UNITED STATES PATENT OFFICE.

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VALVE FOR ORGAN-BLOWERS.

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To all whom it may concern:

Be it known that I, IRA H. SPENCER, a citizen of the United States, and a resident of West Hartford, in the county of Hartford and State of Connecticut, have invented a new and Improved Valve for Organ-Blowers, of which the following is a specification.

My invention relates more especially to the class of apparatus used for supplying air to musical instruments, more especially pipe organs, and an object of my invention, among others, is to provide an apparatus of this class by the use of which the flow of air shall be accurately controlled in proportion to the amount used in playing the organ; and a further object of the invention is to provide such an apparatus by the use of which the increase or decrease of the amount of air shall be even and steady.

One form of apparatus embodying my invention and in the construction and use of which the objects hereinafore set out, as well as others, may be attained, is illustrated in the accompanying drawings, in which—

Figure 1 is a diagrammatic view illustrating the construction and operation of my improved device. Fig. 2 is a detail view in central longitudinal section through an air conduit embodying my invention. Fig. 3 is a top plan view of the same, the scale being enlarged in the last two views.

In an apparatus for supplying air to pipe organs, and especially those, as frequently made, that have a number of reservoirs for supplying air to different sets of pipes, it is essential that such supply shall be kept at a constant predetermined pressure in each of the reservoirs, in order that the valves controlling the supply to the different reservoirs shall work smoothly and without liability of jumping action. The pipe that conveys the air from the pump or blower readily conveys sounds made by such pump or blower, and it is therefore important that while the degree of pressure shall be maintained constant for supply to the different reservoirs, the passage through the pipe or conduit shall be closed when little or no air is being used by the organ, this to prevent the objectionable noise of the pump from being conveyed at such time to the ears of the persons within sound of the organ, this noise being downed when the organ is played loudly, causing much air to pass. The requirements of the different sets of pipes supplied from the reservoirs are such as not to require the same pressure of air in all of the reservoirs, and my improved apparatus, illustrated and described herein, provides means whereby the pressure to the several reservoirs, irrespective of their location, one with respect to another, may be so easily regulated that a smooth even action of the valves controlling entrance to the reservoirs will be in direct proportion to the amount of air being used, my improved controlling means being extremely sensitive in action and requiring little power for its operation.

In the accompanying drawings the letter a denotes a blower or pump of any approved form and construction, preferably a multiple stage fan, from which a conduit b extends and is employed to supply air to the different reservoirs c, the delivery to the reservoirs being through branch pipes d, from the main conduit b. These reservoirs are each of the usual and known construction, each including a collapsible section e having springs or like members f located between struts g and the top f of the reservoirs for forcing the top toward the bottom to move the valve h from its seat and allow air to enter the reservoir through the opening i, a rod k connecting the valve with the top of the reservoir.

All of the parts just described are of old and well known construction. In the operation of these devices, an objection has been encountered from the fact that the valves h when they reach a position nearly closing the opening i are forced suddenly into engagement with their seats, causing an objectionable noise and a vibration in the sound produced by the organ, and under certain conditions, opening and closing movement of the valves will be repeated in rapid succession. By my improved apparatus I have provided means whereby the supply of air for delivery to these reservoirs, the pressure in which varies one from another, owing to the requirements of use, may be so regulated that not only is this objectionable operation of the valves prevented, but the passage through the conduit is closed to an extent depending upon the amount of air used, when no air is being used, and the organ is not being played, the passage being
entirely closed, thus preventing the transmission of sound from the blower or pump.

In the device shown, illustrating this apparatus, the air conduit 4 is interposed betwixt the apparatus for producing air currents and the organ, the air travelling in the direction indicated by the arrows in Fig. 1 of the drawings. This conduit or pipe is preferably round in cross section and it has a section on its interior lined with a soft material as felt 5, which may be held in place by by spring hoops 6 extending around the interior of the pipe. A damper or valve 7 is pivotally mounted in this pipe and within the felt lined section, the edge of the damper being formed to engage the felt lined surface when the damper is closed, as shown in dotted outline in Fig. 2. This engagement of the edge of the damper with this felt lined surface enables the flow of air to be completely shut off with little pressure of the edge of the damper in contact with said surface, and little force is therefore required to start the opening movement of the damper. This damper is provided on one side of its pivotal center with a stop 9 arranged to engage a shoulder when the damper has reached its full extent of opening movement, as herein shown this shoulder 9 being formed by the edge of the felt lining of the pipe. A regulator chamber opens out from one side of the passage through the pipe and laterally thereof, as herein shown, chamber being formed within a cylindrical casing 10 secured in any suitable manner to the pipe 4 on the side toward the organ of a diametrical plane passing across the pipe through the axis of the damper 7.

