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2,022,415

HUMIDIFIER

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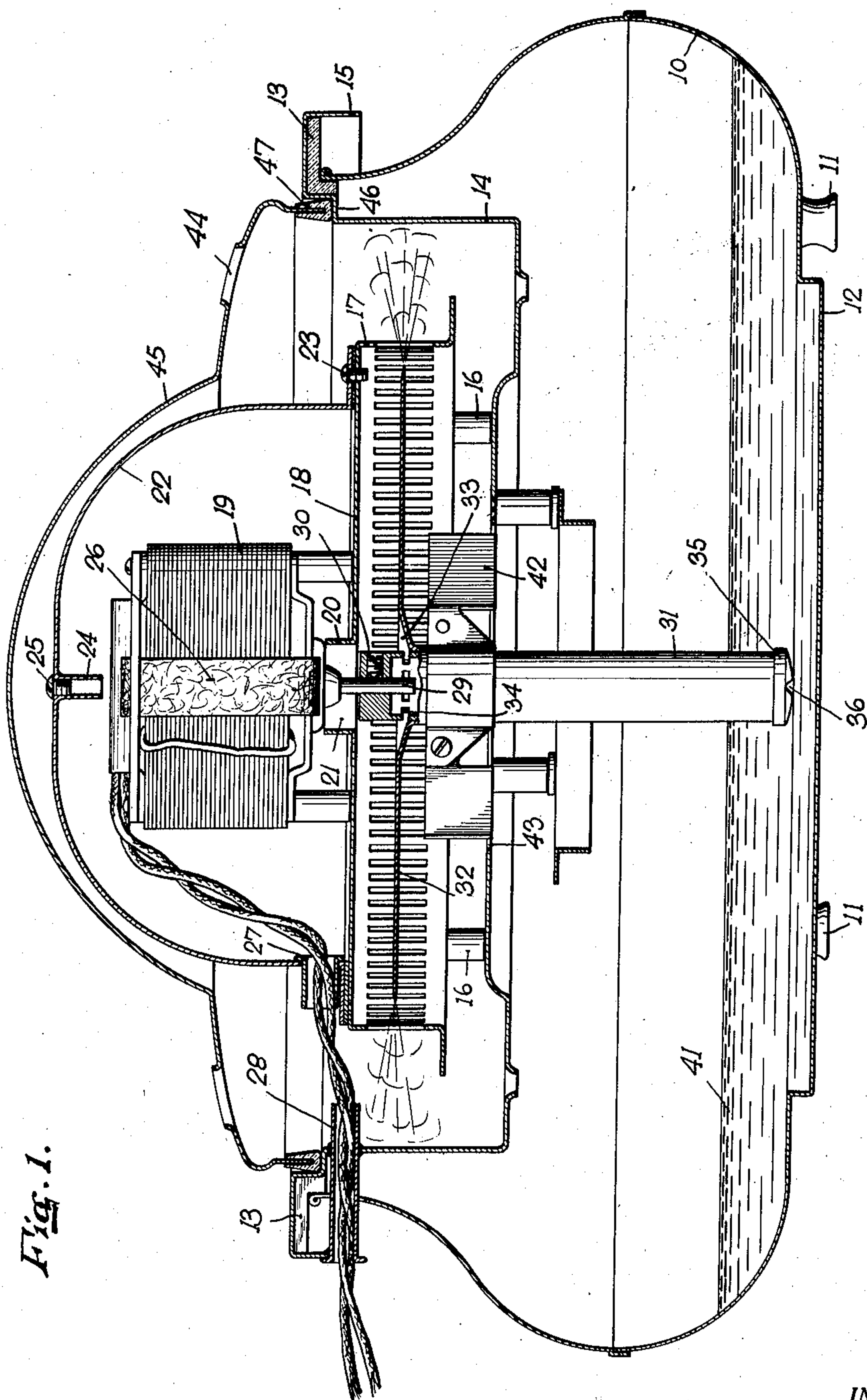


Fig. 1.

