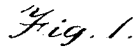


APPLICATION FILED OCT. 9, 1917.

2 SHEETS—SHEET 1.

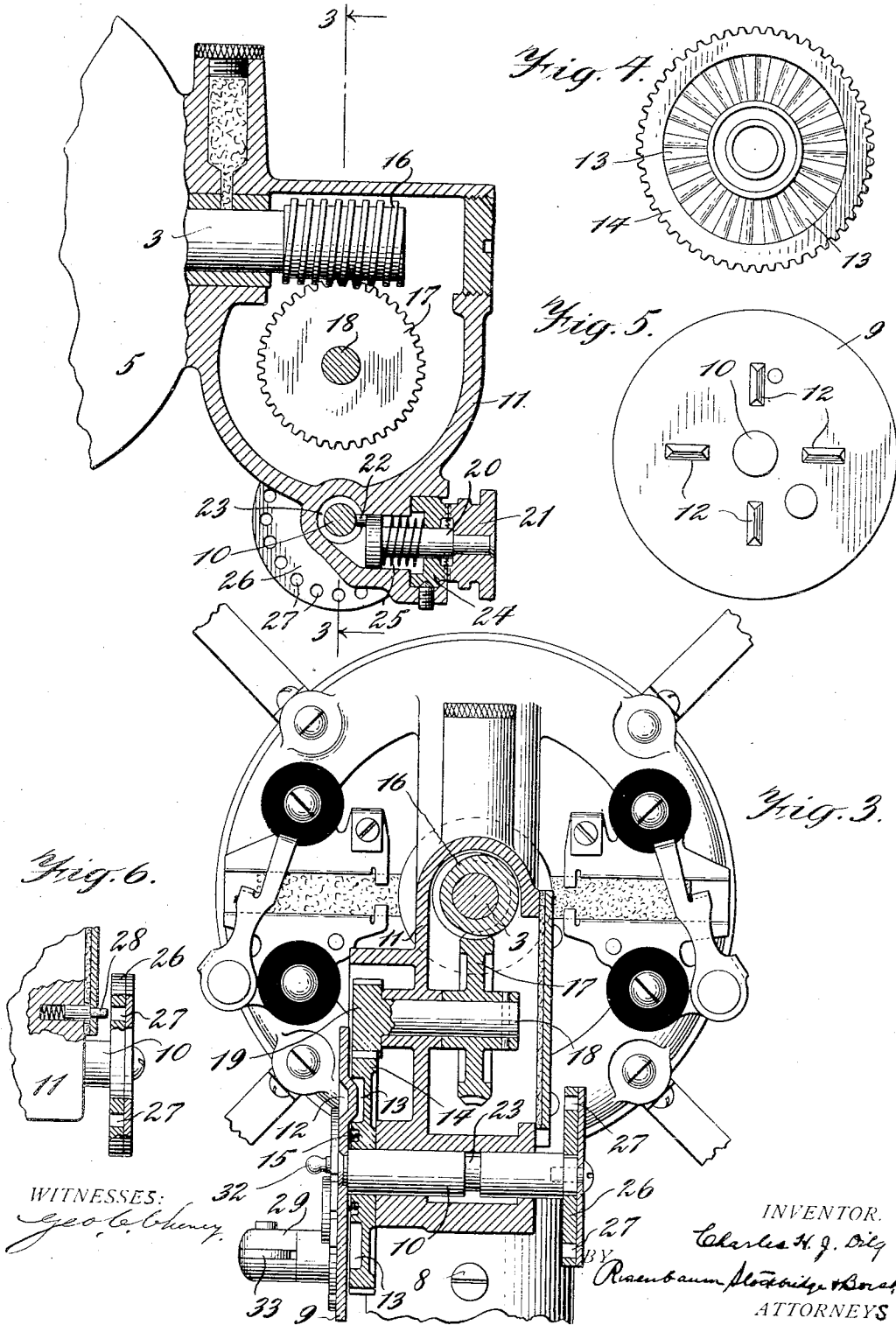


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1,337,644.

