

Jan. 17, 1956

H. W. HARDIN ET AL
ROOM AIR CONDITIONERS

2,730,873

Filed May 19, 1953

6 Sheets-Sheet 1

FIG. 1.

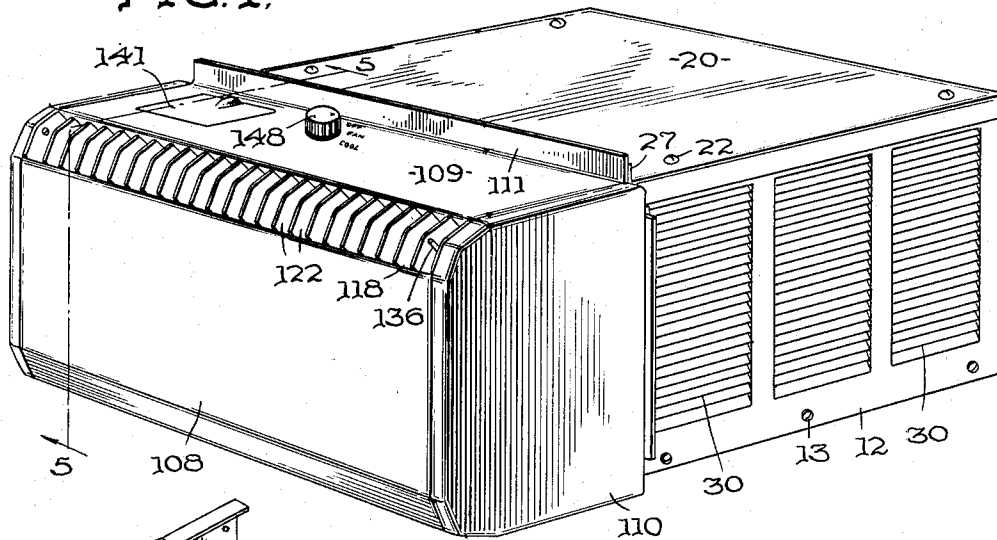
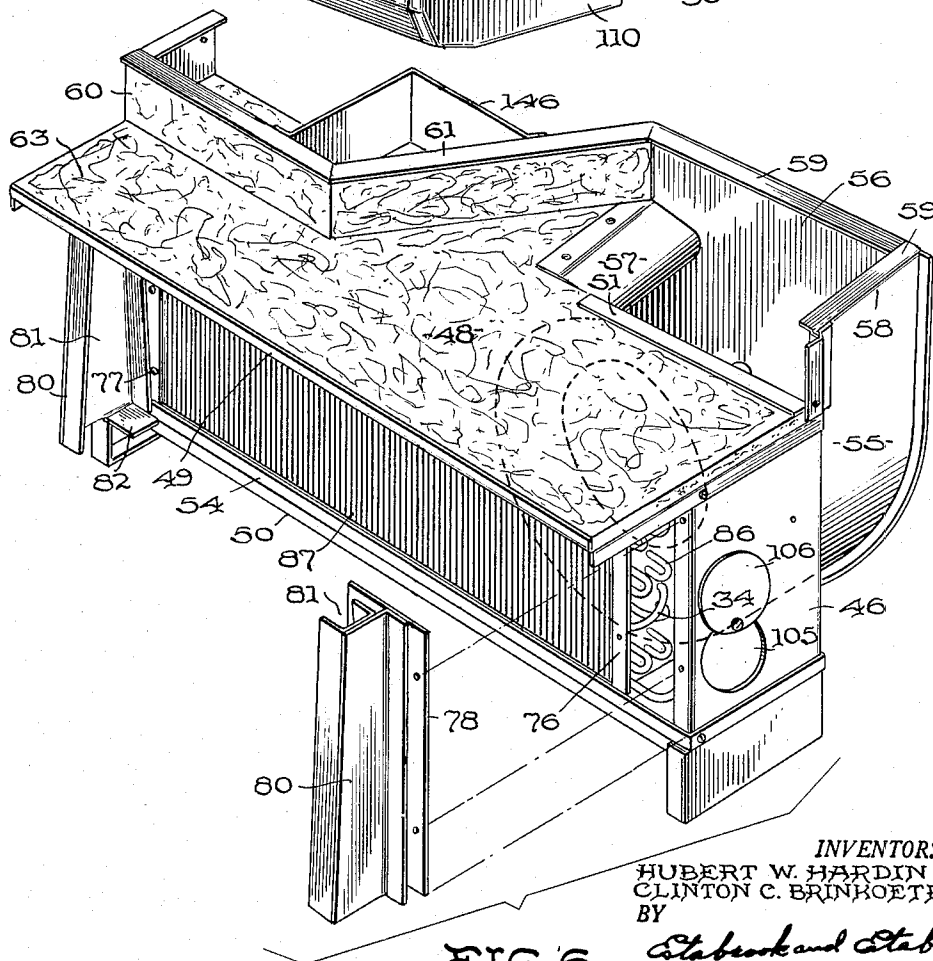


FIG. 6.

