K. BRAINERD.

FAN.

APPLICATION FILED NOV. 17, 1919.

1,373,480.

Patented Apr. 5, 1921.

3 SHEETS—SHEET 1.

Fig. 1

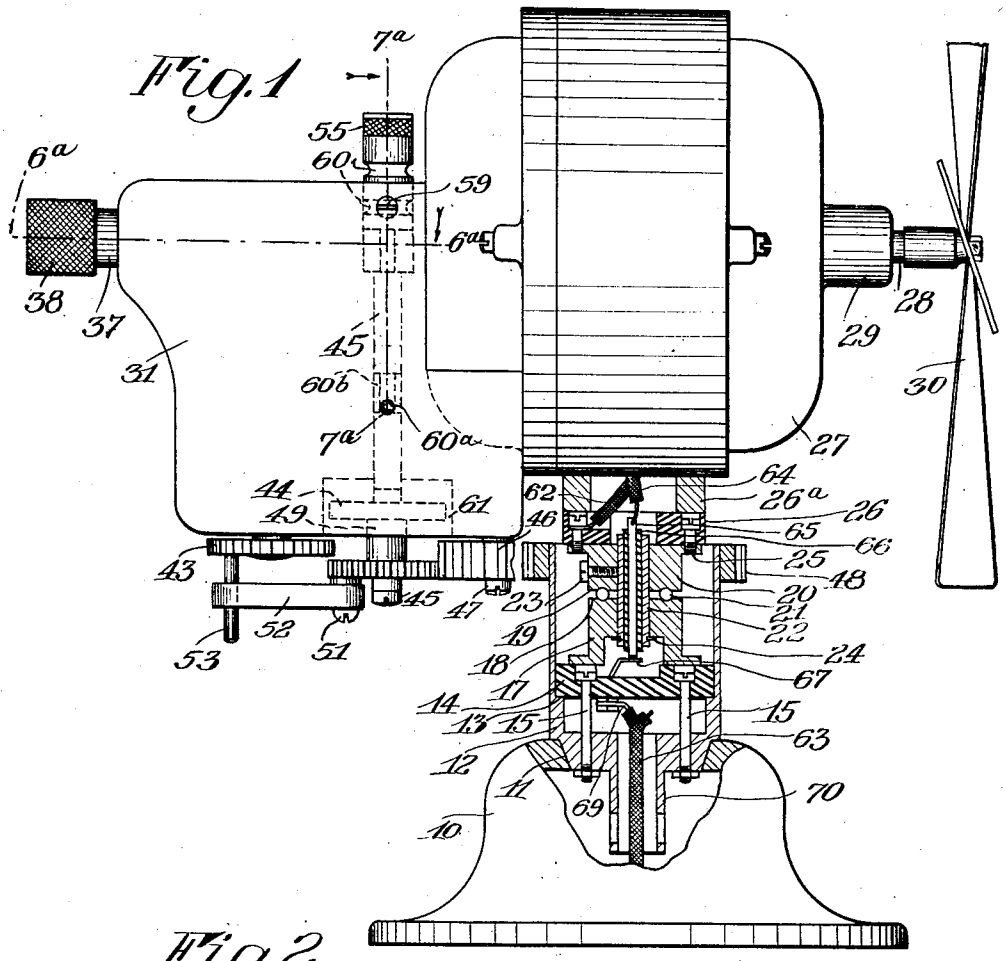
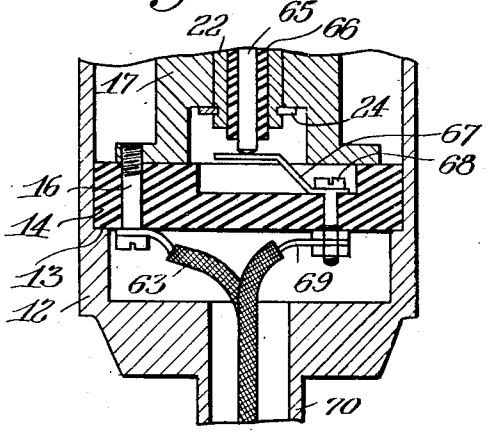


Fig. 2



INVENTOR

Kenneth Brainerd

BY

Judson D. Church

his ATTORNEY

K. BRAINERD.

FAN.

