

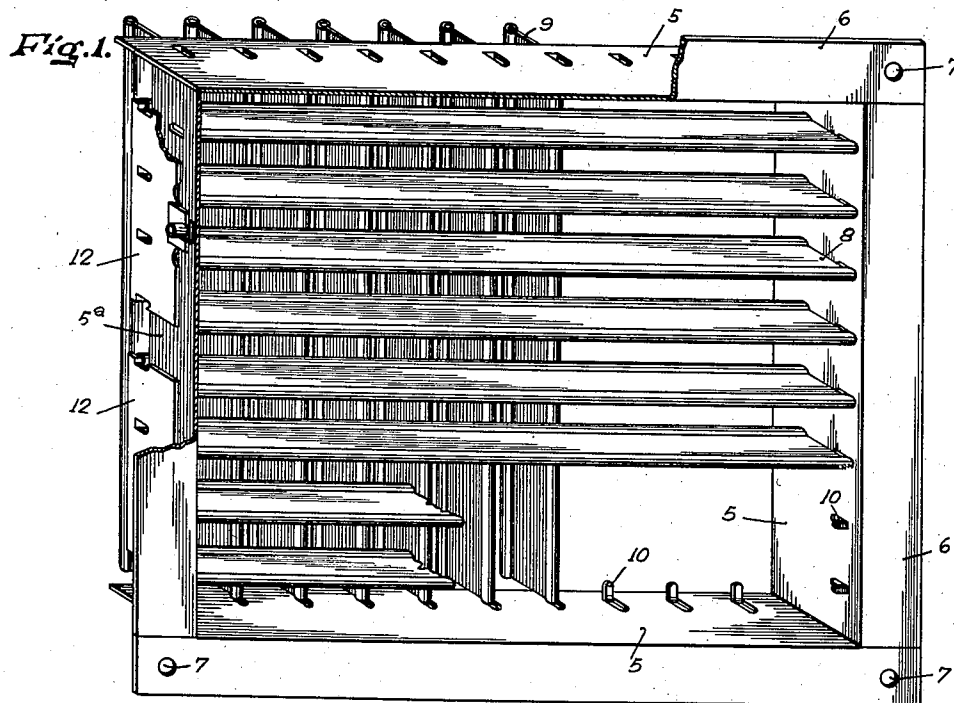
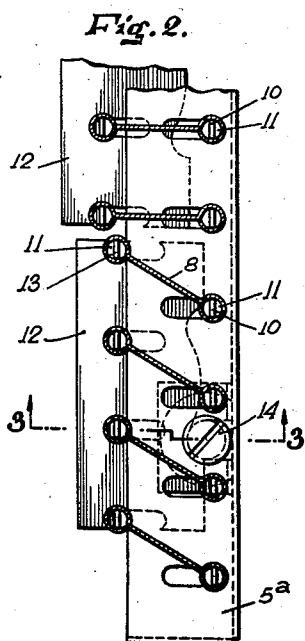
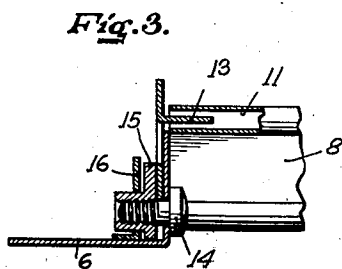
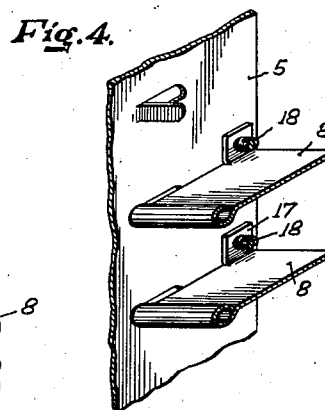
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OUTLET

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2,206,995

OUTLET

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3 Claims. (Cl. 98—40)

This invention relates to an improved method and means for introducing air into an enclosure.

In the art of air conditioning an enclosure, it is general practice to locate the refrigerating and conditioning apparatus at some point remote from the enclosure to be conditioned, as in the cellar or attic of the building. Fresh air or a mixture of fresh and return air is there conditioned, and then distributed, by means of suitable fans and duct work, to the various points at which it is to be introduced into the enclosure. It is important that the air should be discharged into the enclosure at a proper velocity, in the desired directions, and adequately distributed. Such distribution and circulation should not subject persons in the enclosure to drafts or streaks of cold air. Further, the air striking them should not have too high a velocity, and yet, should have sufficient air movement to impart a pleasant sensation to occupants of the conditioned area. Generally, it is desirable that persons in all parts of the enclosure should enjoy substantially the same atmospheric conditions.

