Feb. 13, 1940. G. F. HARDIN 2,190,118

MOTOR DRIVEN FAN

Filed Jan. 28, 1937 3 Sheets-Sheet 1

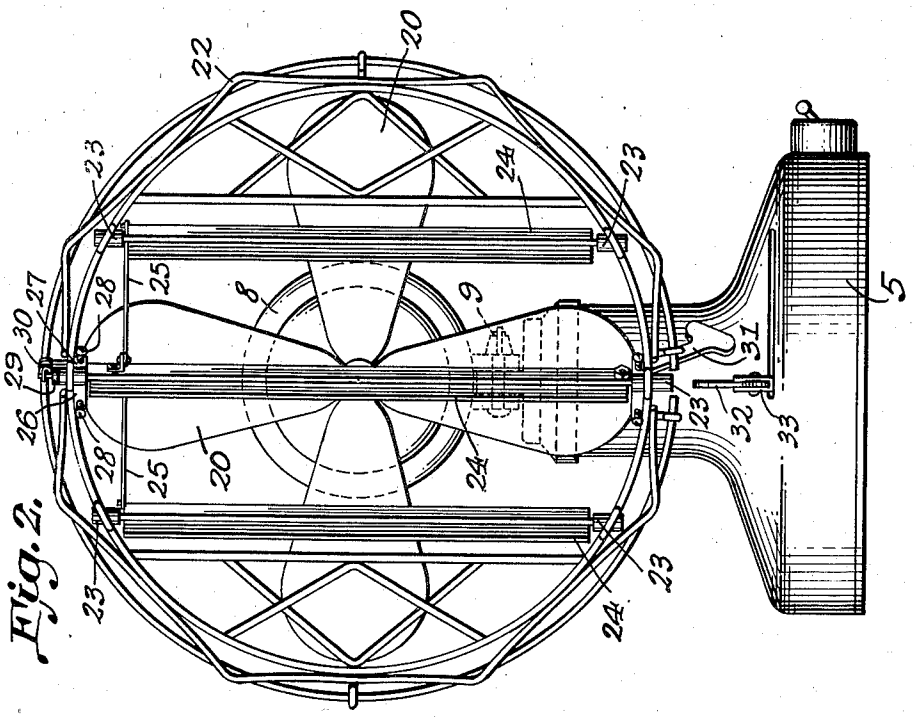


Fig. 2.

