

March 26, 1957

C. D. SARLES ET AL

2,786,407

ADJUSTABLE AIR EXHAUST GRILLE ASSEMBLY

Filed June 10, 1955

4 Sheets-Sheet 1

FIG. 1.

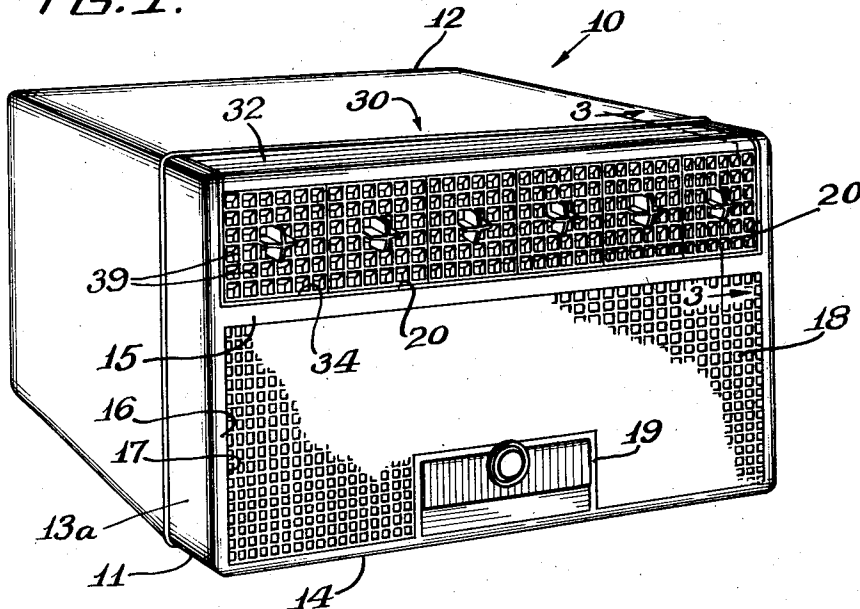
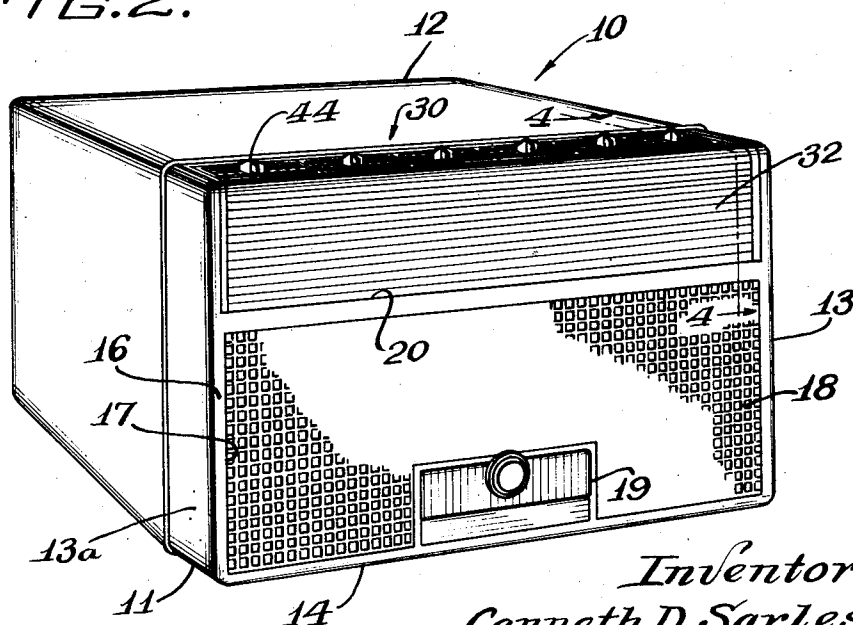


FIG. 2.