A guide rod 11 extends from the end of the casing 10 through an opening 12 between the interior of the conduit and the chamber in said casing, the opposite end of this rod being secured in the wall of the conduit, as shown in Fig. 1. A piston sleeve 13 is mounted to move longitudinally on said guide rod, as shown herein being in bearing for this sleeve. A piston 15 is secured to the sleeve, as by means of nuts 16—17 located on opposite sides of the piston, that is constructed in any suitable manner, as herein shown, it having plates 18 and a packing 19 of felt or other suitable material. The nut 17 forms a pivotal connection for a valve operating link that, in the construction herein shown, consists of two members 20—21 connected with the nut on opposite sides and extending on opposite sides of the sleeve 13, these levers being pivotally connected to a wing 22 extending from the valve or damper 7.

A regulator 23 having openings 24 is secured to the casing 10, the openings 24 being arranged to register with openings 26 in the end of the casing. By means of this regulator the flow of air from the chamber within the casing may be accurately controlled.

The location of the casing 10 with the opening thereof located between the valve 7 and the organ is for the purpose of enabling the chamber within the casing to have exactly the same pressure as is being supplied to the organ, this for the purpose of enabling the piston 15 to readily respond to any changes in that pressure.

A lever 27 is secured to the spindle 28 of the valve 7 and a weight 29 on said lever determines the amount of pressure that will be required to move the piston 15, and by means of this lever the amount of pressure which will exist for supplying air to the organ may be nicely regulated.

The operation of the device the weight having been fixed in proper position, the pressure of air on the organ side of the valve, and consequently at the point of delivery to the organ, will be gradually raised sufficient pressure exists to move the piston 15, it being understood that when the apparatus is first started the valve 7 will be moved to open position as shown in Fig. 2 of the drawings. Should the use of air by the organ not be sufficient to reduce this pressure, but to allow it to increase, the piston will gradually rise thus effecting a closing movement of the valve, and this closing and opening movement of the valve will continue, depending upon the pressure at the points above noted. The regulator 23 enables the flow of air from the regulator chamber to be so controlled that the piston may not be so sensitive to the changes of pressure as to represent those changes by a dancing movement which would become apparent in tremulous sounds produced by the organ, and by properly regulating this escaping air the piston may be caused to have a steady unerring movement.

While I have shown and described herein a preferred form of mechanism for effecting my purpose, this mechanism may be changed to a greater or lesser extent, and yet be within the spirit and intent of the invention, which is therefore not limited to the exact construction herein described.

From the construction above described, taken in connection with the accompanying illustration, it will be seen that the construction and location of my improved regulator so effectually controls the flow of air that smooth and noiseless action of the valves in the reservoirs is obtained, whether air be flowing through all of the of the pipes to the wind chests of the organ or whether only one or any number of such reservoirs are in action.

I claim:
1. A regulator for organ blowers including a conduit having an area covered by a
lining of soft material extending around its inner surface, a valve movably mounted in the conduit in position for its edges to strike said lined surface, a regulator chamber, a regulating member located in the chamber, and an operative connection between said valve and regulating member.

2. A regulator for organ blowers including a conduit having a section covered by a soft lining forming a shoulder, a valve movably mounted in said conduit in position for its edges to strike against said lined surface, a stop on the valve positioned to encounter the shoulder formed at the edges of said lined surface, a casing forming a regulator chamber located at one side of said conduit and having an opening thereto, a regulating member located in said chamber, and an operative connection between said regulating member and valve.

3. A regulator for organ blowers including a conduit, a valve pivotally mounted in said conduit, a casing constituting a regulator chamber located at one side of the conduit and having an opening thereto, a guide rod located in said regulator chamber, a sleeve movably mounted on the guide rod, a piston secured to said sleeve, and an operative connection between said piston and valve.

4. A regulator for organ blowers including a conduit, a valve pivotally mounted therein, a casing secured to the side of the conduit and constituting a regulator chamber, a guide rod extending through the regulator chamber and said conduit, a piston located in the regulator chamber, a piston sleeve mounted upon said guide rod within the conduit, and an operative connection between said piston sleeve and valve.

5. A regulator for organ blowers including a conduit for passage of air to an organ, a casing secured to the side of the conduit and constituting a regulator chamber having an opening into the conduit through the side wall thereof, a valve pivotally mounted in the casing, a piston located in the regulator chamber, a guide, a piston sleeve mounted on said guide, and connecting members pivotally secured to said valve and piston and extending on opposite sides of said sleeve.

6. A regulator for organ blowers including a conduit, a casing secured to the side of the conduit, the wall of the latter forming the bottom of the chamber in said casing, an opening through the wall of the casing from said chamber at the center thereof, a rod projecting through said opening, a sleeve movably mounted on the rod, a piston secured to said sleeve, a valve in said conduit, and a lever connected to said piston and valve and passing through said opening.

Witnesses:

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