No. 859,139. PATENTED JULY 2, 1907.

I. H. SPENCER.

AIR VALVE.

APPLICATION FILED OCT. 30, 1905.

Fig. 2.

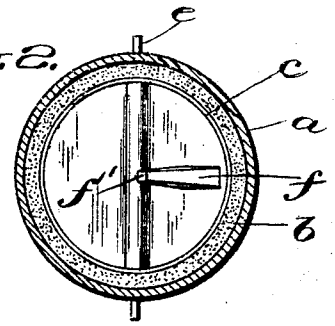


Fig. 3.

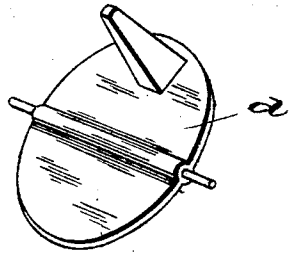
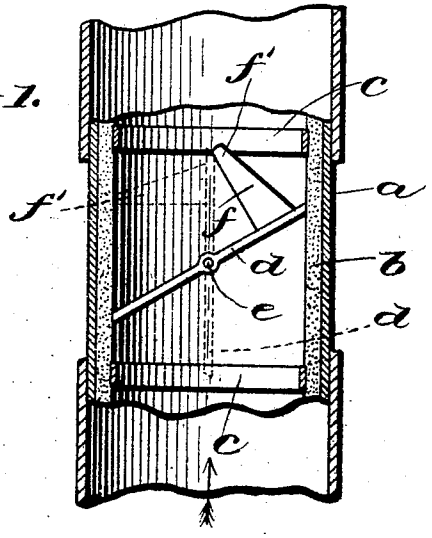


Fig. 1.



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AIR-VALVE.

No. 859,139. Specification of Letters Patent. Patented July 2, 1907.

Application filed October 30, 1905. Serial No. 284,971.

To all whom it may concern:

Be it known that I, IRA H. SPENCER, a citizen of the United States, and a resident of Hartford, in the county of Hartford and State of Connecticut, whose post-office address is Hartford, Connecticut, have invented certain new and useful Improvements in Air-Valves, of which the following is a full, clear, and exact description, whereby any one skilled in the art may make and use the same.

The invention relates primarily to air valves or dampers, and more particularly to a special type of valve which might well be termed a balanced valve.

As hereinafter set forth, the valve shown and described is particularly adapted for use in controlling the flow of fluid through air tubes, and is well adapted for use in connection with organ blowing and ventilating devices.

The objects of the invention are to provide a simple, compact and noiseless structure which will operate with precision.

A still further object is to produce an air valve which may be readily inserted in an air pipe, and will be effective in its opening and closing movements and noiseless in its operation.

A still further object is to provide in connection with a balanced air valve, an arrangement of insulating material which will not only deaden the sound of the moving part of the valve, but will also insulate the air tube within which the valve is arranged.

Referring to the drawings:—Figure 1 is a sectional view through an air tube showing the valve and appurtenant parts. Fig. 2 is a cross sectional view through said valve. Fig. 3 is a perspective view of vane.

The invention herein set forth, while applicable to many purposes, is particularly useful in connection with organ blowing and ventilating apparatus where large volumes of air are forced through an air tube. In such devices it is necessary to provide some automatic means for closing the tube upon varying conditions of pressure and volumes of air, leaving said tube normally closed and varying the opening there through dependent upon the passage of air. It is also essential to provide a simple mechanism in which there will be the smallest possible amount of tendency to "wire draw" the air in its passage.

To accomplish these results the present invention contemplates providing a balanced vane fitting within the air tube and with a suitable stop for holding the valve in position with the vane extending longitudinally of the tube while air is passing.

In the accompanying drawing the letter *a* denotes an air tube preferably formed of sheet metal and arranged to be inserted as a section of an air tube of any desired length. Within this tube or outer shell is secured a sheet of insulating material *b* which is of a correct size to nicely fill the inner surface of the air tube or pipe *a* and with its edges abutting each other longitudinally of said tube. This insulating lining may, of course, be made of tubular form and inserted within the air pipe *a*, or it may be made up of sections and of any desired material. As a preferred means of holding said insulating tube in place within the air tube *a*, there are provided rings *c* which are sprung into the interior of the insulating tube and force it tightly against the inner surface of the tube *a*, holding it securely in position. These rings are preferably arranged on both sides of the damper or balanced vane hereinafter described, and any requisite number of the rings may be applied to firmly secure the insulation. Ordinarily one ring at either end of the valve section is all sufficient for the purposes defined. Within the insulated valve tube thus formed is arranged a vane *d* centrally pivoted as at *e* and normally occupying a position filling the tube. When in closed position, this vane occupies an angular position with reference to the central axis of the tube, and is provided with a counter-weight or balance *f* preferably integral with the vane and extending backward therefrom at a slight angle to its surface. This counter-balance *f* is preferably cast integral with the vane *d;* and as its outer end *f'* is at some distance from the surface of the disk *d*, the effective weight of the counter-balance is distributed in such manner as to give a substantially perfect balance to the vane in its operation.

