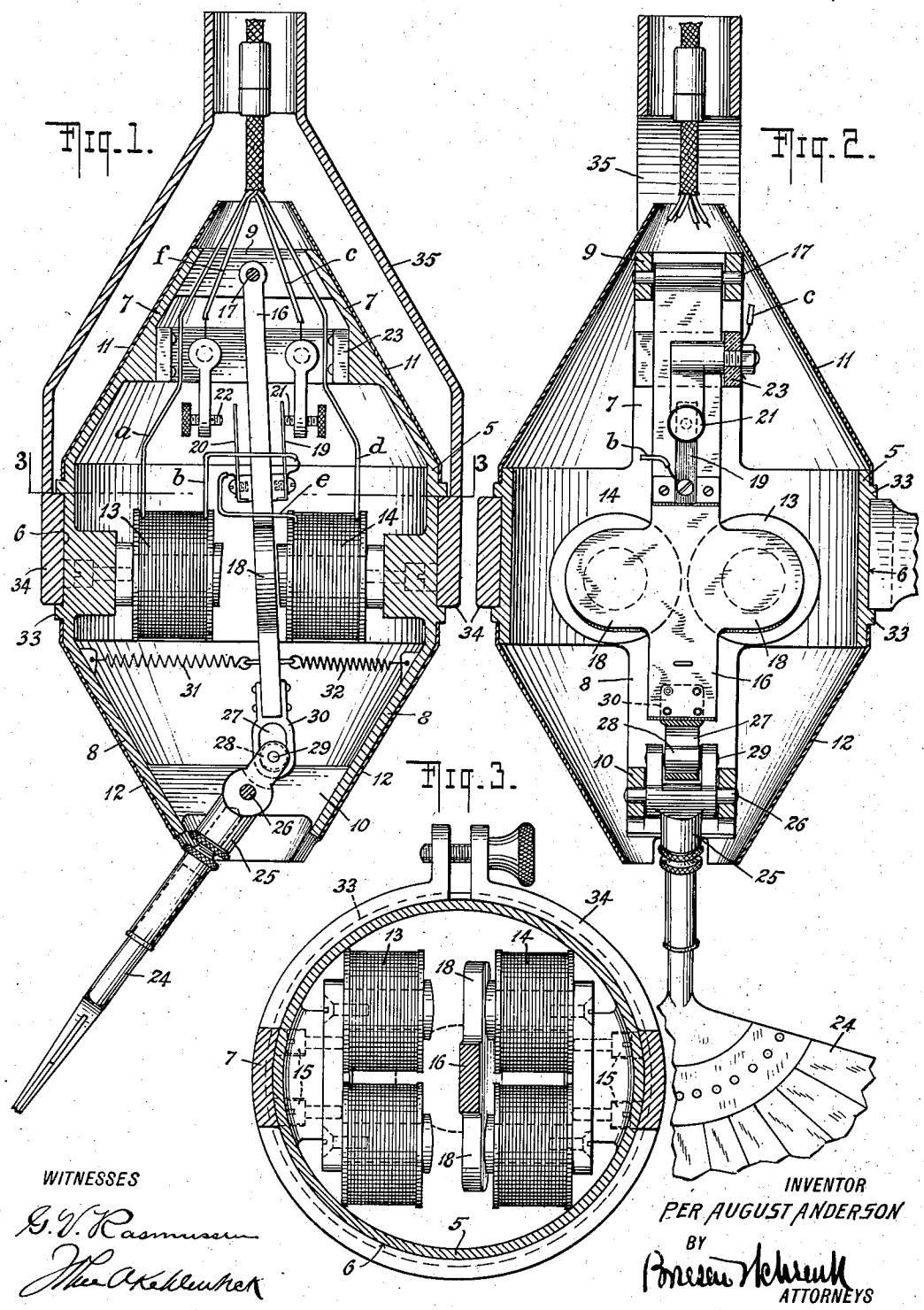
P. A. ANDERSON.

FAN.

APPLICATION FILED MAY 17, 1919.

1,328,255. Patented Jan. 20, 1920.



WITNESSES

G. V. Rasmussen

Wm. A. Kehlenbeck

INVENTOR

PER AUGUST ANDERSON

BY

Bonsen & Schrenk

ATTORNEYS

UNITED STATES PATENT OFFICE.

PER AUGUST ANDERSON, OF NEW YORK, N. Y.

FAN.

1,328,255. Specification of Letters Patent. Patented Jan. 20, 1920.

Application filed May 17, 1919. Serial No. 297,770.

To all whom it may concern:

Be it known that I, PER AUGUST ANDERSON, a citizen of the United States, and resident of the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Fans, of which the following is a specification.