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6 Sheets-Sheet 2

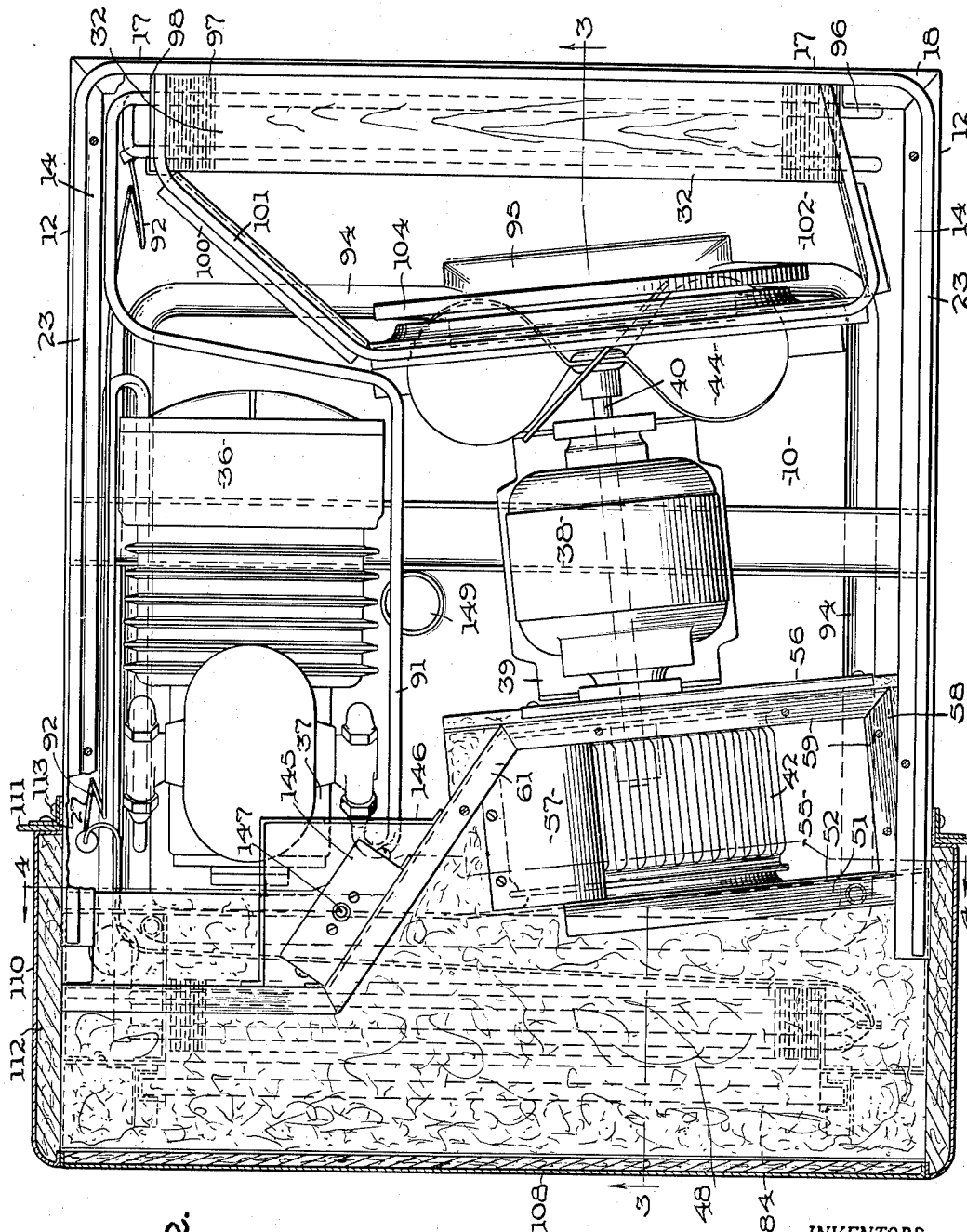


FIG. 2.

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6 Sheets-Sheet 4

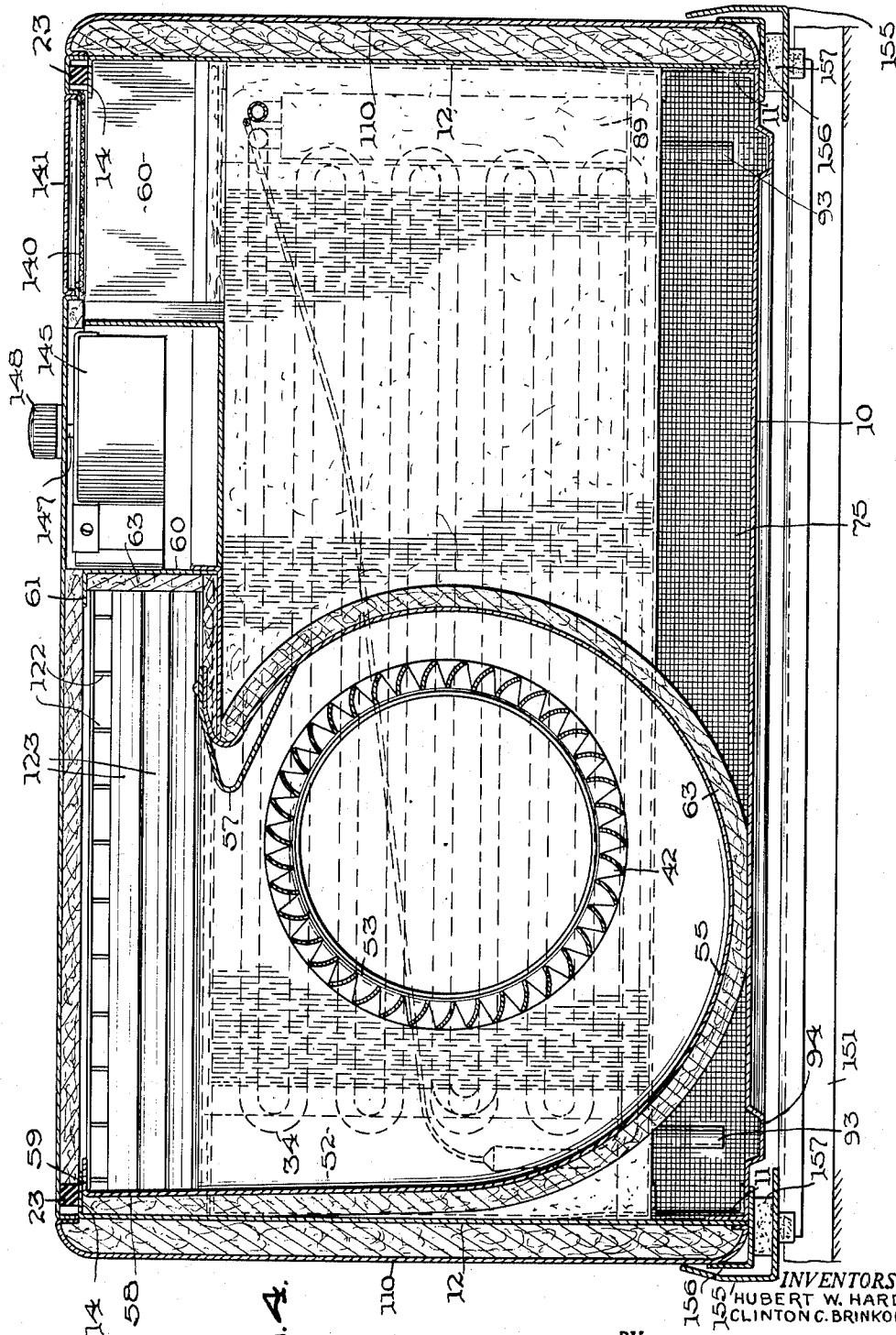


FIG. 4.

