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2,571,374

VENTILATING FAN

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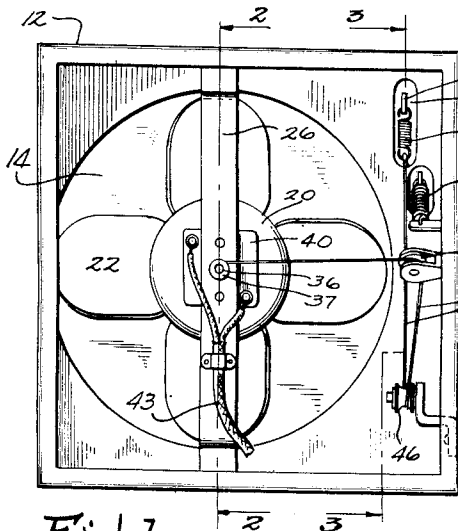


Fig. 1

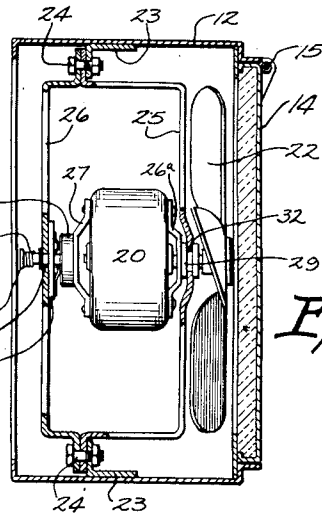


Fig. 2

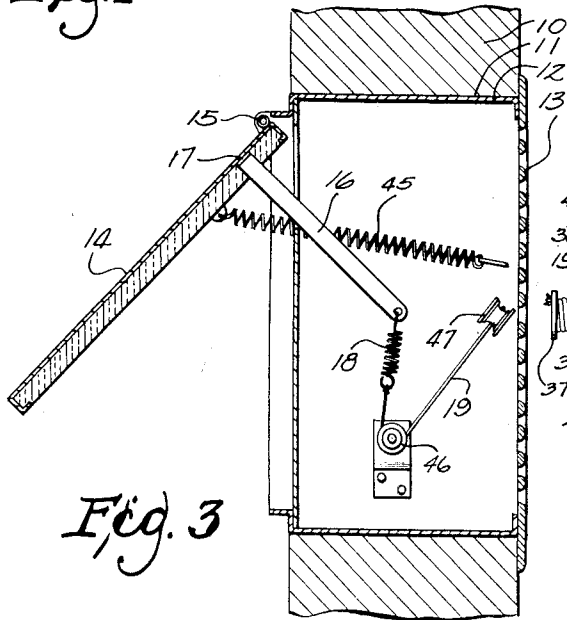


Fig. 3

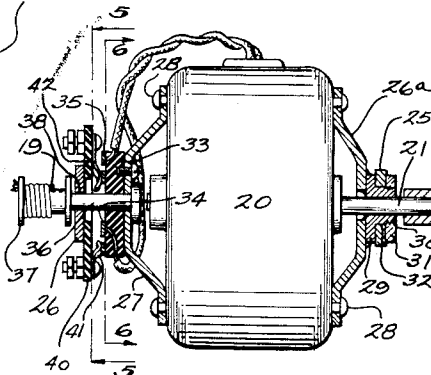


Fig. 4

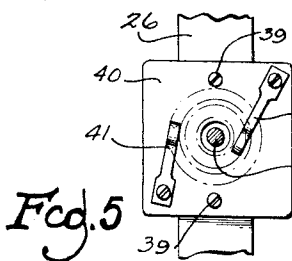


Fig. 5

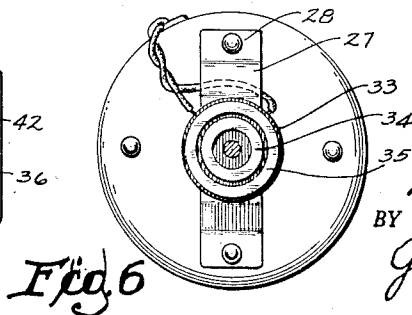


Fig. 6

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VENTILATING FAN

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8 Claims. (Cl. 230-114)

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This invention relates to improvements in ventilating fans, and more particularly to a novel ventilating fan equipped with a reaction operated shutter.

An object of the invention is to provide a device of the type having a shutter operated by mechanical means, utilizing the reaction of the fan motor as a source of energy continuously as long as the motor is energized.

Another object of the invention is to eliminate the auxiliary motors or solenoids found in devices of the type now in use for actuating ventilating fan shutters.

Other objects of the invention will be apparent as the description proceeds, reference being had to the accompanying drawing, in which:

Fig. 1 is a rear view through the casing, showing the fan, motor and shutter opening mechanism.

Fig. 2 is a side view partly in elevation and partly in section of the device.

Fig. 3 is a side view partly in section and partly in elevation showing a detail of the shutter mechanism.

Fig. 4 is a vertical sectional view showing the motor suspension.

