March 17, 1942. A. MARTI 2,276,993

VENTILATING FAN

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Fig. 1.

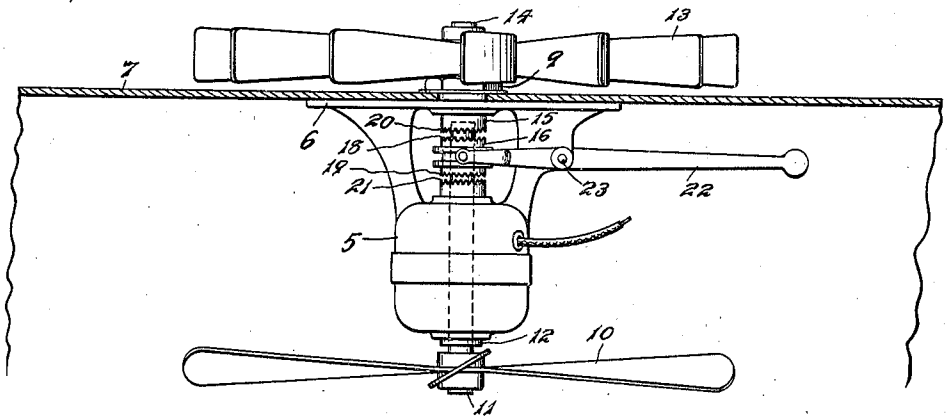


Fig. 2.