As will be understood, each enclosure presents an individual problem of air distribution. Its size and shape, the height and contour of its ceiling, the number and location of seats within the enclosure, and the direction in which they face, the location of beams or fixtures, or of other impediments to circulation—all constitute factors affecting air distribution in the enclosure. Notwithstanding the experience of many persons skilled in the art, it is virtually impossible, generally, to design air distribution systems which do not require at least some adjustment at the time of or subsequent to installation, in order to provide satisfactory air distribution. Furthermore, circulation requirements may vary, due to structural changes or variations in load conditions within the enclosure, and such considerations necessitate adjustment of the air distributing apparatus. Heretofore, adjustment of such apparatus has been difficult, expensive and generally unsatisfactory.

It is the object of the invention to provide an improved method and means of introducing air into an enclosure.

It is another object of the invention to provide a method of controlling the character, direction and velocity of air streams discharged into an enclosure.

A further object of the invention is to provide means for introducing air into an enclosure, which may be readily and easily adjusted to dis-

tribute air free from drafts or streaks and provide equable atmospheric conditions throughout the enclosure.

Another object of the invention is to provide an outlet capable of handling air at a very high velocity without making an appreciable amount of noise.

A feature of the invention resides in passing air through a first set of vanes and then through a second set of vanes proximate the first set.

Another feature of the invention lies in controlling the direction, concentration and velocity of an air stream in a plurality of horizontal planes and then in a plurality of vertical planes.

Other objects and features of the invention will be apparent from the following description, to be read in connection with the accompanying drawing, in which:

Fig. 1 is a fragmentary perspective view, partly in section, of one embodiment of the invention;

Fig. 2 is a fragmentary side elevational view of the embodiment of Fig. 1, showing the front vanes and adjusting means therefor;

Fig. 3 is a fragmentary plan view taken on the line 3—3 of Fig. 2, and

Fig. 4 is a fragmentary perspective view illustrating means for individually adjusting the vanes.

Referring to the drawing, the numeral 5 designates the outlet casing. The flange 6 is provided with suitable means, openings 7, adapted to receive mounting screws or the like, for mounting the outlet in an air supply duct. Within the casing are positioned two rows of vanes, extending across the air passage provided by the casing. In the embodiment of the invention illustrated, in Figs. 1-3, the vanes 8, comprising the row nearest the front of the outlet, are adapted to rotate about horizontal axes. The vanes 9, comprising the row at the rear of the outlet, are adapted to rotate about vertical axes.

Pivots of any suitable type may be provided, but applicant prefers to utilize as pivots the tongues 10, punched out of the casing plates, the tongues 10 being received within cavities 11 formed in the edges of the vanes. As illustrated, vanes 8 rotate about pivots positioned near the front of the outlet. The vanes 9 rotate about pivots at the rear of the outlet. The free ends of vanes 9 may extend beyond the casing into the supply duct for a purpose hereinafter to be made clear.

As above set forth, the vanes are made adjustable in order that the character, direction and velocity of air discharge may be controlled in

accordance with the requirements of particular installations. Thus, when the ceiling of an enclosure is low and a long blow is required, the front vanes may be adjusted so as to cause air leaving the outlet to converge to form a concentrated stream, flattened out and capable of providing a blow of the requisite length. In some installations, it may be desirable to locate the outlet at a fairly low level in the enclosure, in which case the front vanes would be adjusted to direct the air at an upward angle. The air would then describe a trajectory and would not enter into the zone of occupancy as quickly as though it were discharged horizontally into the enclosure. On the other hand, it might be desirable to discharge directly into the zone of occupancy, as in the case of relief cooling, and in such event, the vanes 8 would be adjusted accordingly. Again, ceiling beams, lighting fixtures and other impediments to the free circulation of air throughout the enclosure, may be avoided by suitable adjustment of the outlet vanes.

