

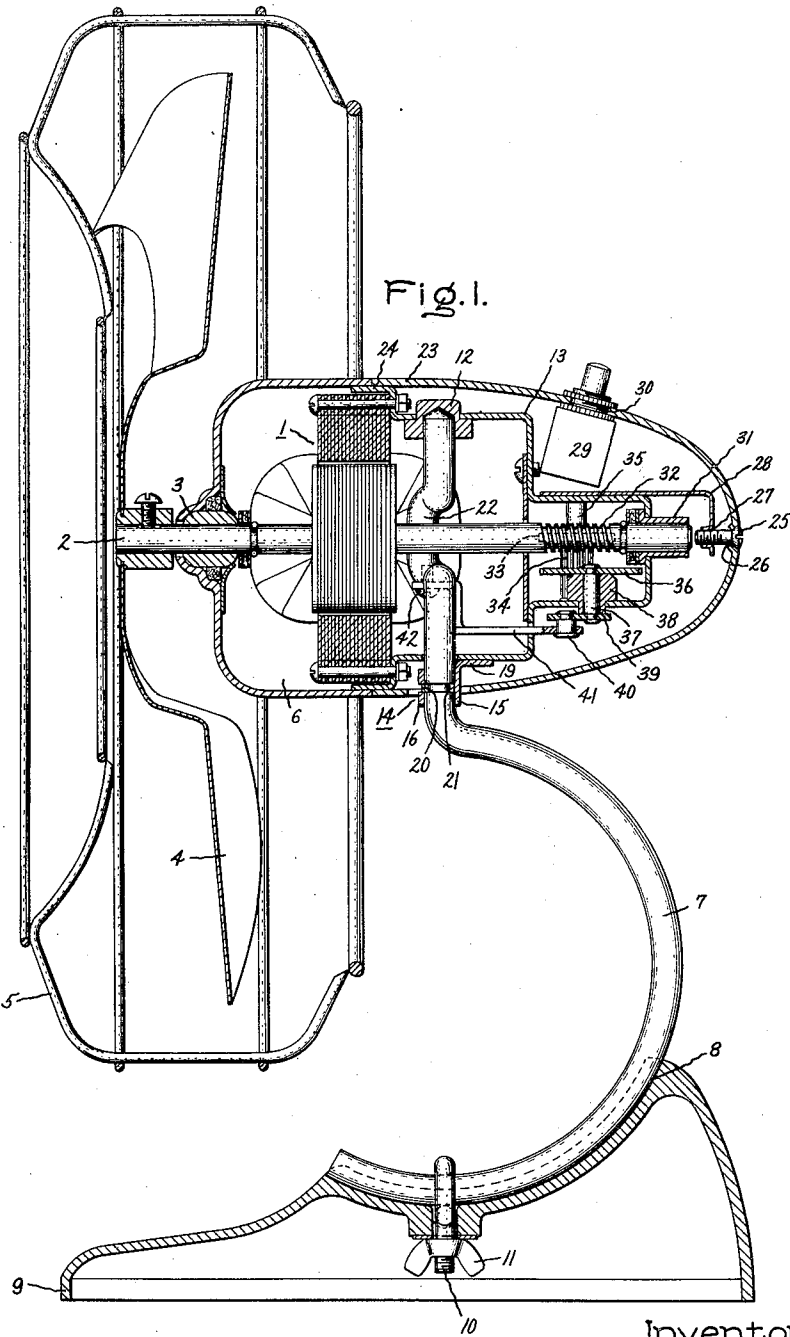
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ELECTRIC FAN