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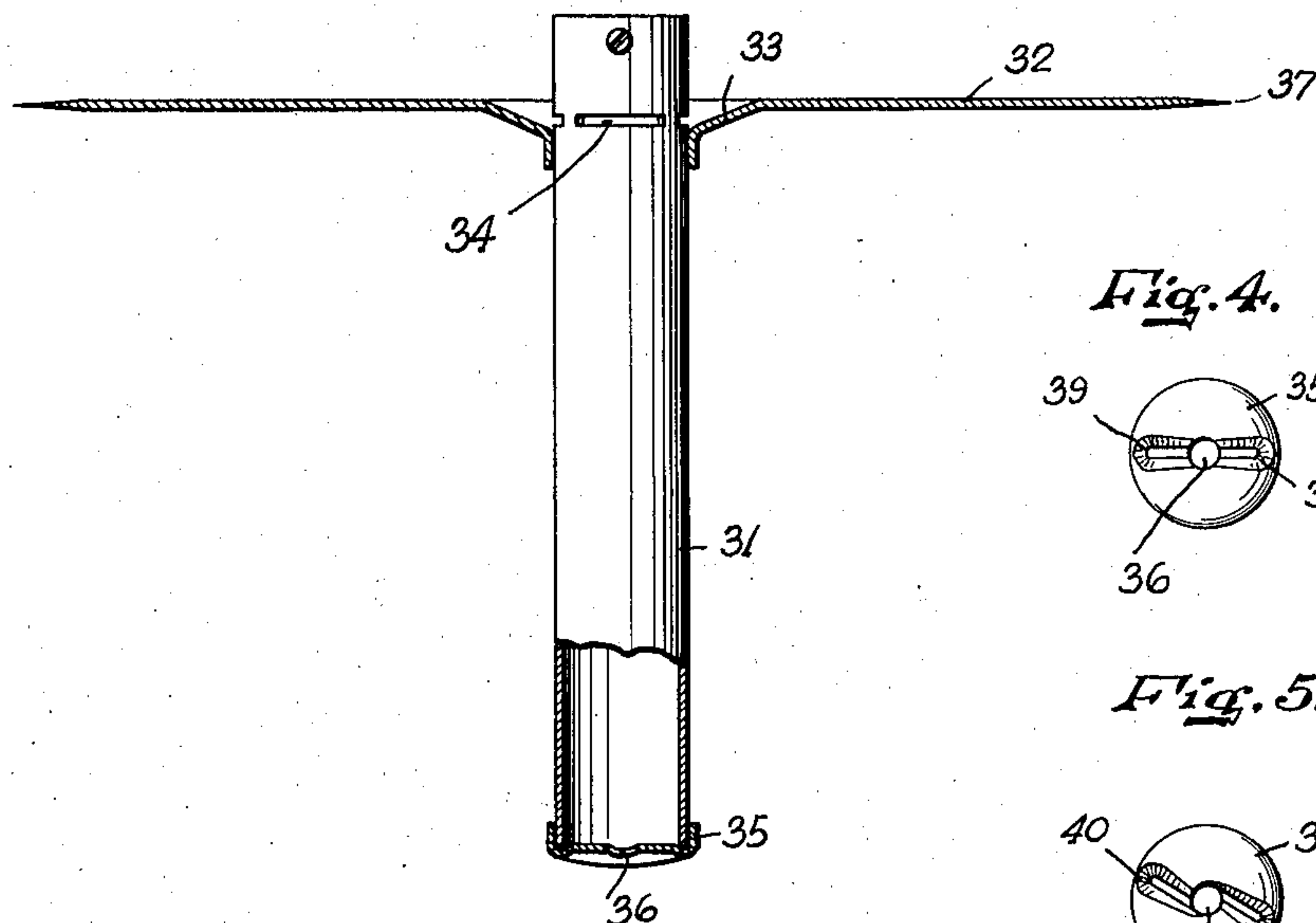
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