July 19, 1960 D. E. MacLEOD ET AL 2,945,358

AIR CONDITIONING UNIT AND MOUNTING MEANS THEREFOR

Filed Sept. 22, 1958 2 Sheets-Sheet 1

FIG. 1

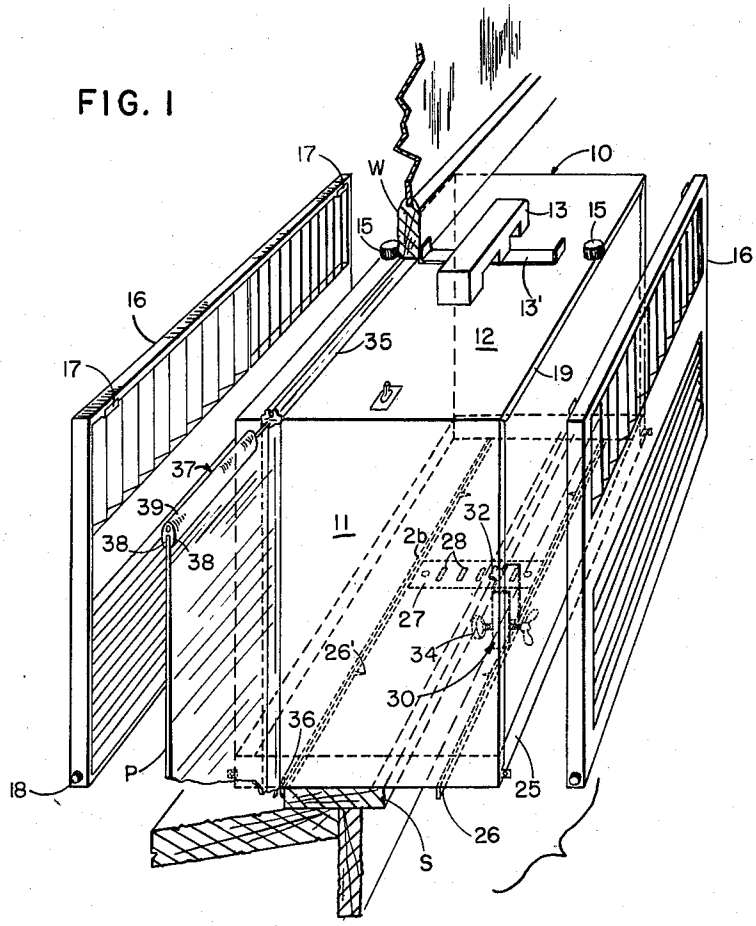


FIG. 6

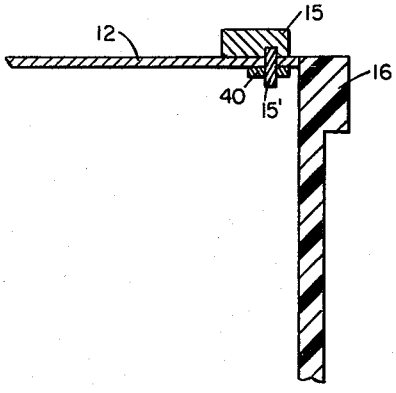
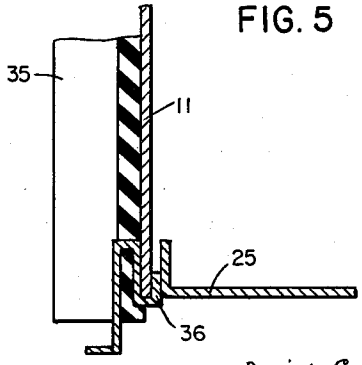


