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HOT AND COLD AIR CONDITIONERS

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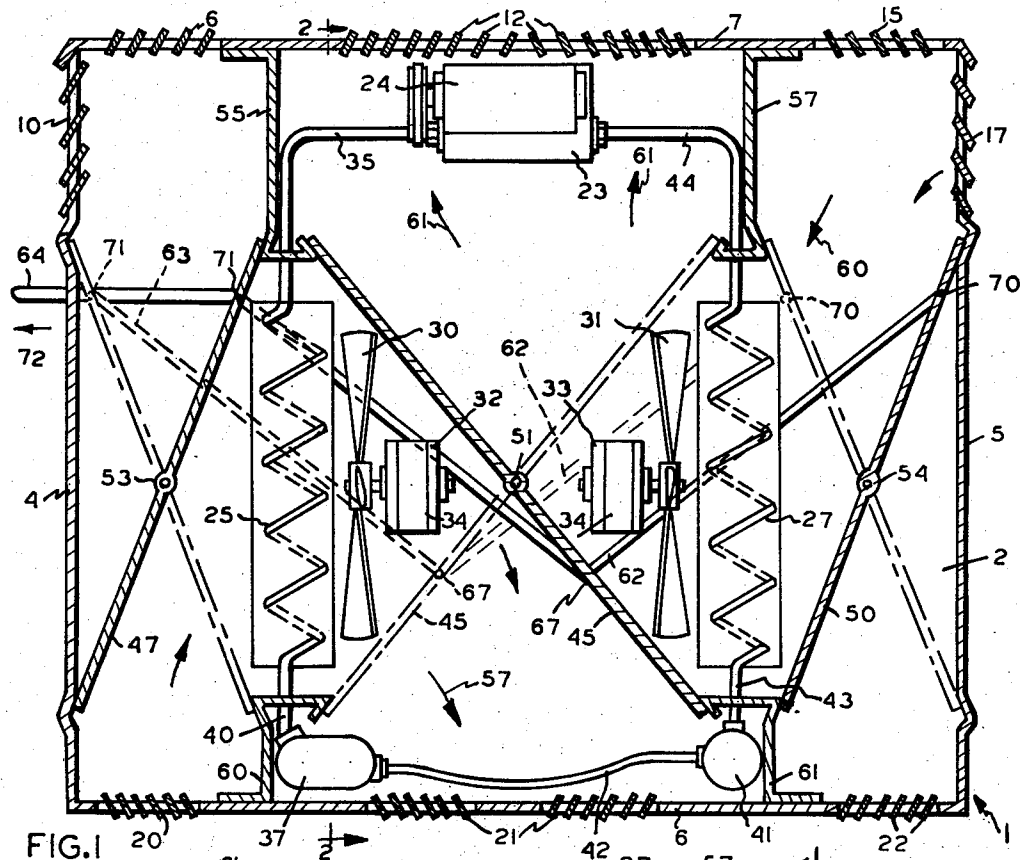


FIG. 1

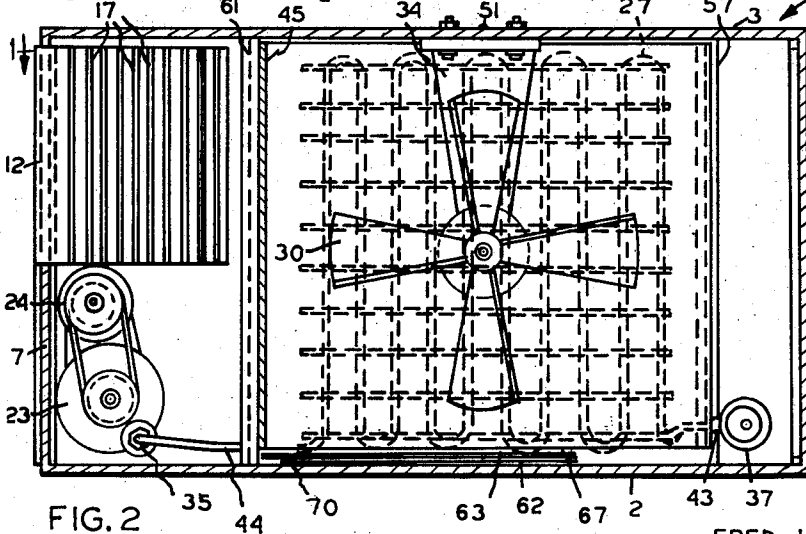


FIG. 2

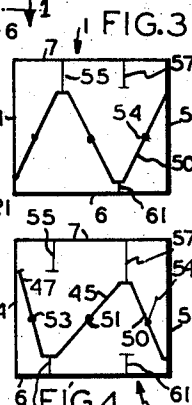


FIG. 3



FIG. 4

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HOT AND COLD AIR CONDITIONERS

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The present invention relates to improvements in air conditioners and hot air heaters and, more specifically, it relates to a new and improved apparatus for cooling or heating the air in a room or in the interior of a building or the like.

