Nov. 8, 1955 P. ARGENTIERI ET AL 2,722,880

DISC DAMPER FOR DIFFUSERS AND THE LIKE

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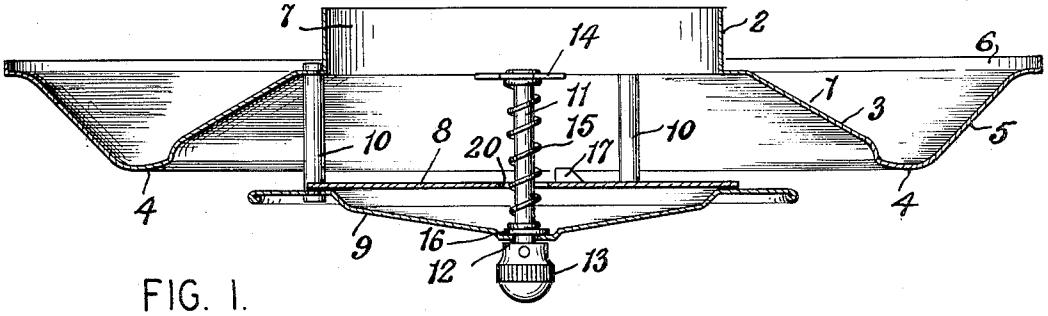


FIG. 1.

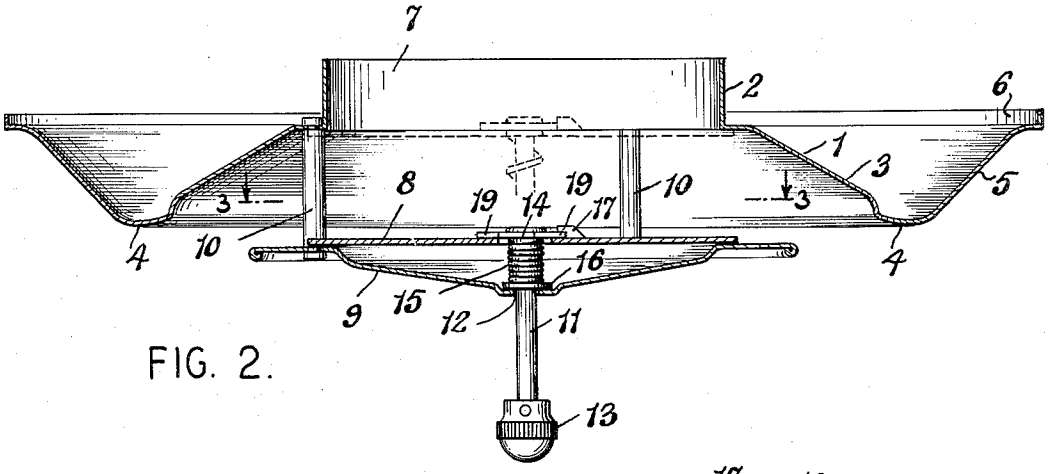


FIG. 2.

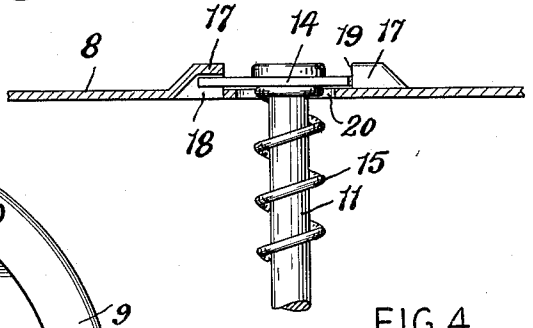


FIG. 4.

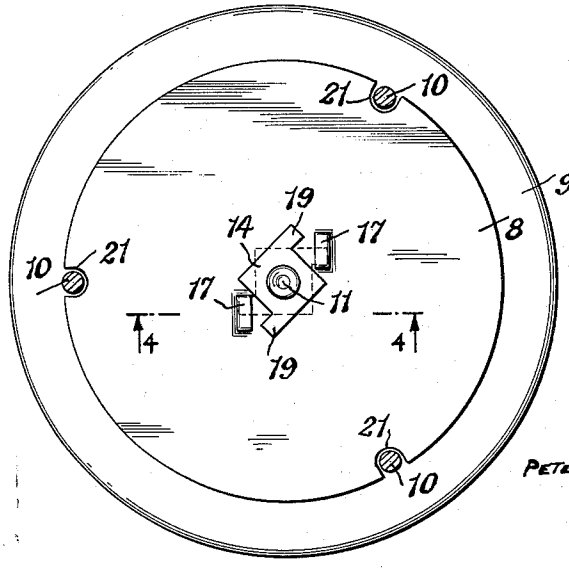


FIG. 3.

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DISC DAMPER FOR DIFFUSERS AND THE LIKE

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7 Claims. (Cl. 98—40)

This invention relates to diffusers of the character generally employed at the outlets of air conditioning systems, and more particularly to damper or closure means for use in closing or opening the outlet of the diffuser.