FIG. 5



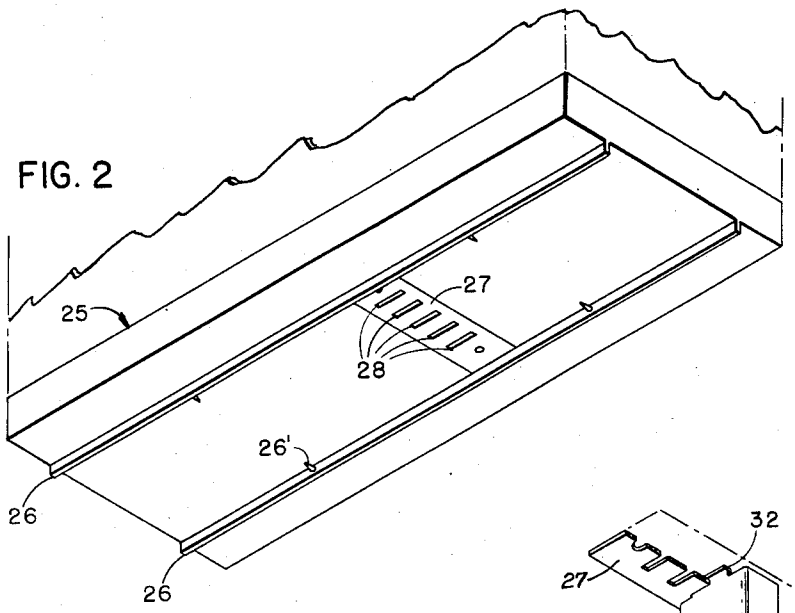
INVENTOR.
David Earle MacLeod
BY & Howard James Tyler
Herman Seid
Atty.

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FIG. 2



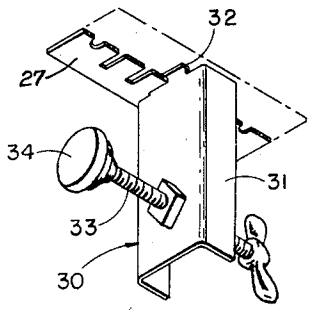


FIG. 3

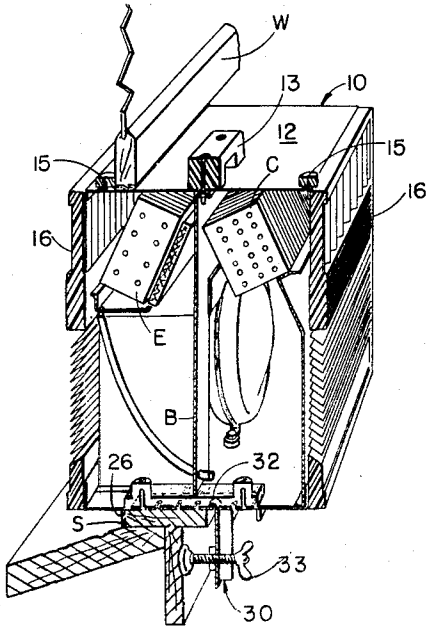


FIG. 4

INVENTOR.
David Earle MacLeod
BY & Howard James Tyler
Herman Seid
Atty.

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AIR CONDITIONING UNIT AND MOUNTING MEANS THEREFOR

David Earle MacLeod, Syracuse, and Howard James Tyler, Salina, N.Y., assignors to Carrier Corporation, Syracuse, N.Y., a corporation of Delaware

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10 Claims. (Cl. 62—262)

This invention relates to air conditioning, more particularly, to means implementing the portability and installation of an air conditioning unit whereby said unit may readily be employed in a variety of places, and may be utilized for either cooling, heating or dehumidifying the air in any conditioned area.

Air conditioning units have been evolved in which the components of a refrigeration system are arranged within a casing, said casing being designed for mounting in a window, or other wall aperture. The conventional air conditioning unit employs a compression refrigeration system comprising a compressor, heat dissipating condenser, expansion means, and heat absorbing evaporator with all of said components arranged in a closed fluid circuit through which refrigerant is passed. Where the unit is employed for cooling purposes, the evaporator coil is placed in heat exchange relationship with the air in the conditioned area, and the condenser is placed in heat exchange relationship with the ambient atmosphere. This is generally accomplished by encasing the aforementioned components in a rectangular casing with the condenser on one side and the evaporator on the other, with a partition panel therebetween. The casing is then mounted in a window, or the like wall opening with the evaporator facing the conditioned area, and the condenser the exterior of the building structure. These units are generally permanently installed in any given area with the result that it is necessary to provide separate units for each area to be conditioned. The permanent installation is necessitated by the relatively heavy, cumbersome nature of the unit, and by the fact that installation requires the services of skilled mechanics in order to insure a secure mounting for the unit and to provide a relatively air tight seal about the unit. This permanent installation results in a lack of flexibility of use of the unit which diminishes its utility by requiring its use in only one area. If it were readily possible to reverse the unit so as to expose the heat dissipating condenser to the conditioned area, and the heat absorbing evaporator to the outside air, then the unit could be employed for heating during the heating season. Additionally, were it readily possible to move the conventional air conditioning unit, these units could be employed primarily for dehumidification purposes by bringing the entire unit into the conditioned area.

