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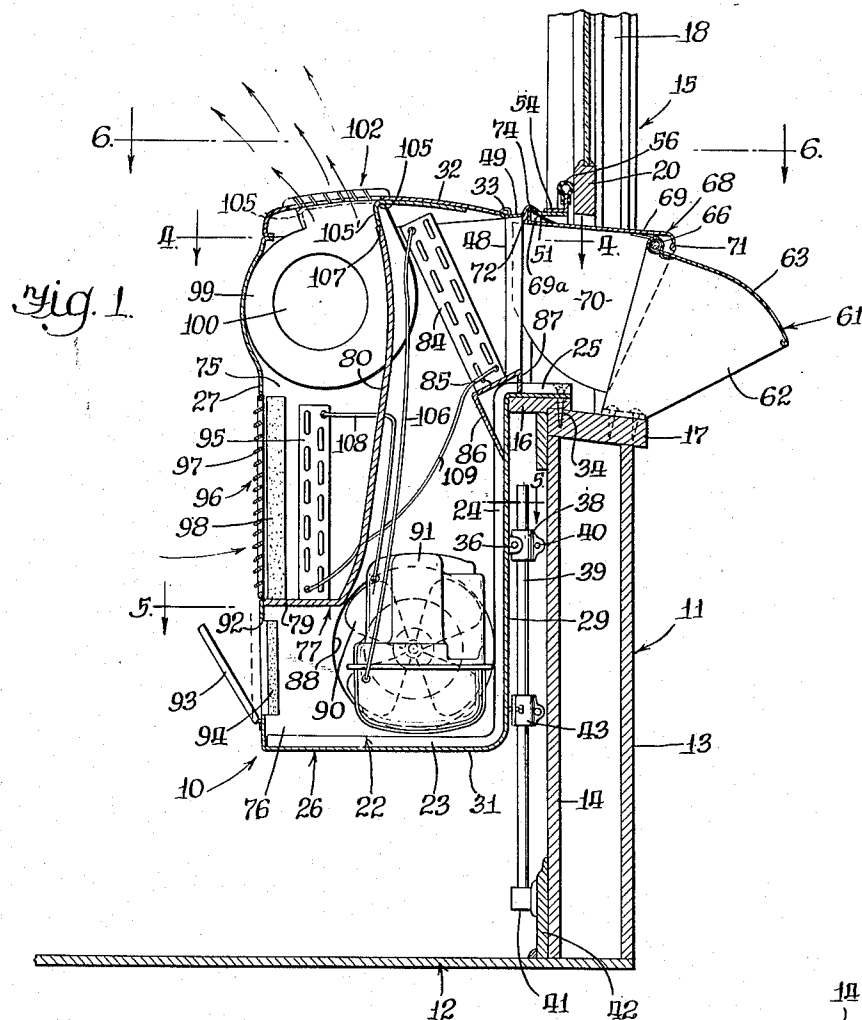
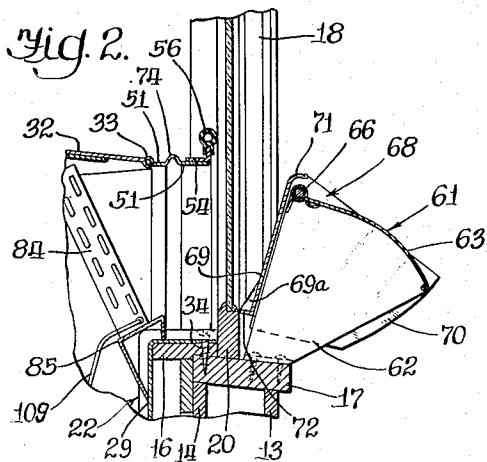
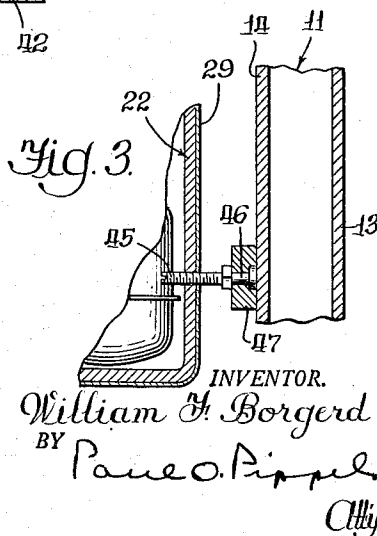
W. F. BORGERD

