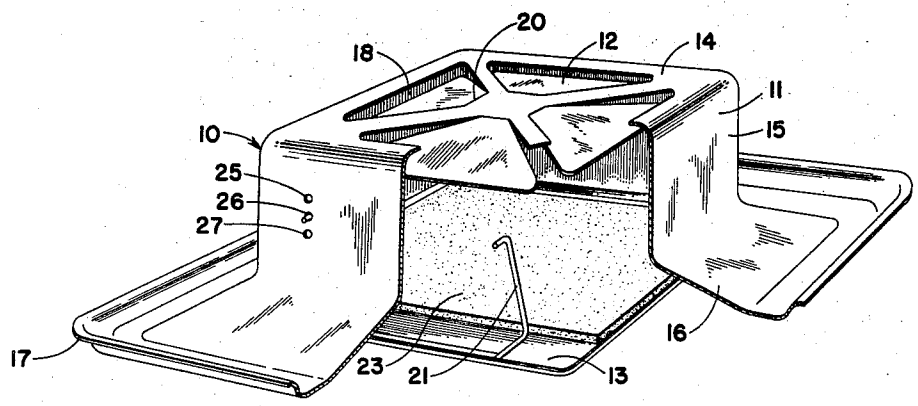
Nov. 4, 1958 H. F. LATHROP 2,858,760

DIFFUSER

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Fig. 1.



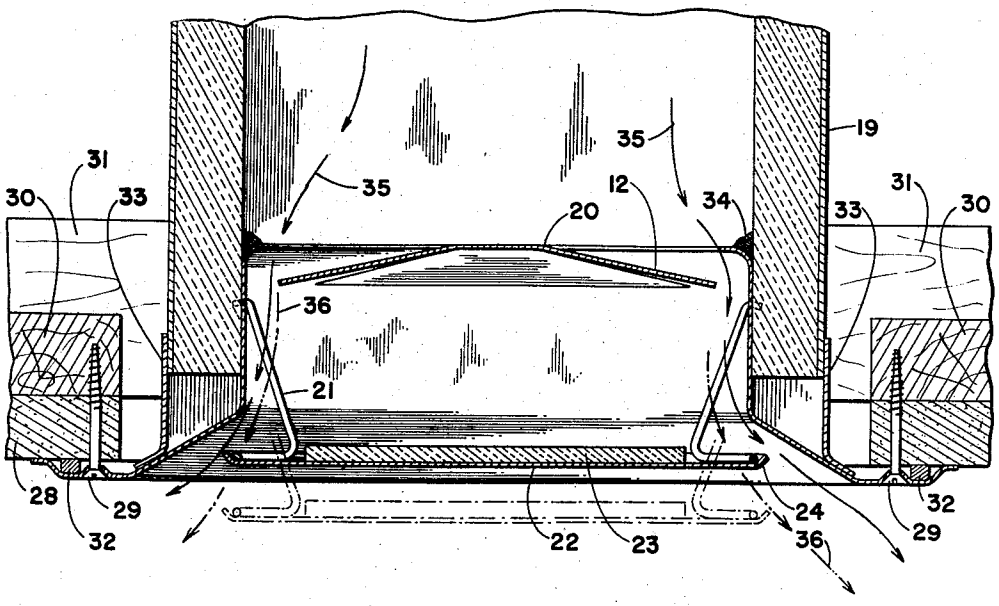


Fig. 2.

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DIFFUSER

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4 Claims. (Cl. 98—40)

This invention relates to improvements in a diffuser assembly or the like used in connection with air distribution systems.

Considerable resistance is added to an air distribution system due to registers, diffusers or the like, and frequently it becomes necessary to deviate from the conventional design of registers and diffusers in order to reduce the high resistance of an air distribution system. Therefore, by reducing the air resistance, a smaller centrifugal fan motor can be used, and reducing the initial cost of installation. By using the smaller centrifugal fan and motor, the operating costs of the air distribution system will be greatly reduced. With this invention, the overall air resistance is greatly reduced. Therefore, by using this invention, the initial installation costs and operating costs are greatly reduced.

