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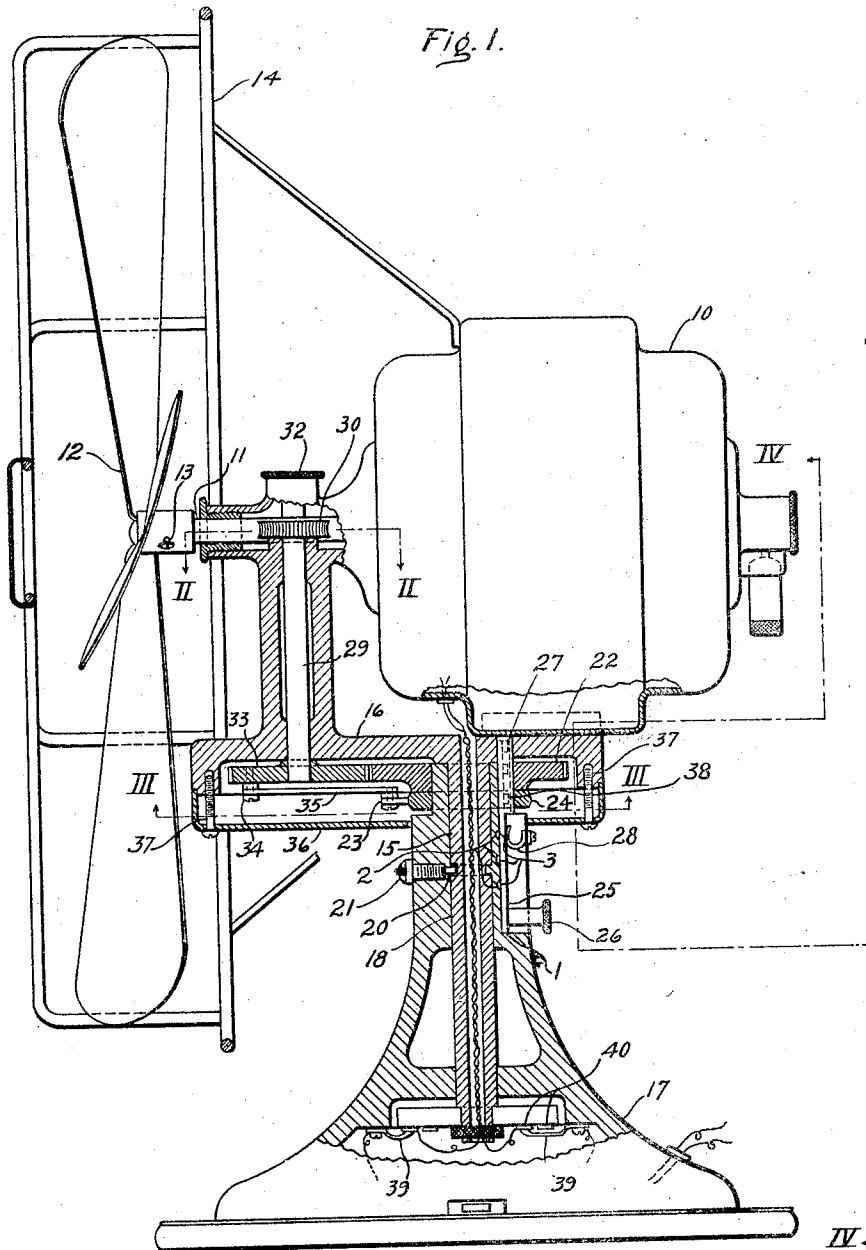
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C. AALBORG

