Dec. 9, 1952 L. A. GRANDINETTI 2,620,638

PORTABLE AIR-COOLING APPARATUS

Filed Sept. 7, 1950 5 Sheets-Sheet 1

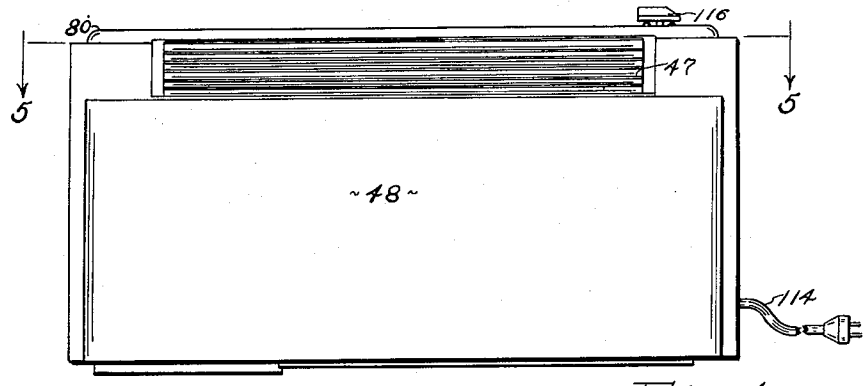


Fig. 1

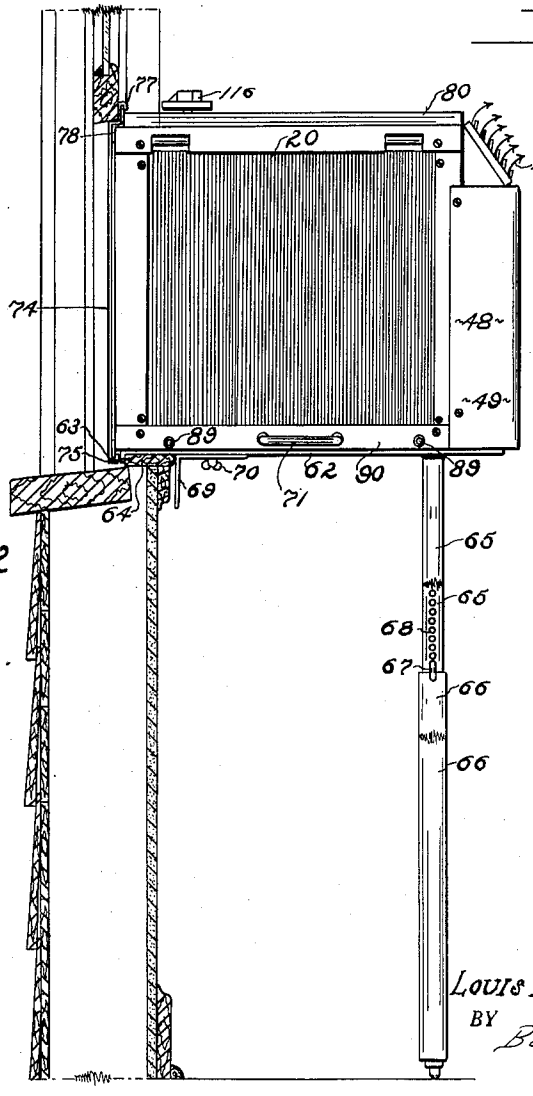


Fig. 2

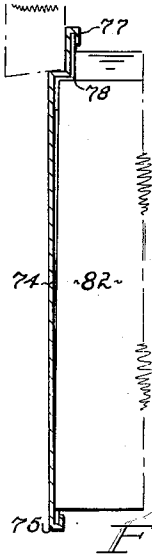


Fig. 11

INVENTOR.
LOUIS A. GRANDINETTI
BY Bodell & Thompson
ATTORNEYS

Dec. 9, 1952 L. A. GRANDINETTI 2,620,638

PORTABLE AIR-COOLING APPARATUS

Filed Sept. 7, 1950 5 Sheets-Sheet 2

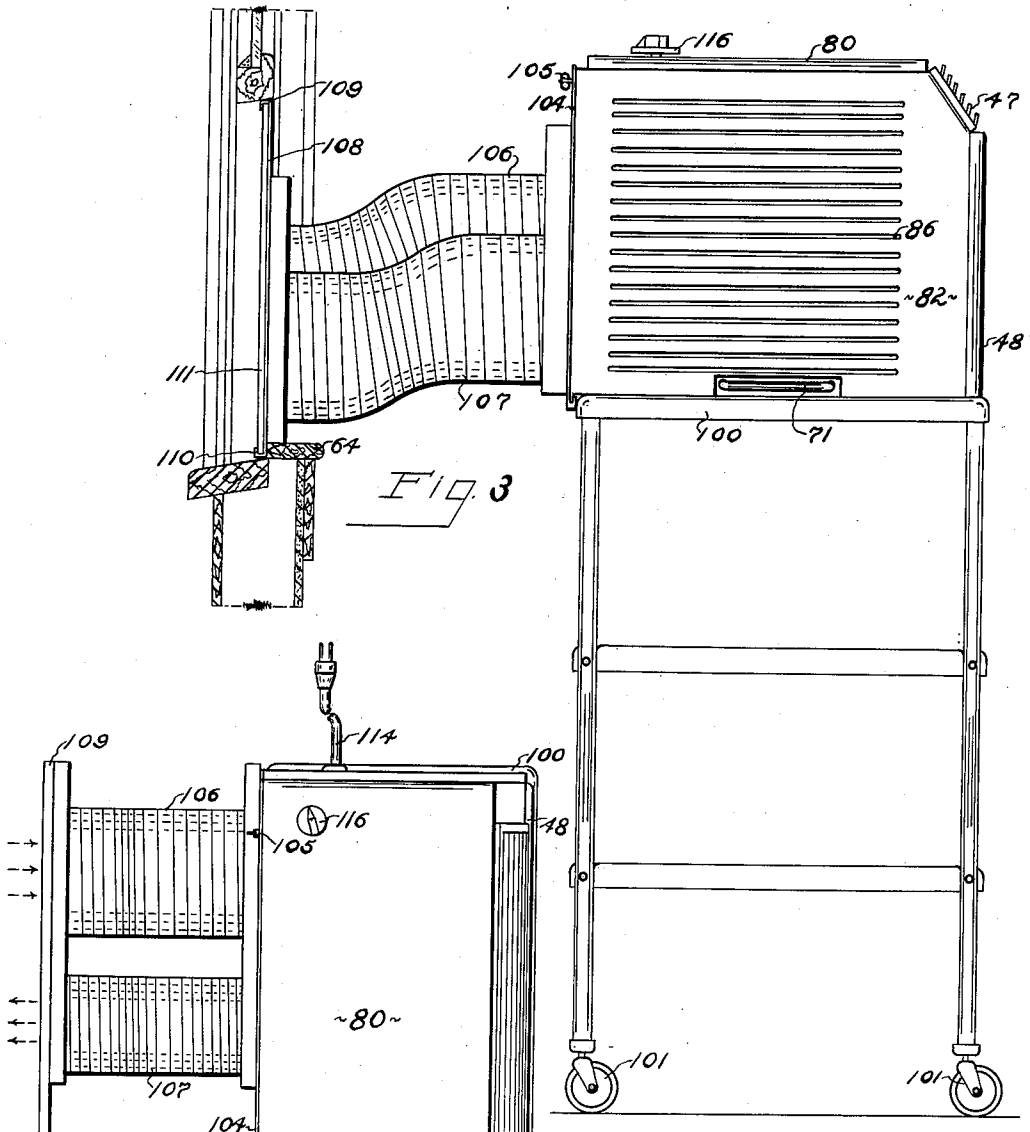


Fig. 3

Fig. 4

INVENTOR.
LOUIS A. GRANDINETTI
BY Bodell & Thompson
ATTORNEYS

Dec. 9, 1952 L. A. GRANDINETTI 2,620,638

PORTABLE AIR-COOLING APPARATUS

