June 7, 1938. G. PASCHAL 2,120,208

AIR CONDITIONING MACHINE

Filed Feb. 26, 1937 5 Sheets-Sheet 1

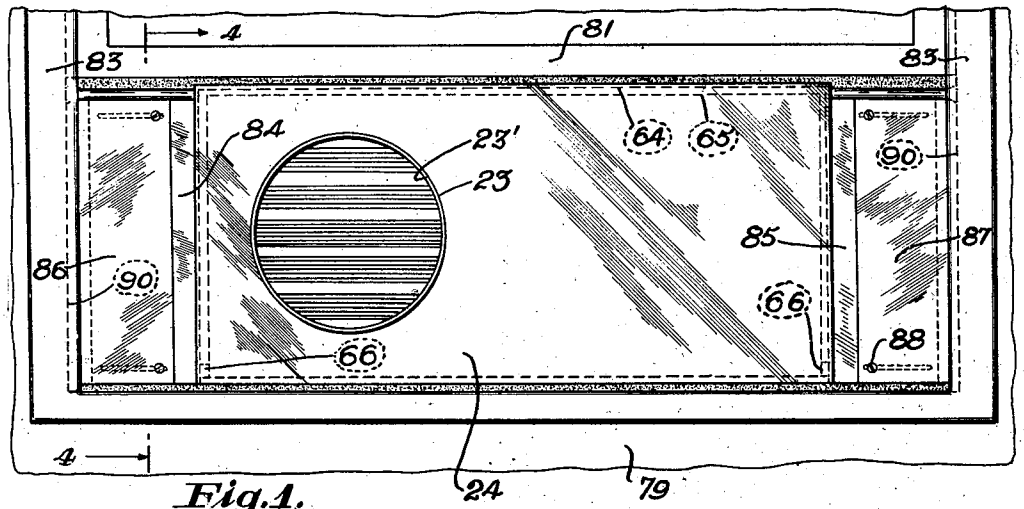


Fig. 1.

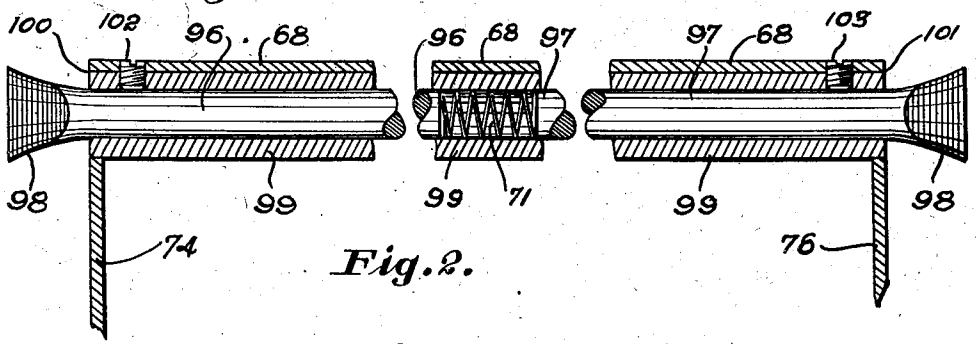


Fig. 2.

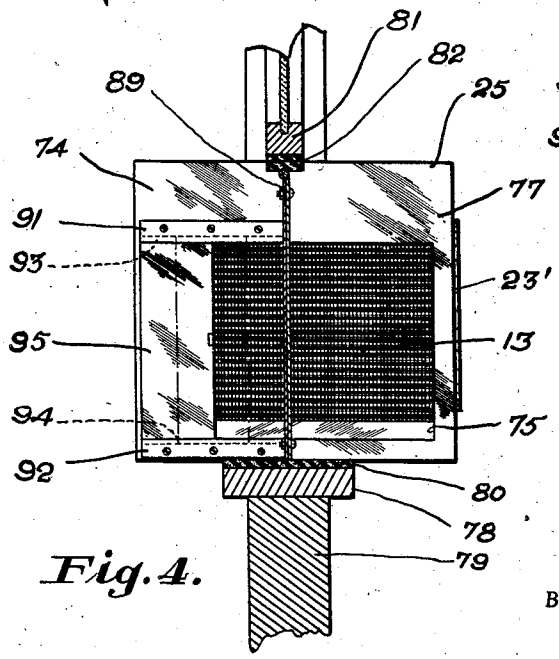


Fig. 4.

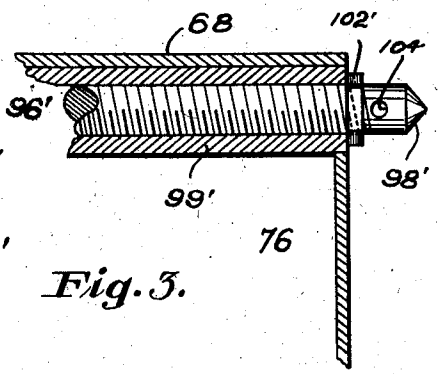


Fig. 3.

