Feb. 24, 1953 A. R. HARRIS 2,629,235

AIR CONDITIONER EVACUATION DAMPER

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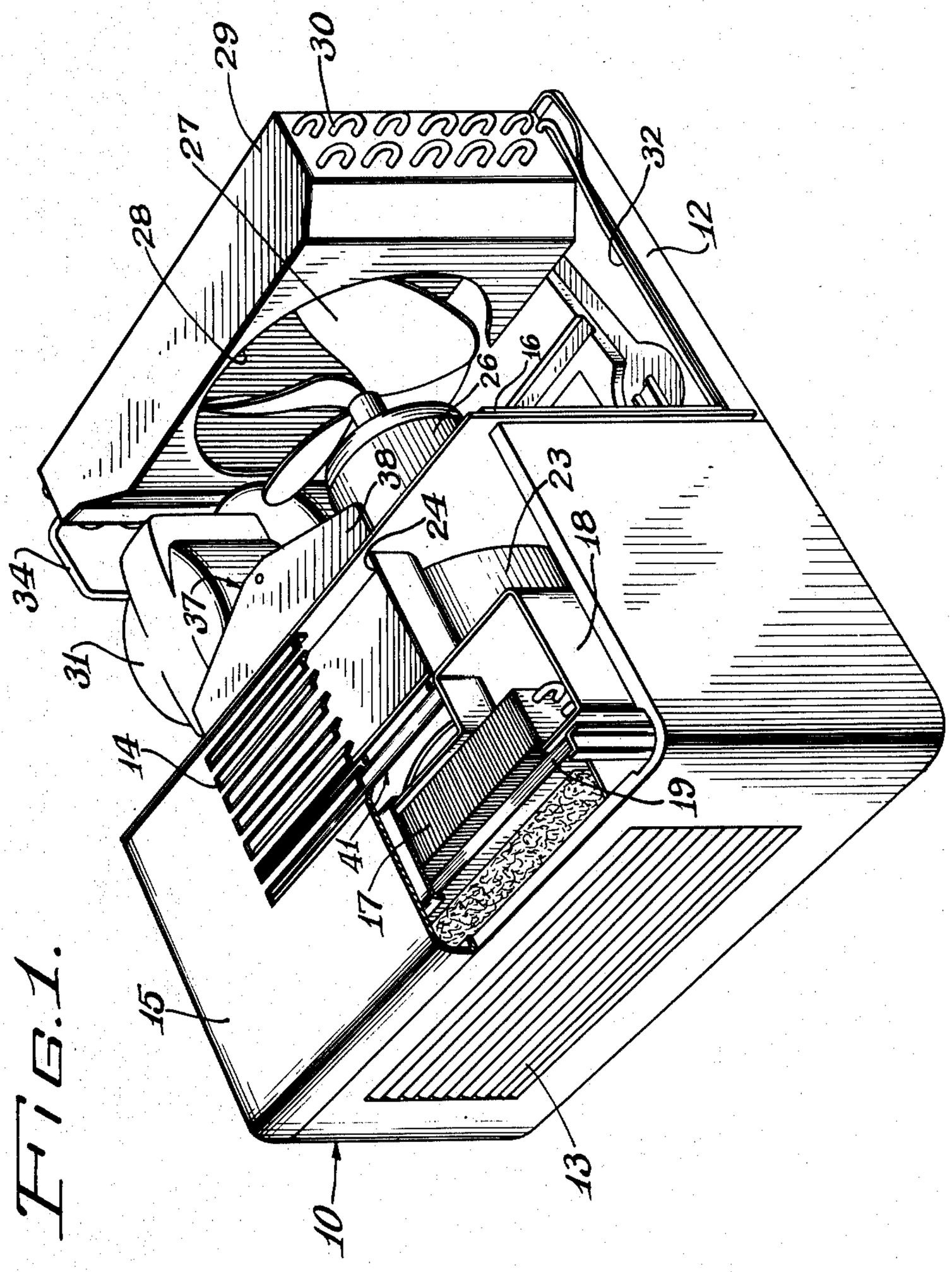

FIG. 1.

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FIG. 2.

