Oct. 25, 1949. A. TRASK 2,486,226

AIR CONDITIONING APPARATUS

Filed March 17, 1945 3 Sheets-Sheet 1

Fig. 1

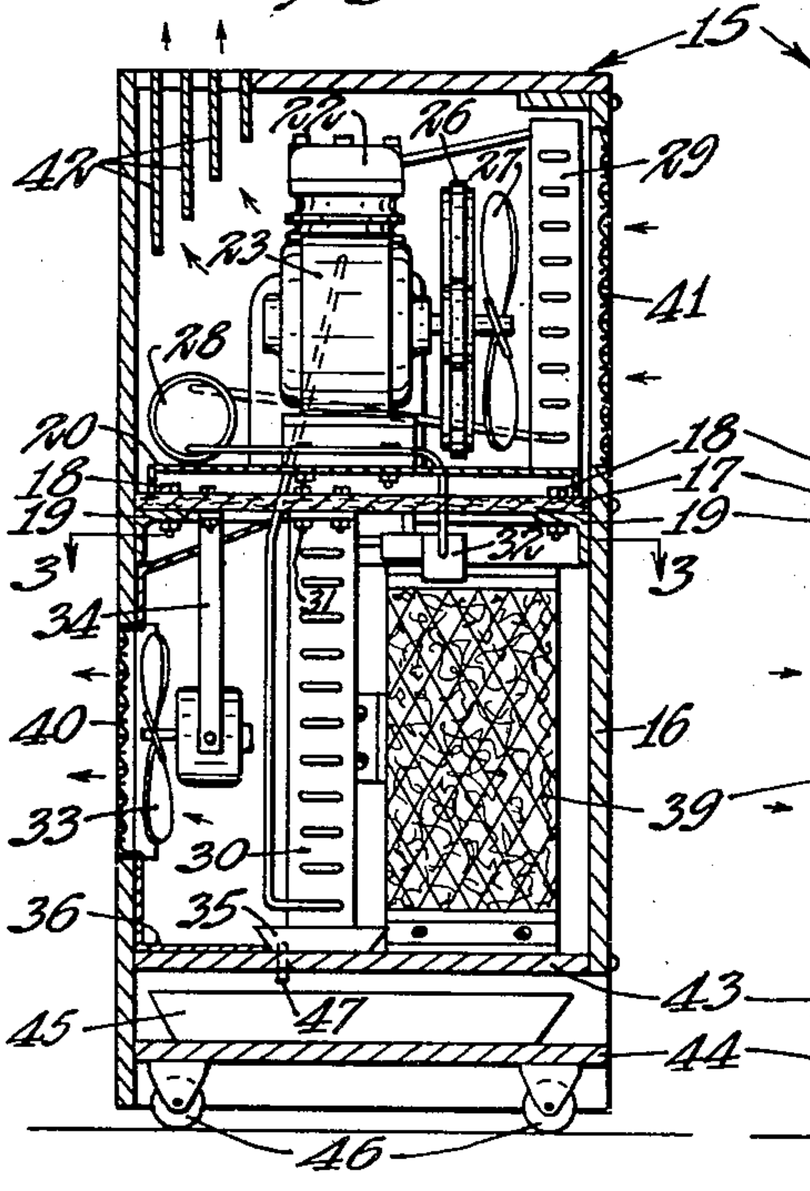


Fig. 4

