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LOUVER CONTROL FOR AIR CONDITIONING GRILLE

Filed May 10, 1957

3 Sheets-Sheet 1

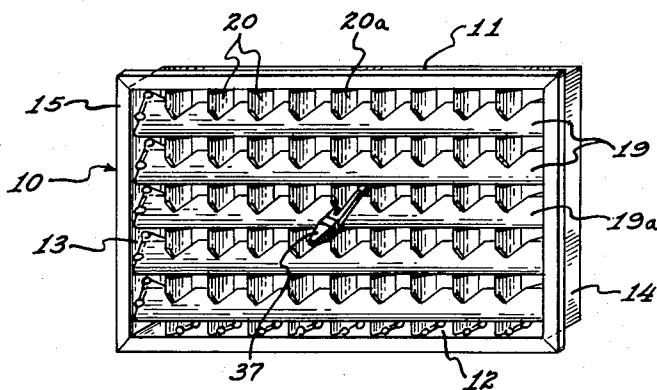


Fig. 1

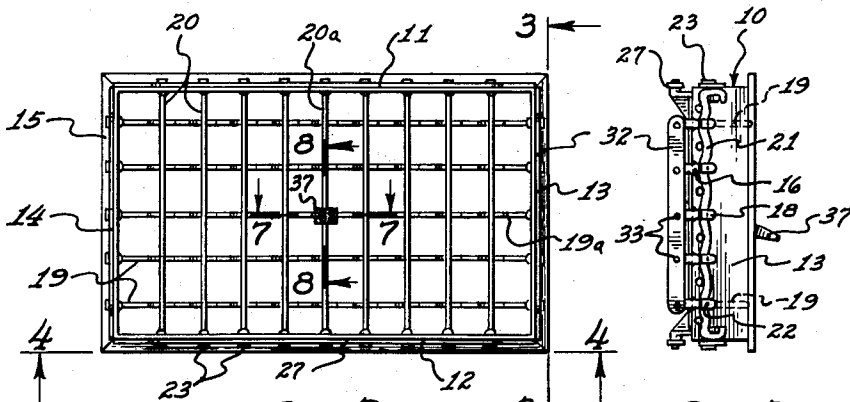


Fig. 2

Fig. 3

