Nov. 26, 1935. W. H. MOTTERSHALL 2,022,143

VENTILATOR

Filed March 30, 1934

Fig. 1.

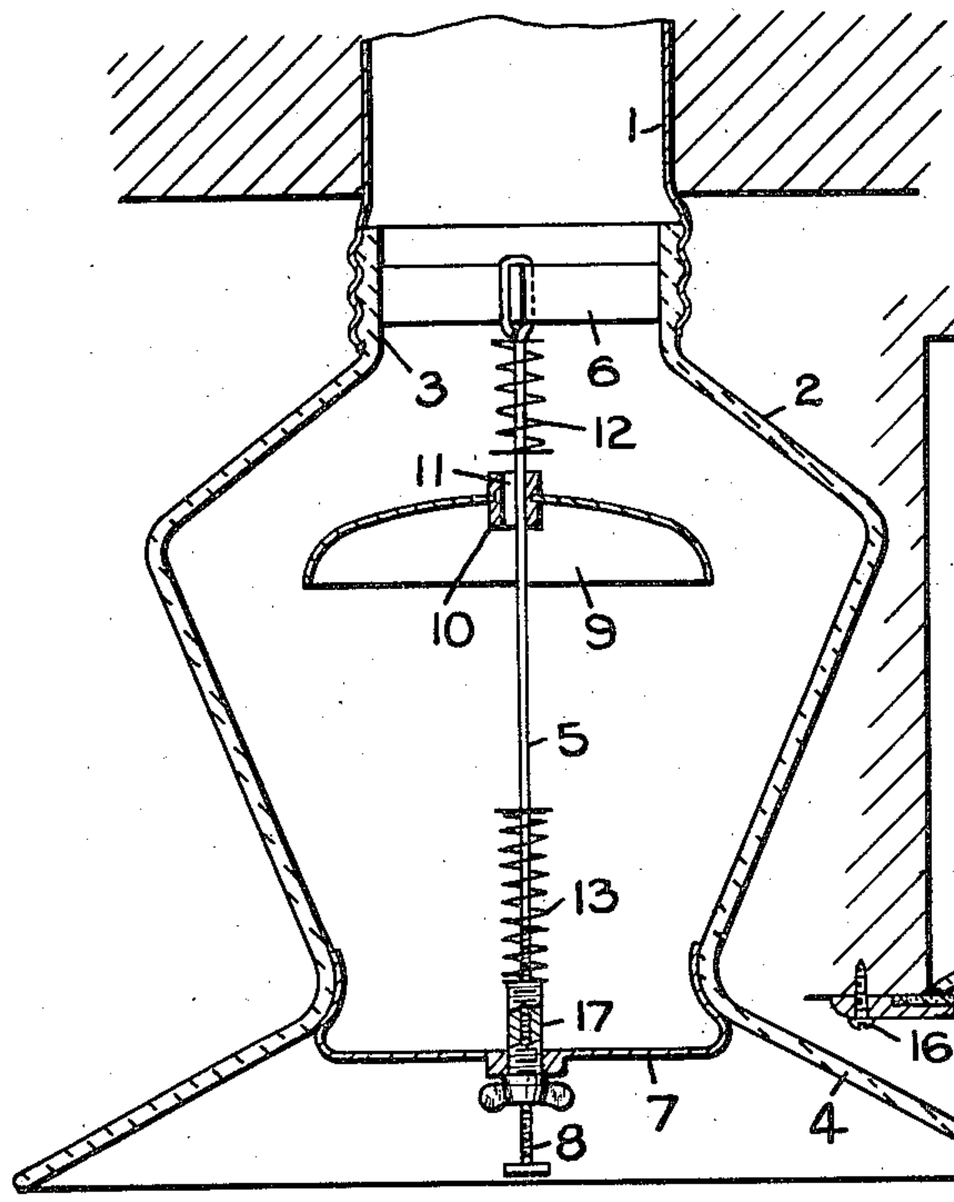


Fig. 4.