It is with the above desiderata in mind that the present means have been evolved, means implementing and facilitating the ready portability of an air conditioning unit whereby the unit may be moved to any location desired, and may be positioned in a window, or the like wall aperture with either the heat dissipating condenser, or the heat absorbing evaporator in heat exchange relationship with the conditioned area, said unit being securely mounted and tightly sealed in position in any selected location without requiring the services of skilled mechanics and readily removed therefrom when desired to be placed in some other location.

It is accordingly a primary object of this invention to provide an improved air conditioning unit.

A still further object of this invention is to provide novel mounting means for an air conditioning unit which will permit said unit to be readily placed in cooling, heating or dehumidifying positions without requiring the services of a skilled mechanic.

Another object of the invention is to provide a novel air conditioning unit which may be employed alternatively for heating, cooling, or dehumidifying with the same esthetic effects regardless of functioning.

These and other objects of the invention which will become apparent from the following description and claims are achieved by provision of a novel air conditioning unit enclosure means or casing and appurtenant hardware, whereby said unit may readily be moved from place to place, and may readily be installed in operative position to either cool, heat, or dehumidify air in an area to be conditioned. The novel casing substantially reduces the weight of the unit and is provided with a novel handle structure which enhances the decorative appearance of the unit as well as its portability. The casing is provided with window engaging means including alternatively employable window sash engaging means and novel reversible clamping means which function to secure the unit in operative position in a window, to either heat or cool the conditioned area. Additionally, a novel sealing gasket structure is provided for sealing the unit in the window to prevent the flow of air between the exterior of the building structure and the conditioned area.

A primary feature of the invention resides in the provision of a lightweight casing having a novel reversible window saddle clamp which permits the unit to be readily moved, and positioned with either its heating condenser or cooling evaporator in heat exchange relationship with the conditioned area so that the unit may function to either heat or cool, as desired.

Another feature of the invention resides in the provision of novel sealing means which permits any user, without particular skills, to effectively seal a unit in operative position.

The specific details of the invention, and their mode of functioning will be made most manifest and particularly pointed out in conjunction with the accompanying drawings, wherein:

Figure 1 represents a perspective view of an air conditioning unit mounted in operative position in a window, with parts exploded and broken away showing the details of the invention;

Figure 2 is a perspective view looking upwardly at the bottom pan of the unit Figure 1 showing the details of the saddle plate;

Figure 3 is a perspective detail view of the reversible clamp and saddle plate; and

Figure 4 is a cross sectional elevational view through the unit showing the details of the novel clamp in position on the saddle plate, the refrigeration system components being shown pictorially.

Figure 5 is a cross-sectional detail view on an enlarged scale of the means securing the gasket to the side walls of the casing.

Figure 6 is a cross-sectional elevation view on an enlarged scale showing the detail of the novel eccentrically mounted knob.

Referring now more particularly to the drawings, like numerals in the various figures will be taken to designate like parts. As best seen in Figure 1 the novel unit enclosure or casing 10 is shown positioned in a window having stool S and window sash W.

Within casing 10 a refrigeration system is provided,

The refrigeration system includes a heat dissipating condenser C, and a heat absorbing evaporator E separated by a partition panel or barrier B as seen schematically in Figure 4. The barrier B forms a condenser chamber and evaporator chamber on opposite sides of the casing.

Enclosure or casing **10** includes a rectangular housing having side walls **11**, and upper surface **12**. Arranged on upper surface **12** at its center point are carrying means in the form of handle **13**. If desired, a bracket **13'** may be employed to prevent rearward tilt of the unit in use, as hereinafter explained. Alternatively employable window sash engaging means in the form of knurled knobs **15** are eccentrically pivoted on pivot stems **15'**, at least one, on each edge of the top surface **12**. The knobs are connected to the top surface **12** by friction washers **40** as best seen in Figure 6. Identical facade grills **16** are provided for securing to the faces of the unit by means of engaging lips **17** and set screws **18**. Engaging lips **17** engage flange **19** which extends along the edges of top surface **12**. The bottom wall of the enclosure comprises a pan element **25** preferably formed of a lightweight material such as plastic or the like, as best seen in Figure 2. Guide rails **26** carrying pins **26'** are formed along the lower surface of pan **25**, and a saddle plate **27** having spaced slotted apertures **28** formed therein is secured to the lower surface of pan **25**. Pins **26'** will dig in the stool in use without any visible marring of the wood. It is preferred to form the saddle plate **27** of a rigid material such as steel, or the like, imbedding same in the pan.