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2 Sheets-Sheet 1



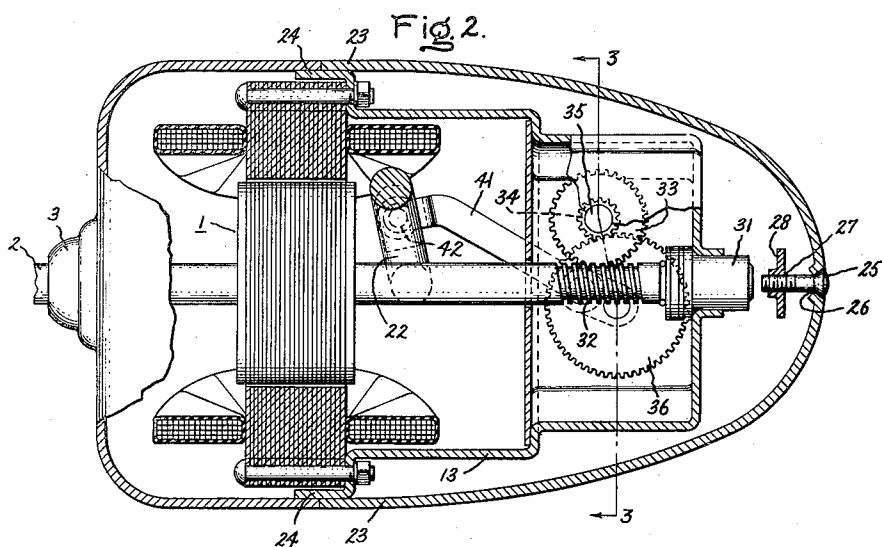
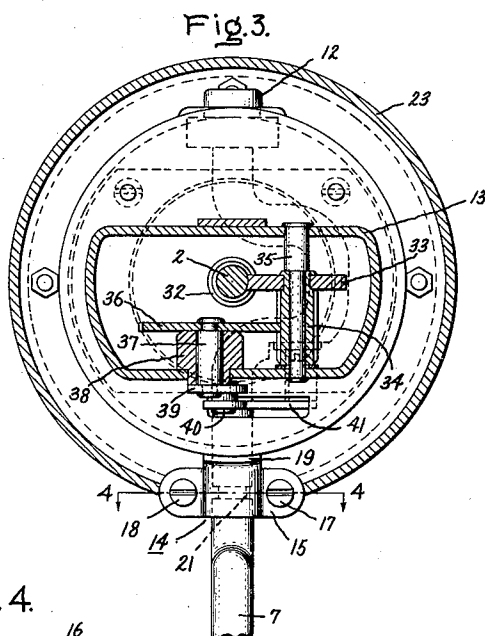
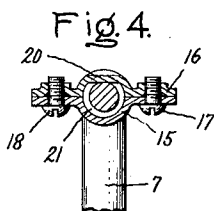
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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ELECTRIC FAN

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My invention relates to electric fans and has for its object the provision of an improved easily adjustable combined support and swivel for electric fans, together with automatic means for oscillating the electric fan upon said support so as to describe a limited oscillating arc in either direction.

One of the features of my invention is the use of a single supporting rod having an arcuate lower portion, easily adjustable in angle of elevation by being secured to a fixed base at variable points along its contour, the upper portion of the supporting rod acting as a swivel stud around which an electric fan can oscillate. Another feature of my invention is an automatic means for oscillating an electric fan on a supporting rod by a gear train rotated by a driving fan motor and connected to a crank arm pivotally attached to the supporting rod. A still further feature is the provision of a one piece casing, easily fabricated by such means as die-casting, which acts as a gear case and supports all the operating parts of the fan, thereby permitting the outer enclosing member to be easily removed without interfering with the operation of the fan.

For a more complete understanding of my invention, reference should be made to the accompanying drawings in which Fig. 1 is a vertical sectional view of a fan embodying my invention, Fig. 2 is a sectional plan view of the motor and gear assembly of the fan of Fig. 1; Fig. 3 is a sectional view taken along line 3—3 of Fig. 2; and Fig. 4 is a sectional view of the lower motor support bearing assembly taken along line 4—4 of Fig. 3.