APPLICATION FILED NOV. 17, 1919.

1,373,480. Patented Apr. 5, 1921.

3 SHEETS—SHEET 2.

Fig. 3

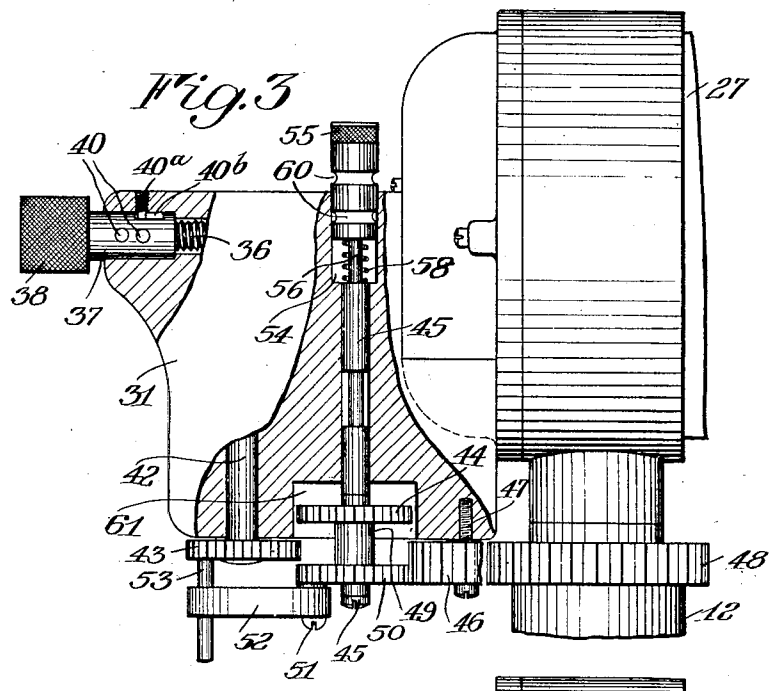
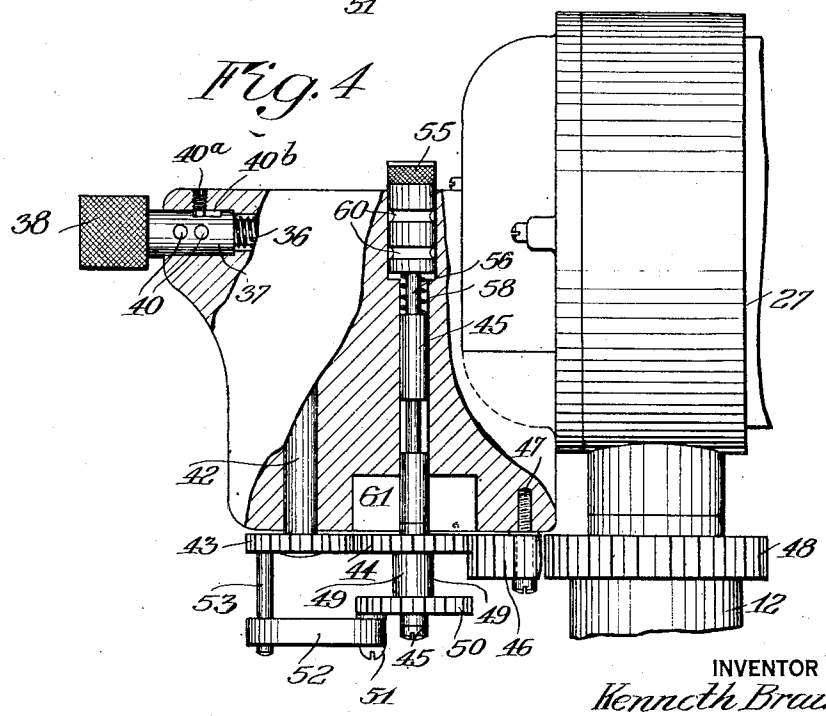


Fig. 4



INVENTOR

Kenneth Brainerd

BY

Frederick G. Church

his ATTORNEY

K. BRAINERD.

FAN.