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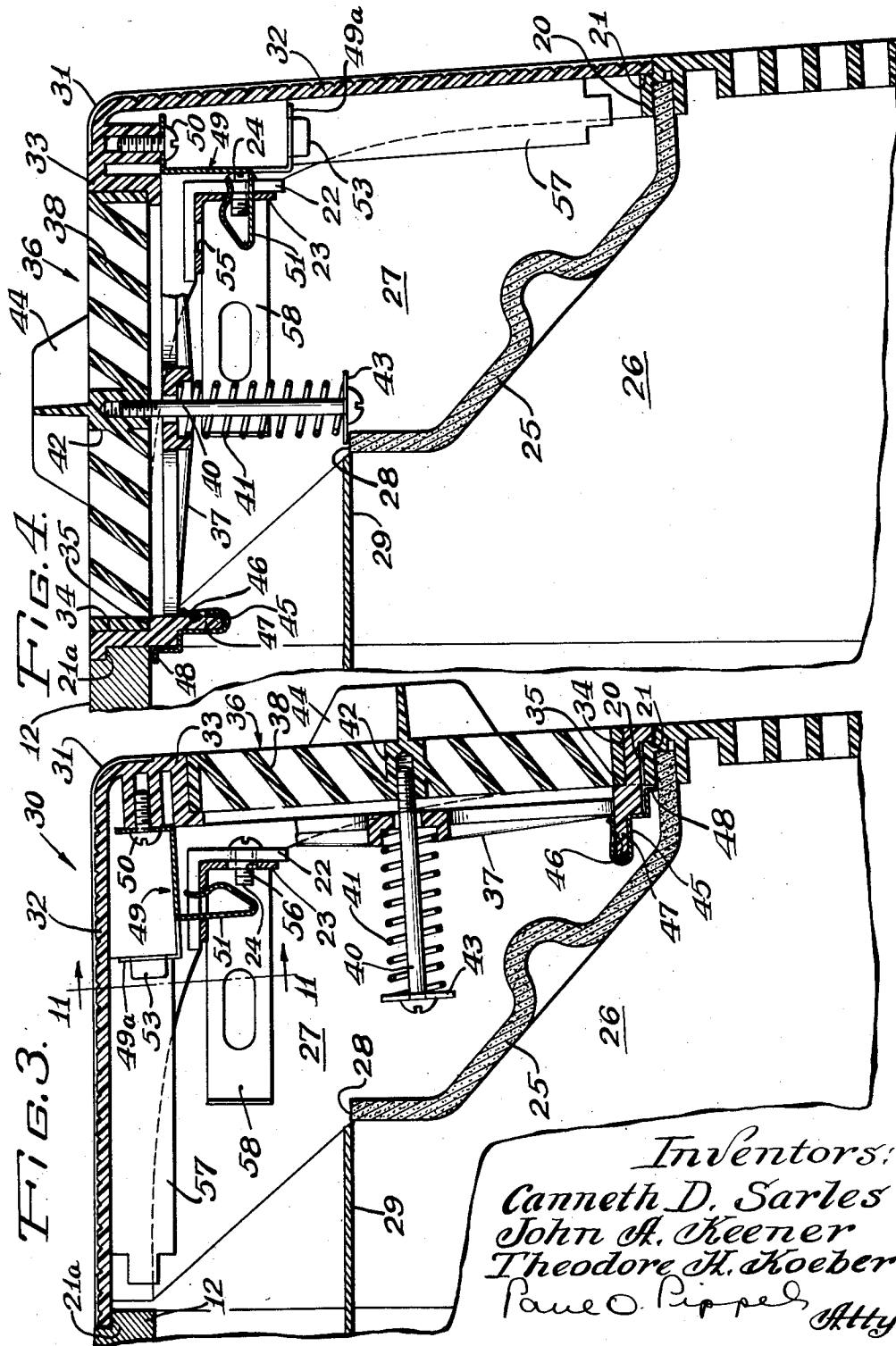
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4 Sheets-Sheet 2