In the prior art, a diffuser or register could be manually adjusted to control the quantity of air and direction of air by changing the arrangement of the deflectors and baffles, therefore changing the outward appearance. This invention provides for a diffuser or register to be manually adjusted to control the quantity and direction of air without changing the outward appearance as in the prior art.

An object of this invention is to provide a diffuser which is constructed with a minimum number of parts.

Another object of this invention is to reduce the resistance to air flow through the diffuser.

A further object of this invention is to provide means for controlling the quantity of air flow.

Still another object of this invention is to provide a diffuser with individually adjustable deflectors to regulate the quantity of flow in more than one direction.

Yet another object of this invention is to provide a diffuser whereby the direction of air flow is adjustable.

A further object of this invention is to provide a diffuser which is flush mounted with the ceiling.

Another object of this invention is to provide a diffuser with an attractive and unobtrusive appearance.

A further object of this invention is to provide a diffuser through which the flow of air may be blocked off or stopped by a simple arrangement of integral bendable deflectors.

Still a further object of this invention is to provide a diffuser which attaches directly to the supply air duct, therefore reducing the air leakage.

Another object of this invention is to provide a diffuser which does not change in outward appearance due to adjustments for quantity, direction, and throw of air.

Yet another object of this invention is to provide a diffuser where the throw of air is controlled.

Still another object of this invention is to provide a diffuser with sound absorbent material to reduce noise due to air velocity.

A further object of this invention is to provide a diffuser which has no moving parts, therefore needs no servicing after the air distribution system is balanced.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings wherein the preferred form of the invention is clearly shown.

In the drawings:

Figure 1 is a perspective view partially cutaway showing my diffuser and the arrangement of deflectors and the baffle, and

Figure 2 is a vertical cross-sectional view showing the diffuser mounted in the ceiling and attached to an air supply duct.

Referring more particularly to the drawings and to the form of this invention shown in Figures 1 and 2, there is illustrated a diffuser **10** which includes the casing **11**, deflectors **12**, and an adjustable baffle **13**.

The casing **11** includes the top or inner end wall **14**, side walls **15** which have a peripheral marginal flare **16** to which a peripheral integral flange **17** is attached. The top wall **14** of the casing **11** encloses a series of orifices **18** which are the air inlet openings. The side walls **15** form an air passage-way from the supply duct **19** into the space which is to be air conditioned or ventilated. The casing **11**, the top wall **14**, the side walls **15**, and the deflectors **12** are of a one-piece construction.

The deflectors **12** are stamped from the top wall **14** leaving side **20** of the deflectors **12** attached to the top wall **14** at the center. The deflectors **12** may be bent downwardly to vary the quantity of air.

An adjustable baffle **13** is mounted transverely of the air flow outlet and is employed to adjust the throw of air. The adjustable baffle **13** includes resilient mountings **21**, the plate **22**, and sound absorbent material **23**. The resilient mountings **21** are of a U angular shape and are spot welded to the plate **22**. The plate **22** includes an upwardly turned peripheral flange **24** to conceal the resilient mountings **21**. A layer of sound absorbent material **23** is mounted upon the plate **22** of the baffle **13** to reduce air velocity noise. The adjustable baffle **13** is mounted into the diffuser **10** by the resilient mountings **21** fitting into the holes **25**, **26**, and **27** of the side walls **15**. Holes **25**, **26**, and **27** align with an identical set of holes in the opposite wall. The adjustable baffle **13** is mounted by the holes **25** for maximum throw of air, and when the adjustable baffle is mounted by holes **27** the throw of air is minimum. The holes **26** are for intermediate throw of air.

The casing **11** is mounted through a rough opening in the ceiling **28** and secured therein with wood screws **29**. The wood screws **29** protrude through the ceiling **28** and engage in a wooden framing **30** installed between the ceiling joists **31**. A gasket **32** seals the space between the diffuser **10** and the ceiling **28**. The supply duct **19** is then slipped over the casing **11** and is secured in place by pressure sensitive tape **33**. The inside of the supply duct **19** is sealed to the casing **11** with caulking compound **34**, thereby reducing the air leakage between the diffuser **10** and the supply duct **19**. Although this invention is shown as using a Fiberglas duct, it is well adapted to other types of duct.