FAN CONSTRUCTION

Filed August 14, 1924

2 Sheets-Sheet 1



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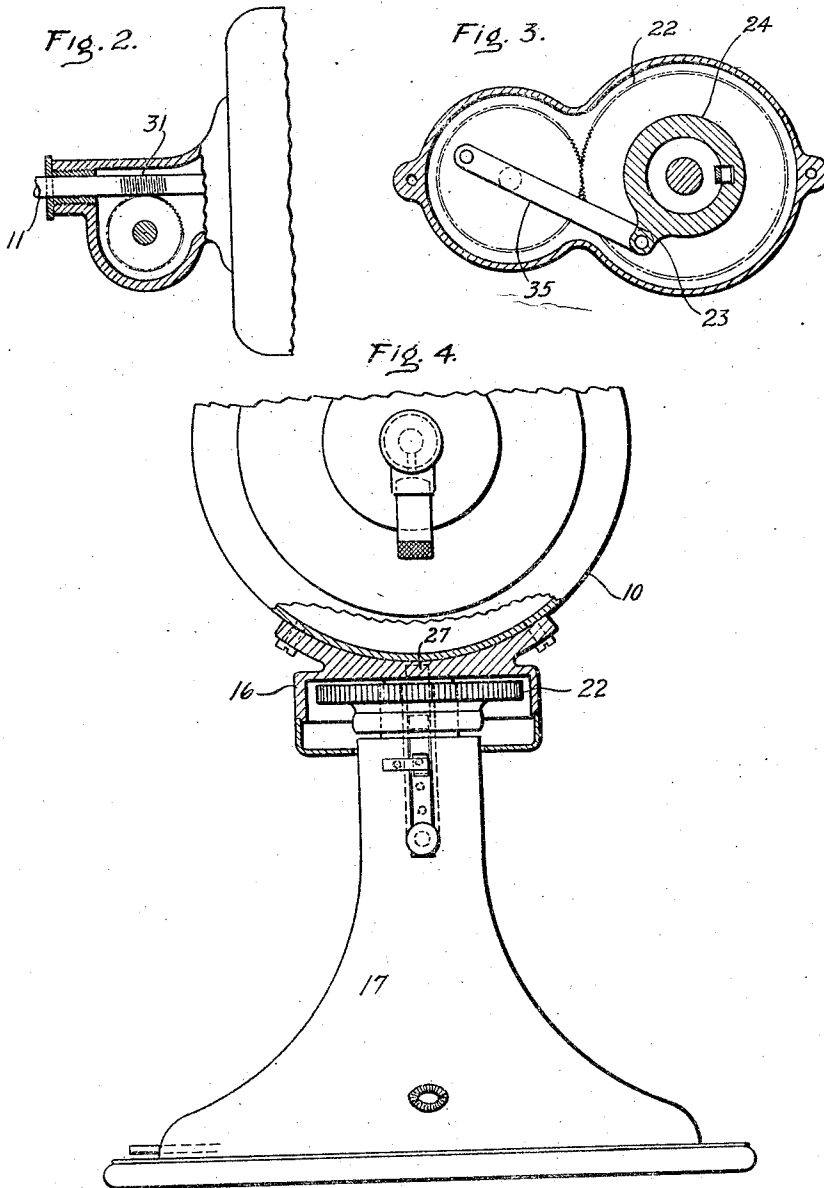
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WITNESSES.

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UNITED STATES PATENT OFFICE.

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FAN CONSTRUCTION.

Application filed August 14, 1924. Serial No. 731,920.

This invention relates to improvements in fans and more particularly to the mechanism provided for moving the fan wheel to diffuse currents of air.

The object of the invention, generally stated, is the provision of a motor-driven fan that shall be simple and efficient in operation, and readily and economically manufactured.

A more specific object of the invention is to provide for the retention of the fan wheel of a motor-driven fan in a pre-determined position, or the movement of the fan wheel in different paths during operation to control the direction of delivery of air currents.

Another object of the invention is to facilitate the setting of the operating mechanism of a motor-driven fan to give the desired diffusion of the currents of air.

Other objects of the invention will in part be obvious and in part appear hereinafter.

This invention accordingly is disposed in the embodiment thereof shown in the accompanying drawing and comprises the features of construction, combination of elements and arrangement of parts which will be exemplified in the construction hereinafter set forth, and the scope of the application of which will be indicated in the claims.

For a fuller understanding of the objects of the invention, reference should be had to the following detailed description, taken in conjunction with the accompanying drawing, in which—

Figure 1 is a side elevation of a fan, parts being broken away to show a construction in accordance with this invention.

Figure 2 is a horizontal section along the line II—II of Figure 1, showing details of the driving mechanism.

Figure 3 is a horizontal section along the line III—III of Figure 1, and

Figure 4 is a fragmentary rear elevation showing details of construction.

Referring now to the drawings, 10 designates generally a fan motor of any well-known construction provided with an armature shaft 11 extended beyond the casing to receive the fan wheel 12. As shown, the fan wheel is mounted on the forward end of the armature shaft and is retained in position by means of a set screw 13. At

tached to the casing of the motor 10 is a fan guard 14 for projecting the fan wheel 12.