Patented Apr. 20, 1920
2 SHEETS—SHEET 2.



UNITED STATES PATENT OFFICE.

CHARLES H. J. DILG, OF NEW YORK, N. Y.

MOTOR-FAN.

1,337,644.

Specification of Letters Patent. Patented Apr. 20, 1920.

Original application filed January 7, 1913, Serial No. 740,641. Divided and this application filed October 9, 1917. Serial No. 195,497.

To all whom it may concern:

Be it known that I, CHARLES H. J. DILG, a citizen of the United States, residing at the city of New York, in the borough of Manhattan and State of New York, have invented certain new and useful Improvements in Motor-Fans, of which the following is a full, clear, and exact description.

My invention relates to motor fans and particularly to motor fans of the oscillating type, this application being divisional of my application Serial Number 740,641, filed January 7, 1913.

One object of my invention is to provide a motor fan which may be easily converted from an oscillating to a non-oscillating fan, and vice versa. Another object is to prevent injuring the motor when any unusual opposition is offered to the oscillation. Other general objects are simplicity and durability of construction, convenience in manipulation, and reliability in operation. Still other objects and advantages of my invention will appear from the following description.

In accordance with my invention, I provide in the oscillating train which operatively connects the motor shaft with a stationary abutment on the base, a clutch designed to automatically disengage under excessive back pressure on the oscillating train, as when an obstruction is encountered by the fan guard, and render the oscillating train inoperative, thereby converting the fan quickly and automatically into a non-oscillating fan. Specifically this is effected by a slidable shaft which carries one element of the clutch and is resiliently held in its position of clutch engagement, the clutch elements being designed to separate when they are subjected to relative movement. My invention also comprehends manual means for effecting the same operation. My invention also comprehends various other features of construction and arrangements and combinations of parts, as will hereinafter more fully appear.

I shall now describe the illustrated embodiment of my invention and shall thereafter point out my invention in claims.

Figure 1 is a side elevation of a complete fan embodying my invention;

Fig. 2 is a longitudinal sectional elevation of the rear portion of the same, on an enlarged scale;

Fig. 3 is a transverse sectional elevation on line 3—3 of Figs. 1 and 2;

Fig. 4 is a detail face elevation of the striated clutch wheel;

Fig. 5 is a similar view of the cooperating crank disk; and,

Fig. 6 is a detail, partially in rear elevation and partially in section, of the crank-locking disk and cooperating parts.

In the illustrated embodiment of my invention an electric motor is employed which is mounted upon a base 1 and carries a fan 2 of suitable construction upon the front end of the armature shaft 3 in the usual manner. The base 1 is provided with an upwardly extending motor-bearing stem or arbor 4, and the motor casing 5 is provided on its under side with an integral cylindrical bearing head 6 which has a cylindrical socket fitting upon the upper end of the stem 4 for rotative movement thereon, and which bears at its lower end upon an adjustable collar 7 supported upon a shoulder on the stem 4. A locking screw 8 in the bearing head 6 engages in a circumferential groove in the stem 4 and locks the motor against movement longitudinally of the stem. An anti-friction bearing is interposed at the upper end of the stem 4. To oscillate the motor upon this bearing means are provided actuated from the armature shaft 3, as will now be described.

A crank member comprising a crank disk 9 is fixed on the end of a horizontal axially slidable shaft 10 mounted below the armature shaft 3 in suitable bearings in a gear casing 11 on the rear of the motor, and on its inner face this crank disk 9 is provided with a plurality of beveled clutch teeth 12 adapted to engage in striations 13 on the adjacent face of a gear clutch wheel 14 which is loosely mounted on the axially slidable shaft 10. A coiled spring 15 is disposed between the clutch wheel and crank disk and tends to separate them, but with the shaft in the position shown in Fig. 3, the two clutch members are held together against the expansive pressure of the spring 15. The clutch wheel 14 is actuated from the armature shaft 3 through reduction gearing comprising a worm 16 on the rear end of the armature shaft, a worm wheel 17 on one end of the stub shaft 18, and a pinion 19 on the other end of the stub shaft

18 and meshing with the clutch wheel 14. Through these transmitting means the clutch wheel 14 is continuously rotated by the motor, and, when the crank disk 9 is in engagement with the clutch wheel 14, it is also rotated by the motor.

