

F. DIEHL & A. F. BECKER.
ELECTRIC FAN.
APPLICATION FILED MAY 11, 1908.

924,601.

Patented June 8, 1909.

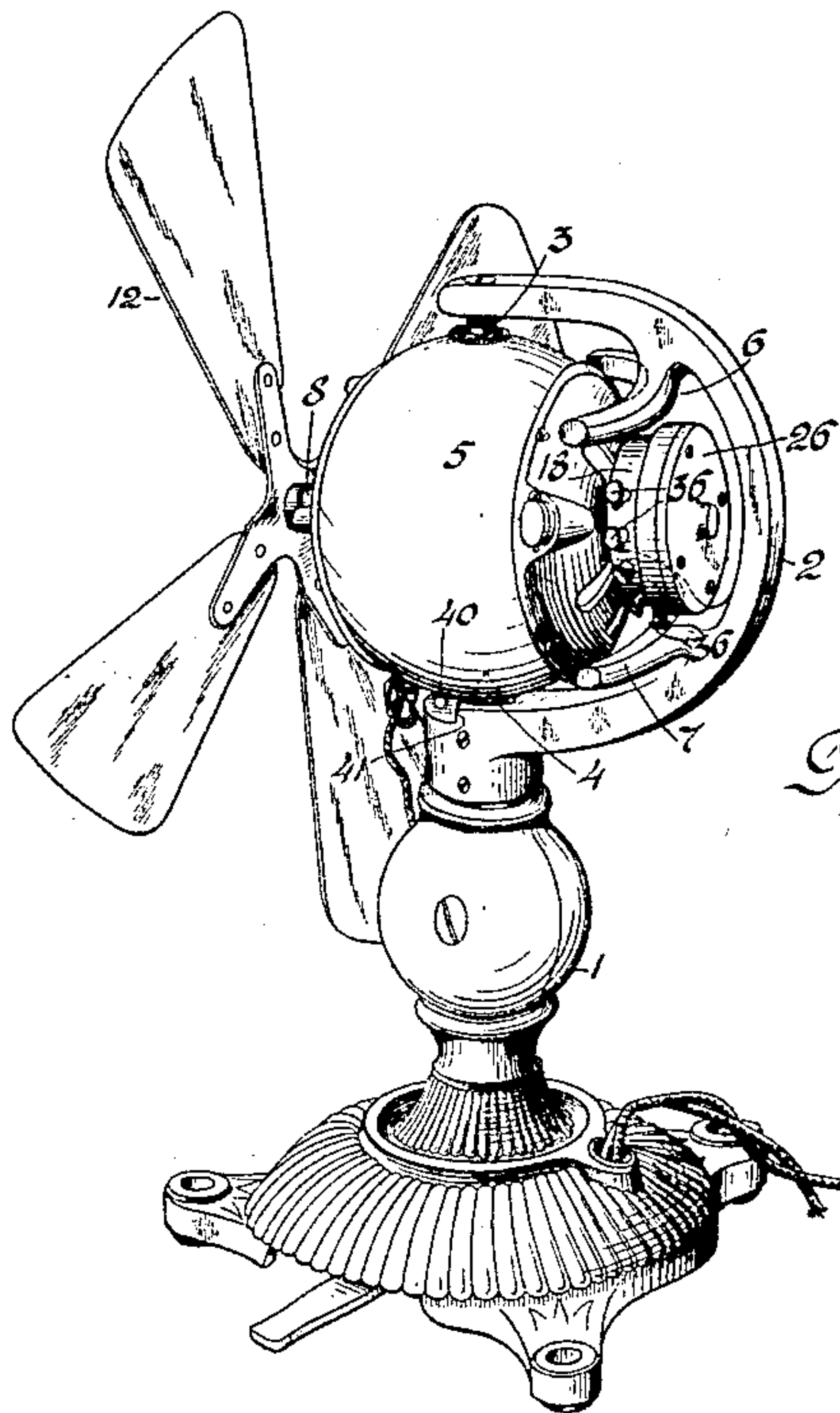


Fig. 1.