One object of the present invention is the provision of a device of the character described which unites to one single unit an air conditioner and an air heater, and which for this dual utilization requires only a few inexpensive parts to be added to a basically standard air conditioner while the same is being assembled at the factory.

Another object of the present invention is the provision of a device of the character described which is only slightly larger than an ordinary air conditioner of equal capacity, and which requires substantially less space than a separate air conditioner plus a separate air heater.

A further object of the present invention is the provision of a device of the character described which does not have more moving parts that are subjected to wear than a customary air conditioner, and whose elements are easily accessible, simple in construction, primarily of standard design and inexpensive to assemble, so that this device is well suited for being manufactured in large quantities by mass production processes.

Still another object of the present invention is the provision of a device of the character described which is easy to operate, and which can be transformed from an air cooling unit to a heating unit easily and quickly, without the use of any tools, without removing it from the location where it is installed, as well as without the use of any amount of skill.

With the foregoing and other objects which will appear as the description proceeds, the invention consists of certain novel details of construction and combinations of parts hereinafter more fully described and pointed out in the claims, it being understood that changes may be made in the construction and arrangements of parts of the embodiment disclosed without departing from the spirit of the invention as claimed.

In the accompanying drawing I have set forth an illustrative embodiment of my invention.

In said drawing:

FIGURE 1 is a top plan view of the interior of a preferred embodiment of my invention, as it appears after a casing containing the same has been cut open along a sectional line 1—1 of FIG. 2;

FIG. 2 is an upright cross-sectional view on the line 2—2 of FIG. 1;

FIG. 3 is a reduced diagram showing parts of the device in a heating position; and,

FIG. 4 is a reduced diagram as FIG. 3, but showing parts of the device in a cooling position.

Similar reference characters refer to similar parts throughout the several views.

In the drawing the numeral 1 denotes a casing, which has a bottom portion 2, a top portion 3 and wall portions 4, 5, 6 and 7. The casing 1 is provided with perforated and/or louvered vent sections 10, 11, 12, 15, 17, 20, 21 and 22. A compressor 23, driven by an electric motor 24, is mounted on the bottom portion 2 within the casing 1. The casing 1 as well as its vent openings may be of any suitable shape, design and arrangement, the one shown in the present instance being adapted for a room air conditioner for installation in a window or an outside wall opening, or the like.

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Mounted within the casing 1 are also a condenser or a hot coil 25, an evaporator or a cold coil 27, and air moving means such as blowers or fans 30 and 31 adjacent the coils 25 and 27 respectively. The fans 30 and 31 may be mounted and operated in any suitable manner. In the instance shown they are driven by means of electric motors 32 and 33 respectively, and they are suspended from the top portion 3 of the casing 1 by means of brackets 34. The fans 30 and 31 also may be driven by mechanical means connected to the motor 24. The condenser coil 25 is connected to the compressor 23 by means of a conduit 35, and to a receiver member 37 by means of a conduit 40. The member 40 is connected to an expansion valve 41 by means of a conduit 42. The evaporator coil 27 is connected to the expansion valve 41 by means of a conduit 43, and to the compressor 23 by means of a conduit 44. The fans 30 and 31 are designed and arranged for drawing air through the coils 25 and 27 respectively toward said fans. The above-described arrangement of the elements 1 to 44 is substantially the same as in every air conditioner, and the usual controls and other component parts added thereto, but not shown, also are identical with those of ordinary air conditioners. However, an important feature of my invention is the provision of three dampers or air diverter blades 45, 47 and 50, which are tiltably mounted on axes 51, 53 and 54 respectively that are vertically extended through the casing 1. The blades 45, 47 and 50 are spaced from one another, as may be seen in FIGS. 1, 3 and 4. Moreover, partition wall portions 55, 57, 60 and 61, which have main portions secured to the walls of the casing 1 and end portions that are right angularly disposed to the main portions, are mounted within the casing 1 and are arranged, dimensioned and located in such a manner that they form compartments with the blades 45, 47 and 50 whenever said blades are in one of their end positions. When the device is in operation, and the blades 45, 47 and 50 are in the positions shown in FIG. 1 in full lines, and indicated in the diagram of FIG. 3, the air drawn into the condenser 25 through the vent section 20, in the direction of the arrow 55, is heated in the condenser 25, and is forced by the fan 30 to move in the direction of the arrows 57 and to pass through the vent sections 21 into a room. Thus the air circulates from the room through the elements 20, 25 and 21 back into said room, thereby heating the same. Simultaneously, air drawn by the fan 27 through the vent sections 15 and 17 and the evaporator or cold coil 27 in the direction of arrows 60, is forced in the direction of arrows 61 through the vent sections 12 out of the casing 1 without reaching the interior of a room, in an outside wall of which the device is installed.

