June 21, 1955 J. H. JENNINGS 2,711,087

AIR CONDITIONING APPARATUS

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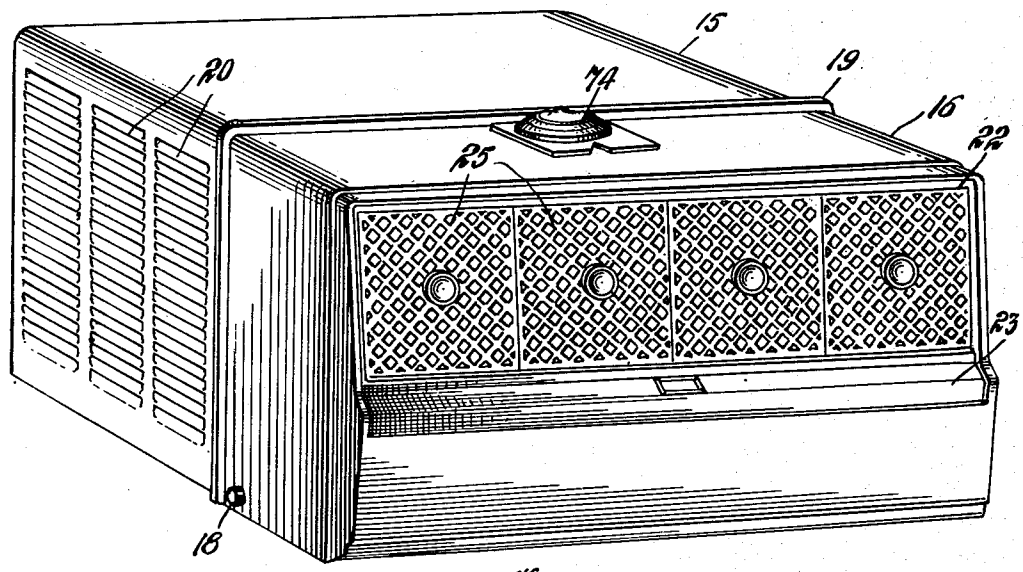
Fig. 1.



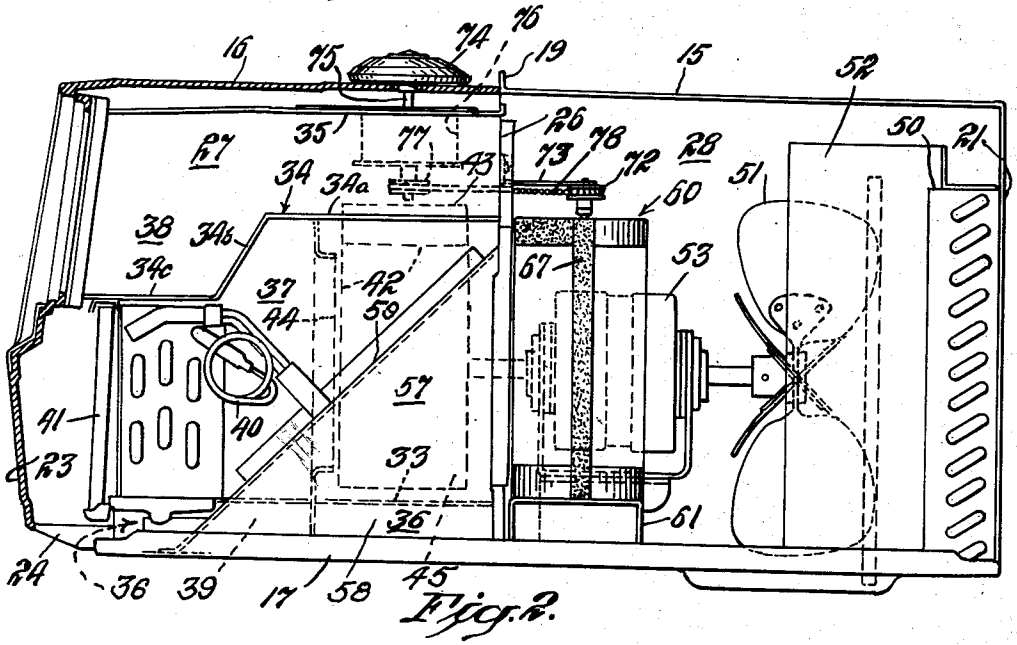


Fig. 2.

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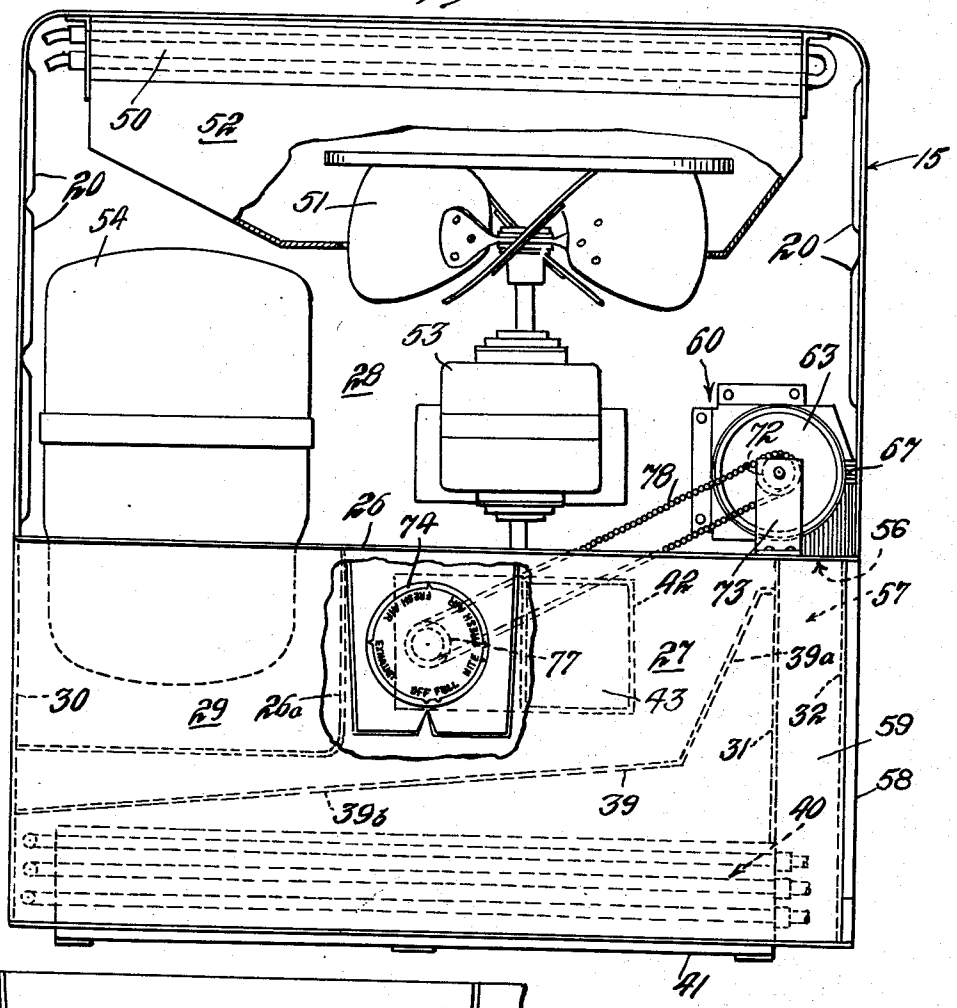
Fig. 3.



