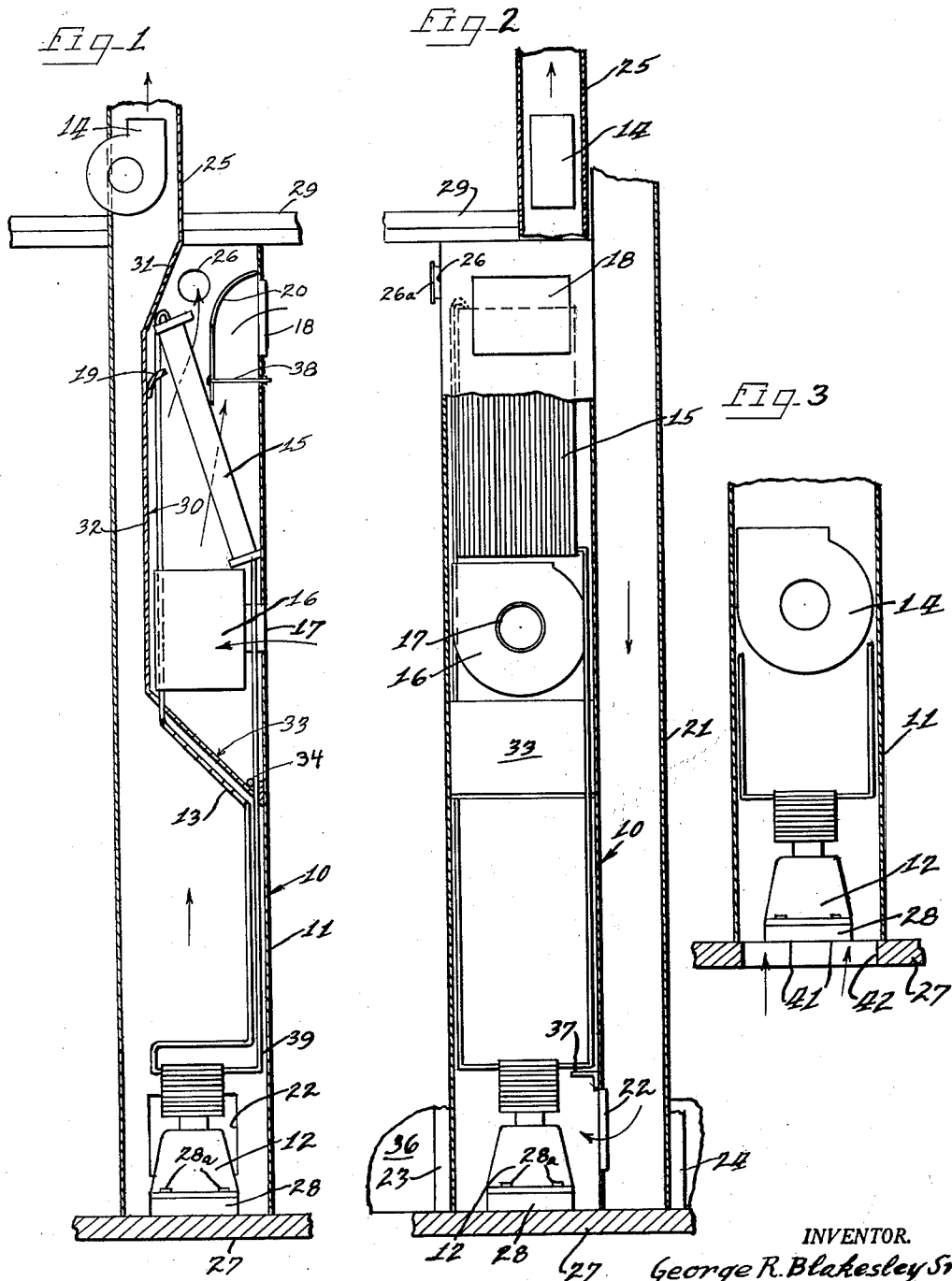


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AIR CONDITIONER APPARATUS

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1

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AIR CONDITIONER APPARATUS
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This invention relates to an air conditioning system, and more particularly to a vertical air conditioning unit positionable in the wall of a home or the like.