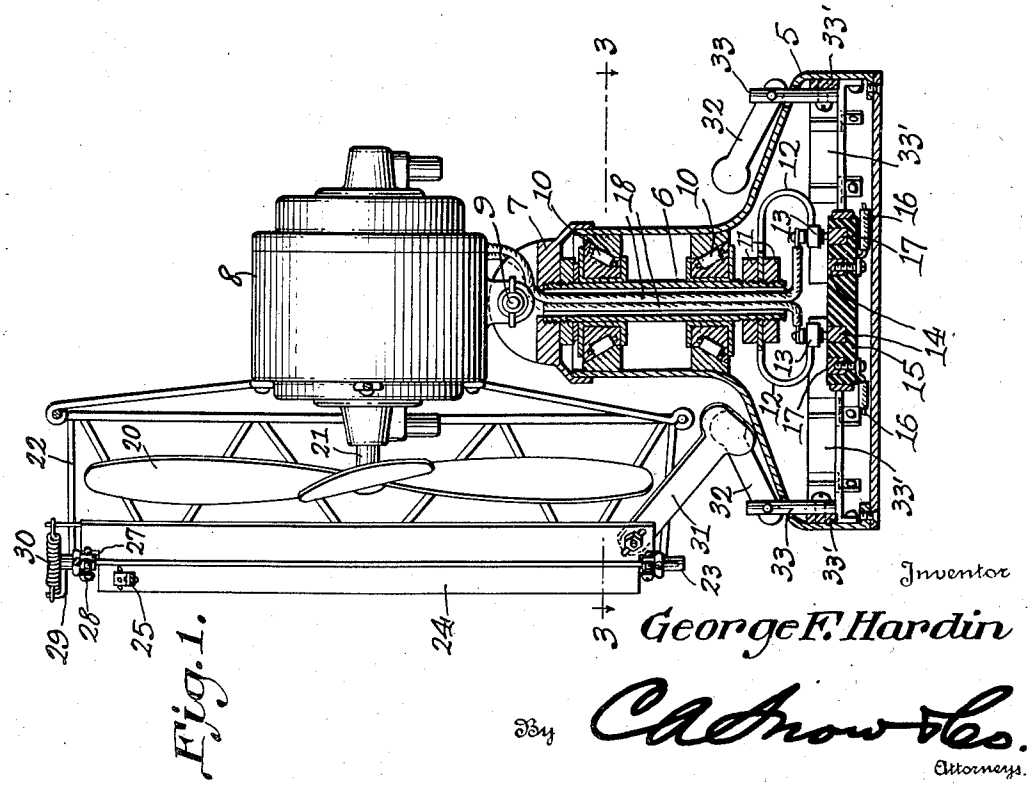


Fig. 1.

Inventor

George F. Hardin

By C. A. Snow & Co.

Attorneys.

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MOTOR DRIVEN FAN

Filed Jan. 28, 1937 3 Sheets-Sheet 2

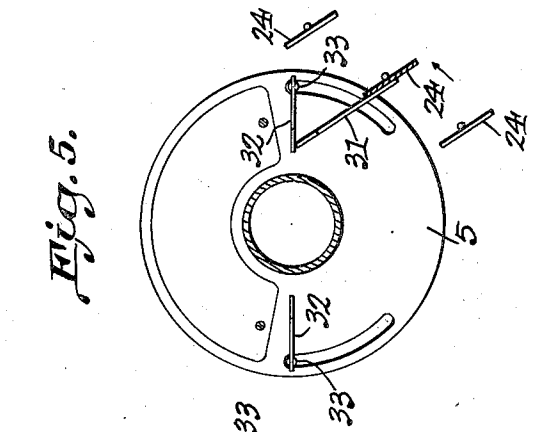


Fig. 5.

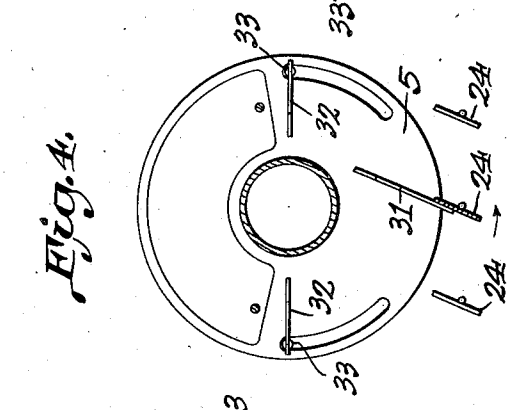


Fig. 4.

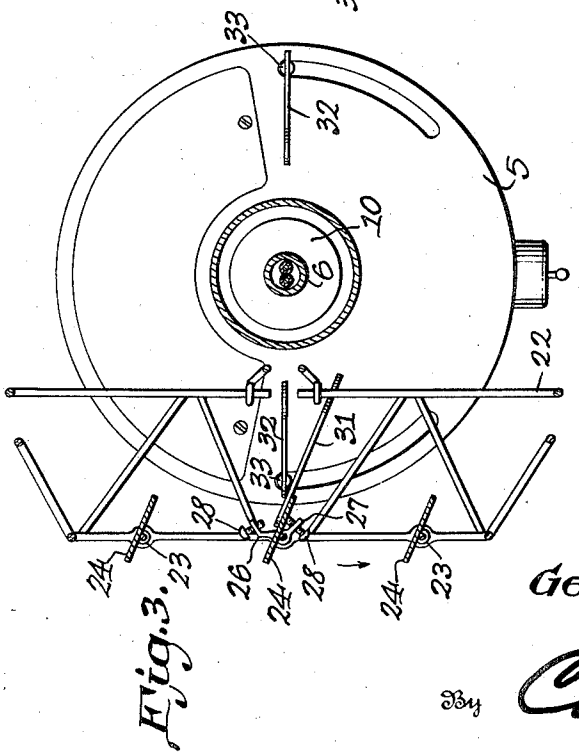


Fig. 3.