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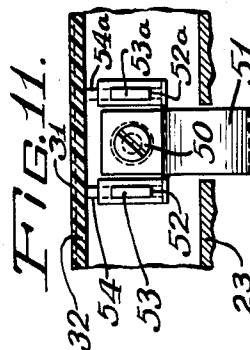
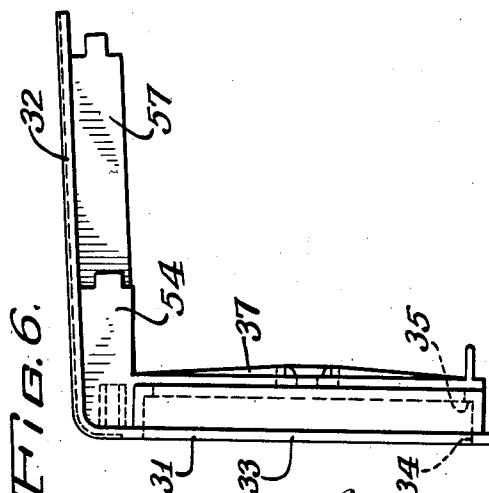
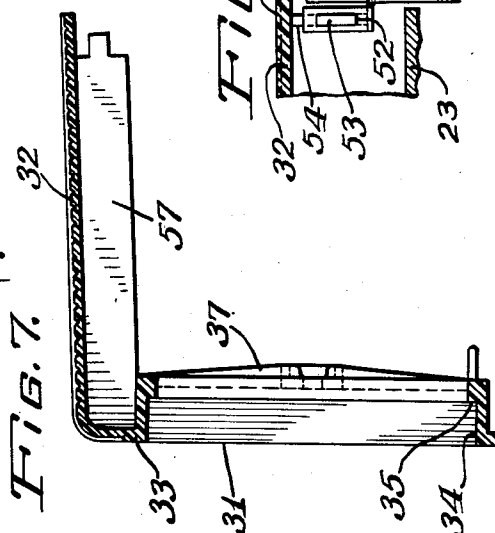
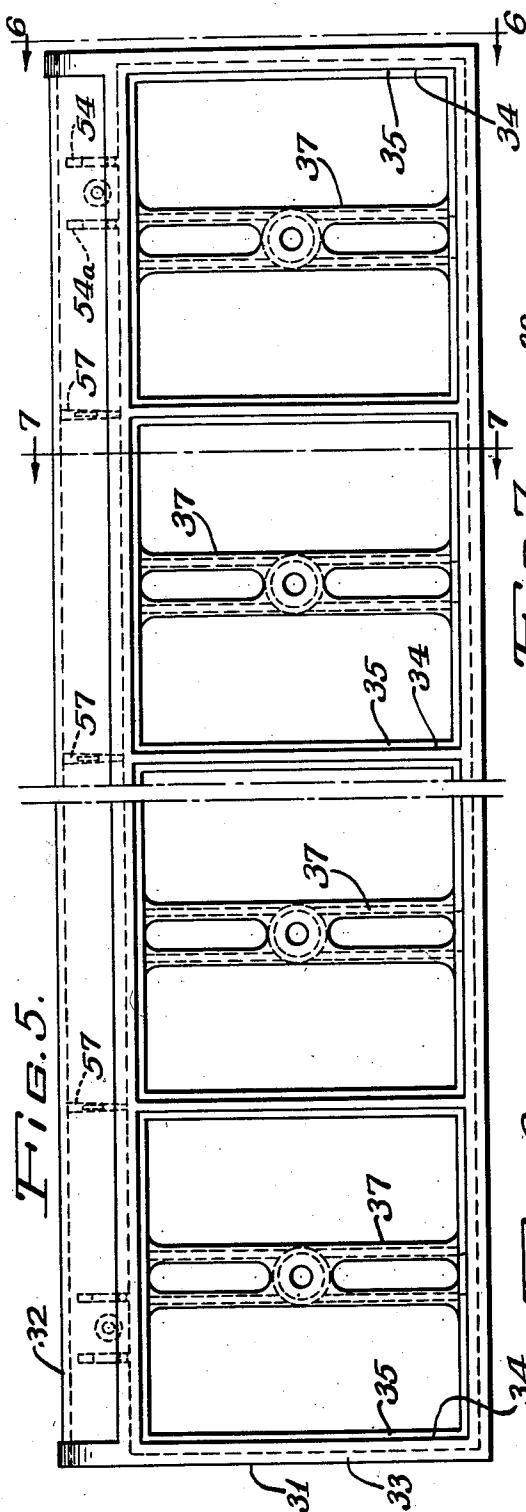
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ADJUSTABLE AIR EXHAUST GRILLE ASSEMBLY