Air conditioners currently on the market are generally designed on a horizontal basis or plane, and the compressor, condenser coil, evaporator coil, blowers and other components thereof are set side-by-side so that a relatively large amount of floor space is taken up, which is highly undesirable in view of the premium on such space. Likewise, central air conditioning systems require a closet space, which is objectionable to many housewives. Again, window air conditioners are unsightly since they protrude from the windows and mar the appearance of the external architecture and block the view and the light from the window, and they can only condition one room properly.

The present invention overcomes the foregoing objectionable features and characteristics of presently available air conditioning systems and provides a conditioner which is designed on a vertical plane, with the components thereof being disposed in a shell, casing or housing adapted to fit in between the usual stud spacing in a partition wall and extending into an adjacent room space from the wall only a few inches on the front side and a few inches on the back side, although the conditioner unit may also be disposed with its back side in the partitioned portion of the wall. Thus the device takes up practically no floor space and in this respect may be compared to the wall furnaces in general use in the smaller homes.

The air conditioner of the invention thus includes a shell made of flat metal shaped to contain the component parts, with the compressor positioned at the bottom thereof and a flue at the top thereof preferably extending into an attic and to a suitable outlet therefrom. In a preferred form of the invention also, a condensing blower is disposed in the attic to cool a condenser coil in the flue, although the blower may also be disposed above the compressor in the shell. A baffle construction is provided to form a confined space in the shell for the evaporator coil and evaporator blowers, with suitable inlet and outlet openings in the shell for the purpose. The baffle unit includes a bottom portion which forms a condensate pan for the evaporator coil in accordance with the invention, and which is disposed above the compressor, and above the condensing blower in the form wherein this blower is disposed in the shell. In the embodiment herein the blower is disposed in the attic, so that a suitably large capacity for the blower is provided to properly cool the condenser coil portions, the condenser coil is brought down from between the baffle plate and rear wall of the shell to pass underneath the evaporator condensate pan to the compressor along the lower front wall of the unit. Thereby, the flue space in the shell is left empty to afford a better flow of air with less resistance.

Accordingly, it is an object of the present invention to provide an air conditioner which is positionable substantially in the wall of a home or the like, and which occupies a minimum of floor space.

Another object of the invention is to provide an air conditioner as described which does not require exposure on the outside of a window or the like.

Another object of the invention is to provide an air conditioner as described which does not require water

2

cooling but instead is air-cooled in an efficient and convenient manner.

Another object of the invention is to provide an air conditioner having the components thereof disposed in vertically superposed relation and with a baffle and condensate pan of unitary construction.

Another object of the invention is to provide a conditioner as described which may be used for cooling more than one room as desired.

Other objects and advantages of the invention will become apparent as the description proceeds in accordance with the drawings in which:

FIGURE 1 is a vertical sectional view, in diagrammatic form, and taken from the side, of an air conditioner according to the present invention;

FIGURE 2 is a front elevational view, partly broken away and in vertical section, of the air conditioner unit shown in FIGURE 1; and

FIGURE 3 is a vertical sectional view, partly broken away, and in front elevation, of a further embodiment of the invention.

Referring now to the drawings, and to FIGURES 1 and 2 in particular, an air conditioner 10 is shown according to the present invention which includes a shell casing or housing 11, a compressor 12, a condenser coil 13 with a condenser blower 14 therefor, an evaporator coil 15 with a supply blower 16 therefor, in communication with a return air inlet 17, for directing air to a supply register 18 as controlled by a turning vane 19, and an adjustable damper 20, and a compressor condenser cooling air supply duct 21 leading to an air supply inlet 22.

In accordance with the invention, the shell or casing 11 is made preferably of flat metal shaped to contain the component parts, although it may be made of any suitable material, particularly material affording an effective sound proofing. The shell is also preferably of a height such as to be disposed beneath the ceiling of the average home and has a width and depth such that it is positionable within the partition of an ordinary wall for a home or the like. Accordingly, it will extend into an adjacent room only a few inches, and, if desired, may extend slightly into a rear area such as a closet. In FIGURE 2, studs 23 and 24 are shown an opposite sides of the unit 10 including the duct 21, although it will be understood that the shell 11 may be immediately adjacent such studs and the duct 21 positioned on the opposite side, for example, of the stud 24 in the particular embodiment herein disclosed.