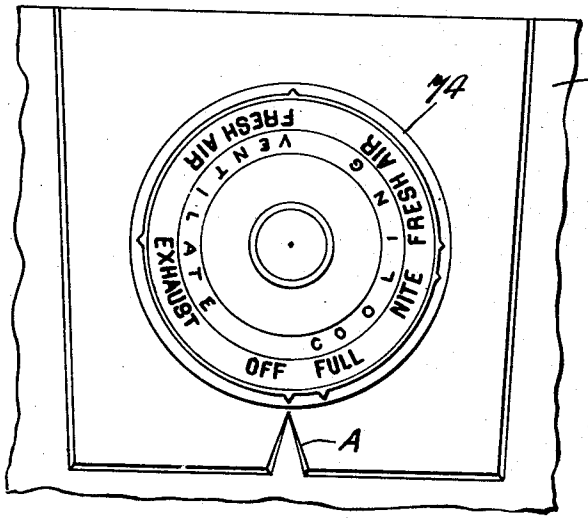


Fig. 4.

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AIR CONDITIONING APPARATUS

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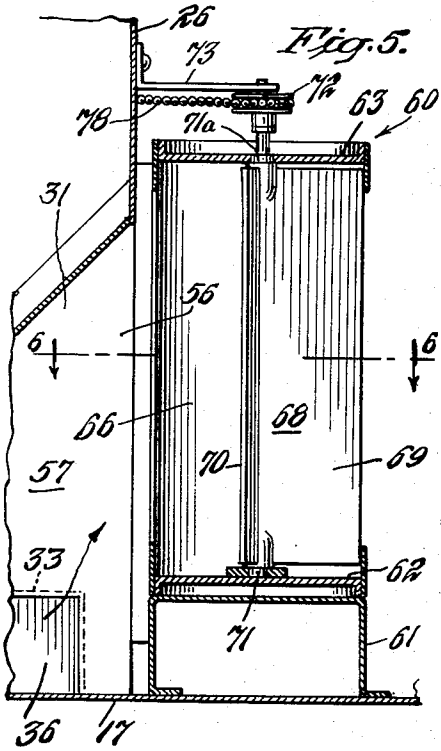
Fig. 5.



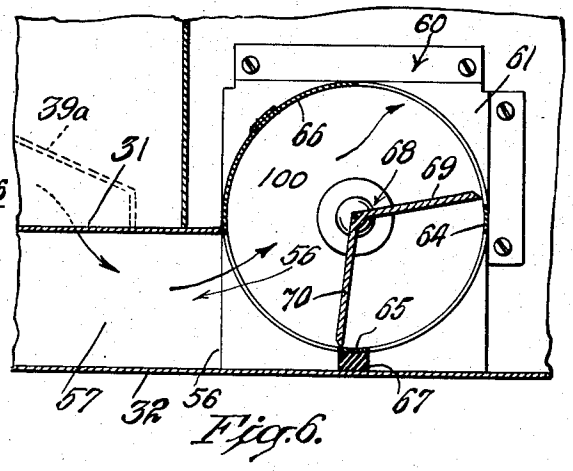
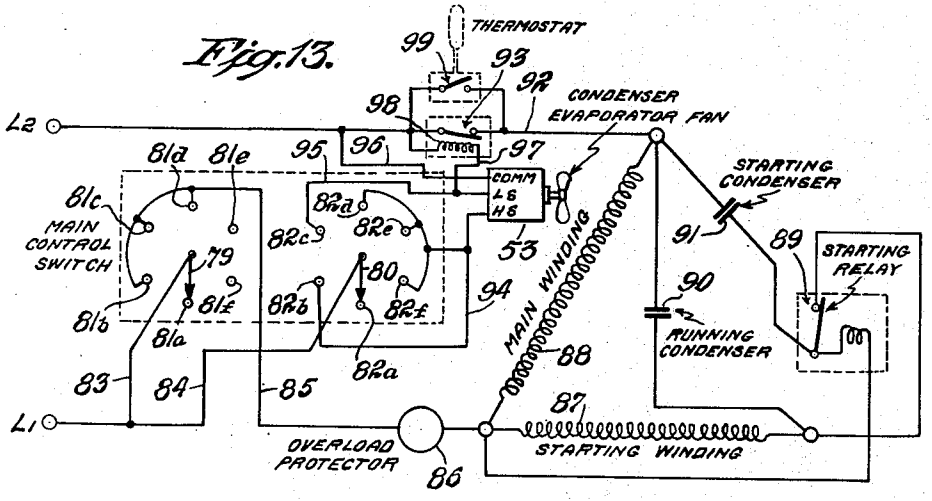


Fig. 6.