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AIR CONDITIONING MACHINE

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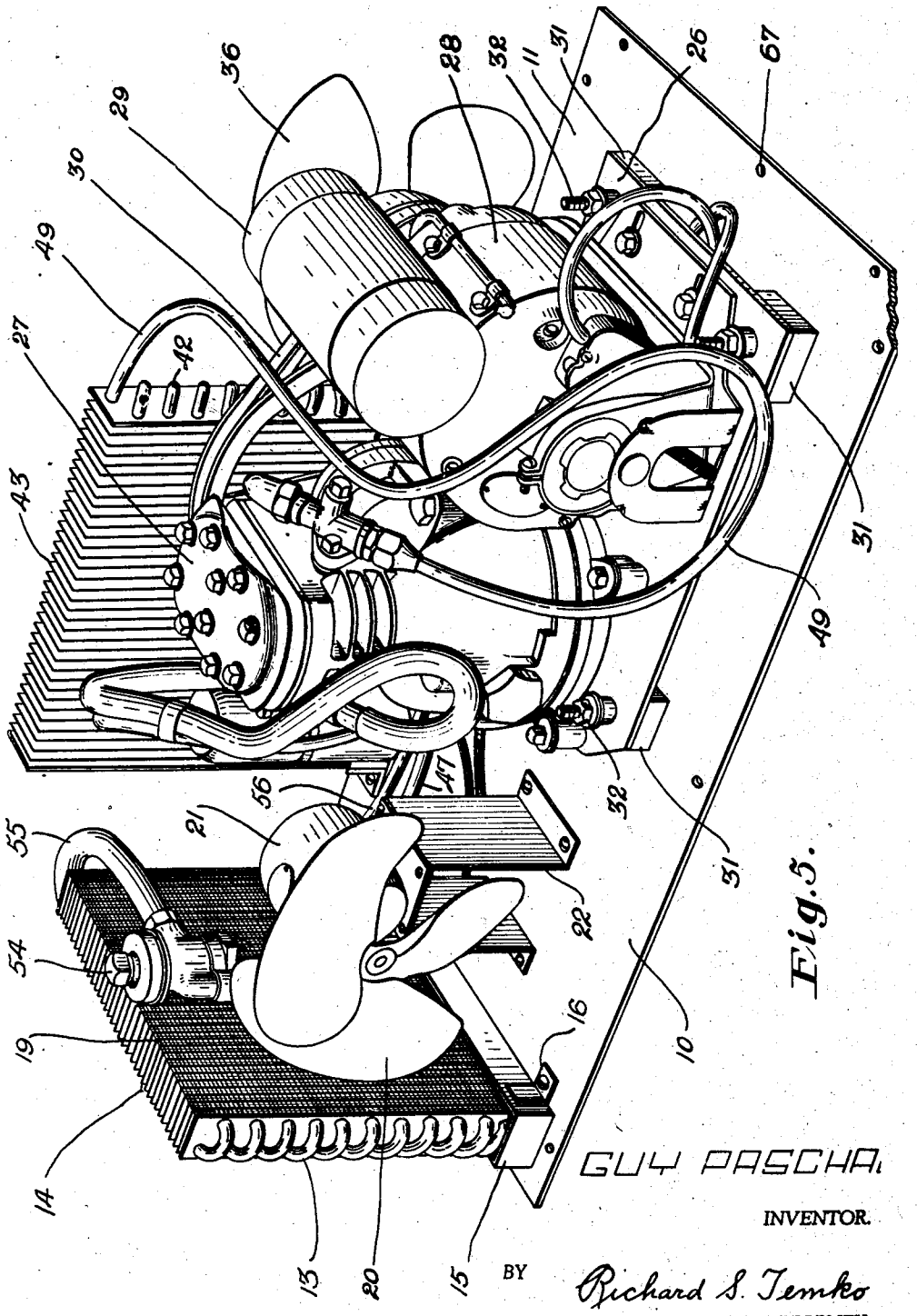


Fig. 5.

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AIR CONDITIONING MACHINE

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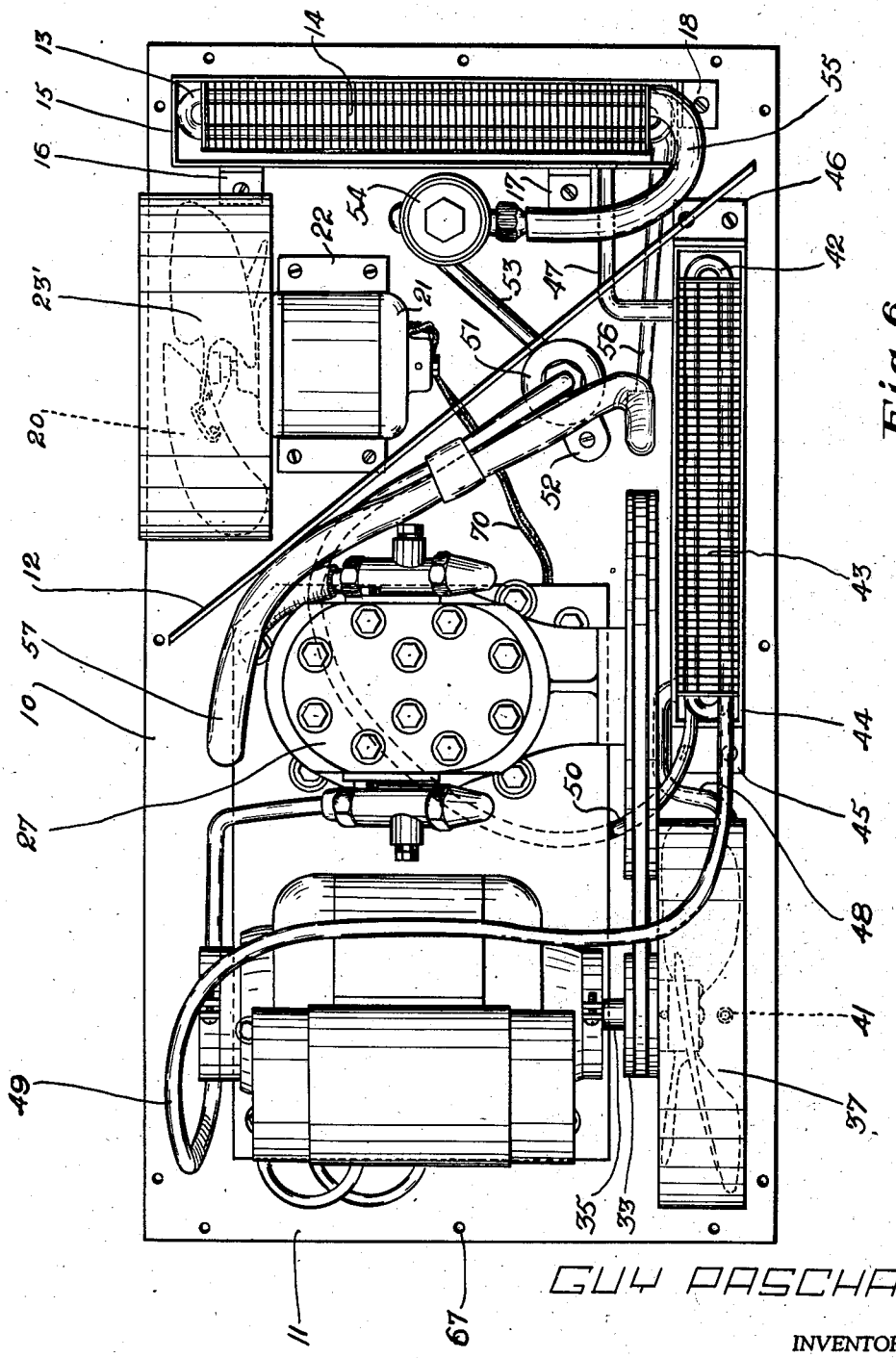


Fig. 6.