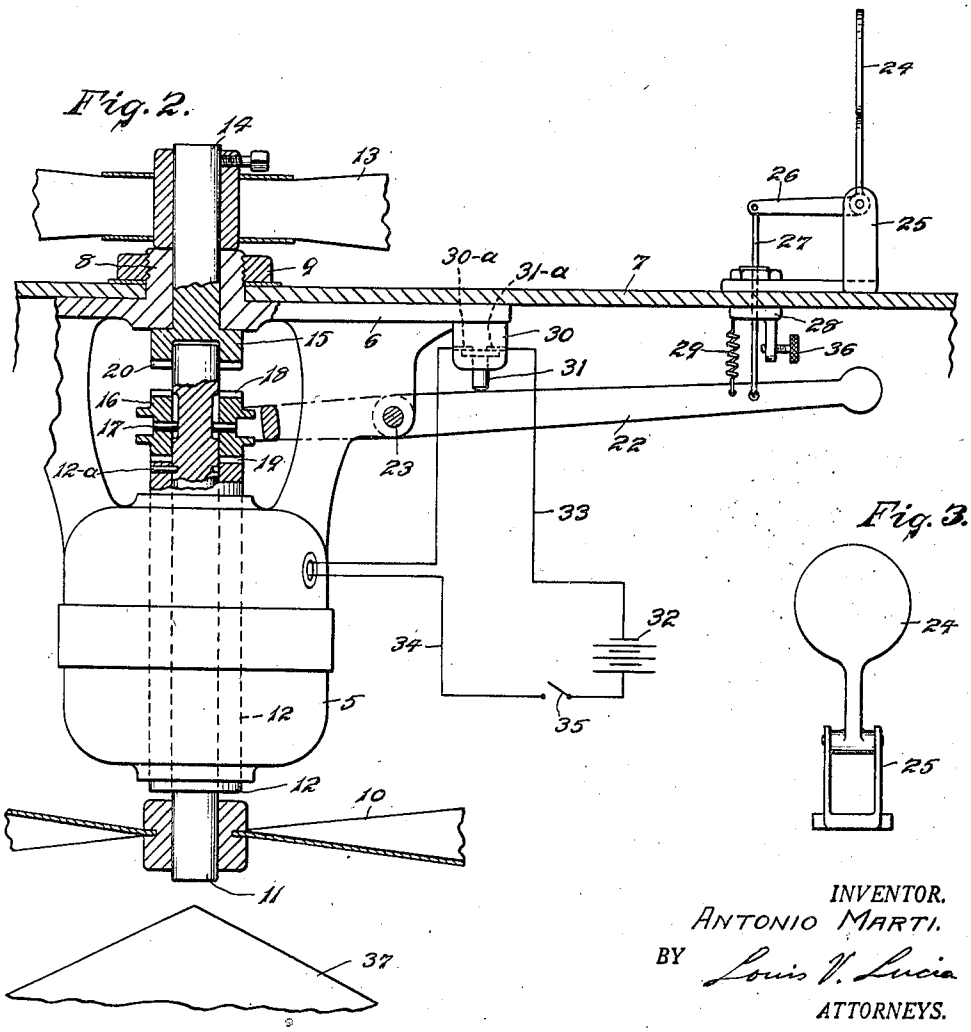


Fig. 3.

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VENTILATING FAN

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5 Claims. (Cl. 98—23)

This invention relates to ventilating fans which are particularly adapted for use in vehicles.

An object of the invention is to provide a fan which may be propelled by air driven means, when the vehicle is in motion, and by electrically driven means when the vehicle is stationary.

A further object of the invention is to provide means for selectively engaging the said fan to be propelled by either the air or the electrically driven means.

A still further object of the invention is to provide means operable by the movement of the vehicle for automatically engaging the said fan with either the air or the electrically driven means for operation thereby.

Further objects and advantages of the invention will be clearly understood from the following description and from the accompanying drawing in which:

Fig. 1 is a fragmentary sectional view, through the roof of a vehicle, showing my improved ventilating fan installed therein.

Fig. 2 is a similar view, on an enlarged scale, showing the fan partly in section and the means for automatically operating the same.

Fig. 3 is a front view of the operating vane of my invention.

As shown in the drawing, the numeral 5 denotes an electric motor having a base 6 which is mountable to a roof 7 of a vehicle. The said base has a threaded projection 8 which extends through an opening in the said roof for securing the base thereto by means of a nut 9. A fan 10 is mounted upon a shaft 11 which rotatably extends through a sleeve 12 that carries the armature of the motor 5 so that it is rotated thereby.

An air driven propeller 13 is rotatably mounted upon the roof of the vehicle by means of a shaft 14 that is rotatable in the projection 8 and to receive the upper end of the shaft 11 so as to retain the same in alignment with the shaft 14.

A clutch collar 16 is slidably keyed to the shaft 11 by means of pins 17 which extend into slots in said shaft. The said collar has teeth 18 and 19 adapted to engage teeth 20, in the enlargement 15, and teeth 21 in the sleeve 12. The said collar is operated by means of a lever 22 which is pivoted at 23 on the frame 6.

As shown in Fig. 2, my invention also contemplates the use of an air operated vane 24 that is pivoted in a frame 25 mounted upon the roof 7. This vane has a lever 26 from which projects a rod 27 that extends through a connection 28, which secures the frame 25 to the roof, and is connected to operate the lever 22. A spring 29 is provided to urge the said lever in one direction.

An electric switch 30, preferably mounted to the frame 6, has a projecting finger 31 which is operated by the lever 22 to control an electric circuit which includes a source of electric energy 32 that is connected to the motor 5 by means of conductors 33 and 34. A separate switch 35 is also provided for manually controlling said circuit.

The operation of my invention is as follows:

If it is desired to operate the fan by means of the propeller 13, when the vehicle is in motion, the lever 22 is pulled downwardly. This raises the clutch 16 to engage the teeth 18 with the teeth 20 on the shaft 14; thus locking the shaft 11 to said shaft and thereby permitting the fan to be driven by means of the propeller 13 which is rotated by the air current caused by the movement of the vehicle. When the vehicle is at a standstill, the lever 22 may be moved upwardly; thus causing the collar 16 to lock the shaft 11 to the sleeve 12 so that the fan may be driven by the motor 5.

In the embodiment illustrated in Fig. 2; when the vehicle is in motion, the vane 24 will be swung by the force of air to rock the lever 26 downwardly. This will move the connecting bar 27 to lower the lever 22 against the tension of the spring 29; thus raising the collar 16 and engaging the shaft 11 with the propeller so that the fan will be driven thereby.