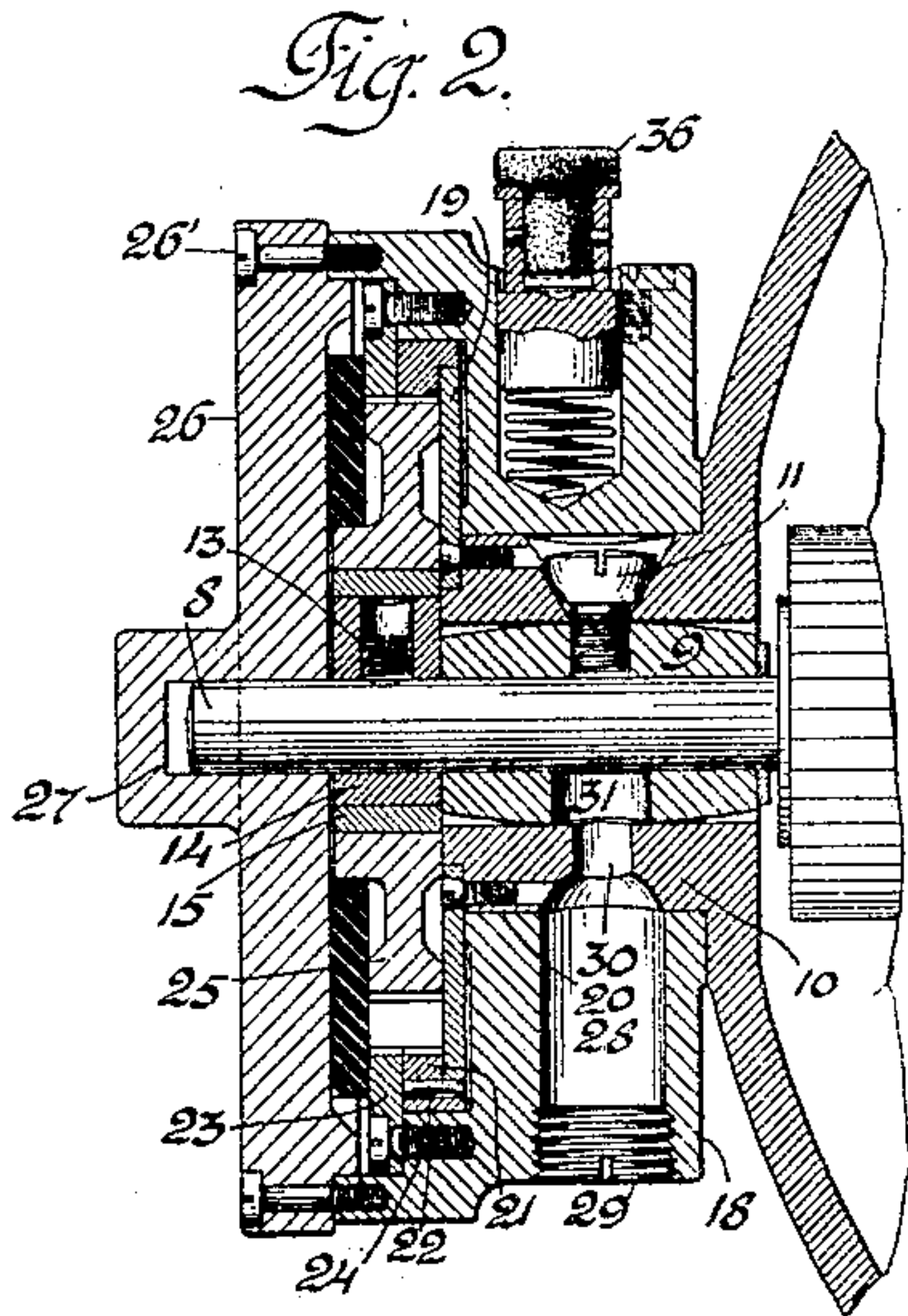


Fig. 2.

