

No. 725,425.

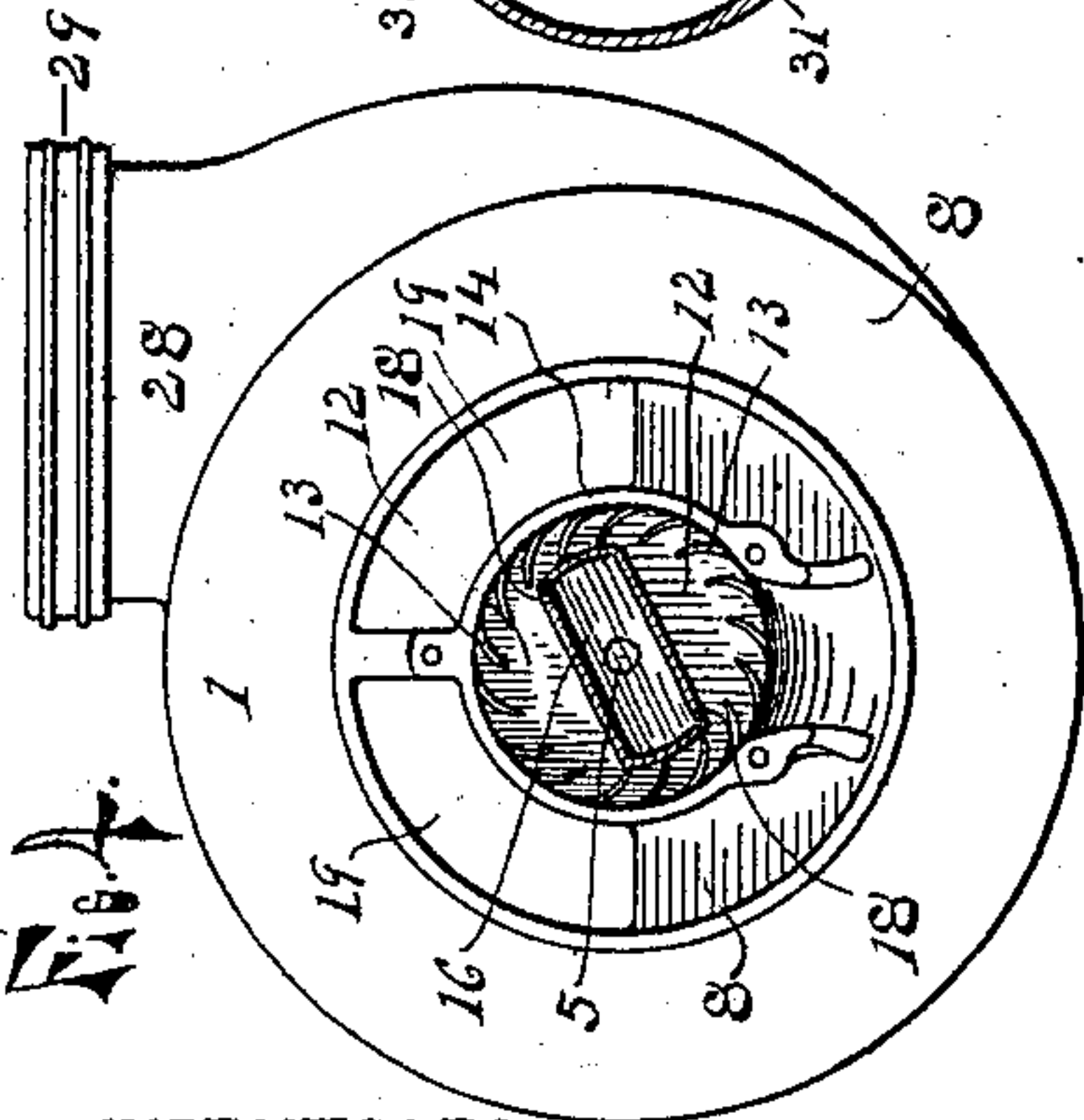