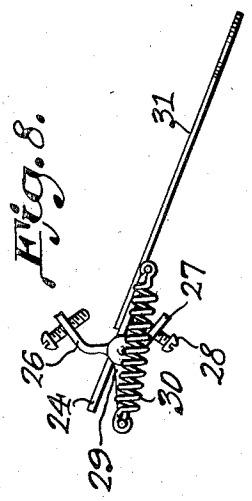


Fig. 8.

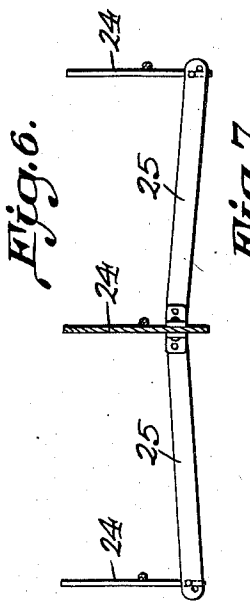


Fig. 6.

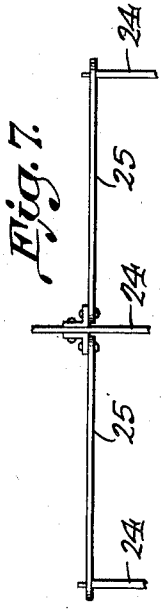


Fig. 7.

Inventor

George F. Hardin

By C. A. Snow & Co.

Attorneys.

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MOTOR DRIVEN FAN

Filed Jan. 28, 1937 3 Sheets-Sheet 3

Fig. 9.

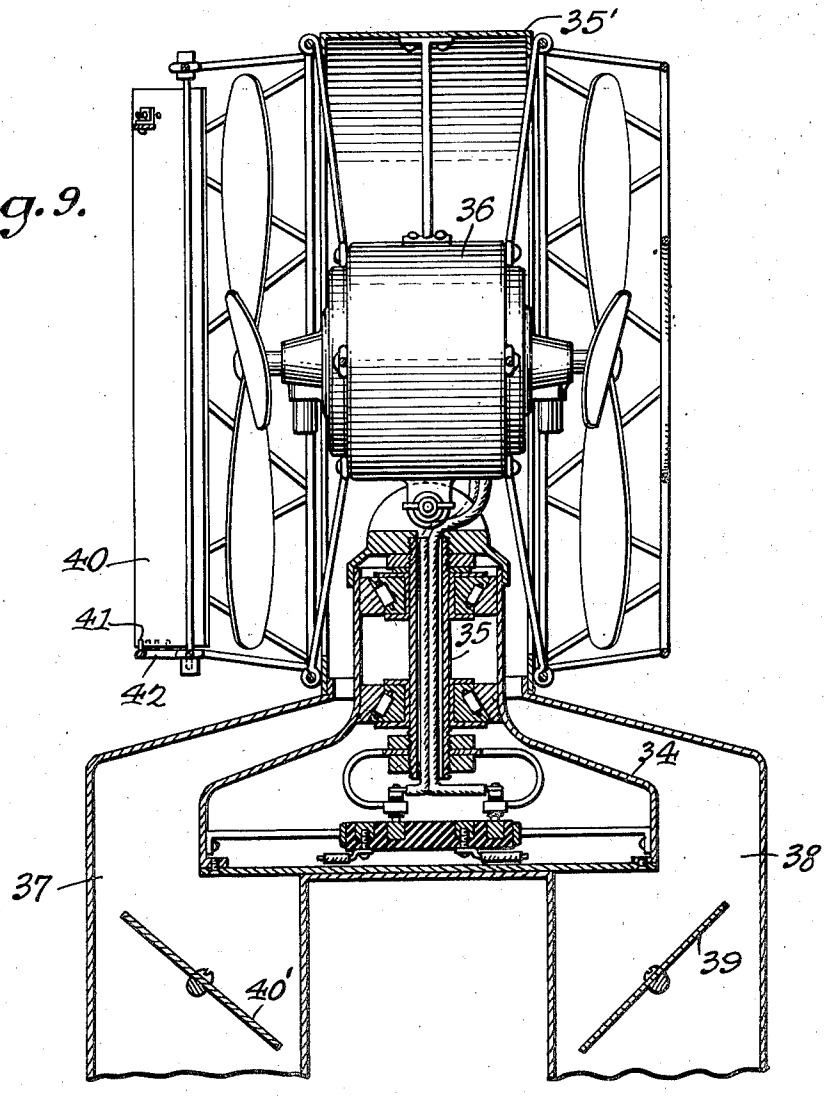


Fig. 10.