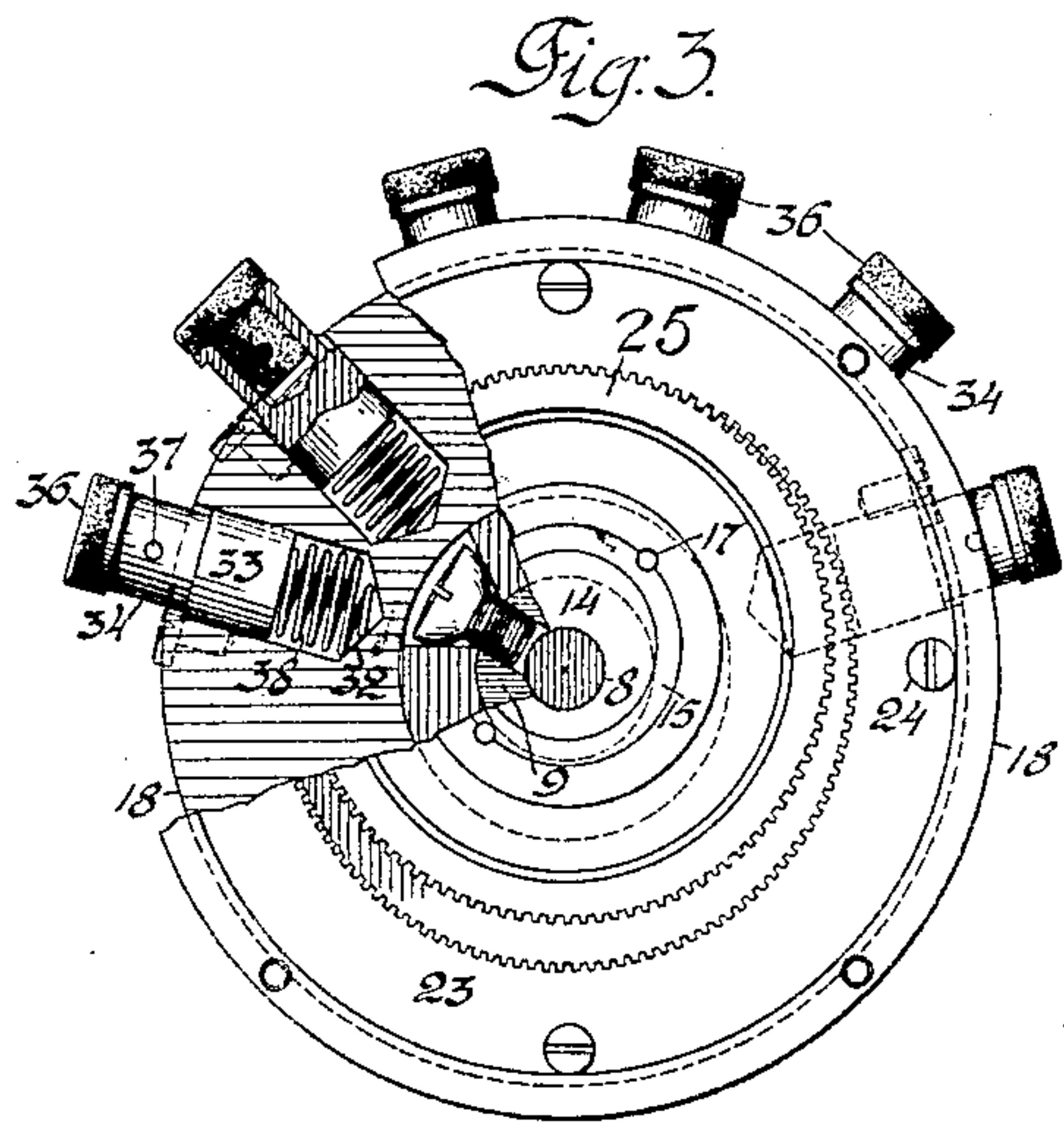


Fig. 3.