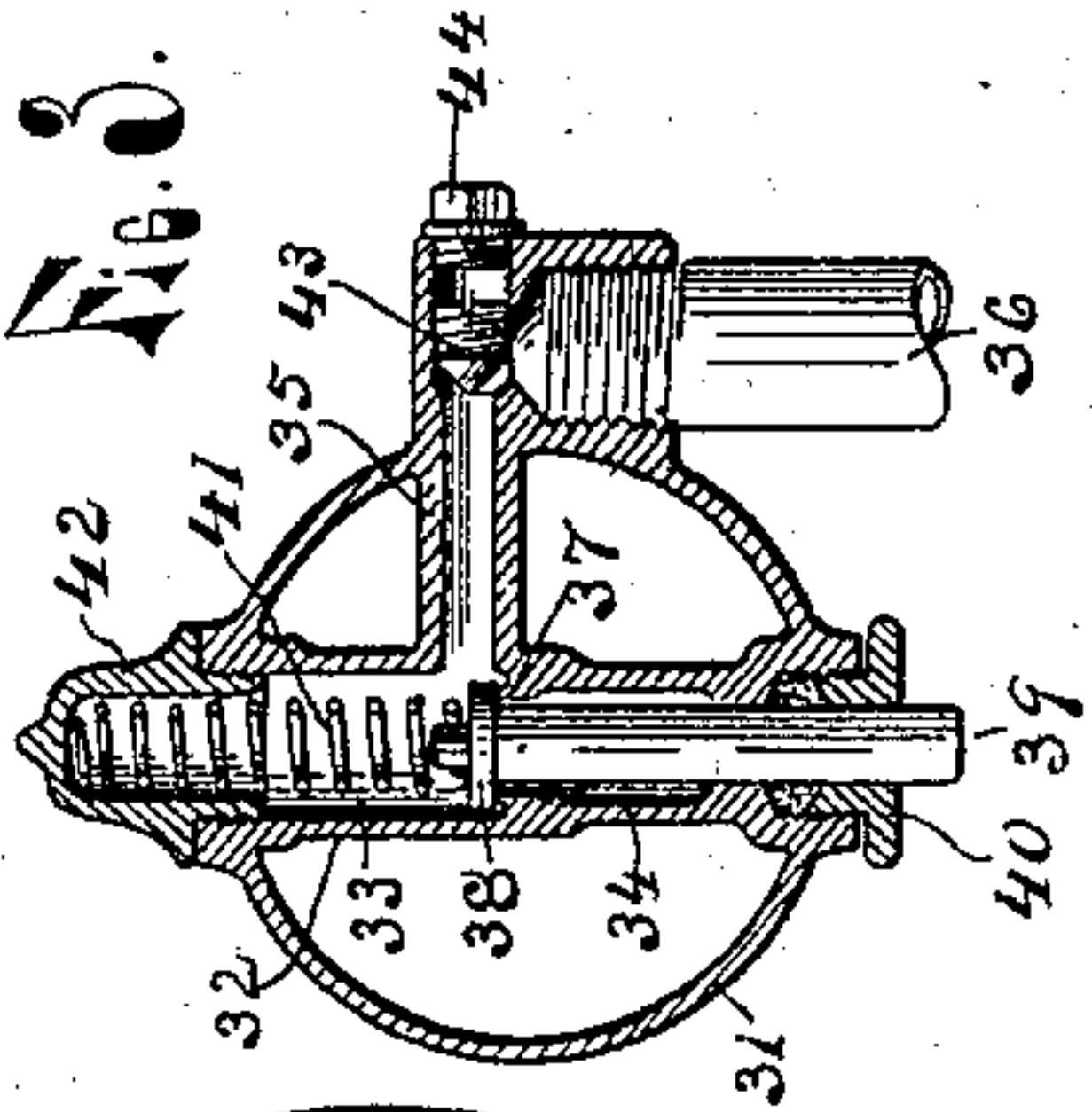
