

June 2, 1953

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ADJUSTABLE GRILLE

2,640,412

Filed Feb. 24, 1949

Fig. 1.

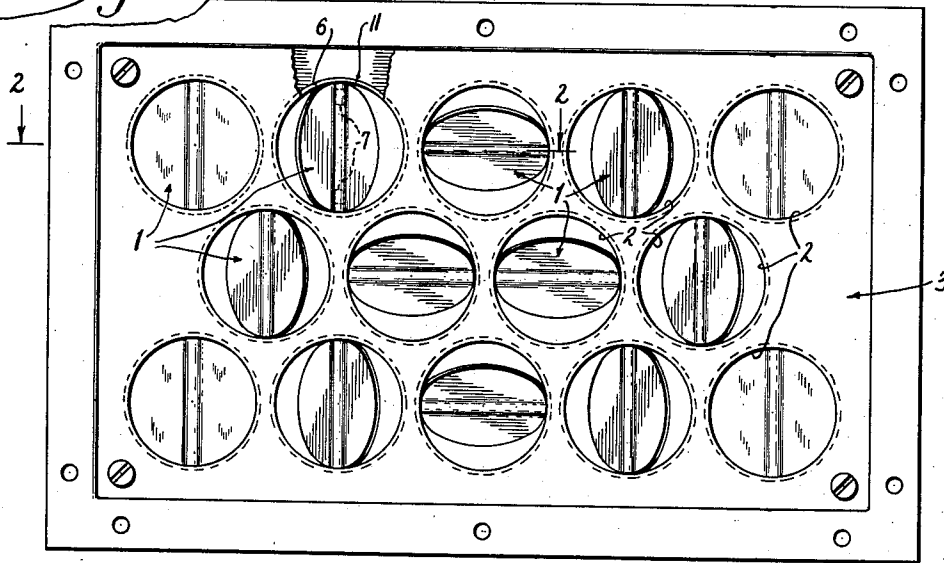


Fig. 2.

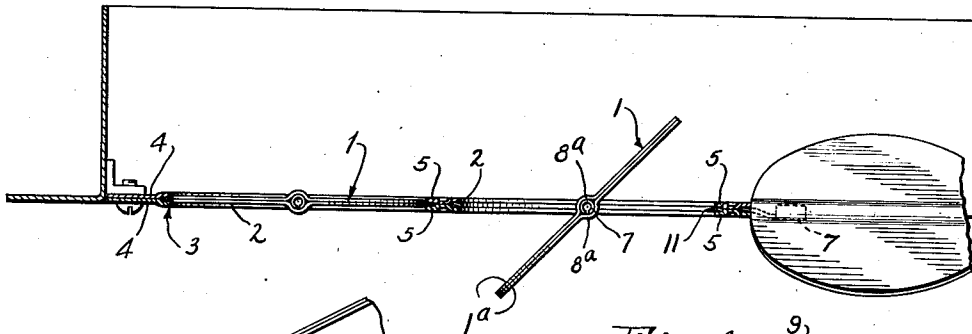


Fig. 3.

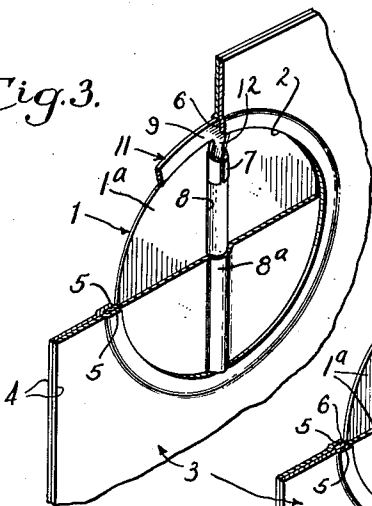


Fig. 5.

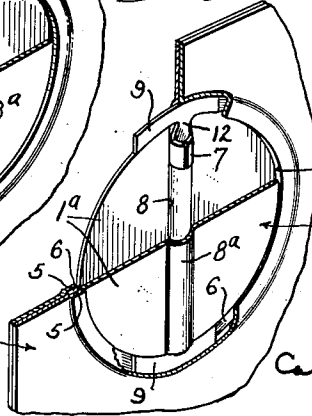
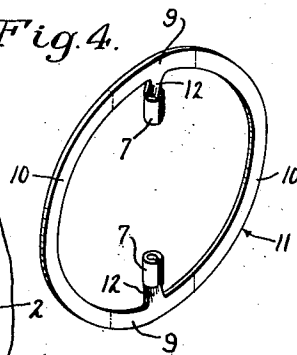


Fig. 4.



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## UNITED STATES PATENT OFFICE

2,640,412

## ADJUSTABLE GRILLE

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Application February 24, 1949, Serial No. 78,215

2 Claims. (Cl. 98—40)

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The invention pertains to a grille especially adapted for industrial applications, and has more particular reference to a grille construction of the type disclosed in a copending application of John L. Orr, Serial No. 63,127, filed December 2, 1948, now abandoned. In such grilles, the pattern of discharge of air through the grille frame is controlled by individually adjustable air deflecting vanes or disks mounted on trunnions which permit adjustment of each disk about a diametrical axis and which, at the same time, are shiftable angularly around an annular guide channel to permit adjustment of the disk about a perpendicular axis coincident with the axis of a hole in the grille frame.

One object of the present invention is to improve upon the mounting of the deflecting vanes so as to facilitate universal adjustment thereof and avoid any danger of binding of the trunnions in the guide channel.