2,664,720

WALL MOUNTED CONSOLE TYPE AIR CONDITIONING APPARATUS

Filed July 11, 1952

3 Sheets-Sheet 1



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WALL MOUNTED CONSOLE TYPE AIR CONDITIONING APPARATUS

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3 Sheets-Sheet 2



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3 Sheets-Sheet 3

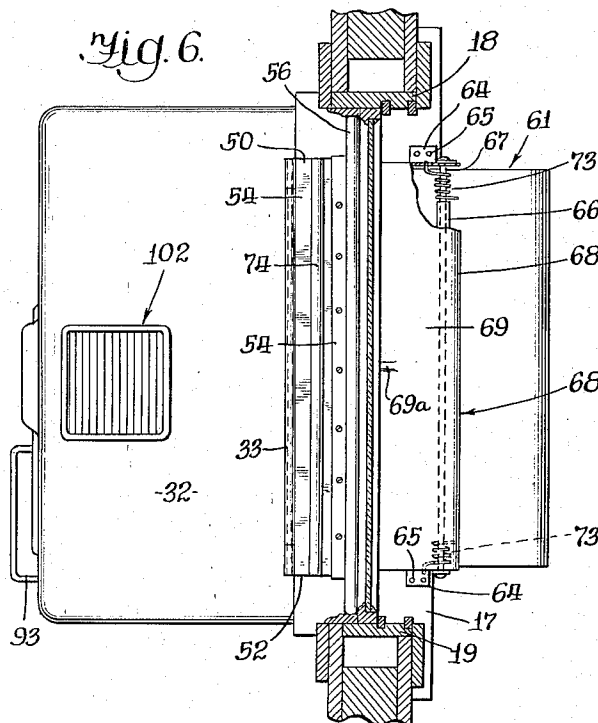
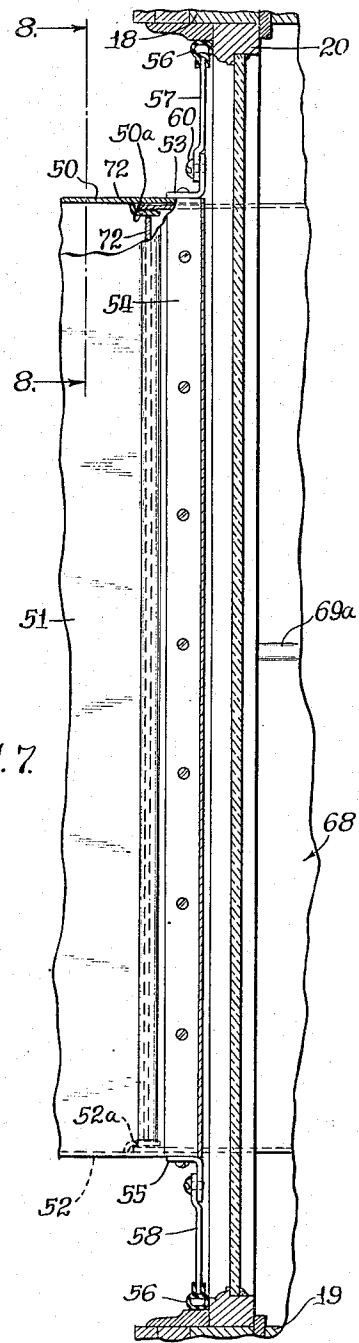
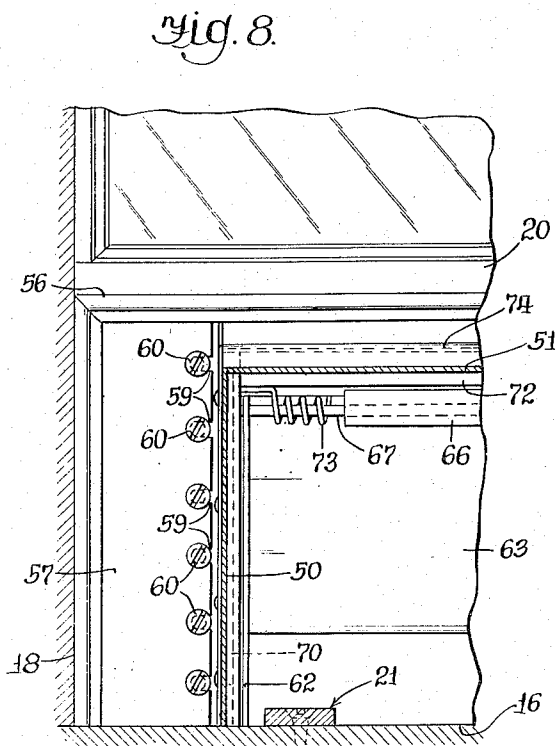


Fig. 7.