Filed Sept. 7, 1950 5 Sheets-Sheet 3

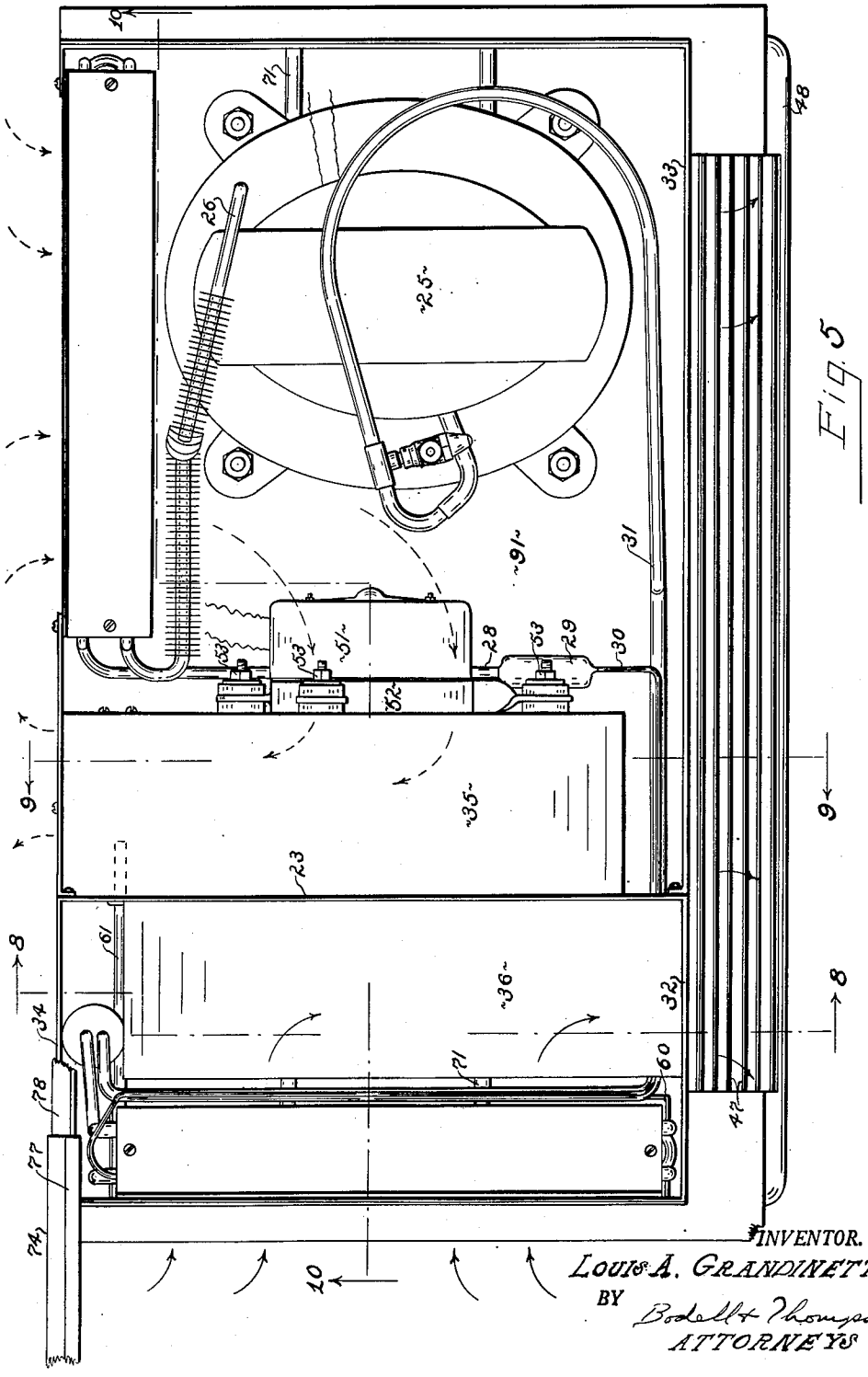


Fig. 5

INVENTOR.
LOUIS A. GRANDINETTI
BY Bodell & Thompson
ATTORNEYS

Dec. 9, 1952 L. A. GRANDINETTI 2,620,638

PORTABLE AIR-COOLING APPARATUS

Filed Sept. 7, 1950 5 Sheets-Sheet 4

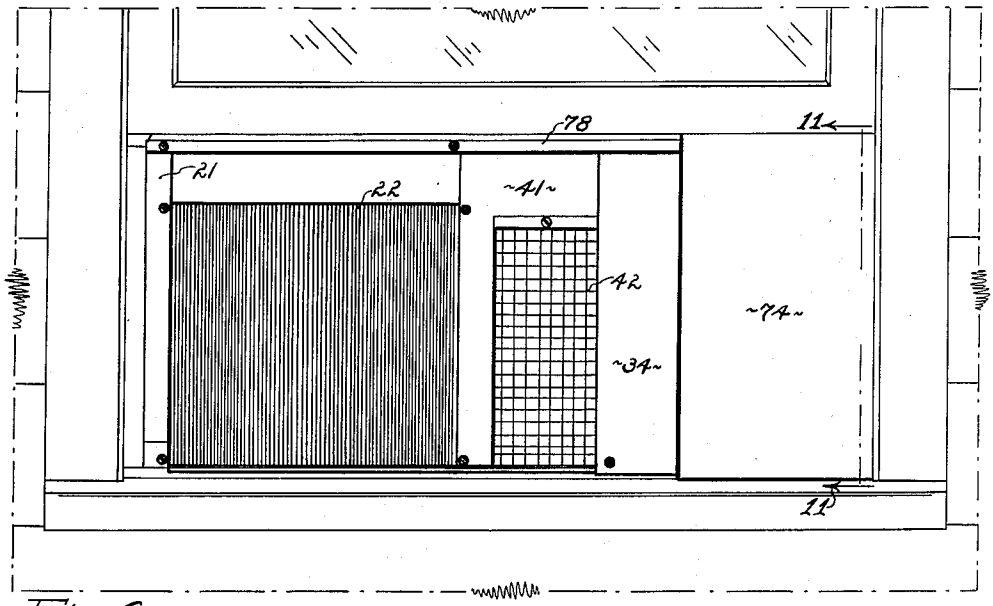


Fig. 6

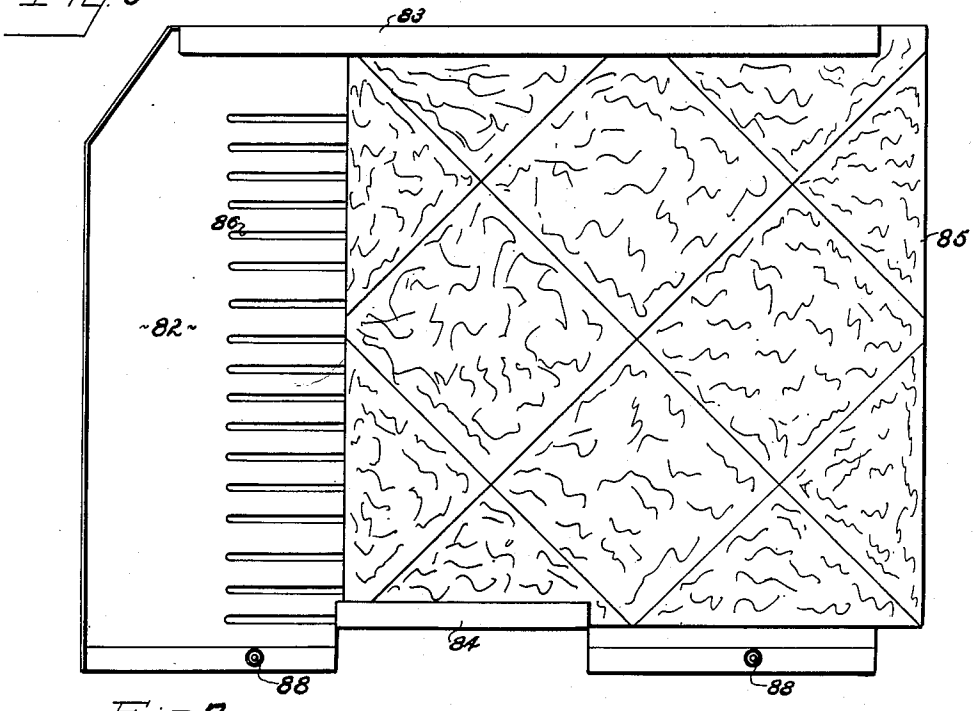


Fig. 7

INVENTOR.
LOUIS A. GRANDINETTI
BY Bodell & Thompson
ATTORNEYS

Dec. 9, 1952 L. A. GRANDINETTI 2,620,638

PORTABLE AIR-COOLING APPARATUS

Filed Sept. 7, 1950 5 Sheets-Sheet 5

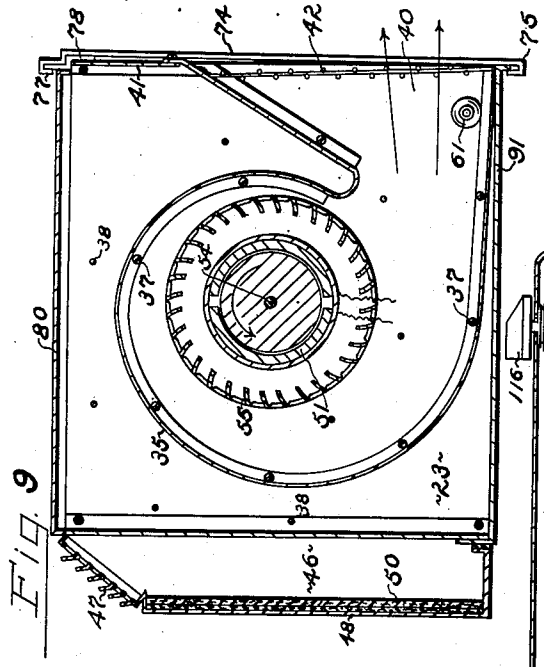


Fig. 9

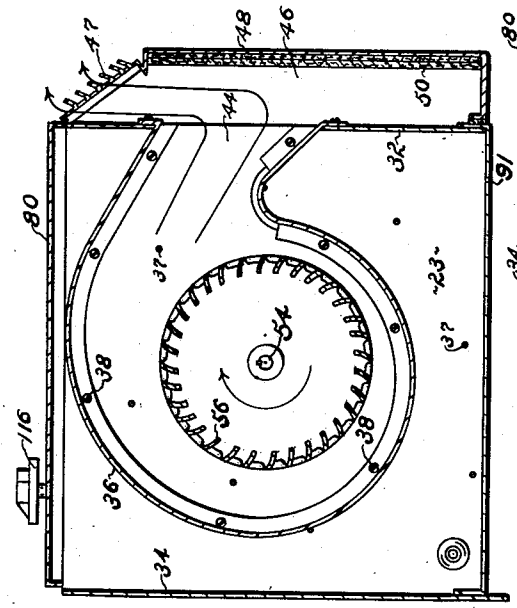


Fig. 8