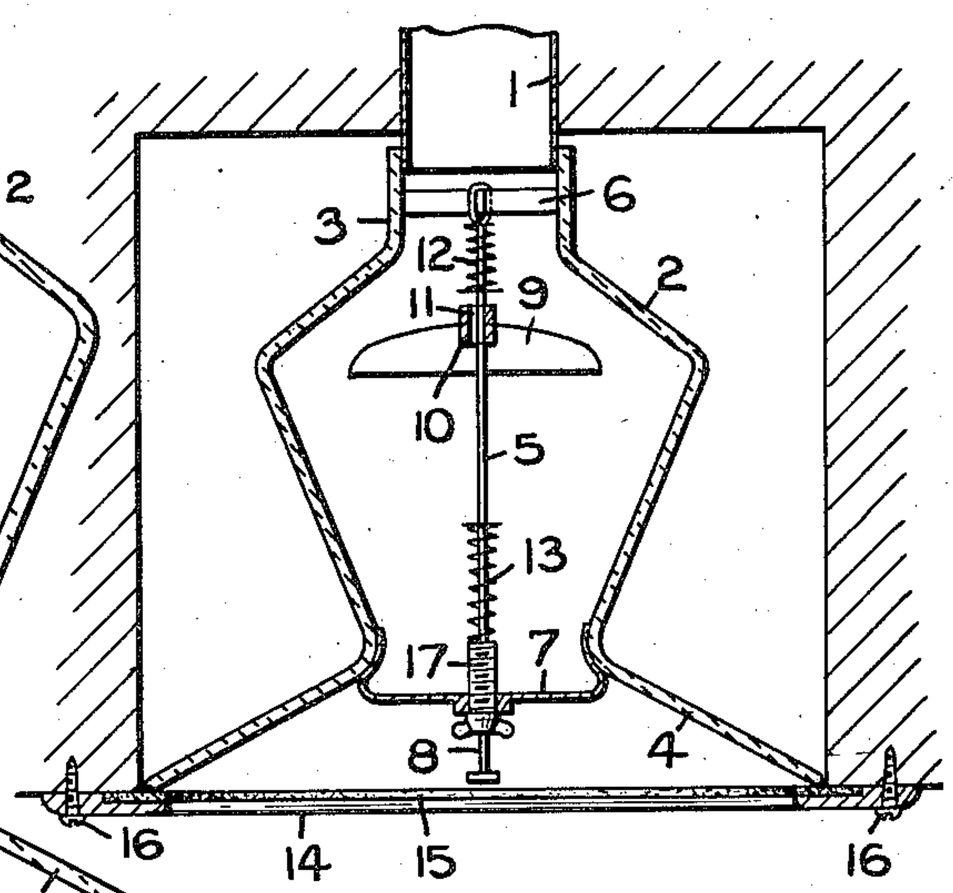


Fig. 2.

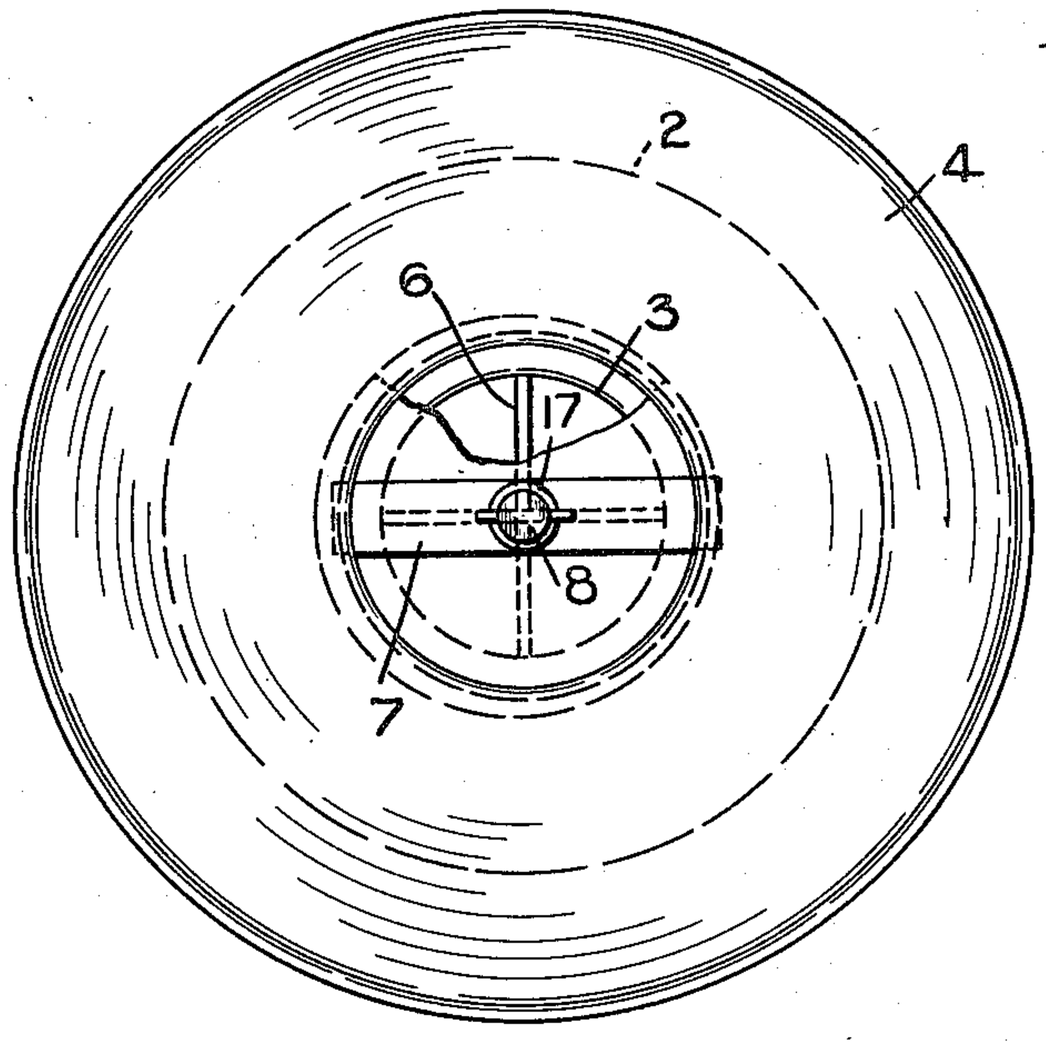
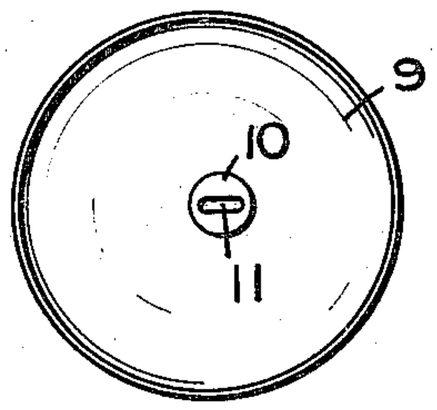