Fig. 13.



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AIR CONDITIONING APPARATUS

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Fig. 7.

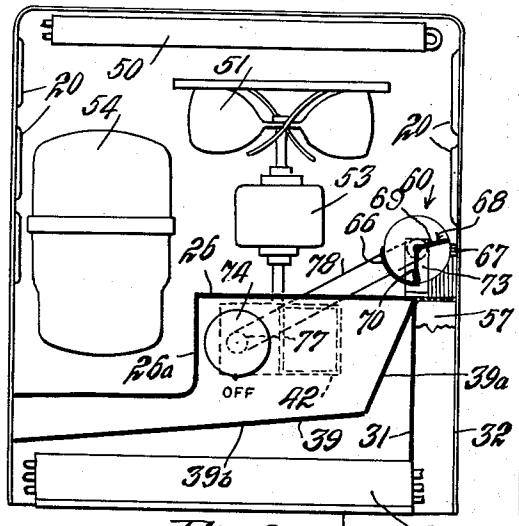


Fig. 8.

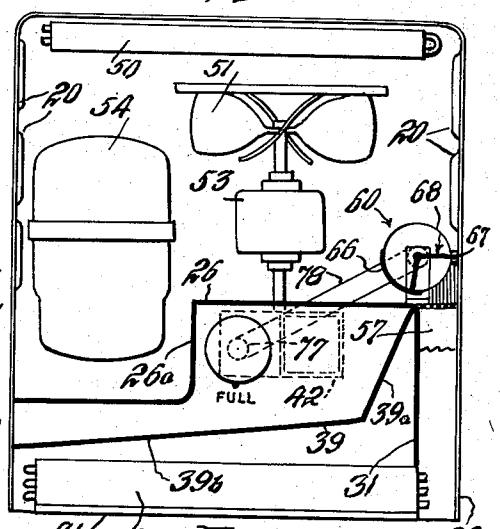


Fig. 9.

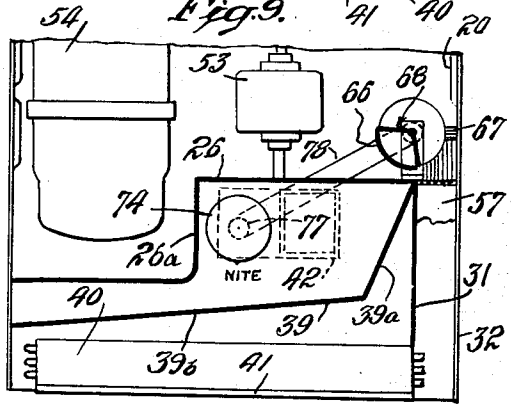


Fig. 10.

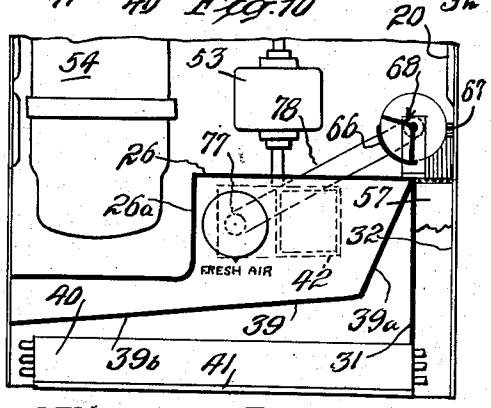


Fig. 11.

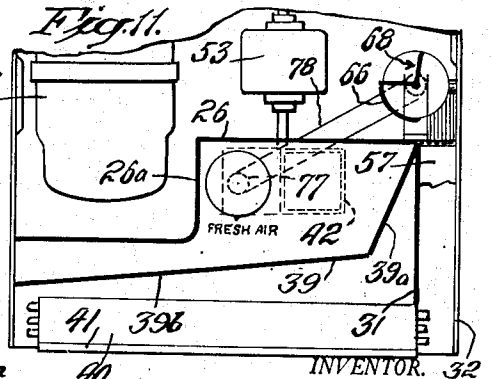
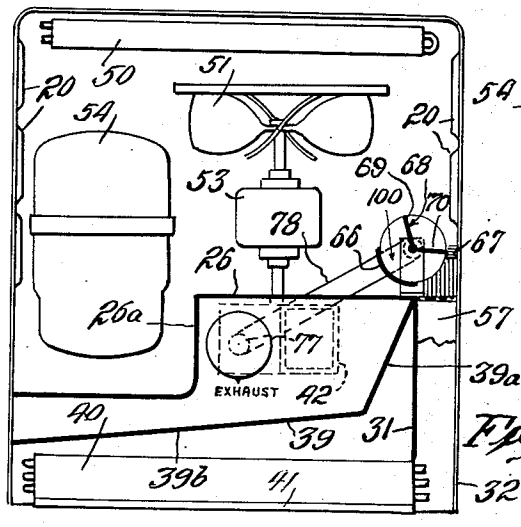


Fig. 12.



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2,711,087

AIR CONDITIONING APPARATUS

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Application November 12, 1953, Serial No. 391,453

9 Claims. (Cl. 62—129)

The present invention relates to air conditioning and more particularly to a self-contained room air conditioning unit.

One of the objects of the present invention is to provide an air conditioning unit with a single control element for starting, stopping and adjusting the unit for any operating condition desired.

Another object is to provide an air conditioner with a single control element for adjusting the conditioner to circulate air in an enclosure with or without cooling and to either add outside fresh air to or exhaust stale air from the enclosure.

Another object is to provide an air conditioning unit of the type indicated with a single control element for adjusting the conditioner for all operating conditions including reduced air circulation with thermostatic control of cooling at night to reduce the noise level to a minimum for producing a comfortable condition for sleep.

Another object is to provide an air conditioner of the type indicated having separate compartments in which room air and outside air is circulated and a novel arrangement between compartments operable in different adjusted positions to cause air to flow in either direction between compartments to supply outside makeup air to the enclosure or exhaust stale air from the enclosure to the outside.

