spring action and the wind tension from passage 21 to collapse the same is controlled by a slide valve 24 held to slide on a plane seat by a spring 24^a, to which is adjustably fixed as at 25 a rod 26 which leads to the adjustable pressure controller now to be described. The rod 26 is connected at 27 to one arm of

a bell crank lever which is fulcrumed at 28 to lugs upstanding from the housing and to the other arm of this bell crank lever is pivoted at 29 a link 30 whose other end is pivoted at 31 to a lever arm 32. This lever arm 32 is pivoted at its other end as at 33 to the outer end of the movable side of the reservoir bellows. The fulcrum for the lever arm 32 is adjustable and consists in a pivotal connection at an intermediate point as at 34 to a link 35 whose other end is pivoted at 36 to one arm of a bell crank lever having a fixed pivot at 37 and whose other arm extends out as at 38 to constitute a manually operable pedal or lever. The fulcrum pivot point 34 may be at any intermediate point in the lever arm 32 but I preferably position it relatively close to the pivot connection 33 with the reservoir and relatively far from the connection 31 with the rod 30 this resulting in a correspondingly greater degree of sensitiveness to the device and causing the actuation of the feeder from the gear box to be varied and controlled by relatively small variations in tension in the reservoir 10. It is to be understood that this variable adjustment of the lever fulcrum 34 is of special value in a mechanism of the present type involving a collapsing organ or like bellows reservoir, not only because as the spring 11 is expanded it will cause more tension to be put on the reservoir contents, but also because regardless of this increased tension due to the action of the spring, the wind reservoir should be relatively expanded when the instrument is being played "full organ" and relatively collapsed when the instrument is being played softly.

As a means for holding the pedal 38 in any position to which it may be set, I show a ratchet plate 39 having a vertical series of ratchet teeth adapted to engage a side of the pedal 38 which projects through an elongated slot 40 of said plate, these teeth facing as shown in a direction to hold the pedal from raising as it is engaged with one of them. As a means tending to draw the pedal 38 upward I show a spring 41 engaged therewith and held from a fixed pintle 42. Thus the pedal 38 may be set in desired adjusted position and engaged with one of the teeth 39 when it will be held in such position by the action of spring 41, it being understood that the pedal 38 for this purpose is mounted with a capacity for slight sidewise movement in the slot 40 or it might carry a spring pressed dog to engage the teeth 39.

It is to be noted by reference to Fig. 3 that with the slide valve 24 in the position shown, its lip 240 closes the passage 22 to the pneumatic 23 so that so long as the slide valve is in this position the pneumatic does not alter its position. If however the reservoir 10 begins to collapse under increased tension, the slide valve is through the lever arm 32, link 30, and rod 26 caused to move in a direction to admit tension from passage 21 through passage 22 to collapse pneumatic 23 which through connections to be presently described disconnects the wind supply actuator. If however the reservoir 10 expands under decreased tension the slide valve 24 is moved to connect passage 22 to the atmosphere permitting pneumatic 23 to open and pushing on the rod 24 to throw in the supply actuator to a greater or less extent as later and more fully explained. It may now be understood that the fulcrum point 34 may be adjusted with reference to the pivot point 33 of the lever 32 by means of the pedal 38 so that the pivot point 31 and hence the slide valve 34 will occupy a proper position to control the tension in the reservoir to keep such tension at any required degree, the varying degrees of tension being represented by correspondingly different degrees of collapse of reservoir 10 and hence by a simple adjustment of the pedal 38 the reservoir 10 is adapted to govern the valve 24 to maintain any desired degree of tension therein.

The variable control for the supply actuator may be embodied in many different forms but for illustrative purposes I show a preferred construction wherein the rod 24 as actuated by the pneumatic 23 in turn operates a rock shaft 43 being connected therewith by a lever arm 44 fixed to said shaft and engaged by a spring 45 tending to rock the shaft to position for engaging the actuating connections. The shaft 43 is vertically journaled in the gear box 19 and it will hereinafter be termed a cam shaft since it has fixed thereon four spaced apart cams 46, 47, 48, 49 which control corresponding clutches as now to be explained. The prime driver for the mechanism is shown as an electric motor 50, this typifying any suitable constant speed prime driver and it has a pulley and belt connection 51 to a shaft 52 horizontally journaled near one side of the gear box. This shaft has fixed thereon a sprocket wheel 53 engaged by a sprocket chain 54 which also engages and drives three other sprocket wheels 55, 56, and 57 mounted respectively on shafts 58, 59, 60 horizontally journaled in the gear box at different sides of, and in determinably spaced apart relation from a central shaft 61 also journaled in the gear box. Each of the shafts 52, 58, 59, 60 has loosely mounted thereon one of a series of pinions 62, 63, 64, 65, all engaging with a large gear 66 fixed on the shaft 61. The pinions 62, 63, 64, 65 are adapted to be selectively brought into clutched driving engagement with the shaft 52 and their respective sprocket wheels 55, 56, 57 by the following means. A series of friction clutch elements 67, 68, 69, 70 are fixed on the shaft

