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ELECTRIC FAN.

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1,196,256. Patented Aug. 29, 1916.

Fig. 1.

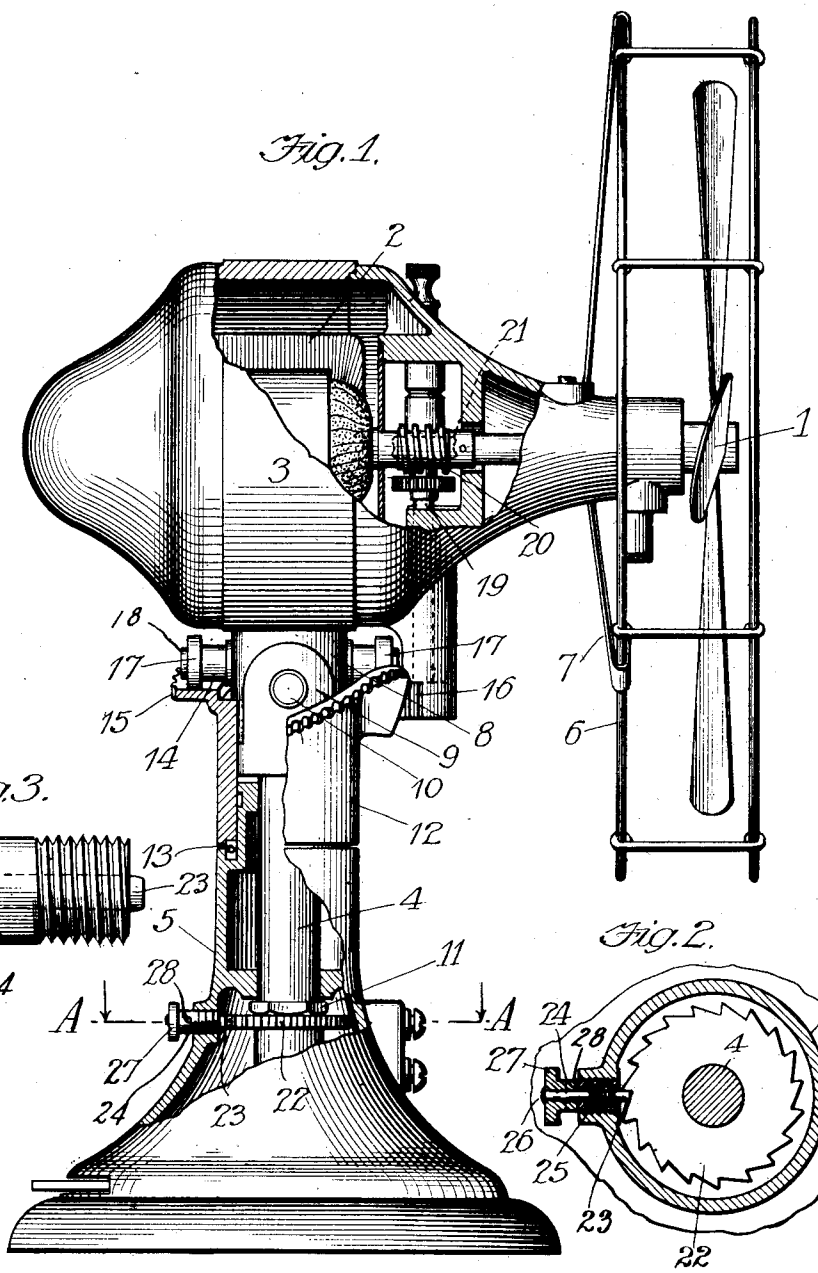


Fig. 3.

Fig. 2.

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ELECTRIC FAN.

1,196,256. Specification of Letters Patent. Patented Aug. 29, 1916.

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To all whom it may concern:

Be it known that I, WILLARD M. McEWEN, a citizen of the United States of America, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Electric Fans, of which the following is a specification.