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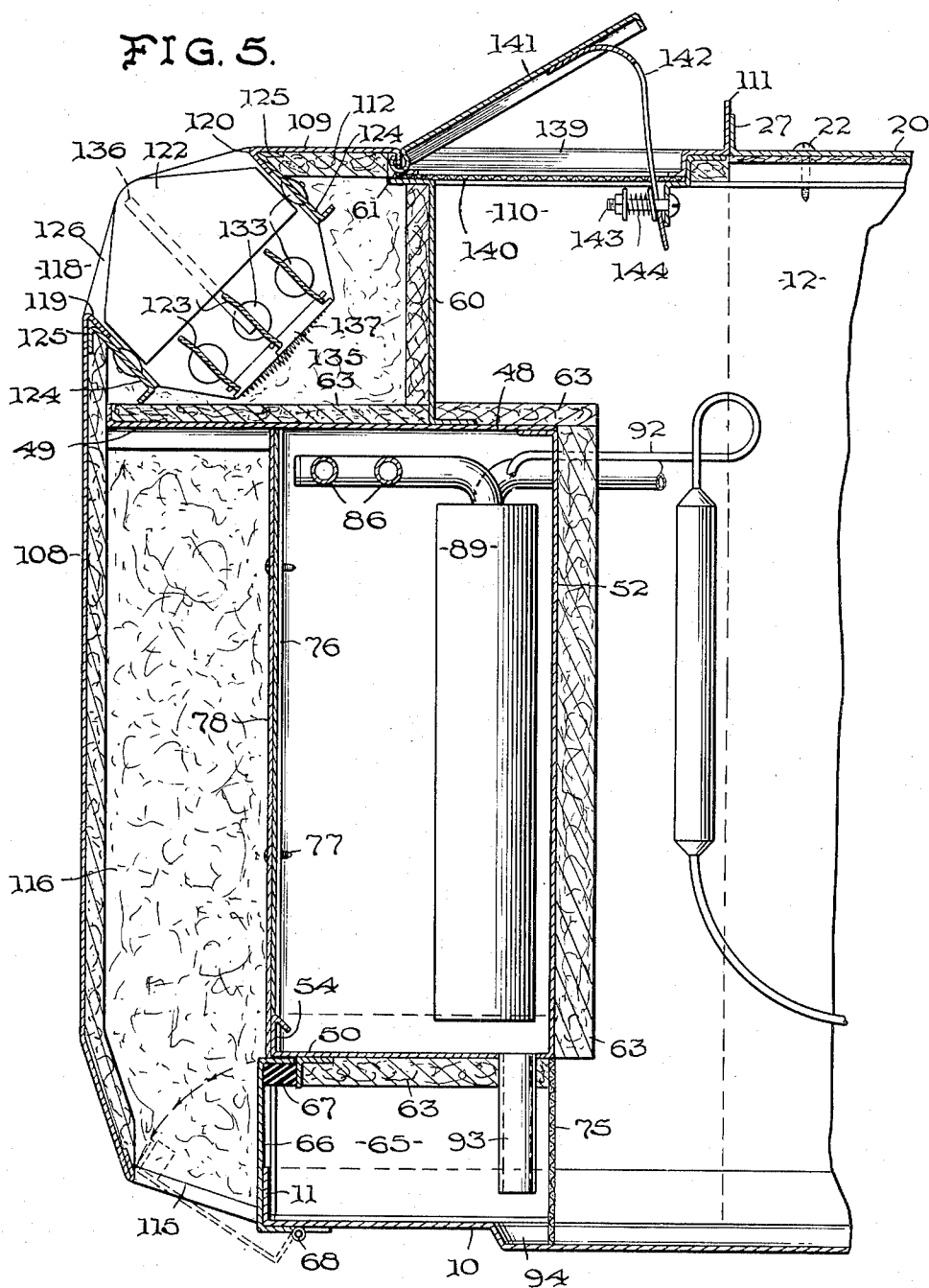
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ROOM AIR CONDITIONERS

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6 Sheets-Sheet 5



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ROOM AIR CONDITIONERS

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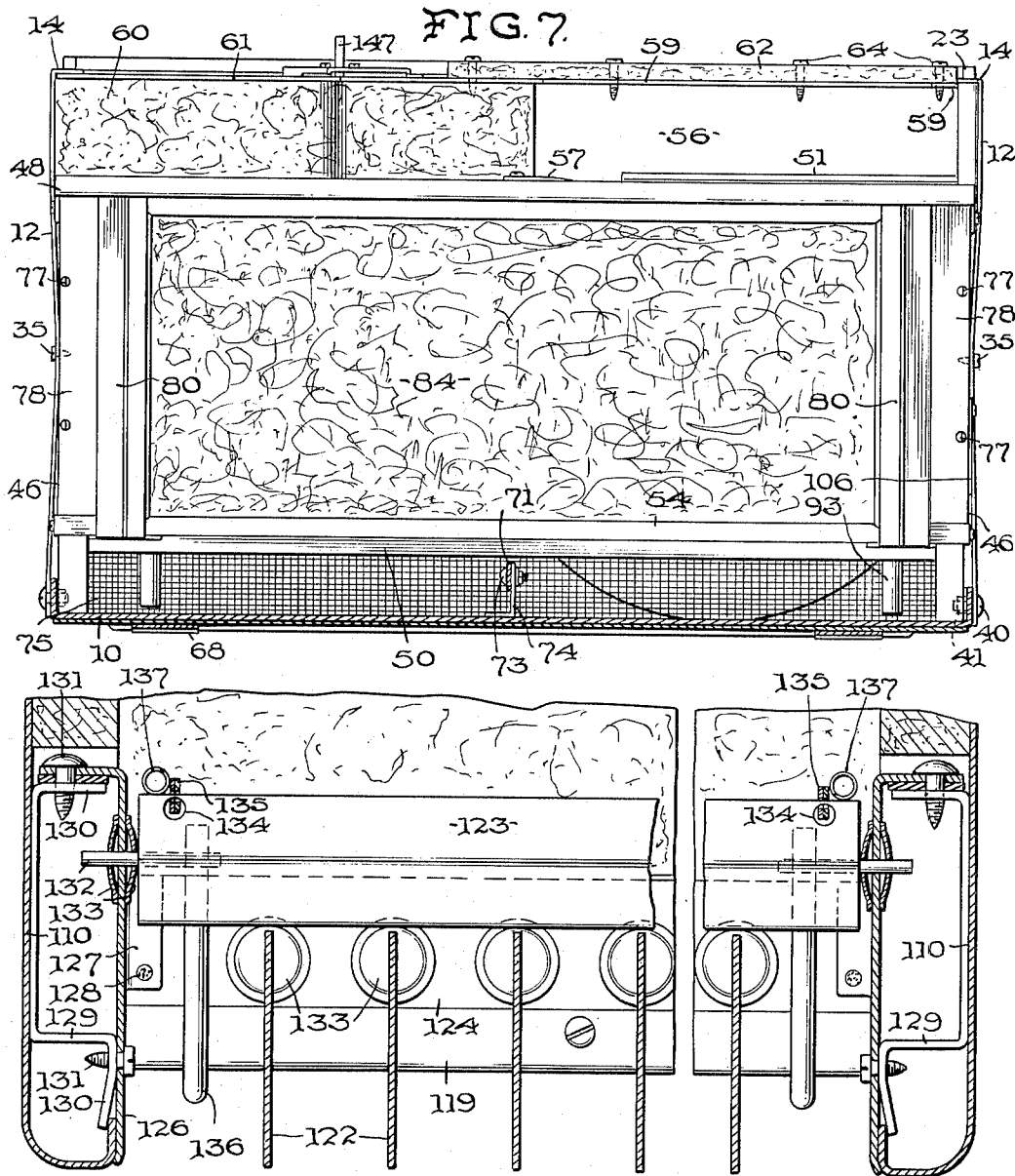


FIG. 8.

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ROOM AIR CONDITIONERS

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Application May 19, 1953, Serial No. 355,928

14 Claims. (Cl. 62-129)

This invention relates to an improvement in room air conditioners, and more particularly to the type which is supported in a window or opening of a building.

An object of the invention is to conduct the room air, fresh air, or a combination of room air and fresh air through the conditioning unit so that the air is drawn into the conditioning unit by a turbine and through a filter, an evaporator and into the turbine, and then elevated to a cooling chamber for distribution to a room.

A further object is to provide means for controlling and directing the distribution of air to the room from the cooling chamber.

Another object is to control the admission of room air and fresh air to the conditioning unit.

Another object is in disposing of any condensate from the evaporator.

Another object is in supporting as a unit the filter, evaporator and turbine in the conditioning unit.

The invention consists of other features of construction and combinations of parts which will be described in the specification and claims.