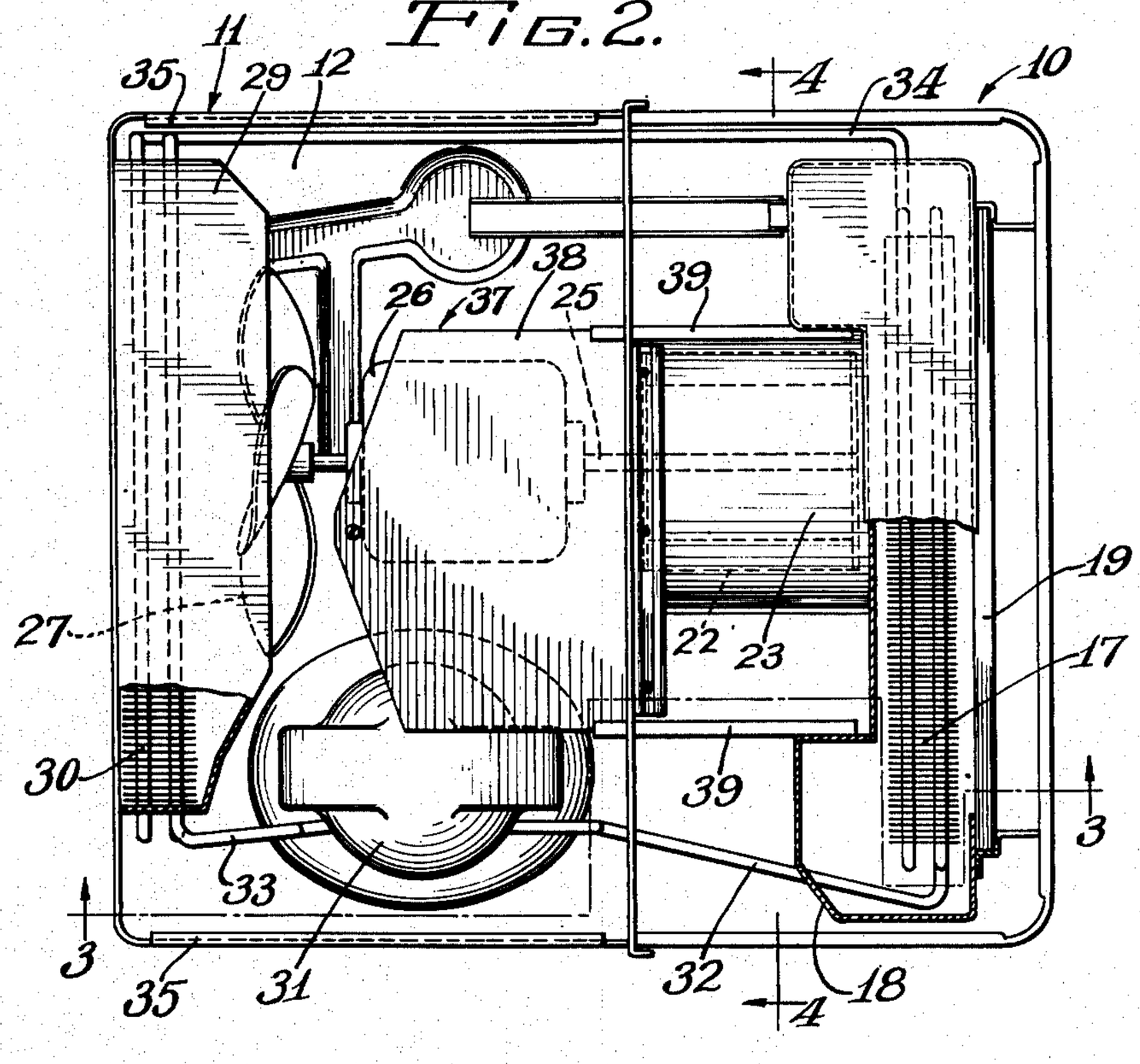

FIG. 3.