When the vehicle comes to a standstill, the spring 29 will pull the lever 22 upwardly, raising the vane 24 and lowering the collar 16 into engagement with the teeth on the sleeve 12 to lock the shaft 11 to said sleeve 12 so that the fan will be driven by the motor.

As the lever 22 is moved upwardly to engage the fan with the motor, the said lever will raise the finger 31 and close the electric switch 30 by means of a switch bar 31—*a* coming into contact with contacts 30—*a* and 31—*a*. This will close the electric circuit to energize the motor providing that the manual switch 35 is closed for the operation of said motor.

As the lever 22 is moved downwardly by the vane 24, the finger 31 of the switch will drop and thus cause the electric circuit to the motor to be broken while the shaft 14 is locked to the shaft 11 for driving the fan by means of the propeller 13.

When it is desired to lock the entire mecha-

nism to render the fan inoperable, the lever 22 may be locked in position by means of the locking screw 36 which will engage the bar 27 and lock the lever into a neutral position.

The shaft 11 is rotatable in the sleeve 12 and is retained against longitudinal movement therein preferably by means of a pin 12—a which projects into an annular groove in said shaft.

When the said shaft 11 is connected to the shaft 14, it will rotate freely in the sleeve 12 so that the propeller 13 will not be required to drive the motor. Also, when the shaft 11 is connected to the sleeve 12 it will be disconnected from the shaft 14 so that the motor will not be required to drive the propeller; thus, the propeller and the fan are at all times disconnected one from the other while driving the fan; thereby adding to the efficiency of the propeller and motor in driving the fan and, at the same time, reducing the cost of operating the fan.

If desired, a deflector in the form of a cone 37 may be provided below the fan 10 to deflect air currents from the fan throughout the interior of the vehicle. Also, if desired, a deflector may be used for directing the said air currents against the windshield of a vehicle in order to keep the same dry or free from frost.

It will be clearly understood, from the above description, that I have provided, for a vehicle, a ventilating fan which may be driven either by air or by an electric motor, and that I have also provided novel means for automatically controlling the operation of said fan so that it will be driven by air when the vehicle is moving and, by other means, such as an electric motor, when the vehicle is stationary.

I claim:

1. For a device of the character described, the combination comprising an electric motor, a shaft extending through said motor and rotatable free thereof, an air driven propeller for rotating said shaft, a fan carried by said shaft, and means on said shaft for independently connecting the same either to said propeller or to said motor for operating the said fan.

2. For a vehicle, a device of the character described, comprising the combination of an electric motor, a frame for mounting said motor onto said vehicle, a propeller rotatable in said frame and disposed on the outside of said vehicle, a free shaft extending through said motor, a fan secured to said shaft, a sleeve driven by said motor, a clutch slidable on said shaft for connecting the same with either said propeller or sleeve, and means for operating the said clutch.

3. In a device of the character described, the combination of a frame, a motor on said frame, a propeller shaft freely rotatable in said frame, a propeller on said shaft, a sleeve rotatable by said motor, a fan shaft co-axial with said sleeve and said propeller shaft, a fan on said fan shaft, a clutch member slidable on said fan shaft, and means operable by air currents for operating said clutch member to lock said fan shaft for driving said fan either by said propeller or said motor independently of the other.

4. In a device of the character described, the combination of a frame, a motor mounted in said frame, an extension in said frame, a propeller shaft rotatable in said extension, a propeller on said propeller shaft, a sleeve extending through said motor and adapted to be driven thereby, a fan shaft extending through said sleeve and rotatable therein, a fan secured to said shaft, and means for connecting said fan shaft either to said sleeve or to said propeller shaft independently of the other.

5. In a device of the character described, the combination of a shaft, a fan on said shaft, an electric motor, an electric circuit for said motor, a switch in said circuit, a propeller driven by air currents, a clutch member for connecting said shaft to either said propeller or said motor, an operating member for operating said clutch member and said switch to connect said shaft with said propeller and cause the switch to break said circuit, or to connect said shaft with said motor and cause the switch to close said circuit, means operated by air currents for controlling said operating member, and means for retaining said clutch member in inoperative position.

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