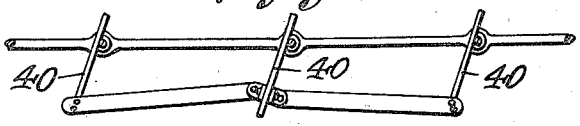
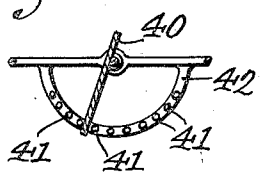


Fig. 11.



Inventor

George F. Hardin

By Crow & Co.

Attorneys.

Patented Feb. 13, 1940

2,190,118

UNITED STATES PATENT OFFICE

2,190,118

MOTOR DRIVEN FAN

George F. Hardin, McKenzie, Tenn.

Application January 28, 1937, Serial No. 122,871

3 Claims. (Cl. 230—254)

This invention relates to air conditioning apparatus, the primary object of the invention being to provide an electrically controlled fan having means whereby the fan may be adjusted to cause the fan to revolve, oscillate or remain stationary, to the end that the fan may be employed as a means for creating a circulation throughout the entire area of the room, or may direct a current of air to a particular location within the room, at the will of the operator.

An important object of the invention is the provision of means whereby the blast of air caused by the fan, may be utilized in controlling the movements of the fan, thereby eliminating the necessity of using mechanical means, such as motors or the like, for controlling the movements of the fan.

Another important object of the invention is to provide an electric fan constructed in such a way that heated or cooled air may be drawn through the fan and directed into the room to be circulated by the fan.

With the foregoing and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein described, may be made within the scope of what is claimed, without departing from the spirit of the invention.

Referring to the drawings:

Figure 1 is a side elevational view of a fan constructed in accordance with the invention, the base and pedestal of the fan being shown in vertical section.

Figure 2 is a front elevational view of the fan.

Figure 3 is a transverse sectional view taken on line 3—3 of Figure 1.

Figure 4 is a diagram, parts of the fan having been omitted.

Figure 5 is a diagram showing the blades of the control device prior to the turning of the blades to their reverse positions.

Figure 6 is a plan view of the control blades, the central control blade being shown in section.

Figure 7 is a fragmental elevational view disclosing the upper ends of the control blades.

Figure 8 is a top plan view disclosing the means employed for tilting the control blades.

Figure 9 is a modified form of fan construction, illustrating the fan as positioned over hot air or cold air ducts.

Figure 10 is a plan view disclosing the means for operating the control blades.

Figure 11 is a plan view of the control blade adjusting means.

Referring to the drawings in detail, the reference character 5 designates a hollow base in which the tubular support 6 is mounted, the tubular support being connected to the head 7, to which the motor casing 8 is adjustably connected, as at 9. Roller bearings 10 are mounted within the hollow base, and have connection with the tubular support 6 in such a way that free rotary movement of the tubular support 6 within the hollow base 5, will be permitted.

As clearly shown by Figure 1 of the drawings, the tubular support 6, extends an appreciable distance below the lower roller bearing 10, where it provides a support for the nuts 11, between which the spring arms 12 are held. These spring arms 12 curve downwardly and inwardly, and provide supports for the contact members 13 which wipe the collector rings 14 mounted in the block 15, that is constructed of insulating material. Wires 16, which connect with a suitable source of electricity supply, provide means whereby electric current may be supplied to the collector rings 14, through the contact rings 17, to which the wires 16 are connected. Thus it will be seen that due to this construction, a sliding contact is had between the tubular support, and the base. Wires 18 connect with the contact members 13, and lead to the fan motor, which is mounted within the motor casing 8. The fan motor is of the usual and well known construction and includes the blades 20 that are mounted on the motor shaft 21.

The fan guard is indicated generally by the reference character 22 and is constructed preferably of wire arranged in such a way as to provide bearings 23 that accommodate the shafts of the control blades 24 that are disposed directly in front of the blades 20 of the fan. Rods 25 have pivotal connection with the control blades, so that the blades move in unison.

