

Jan. 22, 1935.

J. R. HOWARD

1,989,010

VENTILATOR OPERATOR

Filed Oct. 27, 1930

Fig. 1.

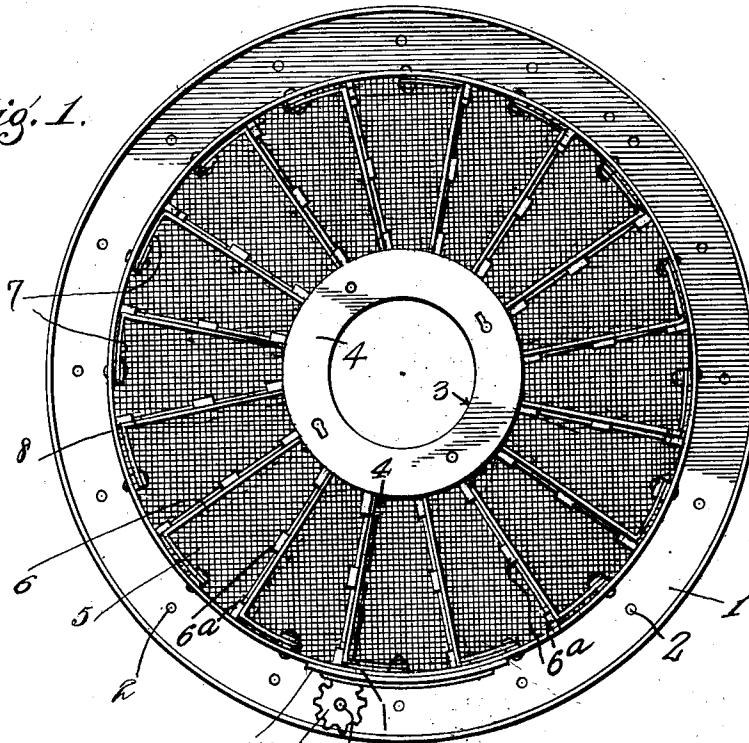


Fig. 2.

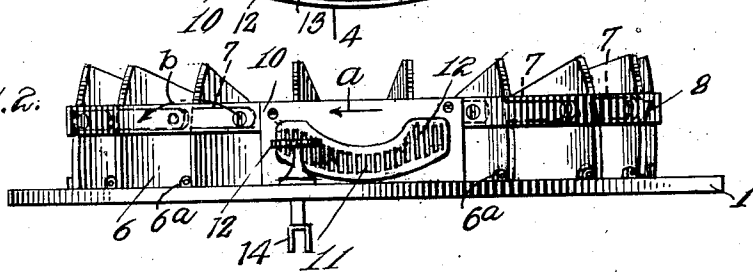


Fig. 3.

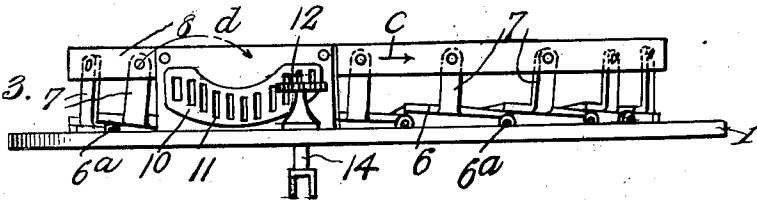
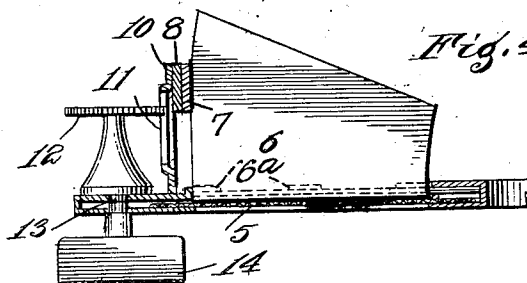


Fig. 4.



WITNESS
J. H. Taylor

INVENTOR
J. R. Howard
BY *Wm. L. Les.*
ATTORNEY

UNITED STATES PATENT OFFICE

1,989,010

VENTILATOR OPERATOR

James Robert Howard, Tulsa, Okla.

Application October 27, 1930, Serial No. 491,549

4 Claims. (Cl. 98-111)

This invention relates to ventilators and more particularly to operators for ventilators.

A primary object of the invention is to provide a ventilator in which the actuating movement of a plurality of hinged vanes is compensated for by the mode of construction and operation of the band which connects them.

Another object of the invention is to actuate a plurality of radially hinged vanes and an annular band pivotally connected with the vanes, by a rack and gear the rack being conveniently of arc shape to conform to the composite circular and arcuate turning of the band due to its articulations.

This invention is designed as an improvement over my Patent No. 1,735,760 dated November 12, 1929 in which the ventilator construction is the same as that shown therein means for operating the ventilator constituting the new invention.

In carrying out these objects, the invention is susceptible of a wide range of modification without departing from the spirit or sacrificing any of the advantages of the claimed invention; there being shown in the drawing for illustrative purposes a preferred and practical form, in which:

Figure 1 represents a plan view of a ventilator equipped with the improved apparatus constituting this invention with the slats open;

Fig. 2 is a side elevation thereof with the ventilating slats shown in open position;

Fig. 3 is a similar view with the slats shown closed; and

Fig. 4 is an enlarged detail transverse section taken on the line 4-4 of Fig. 1.