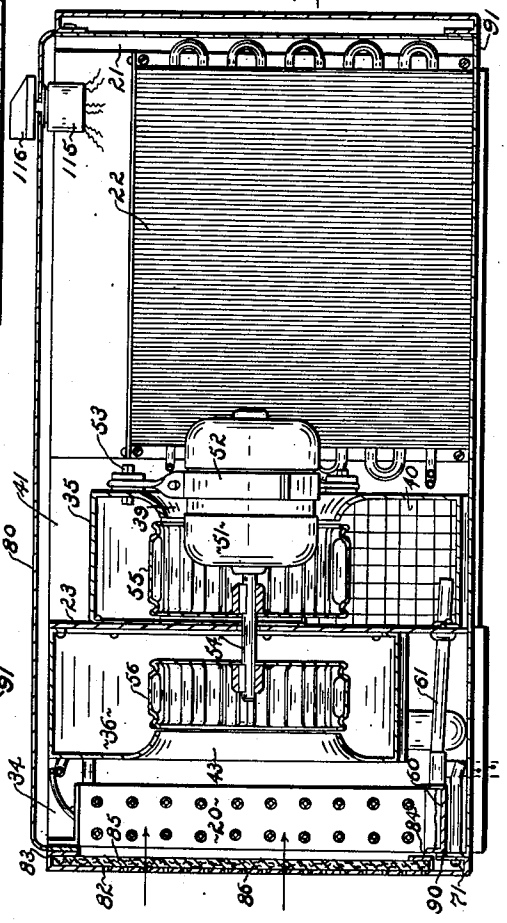


Fig. 10

INVENTOR.
LOUIS A. GRANDINETTI
BY
Bodell & Thompson
ATTORNEYS

Patented Dec. 9, 1952 2,620,638

UNITED STATES PATENT OFFICE

2,620,638

PORTABLE AIR-COOLING APPARATUS

Louis A. Grandinetti, Syracuse, N. Y.

Application September 7, 1950, Serial No. 183,568

7 Claims. (Cl. 62—129)

1

This invention relates to portable air conditioning units of the type adapted to be positioned in the window opening of a room. Such units are used extensively at the present time to reduce the temperature in a room, or similar enclosure. The units now in use are of substantial dimensions and weight, and when positioned in the window opening, substantially one-half of the unit projects outwardly from the window opening. This arrangement is undesirable, not only from the standpoint of weight and size, but some cities in some of the better class apartment houses, apartment hotels, and office buildings, do not permit projections beyond the base of the building.

If the units now in use are arranged to be contained wholly within the room, the necessarily large space occupied by the unit is objectionable. Also because of the size and weight of the units, it is difficult to remove them from the windows for maintenance work, such as washing the window panes.

The invention has as an object an apparatus of the type referred to embody a particularly compact arrangement whereby the number of parts and the cost of construction is materially reduced and the unit is of such weight that it can be conveniently moved by bodily manipulation and is of a size that permits the portion extending into the room, when mounted in a window opening, to be kept within established conventional dimensions and yet no part of the unit extends outwardly from the window opening.

The invention consists in the novel features and in the combinations and constructions hereinafter set forth and claimed.

