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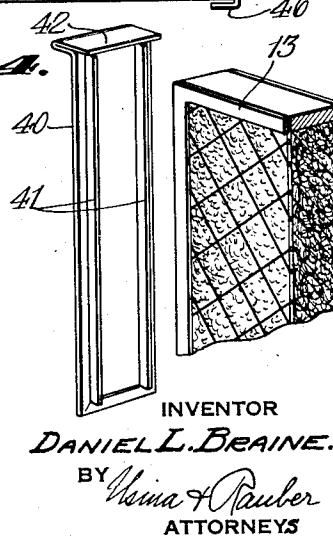
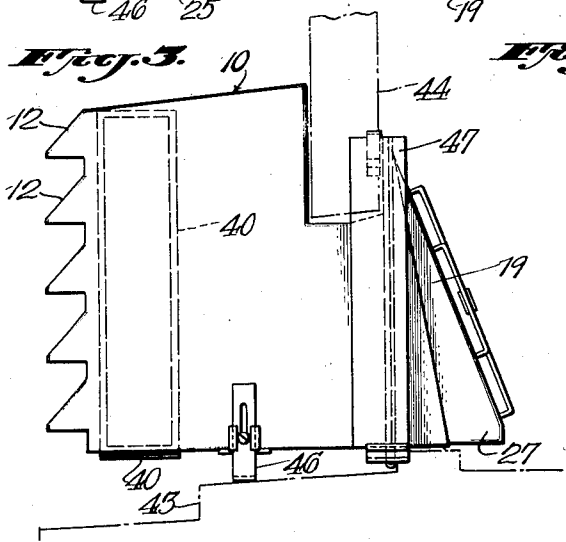
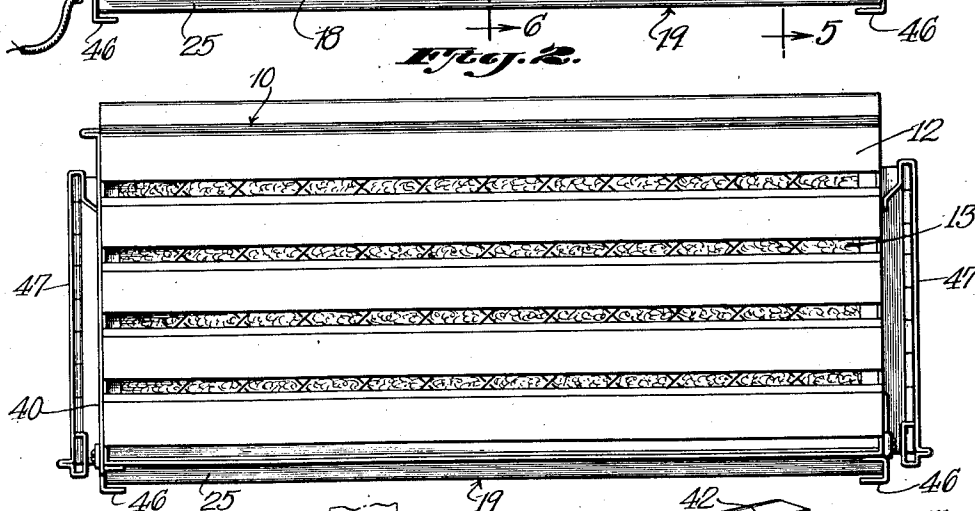
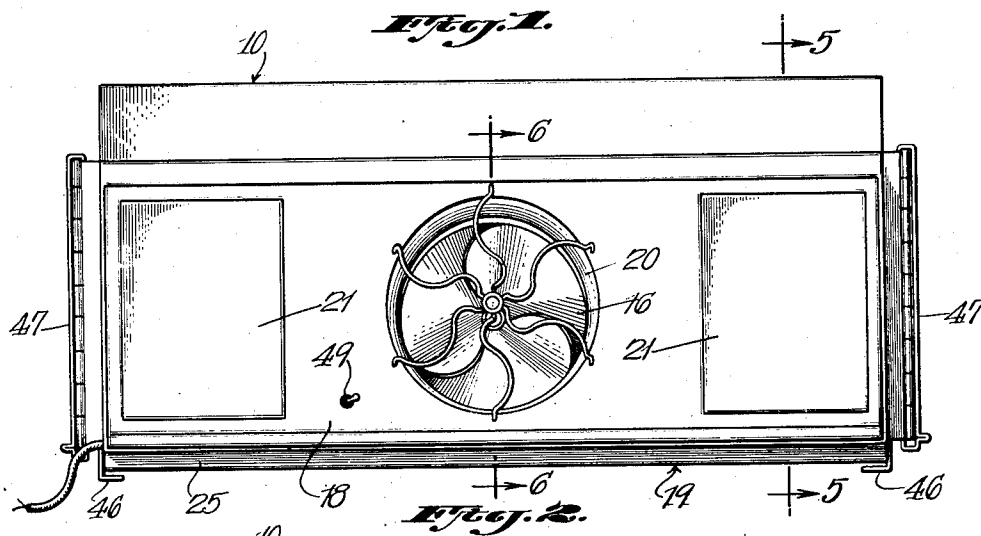
D. L. BRAINE