Fig. 3.



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2,022,143

VENTILATOR

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5 Claims. (Cl. 98—42)

My invention relates to improvements in ventilators, and the object of the invention is to devise means for controlling the up-draught in vent pipes used for expelling vitiated air from rooms so that the same may be substantially constant irrespective of the velocity of the up-current of air.

A further object is to provide adjustable means for controlling the size of the vent pipe inlet whereby upon the velocity of the up-current of air increasing beyond a predetermined point the size of such inlet is commensurately reduced and may be closed altogether when the velocity is excessive.

A still further object is to devise means whereby the size of the inlet to the vent pipe is reduced or closed altogether upon a back draught being present in the pipe, and another object is to provide tell-tale means for showing that the device is operating and the vitiated air is being drawn out of the room.

With the above and other objects in view which will hereinafter appear as the specification proceeds, my invention consists, in its preferred form, of the construction all as hereinafter more particularly described and illustrated in the accompanying drawing in which:—

Fig. 1 represents a vertical section through my device showing it connected to the inlet end of a vent pipe.

Fig. 2 is an inverted plan view.

Fig. 3 is a plan view of the valve member used in my device, and

Fig. 4 is a vertical section through a modified form of my apparatus showing the same inset into a ceiling recess and secured in position in connection with the inlet end of the vent pipe disposed in such recess.

Like characters of reference indicate corresponding parts in the different views.

Over the inlet of the vent pipe 1, I provide an open ended casing 2 which is preferably constructed of transparent material and of opposed conical form, its upper end 3 being connected to the vent pipe, as for instance, by providing a thread on each and screwing one into the other as illustrated in Fig. 1.

The lower end 4 of the casing is preferably flared to constitute an enlarged skirt. A vertically extending spindle 5 is disposed axially in the casing, being provided at its upper end with a cruciform member 6 adapted to engage the wall of the upper or outlet end of the casing and centre the spindle in position. The lower end of the spindle is threaded through a sleeve 17 in turn threaded into a spring clip 7 and said clip engages the wall of the casing in the vicinity of its lower or inlet end thus holding the spindle in position. The lower end of the spindle 5 may be provided with a knob 8 to rotate it and the cruciform member 6 which is rigidly secured thereto.

A valve 9 of very light material, for instance mica or celluloid, and of inverted cup-shape form, is provided with a central bushing 10 having a laterally elongated orifice 11 therethrough through which the spindle 5 freely extends. The bushing 10 may be slightly offset from the centre of the valve 9 and is laterally a loose fit on the spindle 5. Owing to the fact that the valve is a loose fit on the spindle and is eccentrically mounted thereon, it will tip up and down under the influence of variations in air velocity with the result that it will rock back and forth giving it a rotative or slowly spinning movement and depending upon the velocity of such current of air it will assume a balanced position in the casing controlling the amount of air delivered to the vent pipe. Should the velocity of the upwardly moving air be excessive the valve 9 will move upwardly until the bushing 10 engages the spring 12 depending from the cruciform member 6 around the spindle 5, compressing such spring and causing the valve to close the upper end of the casing 2 consequently shutting off the flow of air to the vent pipe.