APPLICATION FILED NOV. 17, 1919.

1,373,480.

Patented Apr. 5, 1921.

3 SHEETS—SHEET 3.

Fig. 5

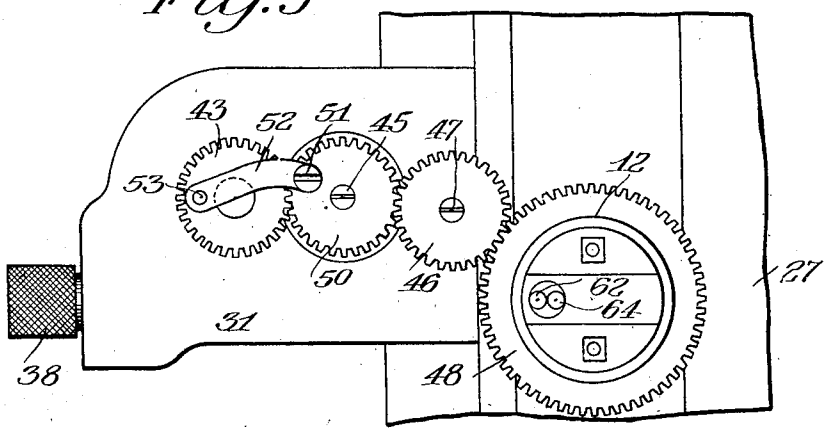


Fig. 6

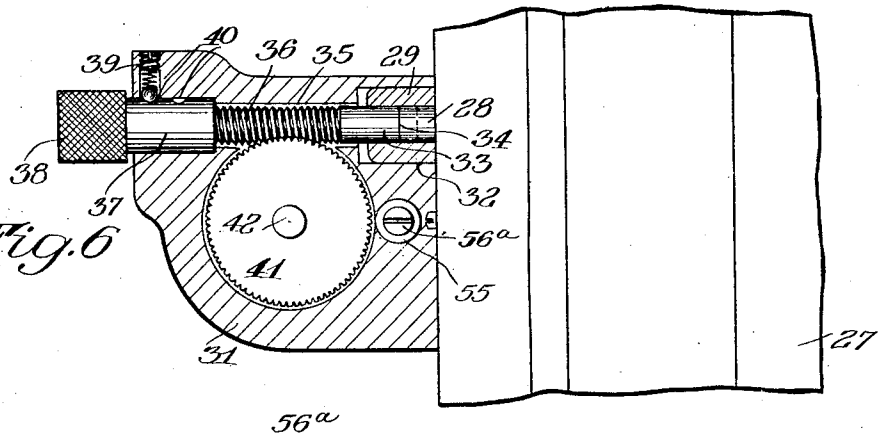


Fig. 7

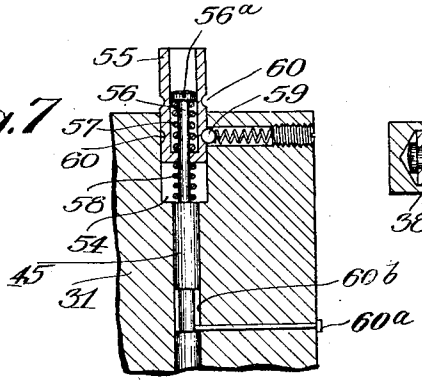
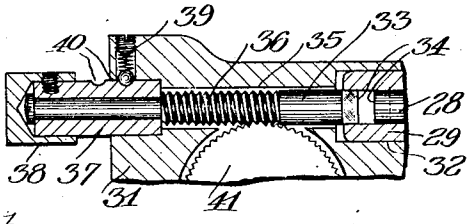


Fig. 8



INVENTOR

Kenneth Brainerd

BY

Frederick S. Church

his ATTORNEY

UNITED STATES PATENT OFFICE.

KENNETH BRAINERD, OF ROCHESTER, NEW YORK.

FAN.

1,373,480. Specification of Letters Patent. Patented Apr. 5, 1921.

Application filed November 17, 1919. Serial No. 338,427.

To all whom it may concern:

Be it known that I, KENNETH BRAINERD, a citizen of the United States, residing at Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Fans; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the reference numerals marked thereon.