Another object is to provide an air conditioner of the type indicated with a damper having angularly spaced radial vanes movable to a plurality of positions relative to streams of air circulating in separate compartments to either close a port opening between the compartments or selectively cause flow of air in either direction between the compartments.

Still another object is to provide a novel control for an air conditioner of the type indicated which is of simple and compact construction, economical to manufacture and assemble and reliable in operation.

These and other objects will become more apparent from the following description and drawings in which like reference characters denote like parts throughout the several views. It is to be expressly understood, however, that the drawings are for the purpose of illustration only and not a definition of the limits of the invention, reference being had for this purpose to the appended claims. In the drawings:

Fig. 1 is a perspective view of an air conditioning unit incorporating the novel features of the present invention.

Fig. 2 is a sectional view of the air conditioning unit in side elevation showing the fans for circulating air in adjacent compartments and the passageway through which air may flow between compartments.

Fig. 3 is a plan view partly in section showing the passageway between adjacent compartments and the connection between the single dial control and damper for controlling air flow through the passageway;

Fig. 4 is a plan view of the single dial control.

Fig. 5 is a detail view showing the control damper in side elevation.

Fig. 6 is a sectional view on line 6—6 of Fig. 5 showing the angularly related vanes of the damper and the relation of the damper to the passageway between adjacent compartments.

Fig. 7 is a plan view showing the position of the damper when the dial is at "Off" position.

Fig. 8 is a view similar to Fig. 7 showing the damper closing the passageway when the dial is moved to "Full" on position.

Fig. 9 is a similar view showing the position of the damper when the dial is moved to "Nite" position to cause outside air to flow through the passageway into the enclosure.

Fig. 10 is a similar view showing the position of the damper when the dial is moved to "Fresh Air" cooling position.

Fig. 11 is a similar view showing the position of the damper when the dial is moved to "Fresh Air" ventilating position.

Fig. 12 is a similar view showing the position of the damper when the dial is moved to "Exhaust" position to withdraw stale air from the enclosure; and

Fig. 13 is a diagrammatic view of the electric control circuit for controlling operation of the air conditioner at the various operating positions of the single dial control element.

The present invention is shown applied to a room air conditioning unit adapted to be mounted in a window or other suitable wall opening of the enclosure to be air conditioned. The air conditioning unit is enclosed in a housing comprising a weather casing **15** adapted to be fixedly mounted on a ledge in the wall opening such as a window sill and projecting outwardly therefrom, and a decorative casing section **16** projecting into the room or enclosure, see Fig. 1. The unit, per se, comprises a base **17**, see Fig. 2, mounting the various operating elements and partitions and is slidable bodily into the weather casing section **15**. When the unit is slid into operative position in the weather casing **15** the latter encloses the rearward portion of the unit. The decorative casing **16** is then applied over the inwardly projecting portion of the unit. Certain portions of the unit cooperate with the casing sections **15** and **16** to form seals therebetween and screws **18** inserted through the sides of the decorative casing section **16** into projections of the weather casing **15** lock the casing sections together and hold the unit therein. A flange **19** is provided at the forward edge of the weather casing section **15** for mounting a suitable gasket to seal the casing in the window or other opening in the wall of the enclosure.

The weather casing **15** is of generally rectangular form having rows of louvers **20** at each side thereof, see Figs. 1 and 3, through which outside air may flow into the casing. The rearward wall of the weather casing section **15** has a rectangular opening **21**, see Fig. 2. The decorative casing **16** also is of generally rectangular shape having an open bottom and a rectangular opening **22** in the front wall **23** thereof. The lower portion of the front wall **23** is spaced from the forward edge of the base **17** to provide a room air inlet opening **24**. A plurality of perforated panels **25** are mounted in the opening **22** to provide room air outlets. Preferably, the individual panels **25** have a series of decorative cross ribs for directing the air in one direction and are movable relative to the casing section **16** to direct the air in any one of a plurality of directions desired.

A transverse partition wall **26** extends upwardly from and across the base **17** to divide the interior of the unit into an inner compartment **27** projecting into the en-

closure and an outer compartment 28 in the weather casing 15. As illustrated in Fig. 3, the transverse partition wall 26 has an offset portion 26*a* at the left-hand side to provide a recess 29 for a purpose as later explained. Side walls 30, 31, and 32 project inwardly from the transverse wall 26 and horizontal partitions 33, 34 and 35 complete the compartment 27 and divide it into a plurality of superimposed chambers 36, 37 and 38. As shown in Figs. 2 and 3, a second transverse partition wall 39 extends upwardly from the base a height equal to the height of the chamber 36. The second transverse partition wall 39 has a portion 39*a* extending forwardly at an angle from the first partition wall 26 at a point spaced from the right-hand edge thereof and a portion 39*b* extending laterally at an angle to the side wall 30. Horizontal partition 33 overlies the second transverse wall 39 and extends inwardly therefrom to approximately the forward edge of the base to define the lowermost chamber 36 and the inward end of the chamber communicates with the air inlet opening 24 throughout its width.

The horizontal partition 34 overlies the partition 33 in spaced relation thereto, see Fig. 2, and has a horizontal portion 34*a* projecting inwardly from the transverse wall 26, a downwardly inclined portion 34*b* and a forwardly projecting horizontal portion 34*c* which together with the side walls 30 and 31 form the intermediate chamber 37. A cooling element 40, constituting the evaporator of a compression type refrigeration system, is located between the forward portions of the horizontal partitions 33 and 34*c* throughout the width of the unit. A filter 41 is mounted in suitable brackets at the front of the cooling element 40 and is located rearwardly and above the air inlet opening 24. The forward portion of the horizontal partition 33 underlying the cooling element 40 constitutes a drip pan for receiving condensate from the cooling element and draining it to the compartment 28. A centrifugal fan 42 is located in the intermediate chamber 37 and has a scroll casing mounted on the base 17 at the rear of the second transverse partition 39, see Fig. 3, with an outlet 43 projecting through the horizontal partition 34*a*. Fan 42 has an axial air inlet opening 44 and a rotor 45 with peripheral blades.