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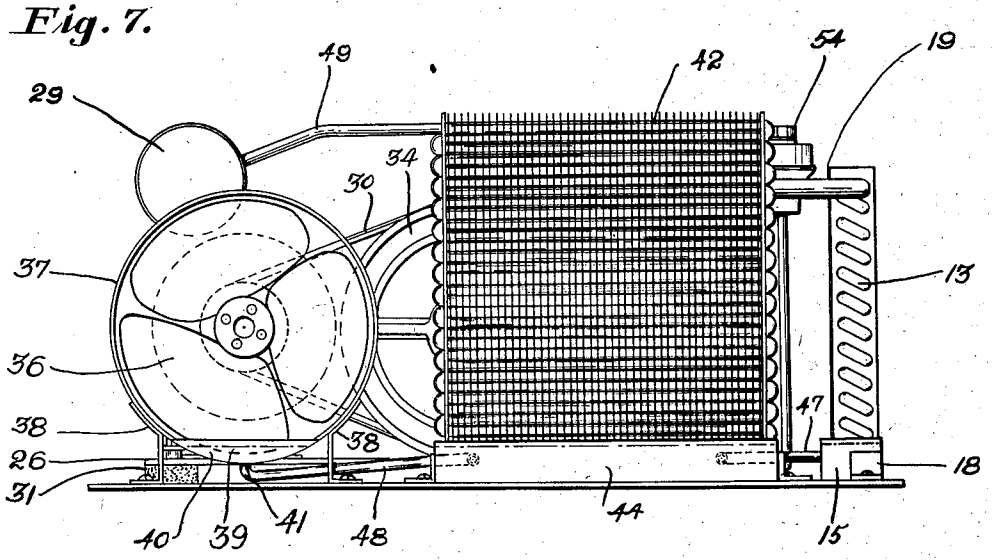
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AIR CONDITIONING MACHINE

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Fig. 7.



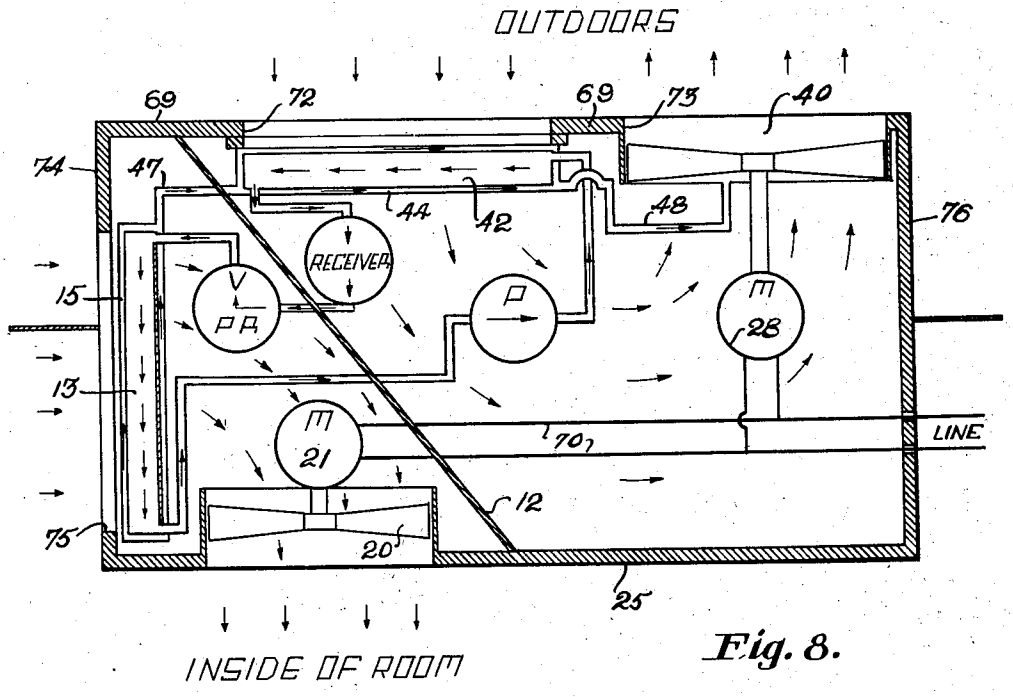


Fig. 8.

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AIR CONDITIONING MACHINE

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Fig. 10.

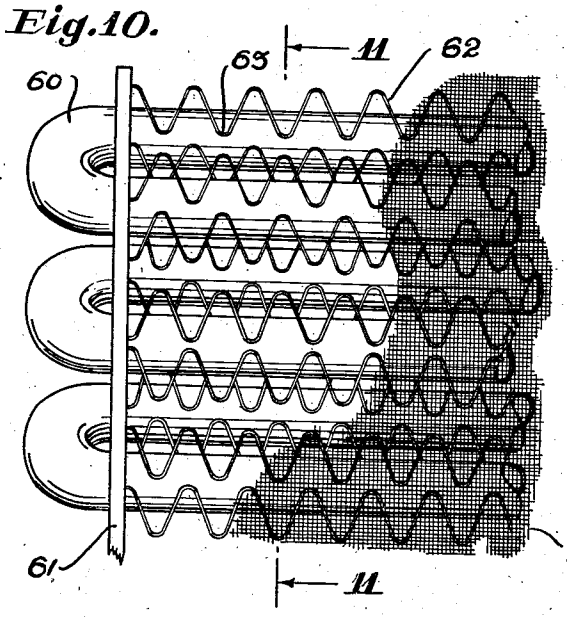
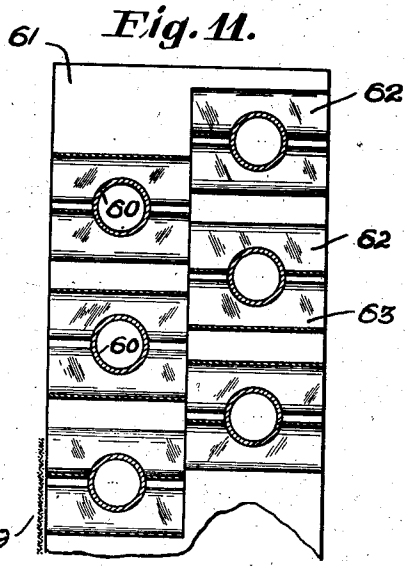


Fig. 11.



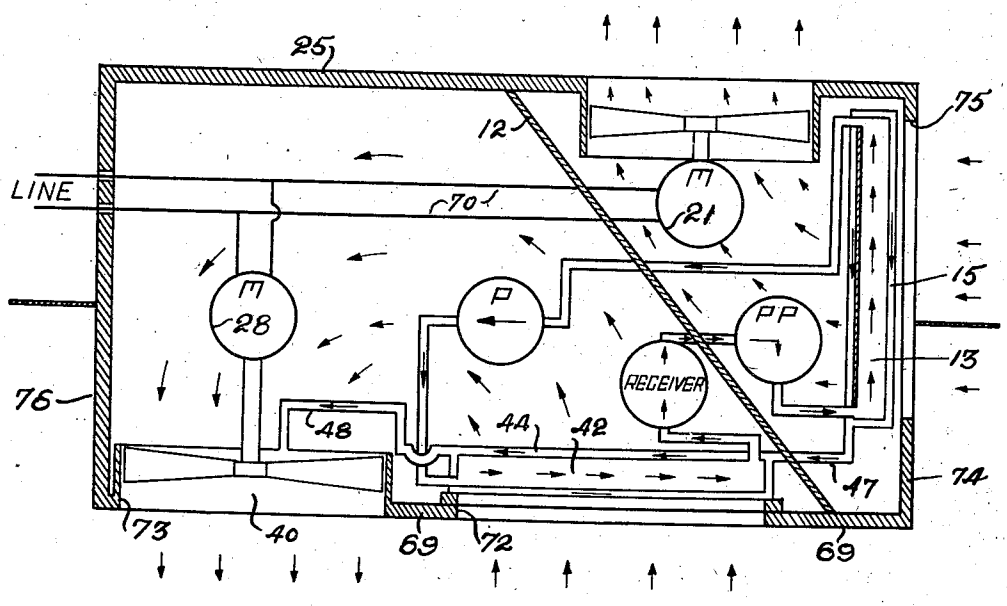


Fig. 9.