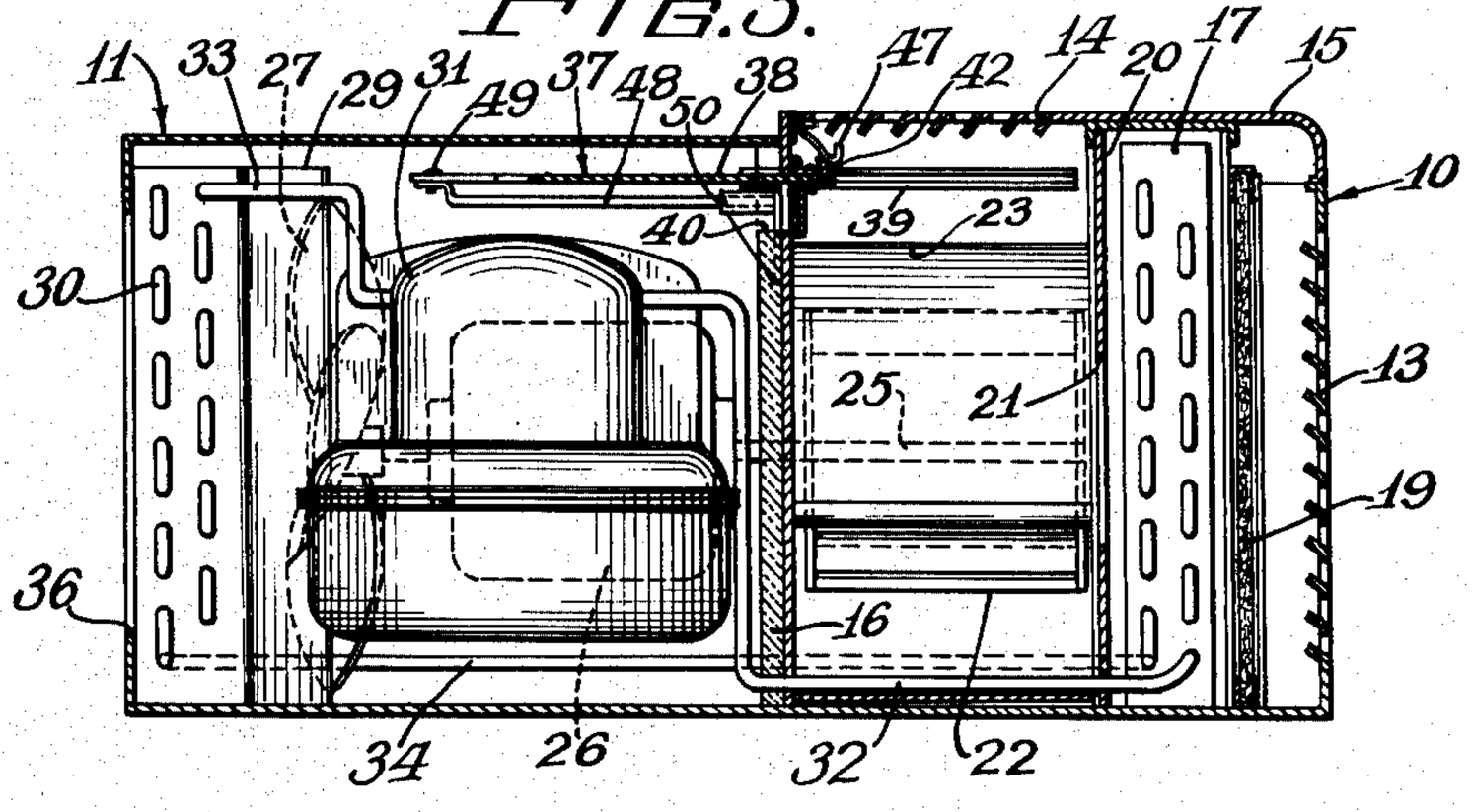

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FIG. 4.

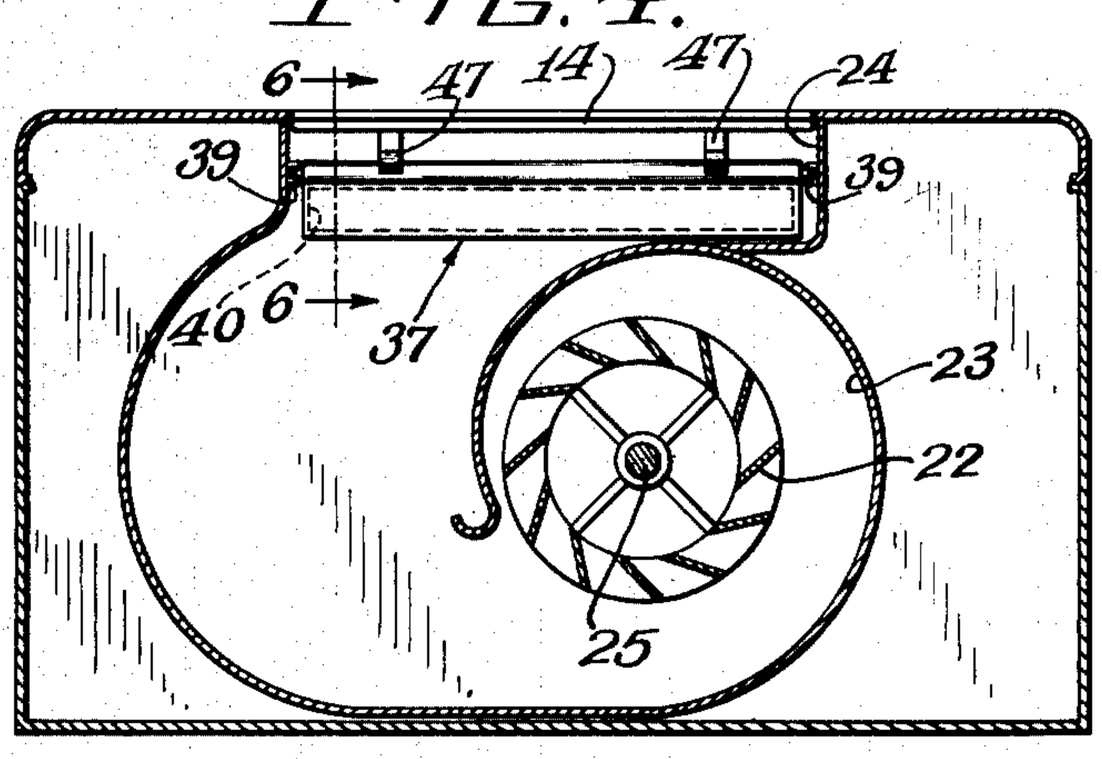


FIG. 5.