In describing this invention, reference is had to the accompanying drawings in which like characters designate corresponding parts in all the views.

Figure 1 is a front elevational view of a cooling apparatus embodying my invention.

Figure 2 is an end elevational view looking toward the right, Figure 1, and showing the apparatus mounted in a window opening and being supported in part by an adjustable stand arrangement.

Figure 3 is a view, similar to Figure 2, illustrating the device mounted upon a portable dolly in spaced relation to the window opening.

Figure 4 is a top plan view of the arrangement shown in Figure 3.

Figure 5 is a top plan view with the top wall or cover of the cabinet removed, as indicated by line 5—5, Figure 1.

2

Figure 6 is a rear elevational view of the arrangement shown in Figure 2.

Figure 7 is an elevational view of the inner side of one end panel of the cabinet, and air filter.

Figure 8 is a view taken on line 8—8, Figure 5.

Figure 9 is a view taken on line 9—9, Figure 5.

Figure 10 is a view taken on line 10—10, Figure 5.

Figure 11 is a view taken on line 11—11, Figure 6.

The apparatus comprises a rectangular shaped sheet metal cabinet having an opening in one end wall in which, or in registration with which, there is mounted an evaporator radiator 20. The rear wall 21, adjacent the opposite end of the cabinet, is also formed with an opening in which is mounted a condenser 22. A partition 23 extends transversely of the cabinet, dividing the cabinet into an evaporator compartment at one end and a compressor compartment at the opposite end in which the condenser 22 and compressor 25 are mounted. The compressor, condenser and evaporator are properly connected with refrigerant flow connections including a conduit 26 extending from the compressor to the condenser 22. The refrigerant condensed in the condenser 22 flows through a conduit 28 to a strainer 29 and thence through a capillary conduit 30 to the evaporator 20. The return connection from the evaporator to the compressor consists of a conduit 31 including an accumulator.

A fan housing is mounted on each side of the partition plate 23. Preferably, for purposes of manufacture and assembly and as here shown, the partition member 23 is formed with a flange 32 forming a continuation of the front wall 33 of the cabinet and with a flange 34 forming a portion of the back wall of the cabinet. I have also found that it is advantageous to attach the fan housings 35, 36, directly to the partition 23, as by screws 37, 38, respectively. The fan housing 35, arranged in the compressor compartment, is formed with a central inlet 39 and with a discharge outlet 40 to which there is attached a plate 41 forming a portion of the back wall of the cabinet and arranged adjacent the flange 34 of the partition member. The discharge 40 of the fan housing 35 is closed by a suitable screen 42.

The fan housing 36 is formed with a central inlet 43 arranged adjacent the evaporator 20 and with a discharge outlet 44 discharging through the flange 32 of the partition member into a discharge compartment 46 arranged on the exterior of the front wall 32—33. This discharge com-

partment is formed by a sheet metal member 48 attached to the ends of the cabinet as by screws 49 and provided on its inner surface with suitable insulating material 50. A pan is operatively mounted in each of the housings 35, 36. Preferably, both of these fans are operated by one motor having an extended shaft on which both of the fans are mounted.

A motor 51 is attached to the fan housing 35, as by a yoke member 52 secured to the housing by bolts 53. The motor 51 is mounted in the inlet passage 39 of the housing and extends an appreciable distance within the housing and has its shaft 54 extending through the partition member 23. A fan 55 arranged in the housing 35 is keyed to the motor shaft, and a fan 56 arranged in the housing 36 is also keyed to the shaft, whereby both fans 55, 56, are rotated by the motor 51.

With this arrangement, the fan housings 35, 36, are arranged in close proximity on opposite sides of the partition member 23 and the fans therein are both operated by the motor 51, the major portion of which is arranged within the housing 35.

The inlet opening 43 of the fan housing 36 is arranged centrally in registration with the evaporator 20 and draws air from the room inwardly through the evaporator and discharges the chilled air into the compartment 46 where it is blown out through the louvers 47. The fan 55 mounted in housing 35 functions to draw air inwardly through the condenser 22 into the compressor compartment and to discharge the air through the opening 40 in the rear side wall of the cabinet.