GUY PASCHAL

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Patented June 7, 1938

2,120,208

UNITED STATES PATENT OFFICE

2,120,208

AIR CONDITIONING MACHINE

Guy Paschal, New York, N. Y., assignor, by mesne assignments, to Pleasantaire Corporation, New York, N. Y., a corporation of Delaware

Application February 26, 1937, Serial No. 127,962

20 Claims. (Cl. 62—129)

This invention relates generally to air conditioning, and more particularly to unit air conditioners of the portable type.

Among the objects of the present invention is the provision of air conditioning mechanism which provides high dehumidification; advantageous utilization of the moisture resulting from such dehumidification, and simple disposition of said moisture.

Another object of this invention is the provision of means whereby the air which the machine is conditioning is passed through novel mechanism and is subjected to a unique washing process, and the impurities obtained therefrom are ejected from the machine.

Another object herein is the provision of a new air conditioning unit casing including internal partitioning and air current deflection and conduction, and novel means to support the casing and secure same in place.

Another object is the provision of means for the adjustable, substantially air-tight, connection of the casing with the building orifice in which the casing is placed.

A further object is the provision of means to control the mixture of outside and inside air treated by the air conditioner.

A feature of the invention is the provision of air conditioning structure which may be reversed in position and thereby used to heat and humidify the air inside of the room or other enclosure.

And still another feature of this invention is the provision of an air conditioning unit which is light in weight; economical in manufacture and use; presents a good appearance and is compact, quiet, and efficient in operation.

These objects and other incidental features and advantages will more fully appear in the progress of this disclosure and as pointed out in the appended claims.

In the drawings, in which similar reference characters designate corresponding parts throughout the several views:

Figure 1 is a front elevational view of a preferred embodiment of the invention as installed on a window sill, showing the main casing and associated parts.

Figure 2 is an enlarged fragmentary longitudinal vertical sectional view showing the adjustable clamping members and the adjacent portions of the casing.

Figure 3 is a view similar to Figure 2 showing an alternate form of clamping member.

Figure 4 is a vertical transverse sectional view of Fig. 1 as seen from the plane 4—4 indicated thereon.

Figure 5 is a perspective view of the air conditioning unit with the casing removed, and as seen from the front and right side thereof. In this view, the housings have been removed from the fans, and the air current separator is omitted.

Figure 6 is a plan view of Figure 5 with the fan housings in position and the air current separator in place.

Figure 7 is a rear elevational view of Figure 6 with the air current separator removed.

Figure 8 is a schematic diagram of the invention, shown in position for cooling, washing, and dehumidifying the air inside of a room.

Figure 9 is a schematic diagram similar to Figure 8 with the position thereof reversed and thus shown in position for heating and humidifying the air inside of a room.

Figure 10 is a fragmentaory view of an alternate type of evaporating or cooling coil shown with the washing and filtering screen broken away for purposes of clarity.

Figure 11 is a sectional view of Figure 10 as seen from the plane 11—11 thereon.

In accordance with the invention and with the accompanying drawings, the chassis 10 comprises an oblong plate 11 which is substantially rigid and has mounted thereon the operating elements of the air conditioning unit 77. The chassis is divided into at least two portions by a vertically and diagonally disposed air current deflector or separator 12 as seen in Figures 6 and 8. Air current separator 12 is preferably thin and durable and may be constructed of sheet metal. Where desired, the separator may have insulating material affixed to each of the principal surfaces thereof. The air current separator in conjunction with the casing 25 and the base plate 11 forms two compartments in the air conditioning unit 77, as will be more fully described below and air insulates these compartments from one another. To the left of separator 12 as viewed in Figure 8, is found the air conditioning compartment and to the right of said separator there is found the refrigerant compressing and condensing, and moisture expelling compartment.

In the air conditioning compartment, adjacent the left edge of the base plate 11 and substantially parallel to and spaced therefrom is an evaporating or cooling coil 13. Cooling coil 13 may be of any type suitable to withstand the required internal pressure and having sufficient radiation area. Coil 13 is preferably of compact construction, including a plurality of fins 14 and is mount-

ed within a shallow moisture receiving trough 15. Trough 15 is suitably attached to base plate 11 by means of brackets 16, 17, and 18. The horizontal inside dimensions of said trough are preferably slightly larger than the horizontal dimensions of the coil 13, so that moisture condensing on said coil and fins 14 and a fine wire screen 19, will be induced by gravity to flow into the trough 15. The wire screen has been found to function best when same is of so called "20 mesh", or twenty threads or wires to the inch. Too many threads or wires will result in too little air circulation therethrough. When the wire screen contacts the inner edges of the fins 14 or 62 it is preferably maintained in position by soldering at points along the edges thereof, to the adjacent fin edges. The functions and operation of screen 19 will be more particularly set forth below.

Also in the air conditioning portion there is a rotary fan 20 driven by an electric motor 21. Motor 21 is maintained in position by being mounted upon a pedestal type bracket 22 affixed to the base plate 11. The fan 20 is so placed that it coincides with the opening 23 in the front wall 24 of the main casing 25. The fan 20 is preferably of a type adapted to move a large volume of air at low speed, so that noise is reduced, and said fan is provided with a housing 23'. As will be observed (Fig. 8), the separator or partition 12 extends at an angle to the end or side walls of the casing from the rear of the casing adjacent one side wall toward the front wall and forms a cooling compartment which gradually enlarges from the rear toward the front of the casing. This angular or diagonal arrangement of the partition serves to permit a gradually expanding air stream to be discharged from the casing and gradually deflects the incoming air toward the fan. Moreover, the expanding form of the chamber facilitates mixing of the fresh make-up air with the recirculated room air within the cooling compartment.

In the refrigerant compressing and condensing, and moisture expelling compartment of the casing, an auxiliary base plate 26 carries mounted thereon a known pump or compressor 27 and an electric motor 28 for driving same. Base plate 26 is resiliently mounted with relation to base plate 11, preferably by being mounted upon rubber blocks 31 and secured by bolts and nuts 32 therethrough. A starting condenser 29 (in the electrical circuit) is carried by the motor 28 which is resiliently mounted with relation to the compressor so that the driving belt 30 is maintained under constant tension. Belt 30 is carried by a small pulley 33 and a large pulley 34. Pulley 33 is mounted on the rear end of the motor shaft 35 adjacent the terminal thereof which carries mounted thereon a fan 36. Fan 36 is of a type similar to fan 20. Pulley 34 is preferably of heavy construction so that it acts as a fly-wheel for smoothing out the pulsations of the compressor 27.

