March 13, 1956 C. M. BUTTNER 2,737,788

ROOM AIR CONDITIONING UNIT

Filed Nov. 20, 1952

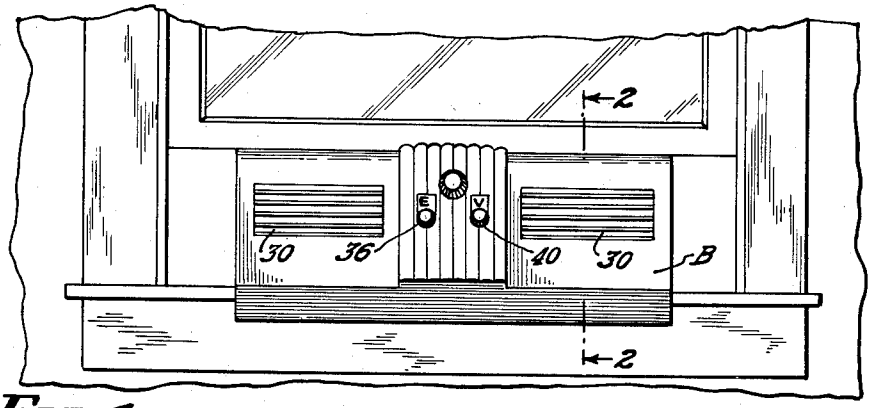


FIG. 1.

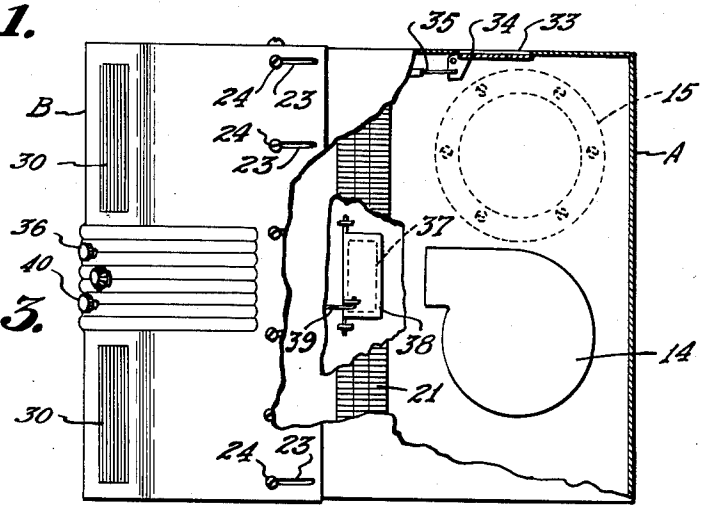


FIG. 3.

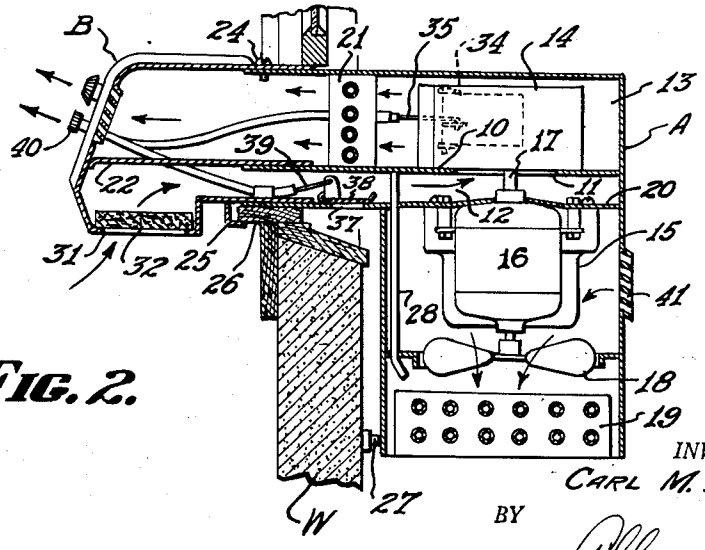


FIG. 2.

INVENTOR.
CARL M. BUTTNER,
BY
Allen & Allen
ATTORNEYS.

United States Patent Office 2,737,788
Patented Mar. 13, 1956

2,737,788

ROOM AIR CONDITIONING UNIT

Carl M. Buttner, Memphis, Tenn., assignor to Hunter Fan and Ventilating Company, Inc., a corporation of Tennessee

Application November 20, 1952, Serial No. 321,625

2 Claims. (Cl. 62—140)

This invention relates to a room air conditioning unit. There are at present many air conditioning units available on the open market which can be installed quite simply in a window opening, and which are of sufficient capacity to provide air conditioned comfort for a single room. Most of these commercially available units are quite similar in design and construction, and all are subject to certain disadvantages.

Generally speaking, the depth of the cabinet is such that it extends far beyond the window sill into the room, and usually the cabinet is of such a height that as much as 30% or more of the window area is obstructed by the unit. This, of course, causes a considerable loss of natural daylight.