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4 Sheets-Sheet 3



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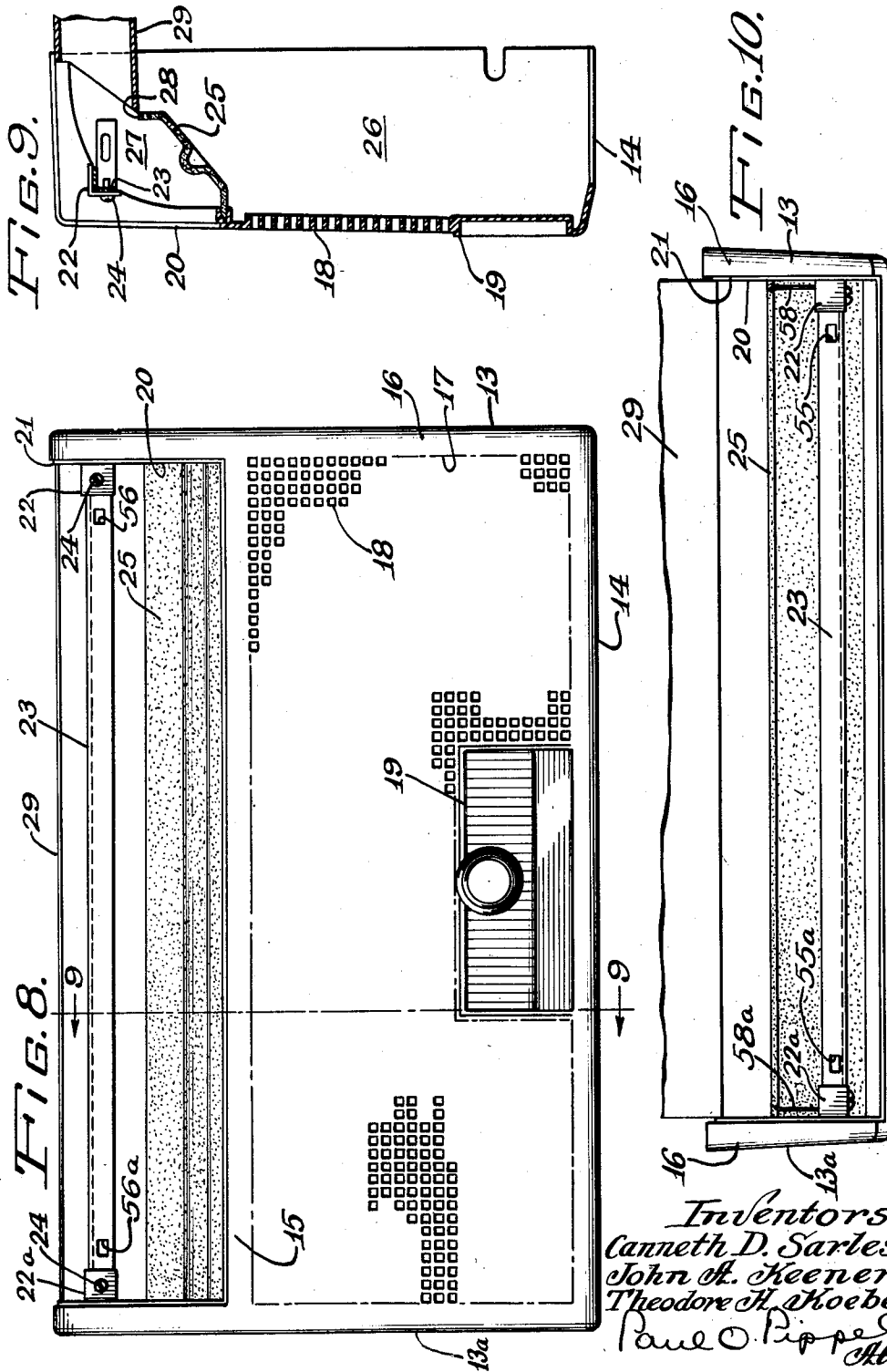
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ADJUSTABLE AIR EXHAUST GRILLE ASSEMBLY

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2,786,407

ADJUSTABLE AIR EXHAUST GRILLE ASSEMBLY

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Application June 10, 1955, Serial No. 514,546

2 Claims. (Cl. 98—40)

This invention relates to air conditioning apparatus and is particularly directed to an improved air exhaust grille assembly suitable for incorporation in the cabinet of an air conditioning unit.

As is well known, air conditioning apparatus is presently employed in any one of many different forms for cooling the interiors of entire buildings or the individual rooms therein. The most popular form, however, is that represented by the room-cooler type unit wherein the cooling apparatus is usually mounted within a cabinet and the cabinet, in turn, is positioned either entirely within the room or space being cooled, or in a window thereof with a portion of the cabinet extending into the room and the remainder projecting into the outside atmosphere. In this type unit many different arrangements and devices have been employed in conjunction with the air outlet or air discharge opening of the cabinet in an endeavor to control the distribution of the conditioned air, and to direct said air in a preselected direction or pattern when discharged therefrom. For instance, discharge outlets have been provided either in the front vertical wall of the cabinet or in the top horizontal wall thereof or, on occasion, diagonally across the top corner where the front and top walls of the cabinet meet, and these outlets, in turn, were equipped with adjustable grille or louver elements which permitted directing the air discharge into any one of a number of different directions within the space being air conditioned. Usually, however, the spread or coverage of the angle over which the discharged air could best be distributed or discharged was not very large and, as a consequence, the vast majority of the arrangements and devices heretofore so frequently employed provided only a limited degree of effectiveness and flexibility because of the limited discharge angle for the conditioned air and, of course, were never entirely satisfactory. Accordingly, it is an important feature of the present invention to provide simple and effective means for readily overcoming the disadvantages heretofore encountered in air conditioning units because of limited regulation and control over the spread or coverage of conditioned air discharged through the outlets therein.