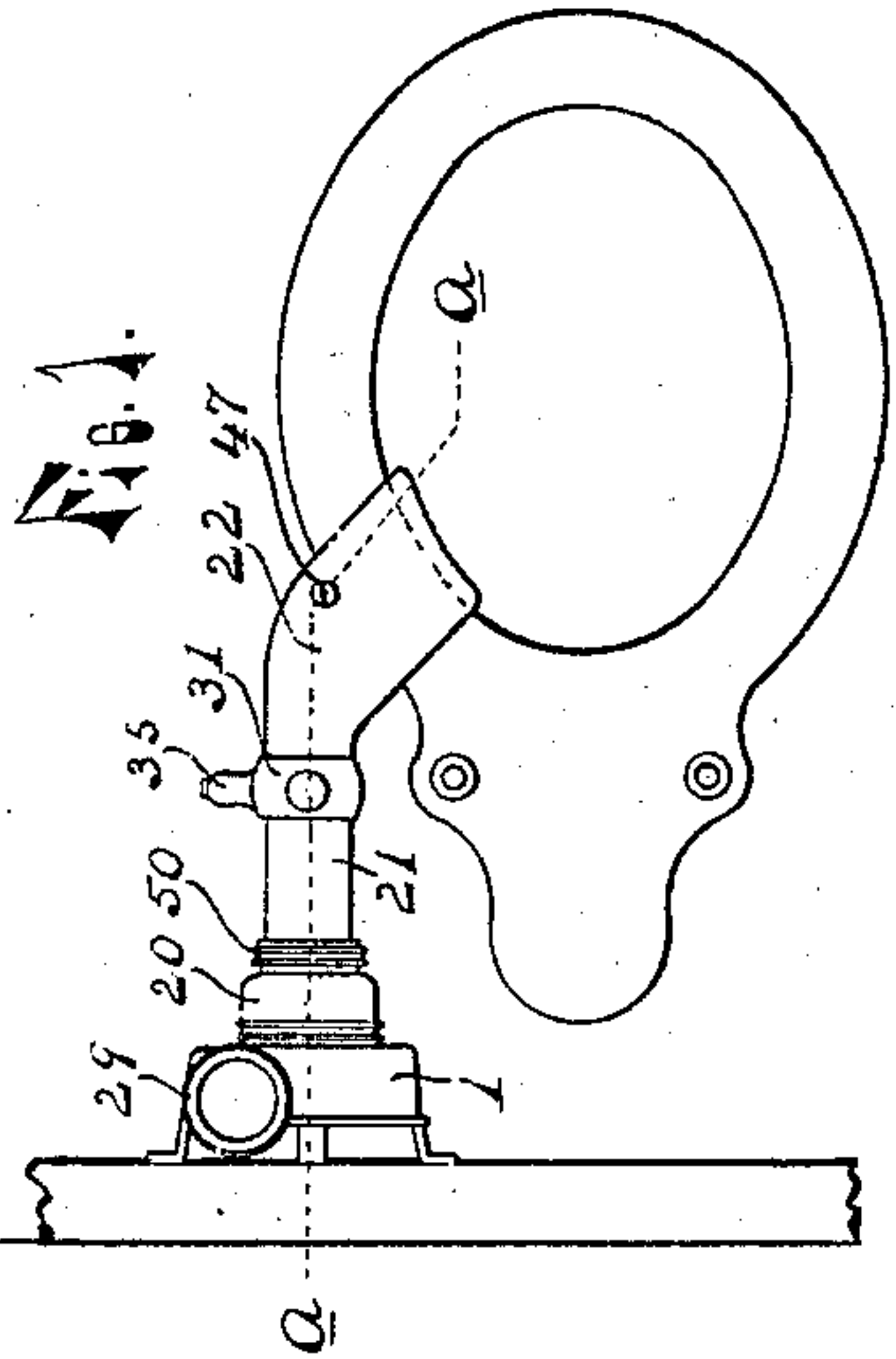
PATENTED APR. 14, 1903.