The deflectors **12** have a two-fold purpose—first, to control the quantity of air; secondly, to control the direction of air. To increase the quantity of air, the deflectors **12** may be bent downwardly, thereby allowing more air to pass through the orifices **18**. The deflectors **12** are individually adjustable and by closing off one or more of the deflectors **12** by bending upwardly, the direction of flow of air through the diffuser may be controlled. The diffuser **10** may be completely closed by bending the deflectors **12** upwardly and closing the orifices **18**, whereby no air would pass through the diffuser **10**.

The adjustable baffle **13** controls the throw of air from the diffuser **10**. Throw of air is defined as the angular deflection of air leaving the diffuser **10** with respect to its initial direction as it comes from the supply duct **19**,

Maximum throw results in maximum spread or coverage of air over the room. Minimum throw results in almost a vertical downward discharge of air from the diffuser. When the resilient mountings **21** are engaged in the top set of holes **25** in the side walls **15** of the casing **11**, the throw of air is maximum. When the resilient mountings **21** are engaged in the bottom set of holes **27** of the side walls **15** of the casing **11**, the air throw is minimum. When the resilient mountings **21** are engaged in the middle set of holes **26** of the side walls **15** of the casing **11**, the air throw is between maximum and minimum. Referring more particularly to Figure 2 of the drawings, the solid arrows **35** indicate the maximum air throw from the diffuser **10**, and the dotted arrows **36** indicate the minimum air throw from the diffuser **10**.

Therefore, by adjusting the deflectors **12** and adjusting the baffle **13**, the quantity, direction, and the throw of air may be controlled.

Although this invention has been described with considerable particularity in connection with the illustrated embodiment, it is to be understood that the invention is not limited to the details of the construction or to the specific relations of parts there described, as many modifications will readily occur to those skilled in the art, and all such modifications as come within the scope of the appended claims and their equivalents are to be considered as being within the invention.

I claim as my invention:

1. In a diffuser for the outlet of an air duct, a casing substantially rectangular in plan open at its lower end and having flat side walls and a top wall, and substantially segmental deflectors cut from said top wall and integrally attached to the central portion thereof at their inner ends, said deflectors terminating short of said side walls and being individually bendable downwardly and inwardly of said casing within the height of the latter and to variable extent for varying the volume and angle of flow of air entering said casing through the openings in said top wall corresponding to said deflectors.

2. In a diffuser for the outlet of an air duct, a casing substantially rectangular in plan open at its lower end and having flat side walls and a top wall, and substantially segmental deflectors cut from said top wall and integrally attached to the central portion thereof at their inner ends, said deflectors being substantially aligned with and terminating short of said side walls and being individually bendable downwardly and inwardly of said casing within the height of the latter and to variable extent for varying the volume and angle of flow of air entering said casing through the openings in said top wall corresponding to said deflectors and effective for directing the entering air against said flat side walls.

3. In a diffuser for the outlet of an air duct, a casing open at its lower end and having a plurality of flat side walls and a flat top wall, and substantially segmental deflectors cut from said top wall and integrally attached to the central portion thereof at their inner ends, said deflectors being substantially aligned with and terminating short of said side walls, the outer ends of said deflectors being respectively substantially parallel with said side walls and said deflectors being individually bendable downwardly and inwardly of said casing within the height of the latter and to variable extent for varying the volume and angle of flow of air entering said casing through the openings in said top wall corresponding to said deflectors and effective for directing the entering air against said flat side walls.

4. In a diffuser for the outlet of an air duct, a casing substantially square in plan open at its lower end and having flat side walls and a flat top wall, and four substantially segmental deflectors cut from said top wall and integrally attached to the central portion thereof at their inner ends, said deflectors being substantially aligned with and terminating short of said side walls, the outer ends of said deflectors being respectively substantially parallel with said side walls and said deflectors being individually bendable downwardly and inwardly of said casing within the height of the latter and to variable extent for varying the volume and angle of flow of air entering said casing through the openings in said top wall corresponding to said deflectors and effective for directing the entering air against said flat side walls.

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