

May 24, 1938.

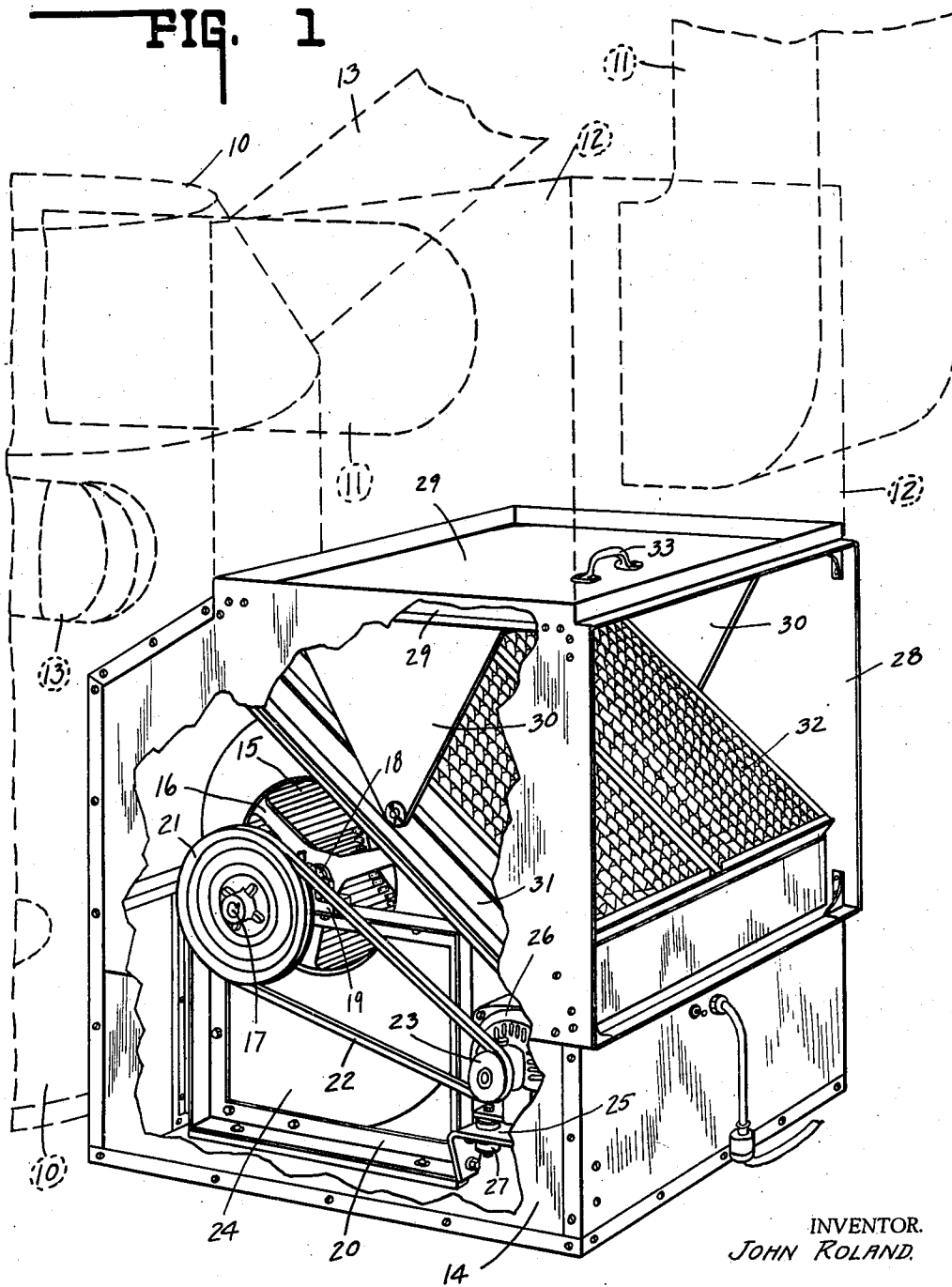
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2,118,328