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UNITED STATES PATENT OFFICE

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WALL MOUNTED CONSOLE TYPE AIR
CONDITIONING APPARATUS

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13 Claims. (Cl. 62-129)

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This invention relates generally to air conditioning apparatus and more particularly to a wall-mounted console type air conditioner.

The console type air conditioner has not become as popular as the window-mounted air conditioner in recent years largely because it obstructs floor space and is more costly to manufacture. The window-mounted air conditioner has the disadvantage of obstructing a large portion of a window and preventing closure of the window. The present invention is concerned with providing an air conditioning unit which will overcome these disadvantages.

One object of the present invention is to provide a console type air conditioner which is adapted to be mounted on the wall of a room below an outside window, thus eliminating the costly provisions of mating the floor to sill height of the room, for instance, with an air conditioning unit that rests on the floor.

Another object of the invention is to provide means for attaching the air conditioner to the window sill of the window.

Another object of the invention is to provide means for adjusting the cabinet of the air conditioner so that it will extend parallel to the inside surface of the wall.

Another object of the invention is to provide a console model air conditioner which is spaced entirely above a floor of a room so that the floor beneath the conditioner can be easily cleaned.

Another object of the invention is to provide an air duct for directing outside air through the window into the high side compartment of the air conditioner. Another object of the invention is to provide an air duct which will prevent rain from leaking into the cabinet of the air conditioner.

Another object of the invention is to provide an air duct which will permit complete closing of the window.

Another object of the invention is to provide a console model air conditioner that will obstruct a minimum amount of floor space.

Another object of the invention is to provide an air conditioning unit which can be left in place all seasons of a year.

Another object of the invention is to provide an air conditioning unit with means for thoroughly filtering the air which is to be conditioned.

Another object of the invention is to provide a console model air conditioner which is compactly arranged and economical to manufacture.

These and other objects will become more ap-

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parent from the following description and drawings in which like reference characters denote like parts throughout the several views. It is to be expressly understood, however, that the drawings are for the purpose of illustration only and not a definition of the limits of the invention, reference being made for this purpose to the appended claims.

In the drawings:

Fig. 1 is a vertical sectional view of an air conditioner and the wall to which it is secured.

Fig. 2 is a vertical sectional view of the air duct and a portion of the wall and air conditioner.

Fig. 3 is an enlarged sectional view of a lower corner of the air conditioner showing a modification of the mounting means.

Fig. 4 is a cross-sectional view taken substantially along line 4-4 of Fig. 1.

Fig. 5 is a cross-sectional view taken substantially along line 5-5 of Fig. 1.

Fig. 6 is a plan view of the air conditioner taken substantially along line 6-6 of Fig. 1.

Fig. 7 is an enlarged view of the baffle arrangement of the unit adjacent the window.

Fig. 8 is a sectional view taken along line 8-8 of Fig. 7.

Referring now to the drawings for a detailed description of the invention, an air conditioning unit, designated generally by reference numeral 10, is shown mounted on an outside wall 11 of a room above a floor 12. The wall comprises an outer panel 13 and an inner panel 14 spaced therefrom with any suitable material therebetween. A window 15 opens through the wall 11 and comprises an inner sill 16, an outer sill 17, and side members 18 and 19 in which a window sash 20 is slidably secured.