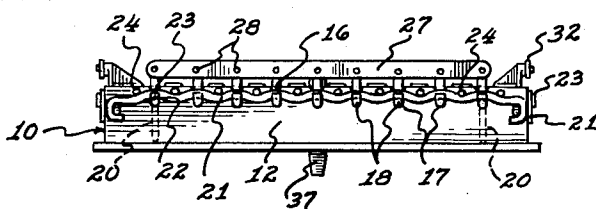


Fig. 4

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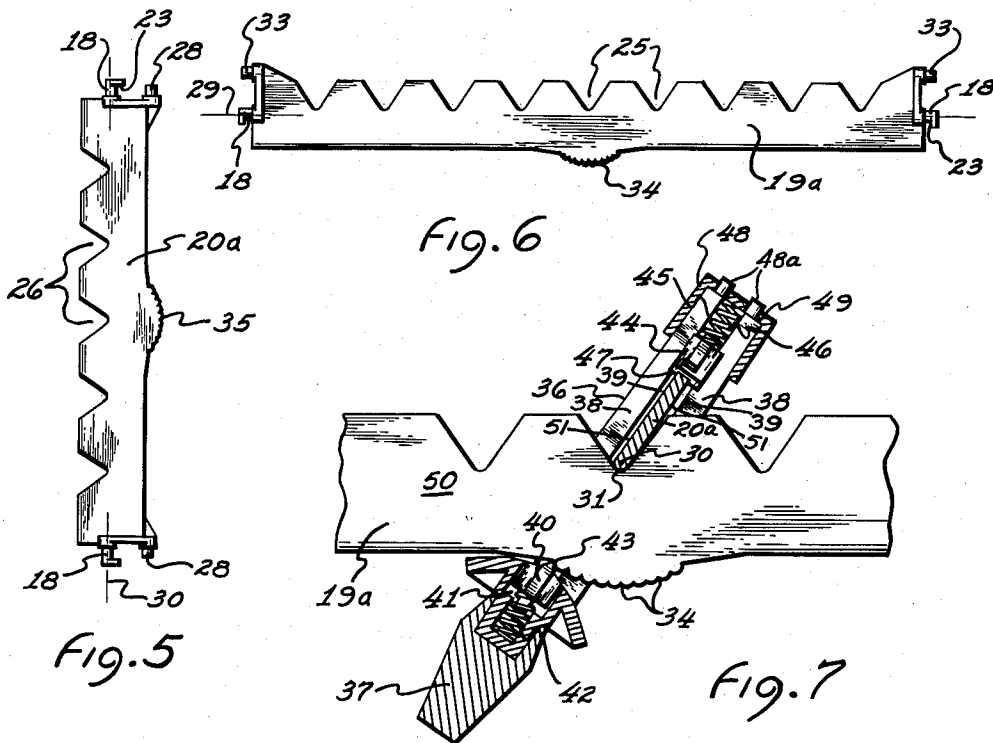
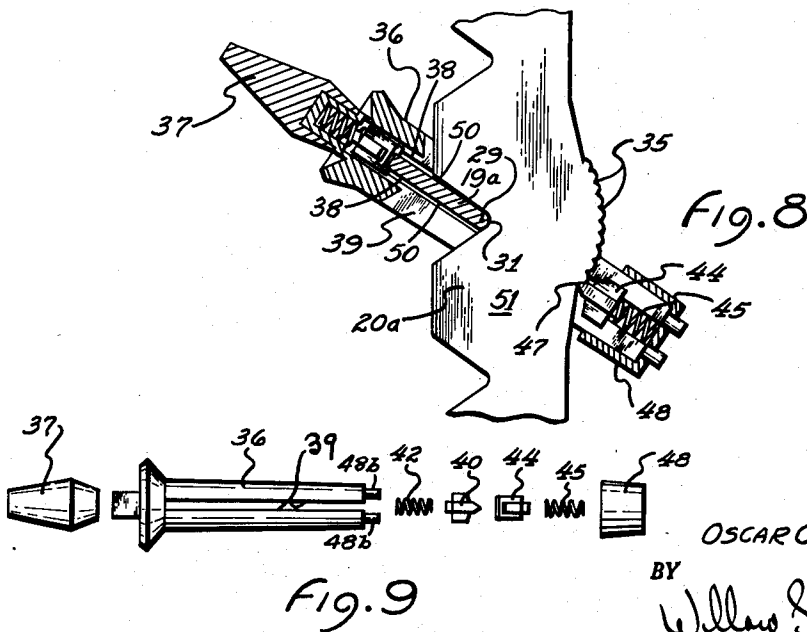
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3 Sheets-Sheet 3