A. DROUILLARD & J. M. TEAHEN.

WATER CLOSET VENTILATOR.

APPLICATION FILED JUNE 2, 1902.

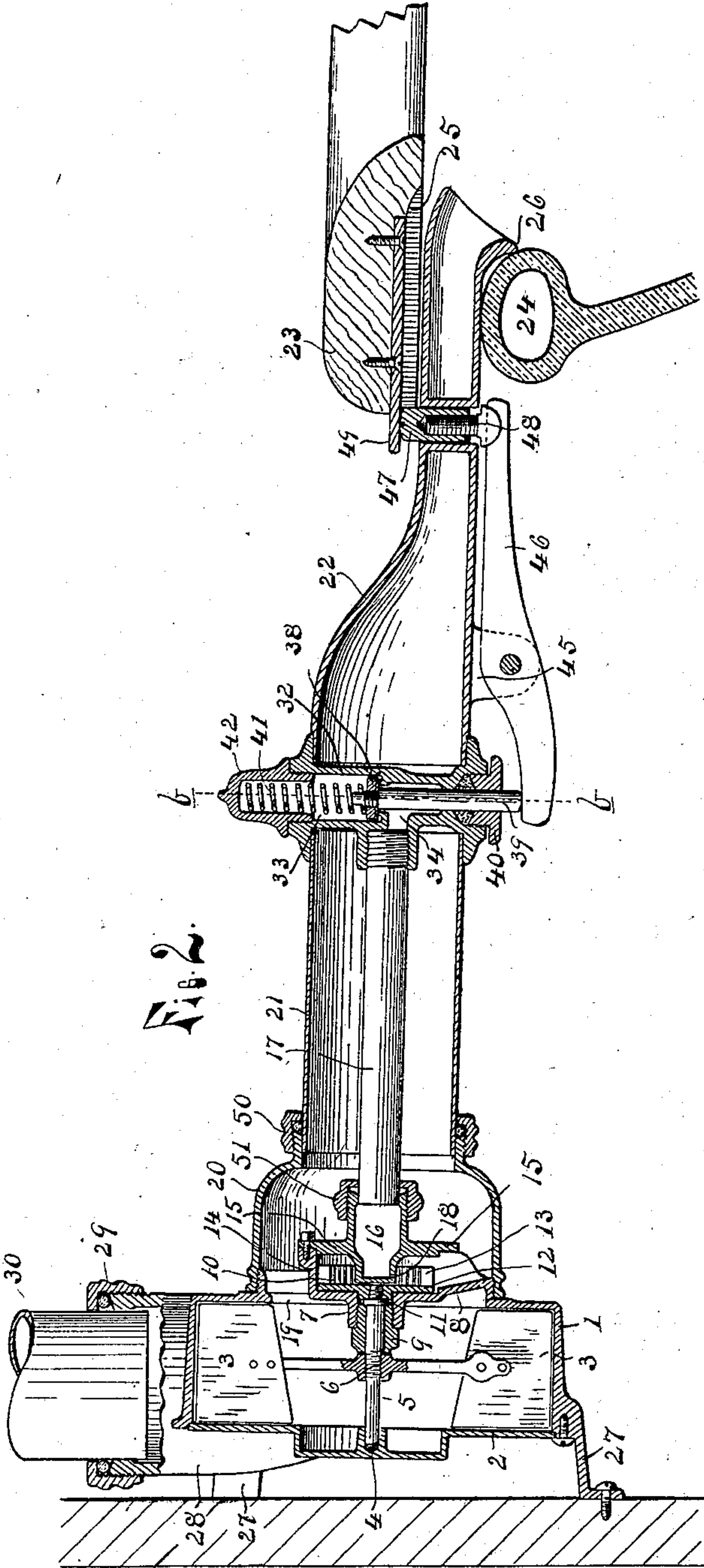
NO MODEL.



WITNESSES.

*Lewis S. Sanders*  
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Fig. 2.



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# UNITED STATES PATENT OFFICE.

ALBERT DROUILLARD, OF WINDSOR, CANADA, AND JAMES M. TEAHEN, OF DETROIT, MICHIGAN, ASSIGNORS TO THE DETROIT VENTILATING COMPANY, LIMITED, OF DETROIT, MICHIGAN, A COPARTNERSHIP.

## WATER-CLOSET VENTILATOR.

SPECIFICATION forming part of Letters Patent No. 725,425, dated April 14, 1903.

Application filed June 2, 1902. Serial No. 109,863. (No model.)