The principal object of the present invention, therefore, is to provide an improved, effective and highly satisfactory air discharge or exhaust means for an air conditioning unit.

Another object is to provide a readily adjustable as well as repositionable air exhaust grille assembly for an air conditioning unit which assembly permits an unusually wide latitude of directional spread in the angle of dispersion for the air discharged therefrom and into the space receiving such air.

A further object is to provide an air exhaust grille assembly for an air-conditioner cabinet wherein the assembly is readily removable and which assembly, furthermore, may be positioned so as to effect a discharge of all of the conditioned air into the space being conditioned through an opening in one wall of the cabinet or, if desired, the assembly may be positioned so as to effect a

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discharge of all of the conditioned air through an opening in another wall of the cabinet.

A still further object is to provide an air exhaust grille assembly which is positionable without appreciable interference with operation of the air conditioner unit so that air discharge openings therein are disposed either in the front vertical wall or the top horizontal wall of an air conditioning unit cabinet, and wherein adjustably mounted louver or grille elements therein permit further selective control of the direction of air discharge from said openings in both the front and top wall positions of the assembly.

A yet still further object is to provide an improved air discharge grille arrangement for an air conditioning unit which permits an unusually large range and a high degree of flexibility of control over the direction of air discharged therethrough.

Further objects and advantages of the invention will become apparent as the following description proceeds, and the features of novelty which characterize the invention will be pointed out with particularity in the claims annexed to and forming a part of this specification. For a better understanding of the invention, reference may be had to the accompanying drawings in which:

Figure 1 is a perspective view of an air-conditioner into which the present invention has been incorporated, the air discharge outlet being shown disposed in the front wall thereof;

Figure 2 is a perspective view similar to Figure 1 but showing the air discharge outlet in the top wall of the cabinet;

Figure 3 is a partial sectional view taken on line 3—3 of Figure 1 and shown in enlarged dimension;

Figure 4 is a partial sectional view taken on line 4—4 of Figure 2 and shown in enlarged dimension;

Figure 5 is a front view of the removable and repositionable frame insert employed for mounting the adjustable grille elements in the air-conditioner cabinet;

Figure 6 is an end view of the frame insert shown in Figure 5;

Figure 7 is a sectional view taken on line 7—7 of Figure 5;

Figure 8 is an elevational view of the front portion of an air-conditioner cabinet with the proposed air discharge grille assembly removed therefrom;

Figure 9 is a sectional view taken on line 9—9 of Figure 8;

Figure 10 is a top plan view of the front portion of the cabinet shown in Figure 8 and with the proposed air discharge grille assembly removed therefrom; and

Figure 11 is a partial sectional view taken along line 11—11 of Fig. 3 and shows one of the spring clip fastener elements for the assembly.

One preferred application of the present invention, as depicted in the drawings herein, envisages the device incorporated in a window-mounted type of air conditioner unit, and although this is the preferred form selected for illustrating a popular adaptation of the invention, it will be appreciated that its use is not limited to the specific embodiment illustrated.

In the drawings the cabinet, indicated generally by the reference numeral 10, represents a somewhat conventional structure of the type usually provided for mounting in a window of the space being air conditioned. Such a cabinet may be divided into a front section 11 and a rear section 12, which is readily separable therefrom for purposes of assembly or repair and the like, while a suitable conventional means (not shown) may be provided for removably fastening the said two sections together. Since this particular fastening arrangement is not peculiarly related to the present invention it is believed a thorough understanding of the invention may be

had without descriptively detailing the features of said fastening means and hence no further reference will be made thereto.

The front cabinet section 11 may be fashioned to resemble an open generally U-shaped framework having opposite side walls 13 and 13a connected together at one end by a bottom wall 14, and intermediate their ends by a transverse member 15. The forward marginal edges of said side and bottom walls may be inwardly turned or bent over to provide a forward peripheral flange 16 which may cooperate with the transverse member 15 to define a lower opening 17 through which air may be admitted from the room or space being conditioned. A decorative open lattice-like grille or screen 18 may, of course, be provided to cover the inlet opening 17 and thus improve the appearance of the cabinet without appreciably restricting the passage of incoming air there-through any suitable conventional means (not shown) may be provided for fastening said screen in place. The present invention also contemplates fashioning the front cabinet section 11 from one of the well-known plastic compositions, such as polystyrene, in which event the lattice-like decorative grille 18 would, preferably, be formed or molded integral with the walls as would also the transverse member 15. The control panel, indicated generally by the reference character 19, and which is generally conventional, may be located at the lower central portion of the front cabinet section 11 and may be suitably formed integral therewith, or, if desired, separately fashioned and thereafter suitably secured in place without deviating from any of the concepts of the present invention.

