May 16, 1939. A. FEINBERG 2,158,413

DUAL DEFLECTOR ARRANGEMENT FOR VENTILATING SYSTEMS

Filed April 25, 1938

Fig. 1.

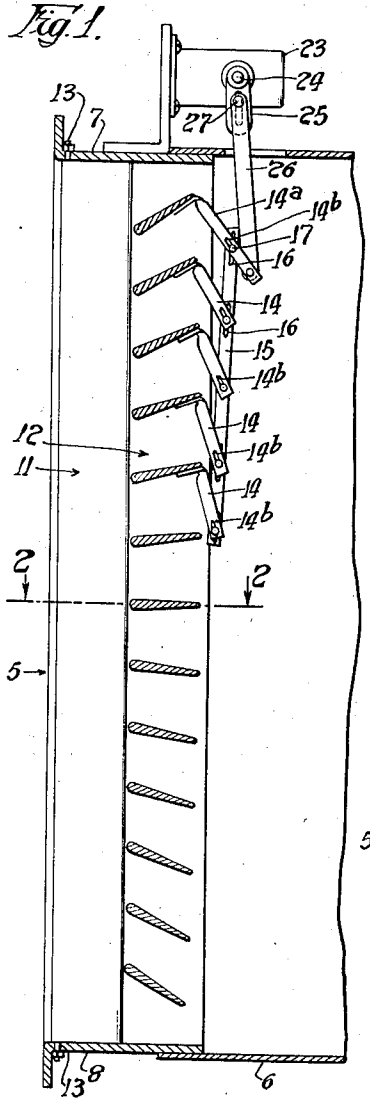


Fig. 2.

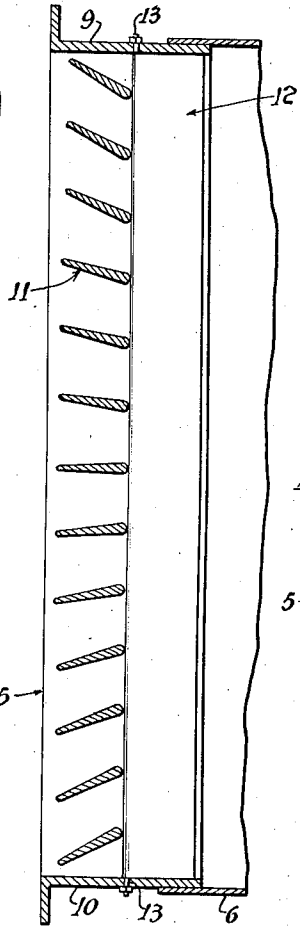


Fig. 3.

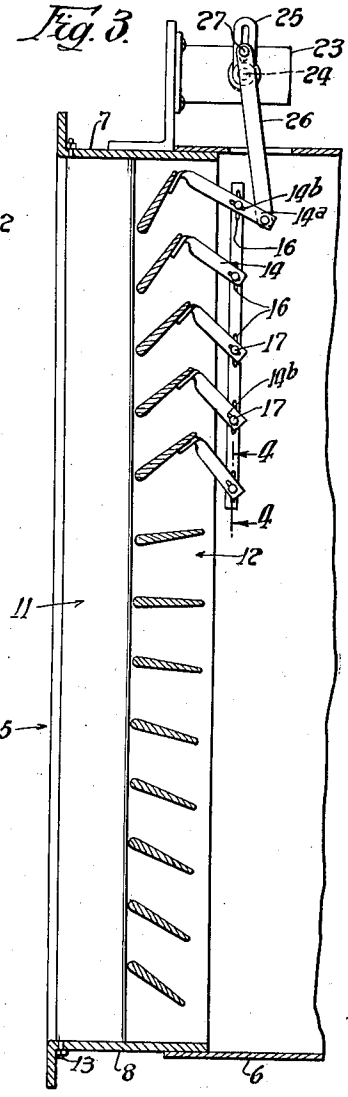
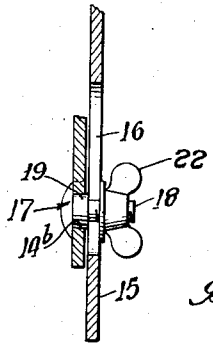


Fig. 4.