Fan 36 is provided with a cylindrical housing 37 which is supported in position by two brackets 38 affixed to the base plate 11. The housing diameter is slightly greater than the circumferential sweep of the tips of the fan blades of the fan 36, and the length of the cylinder of the housing 37 is slightly greater than the transverse sweep of said blades. Where any considerable stretching of the belt 30 is encountered, the brackets 38 may be adapted for attachment to the auxiliary base plate 26 or to the motor 28 to prevent the blade tips from contacting the inner surface of the cylinder when the motor shifts its position, and such construction is to be considered as within the scope of this invention. Housing 37 is provided with a pair of spaced opposed vertical walls 39, the rearmost of which is seen in Figure 7 of the accompanying drawings. Walls 39 in conjunction with the lowermost portion of the housing 37 form a shallow moisture expelling trough indicated by numeral 40 on said figure. An inlet 41 is provided at the lowermost portion of trough 40.

Spaced from and substantially parallel to the rear longitudinal edge of base plate 11 is a condensing coil 42. Coil 42 is situated preferably between cooling coil 13 and housing 37 and may be of any type suitable to withstand the necessary internal pressure and having sufficient radiation area. Coil 42 is preferably of compact construction including a plurality of radiating fins 43, and is mounted within a shallow water conveying trough 44. Trough 44 is suitably attached to base plate 11 by means of brackets 45 and 46. The inside dimensions of trough 44 are preferably of such size that the condensing coil 42 and fins 43 will just fit therein. The trough 44 communicates with trough 15 through a tube 47 and with the moisture expelling trough 40 through a tube 48. The trough 40 serves to bring the moisture into thermal-conductive relationship with the condensing coil, thereby not only cooling the coil, but also raising the temperature of the moisture before it reaches the fan, and thus facilitating expulsion of the heated moisture by the fan. The fan expels the moisture by direct contact of the fan blades, which dip into the trough 40, and also by discharge of the heated air over the moisture in the trough 40.

The refrigerant compressing and condensing compartment (Fig. 8) has the mechanism so arranged therein that the air is drawn inwardly through a portion, at least, of the condensing coil (in the present construction the entire coil), then over the compressor, the air being thereafter discharged from the compartment. The arrows (Fig. 8) indicate the passage of the air and, as will be observed, the inclination of the partition with respect to the side or end walls of the casing, forms a compartment which gradually enlarges from the front toward the rear of the casing. This construction results in a deflection of the entering air by the partition longitudinally of the casing toward the fan and over the compressor. Thus, the arrangement of the condenser coil in transverse planes of the casing between the fan and the partition 12 insures a deflection of the air by the partition over the compressor, after the air has passed through the coil.

The refrigerating circuit is as follows: The compressed refrigerant leaves the high pressure side of the compressor 27 and travels through a long resilient tube 49 and enters the uppermost convolution of the condensing coil 42. The condensed refrigerant leaves the condensing coil 42 by way of a tube 50 which is connected to the lowest convolution of said coil. Tube 50 travels underneath the auxiliary base plate 26 and curves upwardly to enter a receiver 51 which is supported by a bracket 52 affixed to the plate 11. The receiver 51 communicates by means of a tube 53 to a pressure relief or expansion valve 54 which in turn connects with the upper convolution of cooling coil 13 by means of a tube covered with a sponge rubber insulating covering 55. The gaseous refrigerant leaves the low-

est convolution of coil 13 and travels through a tube 56 to the low pressure side of the compressor 27. Tube 56 is partially covered with a sponge rubber insulating covering 57. The purpose of the insulating material is to prevent "sweating" of the tubes, so that all condensation moisture will be deposited in trough 15.

In Figures 10 and 11 there is shown an alternate type of cooling coil designated by numeral 60, while 61 is a vertical supporting end piece. The horizontally disposed straight portions of tubing in coil 60 which are disposed between the supporting end pieces (only one of which is seen, in Figure 10 or 11) are each provided along the upper and lower surfaces thereof with corrugated radiating fins 62. The term radiating as here used is taken from the art to which this device pertains, it being understood that when coil 60 is used as a cooling coil, these fins conduct heat away from the air and into the coil. The configuration of these fins is best seen in said figures, and these fins are preferably attached to the tubing by soldering. Because the fins 62 are generally horizontally disposed, the lower bends 63 of the corrugations serve as water collecting sluices as will be set forth below. The air conditioning unit is supplied with water from these fins as well as from other parts.

The air conditioning mechanism on the chassis is supported within a box-like casing 25 therefor which not only serves to enclose and protect the parts but also is adapted to act as a conduit for air flowing therethrough. The casing may be constructed of any suitable material such as wood or metal. When constructed of metal as illustrated in Figure 1, the dotted lines 64 indicate the inner surface of the casing and the dotted lines 65 indicate sound deadening material placed against the inner surface of the casing. The casing is provided with integral blocks 66 adjacent the lower edge thereof which are adapted to engage the upper surface margin of the base plate 11. The blocks 66 are provided with threaded orifices and screws (not shown) penetrate the holes 67 and are secured within said blocks thereby holding the casing in place.

Affixed to the under surface of the top wall 68 and to the inner surfaces of the front wall 25 and the rear wall 69, is the previously referred to air current separator 12 which is a partition, the lower edge of which is suitably indented so that it forms a substantially air-tight fit with the wires 70 carrying current to motor 21; the tubes 47, 53, and 56; and the bracket 46. Or, said lower edge may be spaced from the base plate 11 with a resilient felt strip therebetween to form a substantially air-tight seal.

The casing may be placed on or removed from the chassis 10 with the housing 37 in place, but the housing 23' is placed in position after the casing is attached to the chassis. Housing 23' frictionally engages the abutting orifice 23 in the front wall 24 and is supported thereby. Suitable air deflecting vanes may be associated with the housing 23' when desired.

The rear wall 69 is provided with a large rectangular orifice 72 which coincides with the condensing coil 42 and a circular orifice 73 which coincides with the fan 36 and housing 37. As will be noted, the condensing coil 42 is disposed vertically and is substantially co-extensive with the opening or orifice 72 which it directly faces immediately adjacent the orifice.

The end wall 74 is provided with a rectangular opening 75 which coincides with the cooling coil 13, while the end wall 76 has no such opening. It will be noted that the cooling coil 13 is disposed vertically immediately adjacent the opening 75 and is substantially co-extensive with this opening. It also extends over that portion of the opening which is outside the vane (hereinafter described), and thus fresh make-up air entering the cooling compartment also passes through the cooling coil. The arrangement of the coil immediately adjacent the opening 75 insures that all the re-circulated air passes through the coil.