The casing 11 may also be integrally formed with a vent or flue 25 which may extend to the roof of a home in which the unit is installed, it being understood that the vent may, in alternate embodiments of the invention, dispense air circulated past the condenser coil into the attic. Other variations in this particular relationship are encompassed within the scope of the invention. It will be seen that a supply duct 26 communicates with the air cooled by the evaporator 15, and other supply ducts may be utilized with the system also, so that a plurality of rooms can be cooled by the unit of the invention, duct 26.

The shell 11 is preferably supported on the flooring 27, which in the embodiment shown is continuous beneath the shell. The compressor 12 is also mounted on the flooring 27 and is disposed upon a vibrator pad 28 as secured thereto by bolts or the like 28a. The compressor 12 may be of any suitable type, as understood by those skilled in the art.

In the embodiment shown, the blower 14 is located in an upper room such as an attic, above the capping and ceiling structure 29. The particular disposition of the blower 14 thus described affords space for a relatively

large blower having a capacity for effective condensing action.

In accordance with the invention, a baffle wall 30 is provided in the shell 11 which may be continuous with the vent 25 and is thus angled rearwardly at 31 and downwardly at 32. The evaporator coil 15 requires a condensate pan, as understood by those skilled in the art, and the baffle 30 permits this to be formed in an effective manner such that an enclosure for the evaporator coil is provided with the condensate pan being a part thereof. Thus the condensate pan is formed integrally with the downwardly extending wall portion 32 and is designated by general reference numeral 33, the pan 33 sloping downwardly and preferably leading to an outlet 34 which may be in communication with a sump pump (not shown) in the condensate drain pan or otherwise, whenever the location does not permit a natural drain into a sewer drain in the house. Where the conditioner 10 of the invention is utilized in a newly constructed house, of course, this natural drain can be incorporated in the plans.

The embodiment of FIGURES 1 and 2 is suitable for installation where a slab floor construction 27 is provided and where the unit must be installed in an existing home, and for such an installation, the air supply duct 21 is installed along the side of the unit and extended no further from the wall than the unit itself. Preferably, this duct 21 extends from the attic space in the home above the ceiling 29, for example, and enters the lower shell through the opening 22; it being appreciated that several such openings may be provided some of which may communicate with a room space adjacent the unit 10. The provision of the duct 21 is advantageous in that by drawing a supply of air from the attic, the attic will be kept much cooler than would otherwise be possible, and there will be less infiltration of heat from the attic through the ceiling 29 to the interior of the home, it being noted that heat is often transmitted from the attic to the home interior because insulation may be insufficiently thick to prevent such heat transfer. A baffle 37 may be provided above the inlet 22 to assist in directing the air across the compressor and upwardly through the open casing 11.

It will be appreciated that the blower 14 is disposed to direct air upwardly through the casing 11 and the vent or flue 25 from the opening or openings 22, and in accordance with the present embodiment, and as a result of the location of the blower 14, the condenser coil is aligned to permit a free flow of air from the lower portion of the casing 11, so that the rising air is substantially unimpeded. Thus the coil 13 slants from the lower front of the unit, underneath the evaporator condensate pan, upwards to the back of the unit. This construction leaves the flue space substantially empty.

The condensed fluid is led from the coil 13 to the evaporator coil structure 15, and it will be seen that the coil 15 is preferably angularly disposed in overlying relation to the blower 16, which blows the air upwardly from the return air inlet 17 across the coil 15. Although a vertical alignment of the coiled portions of the coil 15 is shown, FIG. 2, it will be appreciated that other constructions, such as a horizontal alignment thereof, are encompassed within the scope of the invention. Dual blowers may be utilized rather than the single blower 16, and optimum heat exchange between the air from the blower 16 and the evaporator coil 15 may be provided by the turning vane 19 which directs the flow of air around the end of the coil 15. The damper 20 is preferably adjustable by means of a damper adjusting screw 38 to control the volume of air to the front supply register 18, the damper 20 being screwed inward or outward as the need may be. It will be appreciated that the air thus circulated through the return air inlet 17 and the supply register 18 may be filtered as by means of a filter set in the return air inlet 17. From the evapo-

rator coil 15, the fluid is returned in its expanded state through a conduit portion 39 to the compressor 12, to be recycled as understood by those skilled in the art.