2,010,809

AIR CONDITIONER

Filed Dec. 30, 1933

3 Sheets-Sheet 1



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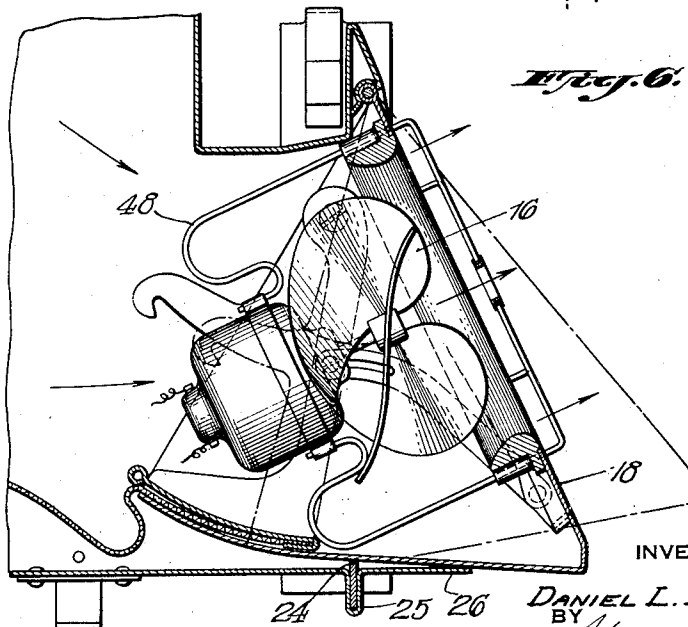
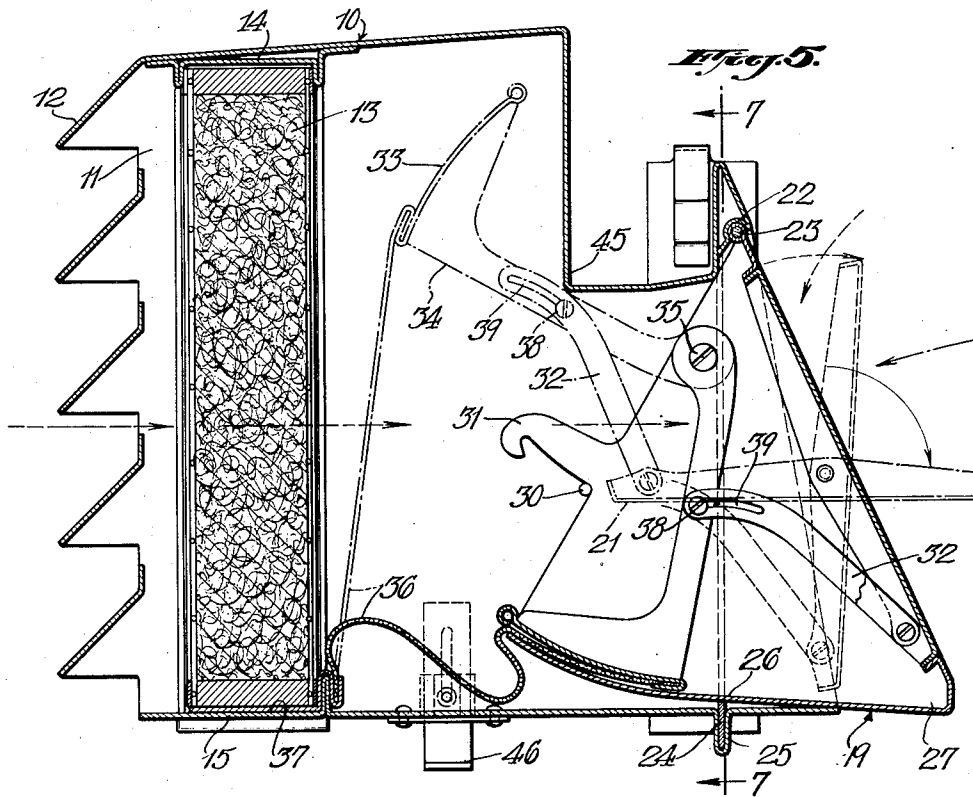
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3 Sheets-Sheet 2