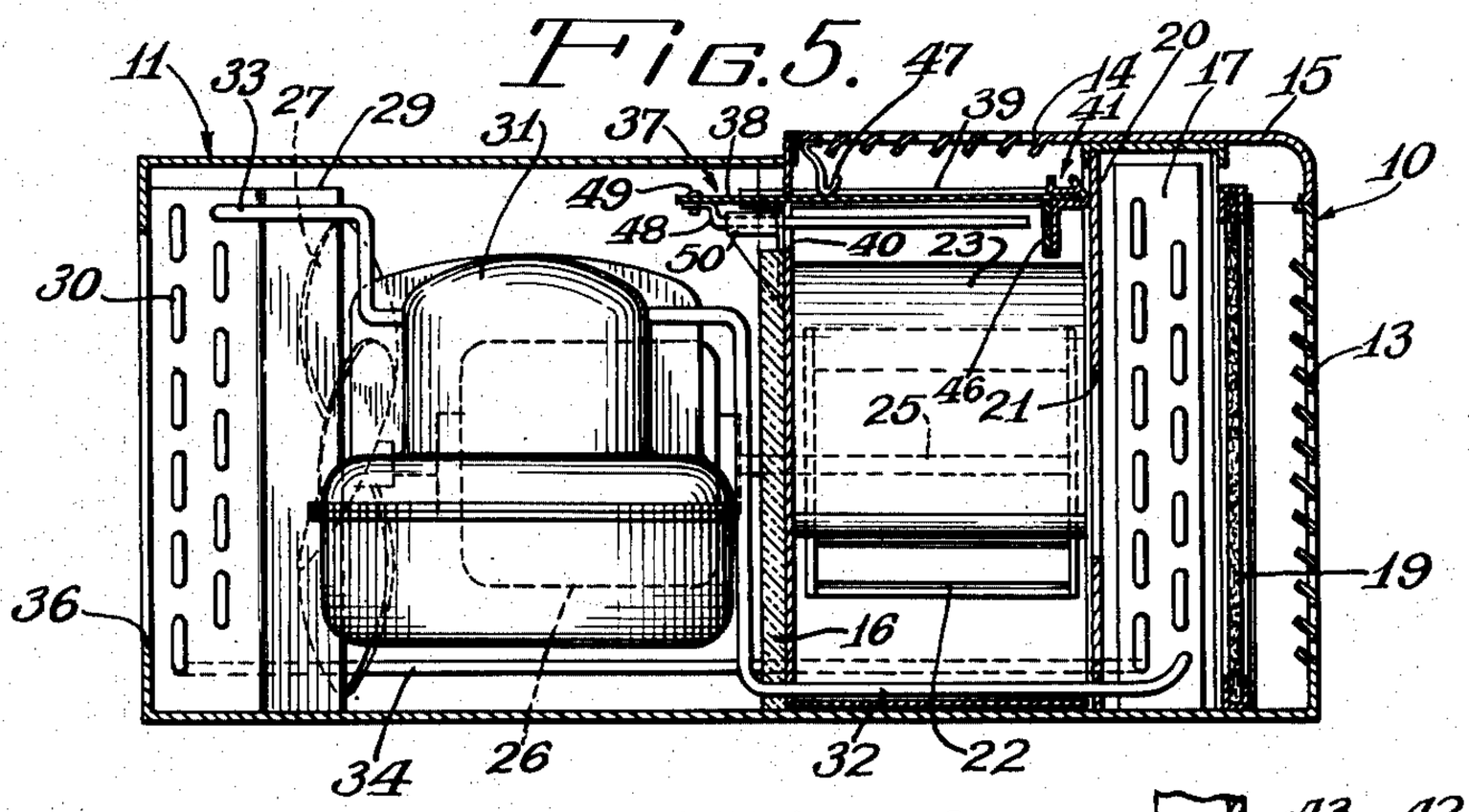


FIG. 6.