AIR CONDITIONING UNIT

Filed April 16, 1936

3 Sheets-Sheet 1



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FIG. 2

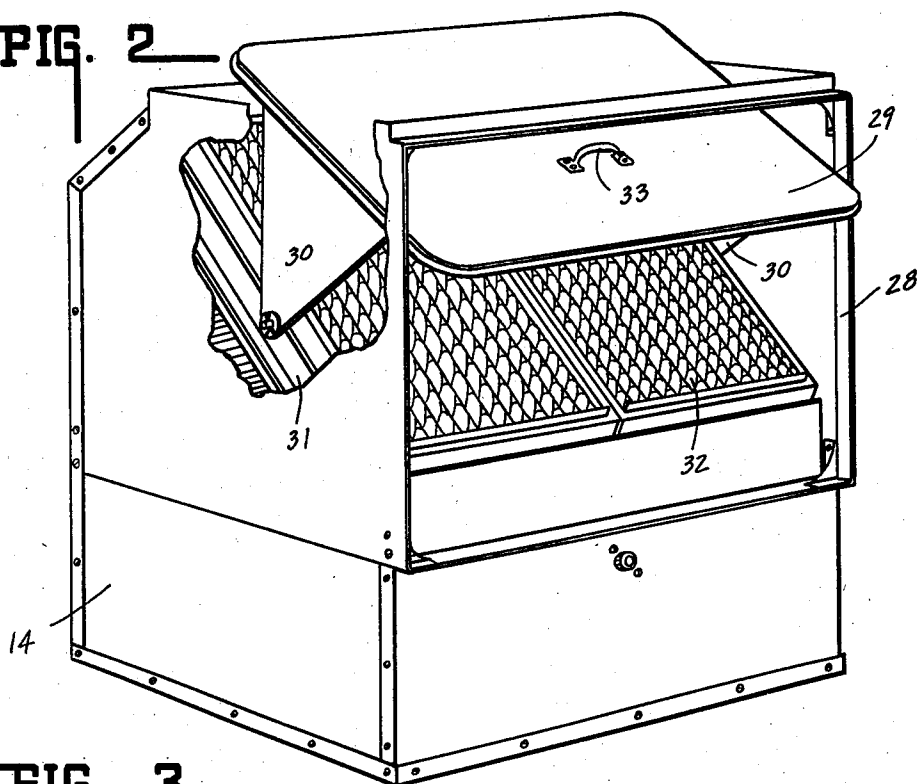
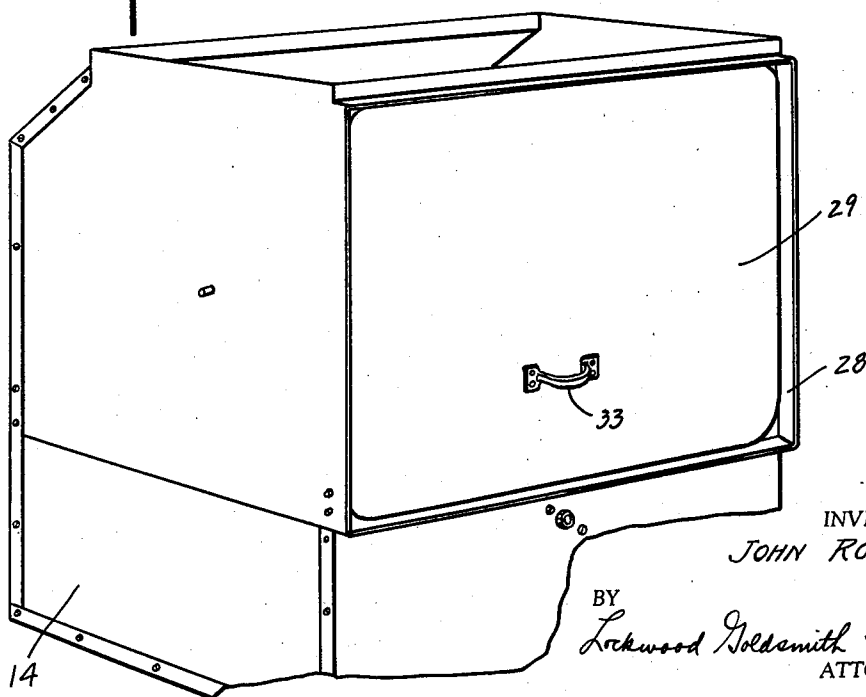