The portion of the cabinet which is on the outside of the building is generally clumsy in appearance and quite unsightly.

The motor noises and compressor noises are readily transmitted into the room, and this is a great disadvantage particularly where the unit is to be used in a bedroom or office.

Additionally, the units are so constructed that they must be installed in a double-hung window opening and cannot be readily installed in a casement window, awning type window or a hole cut in the wall.

With the foregoing objections in mind it is an object of the present invention to provide a unit of the class described above which will not extend far into the room so as to present an unsightly appearance within the room, and which will be of relatively small vertical extent so that if it is installed in a window opening it will not obscure a major portion of the window area.

It is yet another object of the invention to provide for a construction wherein the motor and compressor are so mounted that the noises therefrom are not readily transmitted into the room, whereby the unit will be particularly desirable for use in connection with bedrooms and any installation where quietness is essential.

Yet another object of the invention is to provide a construction whereby the unit may readily be mounted in a hole cut in the wall; and by modification of the air intake and the discharge member, to provide a construction whereby the unit can be mounted in a casement window or an awning type window.

It is an ancillary object to provide a construction whereby the unit may be adjusted to the wall thickness or sill widths so that it can be installed readily under almost any conditions found in practice.

These and various other objects of the invention, which I shall point out in greater detail hereinafter, or which will become apparent upon reading these specifications, I accomplish by that certain construction and arrangement of parts, of which I shall now describe an exemplary embodiment.

Reference is made to the drawings forming a part hereof, and in which:

Figure 1 is a fragmentary elevational view of the unit as mounted in a window opening;

Figure 2 is a cross sectional view of the same taken on a line 2—2 of Figure 1; and

Figure 3 is a plan view of the unit with portions of the casing broken away to show the construction within.

Briefly, in the practice of my invention I provide a unit in the form of a two-part casing. One part of the casing is L-shaped in vertical cross section and is arranged to be mounted in the relatively short and thin arm of the L's extending through the building wall either through a window opening or through a hole cut in the wall with the larger arm of the L depending downwardly on the outside; the other part of the casing is arranged to be telescopically secured to said one arm from the inside of the room, and by virtue of the telescopic connection the unit may be adapted to various wall thicknesses or sill widths.

Referring now in more detail to the drawings, the L-shaped portion of the new unit is generally designated at A, while the portion of the casing which telescopes therewith is generally indicated at B. These two casing portions are made in conventional manner from sheet metal, plastic or the like, and the portion of the casing extending through the wall opening is divided into an upper and lower chamber by means of a partition element **10**. The partition element **10** is provided with an opening **11** communicating with the lower compartment which is indicated generally at **12**, the upper compartment being designated at **13**.

A blower, or fan **14** is mounted in the chamber **13** in communication with the opening **11** so as to draw air from the chamber **12** and below it through the chamber **13**, as indicated by the arrows in Figure 2. The depending portion of casing member A houses a compressor **15** which may be of the sealed dome type, and it also houses a motor **16** which is connected by a shaft **17** to drive the blower, or fan **14**. The other end of the shaft **17** below the motor has mounted on it the fan element **18**, the purpose of which is to provide a blast of cooling air for the condenser **19**, which is mounted at the bottom of the casing portion A. The motor **16** and compressor **15** are mounted on the support **20**.

The evaporator **21** is mounted in the upper portion of the casing member A so that the air delivered by the blower **14** passes around and about the coolant elements thereof before entering the room.

The portion of the casing on the inside of the room, and designated at B, is likewise provided with a partition element **22** which overlaps the partition element **10** when the portion B is telescoped on the portion A. The portion B is provided with a series of slots **23**, and the portion B is secured to the portion A by means of screws **24** passing through the slots **23** and threaded into the portion A. By virtue of the slots **23** the parts A and B may be more or less telescoped together depending upon the wall thickness or sill widths as the case may be. Any number of other locking devices may be used to secure the portions A and B together.

The portion B is provided with the flange element **25** which is adapted to engage under the sill **26** of the window or a similar element secured to a wall opening if the unit is to be mounted in a hole in a wall rather than in a window opening. The portion A is provided with the adjustable foot element **27** which is adapted to rest against the wall W and by this means adjust the position of the unit so that the motor shaft **17** will be in a vertical position. Condensate which forms on the evaporator will drip off and pass through the pipe **28** to be discharged over the condenser. The heat of the condenser will evaporate the condensate thus disposing of the condensate and increasing the efficiency of the unit.

The casing portion B is provided with the louvers **30** through which refrigerated air is delivered into the room.

On its under side, portion B is provided with an opening to provide an air intake from the room. A filter element may be disposed in any desired location within the air circuit of the unit and is shown herein at 32, as being located in the intake opening 31.

In a side of the casing portion A is provided an opening 33, together with a closure element 34, through which air may be exhausted if desired. The closure member 34 is actuated through the medium of a Bowden cable 35 from a knob 36 on the face of the unit.