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Fig. 7.

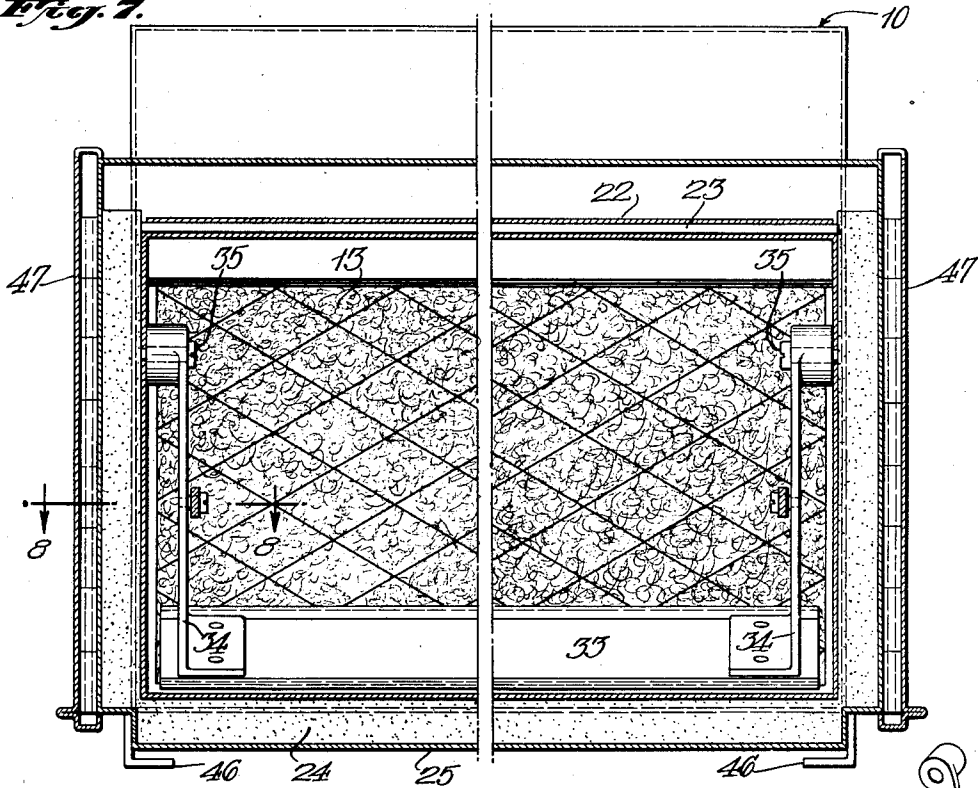


Fig. 8.