*To all whom it may concern:*

Be it known that we, ALBERT DROUILLARD, a subject of the King of Great Britain, residing at Windsor, Province of Ontario, Canada, and JAMES M. TEAHEN, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Water-Closet Ventilators, of which the following is a specification.

This invention relates to improvements in water-closet ventilators for removing the foul air and gases from closet-bowls; and its object is to provide a device which may be readily attached to any ordinary closet without necessitating any material alteration thereof and is adapted to be carried in stock by the trade as a fitting.

A further object is to provide a device the casing of which is so made that it may be readily taken apart and also so constructed as to form a part of the ventilating-pipe and contains the fan, motor, water-pipe, and valve therefor. It not only is very compact, but is also light, cheap, durable, and possesses no complicated mechanism to get out of order.

An additional object of the invention is to provide a novel motor having a wheel operated by a jet of water supplied at the axis of the wheel and acting outward upon its peripheral buckets to actuate the wheel, it being thus peculiarly adapted for use in connection with this construction of ventilator.

To this end the invention consists in the particular construction, arrangement, and combination of parts, all as hereinafter more fully described, and particularly pointed out in the claims, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view of a device embodying our invention, showing the same in position for use. Fig. 2 is a section on the line *a a* of Fig. 1, showing the same on a larger scale. Fig. 3 is a section on the line *b b* of Fig. 2, and Fig. 4 is a side elevation of a fan and motor with the outer casing 20 and cap 15 removed.

As shown in the drawings, 1 is the fan-casing, having a plate 2, forming the side

of the casing, which is removable for the insertion of the fan-wheel 3 and is provided with a bearing 4 at its axis for one end of the shaft 5, upon which shaft the fan is secured by having its hub internally screw-threaded to engage the screw-threaded portion 6 of said shaft. The opposite end of said shaft projects into a flanged opening 7 in the side 8 of the casing, which opening is internally screw-threaded to receive the bushing 9, forming the other bearing for the shaft, and on this end of said shaft is screwed a motor-wheel 10, the hub of which projects into the opening 7 and engages the shoulder 11 on the shaft, against which it is turned up hard to prevent the wheel coming loose. The wheel 10 consists of the disk 12, provided with walls projecting outward from the face of said disk and curved eccentrically inward toward the axis thereof to form buckets 13. A flange 14, projecting outward from the side wall of the fan-casing, forms the edge of a casing for the motor-wheel, an opening being left at the lower end for the escape of water. A cap 15, secured to said flange, forms the side of the motor-casing and is provided with an inwardly-projecting rectangular chamber 16, to which is connected the water-pipe 17, jet-openings 18 being provided in opposite corners of said chambers, through which the water escapes and impinging upon the inwardly-curved buckets 12 causes the wheel to revolve, thus revolving the fan.

The side wall 8 of the fan-casing is provided with the openings 19, and on said wall and inclosing said openings, together with the motor-casing, is a circular flange, which is screw-threaded on its outer surface to engage one end of an outer casing 20, which is reduced at its opposite end and connected to a pipe 21, which pipe is provided with a flattened end or mouth portion 22 to project between the seat 23 and the rim 24 of the bowl, the seat being cut away at its under side at 25 to make room for the same. This flattened end portion or mouth 22 is bent laterally to project in over the side rim of the bowl, and the lower side of the mouth is provided with a downwardly-turned lip 26 to engage the in-



ner side of the rim. The device is thus supported at one end upon the rim of the bowl, and the fan-casing 1 is provided with legs 27 for attaching the same to the wall of the room to support the device at the opposite end. The fan-casing 1 is also provided with the tangential flue 28, which is connected by a suitable packing-ring 29 to the ordinary ventilating-pipe 30, and thus the fan-casing and pipe 21 form a part of the vent-pipe to carry off the odors and gases from the closet. The fan-casing may be made with the flue 28 extending vertically, as shown, or it may extend laterally or downwardly, as circumstances require.