Window stool engaging means are formed by providing clamp **30** for removable and reversible positioning with respect to saddle plate **27**, for a purpose to be made hereinafter more apparent. Stool clamp **30** comprises channel **31** having engaging dog **32** formed at one end thereof, and is provided with a thumb screw **33** having a padded button **34** at one end thereof, as best seen in Figures 3 and 4.

Alternatively functioning movable weather stripping gasket **35** having a cross-section in the form of a concave bottomed U-shaped member, as best seen in Figure 1 is arranged along the sides, and across the top surface of the enclosure. Each end of the gasket **35** is provided with an engaging lip or hook-like member **36** which grasps the lower edge of the respective sides to maintain the gasket in position. The gasket may be alternatively mounted on either side of handle **13** to seal the unit with respect to a window sash with either the condenser C or evaporator E exposed to the conditioned area.

Panel gasketing **37**, as best seen in Figure 1 is formed with panel engaging lips **38** and hollow cushioned body portion **39** to seal in position any side panels employed.

It will be observed that when the aforedisclosed air conditioning unit enclosure is employed, the unit may readily be moved from one position and installed in another, and may be reversed to present either or both the heat dissipating condenser, and the heat absorbing evaporator to the conditioned area, whereby the unit may function to cool, heat, or dehumidify.

The unit is positioned in conjunction with a window by mounting window clamp **30** in saddle plate **27** by means of dog **32** engaged in slot **28**. The particular slot in which the dog is engaged is selected dependent on the width of the window stool so that the stool S as viewed in Figures 1 and 4 will extend between channel **31** of clamp **30** and guide rail **26**. Thereafter once the unit is positioned in the window, tightening of thumb screw **33** will cause button **34** to engage against the lower wall of the window frame beneath the stool S and will cause pins **26'** to penetrate the stool without visible marring of the wood thus preventing forward rocking of the unit.

Weather stripping gasket **35** having a cross-section as best seen in Figure 1 is positioned to extend about the sides and top of the enclosure. Window sash W is brought down contiguously to the weather stripping, and if knob **15** is not properly adjusted with respect to sash W, the window may be raised and knurled knob **15** adjacent window sash W is turned on its pivot so that it will engage the rear edge of window sash W. The window sash is then lowered into contact with the weather stripping. The eccentricity of knob **15** is provided to take care of different sash thicknesses. The result is that any tendency for the unit to tilt forward is resisted by knob **15** and pins **26'**. Bracket **13'** prevents rearward tilt of the unit.

Where, as is usually the case, there is a space between the sides of the unit and the window frame, panel members P are positioned within the slot of gaskets **35** to extend into the window sash channels in the window frame. Panel gasketing **37** is positioned on top of panels P to provide a seal between the panel and the window sash W.

Where it is desired to change from heating to cooling operation, or vice versa, then it is merely necessary to turn the unit to expose the opposite facade to the conditioned area. This is accomplished by loosening screw **33**, lifting the unit from the window, disengaging dog **32** of clamp **30**, reversing the clamp in saddle plate **27**, and moving the weather stripping gasket **35** to the opposite side of handle **13** so that said gasket lies beneath the window sash. Thereafter the aforedescribed installation procedure involving the rotation of eccentrically pivoted knurled knobs **15**, and the tightening of thumb screw **33** is followed, and panels P and their associated gasketing **37** and **35** are positioned as required.

The unit may readily be employed as a dehumidifier by removing clamp **30** from saddle plate **27**, and bringing the entire unit into the conditioned area, thereby exposing the condenser and evaporator to the conditioned air.

It is thus seen that novel means have been provided implementing the portability and installation of an air conditioning unit. The novel means permit installation without requiring the services of skilled mechanics and permit use of the single unit in any one of a variety of areas either for heating, cooling or dehumidifying.

The above disclosure has been given by way of illustration and elucidation and not by way of limitation and it is desired to protect all embodiments of the herein disclosed inventive concept within the scope of the appended claims.