This invention relates to fans and, more particularly, to the type of such apparatus having an automatic movement of the axis of the propeller for varying the direction of the induced air current so as to distribute its effects over a greater area, one object of the invention being to provide a simple, effective and convenient mechanism for producing such movement of the propeller axis.

Another object is to provide an advantageous mechanism of the latter character, by a simple adjustment of which the propeller or fan axis may be either locked in stationary relation or given a plurality of different kinds of motion, as may be desired.

A further object is to provide efficient electrical connecting means between the fan motor and a source of power for operation in conjunction with the above mechanism.

To these and other ends the invention consists in certain improvements and combinations of parts as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings:

Figure 1 is a side elevation of a fan embodying the present invention with parts in section to show the construction.

Fig. 2 is an enlarged fragmentary sectional view showing a part of the electrical connections.

Fig. 3 is an elevation of the mechanism for moving the fan on its support with parts broken away in section to show the construction.

Fig. 4 is a similar view showing the parts in a different position.

Fig. 5 is a fragmentary bottom plan view of the same.

Fig. 6 is a section on the line 6^a—6^a of Fig. 1.

Fig. 7 is a fragmentary sectional view on the line 7^a—7^a of Fig. 1.

Fig. 8 is a fragmentary sectional view similar to Fig. 6 but with the parts in a different position.

Similar reference characters throughout the several views indicate the same parts.

This invention, in one of the possible embodiments thereof, selected for the purpose of a present disclosure to illustrate the principles involved, comprises a fan base, or support 10, Fig. 1, of any suitable shape preferably having in the upper portion thereof a socket 11 in which is supported a hollow cylindrical member 12 having therein an annular shoulder 13 on which is supported a head 14 of insulating material, the latter being secured to the lower end of member 12 by means of countersunk bolts 15. Secured to the upper side of head 14 by means of bolts 16 is a lower bearing part 17 provided at its top with a bearing surface 18 cooperating with a similar surface 19 on an upper bearing part 20, between which bearing surfaces are interposed roller bearing members 21. Each of the bearing parts 17 and 20 is provided with a central bore in which is fitted a sleeve 22 rotatable in the lower bearing part but fixed to the upper part, as by means of a set screw 23. A thrust washer 24 adjacent the bottom of the sleeve maintains the parts in proper relation. Secured to the upper bearing part 20 by means of screws 25 is a plate 26 of insulating material to which in turn is secured, in any suitable manner, the lower portion 26^a of the electric fan motor, the frame of which is indicated generally at 27.

The driven element or shaft of the motor is indicated at 28, rotatably carried in bearings 29 on either side of the motor frame and having secured at one end the fan or propeller 30, as is usual in devices of this character employed for circulating air in buildings. Secured to the motor frame in any suitable manner, on the side thereof opposite the propeller, is preferably, a supporting housing 31, having therein a recess 32, Fig. 6, receiving the rear shaft bearing 29. The latter is elongated and serves also as a bearing for a spindle 33, carried in the housing, the adjacent ends of the spindle and motor shaft being formed with coöperating shoulder portions 34 serving as a

clutch connection which is readily engaged and disengaged by longitudinal sliding movement of spindle 33 in the housing. The latter extends through a bore in the housing communicating with recess 32 and the spindle is provided adjacent its center with worm threads 36 beyond which the spindle is enlarged to form a bearing portion 37 slidably fitting a correspondingly enlarged portion of the bore. Outside the housing the spindle carries a knurled finger piece 38 and a spring actuated detent 39 coöperating with spaced sockets 40 in the spindle serves to accentuate and retain the spindle in two positions of longitudinal adjustment corresponding to the engaged and disengaged positions of clutch portions 34. A screw 40^a in the housing engaging in a seat 40^b in the spindle, prevents inadvertent movement of the latter beyond its proper positions.