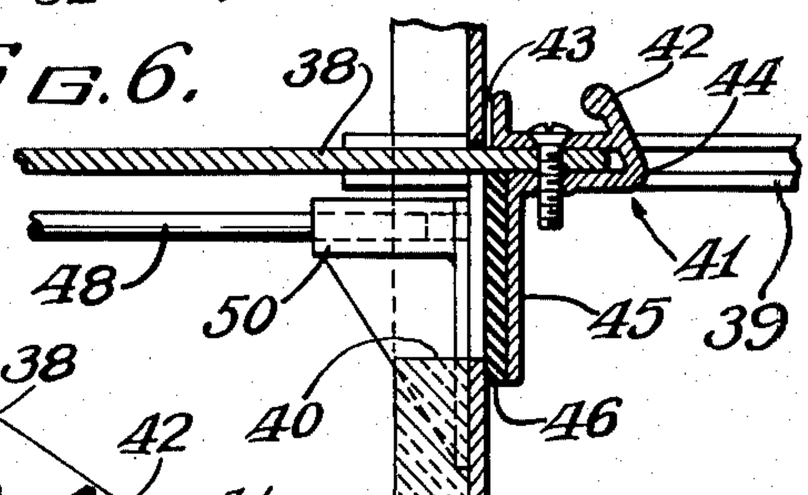
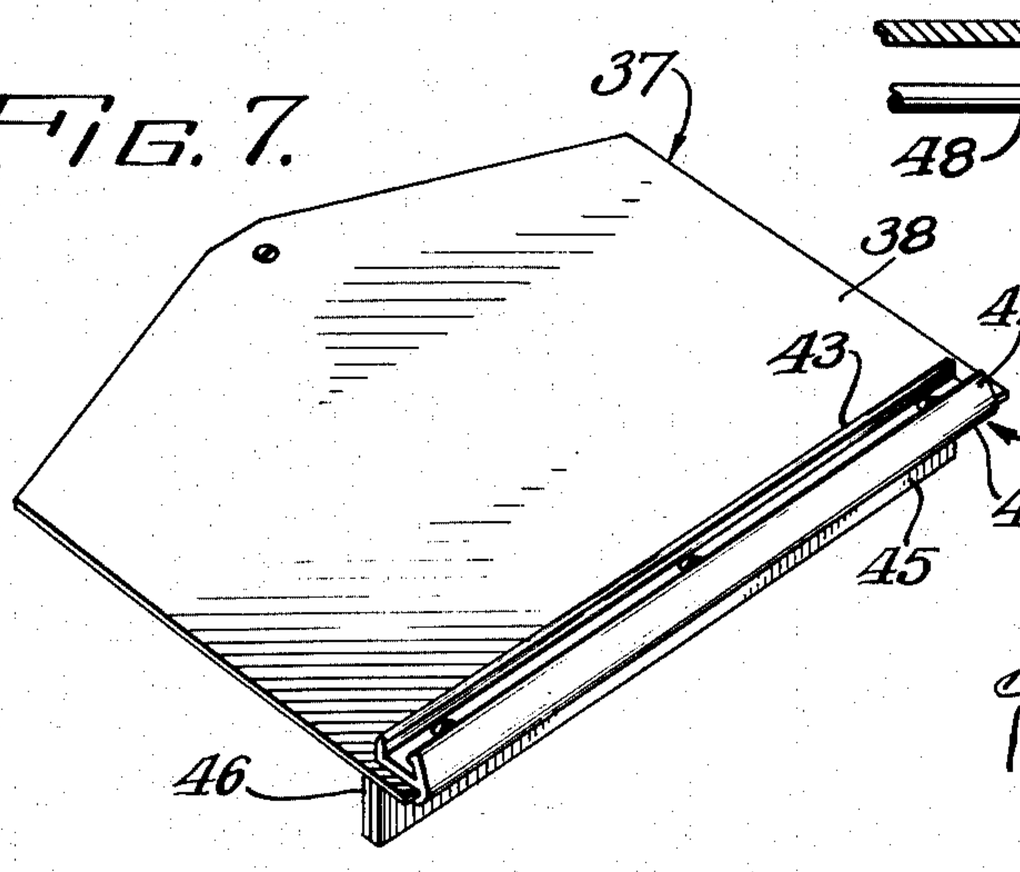


FIG. 7.



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AIR CONDITIONER EVACUATION DAMPER

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8 Claims. (Cl. 62—129)

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This invention relates to air conditioning apparatus of the portable unit type suitable for window mounting. More particularly, however, the invention is concerned with the ventilation aspects of a unit of this character, and specifically relates to an evacuation or pump-out damper readily adaptable for use with such apparatus.

In a modern room air conditioning unit the apparatus must be capable of properly conditioning, as well as cooling, air before such unit acquires an acceptable status. Since proper conditioning of the air within the room or space being cooled is frequently as important as the cooling thereof apparatus of this character is usually developed with this in mind. In order to accomplish proper conditioning of air the apparatus in such a unit, in addition to filtering, must be capable of: recirculating room air; supplying fresh make-up air in adjustable quantities; exhausting stale or foul air from the room to the outside; and varying the proportions, in almost unlimited degrees, of the amount of fresh or make-up air admitted with respect to the amount of stale or foul air evacuated or exhausted to the outside atmosphere, or with respect to that recirculated.