The side walls 30 and 32 and the horizontal partitions 34 and 35 define the upper or air outlet chamber 38 and their forward edges have a sealing engagement with the decorative casing 16. Thus, air in the enclosure to be conditioned is drawn into the unit through the air inlet opening 24 by the fan 42 and flows through the filter 41 and cooling element 40. The conditioned air is then discharged by the fan 42 into the chamber 38 constituting a plenum and is discharged through the perforated air directing elements 25 back to the enclosure.

The weather casing 15 and base 17 define the entire outside compartment 28. A heat dissipating element 50, constituting the condenser of the refrigeration system, is mounted on the base 17 and closely fits the opening 21 in the rear wall of the casing section. A propeller type fan 51 is mounted in a shroud ring 52 in front of the condenser 50. Fan 51 and rotor 45 of fan 42 are driven by a single motor 53 mounted on a suitable bracket on the base 17 in compartment 28. Motor 53 is preferably constructed to operate at high and low speeds as well understood by those skilled in the art and has three connections for that purpose, see Fig. 13. The refrigerant compressor may take any suitable form but as herein illustrated comprises a hermetically sealed unit 54 mounted resiliently on the base 17 in compartment 28 with one end projecting into the recess 29 and its opposite end projecting rearwardly of partition 26 so as to distribute its weight on the ledge or window sill on which the air conditioner is mounted. It will be understood that the compressor 54, condenser 50 and evaporator 40 are suitable connected in a conventional manner to produce a complete refrigeration system but such connections are not herein illustrated or described as they form no part of the present invention. Fan 51 draws air into the weather casing 15 through the louvers 20 in the side walls thereof and directs the air over the heat dissipating element or condenser 50 to the outside ambient to remove the heat absorbed from the air in the enclosure to be conditioned. It will be observed by reference to Fig. 3 that the air flowing toward the fan 51 circulates around the motor compressor unit 54 to cool the latter.

In accordance with the present invention, a novel construction is provided to adapt all of the functions of the air conditioning unit to be controlled by a single element. The construction further includes a novel arrangement to either supply outside fresh air to the enclosure to be conditioned or exhaust stale air therefrom. The various functions of the unit controlled by the single element are recirculation of room air either with or without cooling, cooling at full capacity, cooling with reduced air circulation and thermostatic control for night operation to reduce noise to a minimum, addition of outside make-up air to recirculated room air either with or without cooling and exhaust of stale air from the enclosure.

The arrangement for supplying fresh make-up air to or exhausting stale air from the enclosure being air conditioned comprises a passageway 56 in the transverse partition 26 through which air may pass in either direction between compartments 27 and 28. The passageway 56 is in the form of a narrow rectangular opening at the right-hand end of the vertical transverse wall 26, see Figs. 3 and 5. A triangular chamber 57 projects inwardly into compartment 27 from the passage 56 and the chamber is formed between side wall 31, a triangularly shaped side wall 58 spaced from wall 31 a distance equal to the width of the passageway and a top wall 59 between the side walls inclined downwardly from the top of the passageway to the base 17, see Figs. 2 and 3. The bottom of the triangular chamber 57 opens into the lower chamber 36 previously described. By reference to Figs. 2 and 3, it will be noted that the triangular chambers 57 and 36 in vertical and horizontal planes, respectively, have the same area at their point of juncture so that air can flow from a vertical inlet to a horizontal outlet or vice versa with a minimum impedance in its path of flow.

The air flow through the passageway 56 is controlled by a damper 60 located in compartment 28 adjacent the passageway and side wall of the weather casing 16, see Figs. 2, 3, 5, and 6. By reference to Figs. 5 and 6, it will be observed that the damper comprises a frame or casing mounted on a pedestal 61 and having a circular base plate 62 and circular top plate 63. Extending vertically between the peripheries of the circular base and top plates 62 and 63 are narrow arcuate walls 64 and 65 and a relatively wide arcuate wall 66 extending through substantially 90°. Narrow arcuate wall 64 is located rearwardly from the passageway 56 while arcuate wall 65 is located adjacent the side wall of the weather casing 15 with a sealing strip 67 therebetween. The wider arcuate wall 66 has one end engaging a sealing strip or layer of sound deadening material and the wall projects from the inside wall 31 of passageway 56 transversely and rearwardly of the compartment 28. Mounted for rotation between the base and top plates 62 and 63 is the movable damper element 68 comprising a pair of angularly related blades 69 and 70 projecting at a slightly greater angle than 90° and of a radius substantially equal to the radius of the damper casing. The movable damper element 68 has axial pintles 71 and 71*a* journaled in base plate 62 and top plate 63, respectively, and pintle 71*a* mounts a sprocket 72 at its upper end. A bracket 73 projecting rearwardly from partition 26 embraces the pintle 71*a* to brace the movable damper element 68.

The spindle control element is illustrated in the form of a dial 74, see Figs. 1 to 4, at the top of the decorative casing 16 and is mounted on a shaft 75. It will be noted by reference to Fig. 4 that the dial is marked with in-

dicia indicating "Cooling" throughout one half its periphery and "Ventilating" throughout the other half its periphery with six different operating positions which may be registered with an indicating mark or arrow A on casing 16. The six operating positions are "Off" position, "Full" on position, "Nite" position, "Fresh Air" cooling position, "Fresh Air" ventilating position, and an "Exhaust" position on the ventilating side. Shaft 75 extends through a switch box 76 mounted on and depending from the horizontal partition wall 35, see Fig. 2, and the lower end of the shaft projects beyond the switch box and mounts a sprocket 77 in alignment with the sprocket 72. An endless flexible chain 78 connects the sprockets 72 and 77 so that rotation of the dial 74 is transmitted to the movable damper element 68 with a 1:1 ratio so that the position of the vanes 69 and 70 of the damper always correspond with any particular operating position of the dial. The portion of the shaft 75 extending through the switch box 65 has a pair of brushes 79 and 80, see Fig. 13, which cooperates with one or the other of a plurality of fixed contacts 81*a*, 81*b*, 81*c*, 81*d*, 81*e* or 81*f*, and 82*a*, 82*b*, 82*c*, 82*d*, 82*e*, or 82*f*, respectively, so that the switches and movable damper element 68 operate simultaneously. The detailed construction of the switches 79 and 80 is not illustrated but will be fully understood by one skilled in the art from the diagrammatic illustration in Fig. 13.