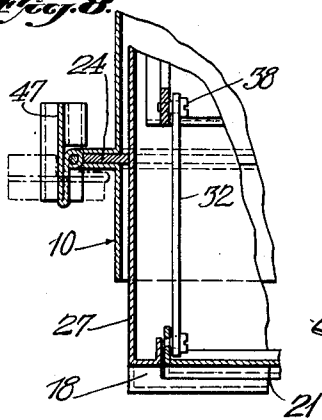
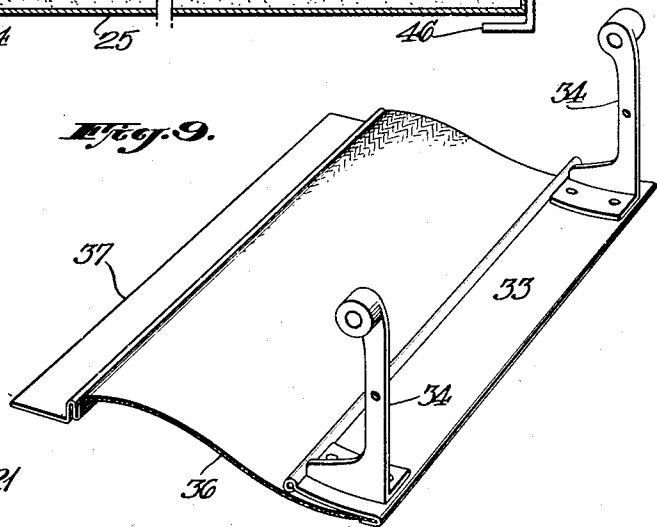


Fig. 9.



UNITED STATES PATENT OFFICE

2,010,809

AIR CONDITIONER

Daniel L. Braine, Brooklyn, N. Y.

Application December 30, 1933, Serial-No. 704,722

11 Claims. (Cl. 98—94)

My invention relates to air conditioners and particularly to an air conditioner that may be set into a window opening.

The present application is a continuation in part of co-pending application Serial No. 663,932 filed April 1, 1933.

Objects of my invention are to provide an air conditioner by which air may be drawn from outside a building, filtered, mixed in selected proportion with air from the interior of the building and distributed into a room or building in a selected path; to provide an air conditioner that may be set into a window opening; to provide a maximum conditioning effect for a minimum opening of the window, and to provide a conditioner having few parts and that may be easily removed, taken apart and re-assembled.

Other objects of the invention will appear from the following description.

The various features of the invention are illustrated in the accompanying drawings, in which—

Fig. 1 is a vertical elevation of an air conditioner embodying a preferred form of the invention taken from the interior side of the air conditioner.

Fig. 2 is a vertical elevation taken from the opposite or outside of the air conditioner.

Fig. 3 is a side view showing the position of the air conditioner in a window opening, the window and sill being shown in broken lines.

Fig. 4 is a detail perspective view of a portion of the filtering device.

Fig. 5 is a vertical section of the air conditioner taken on line 5—5 of Fig. 1 and on a somewhat larger scale.

Fig. 6 is a vertical section of a part of the air conditioner taken on line 6—6 of Fig. 1.

Fig. 7 is a vertical sectional view of the air conditioner taken on line 7—7 of Fig. 5.

Fig. 8 is a sectional detail view of a part of the air conditioner taken on line 8—8 of Fig. 7, and

Fig. 9 is a perspective view of a shut-off or control curtain forming a part of the air conditioner.

In my invention the air conditioner is provided with a removable filter through which the outside air is drawn by means of a fan, and with dampers which admit air from the interior to mix with the filtered outside air and then to be distributed by the fan to the interior of the room. The amount of outside air drawn through the apparatus is controlled by means of a shut-off curtain actuated by the dampers so as to restrict the inflow of outside air progressively as the dampers are opened.

The entire apparatus is mounted in a casing or

chamber that is low and wide so as to fit within a window opening and having a groove into which the lower end of the window sash fits and holds the apparatus as described in co-pending application Serial No. 663,932.