The main objects of this invention are to provide an improved form of mechanism for swinging an electric fan in a substantially horizontal plane, and at the same time tilting it up and down; to provide improved mechanism for causing the fan to oscillate vertically and at the same time turn intermittently in one direction; and to provide improved means for rendering said checking mechanism inoperative.

An illustrative embodiment of this invention is shown in the accompanying drawings, in which—

Figure 1 is a front elevation partly sectional of an electric fan constructed in accordance with this invention. Fig. 2 is an enlarged fragmentary detail as viewed from the plane of the line A—A of Fig. 1. Fig. 3 is an enlarged detail of the pawl in its retracted position.

In the construction shown in the drawings, the blower mechanism comprises a fan 1, connected to a motor 2 rotatably mounted in a casing 3, which is tiltably supported on a member or shaft 4 journaled in a supporting member or base 5. The fan 1 and motor 2 may be of any desired construction, the fan being provided with the usual protecting guard 6 supported on the motor casing 3 by means of arms 7.

The motor casing 3 is connected to the shaft 4 by a lug 8 formed on the under side of the casing, which is received in the bifurcated head 9 of said shaft and pivotally connected thereto by a stud shaft 10. The blower mechanism is thereby supported so as to be tilted in the plane of the axis of said shaft. A suitable connection 11 is attached to the end of the shaft 4 for securing the shaft against upward longitudinal movement in the member 5.

A sleeve or member 12 embraces the shaft 4 and is rotatably supported on the standard 5 by means of ball bearings 13, so that it will freely rotate independently of the shaft 4. The member 12 is provided with an integral transversely disposed annular flange or track 14 concentrically arranged with respect to said shaft. This flange is of wave-like construction with the crowns and valleys of the waves disposed diametrically opposite. Gear teeth 15 are formed on the periphery of the track so as to provide an annular rack or gear with which the pinion 16 meshes. Rollers 17 journaled on trunnions 18 carried by the lug 8 engage the track 14 at diametrically opposite points, and coacting with the crowns and valleys thereof, cause the fan 1 to tilt up and down in a vertical plane. The pinion 16 is carried on a shaft 19 journaled in the casing 3 and connected to the motor shaft by means of a worm 20 and gear 21.

This type of fan employs the same principle of oscillation as is described in my copending application Serial Number 29,129, filed May 19, 1915, for electric fans, wherein by tilting the axis of rotation of the fan in a vertical plane, gyratory forces are brought into play which cause the fan to swing in a horizontal plane and to reverse the direction of horizontal swinging whenever the direction of vertical tilting is reversed.

In the herein described form, pawl and ratchet mechanism is provided so as to check the tendency of the fan to turn in one direction, whereby the fan turns horizontally through a complete circle, advancing by intermittent angular stages, the advances occurring as the fan is tilted in one direction, and there being no advance during the reverse tilting movement. This mechanism comprises a ratchet 22 suitably secured to the shaft 4 in the lower part of the base, and a pawl 23 in the form of a pin shiftably supported in a sleeve 24 and normally urged by a spring 25 to bear against said ratchet. The sleeve 24 has threaded engagement with the base 5, and is provided with a head 26 which engages the nut 27 and limits the action of the spring 25. The nut 27 is provided with shoulders 28 (Fig. 1), arranged to engage suitable notches formed in the sleeve 24 whereby the nut becomes rigidly connected to the sleeve for the purpose of turning it for screwing into or withdrawing from the support 5. The shoulders 28 also may be set to engage the end of the sleeve 24 so as to hold the pawl 23 retracted from the ratchet 22, as shown in Fig. 3. This construction provides for oscillating the fan back and forth in a horizontal plane at the same time that it is being tilted up and down in a vertical plane or for moving