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DUAL DEFLECTOR ARRANGEMENT FOR VENTILATING SYSTEMS

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Application April 25, 1938, Serial No. 204,132

6 Claims. (Cl. 98—40)

This invention relates to improvements in dual deflector arrangements for ventilating systems and it consists of the matters hereinafter described and more particularly pointed out in the appended claims.

The deflector arrangement, with which the present invention is more particularly concerned, is of the kind comprising a set of vertically extending deflector blades and a set of horizontally extending deflector blades, the blades in each set being disposed at different relative edgewise angles so as to diffuse the air blast discharged therethrough upwardly, downwardly and laterally in opposite directions.

In such arrangements the horizontally placed blades expend most of the velocity and the pressure exerted by the air stream, into the overhead regions of the room or space being ventilated, above the breathing zone so that a turbulence of the air above said zone creates but a gentle turbulence below in the breathing zone. Such deflector arrangements are generally disposed in a high overhead position which makes it difficult to adjust the edgewise angle of any of the blades in the horizontal set to increase turbulence in the breathing zone from time to time as needed.

One of the objects of the present invention is to provide a deflector arrangement of this kind wherein it is possible to adjust the edgewise angle of a group of the horizontal blades to induce a greater or lesser turbulence in the breathing zone as will produce the desired cooling effect therein.

Another object of the invention is to provide improved means for connecting a group of the blades in one set at points between their ends for simultaneous movement by means of an actuator common to all of the blades in the group.

A further object of the invention is to provide in an arrangement of this kind, simple means whereby it is possible to adjust each blade in the group with respect to the actuator, whereby said group may be made to deflect the air into the breathing zone at that angle and in that volume which produces the desired turbulence in said zone.

Again, it is an object of the invention to provide means of this kind which holds the blades in the group to be adjusted, against vibration under the action of the air stream passing therethrough so that no objectionable noise is produced.

The above mentioned objects of the invention, as well as others, together with the advantages thereof will more fully appear as the specification proceeds.

In the drawing:

Fig. 1 is a vertical sectional view through a deflector arrangement for ventilating systems embodying the preferred form of the invention, and shows the deflector blades in the horizontal set disposed in their normal relative edgewise angular positions.

Fig. 2 is a horizontal sectional view through the improved deflector arrangement as taken on the line 2—2 of Fig. 1.

Fig. 3 is a fragmentary view similar to Fig. 1 and shows a group of the topmost blades in the horizontal set, moved into a different relative edgewise angular position, with respect to each other and to the other blades in said set.

Fig. 4 is a detail vertical sectional view through a part of the improved deflector arrangement on an enlarged scale as taken on the line 4—4 of Fig. 3.

The dual deflector arrangement includes a rectangular frame 5 open at the front and rear and adapted to be operatively connected to the discharge end of the air delivery duct 6 of a ventilator system. The frame as shown herein comprises horizontally disposed top and bottom members 7 and 8 respectively and upright side members 9 and 10 respectively, arranged with the edges parallel to the axis of the frame.

In said frame are front and rear sets of louvers 11 and 12 respectively in the form of relatively flat blades, the blades in one set all being arranged parallel and at a right angle to those in the other set and which are also parallel. As shown herein the blades of the front set are arranged vertically and the blades of the rear set are arranged horizontally. Each blade is provided at one edge with a rod 13, the ends of which extend through the associated frame members 7 and 8 or 9 and 10 respectively, as the case may be, to form the axes about which the blades in the respective sets may be swung into different edgewise angular positions. The middle blade in the front set stands in a plane parallel with the side members of the casing and those blades to each side thereof stand in oppositely disposed planes that radiate from a point spaced from but in the plane of the middle blade. The middle blade in the rear set stands in a plane parallel with the top and bottom members of the frame and those blades to each side thereof stand in oppositely disposed planes that radiate from a point spaced from but in the plane of the middle blade of that set. This arrangement of the blades in each set best appears in Figs. 1 and 2. The rods providing the trunnions before mentioned are each provided at one end with a nut

whereby the associated blade may be secured in the set position.