A more detailed object is to provide arcuate members of substantial length on the outer ends of the vane trunnions so as to extend the areas of engagement between the trunnions and their guideways and thus provide more effective guiding of the vanes around their center axes.

Still another object is to join the arcuate members into a complete annulus and thus further improve the guiding action.

The invention also resides in the novel construction of the arcuate trunnion members to permit the latter and the trunnions to be formed as a sheet metal stamping.

Other objects and advantages of the invention will become apparent from the following detailed description taken in connection with the accompanying drawings, in which

Figure 1 is a fragmentary front elevational view of a grille embodying my invention.

Fig. 2 is a fragmentary transverse sectional view taken in the plane of line 2—2 of Fig. 1, but on a somewhat enlarged scale.

Fig. 3 is a fragmentary perspective view.

Fig. 4 is a perspective view of the vane supporting trunnions and the annulus.

Fig. 5 is a fragmentary perspective view similar to Fig. 3 showing a modified vane mounting.

The invention is embodied for purposes of illustration in a grille comprising generally a plurality of air deflecting vanes or panels 1 adapted to control the flow of air through a plurality of closely spaced holes 2 in a frame 3 which may be mounted in an air outlet or duct as shown in Fig. 2. In the present instance, the

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frame comprises two flat plates 4 punched out to form the holes 2 and secured together with the holes aligned axially. Around each hole the plates are depressed axially and in opposite directions to form parallel flanges 5 which are spaced axially and constitute the opposite walls of an inwardly opening annular channel 6.

The vanes 1 are circular disks only slightly smaller than the holes so as to close the latter when lying in the plane of the holes as shown in Fig. 3. Herein, each disk comprises two thin plates 1<sup>a</sup> welded together and deformed for a purpose to appear presently.

Each disk is supported in a frame for universal adjustment into any plane so that by setting the disk at the proper angle, the air stream forced through the hole may be deflected or directed in a desired direction. To this end, the disk is connected to the channel 6 through the medium of two trunnions 7 projecting edgewise and outwardly from the disk along a diametrical axis. In this instance, the trunnions are journaled in the disk and more particularly in bearings 8 formed by depressing the disk plates so as to form therein diametrical grooves 8<sup>a</sup> which constitute the opposite halves of the bearings.

The invention contemplates extending or increasing the arc of guiding engagement between the trunnions 7 and the walls of the guide channels 6 so as to provide for more effective guiding of the disk during its adjustment about the axis through the center of the hole 2. This is accomplished by forming the outer trunnion ends as arcuate members or segments 9 which are preferably flat and rigid so as to seat slidably in the channels at any point thereon. A maximum arc of effective guiding engagement is achieved in the preferred embodiment of the invention shown in Fig. 4 by joining the adjacent ends of the segments 9 by arcuate connections 10 of the same curvature as the segments whereby to form a complete annulus or ring 11 which extends completely around the channel 6 and is journaled in the latter. The ring fits snugly in the channel 6 and is thus held frictionally in its adjusted positions.

The trunnion construction above described lends itself to formation of the guide ring 11 and the trunnions proper as a single piece of sheet metal. In the stamping operation, the ring is first formed with inwardly projecting lugs 12, the wider end portions of which are curled together as shown in Fig. 4 to form split tubes constituting the trunnions proper. In assembly, these tubes are seated in the grooves 8<sup>a</sup> of the

main disks 1<sup>a</sup> with the latter centered within the ring 11. Then the disks are welded together. The subassemblies thus formed may be seated in the flanges 5 of the frame plates 4 after which the plates are welded together to complete the grille unit. The resiliency of the disks 1<sup>a</sup> combined with that of the split trunnions 7 is utilized to advantage in frictionally holding the disk in its different positions of adjustment about the trunnions. The arcuate members 9 and the connections 10 may be deformed slightly to achieve the desired frictional fit in the channel 6.

If desired, the connections 10 above referred to may be omitted as shown in Fig. 5. In such a case, the trunnions are guided in the channel 6 by the arcuate members 9 alone which should be of sufficient arcuate length to insure against binding during the sliding movement around the channel.

It will be apparent from the foregoing that each vane when mounted as described above may be turned readily about its diametrical axis simply by pressing axially on the disk at a point offset from this axis. The disk then turns on the trunnions 7, the position of the ring 11 remaining fixed. To adjust the disk about its center axis, the edge portion projecting from the plane of the frame is grasped and twisted in the desired direction. Under the torque thus applied, the ring turns freely around the channel 6 and thus holds the disk against lateral shifting during the adjustment. Any danger of binding during adjustment about either axis is thus avoided. Moreover, all of the parts are simple sheet metal stampings, so that the grille as a whole may be made economically.

I claim as my invention:

1. In a grille, the combination of, a frame formed with an annular guide channel defining a circular opening, a sheet metal annulus dis-

posed in said channel and guided by the channel walls, sheet metal projections integral with said annulus and curled about a radius thereof to form generally cylindrical split pivots projecting inwardly from diametrically opposite sides of the annulus, and a disk having outwardly opening recesses on diametrically opposite sides thereof receiving said pivots.

2. In a grille, the combination of, a frame formed with an annular guide channel defining a circular opening, a pair of arcuate members disposed in said channel on diametrically opposite sides thereof and guided by the walls of the channel for circumferential movement therein, a trunnion rigid with and projecting inwardly from each of said arcuate members and partially across said opening, said trunnions being disposed wholly within said opening, and a disk disposed in said opening and having outwardly opening recesses on diametrically opposite sides thereof receiving said trunnions to permit swinging of the disk about a diameter of said opening.

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