To axially slide the shaft 10 and move the crank disk 9 into and out of engagement with the clutch wheel 14, manually operative means are provided comprising a stud or shaft 20 disposed at right angles to the slidable shaft 10, and having a knurled knob 21 on its outer end, and a crank or eccentric pin 22 on a head on its inner end extending into a circumferential groove 23 in the slidable shaft 10. The shaft 20 bears in a plug 24 and a coiled spring 25 is disposed between the plug 24 and the head on the end of the shaft 20, and holds the pin 22 in the groove 23, while permitting the shaft 20 to yield longitudinally. The engaging faces between the knob 21 and the plug 24 are preferably striated to securely lock the knob in adjusted position. It is now apparent that the turning of the knob 21 serves to adjust the slidable shaft through the engagement of the crank pin 22 in the groove 23, and to thereby throw the crank disk 9 into and out of engagement with the clutch wheel 14.

To lock the crank disk 9 against rotation when out of engagement with the clutch wheel, a lock disk 26 is provided on the opposite end of the shaft 10, which is provided with a plurality of socket holes 27 near its periphery adapted to engage with a spring pressed pin 28 in the casing 11, when the shaft 10 is moved to disengage the crank disk. The spring permits the pin 28 to yield until it drops into one of the socket holes 27.

The crank pin 29 for the crank disk 9 is mounted on a crank member consisting of a disk 30 pivoted eccentrically upon the crank disk 9 and so arranged that the center of the crank disk 9 is in the path of rotation of the crank pin 29. On the periphery of the eccentric disk 30, suitably spaced locking notches are provided into which a spring pressed locking pawl 31 is arranged to engage. A knob 32 on the eccentric disk 30 affords convenient means for manually rotating the eccentric disk to vary the eccentricity of the crank pin 29 and thereby vary the throw of the crank pin, the locking pawl 31 serving to lock the eccentric disk in adjusted position. It is evident that if the eccentric disk is adjusted to bring the crank pin 29 concentric with the crank disk 9, the throw of the crank pin will be zero.

To mechanically connect the crank pin with a fulcrum or stationary abutment to impart oscillation to the motor as the crank is actuated, a connecting rod 33 is employed, which at one end has a pivotal and swivel

connection with the crank pin 29, and at the other end has a similar connection with a lug 34 on the adjustable collar 7. The adjustment of this collar adjusts the fan relative to the base, as is apparent, and permits the breeze to be sent in any direction without altering the position of the base 1 relative to its support. A set screw 35 locks the adjustable collar 7 to the motor-bearing stem 4 in adjusted position.

The striated engaging faces between the crank disk 9 and the clutch wheel 14, being beveled or inclined, co-act to spread the two members apart if any excessive load is placed upon them, as occurs, for example, when any unusual opposition is offered to the oscillation, as when an obstruction is placed in the way of the fan guard. If the crank disk is held against rotation, the rotative effort of the clutch wheel 14 causes the striated clutch face to act as a cam on the teeth 12 and force the crank disk and slidable shaft 10 to the left, thereby rotating the shaft 20 and the knob 21, which is permitted by the striated engaging faces between the knob 21 and the plug 24, the shaft 20 yielding longitudinally against the tension of the spring 25. In this way the oscillating mechanism is automatically disengaged and the motor prevented from becoming overloaded and possibly burned out when oscillation is prohibited. When the obstruction has been removed, the knob 21 may again be turned back and the oscillating mechanism thrown into operation.