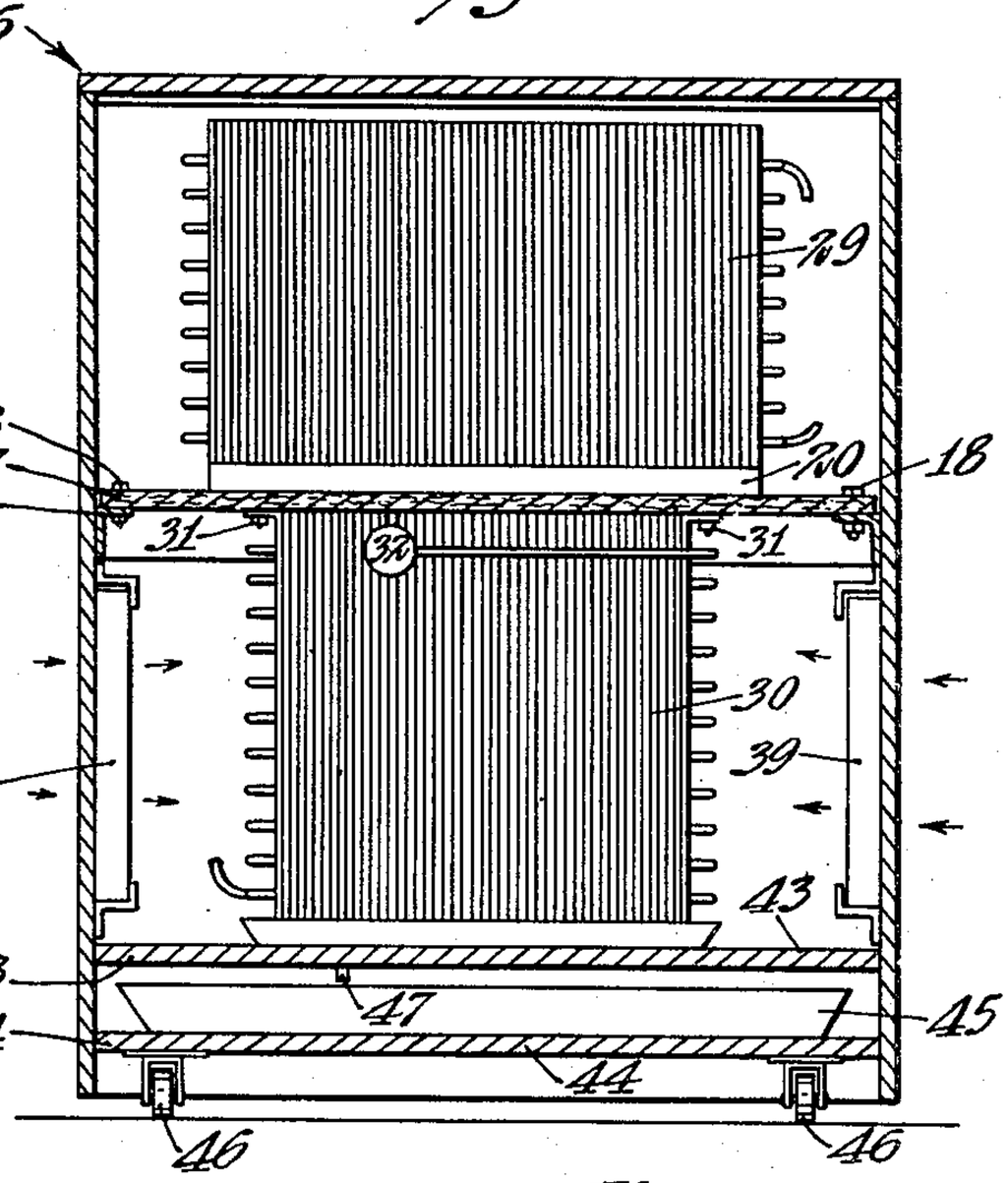


Fig. 2

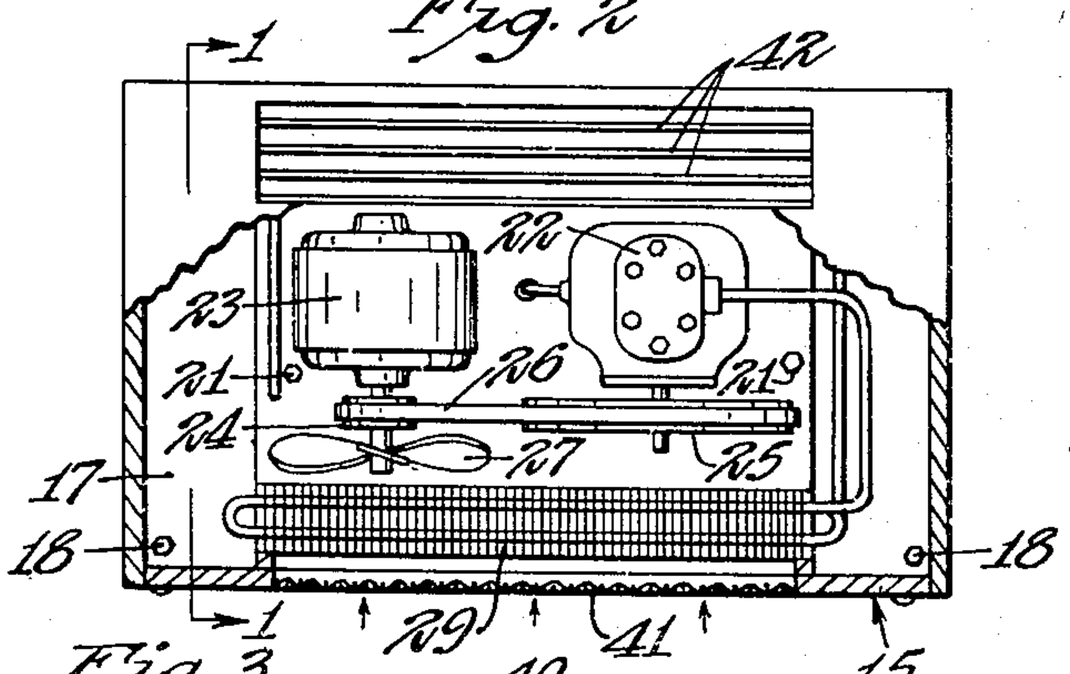


Fig. 3

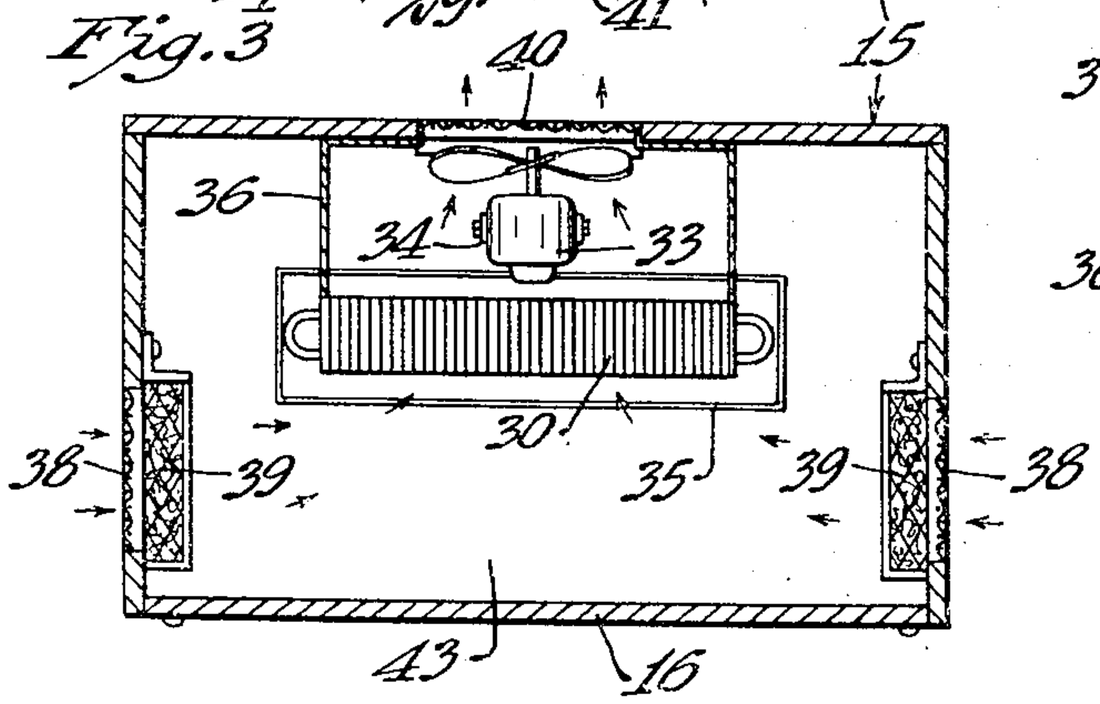
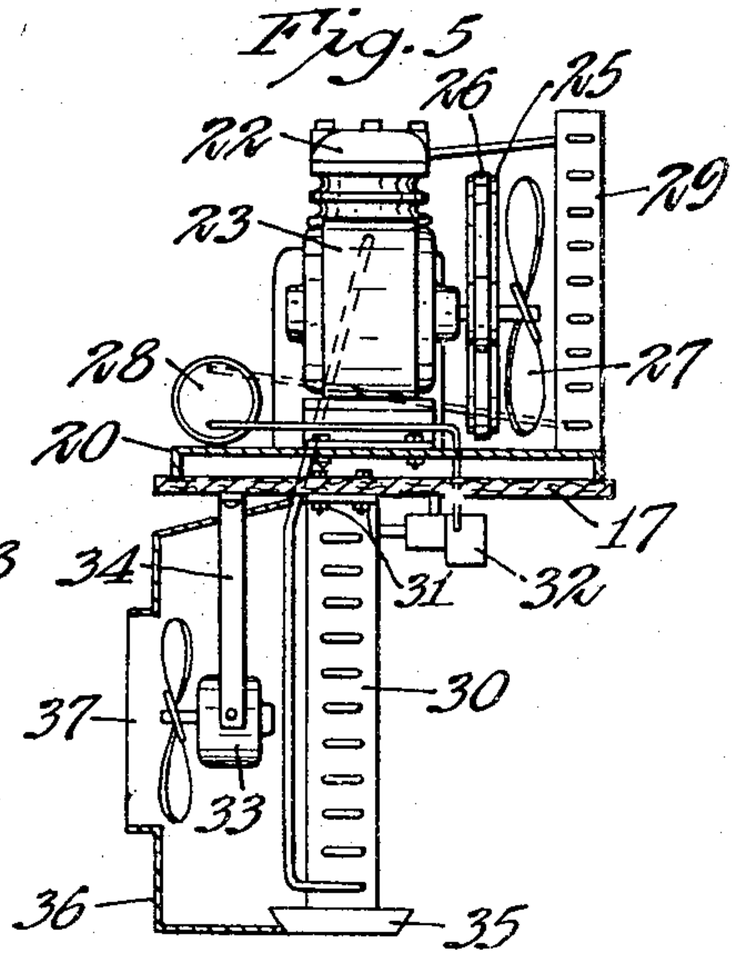