Heretofore, various arrangements and structures have been employed for the purpose of endeavoring to accomplish the foregoing objectives but such structures as have been utilized have not been entirely satisfactory. Many of these structures have been unduly complicated and costly to fabricate, thus making the overall cost of such units unnecessarily expensive. Furthermore, many prior air conditioning units, because of the complicated nature of the known ventilating mechanisms, were willing to forsake the advantages thereof and completely omitted means for accomplishing the most desirable ventilating objectives. On the other hand, some of the prior art structures provided means for admitting fresh or make-up air while neglecting to provide means for exhausting stale air to the outside atmosphere. This would seem to indicate that the importance of removing stale or foul air from a space being cooled has either been overlooked or neglected for reasons which are presently not completely understood. The complicated nature of the few structures heretofore provided would suggest that the additional costs introduced by the addition of ventilating means into such structures were not warranted. It is felt, however, that a suitable stale air exhausting means is now an essential

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component of a modern air conditioner, hence the present invention has for its principal object the provision of an air conditioner having a simple and inexpensively fabricated means therein for exhausting stale air from a space being conditioned.

Another object is to provide an air conditioning unit wherein the room air fan therein may either discharge air removed from the room being cooled to the outside atmosphere, or recirculate such air back into the room or space from which it was removed.

A further object is to provide in a window mounted air conditioner an evacuation damper that is adaptable for directing stale or foul air from a room being cooled to a condenser fan circuit from whence it may be discharged to the outside atmosphere.

A still further object is to provide a slidable damper disposed in the dividing wall of a window mounted air conditioner, that is adjustable so that in one position thereof the air removed from the room is discharged to the outside atmosphere, while in another position the room air is recirculated through said unit and back into the room.

A yet still further object is to provide a slidable damper, disposed in the dividing wall of a window mounted air conditioner, that is so adjustable as to permit recirculation of only a portion of the air removed from a room while the air so removed is simultaneously discharged to the outside atmosphere.

Another important object is to provide in a window-type air conditioner an inverted L-shaped damper that is slidably mounted in the dividing wall thereof and manually operable between positions which will either effect the recirculation of air through a room being cooled, or the discharge thereof into the outside atmosphere.

Other objects and advantages will be understood and will become more apparent from the following description when read in conjunction with the drawings in which:

Figure 1 is a perspective view, with portions thereof cut away, of an air conditioner provided with an evacuation damper in accordance with the present invention. In this view the unit is shown before mounting in the window box cabinet.

Fig. 2 is a top plan view, with the cover removed and with a portion of the evaporator housing removed, of an air conditioner equipped with the proposed damper.

Fig. 3 is a section taken on line 3—3 of Fig. 2 but slightly modified to show the unit as equipped with a cover.

Fig. 4 is a section taken on line 4—4 of Fig. 2 but slightly modified to show the unit as equipped with a cover.

Fig. 5 is a section similar to that of Fig. 3 but with the evacuation damper in its forward position so that recirculation of air is prevented and all air removed from the room is discharged to the outside atmosphere.

Fig. 6 is an enlarged fragmentary sectional view taken on line 6—6 of Fig. 4 and shows the damper and its mounting means in greater detail.

Fig. 7 is a perspective view of the evacuation damper constructed in accordance with the present invention. In this view the damper is shown removed from its operational environment.

By referring to the drawings it will be noted a portable-type air conditioner suitable for window mounting has been illustrated. Such unit usually includes an inner cabinet, indicated generally by the numeral 10, an outer window box cabinet 11 adapted for mounting in a window casing by suitable means, and a base structure 12 extending between said cabinets and upon which refrigerating apparatus may be mounted. The inner cabinet may have louvers 13 across an opening in the front wall thereof, as well as louvers 14 across a discharge outlet in a top-opening cover 15. The inner and outer cabinets are separated by an insulated dividing wall 16 through which portions of the refrigerating apparatus project for disposition on both sides thereof.

When a unit of this character is employed for cooling a room or similar space the unit is generally mounted in a window casing and, as is well understood, the inner cabinet portion thereof will project into the space being cooled while the window box portion will extend into the outside atmosphere. Since the means for mounting such a unit in a window is not essential to the present invention the details thereof have not been illustrated and no further description thereof will be made herein.

A refrigerant evaporator, indicated at 17, is spaced inwardly of the front wall louvered opening 13 and is enclosed in a shroud-like casing 18, one vertical wall of which is open to permit the insertion therein of a conventional air filtering screen 19. The rear wall 20 of said casing has an opening 21 therein that opens into the axial inlet of a sirocco-type blower 22, in turn, positioned within a volute scroll housing 23, the outlet 24 of which is in vertical alignment with the louvered opening 14 in said cabinet cover. The blower 22 is mounted on a shaft 25 that forms part of an electric driving motor 26 suitably mounted on the base 12. The opposite end of said shaft has a propeller-type fan 27 thereon that projects through an opening 28 in the shroud-like casing 29 which encloses a refrigerant condenser. Positioned to one side of said motor and suitably mounted on the base 12 is a conventional hermetically sealed refrigerant motor compressor unit 31. Conduit lines 32 and 33 are provided to connect said compressor unit, respectively, with the evaporator and condenser, while conduit 34 joins the condenser and evaporator, for transmitting refrigerant therebetween as is well understood in the art.