We claim:

1. In an air conditioning unit having a heat dissipating condenser on one side and a heat absorbing evaporator on the other, means for mounting said unit with either the condenser or evaporator in heat exchange relation with the area to be conditioned, said means comprising means for enclosing said unit, window sash engaging means on the top of said enclosing means, window stool engaging means on the bottom of said enclosing means, said stool engaging means comprising guide means secured to said enclosing means, a clamp reversibly secured to said enclosing means, said guide means and clamp cooperating with one another so that said unit may be mounted in a window with either the condenser or evaporator facing the area to be conditioned.

2. In an air conditioning unit as in claim 1 in which alternatively functioning sealing means are mounted on said unit, said sealing means coacting with said window sash and said unit when the evaporator faces the conditioned area and the sealing means is on one side of said handle means and adapted to coact with said window sash and said unit when the condenser faces the conditioned area and the sealing means is on the other side of said handle means.

3. In an air conditioning unit having a heat dissipating condenser on one side and heat absorbing evaporator on the other, said unit adapted to be mounted in a window with either the condenser or evaporator in heat exchange relation with the area to be conditioned, an enclosure for the components of said unit, window sash engaging means on said enclosure, said sash engaging means com-

prising two knobs, one on each side of said enclosure, whereby either one or the other of said knobs may be employed depending on which side of the unit is exposed to the area to be conditioned, and window stool engaging means on said enclosure, said stool engaging means comprising a clamp removably and reversibly secured to said enclosure whereby said unit may be moved to and from a window and positioned therein for either heating or cooling.

4. In an air conditioning unit having a heat dissipating condenser on one side and a heat absorbing evaporator on the other, said unit adapted to be mounted in a window with either the condenser or evaporator in heat exchange relation with the area to be conditioned, a casing including side walls and a top surface, means on the top surface for engaging the window to prevent rearward tilt of the unit, a bottom pan secured to said casing, guide means on said bottom pan aligning said casing in a window, said guide means comprising two spaced rails, and clamping means reversibly mounted on said bottom pan coacting with one of said spaced rails to secure the unit in a window when the condenser is in heat exchange relation with the area to be conditioned and adapted to coact with the other of said spaced rails when the evaporator is in heat exchange relation with the area to be conditioned.

5. An air conditioning unit according to claim 4 in which pins extend from said rails to aid in preventing forwarding rocking of the unit.

6. In an air conditioning unit as in claim 4 in which said clamping means are removably and reversibly secured to the pan between said guide rails.

7. In an air conditioning unit having a heat dissipating condenser on one side and a heat absorbing evaporator on the other, a casing including side walls and a top surface; a handle on said top surface; a bottom pan on said casing; guide rails on the bottom pan spaced apart a distance equal to or greater than that of the width of a window saddle; a saddle plate imbedded in the bottom surface of said pan, said plate having spaced apertures therein; a sill clamp having a dog for adjustable and reversible positioning in the apertures of said plate; two

eccentrically pivoted knobs on the edges of the top surface of said casing; and a movable sealing gasket on said casing adjustably positionable on either side of said handle, whereby said unit may be moved from window to window and positioned with either the condenser or evaporator facing the area to be conditioned.

8. A removable and reversible window mounting comprising a pan, guide rails on the lower surface of said pan, said guide rails being spaced apart a distance equal to or greater than the width of the window stool with which the mounting is employed, and clamping means reversibly mounted between said rails coacting with one of said guide rails when the pan is in a first position to grip the window stool and for coacting with the other of said guide rails when the pan is in a second reversed position to grip the window stool.

9. A mounting according to claim 8 in which pins extend from the guide rails to aid in preventing forward rocking of a unit with which the mounting is employed.

10. Means for encasing the components of an air conditioning unit, said components including a refrigeration system having a heat dissipating condenser, and a heat absorbing evaporator on opposite sides of a partition barrier, said means comprising a symmetrical rectangular housing having two side walls and an upper wall; a bracket on said upper wall adapted to engage a support to prevent rearward tilt of the unit, pan means forming the bottom wall of said enclosure, symmetrically positioned alternatively employable guide means on said pan means adapted to be positioned on opposite sides of a supporting member; and clamping means removably and reversibly positioned on said pan means to act with said guide means to grip a supporting member, whereby said unit will be maintained in position.

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