The casing 25 and chassis 10 generally comprise the air conditioning unit (indicated by numeral 77) which is adapted to be supported on a window sill 78. In order to reduce noise and the transmission of vibration to the building 79, a sponge rubber pad 80 is interposed between the unit 77 and the sill 78. The movable window sash 81 is adapted to meet the top wall 68 and a rubber pad 82 is used at this point also.

In order to provide a substantially air-tight fit with the adjacent vertical portions 83 of the window frame, the end walls 74 and 76 have adjustable vanes affixed thereto. These vanes project vertically and perpendicularly with relation to said end walls, and are comprised of stationary vanes 84 and 85, and movable vanes 86 and 87. The movable vanes 86 and 87 are adapted for adjustable horizontal movement inwardly and outwardly of casing 25 in a suitable manner such as by means of the short machine screws 88 which penetrate orifices in vanes 86 and 87, and penetrate horizontally disposed slots in vanes 84 and 85. Screws 88 are each provided with nuts 89 so that after the free vertical edges of vanes 86 and 87 have been moved or extended to engage the vertical grooves 90 in the portions 83, the screws may be tightened to secure the vanes 86 and 87 in place. The stationary vane 84 is preferably affixed to the end walls 74 by means of integral right angle brackets 91 and 92, which are either bolted as shown, or spot welded to said end wall, as seen in Figure 4. Bracket 91 at the inner and lower edge thereof, is provided with a rabbet 93, and bracket 92 at the inner and upper edge thereof is provided with a rabbet 94. A slidable air inlet control plate 95 is adapted for manual adjustment horizontally within said rabbets. Plate 95 is shown in open position in full lines, and at a half closed adjustment in dot-dash lines on Figure 4, but sufficient travel is provided to allow the plate 95 to completely cover the portion of the orifice 75 lying between vane 84 and the brackets 91 and 92. The stationary vane 85 is secured in place similarly to vane 84, but the brackets (not shown) corresponding to brackets 91 and 92 need not be as long, nor need they be rabbeted.

In order that the unit 77 may be properly positioned with relation to the building orifice, or as illustrated, a window; and in order that unit 77 may be mounted safely and securely on relatively narrow window sills, clamping members 96 and 97 are utilized. Members 96 and 97 are adapted when horizontally extended to engage the grooves 90 and may be provided with suitable gripping ends such as chisel shape terminals 98. Members 96 and 97 are mounted in a horizontally disposed unit tube 99 which is suitably affixed to the under surface of top wall 68, as for example by welding and the terminals of said tube penetrate orifices 100 and 101 in the end walls 74 and 76 and terminate flush with the outer surface of said end walls. Members 96 and 97 are maintained in any desired position by set screws 102 and 103

which threadedly penetrate the top wall 68 and the tube 99, or by spring 71. These rods or members 96, 97, when extended, may also serve as a means for supporting the unit when it is to be transported.

An alternate form of clamping member is illustrated in Figure 3 in which only one of the clamping members is shown, but it is understood that they are preferably used in pairs. In this form, the clamping member 96' which threadedly engages the internally threaded tube 99' may be adjusted by inserting a rod or other tool in the orifice 104 and rotating the member 96' so that the blunt point 98' engages the groove 90. Member 96' is secured in position by tightening the nut 102'. In this form, the clamping member may be caused to exert considerable outward pressure and is especially suitable for windows having metal stationary frames, or windows in which the stationary frame presents a smooth surface with no grooves corresponding to grooves 90. It may be noted here that the lowest horizontal exposed surfaces of the clamping members abut against the upper edges of the vanes 84—86 and 85—87, while the highest surfaces of the exposed portions of the clamping members contact pad 82.

Operation

With the electric circuit completed to a source of E. M. F., the refrigerating system begins to function and fans 20 and 36 to revolve. Air from inside of the room, and the desired proportion of outside air, if used in any ratio, enters orifice 75 and passes through the cooling coil 13 and through the screen 19. Owing to the low temperature of cooling coil 13, the temperature of the air and the dew point are considerably reduced. The cooled air passes at one side of the air current separator 12 and is circulated into the room by the fan 20 through the housing 23'. By reason of this machine and the operation thereof, it is found that refrigeration and reduction in air temperature has been obtained with greater efficiency and at less cost than heretofore possible in other machines of like nature. As it is now understood, the screen 19 restricts to some extent, the rate of flow of the air through the cooling coil and screen, and thus by reason of the reduction of speed, the air is caused to give up sensible heat and a greater quantity of latent heat, than has been the practice. If desired, for the purpose of obtaining more metal area, the screen may be physically contacted with the cooling coil fins at many points, thereby giving more metal area for conducting away heat taken from the air. The water which condenses out of the air collects on the cooling coil tubes, on the fins 43 or 62, in the sluices 63 and on the screen 19. The moisture in the path of the air picks up solid particles from the air. The screen when wet causes the air to be washed and causes to be deposited into the water, a large amount of the solid particles suspended in the air. The screen restricts the flow of air through the cooling coil and the fan associated therewith creates a partial vacuum within the air conditioning portion of the unit, so that room air enters the housing for said fan at the edges of the housing and through the relatively slower moving blades adjacent the hub of the fan, thereby permitting a large volume of air to be circulated within the room, without unduly increasing the speed of the air through the cooling coil and screen.

As the screen 19 loads up, the water drains by gravity into trough 15, carrying the dirt particles in suspension, and thence through tube 47 to trough 44 where the cold water contacts the lowest convolutions of the condensing coil 42, thereby increasing the efficiency thereof. The water now increased in temperature flows by gravity through the tube 48 to the trough 40 whence it is picked up by the rapidly moving tips of fan 36 and blown outdoors in the form of an atomized spray carrying the suspended matter with it. In many instances, the tips of the fan blades never touch the water, but the flow of air (already heated by the condensing coil, compressor, and compressor motor) over the water caused by the operation of the fan, causes the water to evaporate and be expelled outdoors through orifice 73.

When particularly dirty air is being conditioned, larger particles may be precipitated in the trough 15 and an auxiliary tray may be included therein to collect this sludge.

Where it is desired for purposes of economy or other reasons, the tube 47 may communicate directly with the tube 48 which preferably is of resilient construction where the housing 37 is mounted on the motor 28 or base plate 26 as has been described above. In this construction, the trough 44 and associated parts may be eliminated, with a consequent reduction in condensing efficiency.

Air from the outdoors enters the orifice 72 and passing through the condensing coil 42, over compressor 27 and associated parts, and over motor 28, cools them, and then the air passing through the housing 37 is ejected outdoors again, through orifice 73.