Damper 60 is so constructed and arranged with respect to the air streams produced by the fans 42 and 51 in the compartments 27 and 28 as to selectively cause a flow of air in either direction through the passageway 56. Figs. 7 to 12, inclusive, illustrate various operating positions of the damper to either close the passageway 56, open the passageway to cause outside fresh air to flow therethrough from compartment 28 to compartment 27 or open the passageway to cause stale air to flow therethrough from the enclosure to the outside. With the movable damper element 68 in the position illustrated in Fig. 7, vanes 69 and 70 extend between arcuate walls 65 and 66 of the damper casing to close the passageway 56. With the movable damper element 68 in the position shown in Figs. 9 and 10, the effect of fan 42 on the air entering louvers 20 adjacent the damper is greater than the effect of fan 51 to cause a portion of the outside fresh air entering weather casing 15 to flow through the passageway 56 and chambers 57 and 36 into the air stream entering the compartment 27. With the movable damper element 68 in the position illustrated in Fig. 11, the vane 70 acts as a scoop to positively direct the inflowing fresh air through the passageway 56. With the movable damper element 68 in the position illustrated in Fig. 12, the vane 70 prevents air from the adjacent louver 20 from flowing into the passageway 56 and the damper element as a unit opens a path 100 from the passageway 56 directly to the fan 51 in parallel with the normal path of flow. Under these conditions the effect of fan 51 is greater than the effect of fan 42 on air in the passageway 56 causing a portion of air entering the inlet port 24 to flow through chamber 36 and 57, passageway 56 and path 100 between damper element 68 and arcuate wall 66 to the fan 51 and then through condenser 50 to the outside. Thus, rotation of the dial 74 in either direction will cause operation of the switches 79 and 80 relative to fixed contacts 81 and 82 and rotation of the damper element 68 to any of the plurality of positions illustrated in Figs. 7 to 12.

Switches 79 and 80 are connected in a suitable control circuit such as illustrated in Fig. 13. Current is supplied to each of the switches 79 and 80 from a line conductor L_1 through conductors 83 and 84, respectively. Switch 79 controls operation of the motor compressor unit 54 of the refrigeration system and fixed contact 81*a* corresponding with the "Off" position of dial 74, see Fig. 4, is unconnected or open. Fixed contacts 81*b*, 81*c* and 81*d* are connected to each other and through a conductor 85 and overload control element 86 to one end of the starting and running windings 87 and 88 of the compressor motor. Thus, movement of the dial 74 to any of the positions corresponding to "Full," "Nite" or "Fresh Air" on the cooling side of the dial will initiate operation of the compressor motor. Fixed contacts 81*e* and 81*f* corresponding to the "Fresh Air" and "Exhaust" positions on the ventilating side of the dial 74 are unconnected or open and will not initiate operation of the refrigeration system when engaged by movable switch contact 79. The motor control includes a conventional starting relay 89 and condensers 90 and 91 and the opposite ends of the starting and running windings 87 and 88 are connected by a conductor 92 through a relay switch 93 to the other side of the line L_2.

Switch 80 controls the motor 53 for operating the fans 42 and 51. In the position shown in Fig. 13, switch 80 engages fixed contact 82*a* which is unconnected or open and corresponds to the "Off" position of the dial 74 as shown in Fig. 4. Contact 82*b* is connected by a conductor 94 to the high speed winding of the motor 53 to operate the fans 42 and 51 at full capacity. Contact 82*c* is connected by a conductor 95 to the low speed winding of the motor 53 to operate the fans 42 and 51 at low speed. A common conductor 96 connects the opposite ends of the high speed and low speed windings to the other side of the line L_2 to complete a circuit. Contact 82*c* is also connected through a conductor 97 to coil 98 of relay 93 to open the return conductor 92. A thermostatic control switch 99 is connected in parallel with the relay switch 93 and the thermostat is responsive to the temperature in the enclosure being conditioned for controlling operation of the compressor motor 54. Contacts 82*d*, 82*e* and 82*f* are connected together and to conductor 94 for energizing the high speed winding of the fan motor 53 when engaged by switch 80. One form of the invention having now been described in detail the mode of operation is explained as follows.

With the dial 74 in the "Off" position the switches 79 and 80 are open circuited as illustrated in Fig. 13 and movable damper element 68 is in the position illustrated in Fig. 7 to close passageway 56. To initiate operation of the air conditioning unit, the dial 74 may be moved in either direction. For purposes of description let it be assumed that the dial 74 is moved from the "Off" position to the "Full" on position by rotating the dial clockwise. Switch 79 will have been moved into engagement with fixed contact 81*b* to complete a circuit to the compressor motor and thereby initiate operation of the refrigeration system. Simultaneously, switch 80 will have engaged fixed contact 82*b* to initiate operation of the fans 42 and 51 at high speed to operate the conditioner at maximum capacity. It will be noted that the movement of the dial 74 from "Off" to "Full" on position corresponds to a small angular movement of the dial which motion is transmitted through the shaft 75, sprocket 77, chain 78 and sprocket 72 to move the damper 68 from the position shown in Fig. 7 to that shown in Fig. 8. In this position the vanes 69 and 70 of the movable damper element 68 extend from the arcuate walls 65 and 66 of the damper casing to completely close the passageway 56 between compartments 27 and 28. Thus, air in the enclosure to be conditioned is circulated by the fan 42 through the cooling element 40 in compartment 27 to cool and dehumidify the air and then return it to the enclosure. Outside air is drawn through the louvers 20 in the sides of the weather casing 15 by the fan 51 and directed outwardly through the condenser 50 to dissipate the heat of compression and the heat absorbed by the cooling element 40.