Fig. 5



INVENTOR.
Allen Trask
BY
Williamson & Williamson
ATTORNEYS

Oct. 25, 1949. A. TRASK 2,486,226

AIR CONDITIONING APPARATUS

Filed March 17, 1945

3 Sheets-Sheet 2

Fig. 6

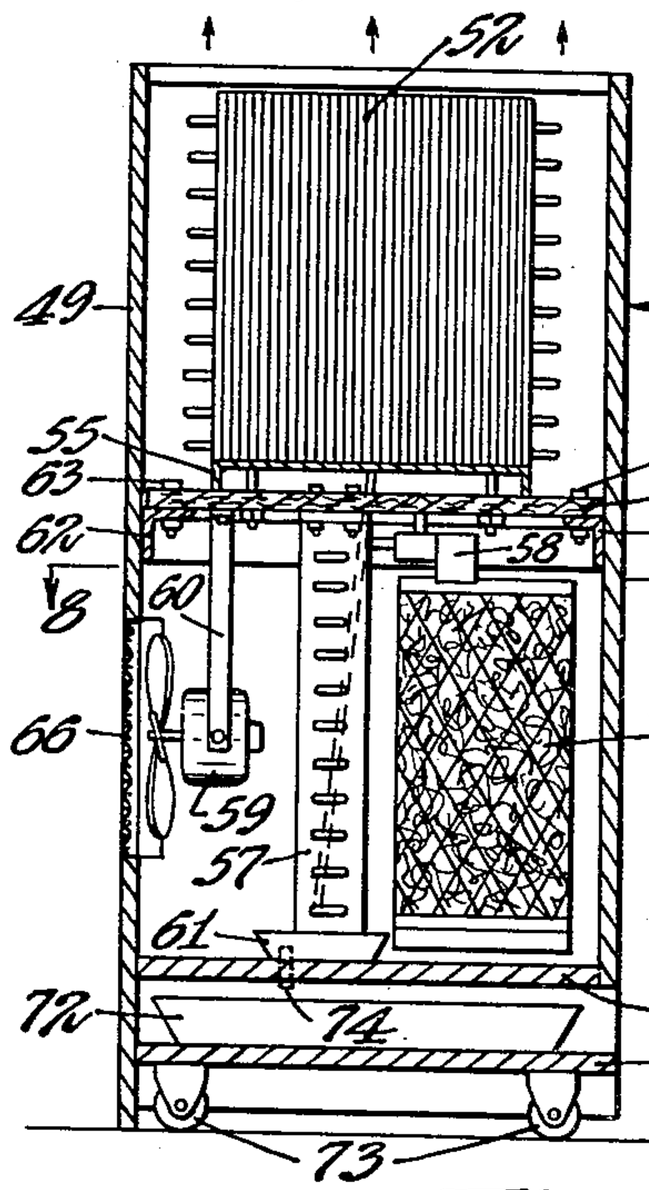