Fig. 5 is a view in elevation of the slip ring brushes.

Fig. 6 is a view in elevation of the slip rings employed.

Referring more particularly to the drawings, a building structure 10 is apertured at 11 to receive the ventilator casing 12 having the grill 13 and the shutter 14 pivotally hung at 15 thereof. The shutter 14 has a lever arm 16 affixed thereto at 17 thereof and connected by a coil spring 18 to a pull cord or chain 19. An electric motor 20 has a conventional drive shaft 21 and the fan 22. The ventilator casing 12 is provided with a pair of brackets 23 disposed at top and bottom interiorly thereof. The brackets 23 secure by means of bolts 24, the frontal frame member 25 and the rear frame member 26, the motor 20 is provided with the front trunnion bracket 26a and the rear trunnion bracket 27 affixed thereto by rivet or threaded means 28. The front trunnion bracket 26a is secured to the hollow spindle 29 which freely surrounds the drive shaft 21 and is threaded at 30 to receive a retainer ring 31. The spindle 29 is rotatably held in the aperture at 32 of the front frame 25. The rear trunnion bracket 27 has disposed exteriorly thereof the slip ring plate 33 provided with the concentric slip rings 34 and 35, and the rearwardly projecting spindle 36 which latter

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has its outer end the reel 37. The spindle 36 is journaled in the aperture at 38 of the rear frame member 26. The frame member 26 has affixed thereto by threaded or other means 39 the plate 40 which supports the slip ring brushes 41 and 42 which latter are connected to the electrical conduit 43. It will be seen that the spindle 36 turns with the motor 20, as does the spindle 29. A coil spring 45 normally maintains the shutter 14 in closed position against the ventilator casing 12. The pull cord or chain 19 is led over the pulley 46 and pulley 47 is wound about the reel 37.

In use, when the motor 20 is energized, the shaft 21 and fan 22 will turn in a normal manner. The motor 20 being mounted as it is on the trunnion brackets 26a and 27 for free rotation in the frame members 25 and 26, will move with a torsional reaction in a direction opposite to that taken by the fan 22, with the result that the cord 19 will be wound upon the reel 37 until the shutter 14 is raised against the tension of spring 45 to the limit of its rise. The action of the cord or chain 19 at this point will be to brake the reactional rotation of the motor 20, thus holding it against further rotation. When the motor 20 is de-energized, the action of spring 45 will unwind the cord 19 and close the shutter 14.

It will be understood that the device is capable of various modifications in structure and design, without departing from the spirit of the invention, within the scope of the appended claims.

Having thus described the invention, what is claimed and desired to be secured by Letters Patent of the United States, is:

1. A ventilating fan assembly comprising an electric motor mounted for coaxial rotation with its rotor, a fan on said rotor, a reel fixed to said motor, a fan shutter, and a pull chain windable on said reel and connected to said shutter whereby when said motor is energized the torsional reaction thereof will wind the chain on said reel and open said shutter.

2. In an electric motor, a rotor, a fan on said rotor, suspension means for said motor rotative coaxially with said rotor, a reel fixed to the motor, a fan shutter, and means windable on said reel by torsional reaction of the motor when the latter is energized to actuate said shutter.

3. A ventilating fan assembly comprising a casing, a frame fixed in said casing, an electric motor journaled in said frame for free coaxial rotation with its rotor, a fan on said rotor, a reel fixed to said motor, a fan shutter on said casing, and

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means connected to said shutter and windable on said reel by torsional reaction of said motor when the latter is energized.

4. A ventilating fan assembly comprising a casing, a frame fixed in said casing, an electric motor journaled in said frame for free coaxial rotation with its rotor, a fan on said rotor, a reel fixed to said motor, a fan shutter on said casing, means connected to said shutter and windable on said reel by torsional reaction of said motor when the latter is energized, and spring means for return of said shutter to closed position when said motor is de-energized.

5. A ventilating fan assembly comprising, a motor having a rotor and a field rotatable in opposite directions, a fan operable by said rotor, a flow control shutter for said fan, means operable by rotary motion of said field to operate said shutter, and means for closing said shutter when said fan stops.

6. A ventilating assembly comprising, a motor having a rotor and a rotor support rotatable in opposite directions, a fan rotatable by said rotor, a fan shutter disposed in the path of air flow induced by the rotating fan, a connection between said support and said shutter for causing the torque of said motor to open the shutter,

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and means for automatically closing said shutter when said fan stops.

7. A ventilating assembly comprising, a motor having a rotor and a rotor support rotatable in opposite directions, a fan rotatable by said rotor, a fan shutter disposed in the path of air flow induced by the rotating fan, mechanism operable by the torsional rotation of said support for opening said shutter, and means operable to close said shutter whenever said motor stops.

8. A ventilating assembly comprising, a motor having a rotary armature and a field movable by torque set up in the armature, a fan rotatable by said armature, a fan shutter, mechanism connecting said field and said shutter and being operable by said torque to open said shutter, and means for closing the shutter when the fan stops.

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

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