52 and rigid with the respective sprocket wheels 55, 56, 57 and these elements have coöperative therewith other friction elements shown as fitting therewithin, the friction element coöperating with the element 68 being shown at 71 and it being understood that the others are similar thereto. The clutch element 71 which coöperates with the clutch element 67 is or may be rigid with the pinion 62 but the other three clutch elements 71 are adapted to drive the respective pinions 63, 64, 65 through a one-way-slip pawl connection best shown in Fig. 7. The reason for this is that the pinion 62 which is shown as the largest of the series meshing with the gear 66 is adapted to impart the highest speed that may be required for operating the blower, and when this is in use it is of course requisite that means be provided so that the other actuating clutch elements can overrun the pinions coöperative therewith. I preferably provide a plurality, shown as three, of pawls 72 pivotally mounted at 73 on the friction elements 71 with beaks adapted to drive the pinion in one direction and to yield and slip in the other direction. These pawls desirably have rearwardly extending ends 74 of some little length and weight so that the pawls tend to come into operative engagement by centrifugal action, and also so that at least one pawl in a lower position will tend to drop into operative position by gravity. As a means for selectively moving the several friction clutch elements 71 into engagement with the clutch elements 67, 68, 69, 70 respectively, I preferably provide a series of levers 75, 76, 77, 78 each having an intermediate fulcrum point preferably on an adjustable fulcrum pin 79 with their outer ends pressing on the ends of the pinions 62, 63, 64, 65 respectively which are slidable on their respective shafts and in turn press upon and slide the clutch elements 71. The other ends of the levers 75, 76, 77, 78 are bent in as seen at 80 and are drawn to engage the cams 46, 47, 48, 49 respectively by suitably mounted springs 81. The cams 46, 47, 48, 49 are each provided with a cut out portion 82 into which the turned in ends 80 of the levers 75, 76, 77, 78 respectively are adapted to drop under the influence of the springs 81 and thus bring the clutch elements into clutched engagement.

It will be understood that the cut out portions 80 on the several cams are in different and properly spaced angular positions on the shaft 43, and as this shaft is oscillated it brings each set of clutch elements into operative relation after effecting the disengagement of a preceding set. It will also be understood that when the cam shaft 43 is rocked far enough all of the cut out portions 80 are past the lever ends so that none of the clutches is in operative engagement; in this position the wind feeder is of course not actuated at all. The set of pinions 62, 63, 64, 65 are of varied and selected sizes, the pinion 62 as noted being the largest, and the sprocket wheels 53, 55, 56, 57 are likewise of varied and selected sizes so that the drive from shaft 52 directly through the pinion 62 and gear 66 on to the shaft 61 imparts the maximum degree of activity to the wind feeder 14 while when pinion 62 is disconnected and the pinions 63, 64, 65 successively brought into operation by the turning of rock shaft 43, the rate of drive to the shaft 61 and hence to the wind feeder 14 is progressively lowered until finally as before noted the drive is altogether disconnected. It may now be understood that with the described mechanism in operation, the controlling device may be set by manipulation of the pedal 38 so that the movable side of the wind reservoir 10 will control the valve 24 to keep the tension or compression, *i. e.*, the power impulse in said reservoir at any required degree according as the fulcrum point 34 of lever 32 is adjusted in and out. The capability of this action is indicated by the dotted line positions of lever 32 and fulcrum point 34 in Fig. 1 wherein it is seen that the fulcrum point 34 may be moved in from the full line to the dotted line position, and as the wind reservoir starts to collapse on the cessation of its feeder actuation, as soon as the pivot point 33 carried by its movable side reaches the dotted line position, the pivot point 31 will have again moved to the full line position bringing the valve 24 again to the position seen in Fig. 4 where its lip 240 is adapted by very slight movements to admit or discharge air from the pneumatic 23 and thus effect a properly controlled actuation of the reservoir feeder 14.