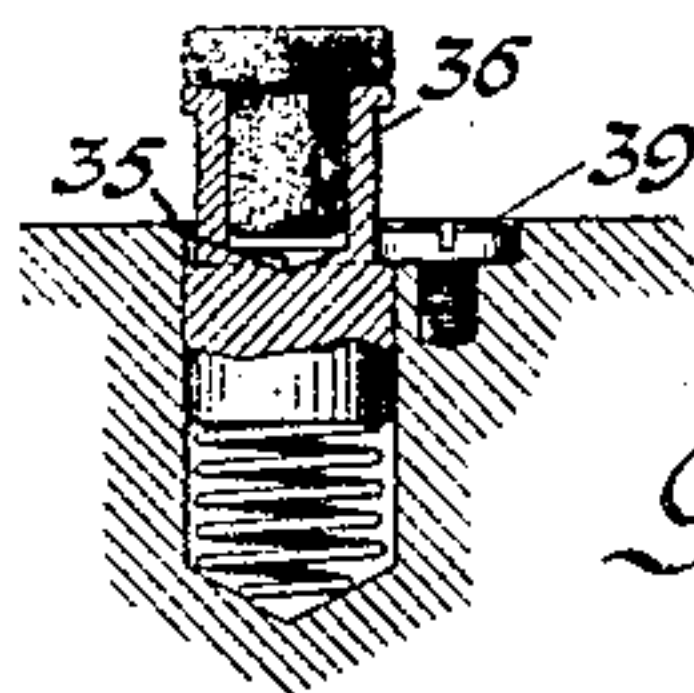


Fig. 4.

WITNESSES:

Geza Terna

H. Kornemann

INVENTORS:

Friedrich Diehl & Adolph F. Becker,

BY

Harry J. Miller

ATTORNEY

UNITED STATES PATENT OFFICE.

FREDERICK DIEHL AND ADOLPH F. BECKER, OF ELIZABETH, NEW JERSEY, ASSIGNORS TO
DIEHL MANUFACTURING COMPANY, A CORPORATION OF NEW JERSEY.

ELECTRIC FAN.

No. 924,601.

Specification of Letters Patent.

Patented June 8, 1909.

Application filed May 11, 1908. Serial No. 432,048.

To all whom it may concern:

Be it known that we, FREDERICK DIEHL and ADOLPH F. BECKER, citizens of the United States, residing at Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Electric Fans, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to an improvement in that class of electric fans forming the subject of the United States Patent to F. Diehl and A. F. Becker No. 867,914, dated October 8, 1907, in which the propelling motor whose armature-shaft carries the propeller-wheel is pivotally mounted upon a standard upon which it receives an oscillatory movement for diffusion of the air current induced by the fan.

The present invention has for its object to improve the construction and increase the effectiveness of the mechanism of the fan, and it consists in the constructive features herein shown and described and pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a perspective view of a fan embodying the present improvements, Fig. 2 an enlarged sectional elevation of the mechanism for producing the oscillatory movement of the motor-frame upon its supporting standard, Fig. 3 a rear side view of such mechanism partially in section, and Fig. 4 a detail sectional view of one of the spring-pressed contact-plugs.

The fan is shown herein constructed with the usual base or standard 1 having the vertically disposed yoke 2 sustaining the vertically arranged center-screws 3 and 4 upon which the motor-frame 5 is journaled to oscillate, and having formed integral therewith the transverse parallel ways 6 and 7 bowed or curved concentrically with the axial line of the bearing screws 3 and 4. The motor is provided with the usual armature whose shaft 8 is journaled in suitable bearings in the armature-frame, one of which is shown as a bushing 9 disposed within a lateral bearing hub 10 of the motor-frame in which it is securely locked from endwise movement, while allowing a slight rocking movement for accommodation to the armature-shaft 8, by means of the locking screw 11. The arma-

ture-shaft carries at the forward end the usual propeller-wheel 12 and has fixed thereon on the opposite end by means of a set-screw 13 an eccentric 14 encircled by a wearing ring 15 secured within the hub of the gear-wheel 25 by means of the pins 17.