Fig. 9

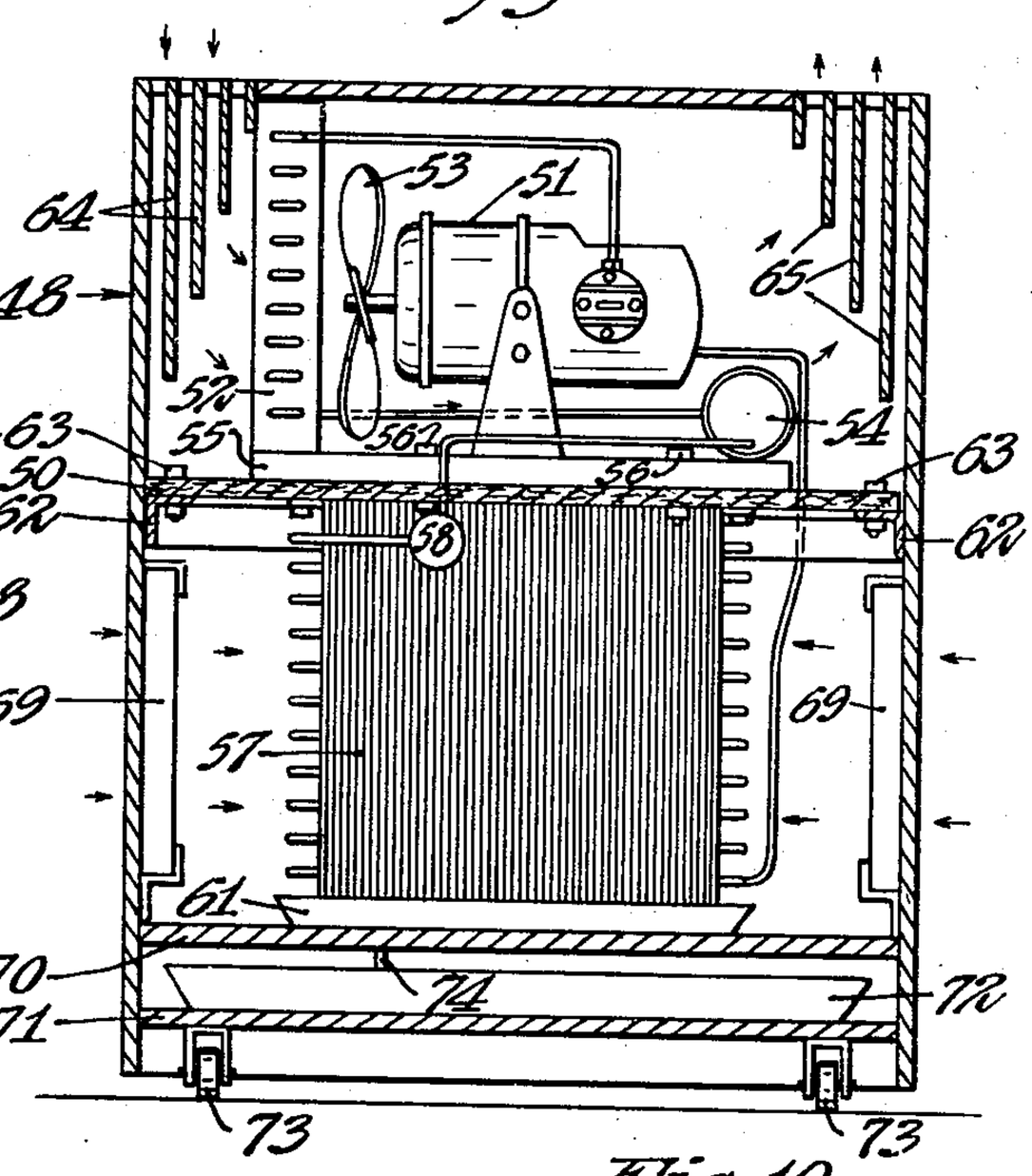


Fig. 7

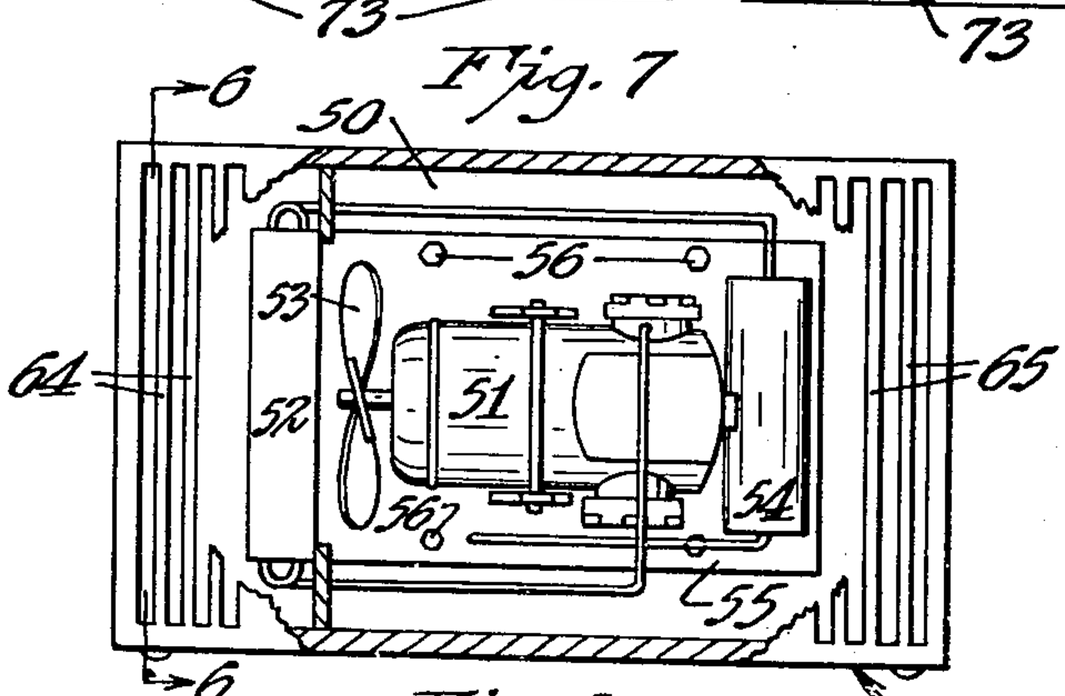


Fig. 10

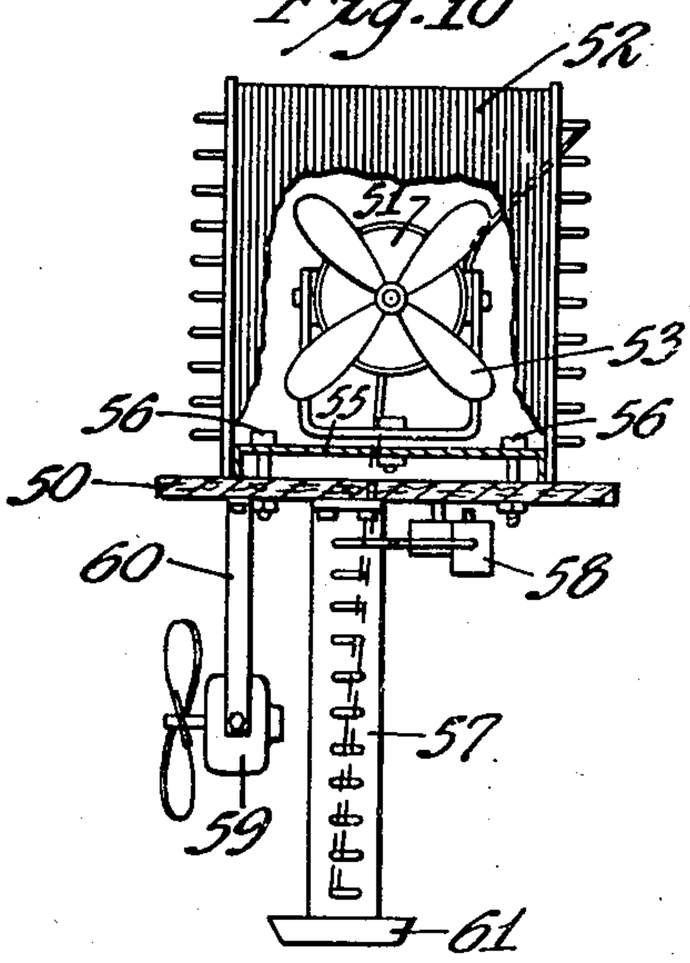
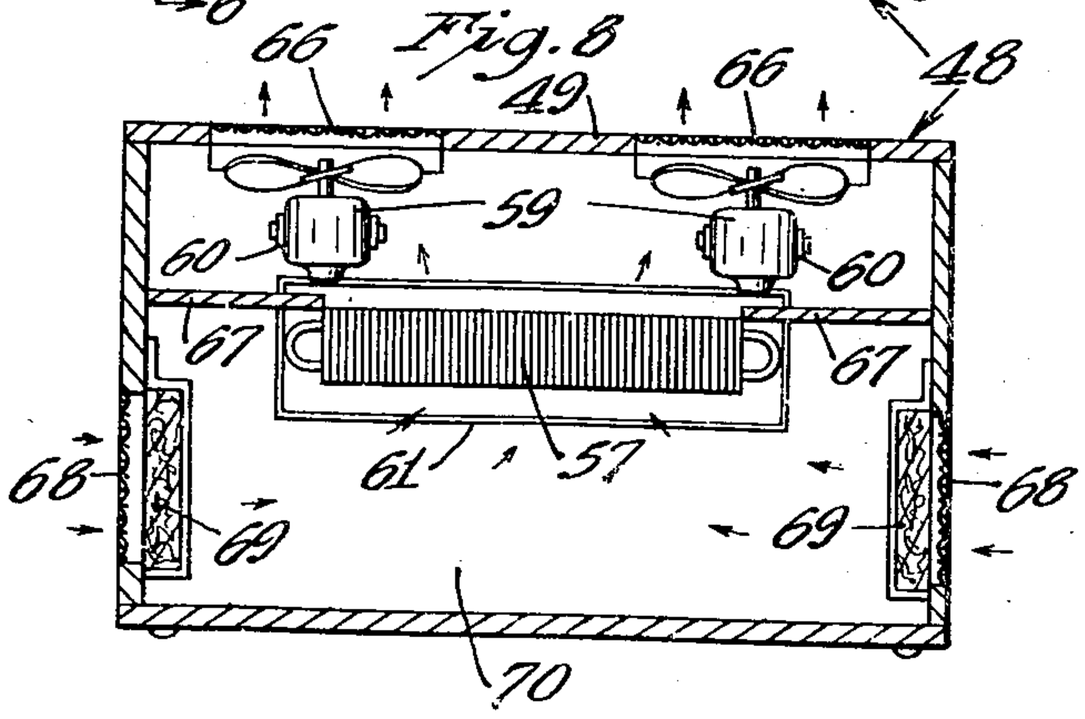