In the accompanying drawings:

Figure 1 is a perspective view of the room air conditioner;

Figure 2 is a horizontal sectional view of the invention;

Figure 3 is a vertical longitudinal sectional view taken on line 3-3 of Figure 2;

Figure 4 is a transverse vertical sectional view taken on line 4-4 of Figure 2;

Figure 5 is a detail longitudinal vertical sectional view taken on line 5-5 of Figure 1;

Figure 6 is a perspective view of the evaporator turbine housing;

Figure 7 is a vertical cross sectional view taken on line 7-7 of Figure 3;

Figure 8 is a transverse vertical sectional view taken on line 8-8 of Figure 3.

The air conditioner casing comprises a bottom wall 10 which extends substantially the full length of the casing and is provided with upstanding flanges 11, along the sides and ends thereof. Side walls 12 are attached to the flanges by screws 13, and are provided with inturned flanges 14 at their upper edges. An open end wall 17 is mounted on the bottom wall 10 between the side walls 12, and is provided with an inturned flange 18 at its upper edge. A cover 20 is mounted on the inturned flanges 14 of the side walls 12 and flanges 18 of the end wall 17, and secured thereto by screws 22. A rubber gasket 23 is interposed between the cover 20 and flanges 14 and 18 to form a sound deadening seal. A flange 26 on the cover 20 overlaps the upper edge of the end wall 17. The inner end of the cover 20 is provided with an upstanding flange 27 which engages the inner side of a window sash 28.

The sides 12 are each provided with several rows of louvers 30 for the admission of fresh air to the conditioner casing. The sides 12 extend nearly the full length

of the bottom 10 and their inner ends are attached to the end panels 46 by screws 35 and to the flange 11 of the bottom 10 by bolts 40 and 41, see Figure 7. Each of the end panels 46 are provided with openings 105 with hinged cover 106 so that access may be had to the evaporator 34 and associated parts.

A condenser 32 is located at the outer end of the bottom wall 10 and adjacent the open outer end wall 17, and an evaporator 34 is located at the inner end of the bottom wall. A compressor 36 is mounted on the bottom wall 10 between the evaporator and condenser and is supported above the bottom wall by a suitable base member 37. An electric motor 38 is mounted on the bottom wall and supported thereabove by a base member 39 and arranged in a diagonal direction with respect to the compressor 36. The armature shaft 40 of the motor has a turbine or impeller 42 mounted thereon at one end for circulating air through the evaporator 34 and a fan 44 is mounted on the other end of the armature shaft for directing air through the condenser 32 and to atmosphere.

A channel shaped beam or brace 45 extends transversely of the bottom wall about midway of its length and the ends of the beam abut the upstanding flange 11 along the two side edges of the bottom wall.

The evaporator 34 and turbine or impeller 42 are disposed in a housing consisting of two end panels 46 which are supported by the bottom wall 10 and adjacent its inner end within the portion thereof located in the room to be conditioned. These panels 46 support a cold air deck 48 at their upper ends, which projects forwardly of the panels to provide an overhanging portion 49. Disposed between the panels 46 and below the cold air deck 48 and above the bottom wall 10 is a shelf 50 upon which the evaporator 34 is mounted. A back wall 52 is connected to the rear ends of the panels and to the rear edges of the cold air deck 48 and shelf 50 to provide an evaporator chamber or compartment. This back wall is provided with a truncated or flared opening 53 to establish communication with the turbine 42 in a turbine or impeller cage attached to the back wall. The turbine cage has a curved or arcuate shaped wall 55 to encompass the turbine 42 and is connected along one edge thereof to the back wall 52. A side wall 56 is attached to the opposite edge of the curved wall 55 and through which the armature shaft 40 extends. The curved wall 55 and side wall 56 of the turbine cage are located above the bottom wall 10 of the conditioner casing unit. One end 57 of the curved wall 55 is connected to the cold air deck 48 while its opposite end 58 projects above the cold air deck, and is disposed adjacent one of the side walls 12 of the conditioning unit casing. The side wall 56 of the turbine cage extends above the cold air deck 48 and is connected to the upwardly projecting end 58 of the curved wall 55. The upper edges of the side and curved walls 56, 55, are in substantial alignment with the upper edges of the side walls 12 of the casing unit.

An upright partition 60 is mounted on the cold air deck 48 adjacent the rear longitudinal edge of the cold air deck and extends a short distance from one end of the cold air deck at right angles to one of the end panels 46 and a side wall 12 and then extends diagonally rearwardly across the cold air deck and is joined to an end of the side wall 56 of the turbine or impeller cage, which is disposed at an angle to the opposite side wall 12. This partition 60 and the upper portions of the walls of the turbine cage provide a bulkhead lengthwise of the cold air deck 48 and transversely of the conditioner casing to direct the conditioned air issuing radially and laterally from the turbine or impeller 42 toward the front of and throughout the length of the cold air deck. Extending across the turbine 42 and mounted

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upon a portion of the bulkhead partition and the side wall 56 of the turbine cage and an end of the curved wall 55 of the turbine cage is an insulated member or platform 62 which insures the air being directed laterally from the turbine 42 and forwardly therefrom against the diagonal portion of the bulkhead.

The partition 60, is provided with an inwardly directed flange 61, and similar flanges 59 are provided at the upper edges of the walls 55 and 56. The platform 62 is secured to the flanges 59 and 61 by screws 64. The portion of the back wall 52 which forms a wall of the turbine cage, is provided an outwardly extending curved lip or flange 51 which overlies the cold air deck 48.

The conditioned air issues from the turbine or impeller cage over the lip 51 and end portion 57 of the wall 55 thereof, onto the deck 48 radially and laterally and against the diagonal portion of the partition. The opening of the turbine cage is arranged adjacent and laterally of one end of the deck 48, and with the partition 60 arranged in a somewhat zig zag path lengthwise of the deck, and with respect to the opening of the turbine cage a more even distribution of the conditioned air transversely of the deck 48 is obtained for delivery to the room to be conditioned.

The cold air deck 48 is covered with a suitable insulation 63 and the shelf 50 and the back wall 52 as well as the curved and side walls 55 and 56 of the turbine cage are all covered on their exterior surfaces with insulation 63 for sound deadening purposes. The lip or flange 51 is disposed over the insulation 63. It will be noted that the shelf 50 which supports the evaporator 34 is disposed above the bottom wall 11 and thereby affords a passage 65 therebeneath which provides a communication throughout the width of the air conditioning unit with the compartment containing the compressor condenser unit. Hinged to the outer surface of the bottom wall is a damper 66 which extends transversely of the bottom wall and is adapted to engage the front edge of the shelf 50 for controlling the supply of fresh air through the passage 65 beneath the shelf 50 carrying the evaporator. Suitable packing 67 is provided along the upper face of the damper 66 which engages the front wall of the shelf 50 to form a seal therebetween. The damper is capable of being swung on its horizontal axis 68 by a knob 70 for opening and closing this passage 65 to suit the operator. A link 71 is pivoted to the inner face of the damper 66 and is provided with an elongated slot 72 for the reception of a stud 73 carried by a bracket 74 to control or hold the damper in its adjusted positions.

A screen 75 is disposed between the shelf 50, or bottom of evaporator housing and inner surface of bottom wall 10, and extends transversely of the bottom wall 11 and in vertical alignment with back wall 52, to eliminate any foreign matter from flowing through the passageway 65.