The ventilator in connection with which this improved actuating or operating device is shown applied is designed for application to the ceiling or side wall of a room or building, it being understood that a hole is cut in the wall to accommodate the ventilator. This ventilator comprises a circular plate or frame 1 provided with a plurality of peripherally spaced apertures 2 for attachment of the frame to a suitable support. A central opening 3 is shown for the passage therethrough of a lighting fixture if desired and around this opening is an annular frame 4 against which the fixture plate, not shown, is designed to fit. It is of course understood that if lights or fixtures are not to be used in connection with the ventilator that the central opening will be closed by a suitable closure, not shown.

A suitable wire screen 5 is attached to the under side of the ventilator to prevent the entrance of insects and the like. A plurality of vanes or shutters 6, hinged at 6^a, is arranged radially be-

tween the frames 1 and 4 any desired number of which shutters may be used. Each of these shutters has a right angular laterally extending arm 7 at its outer end approximately midway the width thereof. These arms are pivoted at their free ends to an annular band 8 herein termed a "rotary ring." It will thus be seen that the mounted shutters fit radially between the two frames 1 and 4 and hinges 6^a connect them to swing vertically into open or closed position. When closed the free edge of one will overlap the hinged edge of the next as shown clearly in Fig. 3. The arms 7 of the shutters are made of flexible or springy material to take care of variations in the movement of the shutters and thus enable them to work smoothly, although the band is particularly designed to adapt itself to the movement of the vanes as it turns them to open and closed positions. By this construction when the band or ring 8 is moved horizontally in a circular direction, (arrow *a*, Fig. 2), pull exerted thereby on the arms 7 of the shutters, (arrow *b*, Fig. 2), will cause them to swing vertically in a circular direction to close them, or to open them should the direction of the band be reversed as denoted by arrows *c* and *d* in Figure 3, the band 8 moving in a composite circular and arcuate direction no matter in which direction it be turned.

The operating means for opening and closing these shutters which constitutes this invention comprises a plate 10 fixed to the band 8 and which extends down adjacent to and abuts the frame 1 when the shutters are either open or closed. The plate 10 thus provides stop means resting on the frame 1 and limiting the opening and closing movements of the band 8.

Carried by the plate 10 is a rack bar 11 which is made arc-shaped with the convex portion facing downwardly and is designed to be engaged by a gear or cog 12 mounted on a rotatable shaft 13 journaled in the frame 1. When this gear is turned by means of the hand grip 14 it operates to move the shutter carried band 8. Since this band is pivoted to the shutters and the shutters are hinged mounted it follows that the band will move in a composite circular and vertically arcuate direction causing a pull to be exerted on the arms 7 of the shutters and swing the shutters vertically in a circular direction to either open or close them according to the direction in which the gear wheel is turned. The teeth of the rack are shorter in length at the center of the rack than at the outer ends and therefore will not bend as easily as if the rack were of rectangular form. The gear-carried shaft 13 has the hand grip

14 thereof shown in the form of a handle U-shaped in cross section so that when necessary an implement may be inserted to operate the shutter band when it is located out of reach of the

5 hand of the operator.

It is to be observed that the power from the ring is applied to the shutters at pivotal points, never less than half the width of the shutter, thereby giving more leverage and requiring less power to operate than if said points were located closer to the shutter hinges 6^a. The attachment of the rotary ring directly to the shutters by means of loose rivets renders the shutters positive in action and enables them to operate in unison and

15 to be stopped, either in opening or closing, at any intermediate point thereby permitting adjustment to any desired opening.

Without further description it is thought that the features and advantages of the invention will be readily apparent to those skilled in the art, and it will, of course, be understood that changes in the form, proportion and minor details of construction will be resorted to, without departing from the spirit of the invention or its scope as

25 claimed.

I claim:

1. In a ventilator or the like a frame, a plurality of radially disposed vanes hinged for movement toward and away from the frame, an arm fixed to each vane and extending at right angles thereto, a ring encircling the vanes and having pivotal connection with the arms, a rack carried by and curved in the direction of the ring, the teeth of the rack being positioned on a curve with

35 the curved portion facing the frame, and a pinion carried by the frame and meshing with said rack.

2. A ventilator or the like comprising a frame, a vane hinged to move toward and away from the frame, a horizontally and vertically movable vane operating band, a connection between said band and vane whereby the opening and closing of the vane is controlled by the movement of the band, a plate carried by the band and having a series of teeth positioned on a curve with the convex portion facing the frame, and a pinion carried by the frame and meshing with said teeth.

3. A ventilator or the like comprising a frame, a vane hinged to move toward and away from the frame, a horizontally and vertically movable vane operating band, a connection between said band and vane whereby the opening and closing of the vane is controlled by the movement of the band, a plate carried by the band and having a series of teeth positioned on a curve with the convex portion facing the frame, and a pinion carried by the frame and meshing with said teeth, said plate being arranged so that its lower edge will abut said frame and limit the opening and closing movements of the vane.

4. A ventilator comprising a frame, vanes and hinge means connecting them with the frame, an annular vane operating member and pivot means connecting it with the vanes, a rack mounted on said member, and a pinion in mesh with the rack and mounted on the frame, said rack being arcuate longitudinally along the band and having its teeth positioned on a curve upright to the frame, said teeth being shorter in the middle of the rack than at the ends.

JAMES ROBERT HOWARD.