It will be understood that the described controlling mechanism is adapted to coöperate with a wind reservoir adapted to keep its contents under either tension or compression at will, by merely changing the character of the spring 11, and reversing the direction of control. I therefore define the wind reservoir as adapted to impart power impulse to its contents, in certain of the claims, meaning by this that the reservoir contents are kept in a condition either above or below atmospheric pressure as found more desirable for any particular mechanism. I therefore desire the present showing of a tension controlling mechanism, as also the special construction of the gear control box and the details of other parts to be considered as illustrative and not restrictive as I am aware that these can be embodied in many other specific forms without departing from the spirit of the invention. I therefore refer to the appended claims rather than to the foregoing description to indi-

cate the scope of protection intended to be had.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. Apparatus of the kind described, comprising a wind reservoir having provision to impart power impulse to its contents, a power feeder for said reservoir having a controller for varying its operation, and means having a connection to be governed by the condition of said reservoir for actuating said controller, said means having provision to be adjusted with the mechanism in action and without disturbing the same for causing the reservoir to maintain its contents in a variable desired condition of pressure.

2. A controller mechanism for organ blowers and the like, comprising an expansible wind reservoir having provision to transmit power impulse to its contents in variable degrees according to the amount of such contents and the extent of expansion of said reservoir, a power feeder therefor having a device adapted to actuate it at variable rates, and means connected to be operated by an element of said reservoir which moves as it expands, having a manually controlled setting device formed and adapted to be adjusted with the mechanism in action and without disturbing the same for controlling said power feeder to maintain a variable and predetermined condition of said reservoir with reference to its capability of transmitting power impulse to its contents.

3. Apparatus of the kind described, comprising a wind reservoir formed to impart power impulse in variable degrees to its contents according to the amount of such contents, a power feeder therefor having a controlling device adapted to actuate it at variable rates, and a lever and link mechanism connecting said reservoir and said controlling device, said mechanism having provision to be adjusted with the mechanism in action and without disturbing the same for maintaining said reservoir filled to variable and predetermined degrees at will.

4. Apparatus of the kind described, comprising a wind reservoir formed to exert variable degrees of power impulse on its contents according to the extent to which it is filled, a power feeder therefor having a feed varying controller, and connecting mechanism between said reservoir and said controller, having as a part thereof a lever with an adjustable fulcrum coöperative with said reservoir and adapted to govern said controller for maintaining the reservoir filled to a variable degree and exerting predetermined power impulse on its contents, at will.

5. Apparatus of the kind described, comprising a wind reservoir formed as a collapsing bellows with constantly acting means tending to actuate it in one direction, a power feeder therefor having a feed varying controller, and mechanism connected with the movable side of said bellows and arranged to govern said controller, said mechanism having a lever with a fulcrum adjustable to correspond with different degrees of reservoir filling and adapted in cooperation with said mechanism to maintain the reservoir filled to a variable and predetermined degree.

6. Apparatus of the kind described, comprising a wind reservoir formed as a tension bellows, a power feeder therefor having a constant speed motor and a speed changing gear box, and connections from said reservoir bellows to said gear box adapted to govern the same, said connections having as a part thereof a lever pivoted at one end to the movable side of said bellows, with an intermediate laterally adjustable fulcrum, and its other end equipped with connections to act on said gear box.

7. Apparatus of the kind described, comprising a wind reservoir of bellows form, a power feeder therefor having a gear-box speed changing controller, and connections from said reservoir bellows to said controller consisting in a lever pivoted at one end to the movable side of said bellows with an intermediate laterally adjustable fulcrum having a pedal control, and its other end equipped with link and lever connections, there being a pneumatic for acting on said controller with its valve engaged by said connections.

8. Apparatus of the kind described, comprising a wind reservoir formed to exert variable degrees of power impulse on its contents, a power feeder therefor, a motor for said feeder, and a speed changing controller interposed between said motor and said feeder, said controller consisting in a plurality of gear elements connected to be driven at various speeds and gear elements having provision to be selectively engaged thereby and connected to actuate the feeder, and means controllable from said reservoir adapted to be variably set for selectively connecting the elements of said controller to actuate said feeder at a rate predetermined according to the pressure condition of the reservoir contents.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

JAMES G. RIMMER.

Witnesses:
CLYDE L. ROGERS,
LOUISE A. JORDAN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."