Attached to each end panel 46 and each end plate 76 of evaporator 34 by screws 77 is a plate 78. These plates 78 extend from the lower side of the cold air deck 48 to and overlie the upturned flange 54 of the shelf 50, Figures 3 and 6. Mounted on each plate 78 is a channel member 80, so arranged that the channels 81 thereof are disposed toward each other. The channels 81 are each tapered with the larger opening of the channel being at the lower end thereof at the shelf 50. Each channel member 80 is provided with a ledge 82 which extends in the plane of the shelf 50 and partially closes the lower end of the channel 81. A filter 84 of any suitable material such as fiber glass, is inserted into the channel member from the bottom or lower ends of the channels and then the lower portion is moved inwardly toward the evaporator until it rests on the ledges 82 whereby the filter is supported in position in front of the evaporator.

The evaporator 34 employed in the unit consists of a series of vertically arranged coils of tubing 86, preferably two rows, which are supported by end plates 76,

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and the tubes 86 are provided with a plurality of fins 87 consisting of thin plates. These fin plates 87 are provided with two rows of openings for the reception of the rows of tubing. The vaporized refrigerant is conducted from the evaporator by tubing 88 to a tank 89 and from which the refrigerant is delivered to the compressor 36. The compressed refrigerant is conducted from the compressor by tubing 91 to a condenser 32 located in the conditioning unit casing at the opposite end thereof from the evaporator, and at the open end of the conditioner casing. The refrigerant after being cooled is conducted by tubing 92 to the evaporator.

The shelf 50 is constructed to collect any condensate from the evaporator 34 and leading therefrom are drain pipes 93 which deliver the condensate onto the bottom wall 10 where it is conducted by embossed grooves 94 or troughs formed in the bottom wall to a sump 95 formed in the bottom wall in rear of the condenser. The condenser fan 44 is mounted on the armature shaft 40 of the electric motor 38 for directing air through the condenser 32 and through the opening in conditioner casing to atmosphere. The condenser is constructed somewhat similarly to the evaporator consisting of tubing 96, fins 97, end plates 98. A shroud 100 is formed in the shape of a vertical channel, with the center thereof provided with an opening 103 for the reception of the fan 44. The sides of the shroud or channel are arranged to diverge from the central portion or opening 103 at different acute angles and are connected to the end plates 98 of the condenser. The shroud 100 extends inwardly from the condenser 32, and is disposed between the bottom wall 10 and cover 20 and is preferably welded to bottom 10 in rear of sump 95. A rubber gasket 101 is secured to the upper edge of the shroud and is engaged by the under surface of the cover 20 to provide a sealed chamber 102 between the shroud and condenser, and also seals the chamber 102 from the motor 38 and compressor 36, except for the opening 103 in the shroud for the reception of the fan 44. A slinger ring 104 is attached to the fan 44 and is located within the chamber 102. The slinger ring 104 dips into the sump 95, so that as the fan is rotated the condensate in the sump is picked up and thrown into the air stream from the fan and against the condenser for disposing of the condensate and cooling the condenser. The shroud prevents any of the moisture or condensate agitated by the fan from contacting the motor or compressor.

The inner or room end of the air conditioning unit is provided with a hood comprising a front wall 108, a top wall 109 and end walls 110, which envelopes or encloses the cool air deck 48, evaporator 34, and a portion of the turbine 42. The top wall 109 is provided with an upstanding flange 111 which abuts the flange 27 of the cover 20 of the conditioning unit. The inner surface of the walls 108, 109, 110 are provided with suitable insulation 112, and the top wall 109 and its insulation rests on the flanges 59, 61 of the bulkhead partition 60 and the gasket 23 of the sides 12 to provide a tight fit and at the same time to deaden any sound due to the operation of the apparatus and flow of air. The end walls 110 overlap and are connected to the sides 12 by screws 113 for securing the hood in place. The front wall 108 is arranged in spaced relation to the evaporator compartment and filter 84, and a room air intake opening 115 is provided between the lower end of the front wall and the inner end of the bottom wall 10 for the admission of room air to the filter and evaporator under the influence of the turbine 42. Access to the damper knob 70 is had through the opening 115 for operating the damper 66, so that fresh air from passage 65 may commingle with room air issuing through opening 115 before the room air and fresh air are delivered to the filter 84 and evaporator 34. The damper 66 may be operated to close the intake opening 115, and the passage 65 will then be fully in open position for supplying fresh air to the receiving chamber 116 provided by the hood. The receiving chamber is closed at the top by the over-

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hanging portion 49 of the cold air deck 48, which snugly engages the front wall 108 of the hood.

The hood is provided with a transverse air outlet opening 118 at the upper peripheral edge thereof, where the front wall 108 and top wall 109, would join, and the edges of the front and top wall along the opening 118 are inwardly bent to provide flanges 119 and 120, respectively. The opening 118 affords an outlet for the cold air above the cold air deck 48 and cold air chamber.

The end walls 110 of the hood extend rearwardly along the side walls 12, and as the back wall 52 is located between the sides 12, the conditioner unit is provided with an evaporator compartment at its inner end. The deck 48 and partition 60 thereon are located between the end walls 110 and sides 12, and the top wall 109 of the hood rests on the partition 60 providing the cold air chamber between the deck and top wall.

Located within the opening 118, Figures 3, 5, and 8, are a plurality of e. g., twenty-four, vertical louvers 122 and three horizontal louvers 123 disposed beneath the vertical louvers to give maximum air flow in any and all directions. The vertical louvers 122 are arranged in spaced relation and pivoted at their ends between two parallel rails 124, 124. An edge of each rail 124 is flanged at 125, and one of the flanged edges 125 is received beneath the flange 119 of front wall 108, and the flanged edge 125 of the other rail 124 is received beneath the flange 120 of top wall 109. The rails 124 are connected at their ends to end plates 126 which are provided with flanges 127 spot welded or riveted to the rails 124, as indicated at 128, in Figure 8. The end plates 126 are supported by end walls 110 on brackets 129 welded to the end walls 110. The brackets 129 are provided with laterally extending lips 130 to which the end plates 126 are attached by screws 131. Mounted on and between the end plates 126 are three horizontal louvers 123 arranged in spaced relation to each other and in alinement, so that they may be arranged in overlapping relation. The louvers 123 are provided at their ends with trunnions 132 which extend through the end plates 126, and mounted on these trunnions 132 on each side of the end plates 126 are resilient friction disks 133 to retain the louvers 123 in their adjusted position. The lower edge of each louver 123 is provided with an orifice 134 for the reception of a notched bar 135. Notched bars 135 are connected to the intermediate louver 123 and to each outer louver 123, so that the three louvers 123 will move in unison when operated by the handle or lever 136 connected to the intermediate louver 123. A spring 137 is connected to the outermost louvers 123 to insure their conjoint operation. The louvers 122 are similarly constructed with trunnions and friction disks in mounting them to the rails 124, and it is considered that the showing in Figure 8, will suffice to show that the louvers 122 are supported in a like manner to the showing for the louvers 123.