Located in an opening in the top of housing 31, Fig. 6, and meshing with worm 36 is a worm wheel 41 preferably fixed on the upper end of a spindle 42 extending vertically downward through and below housing 31, Figs. 3 and 4, where the spindle has fixed thereon a gear 43 adapted to mesh in one position of the mechanism with a gear 44 rotatably carried by a spindle 45 extending vertically upward through and longitudinally slidable in a bore in the housing. Gear 44 is adapted to mesh in turn with a wide faced gear 46 rotatably carried on a stud 47 on the housing and gear 46 also meshes with a stationary gear 48 carried by the upper end of member 12 of the support. Rotatably carried on spindle 45 and spaced from the gear 44 thereon by means of a sleeve 49 is a gear 50 adapted also to mesh with gear 46 when brought to such position, and provided with a pin 51 pivotally carrying one end of a link 52, the opposite end of which is pivotally and slidably carried on a pin 53 in gear 43, pin 51 being at a greater radial distance from the center of its gear than the pin 53.

The means for moving the spindle 45 longitudinally to bring one or the other of gears 44 and 50 selectively into mesh with gear 46 comprises a recess 54, Fig. 7, in the housing in which is slidably carried a sleeve 55 through the closed lower end of which slidably passes a reduced portion 56 at the upper end of spindle 45, the portion 56 having at its upper end a head 56^a, which, with the bearing in the lower end of sleeve 55, guides the sleeve for longitudinal sliding movement on the spindle. Coiled about the reduced portion of the spindle within the sleeve and between the closed end of the latter and the head of the spindle is a compression spring 57, opposing which is a similar compression spring 58 outside the sleeve and acting between the latter and the shoulder on the spindle. These springs provide a connection between the sleeve and spindle for yieldingly moving the latter longitudinally, and a spring actuated detent 59 coöperating with sockets 60 in the sleeve serves to accentuate and retain the latter in two positions of longitudinal adjustment corresponding to the two positions of spindle 45 which place one or the other of gears 44 and 50 in mesh with gear 46. Pin 60^a in the housing engaging groove 60^b in the spindle limits movement of the latter. As shown in the drawings gears 44 and 50 are sufficiently spaced from each other so that but one at a time may be brought to mesh with gear 46 and the longitudinal adjustment of sleeve 55 is adapted by the spring means described to apply a yielding pressure to spindle 45 to move the latter and bring the desired one of its gears into mesh with gear 46, the yielding connection afforded by the springs permitting the spindle to be shifted at any time regardless of the relative positions of the gears with reference to registry, as they will be held in contact, if not in registry, until registry occurs and will then slip into mesh.

The housing is provided about the lower end of spindle 45 with a recess 61 adapted to receive the upper gear when the lower one is meshed with gear 46 in the position shown in Fig. 3.

The operation of the above described gearing is obvious from the description of its construction. With finger piece 38 moved inwardly and with sleeve 45 depressed, gear 44 meshes with gears 43 and 46 when in registry therewith, while gear 50 is in idle position and in this relation of the parts movement of finger piece 38 inwardly engages clutch parts 34 so that the motor shaft, through the train of gearing described, rotates gear 46 and continuously rotates the motor frame and fan axis on the support, so that the fan progressively directs its current of air in all directions radially of the support as is desirable in cases where the fan is located adjacent the center of a room. When sleeve 55 is moved to its upper position gear 44 is moved to idle position and gear 50 brought into mesh with gear 46 or to such position that it will be moved into mesh therewith automatically as soon as it is rotated into registry. Link 52 converts the rotary movement of gear 43 into oscillating movement of gear 50, and the latter of course imparts a similar movement to gear 56 and therefore oscillates the fan on its support so that the current of air driven by the fan sweeps through a sector of a circle only, as is desirable, for example, when the fan is located adjacent a wall or other object in a room.

When it is desired to hold the fan in a stationary operating position on its support to

maintain its current of air in one direction, finger piece 38 may be pulled to its outermost position, thereby disengaging its spindle from the motor shaft. Worm 36 in this position of the parts is no longer driven but, however, remains in mesh with the worm gear and locks the latter, being itself held in position by the detent 39 engaging its spindle. In this adjustment, with either of gears 44 or 50 in active position gear 46 is locked in position and, by reason of its engagement with gear 48 on the support. effectively locks the fan frame in stationary position on the support.