Mounted loosely upon the bearing hub 10 is a sleeve 18 having in its rearward face a cavity embracing the eccentric 14. Within the bottom of this cavity is fitted the annular plate 19 having its apertured inner portion fitted to the annular cut-away end portion of the bearing-boss 10 and secured to the same by means of fastening screws 20. To the outer periphery of the plate 19 is fitted the correspondingly recessed adjacent face of a ring 21 locked from turning in respect of the same by means of one or more transverse pins 22. This ring 21 is provided with an annular series of gear-teeth to form an internal gear-wheel. The annular-plate 19 thus constitutes a rigid connection between the bearing hub 10 and the internal gear-wheel 21 which latter is thus held in fixed relation with the motor-frame, of which the hub 10 is shown as an integral part.

Overlapping the internally toothed ring 21 is a second internally toothed ring or internal gear 23 having teeth of substantially the same pitch but differing slightly in number from those of the internal gear 21, the gear 23 having a flange extending outwardly beyond the periphery of the gear 21 and being secured by fastening screws 24 to a seat provided therefor in the recessed outer portion of the sleeve 18. The teeth of both internal gears 21 and 23 are engaged upon one side of the armature-shaft by a common intermeshing externally-toothed planet-gear-wheel 25 having fitted to its hub the wearing ring 15 mounted upon the eccentric 14, the face of the gear 25 having a width equivalent to the aggregate width of the other two gears.

The gear-cavity within the loose sleeve or housing 18 is closed by a cap-plate 26 fitted upon the rear face of the member 18 and secured thereto by means of suitable fastening screws 26', said cap-plate having an axial bearing recess 27 to receive and support the outer end of the motor armature-shaft 8. The sleeve 18 is also provided with an oil-cavity 28 closed by means of a screw-plug 29, and in register with the alined oil-holes 30 and

31 in the bearing hub 10 and bushing 9, respectively, through which oil is supplied to the surface of the shaft 8.

The sleeve 18 is provided upon one side with
5 a segmental series of radial sockets 32, in each of which is fitted a cylindrical plug 33 having in its outer end a necked or reduced portion 34, and itself provided in its outer end with a cylindrical cavity or recess 35 in which is
10 pivoted the reduced inner end of a plug 36 of soft or yielding material, such as leather, preferably secured therein by means of a transverse pin 37. Interposed between the inner ends of the socket 32 and the plug 33 is
15 a spring 38 operating to yieldingly maintain the plugs 36 in outer position upon the carrying sleeve 18 wherein they are adapted to establish temporarily a rolling contact alternately with the parallel ways 6 and 7, the out-
20 ward movement of the plugs 33 being limited by engagement of the inner end of the necked portion 34 with the head of a stop-screw 39 tapped into the carrier 18 with its head slightly overhanging or projecting into the
25 outer end of the socket 32.

In the operation of the device, the rotation of the motor-shaft 8 causes the planet-gear-wheel 25 to revolve upon the eccentric 14 and to thus impart by a wedge-like action a dif-
30 ferential movement of the internal gear-wheel 21 in relation to the fixed internal gear-wheel 23, which causes the slow rotation of the sleeve or carrier 18, as described in the said United States Patent No. 867,914. In the
35 circular movement of the carrier 18 the heads of the wearing-plugs 36 successively engage each of the ways 6 and 7, the spacing of the ways from the axis of rotation being such that the wearing-plugs are caused to yield slightly
40 in their rolling action upon the stationary ways, thus establishing a continuous rolling contact therewith, every engagement of each way involving in practice the simultaneous contact of at least two of the contact-plugs,
45 thus producing a uniform swinging movement of the motor-frame carrying the actuating member or sleeve 18. As will be readily understood, the engagement of the series of contact-plugs with one of the stationary
50 ways carried by the standard 1 produces a swinging motion of the frame in one direction, and the engagement of the other of such ways by the contact-plugs produces the movement of the motor-frame in the oppo-
55 site direction.

While in practice the segment occupied by the series of contact-plugs 36 is such that the motion of the motor-frame in one direction is arrested immediately at the end of their
60 engagement with one of the ways and at the beginning of the engagement of the opposite way, in order to insure against overthrow of the motor-frame, the base of the yoke 7 is formed with transverse shoulders 41 and the
65 motor-frame is provided adjacent the lower

bearing center with a depending pin 40 whose engagement with the stop-shoulders 41 is designed to insure against such overthrow.