By moving the dial 74 from "Full" on position to "Nite" position, switch 79 moves from contact 81*b* to 81*c* to maintain the refrigeration system in operation and switch 80 is moved from 82*b* to 82*c* to operate the fans 42 and 51 at low speed, see Fig. 13. Simultaneously, coil 98 of relay switch 93 is energized to open the return conductor 92 and operate the refrigeration system under

thermostatic control in accordance with requirements. Rotation of the dial 74 is transmitted through the shaft 75, sprocket 77, chain 78 and sprocket 72 to rotate the movable element 68 of the damper from the position shown in Fig. 8 to that shown in Fig. 9. It will be observed by reference to Fig. 9 that the movable damper element 68 then opens the passageway 56 and closes path 100. The flow of air through the air inlet opening 24 and into the cooling element 40 across the front of the open end of chamber 36 induces the flow of air from chamber 36 into the air stream. Air entering compartment 28 through the louvers 20 adjacent the damper 60 then flows into the passageway 56 to replace the air induced from the forward end of the chamber. In other words, the construction and arrangement of the damper element 68 relative to the air streams in the compartments 27 and 28 is such as to produce a resultant force causing a flow of fresh air through passageway 56 into compartment 27. The air flows through the rectangular passageway 56 in a vertical plane and then flows at the bottom of chamber 57 into chamber 36 in a horizontal plane and, due to the triangular forms of the chambers in right angular plane, the air flows from one to the other with a minimum impedance. Thus, for night operation the fans 42 and 51 operate at low speed to reduce noise to a minimum and fresh make-up air from the outside is introduced into the recirculated air into the enclosure. These functions of the air conditioner together with intermittent operation of the refrigeration system by the thermostat 99 in accordance with requirements all cooperate to induce comfortable conditions for sleep.

When dial 74 is moved from "Nite" position to "Fresh Air" position, switch 79 moves from engagement with contact 81*c* into engagement with contact 81*d* to maintain the refrigeration system in operation and switch 80 moves from contact 82*c* to 82*d* to operate the fan motor 53 at high speed. The movable element 68 of damper 60 is moved through the slight angle from that shown in Fig. 9 to that shown in Fig. 10 and fresh make-up air is added to the recirculated air in the room through the passageway 56 between compartments 28 and 29 as explained above with respect to Fig. 9.

When dial 74 is moved clockwise from "Fresh Air" on cooling to "Fresh Air" on ventilating, switch 79 is moved from engagement with contact 81*d* into engagement with open contact 81*e* to stop operation of the refrigeration system and switch 80 is moved from contact 82*d* to 82*e* to continue operation of the fan motor 53 at high speed. The motion of the dial 74 is transmitted by the chain 78 and sprockets 72 and 77 to move the movable element 68 of the damper 60 from the position shown in Fig. 10 to that shown in Fig. 11. It will be noted that in the latter position the vane 70 of the damper 68 extends rearwardly into compartment 28 in a direction substantially parallel with the wall 31 and overlies a portion of the louver 20 in the weather casing 15. Thus, in addition to the induced circulation of fresh make-up air into compartment 27 as explained above, the vane 70 operates to scoop air tending to flow toward the fan 51 and direct it through the passageway 56 and chambers 57 and 36 into the stream of air flowing into the compartment 27 through the air inlet opening 24. The other vane 69 of the damper element 68 engages the arcuate portion 66 of the damper casing to close path 100 and prevent flow of air from the passageway 56 to the fan 51. The unit then operates to recirculate air in the enclosure to be conditioned with the addition of fresh outside air but without refrigeration.

When dial 74 is moved in a clockwise direction from the "Fresh Air" position to the "Exhaust" position on the ventilating side of the dial, switch 79 is moved from contact 81*e* into engagement with open contact 81*f* to prevent operation of the refrigeration system and switch 80 is moved from contact 82*e* into engagement with contact 82*f* to maintain the fan motor 53 in operation at high speed. The motion of the dial 74 is transmitted to the movable element 68 of damper 60 from the position shown in Fig. 11 to that shown in Fig. 12. The vane 70 of the damper 60 then extends to the narrow arcuate strip 67 of the damper casing to shut off communication between the louver 20 in the weather casing 15 and the passageway 56 and the vane 69 extends rearwardly in a direction parallel with the side wall of the weather casing to open the path 100 between the damper element 68 and the wide arcuate wall 66 of the damper casing. Due to the direct line between the passageway 56 and the fan 51, air is caused to flow from the triangular chamber 57 through the passageways 56 and path 100 directly to the fan 51. A portion of the air from the enclosure entering the air inlet opening 24 to compartment 27 then flows into the open end of chamber 36 in a horizontal plane and then upwardly through the triangular chamber 57 in a vertical plane and outwardly through the passageway 56 into the compartment 28. Thus the air conditioning unit operates to exhaust stale air from the enclosure. It will be understood that the dial 74 can be moved in ither direction to any desired position to obtain the inction desired for comfort conditions.

It will now be observed that the present invention provides a single control element for starting, stopping and adjusting the air conditioning unit for producing any operating condition desired. It will further be observed that the present invention provides a single control element for adjusting the conditioner to circulate air in an enclosure with or without cooling, add outside fresh air to or exhaust stale air from the enclosure and operate the conditioner with reduced air circulation and thermostatic control of cooling for night operation to reduce noise and induce conditions favorable for sleep. It will further be observed that the invention provides a passageway or port opening between adjacent compartments of an air conditioner together with an adjustable damper so related to the streams of air circulating in the compartments as to cause outside fresh air to flow into the enclosure or to cause stale air to flow from the enclosure to the outside. It will still further be observed that the present invention provides a novel control for a room air conditioner which is of simple and compact construction, economical to manufacture and assemble, and reliable in operation.