Inserted between the pipe 21 and its mouth portion 22 and connecting the same is a ring-casting 31, said casting being formed with a valve-casing 32, extending vertically across the ring and connecting the opposite sides thereof. In the valve-casing 32 is the upper chamber 33 and the lower chamber 34, said lower chamber being connected with the water-pipe 17, which extends longitudinally in the axis of the pipe 21. The upper chamber is provided with a branch 35, leading out through the side of the ring, where it is provided with a socket to receive the water-supply pipe 36. Between the two chambers of the casing is a valve-seat 37, engaged by a valve 38, having a valve-stem 39 projecting downward through a stuffing-box 40 in the bottom of the valve-casing, and a spring 41 in the upper chamber presses upon the valve and holds the same to its seat, said spring being inserted in the chamber through an opening in the top thereof, closed by a screw-cap 42. It may be found expedient to make the chamber 33 air-tight to form a compression-chamber and provide the valve with a plunger to move within the chamber, so that the air when the valve is raised will be compressed and operate to depress the valve in the same manner as is done by the spring 41. In the outer end of the branch 35 is inserted a screw-plug 43 to control the opening from the supply-pipe 36 to regulate the flow of water, and a second plug 44 is inserted to close the outer end of the opening and conceal the plug 43.

On the bottom of the mouth-pipe 22 are downwardly-extending ears 45, between which ears is pivoted the lever 46, and extending upward through an opening in said pipe is a pin 47, provided with a screw 48, having a slotted head to embrace one end of said lever, the opposite end of said lever being in engagement with the lower end of the valve-stem 39. Secured within the cut-away portion 25 of the seat and projecting therefrom a short distance is a striker-plate 49 to engage the upper end of the pin 47 and turn the lever 46 on its pivot to open the valve 38 when the seat 23 is depressed by a person sitting upon it. The depressing of the closet-seat thus automatically operates the valve 38 to admit water from the supply-pipe 17,

which conducts it to the chamber 16, where it escapes through the openings 18 and expending its force against the buckets of the motor-wheel turns the same and passes out at the bottom of the motor-casing into the bottom of the pipe 21 and thence through the mouth 22 into the closet-bowl, the lip 26 serving to lead the water to the rim, so that it will not fall directly to the bottom of the bowl and make a noise. It is obvious that the lever 46 may be depressed by other means than the striker-plate 49. The closet-seat hinge may be provided with an attachment to engage and operate the lever when the seat is depressed, or the lever may be operated directly by engagement with the seat.

The fan and motor being mounted upon the same shaft both are actuated by the jets of water, and a current of air is drawn in through the outer casing 20, the pipe 21, the ring 31, and the mouth portion 22 from the bowl and is discharged through the flue 28 during the time the closet is in use, and as soon as the user rises from the seat the spring 41 will close the valve and stop the motor.

The reduced end of the outer casing 20 is connected to the pipe 21 by inserting the plain straight end of said pipe into said end a short distance and screwing a packing-ring 50 over the end of the casing to force the packing therein into contact with the surface of the pipe and make a tight joint. The chamber 16 is connected to the pipe 17 in like manner by the packing-ring 51, so that in case the motor or jet-openings become clogged the casing 20 may be unscrewed from its flange in the fan-casing and slipped longitudinally on the pipe 21 to allow access to the motor-casing, the cap 15 of which is then disconnected and moved longitudinally on the pipe 17, the end of said pipe projecting into the chamber 16, thus exposing the interior of the wheel and the jet-openings. If sediment has collected in the chamber 16, it may be easily removed by unscrewing the packing-ring 51.

By this construction a very compact device presenting a neat appearance is secured having all of its operating parts inclosed within the casing of the device, which casing forms a continuation of the ventilating-pipe and also forms a conduit to conduct the water from the motor back into the bowl, there being no chance for leakage around the valve of the water-supply pipe.

What we claim as new is—

1. In a water-closet ventilator, a motor-wheel having walls forming buckets extending inward from the periphery, a fixed casing having an axial chamber with diametrically-disposed jet-orifices, a fan, a water-pipe and a valve contained within said casing for conducting water under pressure into said chamber and to the axis of said wheel and discharging the same outward from said orifices to enter the buckets and rotate the



wheel, and a ring-casting supported upon the other end of the water-pipe and having a valve.