Referring more particularly to the accompanying drawings, the air conditioner is contained within a chamber 10 having at its outer side a number of openings 11 sheltered by over-hanging fixed louvre plates 12, the size and number of the openings being so selected as to provide a uniform distribution of air throughout the width and height of the chamber. A vertical filter 13 of glass, wool or other fibrous material coated with a sticky material such as petrolatum, is supported between guiding grooves 14 and 15 in the top and bottom of the chamber and so placed that the air admitted through the openings 11 passes transversely through the filter toward the front or interior side of the chamber. After passing through the filter 13, the air is drawn by means of a fan 16, Figs. 1 and 6, mounted on the inner surface of the front wall 18 of a front or interior member 19, the fan 16 directing the air through an outlet opening 20 in the wall 18. The wall 18 is also provided with a pair of inlet dampers 21, one on each side of the fan 16 and outlet opening 20, and tiltable about a horizontal axis 21' to open and close suitable inlet openings in the wall 18.

Air from the interior of the room to be conditioned may be drawn through the damper openings by the suction created by the fan 16 and, mixing with the outer air, is returned by the fan 16 into the interior of the room. The front or room side of the chamber 10 is provided with a receiving groove 22 to receive the upper edge of the wall 18 and the upper edge of the latter is rounded as at 23 to fit the groove 22 and permit a swinging motion relative thereto.

The member 19 is supported against the groove 22 and sealed in the chamber 10 by means of a sealing strip 24 of rubber or other flexible resilient material set into a recess 25 in the bottom and side walls of the chamber 10 and pressing resiliently against a bottom wall 26 and side walls 27 of the member 19 so as to form an air tight seal around the bottom and side walls of the member 19, while permitting the latter to swing freely about the groove 22. This arrangement also provides against vibration and noise. The swinging movement of the member 19 is limited by pins 30, one projecting from each of the side walls of the box 10 to contact with the rear edge of the side walls 27 when the member 19 is swung backwardly into the box 10, and to contact

with a hook 31 extending from the edge of the side wall 27 to engage the pin 30 when the member 19 is drawn forwardly or outwardly of the box 10. By removing the pins 30 the member 19 may be drawn forwardly until its rear edge clears the front edge of the box 10 and then it may be lowered to free the upper edge 23 from the groove 22. The interior of the box 10 is then freely open for inspection or repair and the rear of the front member 19 is also open for inspection and repair.

As the member 19 is tilted about the edge 23, the fan 16 is correspondingly tilted and the current of air propelled by the fan normal to the front face of the member 19 is tilted upwardly to a greater or less angle with the tilting of the member 19. The air propelled by the fan 16 may consist entirely of air drawn from the room for recirculation therein, or may be air drawn entirely from the outer atmosphere through the filter 13, or may be mixtures of air from these two sources in any desired proportion. When the dampers 21 are closed, all of the air supplied by the fan 16 will enter through the inlets 11, pass through the filter 13 into the interior of the box 10 and then be propelled by the fan 16. When it is desired to recirculate only the air within the room without an admixture of air drawn through the filter 13, the dampers 21 are opened wide until they reach a horizontal position. In moving to this position the dampers serve, through a link 32 connected at one end to the lower part of the dampers, to swing the scoop 33 having supporting arms 34 connected to the link 32 and pivoted at their upper ends on pivot pins 35 on the side walls 27 of the member 19. A flexible curtain 36 is secured at its front edge to the front edge of the scoop 33 and at its rear end to a plate 37 engaged and held in the groove 15 beneath the lower edge of the filter 13 so that when the dampers 21 are swung to horizontal position, as shown in dotted lines in Fig. 5, the curtain 36 is stretched upwardly from the plate 37 at the lower edge of the filter 13 and forms, with the scoop 33, a barrier to the passage of air forwardly from the filter 13.

It will be understood, of course, that the curtain 36 together with the scoop 33 may not necessarily form an air tight closure with the side and top walls of the box 10, but will form a substantial obstacle to any considerable passage of outside air to the fan 16. The curtain 36 may be formed of any suitable material such as canvas or other fabric or, if desired, of flexible metal construction or of flexible composition material.