Fig. 8



INVENTOR.
Allen Trask
BY
Williamson & Williamson
ATTORNEYS

Oct. 25, 1949. A. TRASK 2,486,226

AIR CONDITIONING APPARATUS

Filed March 17, 1945

3 Sheets-Sheet 3

Fig. 11

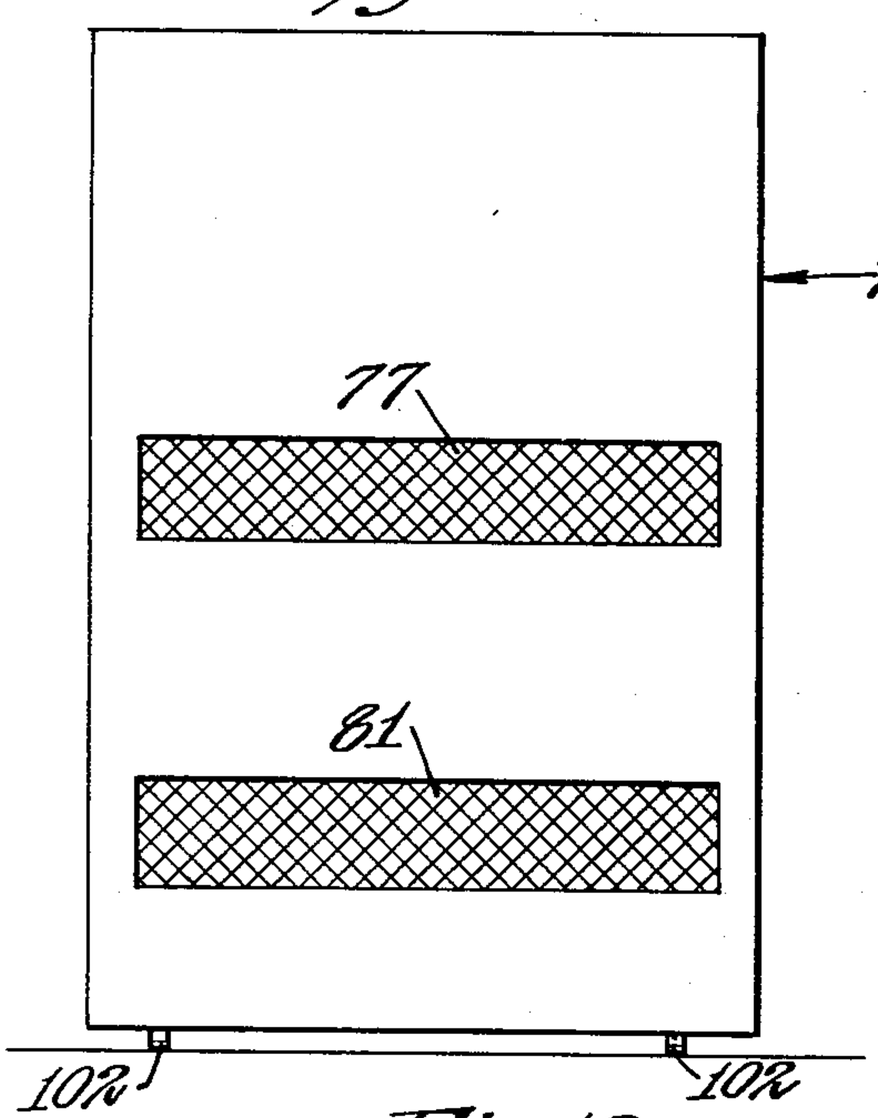


Fig. 12

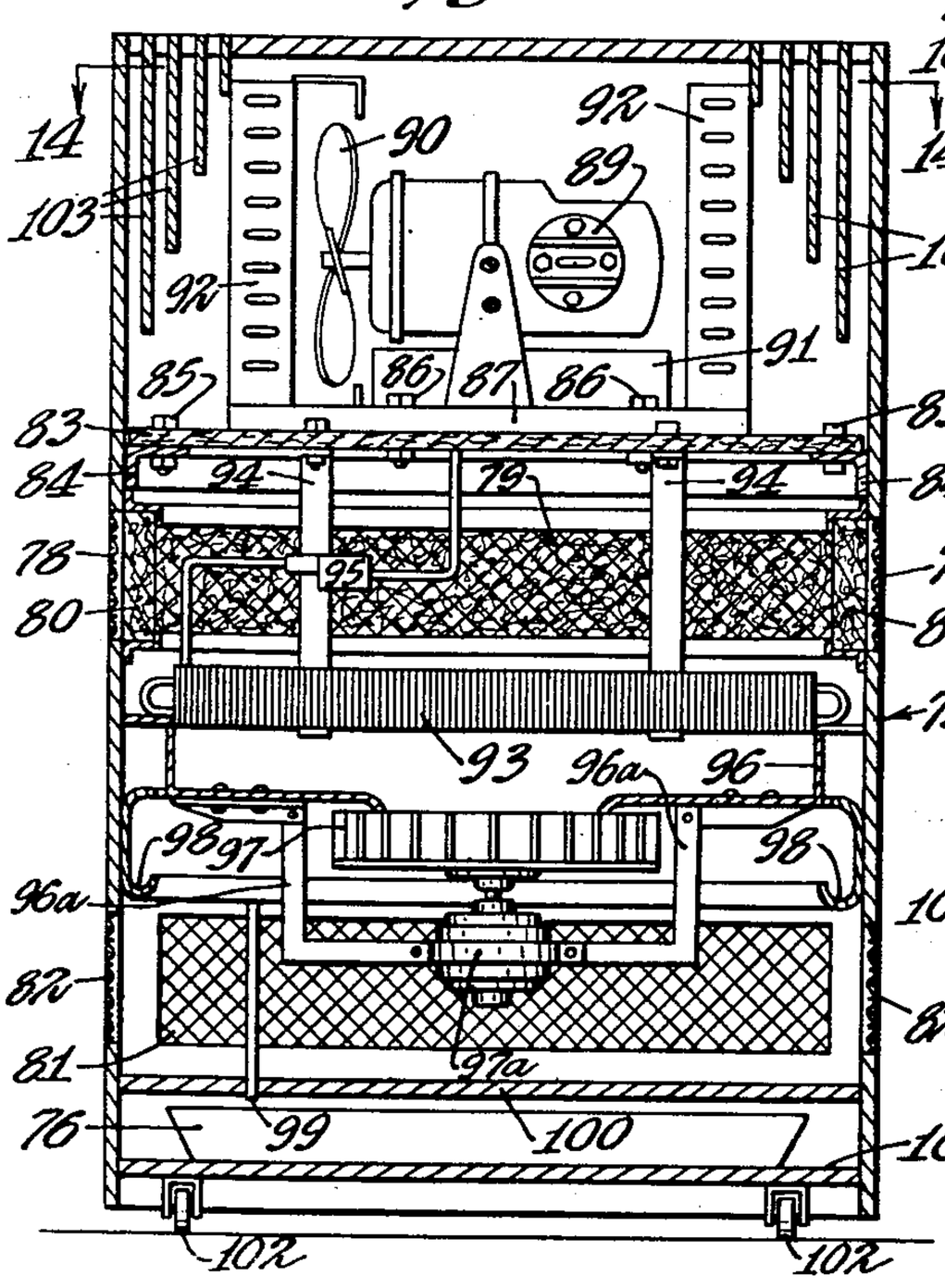


Fig. 13

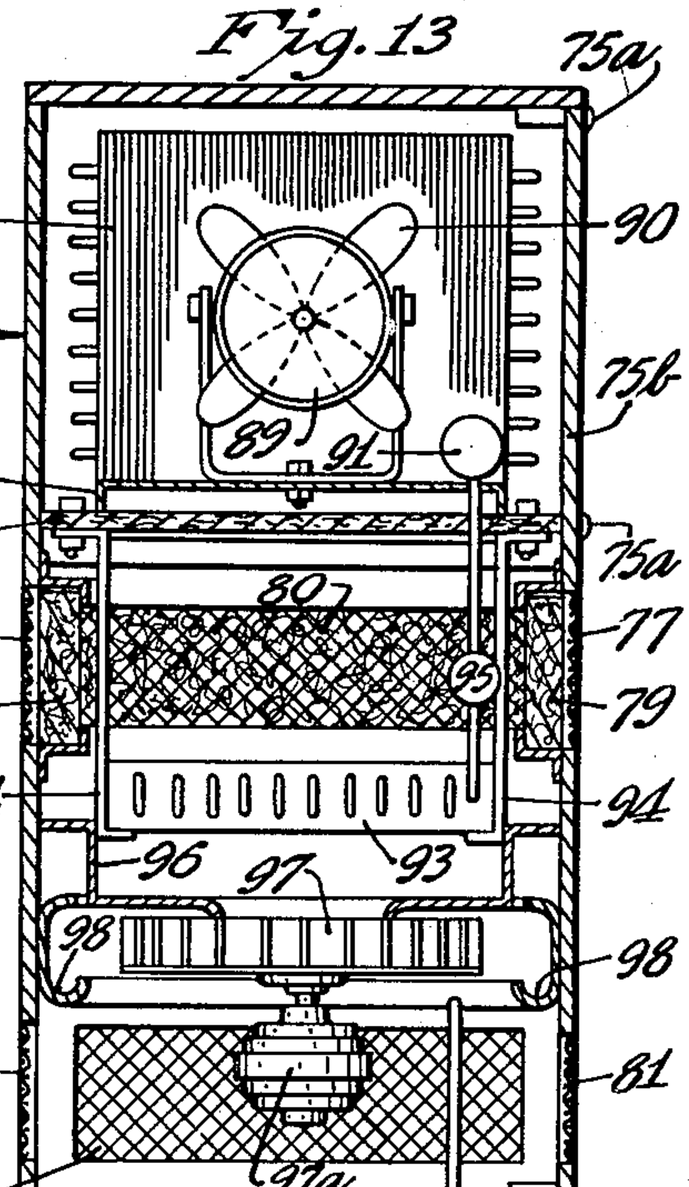
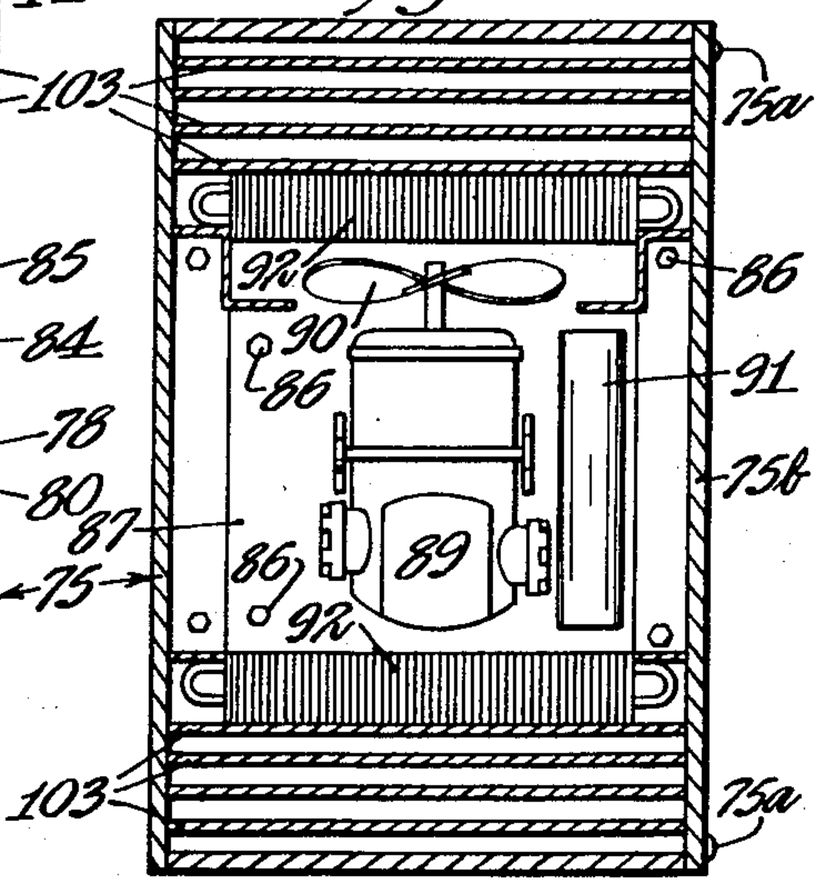


Fig. 14



INVENTOR.

Allen Trask

BY

Williamson & Williamson

ATTORNEYS

Patented Oct. 25, 1949

2,486,226

UNITED STATES PATENT OFFICE

2,486,226

AIR CONDITIONING APPARATUS

Allen Trask, Chicago, Ill.

Application March 17, 1945, Serial No. 583,232

9 Claims. (Cl. 62—129)

1

This invention relates to the self-contained portable type air conditioning units used for cooling and filtering the air of a room. More particularly it relates to air-cooled units of this type which extract heat from the lower air stratum of a room and reject that heat into the upper air stratum.

A principal object of this invention is the provision of an air conditioning unit adapted to incorporate a standard air-cooled condensing unit.

An important object of this invention is to provide a structure adapted to incorporate air-cooled condensing units in integral horsepower sizes.

Another object is to provide a structure with improved facility for production assembly, and for subsequent inspection and repair.

A further object is to provide a cabinet type unit in which the cabinet and its internal mechanism are each completely assembled as separate units.

Still another obect is the reduction of machine sound emanating from the air duct in the machine compartment.