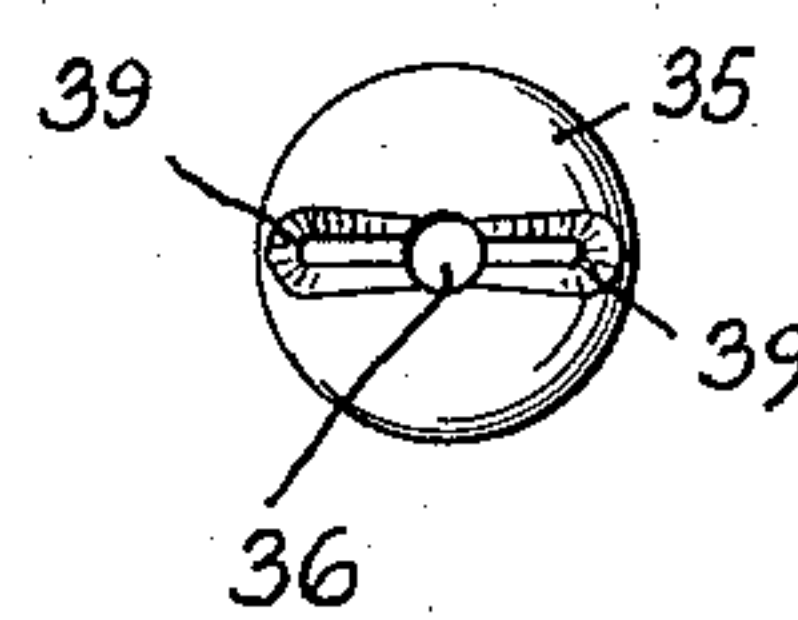
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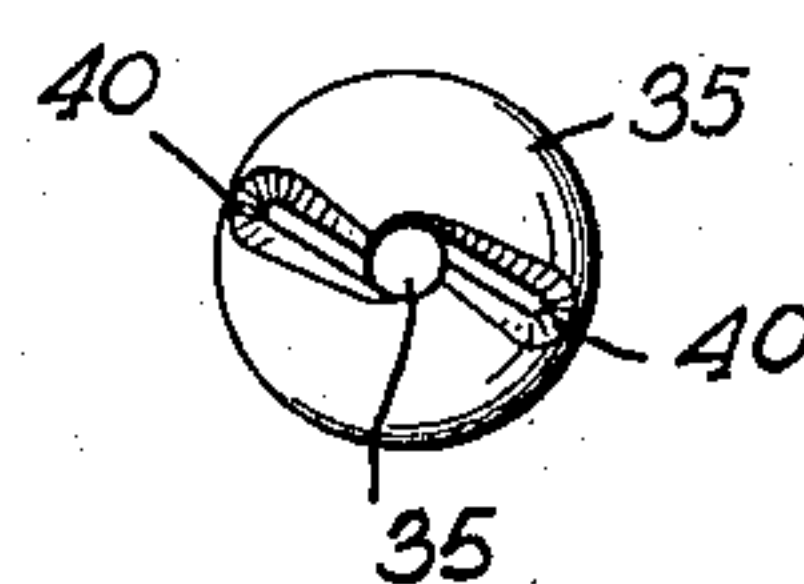
*Fig. 2.*