the fan in a circle by intermittent angular swings, and also provides means for regulating said movements. The movements occur in the following manner: As the motor 2 rotates the fan 1, the pinion 16 engaging the rack 15 causes a relative rotation of the sleeve 12 and the shaft 4. This rotation of the sleeve causes the wave-like track 14 coacting with the rollers 17 to tilt the fan up and down in the plane of the axis of the shaft, whereupon the fan tends to swing back and forth as a result of gyratory action produced by the tilting. If the rotation of the fan is clockwise, then looking at the front of the fan, the forward oscillation or swing to the left occurs during the downward tilting, and the backward oscillation or swing to the right occurs during the upward tilting. The angular extent of the individual horizontal oscillations is controlled by the rate of change in the tilt of the fan, which in turn is determined by the speed of the track. Theoretically, the forward oscillation of the fan should begin at the instant the fan begins to tilt downward, and likewise the backward oscillation should begin at the instant the upward tilting begins, but due to the inertia of the parts the reversal of the oscillations is delayed momentarily after the changes in direction of vertical tilting movement.

If the pawl 23 is set as shown in Figs. 1 and 2, the fan will be free to swing forwardly during the downward tilting and will be prevented from swinging backward during the upward tilting of the fan. Thus as the fan tends to move around a circle by intermittent angular swings, when the pawl 22 is retracted the fan is free to swing in both directions so that it would become an oscillating fan as explained in my copending application Serial No. 29,129.

Although but one specific embodiment of this invention has been herein shown and described, it will be understood that numerous details of the construction shown may be altered or omitted without departing from the spirit of this invention as defined by the following claims.

I claim:—

1. The combination of a support, a member rotatably mounted thereon, motor-driven mechanism tiltably mounted on said member, coacting means on said motor-driven mechanism and said support adapted to tilt said motor-driven mechanism and thereby through gyratory forces tend to cause the horizontal swinging of said member and said motor-driven mechanism, and means for holding said member and mechanism against horizontal swinging in one direction.

2. In an air-circulating device, the combination of a support, rotary fan mechanism mounted to oscillate horizontally thereon, mechanism for tilting said fan mechanism vertically and thereby through gyratory forces tend to cause the horizontal swinging thereof, and means for holding said fan mechanism against horizontal swinging in one direction.

3. In an air-circulating device, the combination of a support, a shaft journaled thereon, blower mechanism tiltably mounted on said shaft, coacting means on said blower mechanism and said support adapted to tilt said blower mechanism and thereby through gyratory forces tend to cause the horizontal swinging of said shaft and blower mechanism, and ratchet and pawl mechanism coacting between said shaft and support for holding said blower mechanism against horizontal swinging in one direction.

4. In an air-circulating device, the combination of a support, a shaft journaled thereon, blower mechanism tiltably mounted on said shaft, coacting means on said blower mechanism and said support adapted to tilt said blower mechanism and thereby through gyratory forces tend to cause the horizontal swinging of said shaft and blower mechanism, a ratchet carried by said shaft, and a pawl on said support engaging said ratchet so as to hold said blower mechanism against horizontal swinging in one direction.

5. In an air-circulating device, the combination of a support, a shaft journaled thereon, blower mechanism tiltably mounted on said shaft, coacting means on said blower mechanism and said support adapted to tilt said blower mechanism and thereby through gyratory forces tend to cause the horizontal swinging of said shaft and blower mechanism, ratchet and pawl mechanism coacting between said shaft and support for holding said blower mechanism against horizontal swinging in one direction, and means for rendering said ratchet and pawl mechanism inoperative.

6. In an air-circulating device, the combination of a support, a shaft journaled thereon, blower mechanism tiltably mounted on said shaft, coacting means on said blower mechanism and said support adapted to tilt said blower mechanism and thereby through gyratory forces tend to cause the horizontal swinging of said shaft and blower mechanism, a ratchet carried by said shaft, a pawl on said support engaging said ratchet so as to hold said blower mechanism against horizontal swinging in one direction, and means for retracting said pawl from engagement with said ratchet.

Signed at Chicago this 8th day of July 1915.

WILLARD M. McEWEN.