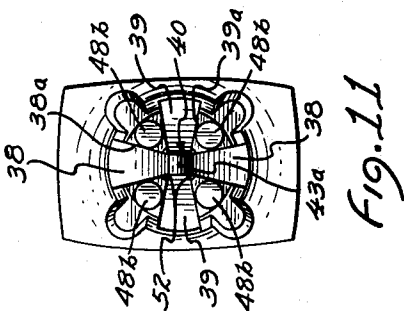


Fig. 11

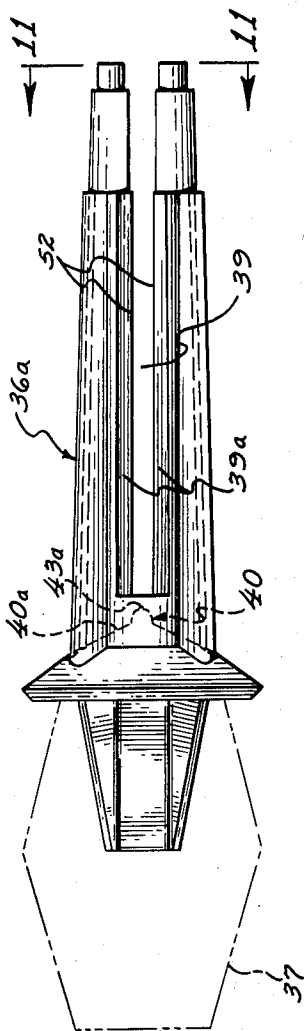


Fig. 10

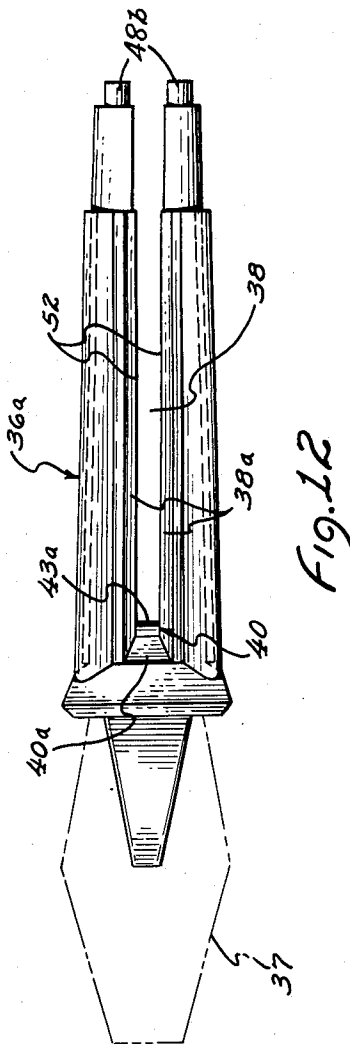


Fig. 12

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2,948,211

LOUVER CONTROL FOR AIR CONDITIONING GRILLE

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12 Claims. (Cl. 98—40)

This invention pertains to improvements in a louver control for air conditioning grilles and is particularly directed to a single lever control for adjusting the tilted position of the louver elements of the grille.

One of the objects of this invention is to provide a control device for simultaneously adjusting all of the louver elements of a grille from a single universally positionable manually adjustable control element centrally located on the front of the grille louvers.

Another object of this invention is to provide a single lever control carried on the louvers of a grille which may be moved to any desired directive position to simultaneously position the horizontal and vertical louvers of the grille.

A still further object of this invention is to provide a single control element mounted on a pair of intersecting louvers movable to effect any directive discharge of air from said grille.

Further features and advantages of this invention will appear from a detailed description of the drawings in which:

Fig. 1 is a perspective view of an air conditioning grille incorporating the features of this invention.

Fig. 2 is a rear elevation of the grille shown in Fig. 1.

Fig. 3 is an end elevation of the grille indicated by the line 3—3 in Fig. 2.

Fig. 4 is a bottom view of the grille indicated by the line 4—4 of Fig. 2.

Fig. 5 is an enlarged side elevation of the master vertical louver of the grille.

Fig. 6 is an enlarged side elevation of the master horizontal louver of the grille.

Fig. 7 is an enlarged fragmentary sectional view on the line 7—7 of Fig. 2.

Fig. 8 is an enlarged fragmentary sectional view on the line 8—8 of Fig. 2.

Fig. 9 is an exploded view showing the relationship of the parts in the control pin assembly.

Fig. 10 is an enlarged plan view of a preferred form of a control pin.

Fig. 11 is an enlarged end elevation of the control pin indicated by the line 11—11 of Fig. 10.

Fig. 12 is an enlarged side elevation of the control pin shown in Fig. 10.

As an example of one embodiment of this invention there is shown an air conditioning grille structure in Fig. 1 comprising a frame 10 including the integral top 11, bottom 12, and sides 13 and 14 and the mounting flange 15 on the front edges of the top, bottom and sides. Formed in the top, bottom and sides are notches 16 which terminate in arcuate bearing surfaces 17 adapted to receive and pivotally support the trunnions 18 on the vertical louvers or slats 20, suitable retaining means 21 passing over the trunnions 18 at the point 22 behind the lips 23 of the trunnions 18 and under the pins 24 fixed to the frame 10 serve to maintain the horizontal louvers or slats 19 and vertical louvers 20 in proper pivotal con-

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dition in the frame. Any other suitable mounting means may be provided as desired for securing the louvers pivotally to the frame.

The horizontal louvers 19 are mounted on the trunnions 18 as recited above in the ends 13 and 14 of the frame 10 and have cut-out V-notches 25 which engage in mating cut-out V-notches 26 formed in the vertical louvers 20 which are pivotally mounted in the top 11 and bottom 12 of the frame 10 as pointed out above, the vertical louvers 20 touching the horizontal louvers 19 in the notches in the sides 13 and 14 at the point of engagement 31 of the crotches of the V-notches 25 and 26.

Thus, both horizontal and vertical louvers have free pivotal tilting movements limited relative to one another. In order that the vertical louvers 20 tilt in unison there is provided a linkage strip 27 journaled on the pins 28 positioned radially outwardly from the axes of the vertical louvers 20. Similarly, the horizontal louvers 19 are connected to tilt in unison by means of the linkage strip 32 journaled on the pins 33 positioned radially outwardly from the axes of rotation 29 of the horizontal louvers 19 and 19a.

Referring particularly to Figs. 7 and 8, the intermediate master horizontal louver 19a has formed thereon a series of detent notches 34 in an arcuate position disposed relative to the axis of pivoting 30 of the master vertical louver 20a while on the intermediate master vertical louver 20a there is formed the series of detent notches 35 arranged in an arcuate position radially of the axis of pivoting 29 of the master horizontal louver 19a.