Immediately the velocity of the up-draught falls the spring 12 will force down the valve 9 so that it ceases to close the upper end of the casing. In the event of a down-draught of air from the vent pipe through the casing 2, the valve 9 will be moved downwardly and provided the velocity of such down-draught is sufficient to cause the valve 9 to compress the spring 13, the former will close the lower end of the casing and prevent the downwardly moving air being projected into the room. To vary such downward closing position of the valve, the sleeve 17, to which the spring 13 is adapted to be connected, can be moved up or down by rotating the sleeve in the clip with the result that the spring 13 will engage the valve earlier or later and thus govern the amount the lower end of the casing is closed by such valve under the influence of the down-draught of air.

By turning the spindle 5 by means of the knob 8 so that it is moved downwardly, the cruciform member 6 attached thereto will be correspondingly moved downwardly so that the valve 9, by abutting against the spring 12, even if the latter

is compressed, will be prevented from shutting the upper end of the casing entirely and such adjustment may, at will, vary the size of the opening left in the case of an excessive up-draught of air.

The device can be readily assembled and disassembled for cleaning or repair by merely disengaging the clip 7 and drawing down the spindle 5 and its attached parts through the lower end of the casing and finally unscrewing said casing from the vent pipe. Alternatively, the casing may be removed with the parts in position therein and the latter removed subsequently.

The form of the invention illustrated in Fig. 4 of the drawing only differs from the form shown in the other figures in that the casing 2 is held in place in connection with the vent pipe 1 by means of a ring 14 provided with a resilient washer 15 engaging the lip of the lower end 4 of such casing, said ring being suitably attached to the ceiling of the room, as for instance by the screws 16. By detaching the ring 14 the casing with the assembled parts therein can be removed, or such parts can also in this case be removed alone.

The provision of a rotating valve constitues a tell-tale for indicating by its operation that the vitiated air is being dispelled from the room. It also obviates the liability of the valve sticking on the spindle due to the deposit of dust from the dust laden air passing through the device. The fact that the valve may be disposed slightly off centre does not impair the efficiency of operation of the apparatus as it is not essential that the valve seat accurately.

From the above description it will be apparent that I have devised a simple, effective and comparatively cheap apparatus for controlling the up-draught of air to ventilator vent pipes so that the same is substantially constant and which will, at the same time, prevent any down-draught of any appreciable velocity. Moreover, I have constructed a device which can be readily assembled taken apart so as to be effectively cleaned and which will, therefore, be extremely hygienic.

What I claim as my invention is:—

1. A device of the character described comprising an open ended casing including an axial inlet and outlet, a spindle axially supported therein, and an eccentrically disposed valve loosely rotatably and slidably mounted on the spindle and movable longitudinally in the casing to alternatively constrict the size of the air outlet and inlet thereof, said valve being capable of rocking movement on the spindle under the influence of the air passing through the casing.

2. A device of the character described comprising an open ended casing including an axial inlet and outlet and tapering inwardly toward its air inlet and outlet ends, a spindle axially supported in the casing, and an eccentrically disposed valve loosely rotatably and slidably mounted on the spinde for alternatively constricting the size of the outlet and inlet end of the casing, said valve being capable of rocking movement on the spindle under the influence of the air passing through the casing.

3. A device as claimed in claim 2 wherein a member attached to one end of the spindle centres it in the air outlet end of the casing and a spring clip through which it extends centres it in the air inlet end of the casing, said spring clip engaging the casing wall.

4. A device as claimed in claim 2 wherein a member attached to one end of the spindle centres it in the air outlet end of the casing and a spring clip through which it extends centres it in the air inlet end of the casing, said spring clip engaging the casing wall, and means for permitting the spindle to be moved longitudinally in the casing whereby the member attached to one end of such spindle constitutes a stop to limit the closing of the air outlet of the casing by the valve.

5. A device of the character described comprising a casing including an axial air inlet and outlet in its opposed ends, said casing tapering from an intermediate point in its body towards the inlet and outlet, an axial spindle in the casing, a vertically slidable valve on said spindle alternatively to close the inlet and outlet, and adjustable means on the spindle for limiting the vertical movement of the valve.

WILLIAM HEYWOOD MOTTERSHALL.