Where a plurality of rooms are to be cooled by the unit 10, an additional blower or a plurality of blowers may be provided to direct the cooled air from the compartment formed by the baffle 30 around the evaporator coil 15, into the rooms through suitable vents, as previously indicated. For example, a blower may be disposed above the evaporator which may supply air to a smaller area which is separated from the room cooled by the supply register 18, and in such a way as to prohibit conduction from the larger area. In this connection also, it will be appreciated that the blower 16 could, if desired, be disposed above the evaporator coil by a suitable arrangement of the coil in a lower portion of the compartment formed by the baffle 30, and for the purpose of selectively directing the current through one or another of a plurality of vents, the blower may be rotatable.

Referring now to FIGURE 3, another embodiment of the invention is shown, wherein the entire bottom of the shell 11 is open, with a frame work 41 supporting the compressor, so that where there is an air supply from under the floor, such as a basement or a crawl space, the air may be immediately directed upwardly and will generally be relatively cool initially. In newly constructed homes, the plans may include an open tile to be installed under the floor which is laid on the ground, the tile running from the air conditioner location to an adjacent outside area. Thus it will be seen that the frame 41 is secured to the flooring 27 in an opening 42 in the flooring so that a direct upward movement of the air is provided. In this construction also, an alternate mounting for the blower 14 is provided such that the blower is in the lower portion of the casing and directly moves the air upwardly through the casing, with the coil 13 being formed to operate in a vertical position with the air thus forced from bottom to top. In this installation, a pressure fan may also be provided which can force the heated air to rise rapidly through a vent as described hereinbefore. A rotatable blower or a plurality of such blowers may also be provided to direct air through one or more supply outlets as desired, in accordance with the requirements of the particular installation.

It will thus be seen that I have provided an air conditioner which is exceptionally well suited for the needs of modern homes, since the decoration in the home is preserved and cooling capacity is in excess of that afforded by a window air conditioner. Likewise, the difficulties inherent in water cooling are avoided thereby. The unit is extremely compact so that it may be set vertically substantially in the wall structure of a room, or may extend slightly into a closet adjacent such a room, and one or more rooms may be cooled as desired by suitable arrangement of the venting and blower apparatus for the conditioner. The conditioner has the further advantage that it eliminates the relatively undesirable situations encountered with window air conditioners wherein the furniture is disposed next to the conditioner with a consequent health hazard, and it will be appreciated also that with window air conditioners only one room can be cooled so that the adjacent room may be much too hot in comparison. The present invention eliminates this difficulty by affording a cooling of more than one room if desired. Again, the saving in floor space afforded by the present invention represents a major advantage with respect to other conditioners currently on the market, which are generally designed on a horizontal plane, and even where the conditioner of the invention is disposed adjacent the closet, so as to extend slightly thereinto, the closet space is still available as a result of the unusually thin construction of the shell and the vertical stacking of the components.

Accordingly, the vertical in-the-wall-conditioner of the

5

invention may be used with great advantage in the smaller homes which are being built today in great numbers, and may also be used in a wide variety of installations in addition to those described.

Although I have herein set forth my invention with respect to certain specific principles and details thereof, it will be understood by those skilled in the art that these may be varied without departing from the spirit and scope of the invention as set forth in the hereunto appended claims.

I claim as my invention:

1. In association with a wall structure and floor structure, the improvement of an air conditioner unit including a casing mounted substantially in the wall structure and extending vertically therealong, and having a bottom end supported on said floor structure, a compressor means mounted on said floor structure, a condenser coil, an evaporator coil, conduit means circulating fluid through said condenser coil, said evaporator coil and said compressor means, and said compressor means, said condenser coil and evaporator coil being disposed in superposed relationship in said casing, said floor structure being open within the bottom portion of the casing, a frame supporting said compressor means within the open portion of said floor structure, an upper outlet in said casing, blower means for moving air from said inlet to said upper outlet past said condenser means, an inlet in said casing adjacent said evaporator coil, an outlet in said casing adjacent said evaporator coil, a blower for moving air from said inlet adjacent said evaporator coil and past said evaporator coil through said outlet adjacent said evaporator coil, and baffle means separating said evaporator coil from said condenser coil.