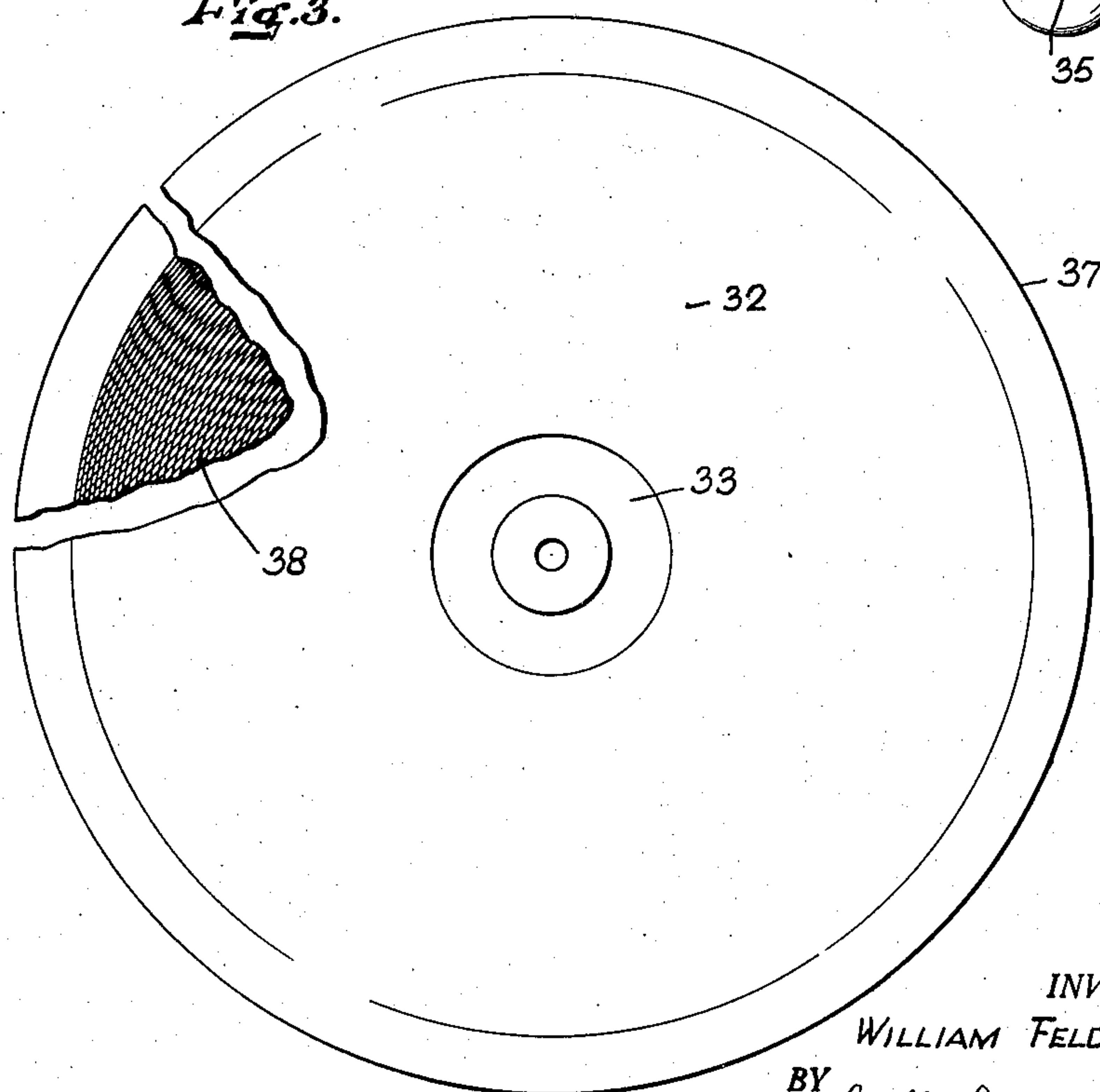
*Fig. 4.*



*Fig. 5.*



*Fig. 3.*



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## UNITED STATES PATENT OFFICE

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## HUMIDIFIER

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Application November 14, 1933, Serial No. 698,019

3 Claims. (Cl. 261—91)

This invention relates to apparatus of the humidifier type.

It is an object of the invention to provide a humidifier of relatively simple construction which at the same time delivers a maximum quantity of moisture for humidifying purposes.

It is another object of the invention to reduce the number of moving parts and to provide a structure which will operate over long periods of time with freedom from mechanical difficulties.

With these and other objects in mind, reference is had to the accompanying drawings, in which

Fig. 1 is a cross-section through one type of humidifier and taken slightly to one side of the center line thereof;

Fig. 2 is a detail view of one form of disk and rotor employed, while

Fig. 3 is a plan view of the disk disclosed in Fig. 2 with a modified form shown in fragment, and

Figs. 4 and 5 are detail views of two forms of caps for use in connection with the rotor.

As shown in the drawings and particularly in Fig. 1 thereof, the humidifier comprises a base or container 10 which may be provided with leg members 11 and has a dropped central portion 12. Resting on the upper lip of said container and spaced therefrom by means of rubber or other suitable cushions 13 is a supporting frame 14. This frame has laterally spaced shoulder members 15 which provide a passageway between the body of the container and the frame, for a purpose hereinafter brought out. Secured to the frame and spaced therefrom by means of legs 16 is a diffusing ring 17 provided around its periphery with a series of vertically extending slots.

Integral with the diffusing ring is a motor platform 18 upon which is centrally positioned an electric motor 19. The motor platform may be provided with a collar 20 formed adjacent the motor shaft aperture 21 which extends through the center of the platform. This collar rests against the lower motor bearing and prevents water or moisture from contacting the motor itself, with resultant destructive effects. The motor in turn is covered by means of a dome 22 which is secured to the motor platform as at 23 by screws or other suitable means. This dome is likewise provided with an opening 24 which is normally sealed by means of the set screw 25 and through which oil may be applied to the felt bearing strip 26 which provides the bearings at all times with sufficient oil for their proper lubrication. An opening 27 is also provided in the

dome for the purpose of passing therethrough the lead wires from the motor to a source of electrical energy and this opening is positioned adjacent a tube 28 which extends through the base and frame and carries the lead wires to the outside of the apparatus. The lead wires are, of course, rubber coated, or in some other fashion treated so as to be water-proof and are not affected by any moisture which may come in contact with them. Secured to the motor shaft 29 by means of the set screw 30 is a rotor 31 which, in turn, carries a disk 32. Adjacent the point of contact of the disk with the rotor the disk is tapered downwardly to form a funnel-like recess 33. The rotor is provided with openings 34 leading from its interior to the bottom of this recess. The bottom of the rotor has a cap 35 having an opening 36 in the bottom thereof.