Having thus set forth the nature of the invention, what we claim herein is:—

1. In an electric fan, in combination, a motor-frame having a lateral bearing-boss, a standard upon which said motor-frame is pivotally mounted provided with a way adjacent said bearing-boss, a motor comprising
75 an armature-shaft, a circularly moving actuating member mounted upon said bearing boss, operative connections between the armature-shaft and said actuating member for imparting circular movements to the lat-
80 ter, and a segmental series of independently mounted and spring-pressed frictional contact points carried by said actuating member and adapted to successively and intermittently engage said way upon the standard.
85

2. In an electric fan, in combination, a motor-frame having a bearing-boss, a standard upon which said motor-frame is pivotally mounted provided with spaced parallel ways embracing said bearing boss, a motor
90 comprising an armature-shaft, a rotary actuating member mounted upon said bearing boss and operatively connected with the armature-shaft, and a segmental series of independently yielding contact-points car-
95 ried by said actuating member and adapted to successively engage each of said ways of the standard.

3. In an electric fan, in combination, a motor-frame, an armature-shaft journaled
100 therein, a standard upon which said motor-frame is pivotally mounted provided with spaced parallel ways embracing said motor-shaft, a rotary sleeve journaled upon the motor-frame intermediate said ways and
105 provided with a series of radial sockets, operative connections between the motor-shaft and said actuating member, contact-blocks fitted to said radial sockets in the rotary sleeve and provided in their projecting outer
110 ends with yielding caps or facings, springs interposed between the bottoms of said sockets and the contained plugs, and stops for limiting the outward movement of said plugs under the action of said springs.
115

4. In an electric fan, in combination, a motor-frame, an armature-shaft journaled therein, a standard upon which said motor-frame is pivotally mounted provided with
120 spaced parallel ways embracing said motor-shaft, a rotary sleeve journaled upon the motor-frame intermediate said ways and provided with a series of radial sockets, operative connections between the motor-shaft and said actuating member, contact-blocks
125 fitted to said radial sockets in the rotary sleeve and provided with cavities in their outer ends, wearing blocks of yielding material having reduced portions inserted with-
130 in the cavities in said contact-plugs, springs

interposed between the bottoms of said sockets and the contained plugs, and stops for limiting the outward movement of said plugs under the action of said springs.

5 5. In an electric fan, in combination, a motor-frame, an armature-shaft journaled therein, a standard upon which said motor-frame is pivotally mounted provided with spaced parallel ways embracing said motor-shaft, a rotary sleeve journaled upon the motor-frame intermediate said ways and provided with a series of radial sockets, operative connections between the motor-shaft and said actuating member, contact-blocks fitted to 10 said radial sockets in the rotary sleeve and provided in their outer ends with cavities and with lateral recesses, springs interposed between the bottoms of said sockets and the contained plugs, and stop-screws tapped 15 radially into said sleeve adjacent its radial sockets and having their heads adapted to overhang the latter and to enter the lateral recesses in said plugs to limit their outward movement under the action of said spring.

20 6. In an electric fan, in combination, a motor-frame, an armature-shaft journaled

therein, a standard upon which said motor-frame is pivotally mounted provided with a way adjacent said motor-shaft, and having stop-shoulders upon opposite sides of the 30 pivotal support of said motor-frame, a stop-member carried by said motor-frame and movable therewith in a path within which said stop-shoulders of the standard are disposed, a circularly moving actuating member 35 mounted upon said bearing boss, operative connections between the armature-shaft and said actuating member for imparting circular movements to the latter, and a segmental series of independently mounted contact-plugs carried by said actuating member 40 and adapted to successively engage said way upon the standard with which rolling contact is thus established.

• In testimony whereof, we have signed our 45 names to this specification, in the presence of two subscribing witnesses.

FREDERICK DIEHL.
ADOLPH F. BECKER.

Witnesses:

H. A. KORNEMANN,
JOSEPH F. JAQUITH.