An opening 139, Figure 5, is formed in the hood top wall 109, adjacent one end thereof, which provides communication with the room to be conditioned and the compartment of the air conditioner casing having the motor-compressor-condenser, so that stale air may be drawn from the room by the condenser fan 44 and discharged to atmosphere. This opening 139 is located rearwardly beyond the partition 60, and is provided with a screen or filter 140. A hinged lid 141 is connected to the top wall 109 and may be held in a closed or open position by a slotted plate 142 connected to the cover. A bolt 143 is connected to the top wall 109 which extends through the slotted plate, and a spring 144 on the bolt exerts a pressure on the plate 142 for holding the lid 141 in its varied positions of adjustment.

A switch 145 for controlling the operation of the compressor 36, and motor 38, is disposed on the deck 48 in the rear of the partition 60, and a guard plate 146 connected to the rear wall of the partition encompasses three sides of the switch. A shaft 147 of the switch extends

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vertically through the top wall 109 of the hood, and is provided with a knob 148, which may be rotated to three positions, for causing either the operation of the refrigerating system and fans; to operate only the fans; to an off position which would cut off any source of current or power to the fans and cooling system. An overflow stand pipe 149 is formed in the bottom 10 in the motor-compressor compartment to drain off any excess condensate or water that may be collected in the compartment, and primarily from a storm where a driving rain might pass through the louvers 30 of the sides 12.

Figures 3 and 4 illustrate a method of supporting the conditioning unit in a window, with a rectangular cradle frame, having one end rail 150 secured to the window sill 151 by screws 152. Extending lengthwise of the sill is a cross bar 153 to which brackets 154 are removably attached and which are connected to each side rail 155 of the cradle frame. Cradle slides or angle guide rails 156 on which the bottom 10 of the conditioner unit is mounted, are supported in spaced relation to the side rails 155 by rubber pads 157, to reduce vibration and also act as sound deadening means. The outer ends of the side rails 155 are provided with a cross-bar 158 for limiting the sliding of the casing on the cradle frame and retaining the casing in position on the cradle frame.

The present air conditioning unit is arranged so that the evaporator is separated from the condenser by the housing provided for the mounting of the evaporator, so that the room air may be drawn through the opening 115 and thence through the filter, evaporator and into the impeller, and the conditioned air delivered to a cold air chamber located above the evaporator and turbine, and discharged therefrom through an opening 118 in the peripheral edge of the casing. A plurality of individually operable louvers are located in this opening 118, which may be adjusted to cause the air to flow in several different directions, and the flow of air is further controlled by the three horizontally disposed louvers located below the independently operable louvers. The horizontal louvers are operable by a lever 136 simultaneously. In this manner directional control of air movement through the system is at the option of the user.

The evaporator and its housing is disposed above the bottom wall 10 of the casing providing a passage 65 for fresh air delivery to the evaporator. The fresh air is admitted through the louvers in the sides 12 and is drawn through the passageway beneath the evaporator where it is pre-cooled to a certain degree as it passes beneath the shelf 50 which supports the evaporator. This fresh air before entering the passageway passes through the filter or screen 75 so that a certain amount of foreign matter is eliminated before the air enters the filter 84 which will remove any dust, pollen, soot and the like from the air. This passageway 65 as well as the opening 115 is controlled by a damper 66 hinged to the inner end of the bottom wall and which damper is operated by the insertion of the hand through the opening 115 so that either room air is admitted at 115 to the evaporator or only fresh air through the passage 65; then again by pushing this damper in an intermediate position a mixture of room and fresh air can be admitted to the evaporator for the purpose of conditioning the air before delivery to the cold air chamber, and then to the room through the direction control of the two sets of louvers in the cold air discharge outlet. The bulkhead or partition 60 and back wall 52 of the evaporator housing separate the evaporator from the compressor and motor and condenser, as the only communication therebetween is had by the passage 65 beneath the evaporator housing. As the fan 44 draws fresh air through the sides 12 it directs the air through the condenser without the air being delivered to the evaporator being contaminated in anyway. Furthermore, the shroud 100, which is connected to the condenser, and through which the fan 44 is located, separates the condenser and the warm air issuing therefrom, from entering the casing through

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the shroud and mixing with the air that would pass to the evaporator through the passage 65.

Any heat developed by the compressor 36 and motor 38 will be evacuated by the fan 44 so that in a sense the compressor 32 and motor 38 are separated from the evaporator and they in turn are separated from the condenser by the shroud 100, so that the supply of fresh air to the evaporator is entirely separate and distinct from any air that is delivered to the condenser. The fresh air going to the evaporator is drawn primarily from the side louvers of the sides 12, which are adjacent the intake passage 65 and the impeller fan 42 produces a stronger suction to overcome the pull of the condenser fan 44 which is forcing air in the opposite direction, although both the impeller 42 and fan 44 are driven from the same motor 38. The condenser fan will continue to draw in its normal air and forcing the air through the condenser in the opposite direction with no measurable change in its capacity due to the open position of the damper 66. This is due to the fact that the louver openings in the sides 12 are sufficient to furnish both fans without affecting the operation of either.

If the room to be conditioned is filled with stale or impure air due to smoking or otherwise, the damper 66 would be swung to a position to close the opening 115, whereupon the fresh air would be drawn through the passageway 65 and through the evaporator and discharged into the room and the stale air in the room would be expelled from the room through the opening 139. The lid 141 in this instance in the top wall 109 would be opened, Figure 5, and the room air would be exhausted through the opening 139 into the motor compressor compartment, and drawn by the fan 44 through the shroud 100 and then through the condenser to atmosphere. It will be appreciated that the positioning of the damper 66 and the louvers 122 and 123 permits the user to regulate and control the supply of air to and from the room to be conditioned.

The evaporator is supported in its housing on a shelf 50, which is provided with tubes 93 for draining any condensate that is collected by the shelf, and which condensate is collected on the bottom 10 in the grooves 94. The bottom slopes in an outward direction or is inclined so the condensate will drain into a sump 95 in the outer end of the casing, where it is discharged by the fan 44 and slinger ring 104 against and through the condenser to the atmosphere.

I claim:

1. In a room air conditioning unit, a casing having openings at the ends thereof, a condenser mounted in said casing and disposed at one of said open ends, a removable hood consisting of a front, top and side walls mounted on said casing and extending over the other open end thereof, a housing mounted in said casing at said last mentioned open end, comprising a back wall having a shelf and a cold air deck extending laterally therefrom and arranged in spaced relation to each other, a turbine cage connected to said back wall, an air intake opening in said back wall between said deck and shelf for communication with said turbine cage, a turbine in said turbine cage, an evaporator mounted on said shelf extending across said opening and beneath said cold air deck being operatively connected to said condenser, said cold air deck having engagement with the front wall of said hood, a bulkhead provided along the rear of said cold air deck and said turbine cage, said turbine cage having an air outlet opening for delivering cold air onto said deck, said hood having an air outlet at the peripheral edge thereof through which air is discharged from said cold air deck, said casing and said front wall of said hood being spaced from each other at the bottoms thereof to provide an air intake opening.