It is an object of the invention to provide means by which the outlet passage through the diffuser can be readily opened or else completely closed by means of a damper plate moved to open or closed position by a relatively simple, easily-operated device, unlikely to get out of order and operated manually with a minimum of effort.

More particularly, the invention contemplates the provision of an air outlet provided by a diffuser housing and to which is secured a fixed diffuser plate. A movable damper plate is located between the outlet and the diffuser plate, which damper plate is adapted to be urged into closed position by a spring operative between the diffuser plate and one end of an operating spindle, said spindle having means by which it may be selectively coupled to the damper plate so that the spring may be either effective to move the damper plate to closed position or else will be ineffective against the damper plate and will permit the damper plate to remain open.

With these and other objects to be hereinafter set forth, in view, I have devised the arrangement of parts to be described and more particularly pointed out in the claims appended hereto.

In the accompanying drawing, wherein an illustrative embodiment of the invention is disclosed,

Fig. 1 is a vertical sectional view through a diffuser provided with the improved damper construction, the damper being shown in its open position.

Fig. 2 is a similar sectional view, showing the damper engaged by the operating spindle and about to be moved to closed position;

Fig. 3 is a sectional view, taken substantially on the line 3—3 of Fig. 2, looking in the direction of the arrows; and

Fig. 4 is a sectional view, taken substantially on the line 4—4 of Fig. 3, looking in the direction of the arrows.

Referring to the drawing, 1 generally indicates a diffuser housing of the type often employed in connection with air-conditioning systems. The housing 1 includes a collar 2 extended into the air outlet in the ceiling or wall of the building or structure in which the system is embodied. The housing also includes the outwardly and laterally-inclined deflector wall 3, which has a return bend 4 and an upwardly flared part 5 which terminates in the circumferential flange 6 located against the ceiling.

The collar 2 defines an outlet passage 7 through which the air flow passes and a movable, disk-shaped plate 8 constituting a damper is adapted to be moved in position to either close this outlet 7, as shown in dotted lines in Fig. 2, or else to a position to permit the outlet 7 to be open, as shown in Fig. 1. A fixed diffuser plate 9 is located in registration with the outlet 7 but is held spaced therefrom in the known manner by means of the spacers 10.

A spindle 11 is longitudinally slidable through a central opening 12 in the diffuser plate 9, said spindle having a knob 13 secured on one of its ends, and a plate 14 secured on its other or upper end. A coil spring 15 encircles the spindle 11 and one end of the spring bears against the under side of the plate 14 while the opposite end of the spring bears against a washer 16 seated on the upper face of the diffuser plate 9 around the central opening 12 in said plate. The spindle 11 is slidable through said washer which remains constantly seated on the diffuser plate 9.

Provided on the upper face of the damper plate 8 is a pair of spaced lugs 17 which may be formed by being stamped or pressed out of the body of the damper plate, or produced on the top of the damper plate 8 in any other feasible manner. Each of these lugs 17 forms a recess 18 into which one or the other of two ears 19 formed on the opposite side edges of the plate 14 can enter when the spindle is rotated slightly as shown in Fig. 4. The damper plate 8 is provided with a central opening 20 through which the spindle is axially slidable at times when the spindle is uncoupled from the plate 8.

From the foregoing, the operation of the improved damper control mechanism will be readily understood. In Fig. 1 it will be seen that the damper plate 8 is in its open position and is at this time spaced away from the outlet opening 7 and thus does not impede the flow of air therefrom. The damper plate 8 is shown resting upon the diffuser plate 9, while the coil spring 15 is in its extended position and is holding the spindle 11 elevated and free of the damper plate. To close the damper, the spindle is grasped by the knob 13 and is drawn downwardly against the pressure of the spring 15. As a result, the spring 15 will be compressed as shown in Fig. 2, until the plate 14 is brought into contact with the damper plate 8. When this point in the descent of the spindle 11 is reached, the knob 13 is then rotated sufficiently to cause the plate 14 to be turned to an extent necessary to bring its ears 19 into the recesses 18 in the lugs 17. This establishes a coupling between the spindle 11 and the damper plate 8. Hence, when downward pull on the knob 13 is released, the spindle 11 will be elevated, and being coupled to the plate 8 as above described, will elevate the plate 8 and bring it into closed position over the outlet 7 as shown in dotted lines in Fig. 2.

When it is desired to bring the damper plate 8 to its open position, or that shown in Fig. 1, the knob 13 is grasped and pulled downwardly to thereby draw down the spindle 11 until the damper plate 8 reaches and contacts with the diffuser plate 9. To allow the damper plate to remain in this lowered or open position, the knob 13 is then rotated to disengage the ears 19 from the lugs 17 and shown in Fig. 3. When the spindle has been thus uncoupled from the damper plate and pull on the knob 13 is discontinued, the spring 15 will become effective to elevate the spindle to the position shown in Fig. 1 while the damper plate remains in its lowered or open position, resting upon the diffuser plate 9.