While a single embodiment of the invention is herein illustrated and described, it will be understood that modifications may be made in the construction and arrangement of elements without departing from the spirit or scope of the invention. Therefore, without limitation in this respect, the invention is defined in the following claims.

I claim:

1. An air conditioner having separate compartments, a refrigeration system having a heat absorbing element in one compartment and a heat dissipating element in another compartment, means for circulating room air and outside air through the respective compartments, means for separately controlling operation of the refrigeration system and air circulating means, respectively, a passageway communicating with adjacent compartments, a damper movable relative to the passageway and so constructed as to close the latter or provide separate paths to or from the passageway, and a single control element connected to simultaneously actuate the control means for the refrigeration system, air circulation means and damper to selectively circulate room air with or without cooling or the addition of outside air or exhaust room air.

2. An air conditioner having a housing divided into adjacent compartments, a refrigeration system having a heat absorbing element in one compartment and a heat dissipating element in the adjacent compartment, means for circulating room air and outside air

through the respective compartments, separate controls for the refrigeration system and air circulating means, respectively, a port opening between adjacent compartments, a damper having angularly related radial vanes and mounted to rotate about a fixed axis relative to the port opening to provide separate paths to and from the latter, and a rotatable element at the exterior of the conditioner and connected to actuate the refrigeration and air circulation controls and damper simultaneously in a predetermined sequence.

3. An air conditioner having a housing divided into adjacent compartments, a refrigeration system having a heat absorbing element in one compartment and a heat dissipating element in an adjacent compartment, means for circulating room air and outside air through the respective compartments, a port opening between adjacent compartments, a damper having angularly related vanes and mounted to rotate about a vertical axis relative to the port opening, a switch box having a shaft extending vertically therethrough, an actuating element at the exterior of the housing for rotating the shaft, electric switches in said switch box for controlling the refrigeration system and circulating means and actuated by the shaft, and a chain and sprocket connection between the shaft and damper for simultaneously actuating the control switches and damper.

4. An air conditioner comprising a housing, a base in the housing, a tranverse wall extending upwardly from the base to divide the housing into adjacent compartments, one of the compartments having spaced partition walls parallel to the base to divide it into separate chambers, an air inlet opening in the housing communicating with the lower and intermediate chambers, an air outlet in the upper chamber, a passageway in the transverse wall communicating with the lower chamber, air inlet and outlet openings in the walls of the other compartment, a refrigeration system having a heat absorbing element in the intermediate chamber of one compartment and a heat dissipating element in the other compartment, fans in each of the compartments for circulating room air and outside air through the respective compartments, a rotatable damper for controlling the flow of air through the passageway between compartments, a switch box having electric switches for controlling operation of the refrigeration system and fans, and a single control element at the exterior of the housing and connected to operate the switches in the switch box and movable damper element in a predetermined sequence.

5. In an air conditioner of the type having a compartment with a heat absorbing element therein through which air in an enclosure is circulated and an adjacent compartment with a heat dissipating element therein through which outside air is circulated, the combination with such an air conditioner of a port opening between adjacent compartments, and a single damper having angularly related radial vanes and movable to a plurality of positions relative to the port opening and air circulating means in adjacent compartments to close the port in one position, induce flow of outside air through the port into the enclosure in another position and induce flow of room air through the port from the enclosure to the outside in another position.

6. An air conditioner having a housing divided into adjacent compartments, a refrigeration system having a heat absorbing element in one compartment and a heat dissipating element in another compartment, each of said compartments having an air inlet and outlet, a fan in each compartment for circulating room air and outside air through the respective compartments, a passageway between adjacent compartments, and a movable

damper having angularly related radial vanes and located between the air inlet and fan in one of said compartments, the angular vanes of said damper closing the passageway in one position, opening a path from the air inlet of one compartment to the passageway and baffling the flow of air from the air inlet to the fan in another position and baffling the flow of air from the air inlet to the passageway and opening a second path from the passageway to the fan in another position.

7. A room air conditioner having a housing with a transverse wall dividing the housing into separate compartments, a refrigeration system having a heat absorbing element in one compartment and a heat dissipating element in the other compartment, each of said compartments having air inlet and outlet openings, the air inlet openings to one compartment being located in the side wall of the housing, means for circulating room air through the compartment having the heat absorbing element and outside air through the compartment having the heat dissipating element, a passageway in the transverse wall adjacent the side wall of the housing having air inlet openings, a damper mounted for rotation about a vertical axis adjacent the passageway and side wall of the housing having the air inlet openings, said damper having angularly related radial vanes, and means for rotating the damper relative to the passageway and side wall of the housing.

8. A room air conditioner having a base, a housing enclosing the base, a transverse wall projecting upwardly from the base and dividing the housing into separate compartments, spaced partition walls in one of the compartments parallel to the base to provide superimposed chambers, an air inlet in the bottom of the housing at the front of the base and lowermost partition wall, a passageway in the transverse wall adjacent one side of the housing and communicating with the chamber between the base and the lowermost partition wall parallel thereto, the housing for the other compartment having an air inlet opening adjacent the passageway, a rotatable damper having angularly related radial vanes adjacent the passageway and side wall of the housing having the air inlet opening, and means for rotating the damper relative to the passageway and side wall.

9. An air conditioner comprising a housing, a base in the housing, a transverse wall extending upwardly from the base to divide the housing into adjacent compartments, a refrigeration system having a heat absorbing element in one compartment and a heat dissipating element in the other compartment, means for circulating room air and outside air in the respective compartments, the side wall of the housing having an air inlet opening to one of the compartments, an opening in the transverse wall adjacent the side wall with the air inlet opening and providing a passageway between compartments, a cage-like casing of generally cylindrical form positioned between the side wall of the housing and transverse wall adjacent the opening in the latter, said casing having spaced arcuate walls contacting the side wall of the housing and transverse wall at the edge of the opening therein, a movable damper mounted to rotate in the casing and having angularly related radial vanes for cooperation with the arcuate walls of the casing, and means for rotating the movable damper element in the casing.

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