It is apparent that with such an arrangement of louvers or blades, the air discharged therefrom is diffused upwardly and downwardly by the horizontal blades and laterally to each side by the vertical blades.

To induce that turbulence in the breathing zone in the room being ventilated for the comfort of the patrons, it is necessary to change the deflection of certain of the blades in the horizontal set, to direct more of the discharged air downwardly toward that zone and in the present instance this may be accomplished in the following manner: A group of the blades in the horizontal set above the middle blade thereof, are each left loose enough on their rods **13** so that they may be turned about their front edges into different edgewise planes. Each blade of said group has fixed to its mid portion a rearwardly extending arm **14**, the arm associated with the top-most louver or blade in the group being made longer than those associated with the other blades and indicated herein as at **14***a* so as to project beyond the rear edge of the frame. As shown herein, said group includes the five topmost blades in the rear set **12** but the number of blades in said group may be varied to suit the size of the deflector arrangement as a whole.

An actuator bar **15** is operatively connected to all of the arms **14** and **14***a* so that when movement is imparted to the arm **14***a*, a like movement is imparted to all of said arms. The actuator bar **15** is provided with a plurality of longitudinal slots **16**, one for each arm **14**—**14***a*. A pivot pin **17** extends through each slot **16** in the bar **15** and through an elongated opening **14***b* in the associated arm to provide the operative connection therebetween. Preferably each pin has a shank **18** that extends through the slot **16**, a shoulder **19** of a diameter larger than the width of the slot **16** and a head **20** as best appears in Fig. 4. This shoulder **19**, which extends through the hole **14***b* in the associated arm **14**—**14***a* engages one face of the bar **15** and a nut **22** is threaded on the shank **18** to engage the other face of the bar **15**. Thus by loosening the nut, the bolt **17** may be adjusted lengthwise of the slot **16** and locked in the adjusted position without clamping the arm **14** so tight as to effect its movement on the shoulder **19**. Thus each blade in the group may be adjusted into the desired relation edgewise angle of inclination. It is to be noted that the arms **14**—**14***a* and the actuator bar **15** present their edges to the air blast passing through the deflector arrangement as a whole so that there is no tendency of the arms or the actuator to flap or vibrate or produce eddies which result in objectionable noises.

The bar **15** may be actuated from a remote point in any suitable manner and in the present instance the same is actuated electrically. Under such conditions, I mount a small motor **23** on the top member **7** of the frame and this motor is of the kind employed in actuating dampers or the like. Such motors are conventional and obtainable in the open market. The motor **23** includes a transverse rockshaft **24** carrying a slotted arm **25**. A link **26** connects this arm with the free end of the arm **14***a* before mentioned. The pivotal connection **27** between the arm **25** and the link **26** is an adjustable one, similar to that shown in Fig. 4 and previously described herein. The motor **23** may be controlled from a switch arranged conveniently for the operator.

Ordinarily the blades of the horizontal set of blades are disposed in the full line positions shown in Fig. 1. Thus the blades in this group stand in an angular edgewise position opposite that of the corresponding blades on the other side of the middle blade in the set. It is apparent, therefore, that the blades in the horizontal set direct the air both upwardly and downwardly.

When the occasion for deflecting more air downwardly arises, as when more turbulence is desired in the breathing zone, the motor **23** is energized. The arm **25** thereof will move the link **26** upwardly and through the arms **14**—**14***a* will change the edgewise angle of inclination of said blades in the group to a position having a steeper angle as appears in Fig. 3. They will then deflect more of the air stream downwardly to increase the turbulence of the air in the breathing zone. This position of the blades best appears in Fig. 3.

By changing the position of the pivot pins **17** in the slots **16** of the actuator bar **15**, it is possible to swing the blades in the group of movable blades in the horizontal set, into that position giving the desired results in the breathing zone. The deflector arrangement described is quiet and efficient in operation and cannot readily get out of order.