2. In a room air conditioning unit, a casing comprising a top and a bottom wall having an opening at one end thereof, a condenser disposed in said casing

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at said open end, a housing disposed in said casing at the opposite end thereof from said condenser, comprising a cold air deck and a shelf arranged in spaced parallel relation and extending transversely of said casing with said deck spaced from said top wall of said casing and said shelf spaced from said casing bottom wall, a back wall connected to said deck and shelf for closing the space between said deck and shelf, an evaporator disposed between said shelf and said deck, a turbine cage on the outer side of said back wall having communication with space above said deck and a turbine mounted therein, said back wall having an air intake opening communicating with said turbine cage and evaporator, a bulkhead on said deck and turbine cage to provide with said deck and casing a cold air chamber, said casing above said deck having an air outlet opening, and at the bottom thereof provided with an air inlet opening communicating with said evaporator.

3. In a room air conditioning unit, a casing comprising a top and a bottom wall having an opening at one end thereof, a condenser disposed in said casing at said open end, a housing disposed in said casing at the opposite end thereof from said condenser, comprising a cold air deck and a shelf arranged in spaced parallel relation and extending transversely of said casing with said deck spaced from said top wall of said casing and said shelf spaced from said casing bottom wall, a back wall connected to said deck and shelf for closing the space between said deck and shelf, an evaporator disposed between said shelf and said deck, a turbine cage on the outer side of said back wall having communication with space above said deck and a turbine mounted therein, said back wall having an air intake opening communicating with said turbine cage and evaporator, a bulkhead on said deck and turbine cage to provide with said deck and casing a cold air chamber, said casing above said deck having an air outlet opening, and at the bottom thereof provided with an air inlet opening communicating with said evaporator and a damper hinged to and extending transversely of said bottom wall for controlling the flow of air through said last mentioned air inlet opening.

4. In a room air conditioning unit, a casing having a bottom, a top, louvered sides, a front, and an open rear wall, a condenser located adjacent said open rear wall, a housing in said casing including a deck extending transversely of said casing and rearwardly from said front wall, end panels supporting said deck mounted on said bottom wall, a shelf connected to said end panels above said bottom wall to provide a passage therebetween, a back wall connecting said deck and shelf to provide an evaporator chamber between said front wall, shelf, deck and back wall, an evaporator on said shelf operatively connected to said condenser, said back wall and disposed between said deck and said shelf and having an air outlet opening therein, an impeller cage connected to said backwall around said air outlet opening, a rotary impeller in said cage, said front wall and said bottom wall being in spaced relation to provide an air intake opening for admission of air to said evaporator housing, a damper extending transversely of and hinged to said bottom wall for engagement with said front wall and said shelf for controlling the flow of air through said air intake opening and said passage, a partition on said deck and said impeller cage and extending to said top wall for forming an air distributing wall for a cold air chamber formed by said partition, deck, front, top and side walls of said casing, said casing being provided with an air outlet opening for said cold air chamber, and said impeller cage being provided with an air outlet for communication with said cold air chamber.

5. In a room air conditioning unit, a casing having a bottom, a top, louvered sides, a front, and an open rear wall, a condenser located adjacent said open rear wall, a housing in said casing including a deck extending

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transversely of said casing and rearwardly from said front wall, end panels supporting said deck mounted on said bottom wall, a shelf connected to said end panels above said bottom wall to provide a passage therebetween, a back wall connecting said deck and shelf to provide an evaporator chamber between said front wall, shelf, deck and back wall, an evaporator on said shelf operatively connected to said condenser, opposed vertical channel members mounted on said end panels having a ledge at their lower ends, a filter received in said channels in front of said evaporator and supported by said ledges, said back wall having an air outlet opening therein, an impeller cage connected to said back wall around said air outlet opening, a rotary impeller in said cage, said front wall and said bottom wall being in spaced relation to provide an air intake opening for admission of air to said evaporator housing, a damper extending transversely of and hinged to said bottom wall for engagement with said front wall and said shelf for controlling the flow of air through said air intake opening and said passage, a partition on said deck and said impeller cage and extending to said top wall forming an air distributing wall for a cold air chamber formed by said partition, deck, front, top and side walls of said casing, said casing being provided with an air outlet opening for said cold air chamber, and said impeller cage being provided with an air outlet for communication with said cold air chamber.

6. In a room air conditioning unit, a casing comprising a top and a bottom wall having an opening at one end thereof, a condenser disposed in said casing at said open end, a housing disposed in said casing at the opposite end thereof from said condenser, comprising a cold air deck and a shelf arranged in spaced parallel relation and extending transversely of said casing with said deck spaced from said top wall of said casing and said shelf spaced from said casing bottom wall, a back wall connected to said deck and shelf for closing the space between said deck and shelf, an evaporator disposed between said shelf and said deck, a turbine cage on the outer side of said back wall having communication with space above said deck and a turbine mounted therein, said back wall having an air intake opening communicating with said turbine cage and evaporator, a bulkhead on said deck and turbine cage to provide with said deck and casing a cold air chamber, said casing above said deck having an air outlet opening, and at the bottom thereof provided with an air inlet opening communicating with said evaporator, said shelf and bottom wall being arranged in spaced relation to provide a fresh air passage therebetween, and a damper pivoted to said casing and extending transversely thereof for controlling the flow of air through said air passage and said last mentioned air inlet opening.

7. In a room air conditioning unit, a casing comprising a top, a bottom and side walls, a condenser disposed in said casing at one end thereof, a housing disposed in said casing at the opposite end thereof from said condenser and projecting forwardly therefrom, said housing comprising a cold air deck and a shelf arranged in spaced parallel relation and extending transversely of said casing with said deck spaced from said casing top wall and said shelf spaced from said casing bottom wall, a back wall connected to said deck and shelf, an evaporator disposed between said deck and shelf, a turbine cage on the outer side of said back wall having communication with the space above said deck and an impeller mounted therein, said back wall having an air intake opening communicating with said turbine cage and evaporator, a hood having sides, top and front walls enclosing said housing to provide an evaporator chamber beneath said deck and a cold air chamber above said deck, a bulkhead on said deck and turbine cage having engagement with said hood top wall, said hood front wall having an air outlet opening communicating with said cold air chamber and an air intake opening between the bottom thereof and said

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casing bottom wall communicating with said evaporator chamber.

8. In a room air conditioning unit, a casing comprising a top, a bottom and side walls, a condenser disposed in said casing at one end thereof, a housing disposed in said casing at the opposite end thereof from said condenser and projecting forwardly therefrom, said housing comprising a cold air deck and a shelf arranged in spaced parallel relation and extending transversely of said casing with said deck spaced from said casing bottom wall, a back wall connected to said deck and shelf, an evaporator disposed between said deck and shelf, a turbine cage on the outer side of said back wall having communication with the space above said deck and an impeller mounted therein, said back wall having an air intake opening communicating with said turbine cage and evaporator, a hood having sides, top and front walls enclosing said housing to provide an evaporator chamber beneath said deck and a cold air chamber above said deck, a bulkhead on said deck and turbine cage having engagement with said hood top wall, said hood front wall having an air outlet opening communicating with said cold air chamber and an air intake opening between the bottom thereof and said casing bottom wall communicating with said evaporator chamber, said shelf and bottom wall being arranged in spaced relation to provide a fresh air passage therebetween, and a damper pivoted to said casing and extending transversely thereof for controlling the flow of air through said air passage and said last mentioned air inlet opening.