My invention relates to fans and more particularly to that type thereof in which the fan member is vibrated to and fro relatively to a supporting means and has for its object to provide a simple construction in which the operating elements are actuated electro-magnetically in a uniform and efficient manner. Other more specific objects will appear from the description hereinafter and the features of novelty will be pointed out in the appended claims.

In the accompanying drawings, which, for illustrative and descriptive purposes, show an example of my invention, Figures 1 and 2 are longitudinal sections in planes at right angles to each other; and Fig. 3 is a horizontal section on the line 3—3 of Fig. 1.

As shown in the illustrated example, the fan comprises a suitable frame 5 which may be in the nature of a spider having an intermediate section 6 from which converging members 7 and 8 extend in opposite directions as illustrated in Fig. 1. The free ends of the members 7 and 8 are spaced apart and are rigidly connected respectively by transverse members 9 and 10 spaced apart in pairs, as shown in Fig. 2. The construction further includes open-ended tapering covers 11 and 12 which fit over the members 7 and 8 and over the section 6 and are secured in position by friction or in any other convenient manner, as for instance, by means of screws or other fastening devices. The covers 11 and 12, with the frame 5, constitute a casing within which the operating mechanism to be fully explained hereinafter, is contained.

As shown in the drawing, the operating mechanism comprises electro-magnets 13 and 14 arranged in pairs in opposed relation to each other and spaced in axial alinement as shown in Fig. 3. The electro-magnets 13 and 14 are supported upon the intermediate section 6 of the frame 5 and are secured in position in any convenient manner as by screws 15, suitable insulation being provided wherever needed in the well-known way. A lever 16 is pivotally mounted upon a pin 17 carried by and extending between the transverse members 9 and depends therefrom between the magnets 13 and 14. At points in registry with said electro-magnets, the lever 16 is provided with armatures 18 which may constitute integral parts of said lever or comprise soft iron sections suitably connected therewith. The lever 16 carries switch members 19 and 20 properly insulated from the lever and from each other and coöperating respectively with stationary switch-members 21 and 22 mounted upon a bracket 23 secured to the members 7 of the frame 5. The coöperating switch members 19 and 21 are located in a circuit *a—b—c*, whereby the pair of electro-magnets 13 are connected with a source of electrical energy while the switch members 20 and 22 are located in a circuit *d—e—f* whereby the pair of electro-magnets 14 are connected with said source of electrical energy. These coöperating switch members are arranged to alternately close and break the respective circuits to alternately energize each pair of electro-magnets, as will be more fully described hereinafter, it being understood that the circuit *a—b—c* is closed when the circuit *d—e—f* is open and vice-versa. Wherever necessary, the parts are properly insulated in the well-known way against short circuiting.

The construction further includes a fan-member 24 of any suitable construction located exteriorly of the casing formed by the covers 11 and 12 and the support 5, said fan member, in the illustrated example, being detachably connected with a socket-member 25 pivotally mounted upon a pin 26 extending between and carried by the transverse members 10, as shown in Fig. 2. In order that the fan-member may be vibrated back and forth in the intended manner, the socket member 25 is operatively connected with the lever 16 in any suitable way. For instance, as shown in the illustrated example, said socket-member 25 may be continued in the form of a fork 27 in which a roller 28 is journaled upon a pin 29, the roller 28 in turn being located within a yoke 30 projecting from the free end of the lever 16, as shown in Fig. 1. It will, of course, be understood that any equivalent arrangement, other than the one shown and described, may be used for operatively connecting the fan member 24 with the lever 16. To insure a substan-

tially constant and uniform vibratory movement in the fan member 24 when the fan is in operation and to prevent jerkiness and shocks, coil springs 31 and 32 are connected with said lever 16, and extend in opposite directions therefrom to the frame 5 with which said springs are also connected. These springs 31 and 32 balance the lever 16 as will be readily understood; the spring 32 is preferably somewhat shorter or of slightly greater tension than the spring 31 so that the lever 16 will always assume the position shown in Fig. 1, when the mechanism is at rest. The difference between the springs is just sufficient to accomplish this result and is not great enough to interfere materially with the uniformity and evenness of movement of the movable parts.

The fan as a whole may be mounted in any convenient way and upon any suitable devices and may, for instance, be suspended from the ceiling or any other support. In such case the section 6 of the frame 5 may be provided with a pair of annular ribs 33 between which a split collar 34 is accommodated; the collar 34 constitutes part of a suspending means 35 of suitable construction which is attached to the ceiling whereby the fan is suspended in operative position. The described arrangement permits the fan as a whole to be rotatably adjusted in said collar 34 and about its axis to change the plane in which the fan member 24 is vibrated.