Positioned below the disk on the rotor is a fan 42 comprising several blades which, when rotating with the disk, draw air from without the container through the space between the frame and the side walls of the container, through the frame opening 43, past the fan, outside the diffusing ring and finally returns the air, with what moisture it has acquired as it passes the ring, to the room through ports or vents 44 which are positioned near the periphery of a cover member 45 which encloses the entire unit. This cover rests on a shoulder 46 formed in the frame and may be cushioned by means of a rubber or other suitable strip 47 between the points of contact.

With reference to Figs. 2 and 3, it will be seen that the outer edge of the disk 32 is formed with a knife-like edge 37. Likewise, as shown by the fragment of the disk in Fig. 3, the upper surface of the disk may be roughened as at 38, this roughening of the surface to extend throughout the horizontal section of the disk exclusive of the bevelled outer edge and the central recess.

As shown in Fig. 4, the cap 35 and central opening 36 may be supplemented with grooved portions 39 leading from the periphery of the cap to the opening and extending in one straight line. Likewise as shown in Fig. 5 these grooves may be offset with relation to one another as at 40 to form a screw effect when the rotor and cap are turned.

In operation, water, as represented by 41 in Fig. 1, is placed in the container or base, at a sufficient depth to cover the cap at the bottom of the rotor. The motor is then caused to turn and with it the rotor and disk. Water passes through the opening 36 at the bottom of the rotor and through adhesion to the inside surface of



the rotor is carried to the top of this member and ejected through the openings 34 on to the disk. The recess 33 provides storage space for a quantity of water thus ejected, and as the disk continues to rotate, water spreads across its surface and is passed off at the periphery in the form of a fine spray or mist. It has been found that by the use of a knife-edge at the periphery of the disk, the size of the particles of water thus dissipated is materially reduced and any tendency toward spraying large drops of water is completely eliminated. The mist leaving the edges of the disk strikes against the diffusing ring 17 which further breaks up the particles of moisture and causes an even fine spray to emit therefrom. The circulating air put in motion by the fan now picks up this moisture and ejects it into the room.

In utilizing a disk such as shown in the fragment of Fig. 3, a higher degree of surface tension is obtained between the water and disk, resulting in a steadier and more uniform supply of water passing thereover, and being diffused through the ring. Likewise, by utilizing the grooves shown in Figs. 4 and 5 in conjunction with the cap opening, a whirling motion is imparted to the water and a higher degree of efficiency is obtained in raising the water in the rotor.

It is, of course, appreciated that many changes in design and modifications in the structure herein shown might be resorted to without in the least departing from the spirit of the invention herein contained and applicant wishes it to be understood that the foregoing is set forth simply as illustrative and not in a limiting sense.

What is claimed as new, and desired to be protected by Letters Patent, is:

1. An apparatus of the character described, comprising a container body, a rotor positioned within the same, means for effecting a turning of said rotor, a disk for association with the upper end of said rotor, said disk being formed

with a conical portion adjacent said point of connection of said disk and rotor, said rotor being formed with an opening leading from its interior to the upper surface of said disk, a cap adapted to be positioned on the bottom of said rotor, said cap being formed with a central opening, and said cap being formed with diagonally formed grooved portions extending from said opening to the outer edges thereof whereby a liquid is caused to rise in the interior of said rotor and flow out upon the upper surface of said disk when said disk and rotor are turned.

2. A rotor for use in a humidifying apparatus comprising a hollow tubular body and a cap to be associated with the bottom thereof, said cap being formed with a central aperture and having grooved portions extending from said aperture to the outer edges thereof whereby a turning of said rotor and cap in a liquid will result in said liquid being forced into the interior of said rotor through said central cap aperture and to rise to the top thereof.

3. An apparatus of the character described, comprising a container body, a hollow tubular rotor positioned within the same, means for effecting a turning of said rotor, a disk for association with the upper end of said rotor, said disk being formed with a concave surface adjacent its point of contact with said rotor, said rotor being formed with a passageway leading from its interior to the upper surface of said disk, said disk being additionally formed with a roughened upper surface and a knife-edge extending adjacent its periphery, a cap adapted to be positioned over the bottom of said rotor, said cap being formed with a central opening, and diagonally extending grooved portions leading from said opening to the outer edges of said cap whereby a liquid is caused to rise in the interior of said rotor and flow out upon the upper surface of said disk when said disk and rotor are turned.

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