9. In a room air conditioning unit, a casing comprising a top, a bottom, and side walls, a condenser disposed in said casing at one end thereof, a housing disposed in said casing at the opposite end thereof from said condenser and extending transversely of the casing, said housing comprising end panels, a deck mounted on said panels, a shelf disposed between said end panels and arranged beneath said deck and above the bottom of said casing, a back wall connected to said deck and shelf for closing the space between said deck and shelf along one side of said housing, said back wall being provided with an air outlet opening near one end thereof, an impeller cage connected to the rear side of said back wall and around said air outlet opening, an impeller mounted in said impeller cage, said deck having an air intake opening in communication with said impeller cage, an evaporator mounted on said shelf and extending lengthwise thereof and across said outlet opening of said back wall, said casing walls enclosing said housing to provide an evaporator chamber beneath said deck and a cold air chamber between said deck and said casing top wall, a bulkhead extending transversely of said housing and disposed between said deck and said casing top wall to form the rear wall of said cold air chamber, said casing having an air outlet opening in communication with said cold air chamber and an air inlet to said evaporator chamber.

10. In a room air conditioning unit, a casing comprising a top, a bottom, and side walls, a condenser disposed in said casing at one end thereof, a housing disposed in said casing at the opposite end thereof from said condenser and extending transversely of the casing, said housing comprising end panels, a deck mounted on said panels, a shelf disposed between said end panels and arranged beneath said deck and above the bottom of said casing, a back wall connected to said deck and shelf for closing the space between said deck and shelf along one side of said housing, said back wall being provided with an air outlet opening near one end thereof, an impeller cage connected to the rear side of said back wall and around said air outlet opening, an impeller mounted in said impeller cage, said deck having an air intake opening in communication with said impeller cage, an evaporator mounted on said shelf and extending lengthwise thereof and across said outlet opening of said back wall, a filter, means on said end panels for supporting said filter in front of said evaporator, said casing walls enclosing said

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housing to provide an evaporator chamber beneath said deck and a cold air chamber between said deck and said casing top wall, a bulkhead extending transversely of said housing and disposed between said deck and said casing top wall to form the rear wall of said cold air chamber, said casing having an air outlet opening in communication with said cold air chamber and an air inlet to said evaporator chamber.

11. In a room air conditioning unit, a casing comprising a top, a bottom, and side walls, a condenser disposed in said casing at one end thereof, a housing disposed in said casing at the opposite end thereof from said condenser and extending transversely of the casing, said housing comprising end panels, a deck mounted on said panels, a shelf disposed between said end panels and arranged beneath said deck and above the bottom of said casing, a back wall connected to said deck and shelf for closing the space between said deck and shelf along one side of said housing, said back wall being provided with an air outlet opening near one end thereof, an impeller cage connected to the rear side of said back wall and around said air outlet opening, an impeller mounted in said impeller cage, said deck having an air intake opening in communication with said impeller cage, an evaporator mounted on said shelf and extending lengthwise thereof and across said outlet opening of said back wall, said casing walls enclosing said housing to provide an evaporator chamber beneath said deck and a cold air chamber between said deck and said casing top wall, a bulkhead extending transversely of said housing and disposed between said deck and said casing top wall to form the rear wall of said cold air chamber, said casing having an air outlet opening in communication with said cold air chamber and room air intake opening to said evaporator chamber.

12. In a room air conditioning unit, a casing comprising a top, a bottom, and side walls, a condenser disposed in said casing at one end thereof, a housing disposed in said casing at the opposite end thereof from said condenser and extending transversely of the casing, said housing comprising end panels, a deck mounted on said panels, a shelf disposed between said end panels and arranged beneath said deck and above the bottom of said casing, a back wall connected to said deck and shelf for closing the space between said deck and shelf along one side of said housing, said back wall being provided with an air outlet opening near one end thereof, an impeller cage connected to the rear side of said back wall and around said air outlet opening, an impeller mounted in said impeller cage, said deck having an air intake opening in communication with said impeller cage, an evaporator mounted on said shelf and extending lengthwise thereof and across said outlet opening of said back wall, said casing walls enclosing said housing to provide an evaporator chamber beneath said deck and a cold air chamber between said deck and said casing top wall, a bulkhead extending transversely of said housing and disposed between said deck and said casing top wall to form the rear wall of said cold air chamber, said casing having an air outlet opening in communication with said cold air chamber and room air intake opening to said evaporator chamber, said back wall and shelf being spaced from said bottom wall to provide a fresh air passageway therebetween for supplying fresh air to said evaporator, means for controlling the flow of air through said passageway and room air intake opening, and means for operating said turbine for drawing air through said air intake opening, evaporator and said impeller cage and discharging the air to said air chamber and through said outlet in said casing.

13. In a room air conditioning unit, a casing comprising a top, a bottom, and side walls, a condenser disposed

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in said casing at one end thereof, a housing disposed in said casing at the opposite end thereof from said condenser and extending transversely of the casing, said housing comprising end panels, a deck mounted on said panels, a shelf disposed between said end panels and arranged beneath said deck and above the bottom of said casing, a back wall connected to said deck and shelf for closing the space between said deck and shelf along one side of said housing, said back wall being provided with an air outlet opening near one end thereof, an impeller cage connected to the rear side of said back wall and around said air outlet opening, an impeller mounted in said impeller cage, said deck having an air intake opening in communication with said impeller cage, an evaporator mounted on said shelf and extending lengthwise thereof and across said outlet opening of said back wall, a hood having sides, a top and front wall enclosing said housing to provide an evaporator chamber beneath said deck and a cold air chamber above said deck, a bulkhead extending from said turbine cage and across said deck transversely of said housing and disposed between said deck and the top of said hood for forming the rear wall of said cold air chamber and directing the air toward the front wall of said hood, said front wall of said hood having an air outlet opening along the peripheral edge thereof and an air intake opening between the bottom of said front wall and the forward edge of said bottom of said casing.

14. In a room air conditioning unit, a casing comprising a top, a bottom, side walls, a condenser disposed in said casing at one end thereof, a housing disposed in said casing at the opposite end thereof from said condenser and extending transversely of the casing, said housing comprising end panels, a deck mounted on said panels, a shelf disposed between said end panels and arranged beneath said deck and above the bottom of said casing, a back wall connected to said deck and shelf for closing the space between said deck and shelf along one side of said housing, said back wall being provided with an air outlet opening near one end thereof, an impeller cage connected to the rear side of said back wall and around said air outlet opening, an impeller mounted in said impeller cage, said deck having an air intake opening in communication with said impeller cage, an evaporator mounted on said shelf and extending lengthwise thereof and across said outlet opening of said back wall, a hood having sides, a top and front wall enclosing said housing to provide an evaporator chamber beneath said deck and a cold air chamber above said deck, a bulkhead extending from said turbine cage and across said deck transversely of said housing and disposed between said deck and the top of said hood for forming the rear wall of said cold air chamber and directing the air toward the front wall of said hood, said front wall of said hood having an air outlet opening along the peripheral edge thereof and an air intake opening between the bottom of said front wall and the forward edge of said bottom of said casing, a plurality of vertically disposed louvers independently and adjustably supported by said hood in said outlet opening for directional control of air issuing through said outlet opening.

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