The window box cabinet 11 may have louvered openings 35 in the side walls thereof for admitting air from the outside atmosphere for cooling portions of the refrigerating apparatus. The air so admitted is circulated over the motor-compressor 31 and electric motor 26, past the fan 27, over the surface of the condenser coil 30 and through an opening 36 in the rear wall of said cabinet before being returned to the outside atmosphere at a somewhat higher temperature.

As is well understood in the art, in units of this character, air from the room or space being cooled is admitted through the louvered openings 13, in the front of the inner cabinet, then passed through the air filtering screen 19, over the evaporator surfaces where it is cooled, and into the inlet of the blower 22 from whence it is discharged into the volute housing 23 and through the louvered outlet 14, in the cover of the cabinet, back into the room or space from which it was withdrawn.

Now in accordance with the teachings of this invention there is provided an evacuation or pump-out damper, indicated in a preferred embodiment generally by the numeral 37, which includes a substantially flat, preferably non-metallic, slidable panel member 38 horizontally disposed and arranged to slide in channel members 39 affixed on opposite sides thereof to the vertical walls of the volute housing 23. An elongated slot-like horizontally extending opening 40, in the dividing wall 16, permits said damper panel to be slidably positioned across the opening of the volute housing 23, thus restricting the flow of air from the blower 22 and preventing it from returning, by way of the louvered opening 14, in the top cover 15, to the room or space being cooled. The slotted opening 40, it will be noted, is fashioned somewhat larger than that which ordinarily would be necessary to permit the panel 38 to slide therethrough, but the reason for this will presently be understood.

Affixed to the forward edge of said damper panel is a combination handle, stop and closure member indicated generally by the numeral 41. The handle portion 42 may, if desired, be channel shaped to facilitate receiving the ends of the operator's fingers when sliding the panel, while the rear wall 43 of said channel portion may be utilized as a stop or an abutment that contacts the dividing wall 16 when the panel 38 is pushed away from across the opening 24 of said volute housing. The forward edge 44 of said handle portion, preferably, projects laterally therefrom and thus may function as a stop or abutment for contacting the forward vertical wall of the volute housing 23 when the damper panel is in its forward position thereby closing the room outlet of said housing. Depending from said handle portion is a flange member 45, the rear face of which may be covered with a resilient gasket-like pad 46 fashioned from some suitable material, such as felt or soft rubber, or the like. Said flange member 45 is fashioned slightly larger in dimensions than the opening 40, in the dividing wall 16, and is arranged to cover said opening when the damper panel 38 is positioned so as to permit the free flow of air from the blower 22 through the opening 14 and into the room or space being cooled. The gasket-like pad or facing 46 on said flange member assures a good air seal around the opening 40 when the flange 45 is positioned thereover.

A pair of spring members 47, disposed one at either side of the damper panel 38 and affixed to the top cover 15 of the inner cabinet 10, are provided to prevent said panel from

rattling or creeping out of position. When the cabinet cover is closed and the damper panel is in its rearward position, as indicated in Fig. 3, the free ends of the springs **47** press against the handle **42** and thus prevent said panel from creeping forward or rattling. With the cabinet cover closed and the damper panel in a forward position, as shown in Fig. 5, the free ends of the springs **47** will press downwardly on the top of said panel **38** thus preventing creeping either forwardly or rearwardly and likewise stopping any rattle therein. Since these spring members are affixed to the cabinet cover it will be appreciated that when the cover is opened the pressure thereon is released and the panel is, of course, free to slide in either direction.

A guide rod **48** has one end secured, as by the screws **49**, to the panel member **38** while the opposite end thereof is slidably positioned in a bearing member **50**, in turn, suitably affixed to the dividing wall **16**. Although the guide means illustrated represents a preferred embodiment of the arrangement provided for facilitating the operation of the panel damper, particularly when said panel is in its rearward position, it is appreciated that such guide means may take one of many other forms and thus the present invention should not be limited to the specific arrangement illustrated herein.

From the foregoing it should now be apparent that a novel air conditioner having a simple and inexpensive means for exhausting stale or foul air from a room, or for varying the proportion of such air that is recirculated within the room being conditioned, has been shown and described, and it is to be understood that changes may be made in the construction without departing from the spirit of the invention or the scope thereof as defined in the appended claims.

What is claimed is:

1. In an air-conditioning apparatus: an air chamber having a first outlet adapted to provide for the discharge of air into a room, and a second outlet adapted to provide for the discharge of air out of the room; refrigerating means operable to condition the air in said chamber; a damper structure movable to close either of said outlets; said damper comprising a vertically extending member disposed so as to close said second outlet when said first outlet is opened, and a horizontally extending member disposed so as to close said first outlet when said second outlet is opened.