The upper portions of the side walls 13 and 13a cooperate with the transverse member 15 to define an upper opening 20 which overlies adjacent corner portions of the front and top of said front cabinet portion 11. A shoulder or ledge 21 formed along the edges of the opening 20 and a similar ledge or shoulder 21a formed on the forward edge of the top wall of the rear cabinet 12 (Figs. 3 and 4) cooperate to function as a continuously extending seat for an insert-like removable member or air discharge grille assembly which will be more particularly described hereinafter.

Brackets 22 and 22a, mounted on the respective side walls 13 and 13a, support opposite ends of a transversely extending angle member 23 which may be secured thereto by suitable fastening means such as the screws 24. Although the brackets 22 and 22a, as illustrated, are shown as being formed integral with the respective side walls of the cabinet it will be appreciated they may also be separately formed and then mounted by suitable means on said side walls and still fall within the purview of the present invention.

An inclined baffle member 25 extending transversely across the front cabinet portion 11 serves to divide the interior of said cabinet portion into an inlet chamber 26 in the lower portion thereof wherein the refrigerant evaporator and its fan (not shown) are mounted, and an exhaust or outlet chamber 27 in the upper portion thereof. The baffle 25 cooperates with the cabinet side walls 13 and 13a to define an opening 28 in said upper chamber and said opening is adapted to receive one end of an air duct or conduit 29, the opposite end of which communicates with the discharge side of the evaporator compartment wherein the room air is cooled, when the unit is operated on the cooling cycle. Since the refrigeration apparatus contemplated may be generally conventional in arrangement and operation it was not deemed necessary to show such details herein thereby avoiding all unnecessary complexities in the drawings.

Now in accordance with the more specific teachings of the present invention there is provided an air exhaust or discharge grille assembly which resembles a cover and is adapted for insertion in any one of two different posi-

tions in the upper opening 20 of the front cabinet portion 11. The assembly or louvered cover, which is indicated in its entirety by the reference numeral 30, is shown incorporated in the cabinet in one position in Figures 1 and 3, and in its other position in Figures 2 and 4. According to the arrangement of Figure 1 the air is discharged out into the space being conditioned only through the front wall of the cabinet, while in the unit depicted in Figure 2 the air is discharged only through the top wall of the cabinet.

The assembly 30, as fashioned, includes a frame 31 having an imperforate arm portion 32 disposed substantially at right angles to an arm portion 33 having a plurality of generally square openings 34 therein. Each of said square openings is formed with a peripherally extending and inwardly directed flange 35 that provides a seat for a louvered grille element 36 that is removably mounted therein. A bracket-like member 37 transversely disposed across the rearward portion of each grille element opening 34 serves to aid in resiliently mounting the individual grille element in its respective opening in the frame 31.

Each grille element 36 is fashioned with parallel spaced-apart louvers 38 mounted at an angle or inclined with respect to the plane of said element, and a plurality of paralleled spaced-apart rib members 39 that are positioned so as to be disposed at a substantial right angle or normal to said louvers. A centrally disposed threaded stud or screw 40 passes axially through the center of a coil spring 41 and is anchored in a threaded bore 42 in said grille element. The coil spring 41 is positioned in compression between a transverse bracket member 37 and an enlarged ring or washer member 43 disposed adjacent the head of the stud or screw 40. In this manner the individual grille element 36 is resiliently although removably mounted and secured in its respective opening in the frame 31. A handle 44 on each grille element facilitates the individual manipulation and rotation thereof as will be more fully understood subsequently.

Although both the frame 31 and the grille elements 36 are fashioned, preferably, by moulding from a suitable well-known plastic material such, for instance, as one of the high impact polystyrene compositions, it will be understood other suitable materials may also be used without deviating from any concepts envisaged by the present invention.