FIG. 3



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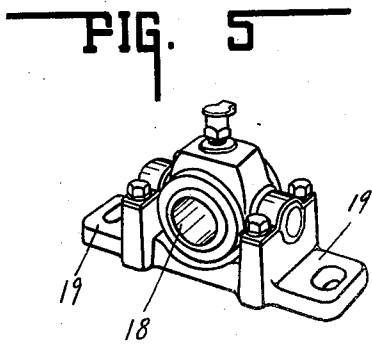
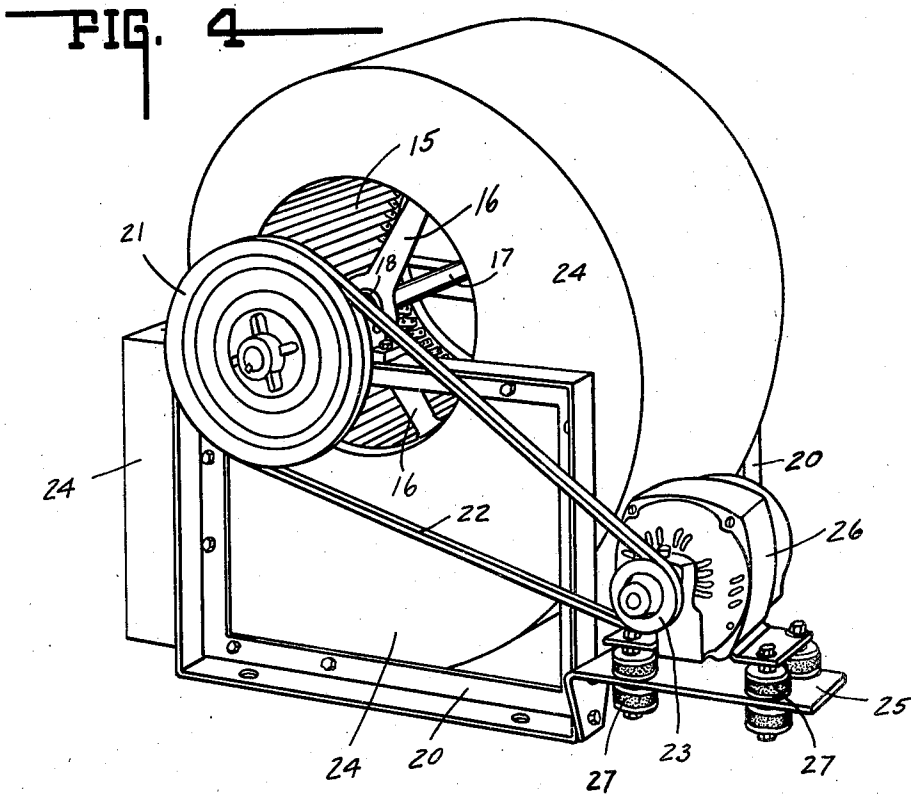
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UNITED STATES PATENT OFFICE

2,118,328

AIR CONDITIONING UNIT

John Roland, Indianapolis, Ind., assignor to
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Application April 16, 1936, Serial No. 74,648

2 Claims. (Cl. 183—32)

This invention relates to an air conditioning unit and particularly with reference to forced draft for heating, ventilating and cooling purposes.

The principal object of the invention is to provide an air conditioning unit which is applicable for use both for heating purposes in the winter and cooling purposes in the summer. The unit may be employed in connection with a hot air furnace for providing a forced draft through the furnace and furnace pipes through the winter months, such as will rapidly withdraw the cold air from overhead rooms and more rapidly force the hot air from the furnace thereto, as is well understood in the art.

Through convenient manipulation of the unit, it may be employed to maintain air circulation during the hot summer months by drawing the cooler air from the ground and basement, filtering it and forcing it through the furnace, furnace pipes and registers into the overhead rooms, at the same time forcing the hot air of the rooms out through the open windows and doors. This is accomplished by providing the unit casing with suitable openings and closures adapted to be shifted between operative connections with the cold air ducts leading from the rooms for heating purposes, or with the open basement for cooling purposes.

In either use, particularly for cooling purposes, cold water sprays may be provided in the unit for cleansing the air, cooling it or controlling the humidity.

Another feature of the invention is to provide a unit which is universal in character such that it may be employed for different air conditioning purposes. Thus, the unit may be set up as a ventilator in the upper story of a house or building for forcing hot air therefrom, resulting in drawing cooler air into the lower part of the house or building. In this use, a home may be made more comfortable in the heat of the summer months, as will be well understood in the art.

Another feature of the invention resides in the frame support for a rotary blower, blower casing and driving motor therefor.

Therefore, the invention resides in the construction of the unit which makes it readily adaptable to the above and other uses without material variation in structure or mounting.

The full nature of the invention will be understood from the accompanying drawings and the following description and claims:

Fig. 1 is a perspective view showing the unit with the housing therefor mounted in conjunction

with a hot air furnace and cold air duct indicated in dotted lines, the unit being arranged for summer ventilation. Fig. 2 is a perspective view of the unit and housing therefor being changed from summer into winter ventilation. Fig. 3 is the same as Fig. 2 showing the housing changed for forced draft of the furnace in winter use. Fig. 4 is a perspective view of the blower unit removed from the housing adapted for top floor ventilating installation. Fig. 5 is a perspective view of the blower shaft bearing.

In the drawings, there is shown in dotted lines a hot air furnace 10 of the usual type for receiving cold air through the cold air duct 11 and cold air header 12, and discharging it through the usual hot air pipes 13.