The vanes 8 may be adjustable individually or in groups. In the form of the invention illustrated in Figs. 1-3, the front vanes are adapted to be adjusted in two groups, since uniform adjustment of the front vanes tend to improve the appearance of the outlet, and because such grouping facilitates adjustment without unduly restricting the flexibility of the outlet. However, applicant does not limit himself as to this method of adjustment. As shown, the side 5a of the casing extends from the front of the outlet to a point between the front and rear of the vanes 8. Adjustment plates 12 are punched to provide tongues 13, similar to tongues 10, and similarly co-acting with cavities 11 at the rear of the vanes 8. Plates 12 are held securely against side 5a of the casing by means of screws 14 and nuts 15. On loosening screw 14, any vane or vanes 8 may be suitably positioned as by means of a screw driver or the like. Plate 12 will move with the vane or vanes adjusted and cause corresponding change in the position of the other vanes 8, rotating about the tongues 10 of the casing. When the vanes are suitably positioned screws 14 may be tightened to hold plates 12, and so the vanes, securely in position. Guide members 16 are provided to hold the nuts 15 in position, in the event screws 14 should be removed.

As illustrated, the back vanes are individually adjustable permitting a wide variety of arrangement. For instance, it is possible to fan the air out and keep the stream shallow, giving the maximum carry for low ceiling heights, the stream being well diffused at the end of the carry. On the other hand, the vanes could be pointed straight to keep the stream concentrated, where a high ceiling is available and a long blow is necessary. The stream could be broken up into elements with spaces between for the recirculation of air. If the outlet is applied directly to a trunk duct, the back vanes 9 act to scoop air therefrom for delivery to the enclosure, straighten and redirect it, without the necessity for other deflector vanes.

The rear vanes may be set in desired positions simply and readily, as by the use of a screw driver or similar tool, inserted between the front vanes. Once set, the rear vanes remain in position, the force of the air being insufficient to overcome the friction at the pivots.

The vertical vanes control the distribution of air in horizontal planes and the horizontal vanes

control distribution in vertical planes. Acting cooperatively, these vanes provide for optimum conditions of air distribution and circulation under a great variety of circumstances. Adjustment of the outlet is simple, quick and effective, so that a relatively unskilled engineer may design a system which, after such adjustment as may be necessary, will function entirely satisfactorily. An installation man may readily make all of his adjustments during a single visit, since he has under his control the character or shape, direction and velocity of the stream from the outlet. Applicant's invention, therefore, not only provides for more satisfactory air distribution than has generally been available heretofore, but it does this at a great saving in time, effort and materials.

In applications where it is desirable individually to adjust the vanes 8, the arrangement of Fig. 4 may be utilized. As illustrated, each vane 8 is provided with an extension tab 17. Screw 18 passes through a suitably threaded opening in tab 17 and abuts against casing plate 5. When the screw is loose the vane may be adjusted as desired. When the screw is tightened against casing plate 5, it securely holds the vane in the position in which it was set.

It is to be noted that the vanes are so formed that the edges, which provide the cavities 11, are rounded. This feature of the design and the general construction of the unit permit the handling of air at very high velocities without making an appreciable amount of noise.

It will be apparent to those skilled in the art that many modifications of the invention may be made without departing from the scope and spirit thereof. Applicant does not limit himself to the particular illustrative embodiments set forth.

I claim:

1. An air discharge outlet comprising a four-sided casing, a plurality of vanes in said casing extending in vertical direction, a plurality of vanes in said casing extending in horizontal direction, said horizontal vanes being positioned nearer to the discharge end of said casing than said vertical vanes, means including tongues punched from the sides of said casing for pivotally mounting said horizontal and said vertical vanes in said casing, a plate adjustably positioned contiguous the outside of one of the sides of said casing which is shallower than other of said sides and extending rearwardly of said side, means for pivotally connecting said plate and said horizontal vanes, and means for holding said plate in frictional engagement with said shallow side of said casing.

2. An air discharge outlet comprising a four-sided casing, one of the sides of said casing being shallower than other of said sides, a plurality of vanes in said casing extending in vertical direction, a plurality of vanes in said casing extending in horizontal direction, said horizontal vanes being positioned nearer to the discharge end of said casing than said vertical vanes, means for pivotally mounting said horizontal and said vertical vanes in said casing, a plate adjustably positioned contiguous the outside of said shallow casing side and extending rearwardly of said shallow side, means for pivotally connecting said plate and said horizontal vanes, and means for holding said plate in frictional engagement with said shallow side of said casing.

3. An air discharge outlet comprising a casing which includes a pair of opposite sides which are

substantially vertical, a plurality of vanes in said casing extending in vertical direction, a plurality of vanes in said casing extending in horizontal direction, means for pivotally mounting said horizontal and said vertical vanes in said casing, a
5 plate adjustably positioned contiguous the outside of one of said vertical casing sides and extending rearwardly of said casing side to which it is contiguous, means for pivotally connecting said plate and the rearward portion of said horizontal vanes, and means for holding said plate in frictional engagement with said side of the casing to which it is contiguous.

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