Referring to the drawings, I have shown my invention in one form as applied to an electric fan comprising a motor 1, a drive shaft 2, a front motor bearing 3, fan blades 4 and fan guards 5, all of the conventional type. The motor assembly 6 is supported on a vertically arranged supporting rod 7, the lower portion of which is arcuate in shape and arranged to slide in a half-rounded channel 8 in a base 9, being adjustably secured in place in channel 8 by eye bolt 10 and wing nut 11. The free upper end of supporting rod 7 is journaled in a rotary bearing 12 which is pressed or welded into a casing 13. This casing 13 is shaped to form a number of telescoped cylindrical chambers serving to support the motor assembly 6 as well as to act as a gear case for an oscillating mechanism. The bottom of casing 13 is attached to supporting rod 7 by a bearing assembly 14 comprising two semi-circu-

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lar clamps 15 and 16 concentrically surrounding the supporting rod 7 and secured together by such means as screws 17 and 18 as shown in Figs. 3 and 4. Clamp 15 has a supporting arm 19 radially extending from the top of its central portion which is brazed, welded, or otherwise suitably secured to gear case 13. A lance 20 in clamp 16 fits into a lance groove 21 formed in supporting rod 7 and serves to position the clamp 16 around said supporting rod 7.

The bearing assembly 14, together with the rotary bearing 12, allows the motor assembly 6 to oscillate horizontally in either direction. The supporting rod 7 has an offset arm in the form of an integral eccentric portion 22 shaped as a semi-circle around drive shaft 2 in order to permit this oscillatory motion.

An outer shell-like enclosing member 23 is secured in place on an annular shoulder 24 of casing 13 by such means as a screw 25 extending through an aperture 26 into a tapped hole 27 in a supporting arm 28 which is secured to casing 13 by brazing or welding or other suitable means. An electric switch 29 is inserted in an aperture 30 in enclosing member 23 and threaded, welded, or otherwise suitably secured thereto. This switch is suitably connected, as by wires, to a circuit which controls operation of the fan motor in the usual fashion.

In the rear of drive shaft 2 supported by casing 13 is a rear motor bearing 31 which seats the drive shaft 2. A worm groove 32 formed in the rear of drive shaft 2 turns a following worm gear 33, best seen in Fig. 2 which rotates a connecting gear train as follows: Worm gear 33 is keyed, swaged or otherwise secured to a pinion 34, and both are journaled on a cross shaft 35 which is secured by any suitable means such as keying to casing 13. The pinion 34, in turn, engages a larger gear 36 which is non-rotatably attached to a shaft 37 extending parallel to shaft 35. A shaft bearing 38 concentrically surrounding shaft 37 is pressed, swaged or otherwise assembled into casing 13 thereby allowing shaft 37 to rotate. Rigidly secured to the lower end of shaft 37 by any suitable means such as keying or riveting is a crank arm 39 which is propelled by shaft 37. Rotatably attached to the outer end of crank arm 39 by such means as a shouldered rivet 40 is an oscillating lever 41. This oscillating lever 41 is shaped at its opposite end to form an inverted L fitting under the eccentric portion 22 of supporting rod 7 and attached thereto by a pivotal connection such as a shouldered screw 42. The shouldered screw 42 and

the shouldered rivet act as front and rear bearings for oscillating lever 41.

In the operation of my invention, the fan is placed at the desired angle of elevation by loosening wing nut 11, sliding the circular supporting rod 7 in half-rounded channel 8 until the angle is reached, and tightening wing nut 11 again. When electric power is applied to motor 1, by closing the circuit through switch 29, the wormed groove 32 of drive shaft 2 rotates worm gear 33, and pinion 34 on shaft 35, which, in turn rotates gear 36, shaft 37 and crank arm 39. As crank arm 39 rotates, it imparts, through oscillating lever 41, a horizontal oscillatory motion to the motor assembly 6 which can oscillate around supporting rod 7 because of upper rotary bearing 12 and the lower bearing assembly 14. Shouldered screw 42, attaching the oscillating lever 41 to the rigid supporting rod 7, and shouldered rivet 40, attaching the oscillating lever 41 to the crank arm 39, act as front and rear bearings for oscillating lever 41, enabling the circular motion of crank arm 39 to be translated into an oscillatory motion of the entire motor assembly 6.