Intermediate the cold air duct header 12 and the furnace 10, there is an air conditioning unit comprising a casing 14. The top of said casing is in communication with the header 12 which is mounted and supported thereon. The forward end of the casing is in direct communication with the hot air drum of the furnace 10. Mounted in the casing there is a blower wheel 15 supported by end spiders 16 on a shaft 17, which shaft is supported adjacent its ends by bearings 18. Said bearings are provided with a base 19 supported on the upper bars of rectangular frames 20. A driving pulley 21 is keyed to one end of the shaft 17 and is driven by a belt 22 from a motor pulley 23. Intermediate the frames 20 and rigidly connected thereto there is a blower casing 24 into which air is drawn through the apertured sides by the blower 15 and forced about the periphery thereof through the lower end opening into the hot air drum of the furnace 10.

Rigidly secured to the opposite brackets 20, below and to the rear of the housing 24 but spaced above the lower level of the frames, there is a rearwardly extending platform 25 upon which a driving motor 26 is mounted by resilient mounting cushions 27. Thus, the motor mounting is suspended above the floor and is secured to the blower unit as an integral part thereof. The platform 25 has a slight springiness which is very material to the noiseless operation of the unit. Thus, upon the motor starting and pulling the blower through the belt, the starting torque will cause slight flexing of the platform, which in turn permits of sufficient belt slippage to eliminate sudden driving action. The speed of rotation of the blower is gradually increased instead of being jerked suddenly to a high speed. The effect of this arrangement is such that the usual flicker of lights in the electric circuit with the

motor is eliminated, and particularly the noise due to the sudden force of air impacting against the furnace walls.

The rear side of the casing 14 away from the furnace is provided with an opening indicated at 28 adapted to be closed by the door 29. Said door is supported at each end by arms 30 having their lower ends pivotally connected with a frame 31 which extends angularly along the sides of the casing and supports air filter plates 32. The door is provided with a handle 33 by which it may be moved to the position as shown in Fig. 3 from the position shown in Fig. 1, or vice versa,—its movement from one position to the other being of a swinging character, as illustrated in Fig. 2.

When the door is in the position of Fig. 3, the unit is then operative for drawing cold air through the cold air ducts 11 and header 12 through the filter 32 and forcing it into the hot air drum of the furnace 10 where it is heated and passes therefrom through the hot air pipes 13. This creates a circulation of hot air for winter use when the furnace is in operation and has the effect of not only maintaining circulation, but filtering and cleansing the air and increasing the heating efficiency of the furnace. When the door 29 is moved to the position shown in Fig. 1, it operates to cut off the cold air ducts and draws the air through the filter plates 32 directly from the basement in which it is positioned, forcing the air through the furnace, through the air ducts 13 into the rooms of the house. However, this arrangement and use is adapted for summer months wherein the air of the basement is supplied through windows and is relatively cool as compared with the air in the rooms of the house. The function in this connection, as is well understood, is to not only force the cooler air of the basement into the rooms of the house through the usual air pipes or registers, but to maintain a circulation of air and prevent accumulation of dead, hot air.

The advantage of this arrangement is that the mounting of the door 29 and the positioning of the filter plates 32 is such that the unit may be readily changed from a heating unit to a cooling unit.

By removing the casing 14, the entire blower

unit, including the blower housing 24 and motor 26, may be set up in the top floor of the dwelling with the discharge end of the blower housing open to the outside through a window or any suitable opening. It may thus be employed to force the accumulation of dead, hot air from beneath the roof and draw fresh air through the windows of the lower part of the dwelling, which will prevent stagnation, reduce the transmission of heat from the upper story and maintain more comfortable circulation. Operation of such a unit during the night is highly advantageous in cooling the dwelling.

The invention claimed is:

1. In combination with a hot air furnace and a cold air duct, an air conditioning unit interposed therebetween including a blower fan, means for driving said blower fan, a substantially airtight casing therefor, an opening in said casing communicating with said duct and an exteriorly positioned opening, an air filter plate mounted in said casing between said openings and fan, a frame for supporting said plate, a door movable into position to close either one or the other of said openings, and a pair of arms extending inwardly from the opposite edges of said door and having their opposite ends pivotally supported upon said filter frame for pivotally supporting said door in position to be swung from closing position of one of said openings to closing position of the other opening.

2. In combination with a hot air furnace and a cold air duct, an air conditioning unit interposed therebetween including a blower fan, means for driving said blower fan, a substantially airtight casing enclosing said fan and motor, said casing having an opening provided in the top thereof communicating with said air duct, and an adjacent opening in the side thereof communicating with the atmosphere exteriorly of said duct, an angularly disposed air filter plate mounted in said casing between said openings and said fan, a door closure adapted to close one or the other of said openings and an arm extending inwardly from opposite sides of said door for pivotally supporting it in position to be swung from one closing position to the other.

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