Secured at the upper end of the shaft on which the central control blade is mounted, is an actuating member embodying spaced arms 26 and 27, which arms are provided with threaded openings through which the adjusting screws 28 extend, the position of the adjusting screws being such that the inner ends thereof will lie in the path of travel of the central control blade 24 for purposes to be hereinafter more fully described. Forming a part of the actuating device, is an arm 29 that extends rearwardly therefrom, the arm

29 being provided with a pin near its free end, over which one end of the coiled spring 30 is mounted, the opposite end of the coiled spring 30 being connected to the central control blade 24, near one edge thereof, as shown by Figure 8 of the drawings. Thus it will be seen that due to this construction, the control blade at the center of the fan guard, will be held in a predetermined position, for a period of time to permit the blade to cause a rotary movement of the entire fan on its base. Pivotally connected to the central control blade 24, and disposed adjacent to the lower end thereof, is an arm 31, which arm is of a length to extend to a point where it may contact with the arms 32 mounted on the posts 33, as the fan rotates. These posts 33 are carried by the members 33' that are frictionally held within the base of the fan, the posts extending through slots in the base, so that the arms 32 may be adjusted with respect to each other to regulate the movements of the fan. When the arms 32 have been moved to positions within the path of travel of the arm 31, and the arm 31 contacts with the arms 32, it will be seen that further rotary movement of the fan will cause the control blade to move to a reverse position, with the result that the spring 30 will snap past dead center and move the blades to positions to direct air from the fan in the opposite direction, which will of course rotate the fan in the opposite direction returning the fan to its initial position.

As the fan rotates to a position to engage the arm 32 at the opposite side of the fan base, the control blades are moved in the opposite direction reversing the movement of the fan. It will of course be understood that when the arm 31 has been moved to a position where it will clear the arms 32 as the fan rotates, the action of the air from the fan, against the control blades will result in the fan rotating continuously.

In the form of the invention as shown by sheet 3 of the drawings, a double fan structure is provided, and includes the hollow base 34 in which the tubular support 35 is mounted, the tubular support being held in roller bearings, as clearly shown by Figure 9 of the drawings. The motor casing is indicated by the reference character 35', and completely surrounds the motor indicated at 36, the fan casing 35' being in communication with the hot air pipe 37, and cold air pipe 38. The hot air pipe 37 is in communication with a source of hot air supply, so that hot air may be drawn into the fan casing 5 by the fans, and directed into the room for heating purposes. Should it be desired to cool the temperature of the room, the damper 39 in the cold air pipe 38, is moved to allow cold air to pass into the fan casing where it is blown into the room.

Damper 40 controls the passage of hot air through the hot air pipe 37, into the fan casing.

In this form of the invention, the control blades are indicated by the reference character 40', the central control blade being so arranged that it may be moved to a position between lugs 41 of the bar 42, with the result that the control blades may be moved to various positions of adjustment, and at various angles with respect to the air blast from the fan. It will of course be understood that as the air from the fan strikes the control blades, the casing together with both fans supported by the casing, will be rotated continuously.

From the foregoing it will be seen that due to the construction shown and described, I have provided an electric fan which may be controlled to cause the fan to rotate continuously, oscillate, or remain stationary at the will of the operator.

Having thus described the invention, what is claimed is:

1. An electric fan comprising a base, a motor supported on the base, pipes having enlarged upper portion merging into a discharge opening and providing communication between the pipes, said base being mounted within the enlarged upper portions of the pipes, a housing in communication with the pipes and completely encasing the motor, fans operated by the motor and adapted to draw air through the pipes and housing, and means for controlling the passage of air through the pipes and housing.

2. An electric fan comprising a base, a motor mounted on the base, an air inlet pipe, said base being mounted within the upper end of the air inlet pipe and spaced therefrom to allow air to pass upwardly to the fan through the air inlet pipe, and means for rotatably mounting the motor on the base.

3. An electric fan comprising a base, a motor supported on the base, pipes having enlarged upper end portions merging into a discharge opening and providing communication between the pipes, said fan base being mounted within the enlarged upper portions of the pipes, a housing rotatably mounted at the upper ends of the pipes and communicating with the pipes through said discharge opening, said motor being mounted within the housing and being completely encased in the housing, fans operated by the motor and adapted to draw air through the pipes and housing, and means for controlling the passage of air through the pipes and housing.

GEORGE F. HARDIN.