An important advantage of my improved fan structure is the simplicity and economy of the construction. The single supporting rod which serves as both an adjustable support as well as a swivel stud around which the motor assembly may oscillate, can be easily formed to shape and milled wherever necessary. The eccentric portion furnishes the necessary location for the oscillating drive connection. The casing need have only a thin wall which can be easily fabricated as, for example, from punched parts or die-castings, and the component parts of my invention may be quickly and easily assembled.

While I have shown a particular embodiment of my invention, it will be understood that I do not wish to be limited thereto since many modifications may be made, and I, therefore, contemplate by the appended claims to cover such modifications as fall within the true spirit and scope of my invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. In an electric fan having a driving motor and a casing therefor, a support for said motor and said casing comprising a vertically arranged rod having an upper end and a groove spaced from said upper end with an eccentric portion positioned between said groove and said end, means journaling said upper end in said casing, a pair of metallic clamps surrounding said rod, one of said clamps being attached to said casing, the other of said clamps having a lanced portion arranged to fit into said groove, an arm pivotally attached to said eccentric portion, and means including a crank attached to said arm and a gear train connecting said crank and said motor for oscillating said casing.

2. In an electric fan having a driving motor and a casing therefor, means for supporting said fan for oscillation and for adjustment at a desired angle comprising a generally vertically arranged rod having an arcuate lower portion, an upper end portion, a groove in said rod spaced from said upper end portion, and an eccentric portion positioned between said groove and said upper end, a supporting base having a channel adapted to receive said arcuate portion, means for adjustably positioning said arcuate portion in said channel to adjust the angular position of said motor and

casing, said rod extending through said casing with said eccentric portion being located entirely within said casing, bearing means arranged in said casing for journaling the upper end of said rod, clamping means attached to said casing and concentrically surrounding said rod at a point positioned between said arcuate and eccentric portions, said clamping means including a lanced portion adapted to engage said groove, an arm pivotally attached to said eccentric portion, and means for oscillating said motor and said casing about said rod comprising a gear train driven by said motor and an eccentric connection between said gear train and said arm.

3. In an electric fan of the oscillating type having a driving motor, a vertically arranged supporting rod having an upper end and a groove spaced from said end with an eccentric portion positioned between said groove and said end, a casing supporting said motor, means journaling said upper end of said supporting rod in said casing, a pair of clamps secured together surrounding said groove, one of said clamps being attached to said casing and the other of said clamps having a lanced portion arranged to fit into said groove, an arm pivotally attached to said eccentric portion, and means including a crank attached to said arm and a gear train connecting said crank and said motor for oscillating said electric fan.

4. An oscillating electric fan comprising a driving motor, an oscillating mechanism driven by the motor, a casing carrying the motor and oscillating mechanism, a base member, a supporting rod extending between the base member and the casing, a free upper end on the rod, an arcuate lower portion on the rod, an upper bearing in the casing for the upper end of said rod, a lower bearing in the casing for a lower portion of said rod but above said arcuate portion, an eccentric portion on said rod between the upper and lower bearings, a driving connection between the oscillating mechanism and the eccentric portion, and means adjustably securing the arcuate portion to the base.

5. In an electric fan having a casing supporting a motor driven oscillating mechanism, and a separate stationary base member, means for supporting the casing from said base for oscillation and for adjustment at a desired angle with respect to the base, comprising a single generally vertical rod, an arcuate lower portion on said rod, means adjustably securing the arcuate portion of the rod to said base, an upper bearing end on said rod, a first bearing in said casing for receiving said upper end, a lower bearing portion on the rod above the arcuate portion, a second bearing in the casing for receiving said lower bearing portion, an offset arm integral with said rod between the first and second bearings, and a driving connection between said oscillating mechanism and said offset arm.

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