Previous to this invention, the various types of self-contained air conditioners have been designed and manufactured as assemblies of conventional refrigeration machine elements within a cabinet. In these structures, standard condensing units are not used. Instead, the usual structure is assembled by the separate attachment of each refrigeration machine part to the cabinet, or its framework, whereupon the said elements are then connected functionally with belts, tubing, wires, etc. Then after a special, individual assembly of the complete mechanism is made within the cabinet, or its framework, the final operating test is made. In these conventional structures, the required components of standard condensing units such as compressors, motors, condensers, receivers, shut-off valves, etc. are mounted and secured separately in special individual relationships as designed to fit their respective cabinet structures.

Standard condensing units comprising the above listed elements assembled in compact functional relationship ready for operation as a unit are manufautured and sold to the refrigeration industry for a wide variety of applications. Standard condensing units have been assembled

2

into other self-contained refrigeration machines previous to this invention, but never before has a self-contained, air-cooled portable air conditioner been made to incorporate a standard air-cooled condensing unit.

This invention originates the completely portable air-cooled unitary air conditioner comprising a standard air-cooled condensing unit. This is an important advantage, particularly to manufacturers of unitary air conditioners who do not manufacture refrigeration compressors or condensing units, because these manufactureres may then purchase as a complete mechanical unit the several essential refrigeration elements, assembled, tested, and guaranteed ready for assembly, as a single unit in the air conditioner. It is also an advantage to the manufacturer of standard condensing units, for it eliminates the additional expense and duplication of assembly effort that would otherwise be required if a special assembly of standard condensing unit elements were made within the framework or cabinet of each model of portable air conditioner.

Standard condensing units carry the advantage of having been tested and approved by the Underwriters' Laboratories, Incorporated, as a guarantee of conformance to the insurance underwriters standards of safety. When a condensing unit so approved is assembled into an air conditioner, the air conditioner then carries the guaranteed standard of quality of the mechanism within, since the condensing unit is the fundamental mechanism of the air conditioner. This is a self-evident advantage that has not heretofore been obtained in air-cooled unit air conditioners.

This invention originates the practical application of integral horsepower air-cooled condensing units to portable unitary air conditioners. Previous to this invention, air conditioners of this type required permanent cooling air duct connections to outside air, which precluded portability. The heat dissipation surface required in the condensers of one, two, and three horsepower condensing units for air conditioning is so large that this invention was necessary to make units of this size completely self-contained and independent of external air duct connections. For industrial applications, and installations within large offices, which require integral

horsepower air conditioners positioned far from any outside wall of a large room, this invention offers the important advantage of eliminating the requirement of specially installed cooling air ducts.

This invention includes the structure of an air conditioner cabinet wherein the entire internal mechanism is assembled on, and attached to, one horizontal cabinet partition which is readily assembled in, and removed from, the cabinet. On the upper side of this removable partition, a standard air-cooled condensing unit is assembled, on the under side is assembled the cooling coil and its air circulating fan. This complete assembly is made on the partition as a unit, outside of the cabinet, on a separate assembly line, where it is operated and tested, and then assembled within the cabinet as the final operation. This structure provides a great improvement in the facility of assembly over that of the air conditioners which require the mechanism assembly to be made within the confines of a cabinet structure. In quantity production it is a disadvantage to be required to make complicated assemblies within the confines of an enclosing framework or cabinet. Final inspection and testing are made more difficult and less efficient by the concealing of the mechanism within a cabinet. Subsequent repairing is also greatly handicapped. This invention eliminates these difficulties and handicaps by making possible the complete functioning mechanism assembly on a flat horizontal member, unobstructed from all sides as well as the top and bottom.

The structure in this invention which provides for the cabinet to be completely fabricated and assembled as a unit, and likewise the internal mechanism to be completely assembled and functionally tested as a unitary structure, is a great improvement over the types of air conditioners which cannot be so assembled into two unitary structures before being finally joined as one. In quantity production of this invention there is one assembly line for complete mechanisms, and one for each type of cabinet. Identical mechanisms may be assembled into cabinets of different materials, different finishes, and different sizes. For instances, the ⅓ horsepower mechanism may be assembled into an expensive polished mahogany cabinet for a luxurious living room, or it may be assembled into a low-priced metal cabinet for cooling partitioned office enclosures in a large factory. Another advantage of this structure is the facility with which the mechanical unit may be replaced by servicemen who bring a replacement unit for exchange. The unitary air conditioners built previous to this invention do not have these advantages.

The assembly line arranged for assembling the mechanical unit of this invention may comprise two parallel conveyor chains on horizontal tracks spaced to accommodate two opposite sides of the cabinet partitions to which the condensing unit, cooling coil, and other mechanism parts are assembled. The tracks may be fixed at such height that a workman may in a standing position assemble the condensing unit on top of the partition, and a workman in a seated position may be at a convenient position to assemble the cooling coils, expansion valves, fans, etc., which are attached to the lower side of the partition. This method of assembly is readily applicable to a production of 200 or more complete air conditioner mechanisms per day. A large production

capacity of these units is highly desirable because of the seasonal nature of the market demand. It is sometimes desirable to concentrate a year's production into the few months that meet the purchasers' orders.

In the air conditioner structures prior to this invention, of the type which maintain a cool stratum of air in the lower part of a room while discharging the heat extracted therefrom into the upper stratum of the room, no special provision is made for preventing the operating sound from freely escaping from the air ducts through which cooling air is circulated to the compressor compartment. It is very desirable to construct machines of this type to have a minimum of running sound outside of the unit. This invention gains the advantage of much sound reduction through the use of a series of flat pieces of sound absorbent material spaced parallel in each cooling air duct of the air conditioner, and parallel to the desired direction of air flow. The structure of this invention thereby attains quieter operation than do the other structures of this type of air conditioner that are known to the art.

The above and other objects and advantages of the invention will more fully appear from the following description made in connection with the accompanying drawings, wherein like reference characters refer to the same parts throughout the views, and, in which:

Figure 1 is a sectional view of an air conditioning unit of this invention taken approximately on line 1—1 of Figure 2;

Figure 2 is a top view with part of the cabinet top removed to show a standard belted type condensing unit;

Figure 3 is a horizontal cross sectional view taken approximately on the line 3—3 of Figure 1;

Figure 4 is a rear view of the unit air conditioner of Figures 1, 2 and 3 with the back cover removed;

Figure 5 is the complete operating mechanism assembly of Figures 1, 2, 3 and 4 ready for insertion within a cabinet;

Figure 6 is a vertical sectional view taken approximately on the line 6—6 of Figure 7, of an air conditioning unit using a direct connected type of condensing unit with an integral motor-compressor unit;

Figure 7 is a top view of the structure in Figure 6 with part of the cabinet top removed to show the condensing unit;

Figure 8 is a horizontal cross sectional view taken approximately on line 8—8 of Figure 6. Figure 8 is similar to Figure 3 except that two fan units for circulating cool air are shown instead of one as shown in Figure 3;

Figure 9 is a rear view of the air conditioning unit shown in Figures 6, 7 and 8, with the back cover removed;

Figure 10 is an elevation of the complete mechanism of Figures 6, 7, 8 and 9 ready for assembly within a cabinet;

Figure 11 is a front view of the cabinet of larger capacity air conditioning unit constructed in accordance with this invention, the inlet and outlet grills for the circulation of a cool air stratum being shown;

Figure 12 is an elevation view, with the rear wall of the casing broken away, of the unit of Figure 11, showing a larger standard condensing unit with two condensers connected in counterflow series in the cooling air path;

Figure 13 is an elevational view, with the cas-

ing broken away, of the structure in Figure 12 taken at a right angle thereto; and

Figure 14 is a horizontal cross sectional view taken approximately on the line 14—14 of Figure 12.

In Figures 1, 2, 3, 4 and 5 is shown one embodiment of the invention. A cabinet 15 is provided with a removable back panel 16 and a removable horizontal partition 17, which is secured to cabinet 15 by bolts 18 extending through an angle iron unit 19 mounted inside the cabinet 15. On the upper side of partition 17 is a base 20 of a standard condensing unit of the belted type. The condensing unit is secured to the partition 17 by bolts 21. It comprises a compressor 22, motor 23, pulley 24 and pulley 25, belt 26, fan 27, receiver 28, and condenser 29.