A control pin 36 is provided with an operating handle 37 projecting outwardly from the face of the grille and has formed therein a pair of slots 38 and 39 located at right angles to each other, the slot 38 slidably engaging the sides 50 of the horizontal louver 19a while the slot 39 slidably engages the sides 51 of the vertical louver 20a. The vertical louver control detent plunger 40 is slidably mounted in a suitable cavity 41 in the control pin 36 and a compression spring 42 carried therein urges the plunger 40 and its point 43 into engagement with the detent notches 34 in the louver 19a. On the opposite side of the louvers 19a and 20a from the detent plunger 40 is the horizontal louver control detent plunger 44 suitably slidably guided in the slots 38 and 39 and urged by a compression spring 45 in the bore 46 in the control pin to move the point 47 of the detent plunger 44 into the detent notches 35 of the vertical louvers 20a. A control pin cap 48 having suitable bores 48a fitting over and fixed to projecting stems 48b of the end surface 49 of the control pin 36, retains the spring 45 and the control pin in proper operative position.

It will be noted that the two detent plungers 40 and 44 oppose each other to properly longitudinally position the control pin 36 relative to the master louvers 19a and 20a.

It will be further noted that the manipulation of the operating handle 37 may be done in either the vertical or horizontal direction independently or simultaneously to provide a resultant direction of directive air flow, in the direction indicated by the pointing of the handle 37, by the combined adjustment of both the horizontal and vertical louvers. Thus, by the simple directive manipulation of the handle any direction of air flow within the range of tilting of both sets of louvers can be instantly obtained. Furthermore, the control pin and handle are carried solely on a master vertical and a master horizontal louver for effecting the universal adjustment of the grille for any direction of air flow.

In Figs. 10, 11 and 12 is illustrated a preferred construction of the control pin 36. In this arrangement the detent plunger 40 is made rigid and an integral part of the control pin 36a as shown at 40a and has a fixed point or edge

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43a which engages the detent notches 34 on the master horizontal louver 19a. The same detent structure 44, as shown in Figs. 7 and 8, may be used at the outer end of the control pin 36a of Figs. 10, 11 and 12, to engage the detent notches 35 of the master vertical louver 20a.

The slots 38 and 39 have divergent radially outwardly extending sides 38a and 39a respectively which intersect in knife edges 52 located in lines defined by the planes of intersection of the sides 50 and 51 of the louvers 19a and 20a respectively as best seen in Fig. 11. The control pin thus is supported on the knife edges 52 on the sides or faces 50—51 of the louvers and the outwardly divergent slots 38a and 39a provide a maximum freedom of tilting of the louvers to any desired position of directional air control.

While the apparatus herein disclosed and described constitutes a preferred form of the invention, it is also to be understood that the apparatus is capable of mechanical alternation without departing from the spirit of the invention and that such mechanical arrangement and commercial adaptation as fall within the scope of the appended claims are intended to be included herein.

Having thus fully set forth and described this invention what is claimed and desired to be obtained by United States Letters Patent is:

1. An air directing grille having a frame, a series of horizontal slats tiltably mounted on said frame to rock about horizontal axes, a series of vertical slats tiltably mounted on said frame to rock about a vertical axis, means on said horizontal slats connecting the same to tilt in unison, means on said vertical slats connecting the same to tilt in unison, and a control device formed with a pair of right angularly disposed slots, said slots defined by side walls diverging outwardly from the central portion of said control device, the narrowest portions of said slots being of a width substantially equal to the thickness of said slats, said control device mounted on one of said horizontal slats and one of said vertical slats engaged in said slots to provide the sole means for effecting the independent and simultaneous tilting of both of said series of slats.

2. In an air directing device, a frame, a series of horizontally disposed slats tiltingly mounted to rock about horizontal axes on said frame, means on said horizontal slats connecting the same to tilt in unison, a series of vertically disposed slats tiltably mounted to rock about vertical axes on said frame, means on said vertical slats connecting the same to tilt in unison, both series of slats formed with cooperating notches, said slats mounted with said cooperating notches in said horizontal slats and said vertical slats in interengagement, said slats mounted so that said axes of tilting of both of said series of slats lie within the width of the slats of both of said series, and a control pin having angularly disposed co-extensive slots therein straddling one of said horizontal slats and one of said vertical slats adjacent their point of intersection so that tilting of said control pin effects simultaneous adjusting of both of said series of slats for any direction of air flow.