It will be noted that the counter-balance is quite broad at its base, tapering to the outer end and with its center lying at an angle with reference to the plane of the vane. It is also arranged between the pivot of the vane and the periphery thereof. The formation and arrangement is such that it gives the required perfect action to the valve, normally holding it in close position with the periphery of the vane resting firmly about the insulating tube. However, upon a predetermined pressure, the vane will open to the full width and, in this position, the stop rests against the lining. The counter-balance *f* has really a double function, and serves the purpose of a counter-weight and provides a stop for limiting the opening movement of the vane. This is indicated in dotted outlines in Fig. 1, where the end *f'* of the weight *f* is shown as resting against the insulated tube *b*.

Of course, it is understood that the vane *d* may be made of any suitable material, and the weight *f* applied thereto, as the exigencies of any particular requirement may demand. The preferred form, however, is a cast vane having a hub at its center and with the counter-balance weight forming an integral part thereof.

It will be observed how readily the valve may be

applied to any desired pipe; and slight variations in size of the pipe with respect to the damper, may be compensated for in the thickness of insulating material used within the pipe. This insulating lining also forms an efficient packing about the vane, insuring a tight joint and a proper operation of the valve. In the particular use of organ blowing apparatus, it is desirable to have the vane tightly close the air tube until a certain pressure is developed within the tube and, thereupon to open to the full width, impeding the passage as little as possible. Such a result is attained in the device described; and by using a soft felt or packing within the air tube, the counter-weight operates with sufficient strength to firmly seat the vane with its entire periphery resting against the insulation. In fact, the valve may be applied to any part of a long length of air tube, or it may be fitted in a short section, providing what is essentially a valve section in the pipe line.

Of course, the pivoted axis upon which the vane turns may be extended through the walls of the tube and any required attachment may be made for manually or otherwise controlling the position of the vane.

It is not desired to claim every form of counter-balance valve or a counter-balance valve arranged in a piping system with resilient sections arranged on one or both sides of the section bearing the valve, as it is understood that counter-balance valves are in common use and that it is common practice to provide hose-like pipes and sections of pipes in wind pressure systems formed of resilient material. The present invention relates particularly to the pipe having an interior lining of resilient sound-deadening material with the balanced valve arranged directly therein and with the insulating material forming a packing for the valve.

Obviously the exact details of constructions of the various parts might be varied without departing from the spirit or intent of the invention, which contemplates a balanced valve or vane of the character described, pivoted within an air tube and within a contained tube or web of insulating material.

What I do claim and desire to secure by Letters Patent is:—

1. In combination with a sheet metal or similar tube a substantially thick inner lining of sound deadening material, completely covering the inner surface of the tube, expansible rings holding said lining in place, and a pivoted vane arranged to swing its entire periphery against said insulating material for closing said tube.

2. In combination in an air valve, an outer tube, an inner lining of insulating material completely covering the inner surface of the outer tube, expansible rings within the said lining for clamping it with reference to the tube, and a balanced vane pivoted within the tube and with its entire peripheral edge formed to rest against the insulating lining.

3. In combination with a sheet metal or similar tube bearing a pivoted vane, a comparatively thick inner lining of sound deadening material completely covering the inner surface of the tube, and forming the abutting surface for the vane, and rings within the lining to bind it to the tube.

4. In combination in an air valve, an outer tube, an inner lining of insulating material completely covering the inner surface of said tube, a pivoted disk arranged to normally rest with its entire periphery in contact with the insulating material and a counter-balance and stop located on the vane between its pivotal center and the peripheral edge of said vane.

5. In combination in an air valve, an outer tube, an insulating material completely lining said tube, a vane centrally pivoted within the tube and arranged to normally occupy a position with its entire periphery in contact with the insulating material and a combined counter-balance weight and stop upon the vane, said counter-balance tapering from the base to the outer end and located between the pivotal center of the vane and its periphery.

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