To the under side of the partition 17 is secured a cooling coil 30 by means of bolts 31, and an expansion valve 32. An electric fan 33 is secured also to the partition 17 by means of a bracket 34. A shallow pan 35 is attached to the cooling coil 30 for collecting condensed water vapor.

A fan shroud 36 provided with an opening collar 37 is attached to the condenser 30 and partition 17 to cause the air drawn by the fan 33 to pass through the cooling coil 30. A shroud 36, as shown attached in Figure 5 to a complete air conditioner mechanism, makes it possible to test the mechanism as shown outside of its cabinet. The shroud 36 may be assembled temporarily for purposes of testing the mechanism in the absence of the cabinet which may be constructed to function as a fan shroud, or it may be included as a permanent part of the mechanism structure for the purpose of facilitating subsequent inspection and testing of an exposed mechanism.

In each side of the cabinet 15 is a cool air intake grill 38, behind which is a replaceable type air filter 39. The air to be cooled enters grills 38, passes through filters 39, and the cooling coil 30 to replace the cooled air discharged from the cabinet by the fan 33. The cabinet 15 is provided with a front opening including a grill 40 so located as to register with the shroud collar 37, when the complete mechanism shown in Figure 5 is assembled into the cabinet 15. The cooled air is discharged by the fan 33 through this front opening of the cabinet as indicated by the air flow arrows.

The upper portion of the cabinet back panel 16 is provided with an opening including a grill 41 in register with the condenser 29, which provides the air inlet for cooling air for the condenser 29 and the entire mechanism of the standard condensing unit. In the top of the cabinet shown in Figures 1 and 2, is a plurality of narrow openings spaced by a corresponding number of flat, parallel pieces 42 of sound absorbing material such as "Celotex." The pieces 42 are spaced to provide openings for the discharge of cooling air that has been drawn through the condenser 29 by the condensing unit fan 27. The direction of cooling air flow is indicated by arrows. The parallel pieces 42 serve dual purposes of, first, sound absorption to reduce the amount of mechanism operating sound leaving the cabinet, and, second, to direct the expelled, warmed air vertically to the upper air stratum of the room in which the air conditioner is operating.

The parallel pieces 42 are constructed of varying widths extending vertically into the condensing unit compartment of the cabinet. The narrowest width is closest to the air inlet grill 41

and condenser 29, and the series of succeeding pieces are of progressively increased width. This structure comprises a strong inherent tendency for equalizing the volumes of air flowing from each narrow aperture between the parallel pieces 42.

The cabinet 15 is provided with a base 43, for enclosing the bottom of the cooling coil compartment above it. The back panel 16 has its lower end at a junction with the base 43. A sub-base 44 is under the base 43 providing a space for a water pan 45. To the sub-base 43 are attached casters 46 for facilitating portability of the air conditioning unit. A short vertical tube 47 opening into the pan 35 provides passage for condensate from the pan 35 to the pan 45. The pan 45 may be freely removed for periodic emptying.

In Figures 6, 7, 8, 9 and 10 a second embodiment of the invention is shown, which comprises a different type of a standard condensing unit. In each of these five figures like numerals refer to like parts.

A cabinet 48 is provided with a removable rear panel 49 and a horizontal partition 50. A standard condensing unit comprising a direct connected integral motor-compressor unit 51, condenser 52, fan 53 for circulating cooling air, and receiver 54 mounted on a base 55 is assembled on top of the partition 50 and secured by bolts 56.

On the under side of the partition 50 is secured a cooling coil 57, expansion valve 58, and two cool air circulating fans 59, secured by brackets 60. A shallow pan 61 is secured to the bottom of the coil 57 for collecting water vapor condensate.

Two angles 62 are permanently attached to the inside surface of the side panels of the cabinet 48, for the purpose of supporting and securing the partition 50 within the cabinet. The parts shown in Figure 10 are assembled as shown to the partition 50 outside of the cabinet. The complete, functionally operable mechanism assembly shown in Figure 10 is then assembled into the cabinet 48 with its rear panel 49 removed by sliding it onto the angles 62 and locating the assembly as shown in Figure 9. The mechanism is secured within the cabinet by means of bolts 63 securing the partition 50 to the angles 62.

In the top of the cabinet 48 shown in Figures 7 and 9, at each end is a plurality of narrow openings spaced by a corresponding number of substantially vertical, flat, parallel pieces 64 and 65 of sound absorbing material such as "Celotex." The pieces 64 are spaced to provide openings for the entrance of cooling air drawn by the fan 53 into the cabinet for the cooling condenser 52 and motor-compressor unit 51. The pieces 64 are of progressively increased width with the narrowest piece closest to the condenser for the dual purpose of equalizing the distribution of cooling air to the surface of the condenser 52, and for absorbing sounds of the operating mechanism.

The sound absorbing pieces 65 are spaced to provide openings for the discharge of cooling air that has been drawn in between the pieces 64, through the condenser 52 and over the motor-compressor unit 51. These pieces are also of progressively increased width with the narrowest piece closest to the condenser, but are arranged thus in width and spacing for the dual purpose of first, sound absorption to reduce the amount of mechanism operating sound leaving the cabinet, and second, to direct the expelled warm air vertically to the upper air stratum of the room in which the air conditioner is operating.

In the cool air chamber of the cabinet 48 under

the partition 50, the two fans 59 register with cool air discharge grills 66 in the front panel of the cabinet 48. A plurality of cool air circulating fans provide for the circulation and distribution of a larger cool air stratum than can be circulated and distributed by a single fan. Partitions 67 are positioned and secured between the walls of the cabinet and the ends of the condenser 57 for the purpose of causing all cooled air drawn into the cabinet by fans 59 to be directed through the condenser 57.

The side panels of the cabinet 48 are provided with cool air intake grills 68 behind which are removable air filters 69 for filtering the dust particles from the cool air stratum of a room as it is circulated by the fans 59.

Similar to the air conditioner shown in Figures 2 and 4, the embodiment of this invention shown in Figures 6 and 9 is provided with a base 70 for enclosing the bottom of the cooling coil compartment above it. The back panel 49 has at its lower end a junction with the base 70. A sub-base 71 is under the base 70 providing a space for a water pan 72. To the sub-base 71 are attached casters 73 for facilitating portability of the air conditioning unit. A short vertical tube 74 opening into the pan 61, provides passage for condensate from the pan 61 to the pan 72. The pan 72 may be freely removed for periodic emptying.

Figures 11, 12, 13 and 14 show a third embodiment of this invention which is particularly applicable to the integral horsepower sizes of air-cooled refrigeration condensing units. In all four figures, like numerals indicate like parts.

Figure 11 shows the outside front view of a cabinet 75 enclosing the mechanism of a self-contained air conditioner. The rear view is practically identical except for screws 75*a* holding the removable rear panel 75*b* in place, and an opening beneath the lower panel for accessibility to a condensate collection pan 76.

Identical cool air intake grills 77 are in the front and rear panels of the cabinet, and also there are similar identical cool air intake grills 78 on each side of the cabinet. Behind the front and rear intake grills 77 are air filters 79, and behind the grills 78 are air filters 80. At the lower part of both the front and rear of the cabinet are cool air discharge grills 81, and at the lower part of the side panels of the cabinet are similar cool air discharge grills 82. Thus it will be seen that this embodiment of the invention is adapted for circulating the lower stratum of cooled air in a room by drawing air in on all four sides of the cabinet and discharging it also on all four sides of the cabinet at once. When this type of unit is centrally located in a large room it will provide substantially equal cool air circulation in the lower air stratum of the entire room.

In the interior of the cabinet 75 is a horizontal removable partition 83 mounted on angles 84 which are permanently secured to the side panels of the cabinet. The partition 83 is secured in its assembled position by bolts 85. In its assembled position it divides the inside of the cabinet 75 into an upper chamber through which the condenser cooling air is circulated, and a lower chamber through which air to be cooled is circulated.

On the upper side of the partition 83 a standard unitary condensing unit is secured by means of bolts 86 through its base 87. The condensing unit includes a motor-compressor unit 89, fan 90, receiver 91, and two condensers 92 mounted on the base 87. On the lower side of the partition 83 is suspended a cooling coil 93 by means of brackets 94. An expansion valve 95 meters refrigerant from the receiver 91 to the cooling coil 93. A pan 96 is attached to the coil 93 to cause the air entering the grills 77 and 78 to flow through the coil 93.