The damper plate 8 is guided in its vertical movements by means of the notches 21 provided in its peripheral edge, which notches fit around the spacers 10. This arrangement, while permitting the raising and lowering of the damper plate 8, prevents rotative movement of the same.

Having described a single embodiment of the invention, it is obvious that the same is not to be restricted thereto, but is broad enough to cover all structures coming within the scope of the annexed claims.

What I claim is:

1. A diffuser housing having an outlet, a diffuser plate located thereover and spaced therefrom, a damper plate located between the diffuser plate and the outlet and movable to cover or uncover the outlet, an operating spindle

axially movable through and guided by an opening in the diffuser plate, spring means for normally urging the spindle toward the outlet, and coupling means on the spindle and on the damper plate by which the spindle can be coupled to the damper plate whereby the spring means, upon movement of the spindle toward the outlet, will move the spindle and the damper plate together and will bring the damper plate to a position to cover said outlet.

2. A diffuser having an outlet, an apertured damper plate movable toward or away from the outlet, an operating element movable through the aperture in the damper plate and movable toward or away from the outlet, means for guiding the operating element in such movement, spring means for normally urging the operating element in a direction toward the outlet, said operating element being capable of such movement independently of movement of the damper plate, and cooperating means on the operating element and damper plate by which the operating element can be coupled to the damper plate so that said damper plate will be moved to closed position over the outlet when the damper plate and operating element are in coupled relation and the spring means urges the operating element in a direction toward said outlet.

3. A diffuser having a housing provided with an air outlet, a diffuser plate spaced from the outlet and maintained in such spaced relation thereto by spacing elements, a damper plate located between the diffuser plate and the outlet and movable to or from the outlet and guided in such movement by said spacing elements, a spindle axially slidable through an aperture in the diffuser plate, a spring surrounding the spindle, a head on one end of the spindle, the spring being located between said head and the diffuser plate, the spring having one end in engagement with the head and its other end engaging the diffuser plate and being normally effective to urge the spindle axially and in a direction toward the outlet and independently of the damper plate, and coupling elements provided on the damper plate for engagement with the head on the spindle upon rotative movement of the spindle to thereby couple the head to the damper plate and enable said damper plate to be moved by the spring in company with the spindle toward and into position to cover the outlet opening.

4. A diffuser having a housing provided with an air outlet, a disk-shaped diffuser plate spaced from the outlet and maintained in such spaced relation thereby by spacing elements, a disk-shaped damper plate movable to or from the outlet and having notches in its peripheral edge fitting around said spacing elements to thereby cause the damper plate to be guided in its movements toward and away from the outlet, the damper plate being located between the diffuser plate and the outlet, a spindle axially slidable through an aperture in the diffuser plate, said spindle having a knob at one end and a locking plate at its other end, said locking plate having projecting ends and being located between the damper and the outlet, a coil spring encircling the spindle and having one end disposed

against the locking plate and its other end arranged against the diffuser plate, said spring being effective to normally urge the spindle toward the air outlet and the damper plate having a central opening through which the spindle is axially movable, the damper plate having raised lugs on its upper face for engagement with the ears on the locking plate upon rotative movement of the spindle to thereby couple the spindle and the damper plate together and permit the spring to move the spindle and damper plate coupled thereto together toward the outlet to cause the damper plate to cover said outlet.

5. A diffuser housing having an outlet, a diffuser plate thereover, a damper plate located between the diffuser plate and the outlet and movable to cover or uncover the outlet, an operating spindle movable through the diffuser plate, the damper plate having a central opening through which the spindle is axially movable, spring means for normally urging the spindle toward the outlet, and coupling means by which the spindle may be coupled to or uncoupled from the damper plate to thereby permit said spindle to be either moved in company with, or independent of, the damper plate as said spindle is moved toward or away from the outlet.

6. A diffuser having an outlet, a diffuser plate located over but spaced away from the outlet, a spindle axially slidable through an opening in the diffuser plate, said spindle having a head at one end, a disk-shaped damper plate located between the diffuser plate and the outlet, said diffuser plate being movable toward and away from the outlet, a spring surrounding the spindle and interposed between the head thereon and the diffuser plate and in engagement with said head and diffuser plate and because of said engagement acting to urge the spindle in a direction toward the outlet, said spindle being normally so urged by the spring independently of the damper plate, and means by which the head on the spindle can be coupled to the damper plate to thereby cause the damper plate to be moved to closed position over the outlet by the spring as said spring acts to urge the spindle in a direction toward the outlet opening.

7. In a diffuser plate as provided for in claim 6, wherein the means which couples the spindle to the damper plate consists in the head on the spindle in the form of a plate having radial ears, lugs on the damper plate for cooperation with said ears and under which said ears extend when the spindle is rotatively moved while the spindle plate thereon is positioned adjacent to the damper plate and the spring is compressed.

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