2. An air conditioner unit comprising an elongated casing adapted to be positioned substantially in the wall and supported at its bottom end on the floor of a home or the like, a baffle structure in said casing forming a flue therewith, said flue extending to an upper end of the casing to provide an upper vent for the casing, an evaporator coil in said casing enclosed by said baffle structure, a condenser coil in said casing separated from said evaporator coil by said baffle structure, a compressor in said casing, conduit means circulating fluid through said condenser coil, evaporator coil and compressor, said condenser coil and evaporator coil being disposed in superposed relationship in said casing, said floor being open within the bottom portion of the casing, a frame supporting said compressor means within the open portion of said floor, inlet means in said casing for said condenser coil, a blower for moving air from said inlet means for said condenser upwardly through said flue, an inlet in said casing for said evaporator coil disposed below said evaporator coil, an outlet for said evaporator coil disposed above said inlet for said evaporator coil, a blower for moving air from said inlet for said evaporator coil to said outlet therefor to supply air externally of the casing, a damper extending in back of said outlet for said evaporator coil, said damper having an adjusting screw to control flow to said outlet for said evaporator coil, and a turning vane directing air from said blower for said evaporator coil across an upper end of said evaporator coil.

6

3. An air conditioner unit comprising a casing adapted to be mounted vertically substantially in the wall of a home or the like, a baffle structure in said casing including a downwardly extending portion forming a flue with the casing and a bottom portion, said baffle structure defining a space substantially closed from the adjacent space in the casing, a condenser coil positioned at an angle beneath said bottom portion of said baffle structure in said flue, an evaporator coil positioned in said closed space in said baffle structure, a compressor in the bottom of said casing, conduit means circulating fluid from the compressor to the condenser coil, to the evaporator coil and thence to the compressor, an inlet in said casing adjacent the compressor, said casing having an upper outlet communicating with the flue, a blower in the lower portion of the casing for directing air from said inlet adjacent the compressor past said condenser coil to the upper outlet, an inlet in said casing for said evaporator coil, and outlet in said casing for said evaporator coil, and a blower in said baffle structure for moving air from said inlet for said evaporator coil past said evaporator coil to said outlet for said evaporator coil.

4. An air conditioner unit comprising a casing adapted to be mounted vertically substantially in the wall of a home or the like, a baffle structure in said casing including a downwardly extending portion forming a flue with the casing and a bottom portion, said baffle structure defining a space substantially closed from the adjacent space in the casing, a condenser coil positioned at an angle beneath said bottom portion of said baffle structure, an evaporator coil positioned in said closed space in said baffle structure, a compressor in the bottom of said casing, conduit means circulating fluid from the compressor to the condenser coil, to the evaporator coil and thence to the compressor, an inlet in said casing adjacent the compressor, said casing having an upper outlet communicating with the flue, a blower in the upper portion of the casing for directing air from said inlet adjacent the compressor past said condenser coil to the upper outlet, an inlet in said casing for said evaporator coil, an outlet in said casing for said evaporator coil, and a blower in said baffle structure for moving air from said inlet for said evaporator coil past said evaporator coil to said outlet for said evaporator coil.

References Cited in the file of this patent

UNITED STATES PATENTS

1,975,859	Nelson	Oct. 9, 1934
2,028,046	Calatroni	Jan. 14, 1936
2,116,873	Williams	May 10, 1938
2,175,946	Smith	Oct. 10, 1939
2,262,477	Taughner	Nov. 11, 1941
2,304,359	Hommel	Dec. 8, 1942
2,725,726	Swanson	Dec. 6, 1955
2,743,908	Tanner	May 1, 1956
2,981,083	Miller	Apr. 25, 1961

FOREIGN PATENTS

689,188	France	May 26, 1930
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