2. In an air-conditioning apparatus: an air chamber having a first outlet at one end thereof adapted to provide for the discharge of air into a room, and a second outlet in one wall of said chamber adapted to provide for the discharge of air to a point exterior of the room; refrigerating means operable to condition the air in said chamber; a damper structure including a vertically extending member arranged so as to close said second outlet when said first outlet is opened, and a horizontally extending member disposed so as to close said first outlet when said second outlet is opened; and means disposed on opposite side walls of said chamber for slidably supporting said damper therein.

3. In an air-conditioning apparatus: an air chamber having a first outlet at one end thereof adapted to provide for the discharge of air into a room, and a second outlet in one wall of said chamber adapted to provide for the discharge of air to a point exterior of the room; refrigerating means operable to condition the air in said chamber; a damper structure movable to close either of said outlets; said damper including a horizontally extending panel disposed so as to project through said second outlet in one wall of said chamber and further arranged so as to close said first outlet when said second outlet is opened, and a flange member vertically depending from said panel arranged so as to close said second outlet when said first outlet is opened; and means for slidably supporting said damper in said chamber.

4. In an air conditioning apparatus: an air chamber having a first outlet at one end thereof adapted to provide for the discharge of air into a room, and a second outlet in one wall of said chamber adapted to provide for the discharge of air to a point exterior of the room; refrigerating means operable to condition the air in said chambers; a damper structure movable to close either of said outlets; said damper comprising a vertically extending member disposed so as to close said second outlet when said first outlet is opened, and a horizontally extending member disposed so as to close said first outlet when said second outlet is opened.

5. In an air-conditioning apparatus: an air chamber having a first outlet adapted to provide for the discharge of air into a room, and a second outlet adapted to provide for the discharge of air to a point exterior of the room; refrigerating means operable to condition the air in said chamber; a damper structure slidably arranged for closing either of said outlets; said damper comprising a vertically extending member disposed so as to close said second outlet when said first outlet is opened, and a horizontally extending member disposed so as to close said first outlet when said second outlet is opened; and means for slidably supporting said damper structure in said air chamber.

6. In air conditioning apparatus: a plurality of cabinets arranged with a dividing wall therebetween; an air conditioning chamber in one of said cabinets; said chamber being arranged so that said dividing wall forms one vertical wall thereof; said chamber being fashioned with a first outlet at one end thereof adapted to provide for the discharge of air into a room, and a second outlet through said dividing wall adapted to provide for the discharge of air to a point exterior of the room; refrigerating means operable to condition the air in said chamber, a damper structure including a horizontally extending substantially flat panel portion having a depending flange proximate one end thereof and being movable to close either of said outlets; said damper being disposed so that the panel portion in one position projects through the outlet in said dividing wall and across said chamber so as to close said first outlet while said second outlet is opened, and in another position said panel portion projects through said dividing wall outlet and the depending flange portion thereof closes said second outlet while said first outlet is opened.

7. In air conditioning apparatus: a plurality of cabinets and a dividing wall therebetween; at least one of said cabinets having a cover hingedly mounted to permit access to the interior of said cabinet; an air conditioning chamber in one of said cabinets; said chamber being arranged so that said dividing wall forms one vertical wall thereof; said chamber being further fashioned

with a first outlet at one end thereof adapted to provide for the discharge of air into a room, and a second outlet through said dividing wall adapted to provide for the discharge of air to a point exterior of the room; refrigerating means operable to condition the air in said chamber; a damper structure including a horizontally extending substantially flat panel portion having a depending flange proximate one end thereof and being movable to close either of said outlets; said damper being disposed so that the panel portion in one position projects through the outlet in said dividing wall and across said chamber so as to close said first outlet while said second outlet is opened, and in another position said panel portion projects through said dividing wall outlet and the depending flange portion thereof closes said second outlet while said first outlet is opened; resilient means having one end thereof affixed to said cabinet cover for movement therewith and so disposed that the opposite end thereof engages said damper when said cover is closed, thereby fixedly retaining said damper in a predetermined position.

8. In an air conditioning apparatus: a plurality of cabinets and a dividing wall therebetween; at least one of said cabinets having a cover hingedly mounted to permit access to the interior of said cabinet; an air conditioning chamber in one of said cabinets; refrigerating means operable to condition the air in said chamber; said chamber being arranged so that said dividing wall forms

one vertical wall thereof; said chamber being further fashioned with a first outlet at one end thereof adapted to provide for the discharge of air into a room, and a second outlet through said dividing wall adapted to provide for the discharge of air to a point exterior of the room; a damper structure movable to close either of said outlets; said damper comprising a vertically extending member disposed so as to close said second outlet when said first outlet is opened, and a horizontally extending member disposed so as to close said first outlet when said second outlet is opened; and guide means affixed to said horizontal member and slidably mounted in said dividing wall; and spring means having one end thereof affixed to said cabinet cover for movement therewith and so disposed that the opposite end thereof engages said damper when said cover is closed, thereby fixedly retaining said damper in a predetermined position.

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