It is obvious that various modifications may be made in the construction shown in the drawings and above particularly described within the principle and scope of my invention.

I claim:

1. In a motor fan, the combination of a base, a motor and casing therefor pivotally supported upon the base, and an oscillating train operatively connecting the motor shaft to the base and including means operable by the motor to interrupt the train upon impedance of the oscillatory movement and thereby to automatically render the fan non-oscillatory.

2. In a motor fan, the combination of a base, a motor and casing therefor pivotally supported upon the base, and an oscillating train operatively connecting the motor shaft to the base and including a yieldable transmitting member arranged in one position to be positively driven and transmit actuation from the motor shaft and in another position to be inoperative to transmit actuation and arranged to yield under excessive back pressure and move from the operative to the inoperative position.

3. In a motor fan, the combination of a base, a motor and casing therefor pivotally supported upon the base, and an oscillating

train operatively connecting the motor shaft to the base and including a shiftable transmitting member arranged in one position to be positively driven and transmit actuation from the motor shaft and in another position to be inoperative to transmit actuation, means resiliently holding the shiftable member in both its operative and its inoperative positions, the said member being arranged to yield under excessive back pressure and be moved from the operative to the inoperative position, and manually operative means for moving the said member into and out of the operative position.

4. In a motor fan, the combination of a base, a motor and casing therefor pivotally supported upon the base, and an oscillating train operatively connecting the motor shaft to the base and including a shiftable transmitting member arranged in one position to be positively driven and transmit actuation from the motor shaft and in another position to be inoperative to transmit actuation, means resiliently holding the shiftable member in both its operative and its inoperative positions, and manually operative means for moving the said member into and out of the operative position.

5. A motor fan comprising a base, a motor and casing therefor pivotally supported upon the base, and an oscillating train operatively connecting the motor shaft to the base, said train including a clutch member one element of which is movable into and out of engagement with its cooperative element, and said train including means operated by the motor shaft to disconnect the said element from its cooperative element when excessive resistance to the oscillation is encountered.

6. A motor fan comprising a base, a motor and casing therefor pivotally supported upon the base, and an oscillating train operatively connecting the motor shaft to the base, said train including a clutch member one element of which is movable into and out of operative engagement with its cooperative element and has means to disconnect it from its cooperative element when the two elements are relatively moved.

7. A motor fan comprising a base, a motor and casing therefor pivotally supported upon the base, and an oscillating train operatively connecting the motor shaft to the base, said train including a clutch member one element of which is movable into and out of operative engagement with its cooperative element, and means resiliently holding the said element in both of its said positions.

8. A motor fan comprising a base, a motor and casing therefor pivotally supported upon the base, and an oscillating train operatively connecting the motor shaft to the base, said train including a clutch member

one element of which is movable into and out of operative engagement with its cooperative element, means resiliently holding the said element in both of its said positions, and manually operative means for shifting the said element.

9. A motor fan comprising a base, an electric motor having pivotal engagement with the base, an axially slidable shaft carried by the motor, a crank member, a connecting rod connecting the crank member to the base and adapted to impart oscillation to the motor as the crank member is operated, and speed-reducing means arranged to transmit actuation from the armature shaft to the crank member and including a clutch member engageable with the crank member, one of said members being carried by the axially slidable shaft and the two members having cooperative clutch means to impart axial movement to the slidable shaft and separate the two members when the two members are relatively moved.

10. A motor fan comprising a base, an electric motor having pivotal engagement with the base, an axially slidable shaft carried by the motor, a crank member, a connecting rod connecting the crank member to the base and adapted to impart oscillation to the motor as the crank member is operated, speed-reducing means arranged to transmit actuation from the armature shaft to the crank member and including a clutch member engageable with the crank member, one of said members being carried by the axially slidable shaft, and means resiliently holding the slidable shaft in both engaging and non-engaging positions of the two members.