A centrifugal fan 97 driven by a motor 97*a* is disposed beneath a circular opening centrally located in the pan 96, and arranged to draw air through the coil 93 and discharge it through the grills 81 and 82. Condensate falling from the coil 93 either falls into the fan 97, or is directed there by the pan 96, from which it is thrown by centrifugal force to a trough 98 which extends around the inside of the cabinet 75. From the trough 98 condensate is drained through a tube 99 to the condensate pan 76. In an optional installation drain the tube 99 may be connected directly to a permanent external drain pipe (not shown). The fan motor 97*a* is suspended from and attached to pan 96 by brackets 96*a*. A sub-base 101 provides a chamber for the condensate pan 76 and to it are attached casters 102.

At each end of the top panel of the cabinet 75 is shown an opening including four vertical flat pieces 103 of sound absorbing material such as "Celotex." These pieces are spaced to make slotted openings for the inlet and outlet of air for cooling the condensers 92 and the motor-compressor unit 89 similar to those shown in Figure 9. The fan 90 draws cooling air into the left hand opening shown at the top of the cabinet in Figure 12, through the left hand condenser 92, and blows it out over the right hand condenser 92 which is connected in the refrigerant circuit in counter-flow series with the first condenser so that the refrigerant flows between the condensers in a direction opposite to the air flow through them.

In the third embodiment of this invention shown in Figures 11, 12, 13 and 14 the entire refrigeration and air circulating system, with the exception of the fan 97 and its motor 97*a*, is attached to the removable partition 83, to which it is assembled and tested in a factory assembly line before it is assembled as a unit within the cabinet 75.

It will, of course, be understood that various changes may be made in the form, arrangement, proportions and details of the various parts without departing from the scope of my invention.

What I claim is:

1. In air conditioning apparatus, a casing having an upper air inlet and outlet and a lower air inlet and outlet, a mounting panel adapted to be removably supported in said casing, a condenser-evaporator air cooling assembly carried by said mounting panel and capable of being installed in and removed from said casing as a substantially fully assembled unit, the condensing unit portion of said air cooling assembly being mounted on one side of said mounting panel, the evaporator portion of said air cooling assembly being mounted on the other side of said mounting panel, said mounting panel constituting a partition dividing said casing into two compartments and being located between said upper and lower air inlets and outlets, and said lower air inlet being disposed above said lower air outlet, and said upper inlet and outlet being directed upwardly.

2. In air conditioning apparatus, a casing having an upper air inlet and outlet and a lower air inlet and outlet, a mounting panel adapted to be removably supported in said casing, said mounting panel being located between said upper air inlet and outlet and said lower air inlet and

outlet for dividing said casing into upper and lower compartments, said upper air inlet and outlet being located in the upper portion of said upper compartment, a condenser coil mounted on the upper side of said mounting panel, a fan mounted on the upper side of said mounting panel and adapted to produce a flow of air from said upper air inlet through said condenser coil to said upper air outlet, an evaporator coil mounted on the under side of said mounting panel and depending therefrom in a generally vertical position, and a fan unit mounted on the under side of said mounting panel and adapted to produce a flow of air from said lower inlet through said evaporator coil to said lower outlet, and said mounting panel, condenser coil, fan unit and evaporator coil being entirely insertable in and removable from said casing as an assembled unit.

3. In air conditioning apparatus, a casing having an upper air inlet and outlet and a lower air inlet and outlet, a mounting panel removably supported in said casing between said upper air inlet and outlet and said lower air inlet and outlet and dividing said casing into two compartments, a condenser coil mounted on the upper side of said mounting panel, a fan mounted on the upper side of said mounting panel and being adapted to produce a flow of air from said upper air inlet through said condenser coil to said upper air outlet, said lower air inlet and outlet being located one above the other, an evaporator coil mounted on the under side of said mounting panel and being disposed substantially horizontally across said casing between said lower air inlet and outlet, and a fan for producing a flow of air from said lower air inlet through said horizontal evaporator coil to said lower air outlet, and said mounting panel, condenser coil, fan unit and evaporator coil being entirely insertable in and removable from said casing as an assembled unit.

4. In air conditioning apparatus, a casing having an upper and a lower compartment, an air cooled refrigerant condensing unit in said upper compartment, said upper compartment having an air inlet opening and an air outlet opening therein, and sound deadening material adjacent to and in the line of air flow through said outlet opening to reduce the emission of sound from said condensing unit through said outlet opening, and said sound deadening material being arranged to direct the flow of air outwardly in a substantially vertical direction.

5. In air conditioning apparatus, a casing, a fixed support in said casing, a mounting panel adapted to be removably supported in said casing by said fixed support, a condenser evaporator air cooling assembly carried by said mounting panel, the condensing unit portion of said assembly being mounted on one side of said mounting panel, the evaporator portion of said assembly being mounted on the other side of said mounting panel, said mounting panel constituting a partition dividing said casing into upper and lower compartments, each having an air inlet and an air outlet, said air outlet in said upper compartment being directed substantially vertically upwardly through a first opening in the top of said casing and said air inlet being directed downwardly in substantially a vertical direction through a second opening in the top of said casing.

6. In air conditioning apparatus, a casing having an upper air inlet and outlet and a lower air inlet and outlet, a mounting panel supported in said casing, a condenser-evaporator air cooling

assembly carried by said mounting panel and capable of being installed in and removed from said casing as a substantially fully assembled unit, the condensing portion of said air cooling assembly being mounted on one side of said mounting panel, the evaporator portion of said air cooling assembly being mounted on the other side of said panel, said panel constituting a partition dividing said casing into two compartments and being located between said upper and lower air inlets and outlets, said upper inlet and outlet being directed substantially vertically through openings in the top of said casing.

7. In air conditioning apparatus, a casing having an upper air inlet and outlet and a lower inlet and outlet, a removable, substantially horizontal mounting panel securable for support within said casing, a condenser-evaporator air cooling assembly secured to and supported by said mounting panel, the condensing portion of said air cooling assembly being mounted on one side of said panel, and the evaporator portion of said air cooling assembly being mounted on the other side of said panel, said panel constituting a partition dividing said casing into upper and lower compartments, and being located between said upper and lower inlets and outlets, said upper inlet and outlet being formed in the upper portion of said upper compartment, said mounting panel with said condenser-evaporator air cooling assembly supported therefrom, forming an assembled unit bodily insertable into and removable from said casing.

8. In air conditioning apparatus, an upstanding, generally rectangular casing, a removable mounting panel securable for support horizontally within said casing and dividing the interior of said casing into an upper compartment and a lower compartment, a condenser unit including a condenser coil and fan secured to and supported by said mounting panel and disposed within one of said chambers, an evaporator unit including an evaporator coil and fan secured to and supported by said mounting panel and disposed within the other of said chambers, said lower chamber having an air inlet and an air outlet cooperating with the fan in said lower chamber to draw air into said chamber and through the coil contained therein and to discharge such air exteriorally of said chamber, said upper chamber having an air inlet and an air outlet in the upper portions thereof constructed and cooperating with the fan disposed in said upper chamber to produce a flow of air downwardly from above said casing into said upper chamber and through the coil mounted therein and to discharge such air upwardly through said outlet above said casing, said mounting panel with said condenser unit and said evaporator unit secured thereto, constituting an assembly, bodily insertable into and removable from said casing.

9. In air conditioning apparatus, an upstanding, generally rectangular casing having an upper air inlet and an upper air outlet and having a lower air inlet and outlet, a generally horizontal mounting panel supported by said casing, and located between said two sets of inlets and outlets for dividing said casing into an upper compartment and a lower compartment, a condenser-evaporator air cooling assembly mounted within said casing with the condenser portion thereof being mounted in one of said compartments and with the evaporator portion of said assembly being mounted in the other compartment, at least one of said portions of said assembly being connected to and supported from said

panel, the portion mounted within said upper compartment including a fan for drawing air into said upper compartment and for discharging air treated in said upper chamber and said upper inlet and outlet being located in the upper portion of said upper chamber and constructed to cooperate with said fan to draw air downwardly from above said casing into said upper chamber and to discharge air in an upwardly direction above the top of said casing.

ALLEN TRASK.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
1,917,537	Melcher	July 11, 1933
1,964,845	Dietze et al.	July 3, 1934
2,047,169	Weiland	July 7, 1936
2,063,646	Whitesel	Dec. 8, 1936
2,161,667	Des Roches	June 6, 1939
2,286,491	Kucher	June 16, 1942