Electrical connections are provided for the motor, through its support or base, adapted for continuous rotation of the fan and comprising preferably a conductor 62, Fig. 1, from the motor connected with one of the screws 25 so that the conductor is electrically connected with bearing parts 17, 20 and 21 and through the screw 16 of the lower bearing part with a conductor 63 in the base. The other motor connection 64 is fixed to the upper end of a conducting rod 65 secured in a sleeve 66 of insulating material fixed in the sleeve 22, the rod extending below the latter into a recess between the lower bearing part and insulating head 14, where its rounded lower end is engaged by a spring plate or brush 67 connected at its other end with a bolt 68 extending through head 14 and having connected to its opposite end the other conductor 69 which with conductor 63 passes downwardly through an outlet sleeve 70 of the member 12 into the bottom of the base from whence it is carried downwardly or laterally in the manner usual in such machines.

The above described electrical connections permit indefinite rotation of the motor on its support and, furthermore, not only oppose a minimum of resistance thereto, but by reason of their construction are subjected to the least amount of wear and deterioration and replacement of parts.

The train of gearing shown at the bottom of housing 31 may of course be inclosed within the latter if so desired. The construction of the parts is simple and effective and the means for controlling the operating connections between the motor and its support may be conveniently manipulated to impart to the motor and the propeller axis either variety of movement desired in order to distribute the current of air as surrounding conditions may require, or to lock the motor in stationary relation to its support so that the air is driven continuously in a single direction.

I claim as my invention:

1. The combination of a support, a motor rotatably carried thereby having a shaft, operative connections between said motor and support connected with said shaft for actuation by the latter, controlling means for said operative connections secured to the motor and support and adapted to selectively effect either positive oscillating or complete rotary actuation of said motor on said support, and adjustable means for disconnecting said operative connections from said shaft and immovably securing said motor to said support.

2. The combination of a support, a motor rotatably carried thereby having a shaft, and operative connections between said motor and support actuated by said shaft comprising shiftable gears for selectively effecting either oscillating or continuous rotary movement of the motor on the support.

3. The combination of a support, a motor rotatably carried thereby having a shaft, operative connections between said motor and support actuated by said shaft comprising shiftable gears for selectively effecting either oscillating or continuous rotary movement of the motor on the support, and adjustable means for discontinuing said operative connections and immovably securing the motor to the support.

4. The combination of a support, a motor rotatably carried thereby having a shaft, operative means for completely rotating the motor on the support comprising a train of gears connected with the latter and actuated by said shaft, and adjustable means for substituting for one of said gears a second gear oscillatingly driven by said shaft.

5. The combination of a support, a motor rotatably carried thereby having a shaft, operative means for completely rotating the motor on the support comprising a train of gears connected with the latter and actuated by said shaft, adjustable means for substituting for one of said gears a second gear oscillatingly driven by said shaft, and electrical connections for said motor adapted for continuous rotation thereof on the support.

6. The combination of a support, a motor thereon bearing surfaces rotatably supporting said motor on said support, means for continuously rotating said motor, a contact rod carried by said motor concentrically with said bearing surfaces, a coöperating contact on said support engaging an end of said rod, and electrical connections between said support and motor comprising said bearing surfaces and coöperating contacts.

7. The combination with a support of a blower and means for causing the axis of the blower to either oscillate or continuously rotate on said support, said means comprising a driving member and two rotatable driven members slidably mounted, a common spindle for said two driven members, a link operatively connecting one of the

driven members with said driving member, and a third rotatable driven member with which the first mentioned two driven members selectively coöperate to produce rotation or oscillation thereof.

8. The combination with a support, of a blower mounted thereon, a frame for the blower, means for selectively rotating, positively oscillating, or immovably securing the blower and frame on said support, said means being secured to the frame and comprising a rotary slidable clutch member secured to the frame.

9. The combination with a blower, of a support therefor, and a driving mechanism for producing either a positive oscillation or rotation of said blower on its support, said mechanism comprising a slidable member for changing from rotation to oscillation or vice versa.

10. The combination with a blower, of a support therefor, a frame for the blower movable therewith on the support, and gears carried by said frame and shiftable to positively rotate or oscillate said blower.

KENNETH BRAINERD