The air conditioning unit 10 is provided with two spaced apart frame members 21 and 22. Each frame member is provided with a base portion 23, a vertical portion 24, and an upper portion 25. Secured to the frame members 21 and 22 is an outer decorative casing 26 which comprises a front wall 27, a side wall 28, a rear wall 29, a side wall 30, a bottom wall 31, and a top cover 32 which is pivotally secured to the cabinet by hinges 33. The casing 26 is positioned adjacent the outer wall 11 with the upper portions 25 of the frame members 21 and 22, as well as the upper marginal edge portion of rear wall 29, overlapping the inner window sill 16 and being secured thereto by screws 34. The frame members 21 and 22 are strong enough to support the entire weight of the unit 10. Fixedly secured to

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the rear wall 29 of the casing 26 are two spaced apart mounts 35 and 36 in which a cross pin 37 is secured. A bracket 38 is pivotally secured to the cross pin 37 and a leg member 39 extends through the bracket 38 and is adapted to be fixedly secured therein by the tightening of a screw 40 threaded into bracket 38. The leg member 39 extends downwardly and is provided with a foot member 41 which abuts a base board 42. A second bracket 43 is fixedly secured to the leg member 39 adjacent the rear wall 29. The bracket 43 is provided with two set screws 44 which may be forced against the rear wall 29 in order to hold the casing in plumb position. The leg member 39 can be adjusted in vertical height by loosening the screw 40 of bracket 38 and moving the leg member to a desired position.

Fig. 3 shows a modification in which a set screw 45 is located in the lower center of the rear wall 29. It has a dowel extension 46 in engagement with a wall member 47 which rests against the inner panel 14 of the outer wall 11. In this arrangement the leg member 39 and brackets 38 and 43 are eliminated and the casing is brought into plumb position by adjusting the screw 45.

The rear wall 29 of the casing 26 terminates on top of the window sill 16 so that an opening 48 is provided in the rear of the casing 26 adjacent the window sash 20. A duct 49, having a side wall 50, top wall 51, and side wall 52, is secured to the casing 26 around the opening 48. The outer edges of the duct 49 are located proximate the window sash 20. Channel members 53, 54, and 55 are secured to the side wall 50, top wall 51, and side wall 52 respectively, and a rubber gasket 56 is secured to the outer leg of the channel member 54. Baffle members 57 and 58 fit between the sides of the window frame 15 and the channel members 53 and 55. Each baffle is provided with a series of slots 59 along the inner edge thereof and screws 60 extend through these slots and are threaded into the adjacent channel member whereby the baffle is fixedly secured in position. The rubber gasket 56 extends over the edges of the baffles 57 and 58 so that the completed assembly is sealed against wind or rain leakage from the window 15.

A fixed air duct 61 having vertical sides 62 and a curved top 63 is positioned outside the window 15. The lower edges of the side walls 62 are provided with outturned flanges 64 which fit against the outer window sill 17 and are secured thereto by screws 65. The inner edge of top wall 63 is provided with a sleeve 66 through which a rod 67 extends. A movable air duct 68 is rotatively secured to the outer ends of the rod 67. The movable duct 68 comprises a top wall 69 and side walls 70 which overlap the fixed duct 61. The outer edge of top wall 69 is provided with a downturned lip 71 and the inner edge of the top wall 69 with an upturned flange 72. Two coiled springs 73 are positioned over the rod 67 adjacent each end thereof. The outer end of each spring 73 is secured to the movable duct 68 whereas the inner end is secured to the fixed duct 61. The springs 73 operate to swing the movable duct 68 about rod 67 to the position shown in Fig. 1. The air duct 49 is provided with a groove 74 along the top thereof into which the flange 72 of the movable duct 68 is adapted to fit. In this construction the fixed duct 61 and movable duct 68 will prevent rain from blowing through the window 15 into the casing 26. The lip 71 and flange 72 will prevent rain from entering the casing 26 from around the top of the

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movable duct 68 while the tunnel-like guards 50a and 52a on the sides of the duct 49 receive the inner edges of the side walls 70 of the duct 68 to provide an effective rain seal around the sides thereof. If window sash 20 is to be closed, it is only necessary to slide it downwardly in the usual manner. Movable duct 68 will rotate downwardly to the position shown in Fig. 2 where it is completely outside the window 15 and will not interfere with the movement of window sash 20. As the window sash 20 is again raised, the springs 73 will automatically return the movable duct 68 to the position indicated by Fig. 1. A centrally located cam-like ridge 69a on the top wall 69, of duct 68, permits the bottom of sill 20 to override the flange 72 without catching or locking therein when the window is being closed.