When the damper 21 is moved to closed position, the scoop 33 is drawn forwardly by the link 32 until it overlies the lower wall 26 of the member 19, the front part of the curtain being drawn between the lower edge of the scoop 33 and the upper face of the wall 26 so as to form a fluid tight closure. In this position the curtain 36 will lie substantially flat along the lower wall of the box 10, giving the widest path for the passage of air from the filter 13 to the fan 16. It will be understood that the curtain 36 need not lie tightly against the lower wall of the box 10 although, preferably, it will take this position when the member 19 is tilted outwardly to its maximum position. When tilted backwardly or into the box 10, the curtain 36 will bulge upwardly slightly, as indicated in Fig. 5, but this will not form any substantial obstacle to the passage of air.

The connection between the link 32 and the arms 34 is by means of pins 38, one on each arm

34, passing through a slot 39 on the link 32 so that the damper 21 may be swung from closed to vertical position, indicated in broken lines in Fig. 5, before the front edge of the slot 39 engages the pin to tilt the scoop. This enables the damper 21 to be opened somewhat without closing the curtain. Further opening of the damper 21 serves to proportionately close the curtain and proportion the inside and outside recirculating air.

The filters 13 are preferably of a replaceable type and are inserted through an opening in the side wall of the box 10, which opening is provided with a door or cover 40 shown in Fig. 4. This door is formed of a solid plate or sheet of metal and has vertical flanges 41 to fit into vertical grooves at each side of the filter opening, and a top flange 42 fitting into a top groove in the box. This provides a substantially air tight closure. When the filter 13 is removed from the box 10 the curtain holding plate 37 is freed and may be removed with the curtain when the front member 19 is removed.

As illustrated in Fig. 3, the box 10 may be held on a window sill 43 by the engagement of a window 44 in a receiving groove 45 (Fig. 5) in the upper or top wall of the box 10. An adjustable foot 46 is provided to support the box on a window sill of any shape or pitch. Adjustable or replaceable side members 47 are also provided on the box 10 to enable it to fit windows of different widths.

It will be noted that the box 10 and the member 19 are of about the width of the window sill and that the lower edge of the sash fits into the narrowest part of the box 10 so that all of the window opening area is free and available for the passage of air, while the box 10 may extend upwardly to the upper edge of the frame portion of the window giving a maximum area of flow through the filter 13 without obstructing any of the light area of the window.

It will be understood that the fan 16 will be preferably of a noiseless type mounted on the front wall of the member 19 by any suitable means such as the arms 48 (Fig. 6). The fan may be operated and controlled through an electric switch 49 mounted on the front wall of the member 19.

Through the above invention, therefore, an air conditioner is provided that may be readily placed in the opening of a window without obstructing the light, and this air conditioner effectively purifies incoming air and tempers it with recirculating air in any desired proportion. The various elements of the invention are simple in construction and may be readily taken apart so as to give access to the interior of the apparatus for replacement or repair.

What I claim is—

1. An air conditioner comprising a chamber having an air inlet at one side exposed to the exterior, and an air outlet and inlet at its opposite side opening to a space to be air conditioned, a damper in said latter inlet, a flexible curtain secured at one edge to one wall of said chamber and having its opposite edge movable from said wall toward another of said chamber to intercept the flow of air therethrough, and means actuated by said damper to move said curtain to intercepting position as said damper is opened and to return it to non-intercepting position when said damper is moved toward closed position.

2. An air conditioner comprising a chamber having an air inlet at one side exposed to the ex-

terior, and an air outlet and inlet at its opposite side opening to a space to be air conditioned, a damper in said latter inlet, a flexible curtain secured at one edge to one wall of said chamber and having its opposite edge movable from said wall toward another of said chamber to intercept the flow of air therethrough, and means actuated by said damper to move said curtain to intercepting position as said damper is opened and to return it to non-intercepting position when said damper is moved toward closed position, said means having a lost motion to permit partial opening of said damper without moving said curtain.