A condensate collecting tray 60 is positioned below the evaporator 20 and is provided with a drain conduit 61 extending through the partition 23 and discharging into the discharge opening 40 of the fan housing 34. With this arrangement, the condensate is atomized and blown out through the discharge opening 40, when the unit is positioned in a window opening, as shown in Figure 2. When the unit is positioned in the window opening, it may be supported by a stand arrangement comprising a plate 62 formed with a depending flange 63 along its rear edge to hook over the window sill 64 and having a pair of legs attached to its forward portion, these legs comprising upper members 65 telescoping into lower tubular members 66 to adjust the plate 62 to suit the height of the window sill 64 from the floor, the upper members being secured in adjusted position by pins 67 placed in one of a series of apertures 68 formed in the upper member 65. An angle member 69 is adjustably secured to the under side of the plate 62 by a screw 70 and is positioned to engage the inner edge of the window sill 64.

The unit is provided with a suitable handle 71 at each end of the cabinet, these handles being slidable in the chassis or base so that they may be moved inwardly when not in use, as shown in Figure 10.

The unit is provided with a plate 74 formed at its lower edge with a channel 75 to slidably engage the lower edge of the flange 34. The upper end of the plate 74 is formed with a similar channel 77 to slidably receive the top edge of a Z-shaped member 78 attached to the rear upper edge of the cabinet. With this arrangement, the plate 74 is slidable lengthwise on the back wall of the cabinet to fill the space between the end wall of the unit and the adjacent side of the window opening, as shown in Figure 6, to close the space between the side of the window and the cabinet and thus accommodate the device to windows of different sizes. The top of the cabinet is closed by a cover member 80.

The open end of the cabinet in which the evaporator 20 is positioned is closed by a panel 82 formed along its upper edge with a channel 83 and with a similar channel 84 centrally of its bottom edge. A filter pad 85 is slidably mounted in the channels 83, 84, see Figures 7 and 10, and which serves to filter air drawn in through the slotted openings 86 in the panel and through the evaporator 20. In Figure 7, the filter 85 is shown partially withdrawn from the panel. The panel is provided at its lower edge with a pair of pins 88 which enter spring catches located in holes 89 formed in the upturned flange 90 of the bottom wall 91 of the cabinet. The top channel 83 engages upturned tabs of top cover 80.

The apparatus may be positioned on a stand 100 provided with casters 101 to render the device portable. With this arrangement, the plate 74 is omitted and a plate 104 is attached to the rear of the cabinet, as by screws 105. This plate is provided with a pair of flexible ducts 106, 107, the duct 106 registering with the condenser 22, and the duct 107 with the discharge outlet 40 of the fan housing 35. The opposite ends of the ducts 106, 107, are attached to a window opening plate 108 formed at its upper and lower edges with channels 109, 110, respectively and in which there is slidably mounted a plate 111 to accommodate the structure for windows of different widths. The compressor and fan motors are supplied with power through a flexible cord 114 and a control switch 115 mounted in the top wall 80 and having an operating manual 116.

What I claim is:

1. A portable air cooling apparatus adapted to be positioned in a window comprising a cabinet open at one end and having an opening in the rear wall in proximity to the opposite end of the cabinet, an evaporator mounted in the open end of the cabinet, a refrigerant compressor mounted in the opposite end portion of the cabinet, a condenser mounted in the opening in the rear wall in juxtaposition to the compressor, refrigerant flow connections between the compressor, condenser and evaporator, a partition extending transversely of the cabinet between the compressor and said evaporator, a fan housing attached to each side of said partition, a fan mounted for rotation in each of said housings, one of said housings having a central inlet adjacent said evaporator, and a discharge opening through the front wall of the cabinet, the other of said fan housings having a central inlet facing the compressor and a discharge opening through the rear wall of the cabinet, a motor having its shaft extending through said partition into both of said housings and being operatively connected to said fans.

2. A portable air cooling apparatus adapted to be positioned in a window comprising a cabinet open at one end and having an opening in the rear wall in proximity to the opposite end of the cabinet, an evaporator mounted in the open end of the cabinet, a refrigerant compressor mounted in the opposite end portion of the cabinet, a condenser mounted in the opening in the rear wall in juxtaposition to the compressor, refrigerant flow connections between the compressor, condenser and evaporator, a partition extending transversely of the cabinet between the compressor and said evaporator, a fan housing attached to each side of said partition, a fan

mounted for rotation in each of said housings, one of said housings having a central inlet adjacent said evaporator, and a discharge opening through the front wall of the cabinet, the other of said fan housings having a central inlet facing the compressor and a discharge opening through the rear wall of the cabinet, a motor mounted on one of said fan housings and extending therein and having its shaft extending through said partition into both of said housings and being operatively connected to both of said fans.