In order to convert the device from a heater into an air conditioner and air cooler, it is only necessary to swing the blade 45 in a clockwise direction, and the blades 47 and 50 in counter-clockwise directions to the positions indicated in FIG. 1 by dash-and-dotted lines and in FIG. 4 by full lines. In this case, outside air is forced by the fan 30 through the vent sections 10 and 11, the condenser 25, and through the vent sections 12 out of the casing 1, without reaching the interior of the aforementioned room; whereas room air is forced by the fan 31 through the vent sections 21, the evaporator or cold coil 27, and through the vent sections 22 back into the room, cooling the same.

The swinging of the blades 45, 47 and 50 can be carried out by any suitable means, preferably from outside of the casing 1. According to the present instance as shown in FIG. 1 and 2, said means consist of link members 62 and 63 as well as a handle member 64. The link member 62 has its ends pivoted to the blades 45 and 50 at 67 and 70 respectively, and the link member 63

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has its ends pivoted to the blades 45 and 47 at 67 and 71 respectively. The lever 64 also is pivoted to the blade 47 at 71, and is extended to the outer side beyond the casing 1 through the wall portion 4. Thus, by pulling the lever 64 in the direction of an arrow 72 (FIG. 1), the device can be converted from a heater to a cooler or air conditioner; while by simply pushing the lever 64 in a direction opposite to the direction of the arrow 72, the device can be converted from an air cooler or air conditioner to a heater. Moreover, if means are provided for moving only the blades 47 and 50 in a position parallel to the walls 4 and 5, outside air directly can be forced into the room, or room air to the outside, through the fans 30 and 31, without operating the compressor 23.

Since certain changes may be made in the above article and different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which as a matter of language might be said to fall therebetween.

Having thus fully described my said invention, what I claim as new and desire to secure by Letters Patent is:

1. A device of the character described comprising a casing having a bottom, a top, and perforated wall portions of which one is adapted to be extended into a room and another wall portion is to be extended outside of a room, a condenser mounted in said casing, an evaporator mounted in said casing, a compressor mounted in said casing being connected to said condenser and said evaporator, fans for blowing air through said condenser and through said evaporator being mounted within said casing adjacent said condenser and said evaporator, a first damper blade movably mounted between said condenser and said evaporator, a second damper blade movably mounted between said condenser and a first one of said wall portions of said casing, a third damper blade movably mounted between said evaporator and a second one of said wall portions of said casing, means for moving said damper blades in unison from one end position to another end position, and two pairs of opposite intermediate wall sections extending into said casing from wall portions thereof to those portions of the interior of said casing in which are located opposite edge portions of said damper blades when the damper blades are in one of their extreme end positions, said damper blades in cooperation with said intermediate wall sections being adapted for alternately forcing room air blown through said condenser

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back into the room, and outside air blown through said evaporator back to the outside; or for forcing outside air blown through said condenser back to the outside, and for forcing room air through said evaporator and back into the room.

2. A hot and cold air conditioner comprising a casing having a bottom, a top, and perforated opposite wall portions of which one is adapted to be extended into a room and another wall portion is to be extended outside of a room, a condenser mounted in said casing, an evaporator mounted in said casing in spaced relation to said condenser, a compressor connected to said condenser and to said evaporator, a first fan adjacent said condenser adapted for drawing air through the condenser, a second fan adjacent said evaporator adapted for drawing air through said evaporator, a first damper blade having a center portion pivoted to opposite sections of the top and bottom portions of said casing intermediate said first and said second fan, a second damper blade having a center portion pivoted to opposite sections of the top and bottom portions of said casing intermediate said condenser and a first one of the wall portions of said casing, a third damper blade having a center portion pivoted to opposite sections of the top and bottom portions of said casing intermediate said evaporator and a second one of the wall portions of said casing, a handle pivoted to one of said damper blades and extended beyond one of the wall portions of said casing, link members pivotally connecting said damper blades to one another so as to move them in unison, and intermediate wall sections having main portions extending into said casing from wall portions thereof and also having end portions right angularly disposed to the main portions and reaching to those portions of the interior of said casing in which are located opposite edge portions of said damper blades when the damper blades are in one of their extreme end positions, said damper blades in cooperation with the end portions of said intermediate wall sections being adapted for alternately forcing room air blown through said condenser back into the room, and outside air blown through said evaporator back to the outside; or for forcing outside air blown through said condenser back to the outside, and for forcing room air through said evaporator and back into the room.

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