In order to detachably affix the air discharge grille assembly in its operable position in the cabinet spring clip fastening and retaining means are provided which are readily and simply detachable without the use of tools or the like. A spring clip retaining member 45 having a sharp-edged prong 46 inwardly directed therefrom is snapped or pressed over the edge of a ledge-like extension 47 on the rearward portion of the arm 33, of frame 31, and, since the prong 46 is bent so as to imbed itself deeper into said extension when lateral pressure is exerted on the clip, the clip remains fixedly attached to the extended portion 47. The opposite end of the retainer clip 45 is outwardly bent or flanged as shown at 48 and this flanged portion seats in abutting fashion against the rearward surface of the front vertical wall at a point adjoining the opening 20 therein in the front cabinet portion 11. If desired, more than one such clip retainer may be used in which event the individual clips may be spaced or distributed at intervals along the opening. In this manner one portion of the air discharge grille assembly 30 is retained tightly seated against the ledge or shoulder 21 of the opening 20 in said cabinet.

A second resilient fastening means serves to secure another portion of the said assembly in a tightly seating position in the cabinet. A generally U-shaped resilient fastening member 49 is attached by means of a screw 50 to a threaded bore in the insert frame member 31 and an outer leg 49a of said U has a center portion thereof punched out, which punched-out portion is formed to

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provide a snap-spring or clip 51 depending from the main part of said resilient member.

In addition, the outer leg 49a of said U (see Fig. 11) is also provided with a pair of spaced openings 52—52a dimensioned to receive cooperating projections or anchoring studs 53—53a which extend from the ends of rib members 54—54a that, in turn, depend from the inner surface of the imperforate arm portion 32, of said frame 31. The ribs 54—54a, preferably, are integrally formed or moulded with the plastic frame 31 and hence the clip member 49, when positioned to cooperate therewith, is rigidly but detachably secured to the said plastic frame. Since the screw 50 is readily accessible it will be appreciated that the clip member 49 may also be easily removed at will.

A slot-like opening 55 disposed near one end of the upper or horizontal arm of the transverse angle member 23 receives in snap fashion the spring portion 51 of the fastening clip member 49 and thus serves to fixedly but detachably secure another portion of the assembly 30 in position in the cabinet. A similar clip fastener arrangement (not shown) at the opposite side of said frame is adapted for insertion in a similar opening 55a in the opposite end of the transverse angle member 23. Additional slotted openings 56 and 56a are provided in opposite ends of the other or vertical arm of the angle member 23 so as to receive the individual clip fastener members 51 when the assembly 31 is positioned in the cabinet in another position as will be more fully explained hereinafter. Reinforcing ribs 57 spaced at intervals along the imperforate arm portion 33, of frame 31, may, if desired, be used to provide additional rigidity and reinforcement for said frame member.

Spring clip members 58—58a, one disposed proximate each end of the transverse angle member 23 and securely mounted by suitable conventional means to the mounting brackets 22 and 22a, respectively, and extending at a slightly spaced interval parallel to the two respective side walls 13 and 13a of the cabinet, may, if desired, be provided as a resilient means for pressing the side walls of the air duct 29 against the respective side walls of the cabinet and thus improving the air seal therearound.

In operation the air received from the room or space being conditioned passes through the inlet grille 18 and into the compartment or chamber 26 wherein it is directed into heat exchange relation with the refrigerant evaporator (not shown) where, in the present instance, it is cooled and thereafter is moved or forced by the evaporator fan (not shown) into the conduit or air duct 29. With the air discharge grille assembly 30 in the position shown in Figures 1 and 3 the conditioned air is discharged into the room through louvered grille elements 36 which are disposed in the front vertical wall of the cabinet 11. As shown, in Figure 3 particularly, the louvers 38, of the grille element 36, are inclined upwardly and hence the air will be discharged upwardly into the room. In the event it is desired the air be otherwise directed the grille element 36 may be pulled out by using the handle 44 and rotated through 90 or 180 degrees either clockwise or counterclockwise depending upon which direction it is desired the air be discharged into the room. The coil spring 41 serves to tightly reseal the grille element 36 after it has been rotated and also to retain it in place and prevent it from rattling because of the pressure of the discharge air thereon.

When it is desired that a greater quantity of air be discharged upwardly or that it be discharged at an angle upwardly that is greater than can be effected with the air discharging through the front wall of the cabinet the assembly 30 is repositioned so as to discharge the air through the top wall, in which event the position of the structure would resemble that shown in Figures 2 and 4. In order to accomplish this simple change in positioning the assembly 30 is removed from the cabinet by lifting upwardly thereby freeing the spring fastening clip 51 at