As illustrated in Figure 9, when the weather outdoors is cool enough to require heating inside the room, the unit 77 may be reversed in position on the sill 78 so that the principle of reverse refrigeration may be employed. The inside or room air, in this arrangement, enters the orifice 72 and is heated by the condensing coil 42, compressor 27, and motor 28, and is humidified by the action of fan 36 and trough 40 as set forth above. In some instances where the outside air is laden with impurities, it may be desirable to employ a screen in orifice 75 to reduce the number of particles in the condensed water, or if desired the water flowing through the pipe 47 may be filtered.

It may now be seen that there has been disclosed a new and useful portable air conditioning unit. Among the many novel features therein are the following: The air current separator obviates the necessity for separate bulky ducts to carry the different currents of air through the machine, since the separator in conjunction with the casing forms the necessary ducts. By reason of the original location and disposition of said separator both currents of air entering the unit casing are completely insulated from each other and these currents strike the separator at a desirable angle so that a smooth air flow results, with consequent reduction in power consumed by the fans. The unique arrangement of the parts in correlation with each other and with the separator results in compactness and efficiency. The clamping members and adjustable vanes adapt the air conditioning unit for varying installation conditions encountered and prevent the unit from becoming accidentally dislodged. The slidable air inlet control plate regulates the mixture of room air and outside air in an adequate and simple manner, when it is desired to add outside air. The novel screen and cooling coil

combination results in the ability to wash the air being conditioned by water obtained from that air, thus requiring no plumbing connection to obtain water. Particles removed from the air are ejected automatically from the unit, as well as the water when it has served its purpose, so that no sewage connection is required. The screen by restricting the flow of the air and subjecting it to greater turbulation increases the refrigerating effect of the cooling coil, and further, the screen by providing greater wet surface in the path of the air flow increases the washing effect on the air and in this action automatically increases the amount of solid particles or impurities taken from the air.

The foregoing description has been made rather detailed for clearness of understanding only, and no unnecessary limitations should be understood therefrom, but the appended claims should be construed as broadly as permissible in view of the prior art.

I claim:

1. In an air conditioning machine: a cooling coil, a relatively shallow trough, a condensing coil disposed at least in part in said trough, primary means associated with said cooling coil to collect the condensation moisture occurring on said cooling coil and to hold said moisture in the path of air passing through the cooling coil whereby the air is washed, secondary means associated with said primary means to store the excess moisture released by the primary means, and conduit means allowing the moisture to flow from the secondary means into the trough.

2. In an air conditioning unit: a cooling coil, a relatively shallow trough, a condensing coil disposed at least in part in said trough, a fan, a housing for said fan, primary means associated with said cooling coil to collect the condensed water deposited on said cooling coil and to hold that water in the path of the air passing through the cooling coil whereby the air is washed, secondary means associated with the primary means to collect the excess water released by the primary means, one conduit means between the secondary means and the trough, and another conduit means between the trough and the housing, whereby water in the primary means may flow to the trough and thence to the housing, there to be expelled by said fan.

3. In an air conditioning machine: a cooling coil, a fan, a housing for said fan, primary means associated with said cooling coil to collect the condensed water deposited on said cooling coil and to hold that water in the path of air passing through the cooling coil whereby the air is washed, collecting means associated with the primary means to collect the excess water released by the primary means, and connecting means between the collecting means and the housing whereby water may flow from the collecting means to the housing there to be expelled by the fan.

4. In an air conditioning machine: a casing having an opening in one wall thereof, a vane extending outwardly from said casing intersecting said opening whereby two entrances are formed for the admission of air from two different sources into said opening, an air inlet control plate adapted to adjustably close one of said entrances whereby the relative mixture of air from the two sources is regulable.

5. In an air conditioning unit in combination, a casing, means for dividing the casing into at least two compartments, means for circulating room air through one compartment, means for reducing the temperature of the air passing through said compartment, and a fine mesh metal screen thermally connected to said temperature-reducing means for collecting moisture from said chilled air and holding at least a part of the moisture across the space through which the air passes for washing it.

6. In an air conditioning unit in combination, a casing, means for dividing the casing into at least two compartments, means for circulating room air through one compartment, means for reducing the temperature of the air passing through said compartment and causing moisture of the air to condense into water, and a screen attached to said temperature-reducing means disposed across the space through which said air is required to pass for collecting and holding some of the condensed water to wash the chilled air passing through the screen.

7. In an air conditioning unit, a substantially rectangular casing adapted to be bodily positioned in a window opening or similar aperture with its front wall and portions at least of its side walls exposed to the interior and its back wall entirely exposed to the exterior of the room having such window opening or aperture, a transverse vertical partition dividing the casing into at least two compartments side by side, said compartments being completely air insulated one from the other by said partition, a cooling coil in one compartment, means for circulating a cooling medium through said coil, said one compartment having an opening in one side of said casing for the introduction of air to pass through said coil, said coil being positioned directly to the rear of said opening and substantially co-extensive in area therewith, a second opening in another wall of said one compartment through which the air entering said compartment is discharged, means for inducing the circulation of air into and from said compartment through said openings, a vane extending outwardly from said one side of said casing and dividing said first mentioned opening into two parts, said vane being adapted to cooperate with the window frame to direct fresh air from the exterior of the room through one part and room air through the other part of said opening.

8. In an air conditioning unit, a substantially rectangular casing adapted to be bodily positioned in a window opening or similar aperture with its front wall and portions at least of its side walls exposed to the interior and its back wall entirely exposed to the exterior of the room having such window opening or aperture, a transverse vertical partition dividing the casing into at least two compartments side by side, said compartments being completely air insulated one from the other by said partition, a cooling coil in one compartment, means for circulating a cooling medium through said coil, said one compartment having an opening in one side of said casing for the introduction of recirculated room air to pass through said coil, said coil being positioned directly to the rear of said opening and substantially co-extensive in area therewith, a second opening in another wall of said one compartment through which the air entering said compartment is discharged, means for inducing the circulation of air into and from said compartment through said openings, a vane extending outwardly from said one side of said casing and excluding outside air from said recirculated room air opening, said casing having another opening in said one side

exterior of said vane for the introduction into said compartment of fresh outside make-up air.

9. An air conditioning unit as specified in claim 8, including adjustable means for controlling the admission of fresh outside make-up air into said one compartment.

10. An air conditioning unit as specified in claim 8 in which the cooling coil extends over the opening exterior of said vane whereby to cool the fresh make-up air as it enters the casing.