3. A portable air cooling apparatus comprising a cabinet formed with a cold air discharge compartment on the exterior of the front wall and extending lengthwise thereof, said compartment being formed with an elongated cold air discharge opening at the top thereof, a partition extending transversely of the cabinet and forming at one end of the cabinet a compressor compartment having an opening in the rear wall of the cabinet, and an evaporator compartment having an opening in the adjacent end wall of the cabinet, a fan housing mounted on opposite sides of said partition in adjacency thereto, one of said housings having a central inlet arranged in juxtaposition to said evaporator and having a discharge through the front wall of the cabinet into said discharge compartment, said other housing having a central inlet in said compressor compartment and having a discharge outlet opening through the rear wall of the cabinet, and a fan arranged for rotation in each of said housings.

4. A portable air cooling apparatus comprising a cabinet formed with a cold air discharge compartment on the exterior of the front wall and extending lengthwise thereof, said compartment being formed with an elongated cold air discharge opening at the top thereof, a partition extending transversely of the cabinet and forming at one end of the cabinet a compressor compartment having an opening in the rear wall of the cabinet, and an evaporator compartment having an opening in the adjacent end wall of the cabinet, a fan housing mounted on opposite sides of said partition in adjacency thereto, one of said housings having a central inlet arranged in juxtaposition to said evaporator and having a discharge through the front wall of the cabinet into said discharge compartment, said other housing having a central inlet in said compressor compartment and having a discharge outlet opening through the rear wall of the cabinet, a motor mounted in the inlet of one of said fan housings and a fan arranged for rotation in each of said housings and being operatively connected to the motor.

5. A portable air cooling apparatus adapted to be positioned in a window opening of a room comprising a rectangular shaped cabinet, a partition member extending transversely of the cabinet and being formed with flanges forming a continuation of the front and rear walls of the cabinet, said partition dividing the cabinet into an evaporator compartment and a compressor compartment, a fan housing mounted on each side of said partition, said cabinet being formed with an opening in one end wall leading into said evaporator compartment, an evaporator positioned in said compartment in registration with said opening, the rear wall of said cabinet being formed with an opening leading into said compressor compartment, a condenser radiator positioned in said last mentioned opening, a compressor mounted in said compressor compartment, each of said fan housings being formed with a central inlet opening, the fan housing in said evaporator compartment having a discharge opening through the front wall of the cabinet and the fan housing in said compressor compartment having a discharge opening through the rear wall of the cabinet and a fan operatively mounted in each of said housings.

6. A portable air cooling apparatus comprising a cabinet adapted to be positioned in a window opening of a room, a partition member extending transversely of said cabinet and dividing the same into a compressor compartment and an evaporator compartment, a fan housing secured to opposite sides of said partition member, a compressor mounted in said compressor compartment and an evaporator mounted in said evaporator compartment, said compressor compartment having an air inlet opening in the rear wall of the cabinet, and said evaporator compartment having an air inlet opening in one end of the cabinet, a fan mounted in the fan housing arranged in said compressor compartment and being operable to draw air inwardly through the opening in the rear wall of the cabinet over the compressor and discharge the air outwardly through the rear wall of the cabinet, a fan mounted in said evaporator compartment and being operable to draw air inwardly through the end wall of the cabinet and said evaporator to discharge the cooled air through the forward wall of the cabinet, a plate slidably mounted on the rear wall of the cabinet and being movable to engage the contiguous side of the window opening.

7. A portable air cooling apparatus comprising a rectangular cabinet, a partition member extending transversely of the cabinet and dividing the same into a compressor compartment and an evaporator compartment, a fan housing secured to opposite sides of said partition member, an air intake opening in the rear wall of said cabinet, a fan operatively mounted in the fan housing arranged in said compressor compartment and being operable to draw air inwardly through the opening in the rear wall of the cabinet over the compressor and to discharge the air outwardly through the rear wall of the cabinet, the end wall of said cabinet contiguous to said evaporator compartment being formed with an air intake opening, a panel detachably secured to said open end of the cabinet and being formed with a plurality of air inlet passages, a filter member slidably mounted on the inner wall of said panel and being coextensive with said inlet passages to filter the air passing therethrough, a fan operatively mounted in the fan housing of said evaporator compartment and being operable to draw air inwardly through said filter and evaporator and discharge the cooled air outwardly through the front wall of the cabinet.

LOUIS A. GRANDINETTI.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,062,042	Sargent	Nov. 24, 1936
2,198,500	Jewell	Apr. 23, 1940
2,278,989	Gruitch	Apr. 7, 1942
2,303,865	Roper	Dec. 1, 1942
2,391,151	Gibson	Dec. 18, 1945