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each end thereof from its respective retaining slot 55 in the transverse angle member 23, and at the same time sliding the flanged over end 48, of retainer spring 45, over the edge of the front wall adjoining the opening 20 in the cabinet. When the fastening and retaining means are thus released and the assembly is completely free it is rotated 180° about a horizontal axis that is normal to the cabinet front wall and then 90° about a horizontal axis that is parallel to the plane of said cabinet front wall. If desired, of course, it will be appreciated that the assembly may be rotated first 90° about the horizontal axis that is parallel to the plane of the front wall and then 180° about the horizontal axis that is normal to the said front wall instead of vice versa without deviating from the teachings hereof. The assembly in either event is now in position so that the flanged spring end 48 may be slipped over the inner surface of the top wall of the rear cabinet portion 12 as the spring clip fastener 51 is pressed into its cooperating opening 56 in the transverse angle member 23. The assembly 30 is now in the position depicted in Figures 2 and 4 of the drawings and all the air received into chamber 27 from the air duct 29 will be discharged into the room or space being conditioned through the top wall opening of the cabinet. Further regulation or control of the direction of such discharged air may then be obtained by manipulation of the individual grille elements 36 as previously explained.

It should now be apparent that a novel air discharge grille assembly has been shown and described, and it is to be understood that changes may be made in the construction without departing from the spirit of the invention or the scope thereof as defined in the appended claims.

What is claimed is:

1. In an air conditioner housing the combination of a housing having side walls, bottom wall, rear wall, and top and front walls, the top and front walls terminating short of the upper front corner which is provided with a frame at each end wall defining rectangular end walls and horizontal frame members for receiving an angular cover, a diagonal partition extending from the top edge of the front wall to the top wall across the front corner and defining an air delivery chamber, said diagonal partition having an aperture and a rectangular conduit delivering air through said aperture, an angular cover member having a vertical portion and a horizontal portion joined at right angles, one of said portions being imperforate and the other of said portions having a plurality of rectangular frame openings therein, said frame openings each having an inwardly projecting louver retaining flange about each frame opening, each frame opening having a transversely extending frame member provided with an aperture for guiding a retaining plunger and each transverse frame member having a cylindrical socket on its inner side for seating a coil spring, a louver frame unit for each of said rectangular louver openings fitting in said opening and comprising an outer frame for supporting a plurality of diagonally extending louvers separated by diagonal slots and the said louvers having a central body provided with a threaded bore on the inside and with a handle on the outside, a threaded bolt in each of said bores and passing through each of the apertures of said transverse frame members, said bolt having its head disposed inwardly and provided with a washer for a spring seat, a helical spring engaging said washer and located about each bolt and seating against the socket of each transverse frame member, the handle permitting each grill to be pulled outwardly, the bolt sliding in said transverse frame member and the spring being compressed until each louver unit clears the frame surrounding each louver opening to permit the turning of each louver unit with its diagonal louvers extending in any one of four directions.

2. In an air conditioner housing the combination of a housing having side walls, bottom wall, rear wall, and top and front walls, the top and front walls terminating

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short of the upper front corner which is provided with a frame at each end wall defining rectangular end walls and horizontal frame members for receiving an angular cover, a diagonal partition extending from the top edge of the front wall to the top wall across the front corner and defining an air delivery chamber, said diagonal partition having an aperture and a rectangular conduit delivering air through said aperture, an angular cover member having a vertical portion and a horizontal portion joined at right angles, one of said portions being imperforate and the other of said portions having a plurality of rectangular frame openings therein, said frame openings each having an inwardly projecting louver retaining flange about each frame opening, each frame opening having a transversely extending frame member provided with an aperture for guiding a retaining plunger and each transversely extending frame member having a cylindrical socket on its inner side for seating a coil spring, a louver frame unit for each of said rectangular louver openings fitting in said opening and comprising an outer frame for supporting a plurality of diagonally extending louvers separated by diagonal slots and the said louvers having a central body provided with a threaded bore on the inside and with a handle on the outside, a threaded bolt in each of said bores and passing through each of the apertures of said transversely extending frame members, said bolt having its head disposed inwardly and provided with a washer for a spring seat, a helical spring engaging said washer and located

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about each bolt and seating against the socket of each transversely extending frame member, the handle permitting each grill to be pulled outwardly, the bolt sliding in said transversely extending frame member and the spring being compressed until each louver unit clears the frame surrounding each louver opening to permit the turning of each louver unit with its diagonal louvers extending in any one of four directions, said cover being provided with spring clips of substantially U shape near its upper front corner on the inside, and the said housing having a transversely extending angle member which is provided with apertures for passing said spring clips when the cover is disposed with its louvers upwardly or its louvers laterally, the U shaped spring clips having projecting humps on their free legs for retaining the cover by means of said angle member in either of two positions.

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