3. An air directing device as in claim 2 and wherein the side walls defining each of said slots diverge outwardly from the central portion of said control pin.

4. An air directing device comprising, in combination, a frame, a first slat tiltably about a first axis of tilting on said frame, a second slat tiltably about a second axis of tilting on said frame angularly related to said first axis, and a control member, said control member formed with a slot to receive and engage the sides of said first slat whereby said control member may be tilted about the axis of tilting of said second slat and wherein said control member is formed with a second slot angularly disposed to said first slot to receive and engage the sides of said second slat whereby said control member is tiltably about the axis of tilting of said first slat, and detent means in said control member including a first spring urged detent

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plunger engaging detent notches in the edge of said first louver and a second spring urged detent plunger opposing the force applied by said first detent plunger and engaging detent notches in the edge of said second slat to provide the sole means for longitudinally and angularly positioning said control plunger on said slats.

5. An air directing device comprising, in combination, a frame, a vertical slat including a notch and having a vertical axis of rocking on said frame, and a horizontal slat including a notch received by said first mentioned notch intersecting said vertical slat and having a horizontal axis of rocking on said frame, a control pin mounted on said slats, said control pin formed with a first transverse slot to receive and engage said vertical slat and a second transverse slot angularly disposed to said first transverse slot to receive and engage said horizontal slat, said slots formed with side surfaces diverging outwardly from the central portion of said control pin and terminating at their inner ends in knife edges, said slots formed of a width whereby said knife edges engage the side faces of said slats at the lines of intersection of the planes defined by the sides of said slats.

6. An air directing device as in claim 5 and wherein detent means including plunger points in the ends of said slots are provided and arcuately disposed notches in the edges of said slats are provided to be engaged and to hold said control pin in desired positions.

7. An air directing device as set forth in claim 6 wherein said knife edges and said detent means comprise the sole support for said control pin on said slats.

8. A grille comprising, in combination, a frame, at least two slats each having V-notches mounted in angular relationship within said frame and pivotable about separate axes parallel to the respective slats, each of said slats defining a plane, said slats disposed and mounted with said V-notches received within each other in a manner wherein said planes defined by said slats and said slats intersect, and a control member, said control member formed with angularly disposed slots, said control member mounted on said slats along the line of intersection of said planes with said slats received in said slots whereby said slats may be singly or simultaneously pivoted about their respective axes by movement of said control member.

9. A grille as in claim 8 and wherein said slots are defined by side walls diverging outwardly from the central portion of said control member and wherein the width of each of said slots at its narrowest point is substantially equal to the thickness of said slats.

10. A louver slat controlling device for slats having sides thereon comprising a body member having a longitudinal central axis and formed with angularly disposed intersecting transverse slots therein, said slots disposed with their major dimension parallel to said central axis, the sides of said slots diverging outwardly relative to said central axis whereby knife edges engaging the sides of the slats are formed at the lines of intersection of said slots.

11. In a louver and control device assembly for an air flow louver, a first plurality of spaced slats, means pivotally mounting said slats, each of said slats having a plurality of spaced substantially V-shaped notches, each notch terminating in a closed apex and extending to a common edge of a respective slat, a second plurality of spaced slats each having a plurality of substantially V-shaped notches, each notch terminating in a closed apex and extending to a common edge of a respective slat, said second plurality of slats being pivotally mounted and being disposed in angular relation to said first plurality of slats so as to mesh therewith, the notches of said first plurality straddling respective notches of said second plurality, the axes of said first plurality being disposed relative the axes of the second plurality whereby each closed apex of the first plurality is closely adjacent to a respective closed apex of the second plurality at any pivoted position of any slat within the pivotal limits de-

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finned by the angle of convergence of the notches, the pivotal axis of each slat passing in close proximity to the regions of the apices of that slat, and a louver controlling device comprising a body member having a longitudinal central axis intersecting the point of intersection of an axis of said first plurality and an axis of said second plurality and including angularly disposed intersecting slots disposed with their major dimension parallel to said central axis and the sides of said slots diverging outwardly relative to said central axis whereby knife edges are formed at the lines of intersection of said slots engaging the side faces of said slats in the lines of intersection of the planes defined by the sides of said slats, which are the slats whose axes intersect the central axis of the body member.

12. In a control device as set forth in claim 11 wherein there is provided a detent means in said body member engaging the edges of said pair of angularly related slats whose said axes intersect with the axis of said body mem-

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ber to limit longitudinal displacement of said body member on said pair of slats and for angularly positioning said body member thereon wherein said pair of slats form the sole means for operatively supporting said control device on said louver.

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