In order that the fan wheel may be given an oscillatory or a revoluble movement during operation, the motor is rotatably disposed on a base 17.

It will be observed that an auxiliary casing, shown generally at 16, is provided in conjunction with the main motor casing and has depending therefrom a vertical shaft 15 adapted to fit into a bearing 18 formed in the base 17. In some cases, the auxiliary casing may be cast integral with the main motor casing but they are preferably made separate, and, when assembled, are attached to one another in any suitable manner, as by the use of the screws shown in Figure 4.

The shaft 15 may be retained in position in the bearing 18 in a variety of ways. In this particular construction, a circumferential groove 19 is provided in the shaft near its upper end and a pin 20, carried by a set screw 21 mounted in the base 17, projects into the groove.

Mounted loosely upon a cylindrical portion of the upper end of the base 17 and within the auxiliary casing 16 are a gear wheel 22 and a ring 24, the latter having a lug 23 to which is pivotally connected one end of a crank arm 35.

In order to fasten either the gear 22, or the ring 24 against rotative movement and thus ensure the desired movement of the fan wheel, a latch 25 is slidably mounted in a longitudinal groove 1 formed in the base 17. As shown, the latch 25 is provided with a head 38 adapted to pass through grooves formed in the ring 24 and gear 22 and to enter a notch 27 formed in the upper wall of the auxiliary casing 16.

The latch 25 may be held in any one of a plurality of positions on the base by any suitable means, such, for example, as notches or recesses 2 in the bottom of the latch groove for the reception of a projection 3 formed on the inner face of the latch. A spring 28 is mounted on the base to press the latch tightly against the bottom of the groove and thereby hold the projection in any notch in which it may be set.

It will be noted that the spacing of the notches in the latch groove is the same as the spacing of the ring 24, gear wheel 22 and notch 27 in the motor casing. Further,

more, the spacing of the ring, the gear wheel and the notch, from their corresponding notches in the latch groove, is equal to the distance between the latch projection and head 38. Therefore, by setting the latch projection in an appropriate notch 2, the head 38 will serve to lock the ring, the gear wheel or the motor in a predetermined position on the base.

A driving connection is interposed between the armature shaft 11 and the gear 22, which, as shown in Figure 1, comprises a shaft 29 rotatably mounted in bearings provided in the auxiliary casing 16, a worm wheel 30 which meshes with a worm 31 formed on the armature shaft 11, and a gear wheel 33 which meshes with the gear wheel 22.

In order to connect the armature shaft 11 to the ring 24, a crank pin 34 is provided on the gear wheel 33 to which is connected one end of the crank arm 35. Thus, a connection is provided whereby the ring may be oscillated by the operation of the motor.

The mechanism for giving the fan wheel revoluble and oscillatory movements is enclosed by means of a pan 36, attached to the lower portion of the auxiliary casing 16 by means of screws 37. Therefore, when repairs are required, access to the driving mechanism may be had by the simple operation of removing the pan.

It will be noted that an oil cup 32 is disposed in the auxiliary casing 16 in alinement with the shaft 29 so that the moving parts may be readily lubricated. Oil ducts are formed in the shaft bearing to hold a quantity of the lubricant.

Electrical energy may be supplied to the motor when it is stationary or moving in any suitable manner, as by mounting in the base 17 a pair of brushes 39 disposed to make contact with the rings 40 carried by the shaft 15. It will be readily understood that the supply of electrical energy may be controlled by means of a transformer or other suitable device mounted in the base 17.

In operation, the latch 25 is manipulated to fix either the motor, the gear wheel 22 or the ring 24 in position on the base. If the motor is locked in a predetermined position on the base, then the fan wheel is operated to deliver currents of air in one direction. When the motor is thus retained stationary during operation, the gear wheel 22 rotates and the ring 24 oscillates on the base.

Assuming now that the latch is manipulated to lock the gear wheel 22 in a predetermined position on the base, then the gear wheel 33, driven from the armature shaft, travels around the gear wheel 22, rotating the motor about the axis of the shaft 15 and giving the fan wheel a revoluble movement. During the rotation of the motor 10, the ring

24 and the crank arm 35 are given a rotary and an oscillatory movement on the base, respectively.

Supposing that the latch 25 has been set to lock the ring 24 in a predetermined position relative to the base, then the gear wheel 22 is free to rotate. When the motor is set in operation, the gear wheel 33 is rotated and the crank arm 35 causes the motor to oscillate about the axis of the shaft 15.