It will be understood that a suitable switch or equivalent means is provided for the purpose of cutting off or turning on the electric current whereby the fan is operated.

In the position of rest, the parts occupy the position shown in Fig. 1 in which the switch members 19 and 21 are maintained in contact with each other so that the circuit *a*—*b*—*c* controlling the electro-magnets 13 is closed. If the main circuit is now closed or in other words the electric current is turned on, the magnets 13 will become electrically energized and will thus exert a magnetic force upon the armatures 18 whereby the lever 16 is pivotally swung toward the left in Fig. 1. As this occurs, the switch-members 19 and 21 will become separated, thus breaking the circuit *a*—*b*—*c* and the switch members 20 and 22 will be caused to contact with each other whereby the circuit *d*—*e*—*f* is closed. In this way the electro-magnets 13 are rendered inactive while the magnets 14 are electrically energized and thus caused to exert a magnetic force upon the armatures 18 whereby the lever 16 is swung back to the right in Fig. 1. The circuits *a*—*b*—*c* and *d*—*e*—*f* are thus closed alternately and opened alternately so that the lever 16 is oscillated back and forth on its pivot 17 between the magnets 13 and 14. This oscillation of said lever 16 is communicated to the fan member 24 through the medium of the roller 28 and yoke 30 and causes said fan member 24 to be pivotally vibrated back and forth on its pivot 26 in sweeping movements corresponding to the movements imparted to an ordinary fan when manually actuated.

The switch members 19 and 20 are resilient and are preferably constructed so as to remain in contact with the members 21 and 22 during the major portion of the swinging movements of said lever 16; with this arrangement one circuit is broken just before the other is closed and vice-versa. The swinging movements of the lever 16, after the circuits have been broken, are completed under momentum of the lever 16 and fan member 24, and by the action of the springs 31 and 32, the latter serving also to render the oscillation of the lever even and uniform. The sweep of the fan member 24 is thus regular and free from jerkiness and brings about an agitation of the air which is cooling and yet is entirely free from drafts. The operation of the fan continues until the circuit which supplies the electrical energy is broken whereupon the parts again come to rest in the position shown in Fig. 1, this being due to the relatively shorter length or greater tension of the spring 32. The fan is thus again ready for immediate operation and the possibility of the lever 16 coming to rest at dead center between the magnets with the consequent necessity for a preliminary manual actuation, is entirely avoided.

The fan is very mild in its action and may thus be used to advantage in the hospital or sick room and elsewhere where a violent disturbance of the air is not desired but where a gentle fanning of a patient is beneficial.

By having the switch members, whereby the circuits controlling the electro-magnets are closed and broken, located directly upon the oscillating lever and carried thereby, the action is positive and of maximum efficiency, the possibility of a miss either in closing or breaking the circuit being done away with. The fan is simple in construction, requires no specially skilled attention, and may be produced ecomically and operated efficiently at a low cost and with practically no attention.

Various changes in the specific form shown and described may be made within the scope of the claims without departing from the spirit of my invention.

I claim:—

1. In an automatic fan, a support, electro-magnets carried thereby in opposed, spaced relation, an armature member having its one end pivotally connected to said support and depending between said magnets and pivotally oscillated thereby, switching

means, including members carried directly by said armature member and partaking of the movements thereof whereby the circuits controlling said magnets are closed and broken and a fan member pivotally mounted on said support independently of said armature member and operatively connected with the latter so as to be pivotally vibrated thereby.

2. In an automatic fan, a support, electromagnets carried thereby in opposed, spaced relation, an armature member pivotally suspended upon said support and depending between said magnets and pivotally oscillated thereby, stationary switch members, on said support, resilient switch members carried by said armature member and partaking of the movements thereof to move into and out of contact with said stationary switch members whereby the circuits controlling said magnets are closed and broken and a fan member pivotally mounted on said support independently of said armature member and operatively connected with the latter so as to be pivotally vibrated thereby.

3. In an automatic fan, a support, electromagnets carried thereby in opposed, spaced relation thereon, an armature member pivotally suspended upon said support and depending between said magnets and pivotally oscillated thereby, a fan member pivotally mounted on said support independently of said armature member and operatively connected therewith so as to be pivotally vibrated thereby, means whereby the electrical energizing of said magnets is controlled and a pair of opposed springs extending in opposite directions from said armature member and arranged to balance the swinging movements thereof, one of said springs dominating the other whereby said armature member assumes a predetermined position of rest.

In testimony whereof I have hereunto set my hand.

PER AUGUST ANDERSON.