11. A motor fan comprising a base, an electric motor having pivotal engagement with the base, an axially slidable shaft carried by the motor, a crank member, a connecting rod connecting the crank member to the base and adapted to impart oscillation to the motor as the crank member is operated, speed-reducing means arranged to transmit actuation from the armature shaft to the crank member and including a clutch member engageable with the crank member, one of said members being carried by the axially slidable shaft, means resiliently holding the slidable shaft in both engaging and non-engaging positions of the two members, and manually operative means for sliding the shaft.

12. A motor fan comprising a base, an electric motor having pivotal engagement with the base, an axially slidable shaft carried by the motor, a crank member on the shaft, a connecting rod connecting the crank member to the base and adapted to impart oscillation to the motor as the crank member is operated, and speed-reducing means arranged to transmit actuation from the

armature shaft to the crank member and including a clutch member engageable with the crank member, the two members having cooperative clutch means to impart axial movement to the slidable shaft and separate the two members and disconnect the crank member when the two members are relatively moved.

13. A motor fan comprising a base, an electric motor having pivotal engagement with the base, an axially slidable shaft carried by the motor, a crank member on the shaft, a connecting rod connecting the crank member to the base and adapted to impart oscillation to the motor as the crank member is operated, speed-reducing means arranged to transmit actuation from the armature shaft to the crank member and including a clutch member engageable with the crank member, and manually operative means to axially adjust the slidable shaft and move the crank member into and out of engagement with the clutch member.

14. A motor fan comprising a base, an electric motor having pivotal engagement with the base, an axially slidable shaft carried by the motor, a crank member on the shaft, a connecting rod connecting the crank member to the base and adapted to impart oscillation to the motor as the crank member is operated, speed-reducing means arranged to transmit actuation from the armature shaft to the crank member and including a clutch member engageable with the crank member, manually operative means to axially adjust the slidable shaft and move the crank member into and out of engagement with the clutch member, and means for locking the crank member against rotation when out of engagement with the clutch member.

15. A motor fan comprising a base having a fulcrum member thereon, a motor and casing therefor having pivotal engagement with the base, a rotative crank member carried by the motor casing and arranged to be rotated by the motor, a connecting rod, connecting the crank member to the fulcrum member and adapted to impart oscillation to the motor as the crank member is rotated, and manually operative means for interrupting the connection between the motor and the crank member.

16. A motor fan comprising a base having a fulcrum member thereon, a motor and

casing therefor having pivotal engagement with the base, a rotative crank member carried by the motor casing, a connecting rod connecting the crank member to the fulcrum member and adapted to impart oscillation to the motor as the crank member is rotated, and speed reducing means including disengageable clutch elements arranged to transmit rotation from the armature shaft to the crank member.

17. In a revoluble motor-driven fan, the combination with an armature shaft and operating means normally coupled thereto for effecting an oscillatory movement of said fan, of means for uncoupling said operating means from said shaft and locking said fan in position.

18. In a revoluble motor-driven fan, the combination with an armature shaft and mechanical means normally coupled thereto for effecting an oscillatory movement of said fan, of means for uncoupling said mechanical means from said shaft and means, including a part of the aforesaid means, for retaining the said fan in position when the said parts are uncoupled.

19. In a revoluble motor-driven fan, the combination with an armature shaft and mechanical means normally coupled thereto for effecting an oscillatory movement of said fan, of means for uncoupling said mechanical means from said shaft and means, including a part of the aforesaid means, for restraining further oscillatory movement of said fan when the said parts are uncoupled.

20. In a revoluble motor-driven fan, the combination with an armature shaft and mechanical means cooperating therewith for effecting an oscillatory movement of said fan, of means for rendering said mechanical means inoperative and locking said fan in position.

21. In a revoluble motor-driven fan, the combination with an armature shaft and mechanical means normally in engagement therewith for effecting an oscillatory movement of said fan, of means for disengaging said mechanical means from said shaft and for restraining further oscillatory movement of said fan when said parts are disengaged.

In witness whereof I subscribe my signature.

CHARLES H. J. DILG.