The interior of the casing 26 is divided into a low side compartment 75 and a high side compartment 76 by a partition 77 comprising a substantially vertical side wall 78, a horizontal wall 79, and a slightly curved inner wall 80. The high side compartment 76 is separated into an inlet chamber 81 and an outlet chamber 82 by a dividing wall 83. A condenser 84 extends across the upper portion of the chambers 81 and 82 and is secured to a support member 85 which has downturned edge portions 86 and 87. The support member 85 extends across the width of the casing 26 with the edge portions 86 and 87 being secured to the frame members 21 and 22. The downturned edge portion 87 extends into contact with the overturned edge portion of the rear wall 28 of the casing 26 whereby it will prevent rain from entering said casing. A circular opening 88 is provided through the wall 83. An electric motor 89 is secured within inlet chamber 81 and is provided with a fan 90 located adjacent opening 88. A motor-compressor unit 91 is secured within said outlet chamber 82. The front wall 27 of casing 26 is provided with a rectangular shaped opening 92 which connects into outlet chamber 82. A door 93 is rotatively secured to casing 26 adjacent opening 92 and a filter element 94 is removably secured over the opening 92.

An evaporator 95 is secured within low side compartment 75 adjacent an air inlet 96 provided through front wall 27 in which a grille 97 is secured. A filter element 98 is removably secured between the inlet 96 and evaporator 95. A centrifugal type fan 99 is installed above the evaporator and is provided with an inlet 100 and outlet 101. The top cover 32 is provided with a louvered opening 102 which fits over the outlet 101 of the fan 99. An electric motor 103 for driving the fan 99 is secured within the high side compartment 76 and is provided with an armature shaft 104 which extends through the vertical wall 78 and is connected to the fan 99. A damper 105 is slidably secured to the top cover 32 and is adapted to be moved away from opening 102 to the open position shown by solid lines in Fig. 1, or to be moved to a closed position shown by dotted lines where it covers and closes the opening 102. The front edge of the damper 105 is provided with a downturned flange 106 which fits within a slot 107 provided in the partition 77 when the damper 105 is in open position.

The refrigeration system is charged with a suitable refrigerant which is compressed by the motor-compressor unit 91 and then forwarded by a conduit 108 to the condenser 84. After flowing through the condenser 84, the refrigerant is then metered into the evaporator 95 by a small diame-

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tered tube 109. Conduit 108 then conveys the refrigerant from the evaporator 95 to the motor-compressor unit 91.

The unit 10 can be easily and quickly assembled to the window sill 16 and brought into plumb position. Controls may be provided for automatically controlling the operation of the refrigeration system but are not shown since they are not important to the invention. With the motor-compressor unit 91 and electric motor 89 operating, outside air will be pulled through the ducts 61, 68, and 49 into inlet chamber 81 by fan 90, over one end of condenser 84, then forced through opening 88, upwardly through outlet chamber 82, over the opposite end of condenser 84 and then discharged through the ducts 49, 68, and 61. The outside air has a path of low resistance through the high side compartment 76 whereby the condenser 84 will be adequately cooled. The motor-compressor unit 91 and electric motor 89 will also be cooled by the outside air.

During operation of the refrigeration unit, room air is pulled through grille 97 by blower 99 and circulated through filter 98 and over the evaporator 95, after which it is pulled through blower inlet 100 and then discharged into the room through the louvered opening 102. The room air will be thoroughly cleaned by the filter element 98 and then cooled to a desired temperature by the evaporator 95.

To add fresh outside air to the room, door 93 is opened to the position shown by solid lines in Fig. 1 so that a portion of the air being circulated through outlet chamber 82 will be forced into the room. This air is filtered by filter element 94, then directed upwardly by door 93 toward grille 97 where it will be picked up by the air stream entering low side compartment 75 and filtered a second time by filter element 98 before finally being cooled by evaporator 95. If it is desired to evacuate air from the room, fan motor 103 may be operated independently. Damper 105 is moved to closed position, as indicated by dotted lines in Fig. 1, whereby the air pulled through grille 97 by fan 99 will be forced through the slot 107 in the partition wall 77 and forced outside through outlet chamber 82 and ducts 49, 68, and 61.

From the foregoing it can be seen that an air conditioning unit 10 is provided which is mounted to a window sill 16 with the floor 12 below the unit being left unobstructed so that it can be easily cleaned. The entire weight of the unit 10 is carried by the outer wall 11 of the room so that no damage will be done to the floor 12 due to the weight of the unit. The ducts 61, 68, and 49 provide a free path for outside air and prevent the entrance of rain into the casing 26. Window sash 28 may be lowered without the removal of any parts. By properly adjusting the door 93 and damper 105, the room air may be conditioned in any desired manner.