11. In an air conditioning unit, a substantially rectangular casing adapted to be bodily positioned in a window opening or similar aperture with its front wall and portions at least of its side walls exposed to the interior of the room having such window openings or aperture, a transverse vertical partition dividing the casing into at least two compartments side by side and completely insulating one compartment from the other, said partition being at an angle to the side walls and extending from the rear of the casing adjacent one side wall toward the front wall to form one compartment which enlarges from the rear wall toward the front wall of the casing, a cooling coil in said one compartment, means for circulating a cooling medium through said coil, the side wall of the casing forming one side of said one compartment having an opening therein for the introduction of air to pass through said coil, said coil being positioned directly to the rear of said opening and substantially co-extensive therewith, a second opening at the front wall of said one compartment through which the air entering said compartment is discharged, a fan positioned directly to the rear of said second opening and discharging air therethrough, said fan serving to induce circulation of air into and from said compartment through said openings.

12. In an air conditioning unit, a substantially rectangular casing adapted to be bodily positioned in a window opening or similar aperture with its front wall and portions at least of its side walls exposed to the interior of the room having such window openings or aperture, a transverse vertical partition dividing the casing into at least two compartments side by side and completely insulating one compartment from the other, said partition being at an angle to the side walls and extending from the rear of the casing adjacent one side wall toward the front wall to form one compartment which enlarges from the rear wall toward the front wall of the casing, a cooling coil in said one compartment, means for circulating a cooling medium through said coil, the side wall of the casing forming one side of said one compartment having an opening therein for the introduction of air to pass through said coil, said coil being positioned directly to the rear of said opening and substantially co-extensive therewith, a second opening in the front wall of said one compartment through which the air entering said compartment is discharged, means for inducing the circulation of air into and from said compartment through said openings, a vane extending outwardly from said side of the casing containing said opening and adapted to make a substantially air-tight fit with the wall of a window opening or similar aperture, said vane intersecting said air introduction opening whereby to leave a portion thereof open to the exterior of a window opening and permit the introduction of fresh outside make-up air.

13. In an air conditioning unit, a substantially rectangular casing adapted to be bodily positioned in a window opening or similar aperture with its front wall and portions at least of its side walls exposed to the interior and its back wall entirely exposed to the exterior of the room having such window opening or aperture, a transverse vertical partition dividing the casing into at least two compartments side by side, said compartments being completely air insulated one from the other by said partition, a cooling coil in one compartment, means for circulating a cooling medium through said coil, said one compartment having an opening in one side of said casing for the introduction of air to pass through said coil, said coil being positioned directly to the rear of said opening and substantially co-extensive in area therewith, a second opening in another wall of said one compartment through which the air entering said compartment is discharged, means for inducing the circulation of air into and from said compartment through said openings, the back wall of said casing in said other compartment having an open portion, a condenser coil over and immediately facing said open portion of the back wall, a compressor unit disposed rearwardly of said condenser unit, and an exhaust fan facing and discharging through said open portion of said back wall and disposed to one side of both the compressor unit and a portion at least of said condenser unit, whereby air is drawn into said other compartment by the fan through at least a portion of the condenser coil and over the compressor unit and is discharged into the outside air by said fan.

14. An air conditioning unit as specified in claim 13, in which said partition extends at an angle with respect to the side walls from the rear of the casing adjacent one side wall toward the front wall thereby forming said one compartment so that it progressively enlarges from the rear toward the front of the casing and said other compartment so that it progressively enlarges from the front toward the rear of the casing, whereby the recirculated air entering said one compartment through its side wall is gradually deflected toward the front wall of the casing and the air entering said other compartment through the rear wall is gradually deflected longitudinally of the casing.

15. An air conditioning unit as specified in claim 13, in which said partition extends at an angle with respect to the side walls from the rear of the casing adjacent one side wall toward the front wall thereby forming said one compartment so that it progressively enlarges from the rear toward the front of the casing and said other compartment so that it progressively enlarges from the front toward the rear of the casing, and in which the air inlet portion of the back wall of said other compartment is adjacent said partition and between the fan and the partition, whereby the recirculated air entering said one compartment through its side wall is gradually deflected toward the front wall of the casing and the air entering said other compartment through the rear wall is gradually deflected longitudinaly of the casing over the compressor and toward the fan.

16. In an air conditioning unit, a casing, a partition dividing the casing into at least two compartments and air-insulating said compartments one from the other, a cooling coil in one compartment, means for circulating a cooling medium through said coil, said one compartment having an opening in one wall of said casing for the introduction of recirculated room air to pass through said coil, said coil being positioned di-

rectly to the rear of said opening and substantially co-extensive in area therewith, a second opening in another wall of said one compartment through which the air entering said compartment is discharged, means for inducing the circulation of air into and from said one compartment through said opening, a second compartment opening to the exterior through the back wall of said casing, a compressor unit in said second compartment, a condenser coil in said second compartment, a fan for causing circulation of air into and out of said second compartment, a drip pan associated with said cooling coil for receiving excess moisture released by the coil, a conduit for gravitationally conducting such moisture from said pan, a trough associated with said fan for receiving and storing such moisture, said trough being disposed sufficiently close to the fan to permit the fan to have a moisture discharging effect.

17. In an air conditioning unit, a casing, a partition dividing the casing into at least two compartments and air-insulating said compartments one from the other, a cooling coil in one compartment, means for circulating a cooling medium through said coil, said one compartment having an opening in one wall of said casing for the introduction of recirculated room air to pass through said coil, said coil being positioned directly to the rear of said opening and substantially co-extensive in area therewith, a second opening in another wall of said one compartment through which the air entering said compartment is discharged, means for inducing the circulation of air into and from said one compartment through said opening, a second compartment opening to the exterior through the back wall of said casing, a compressor unit in said second compartment, a condenser coil in said second compartment, a fan for causing circulation of air into and out of said second compartment, a drip pan associated with said cooling coil for receiving excess moisture released by the coil, a conduit for gravitationally conducting such moisture from said pan, a trough associated with said fan for receiving and storing such moisture, said trough being disposed sufficiently close to the fan to permit the fan blades to dip into the moisture.

18. An air conditioning unit as specified in claim 16 in which the means for conducting the moisture from the drip pan to the fan includes means for bringing the moisture into thermal-conductive association with the condenser coil.

19. An air conditioning unit as specified in claim 17 in which the means for conducting the moisture from the drip pan to the fan includes means for bringing the moisture into thermal-conductive association with the condenser coil.

20. In an air conditioning unit, a casing adapted to be positioned bodily in a window opening or similar aperture with its front wall and portions at least of its side walls exposed to the interior and its back wall to the exterior of the room having such window opening or aperture, a cooling coil in said casing, means for circulating air into the casing through the cooling coil and outwardly therefrom, means for circulating a cooling fluid through said coil, a compressor mechanism and condenser coil in said casing, and means for mounting the casing in a window or similar aperture, said last-mentioned means comprising a rod-like element extending outwardly from each side wall of the casing, means for mounting each rod for adjustment inwardly and outwardly with respect to its side wall, and means for securing each rod in any selected position, said rods serving as handle supports for the unit and anchoring means to engage the side walls of an aperture in which the unit is mounted.

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