It will be readily understood that the speed at which the motor turns upon the axis of the shaft 15 is slow, as compared with the speed of the armature shaft 11. Accordingly, the latch 25 may be manipulated during the operation of the fan without danger of destruction to the driving mechanism.

I would state, in conclusion, that, while the illustrated example constitutes a practical embodiment of my invention, I do not limit myself strictly to the exact details herein illustrated, since modifications of the same may be considerably varied without departing from the spirit of the invention as defined in the appended claims.

I claim as my invention:

1. In a fan, in combination, a base, a motor rotatably disposed on the base, a fan wheel carried by the motor, means co-operative with the motor to cause the fan wheel to revolve or to oscillate as it rotates, and means adapted to effect selective movement of the fan wheel, said means for effecting selective movement being adapted also to retain the fan wheel in a predetermined position.

2. In a fan, in combination, a base, a motor rotatably disposed on the base, a fan wheel carried by the motor, a gear wheel and a ring loosely mounted on the base, means adapted selectively to lock said gear wheel or said ring in a predetermined position on the base, and means operated by the motor and co-operative with the gear wheel and the ring to effect a revoluble or an oscillatory movement of the fan wheel.

3. In a fan, in combination, a base, a motor rotatably disposed on the base, a fan wheel carried by the motor, a gear wheel and a ring loosely mounted on the base, means adapted selectively to lock said gear wheel or said ring in a predetermined position on the base, and means operated by the motor and co-operative with the gear wheel and the ring to effect a revoluble or an oscillatory movement of the fan wheel, said locking means being adapted also to retain the motor against rotation on the base.

4. In a fan, in combination, a base, a motor rotatably disposed on the base, a fan wheel carried by the motor, a gear wheel and a ring loosely mounted on the base, means operated by the motor and co-operative with said gear wheel and said ring to give the fan wheel a revoluble or an oscillatory

movement, and a latch movably disposed on the base to engage selectively the gear wheel and the ring to retain them in predetermined positions on the base, thereby to effect the desired movement of the fan wheel.

5 5. In a fan, in combination, a base, a motor rotatably disposed on the base, a fan wheel carried by the motor, a gear wheel and a ring loosely mounted on the base, means operated by the motor and co-operative with said gear wheel and said ring to give the fan wheel a revoluble or an oscillatory movement, and a latch movably disposed on the base to engage selectively the gear wheel and the ring to retain them in predetermined positions on the base, thereby to effect the desired movement of the fan wheel, said latch also being adapted to lock the motor in a predetermined position on the base.

6. In a fan adapted for oscillatory, revoluble or stationary operation, in combination, a base, a motor rotatably disposed on the base, a fan wheel carried by the motor, a gear wheel loosely mounted on the base, means operated by the motor to rotate said gear wheel, and means adapted to lock the gear wheel against rotation, thereby to cause a revoluble movement of the fan wheel.

30 7. In a fan adapted for oscillatory, revoluble or stationary operation, in combination, a base, a motor rotatably disposed on the base, a fan wheel carried by the motor, a ring loosely mounted on the base, means operated by the motor to oscillate the ring about the base, and means adapted to

lock the ring in a predetermined position on the base, thereby to effect oscillatory movement of the fan wheel.

8. In a fan adapted for oscillatory, revoluble or stationary operation, in combination a base, a motor rotatably disposed on the base, a fan wheel carried by the motor, a latch operable to lock the motor in a predetermined position on the base, a gear wheel and a ring loosely mounted on the base, and means operated by the motor to effect the rotation of the gear wheel and oscillation of the ring when the motor is engaged by the latch, said latch being adapted to selectively engage the gear wheel or the ring when disengaged from the motor, thereby to effect revoluble or oscillatory movement of the fan wheel.

9. A fan comprising, in combination, a base, a motor rotatably mounted on the base, a fan wheel carried by the motor, a gear wheel and a ring loosely mounted on the base, means operated by the motor to effect the rotation of the gear wheel and oscillation of the ring when the motor is retained in one position, and a latch adjustably mounted on the base, to engage selectively the gear wheel and the ring when disengaged from the motor and to lock them in predetermined positions on the base, thereby to give the fan wheel revoluble and oscillatory movements.

In testimony whereof, I have hereunto subscribed my name this 2nd day of August, 1924.

CHRISTIAN AALBORG.