At 37 there is provided a fresh air intake opening provided with a closure 38. The closure 38 is operated through a Bowden cable 39 from a knob 40 on the face of the unit.

Thus, if it is desired to cool and recirculate the room air the closure 34 is closed and closure 48 is closed by means of the controls 36 and 40. As the compressor 15 functions the coils in the evaporator 21 become cool, and as the motor 16 operates the blower 14, air is drawn through the opening 31 past the filter 32, through the lower chamber below the partitions 10 and 22, through the blower 14 and through the evaporator 21, and through the louvers 30 back into the room. The air is thus filtered and then chilled.

If it is desired to add fresh air the closure 38 may be opened so that fresh air may be drawn in through the opening 37 and will mingle with the recirculated air in passing through the blower 14 and pass the evaporator 21 and through the louvers 30 into the room. If it is desired to exhaust stale air from the room the closure 34 is opened whereupon stale air passes out through the opening 33.

By the present construction it will be noted that the condensate dripping off the evaporator 21 and passing downwardly through the pipe 28 discharges over the condenser 19, thus helping to cool the latter. The principal cooling for the condenser however, is achieved by the fan 18 which induces a movement of air through the louvers 41 and downwardly in the direction of the arrows over the condenser 19.

From a consideration of Figure 2 it will be observed how the motor 16 for the blower and the fan, as well as compressor unit 15, are disposed outside of the building and below the level of the opening into the building. In this way the transmission of noise into the building is minimized. It will also be observed from Figure 2 how, by virtue of the telescoping two-part construction of the casing, the unit may be mounted in a wall opening having the dimensions of the horizontal portion of the casing member A. The casing portion A will be positioned from the outside and then the casing portion B will be telescoped therewith from the inside and secured by means of the screws 24. By virtue of the flange member 25 and the member 27 no additional fastening elements are required.

Thus, if the device is mounted in a window a very small portion of the window area is obstructed, and as pointed out above, the unit may be mounted in a hole cut in the wall for that purpose and a window opening need not be used at all. It also will be seen that by modification of the casing portion B from rectangular horizontally divided chambers to rectangular vertically divided chambers the unit may be mounted into a casement window.

It will be clear that numerous modifications may be made without departing from the spirit of the invention. The details of the refrigerating unit, forming no part of the invention, have not been described herein.

In view of these facts I do not intend to limit myself except as pointed out in the claims which follow.

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

1. A room air conditioning unit comprising a two-part casing, one part being L-shaped in vertical cross section and arranged for mounting in an opening in a wall of a room with one arm of said L extending through said opening and the other extending downwardly below said opening on the outside, the other part being telescopically and adjustably secured to said one arm of said L on the inside of said opening, said opening having a sill engaging element, said one arm and said other part which are in telescoping relation being horizontally divided into an upper and lower chamber, a blower disposed in the upper chamber of said one arm, an intake for said blower from the lower chamber of said one arm, a recirculating air intake in the lower chamber of said other part, and a fresh air intake in the lower chamber of said one arm, means for selectively opening and closing said fresh air intake, and actuating means for said opening and closing means on the face of said other part.

2. A room air conditioning unit comprising a two-part casing, one part having a horizontally disposed portion adapted to pass through a wall opening and a downwardly extending portion adapted to be disposed in the outside of said wall, the other part being telescopically and adjustably secured to the horizontally disposed portion and adapted to be disposed inside said room, the horizontally disposed portion of said one part and said other part being provided with a horizontal partition to constitute an upper and a lower passage, a recirculating air opening in the lower passage on said other part, a fresh air intake in the lower passage on said horizontally disposed portion, an opening between said passages in said horizontally disposed portion, a cooling element in the upper passage of said horizontally disposed portion, a cooled air opening in the upper passage of said other part and a blower disposed in the upper passage of said horizontally disposed part to produce movement of air from said lower passage, past said cooling element and through said cooled air opening, a compressor and a condenser in said downwardly extending portion, a motor for driving said blower also disposed in said downwardly extending portion, said motor also driving a fan for cooling said condenser, and a drain pipe for condensate from said evaporator, discharging said condensate on to said condenser to assist in cooling the same.

References Cited in the file of this patent

UNITED STATES PATENTS

1,949,379	Sargent	Feb. 27, 1934
2,035,653	Haskell	Mar. 31, 1936
2,163,691	Lichty	June 27, 1939
2,391,859	Babcock	Jan. 1, 1946
2,467,297	Doe	Apr. 12, 1949
2,472,792	Cohler	June 14, 1949
2,500,852	Money	Mar. 14, 1950
2,608,148	Shapiro	Aug. 26, 1952
2,610,483	Deering	Sept. 16, 1952
2,660,866	Tipton	Dec. 1, 1953
2,660,867	Borgerd	Dec. 1, 1953
2,667,765	Harris	Feb. 2, 1954