3. An air conditioner comprising a chamber having an air inlet at a side exposed to the atmosphere and an air outlet and an inlet at an opposite side to deliver air to the interior of a space to be air conditioned, a damper in said latter inlet, a swinging scoop, and a curtain secured at one end to said scoop and at the opposite end to a wall of said chamber to intercept the passage of air from said exterior inlet to said outlet when swung to one position, and to permit passage of air through said chamber when swung to the opposite position, and means actuated by said inlet damper to swing said scoop.

4. An air conditioner comprising a chamber having an air inlet at one side exposed to the exterior, and an air outlet and inlet at its opposite side opening to a space to be air conditioned, a damper in said latter inlet, a flexible curtain secured at one edge to one wall of said chamber and having its opposite edge movable from said wall toward another of said chamber to intercept the flow of air therethrough, means actuated by said damper to move said curtain to intercepting position as said damper is opened and to return it to non-intercepting position when said damper is moved toward closed position, and a fan in said outlet.

5. An air conditioner comprising a chamber having an air inlet at a side exposed to the outer atmosphere, and an air outlet and a pair of inlets, one on each side of said outlet at the side of said chamber exposed to an interior atmosphere, dampers, one in each of said latter inlets, and a curtain movable to a position intercepting passage between said inlet from the outer atmosphere to said outlet when said inlet dampers are swung from closed toward open position.

6. An air conditioner comprising a chamber having at one side an inlet for outside air and at the opposite side an air outlet, a propelling fan in said outlet and a pair of air inlets, one on each side of said outlet, dampers in said latter inlets, a scoop pivoted to the side walls of said chamber to swing from the base thereof upwardly toward the top, a flexible curtain secured at one end to the lower part of said chamber and at the opposite end to said scoop to extend upwardly transversely of said chamber as said scoop is swung upwardly, an air filter between said curtain and the first mentioned inlet, and links between said dampers and said scoop to swing said scoop upwardly when said dampers are moved to open position.

7. An air conditioner comprising a chamber having lower and side walls and an open front and having a recess in its upper wall at said open front, a front member having side and lower walls and having its upper edge engaged in said recess, and a flexible sealing member in the lower and side walls of said chamber bearing against and sealing the side and lower walls of said front member and holding it in said recess.

8. An air conditioner comprising a chamber having lower and side walls and an open front and having a recess in its upper wall at said open front, a front member having side and lower walls and having its upper edge engaged in said recess, a flexible sealing member in the lower and side walls of said chamber bearing against and sealing the side and lower walls of said front member and holding it in said recess, said chamber having an inlet in the side opposite said open side, a filter near said inlet, said front member having an inlet and an outlet, a damper in said latter inlet, said chamber having a flexible curtain movable to intercept the passage of air from said filter to said front member, and means to move said curtain to intercepting position when said damper is open.

9. An air conditioner comprising a chamber having lower and side walls and an open front and having a recess in its upper wall at said open front, a front member having side and lower walls and having its upper edge engaged in said recess, a flexible sealing member in the lower and side walls of said chamber bearing against and sealing the side and lower walls of said front member and holding it in said recess, said chamber having an inlet in the side opposite said open side, a filter near said inlet, said front member having an inlet and an outlet, a damper in said latter inlet, said chamber having a flexible curtain movable to intercept the passage of air from said filter to said front member, and a link for moving said curtain to intercepting position when said damper is open.

10. An air conditioner comprising a chamber having an air inlet at an exterior side and air outlet and inlet at its opposite interior side, means within said chamber having one edge secured to a wall of said chamber and extensible from said wall to the opposite wall of said chamber to span and close the passage between said air inlet at one side and the air outlet at the opposite side of said chamber and control means to extend said extensible means to and from said opposite wall.

11. An air conditioner comprising a chamber having an air inlet at an exterior side and air outlet and inlet at its opposite interior side, means having one edge secured to a wall of said chamber and extensible from said wall to the opposite wall of said chamber to span and close the passage between said air inlet at one side and the air outlet at the opposite side of said chamber, a damper in the inlet at the interior side and means actuated by the opening of said damper to extend said means across the passage between said exterior and interior inlet.

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