While in describing the invention I have referred in detail to the form and arrangement of the parts thereof, the same is to be considered only in the illustrative sense so that I do not desire to be limited thereto except as may be specifically pointed out in the appended claims.

I claim as my invention:

1. In a deflector arrangement for a ventilating system, the combination of a casing open at the front and rear and including side walls and top and bottom walls, front and rear sets of deflector blades in said casing with the blades in one set extending parallel with the side walls of the casing and with the blades in the other set extending parallel with the top and bottom walls of the casing, the blades in each set being inclined edgewise into substantially different angular inclinations, means providing a plurality of arms, each operatively connected to an associated blade of a group of blades in one set, means connecting all of said arms in said group together, and means providing an adjustable connection between each arm and said connecting means so that each blade in said group may be adjusted into different angles of edgewise inclination with respect to others in said group.

2. In a deflector arrangement for a ventilating system, the combination of a casing open at the front and rear and including side walls and top and bottom walls, front and rear sets of deflector blades in said casing with the blades in one set extending parallel with the side walls of the casing and with the blades in the other set extending parallel with the top and bottom walls of the casing, the blades in each set being inclined edgewise into substantially different angular inclinations, means providing a plurality of arms, each operatively connected to an associated blade of a group of blades in one set, means connecting all of said arms in said group together and means providing a pin and slot adjustable connection between each arm and said connecting means so that each blade in the group may be adjusted into different angles of edgewise inclination with respect to others in said group.

3. In a deflector arrangement for a ventilating

system, the combination of a casing open at the front and rear and including side walls and top and bottom walls, front and rear sets of deflector blades in said casing, with the blades in one set extending horizontally and with the blades in the other set extending vertically, the blades in each set being inclined edgewise into substantially different angular inclinations, means providing a plurality of arms each operatively connected to an associated blade of a group of horizontal blades in one set, means connecting all of said arms in said group together, and means providing an adjustable connection between each arm and said connecting means so that each blade in said group may be adjusted into different angles of edgewise inclination with respect to others in said group.

4. In a deflector arrangement for a ventilating system, the combination of a casing open at the front and rear and including side walls and top and bottom walls, front and rear sets of deflector blades in said casing with the blades in one set extending parallel with the side walls of the casing and with the blades in the other set extending parallel with the top and bottom walls of the casing, the blades in each set being inclined edgewise into substantially angular inclinations, means providing a plurality of arms, each operatively connected at one end to an associated one of a group of blades in one set, an actuator member common to the blades in said group of blades and having longitudinal slots therein, one for each arm, and means passing through the slots in said arms and in said actuator member respectively so that each blade in said group may be adjusted into different angles of edgewise inclination with respect to others in said group.

5. In a deflector arrangement for a ventilating system, the combination of a casing open at the front and rear and including side walls and top and bottom walls, front and rear sets of deflector blades in said casing with the blades in one set extending parallel with the side walls of the casing and with the blades in the other set extending parallel with the top and bottom walls of the casing, the blades in each set being inclined edgewise into substantially different angular inclinations, means providing a plurality of arms, each operatively connected at one end to an associated one of a group of blades in one set, one of said arms being longer than the other, a link pivotally connected at longitudinally spaced points to all of said arms, and means providing an actuator member pivotally connected to said long arm for imparting endwise movement thereto.

6. In a deflector arrangement for a ventilating system, the combination of a casing open at the front and rear and including side walls and top and bottom walls, front and rear sets of deflector blades in said casing with the blades in one set extending parallel with the side walls of the casing and with the blades in the other set extending parallel with the top and bottom walls of the casing, the blades in each set being inclined edgewise into substantially angular inclinations, means providing a plurality of arms, each operatively connected at one end to an associated one of a group of blades in one set, an actuator member common to the blades in said group of blades and having longitudinal slots therein, one for each arm, a pin providing a pivotal connection for each arm with said actuator member, each pin having shank extending through an associated slot in said actuator member and a shoulder on one side of said member that extends through an opening in the associated arm, and means on said shank for engagement with the other side of said actuator whereby said pin may be adjustably moved in said slot and clamped to the actuating member in the adjusting position.

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