While the invention has been shown in a preferred form, it will be obvious to those skilled in the art that it is not so limited but is susceptible to various changes and modifications without departing from the spirit thereof.

What is claimed is:

1. In an air conditioning unit, an outer casing disposed entirely within a room which is to be conditioned, a refrigeration system positioned within said casing, means for securing said casing to a wall of said room with the lowermost portion of the casing being spaced above the floor of

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said room, said casing having a wall located adjacent said room wall, a leg member having one end pivotally secured to said casing wall and an opposite end engaging said room wall, and movable means secured to said leg member intermediate said ends which abuts said casing wall and holds it in parallel relationship to said room wall.

2. In an air conditioning unit, an outer casing disposed entirely within a room which is to be conditioned, a refrigeration system positioned within said casing, means for supporting said casing upon the inner sill of a window with the lowermost portion of the casing being spaced above the floor of said room, said casing being provided with an opening adjacent said window, a duct pivotally secured to the outer sill of said window, said duct extending through said window when the window is open so that it directs outside air into said opening, said duct adapted to be rotated away from said window when the window is to be closed.

3. In an air conditioning unit, an outer casing disposed entirely within a room which is to be conditioned, a refrigeration system positioned within said casing, said casing being provided with an opening adjacent a room window, a first duct fixedly secured to an outer sill of said window, a second duct pivotally secured to said first duct, said second duct extending through said window so that it directs outside air from said first duct into said opening, said second duct adapted to be rotated away from said window when the window is closed, said first duct having an inclined top portion which will prevent rain from blowing thereinto.

4. In an air conditioning unit, an outer casing disposed entirely within a room which is to be conditioned, a refrigeration system positioned within said casing, said casing being provided with an opening adjacent a room window, a first duct pivotally secured to the outer sill of said window, said first duct extending through said window so that it directs outside air into said opening, said first duct adapted to be rotated away from said window when the window is closed, said casing being provided with a second duct which surrounds said opening, said second duct being provided with a depressed portion, and said first duct being provided with a flange which fits into said depressed portion and prevents rain from entering around said first duct.

5. In an air conditioning unit, an outer casing disposed entirely within a room which is to be conditioned, a refrigeration system positioned within said casing, an opening provided in said casing adjacent a room window, a first duct fixedly secured to an outer sill of said window, a second duct pivotally secured to said first duct, a third duct surrounding said opening, said second duct extending through said window so that it directs outside air from said first duct into said third duct, said second duct adapted to be rotated away from said window when the window is closed, said third duct being provided with a depressed portion, and said second duct being provided with a flange which fits into said depressed portion and prevents rain from entering around said second duct.

6. In an air conditioning unit, an outer casing disposed entirely within a room which is to be conditioned, means for supporting said casing upon the inner sill of a window with the lowermost portion of the casing being spaced above a floor of said room, a partition dividing said casing

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into a first compartment and a second compartment, said casing being provided with an opening into said second compartment adjacent said window, refrigerant condensing means disposed in said second compartment with means for circulating outside air thereover through said opening, refrigerant evaporating means disposed in said first compartment, an inlet and outlet provided in said casing into said first compartment, blower means for circulating room air over said evaporating means from said inlet and then discharging it through said outlet, said partition having a slotted opening therein proximate the outlet of said first chamber, and a damper slidably secured within said casing and being selectively positionable between a plurality of positions whereby said damper in one position covers the outlet of said first chamber and in another position covers said slotted opening, said blower means operating to discharge room air through said slot when said damper is in closed position.

7. In an air conditioning unit, an outer casing disposed entirely within a room which is to be conditioned, means for supporting said casing upon the inner sill of a window with the lowermost portion of the casing being spaced above a floor of said room, a partition which divides said casing into a first compartment and a second compartment, said casing being provided with an opening into said second compartment adjacent said window, refrigerant condensing means disposed in said second compartment with means for circulating outside air thereover through said opening, refrigerant evaporating means disposed in said first compartment, an inlet and outlet provided in said casing which communicates with said first compartment, blower means for circulating room air over said evaporating means from said inlet and then discharging it through said outlet, a second opening provided in said casing below said inlet which communicates with said second compartment, and means for directing outside air from said second compartment through said second opening toward said inlet.

8. In an air conditioning unit disposed adjacent a room window, a partition dividing said casing into a first compartment and a second compartment, said casing being provided with an opening into said second compartment adjacent said window, refrigerant condensing means disposed in said second compartment with means for circulating outside air thereover through said opening, refrigerant evaporating means disposed in said first compartment, an inlet and outlet provided in said casing into said first compartment, blower means for circulating room air over said evaporating means from said inlet and then discharging it through said outlet, said partition having a slotted opening therein proximate the outlet of said first chamber, and a damper slidably secured within said casing and being selectively positionable between a plurality of positions whereby said damper in one position covers the outlet of said first chamber and in another position covers said slotted opening, said blower means operating to discharge room air through said slot when said damper is in closed position.

9. In an air conditioning unit disposed adjacent a room window, a partition which divides said casing into a first compartment and a second compartment, said casing being provided with an opening into said second compartment adjacent said window, refrigerant condensing means disposed in said second compartment with

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means for circulating outside air thereover through said opening, refrigerant evaporating means disposed in said first compartment, an inlet and outlet provided in said casing which communicates with said first compartment, blower means for circulating room air over said evaporating means from said inlet and then discharging it through said outlet, a second opening provided in said casing below said inlet which communicates with said second compartment, and means for directing outside air from said second compartment through said second opening toward said inlet.

10. In an air conditioning unit, an outer casing disposed entirely within a room which is to be conditioned, means for supporting said casing upon the inner sill of a window with the lowermost portion of the casing being spaced above the floor of said room, a partition dividing said casing into a first compartment and a second compartment, said casing being provided with an opening into said second compartment adjacent said window, refrigerant condensing means disposed in said second compartment with means for circulating outside air thereover through said opening, and refrigerant evaporating means disposed in said first compartment with means for circulating room air thereover, a duct pivotally secured to the outer sill of said window, said duct extending through said window when the window is open so that it directs outside air into said opening, said duct adapted to be rotated away from said window when the window is to be closed.

11. In an air conditioning unit, an outer casing disposed entirely within a room which is to be conditioned, means for supporting said casing upon the inner sill of a window with the lowermost portion of the casing being spaced above the floor of said room, a partition dividing said casing into a first compartment and a second compartment, said casing being provided with an opening into said second compartment adjacent said window, refrigerant condensing means disposed in said second compartment with means for circulating outside air thereover through said opening, and refrigerant evaporating means disposed in said first compartment with means for circulating room air thereover, a first duct fixedly secured to an outer sill of said window, a second duct pivotally secured to said first duct, said second duct extending through said window so that it directs outside air from said first duct into said opening, said second duct adapted to be rotated away from said window when the window is closed, said first duct having an inclined top portion which will prevent rain from blowing thereinto.

12. In an air conditioning unit, an outer casing disposed entirely within a room which is to be conditioned, means for supporting said casing upon the inner sill of a window with the lowermost portion of the casing being spaced above the floor of said room, a partition dividing said casing into a first compartment and a second compartment, said casing being provided with an opening into said second compartment adjacent said window, refrigerant condensing means disposed in said second compartment with means for circulating outside air thereover through said opening, and refrigerant evaporating means disposed in said first compartment with means for circulating room air thereover, a first duct pivotally secured to the outer sill of said window, said first duct extending through said window so that

it directs outside air into said opening, said first duct adapted to be rotated away from said window when the window is closed, said casing being provided with a second duct which surrounds said opening, said second duct being provided with a depressed portion, and said first duct being provided with a flange which fits into said depressed portion and prevents rain from entering around said first duct.

13. In an air conditioning unit, an outer casing disposed entirely within a room which is to be conditioned, means for supporting said casing upon the inner sill of a window with the lowermost portion of the casing being spaced above the floor of said room, a partition dividing said casing into a first compartment and a second compartment, said casing being provided with an opening into said second compartment adjacent said window, refrigerant condensing means disposed in said second compartment with means for circulating outside air thereover through said opening, and refrigerant evaporating means disposed in said first compartment with means for circulating room air thereover, a first duct

fixedly secured to an outer sill of said window, a second duct pivotally secured to said first duct, a third duct surrounding said opening, said second duct extending through said window so that it directs outside air from said first duct into said third duct, said second duct adapted to be rotated away from said window when the window is closed, said third duct being provided with a depressed portion, and said second duct being provided with a flange which fits into said depressed portion and prevents rain from entering around said second duct.

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