2. In a water-closet ventilator, a motor-wheel having walls forming buckets extending inward from the periphery, a fixed casting having an axial chamber with diametrically-disposed jet-orifices, a fan, a water-pipe conducting water under pressure into said chamber and to the axis of said wheel and discharging the same outward from said orifices to enter the buckets and rotate the wheel, a ring-casting supported upon the other end of the water-pipe and having a valve and a mouth portion supported upon said ring-casting and having flattened end.

3. In a water-closet ventilator, a motor-wheel having walls forming buckets extending inward from the periphery, a fixed casting having an axial chamber with diametrically-disposed jet-orifices, a fan, a water-pipe for conducting water under pressure into said chamber and to the axis of said wheel and discharging the same outward from said orifices to enter the buckets and rotate the wheel, a ring-casting supported upon the other end of the water-pipe and having a valve, a mouth portion supported upon said ring-casting and having flattened end, and a pivoted lever mounted on said mouth portion with one end arranged to be actuated by the seat and the other end to actuate said valve.

4. In a water-closet ventilator, the combination with a ventilating-pipe leading to the bowl of the closet and containing a fan to draw the air from the bowl and a water-motor to actuate said fan, a shaft carrying said fan and motor, said pipe being arranged to receive the waste water from the motor and conduct it into the bowl and having a bell-shaped mouth, of a lip on the ventilating-pipe to engage the rim of the bowl and cause the water to flow over the side wall thereof and a ring-casting inserted in the said pipe between its ends and a valve in said casting.

5. In a water-closet ventilator, the combination of a fan-casing, a vent-pipe leading from said casing, a fan in the casing mounted upon a shaft journaled in bearings in the axis of the casing, a motor-wheel mounted upon said shaft, a casing for said motor-wheel having a removable cap provided with a chamber, a water-pipe projecting at one end into said chamber, a packing-ring on said cap, packing in said ring engaging the water-pipe to make a tight joint, an outer casing inclosing the motor-casing and detachably secured to the side of the fan-casing, a pipe inclosing the water-pipe and extending into the outer casing at one end and engaging the closet-bowl at the other end, a packing-ring on the end of said outer casing, and packing in said ring to engage the pipe and make a tight joint.

6. In a water-closet ventilator, the combination of a fan-casing, a fan in said casing mounted upon a shaft, a motor-wheel mount-

ed upon said shaft, a water-pipe leading to the axis of the motor-wheel, a pipe extending outward from the side of the fan-casing and inclosing the motor and water-pipe, a mouth portion for said pipe to project over the rim of the closet-bowl, a ring connecting the pipe and the mouth portion, a valve-casing connecting the opposite sides of said ring and provided with an opening to receive the end of the water-pipe, a valve in said casing having a projecting valve-stem, and means for operating said valve by the movement of the closet-seat.

7. In a water-closet ventilator, the combination of a fan-casing, a fan in said casing, a motor to actuate said fan, a pipe extending outward from the side of said fan-casing and inclosing said motor, a water-pipe in the axis of said pipe leading to the motor, a mouth portion for said pipe engaging the rim of the closet-bowl, a ring connecting the pipe and the mouth portion, a valve-casing in said ring connecting the opposite sides thereof and having an opening to receive the end of the water-pipe, a branch leading from said casing, a water-supply pipe connected to said branch, a screw-plug to control the opening from the supply-pipe into the branch, a valve in the casing to control the opening into the water-pipe, a valve-stem extended outward through the casing, a spring to hold the valve to its seat, and a lever pivoted to engage the valve-stem at one end and the closet-seat at the opposite end.

8. A water-closet-ventilator casing consisting of a circular fan-casing having a tangential flue and a removable side, a screw-threaded flange on the side of the casing opposite the removable side, an outer casing engaging said flange at one end and reduced at the other, a pipe extending within the reduced end and held therein by a packing-ring, a mouth portion for said pipe having a flattened and laterally-bent end to project between the seat and the rim of the closet and provided with a downwardly-curved lip to engage the rim, and a ring-casting connecting the pipe and the mouth portion forming a valve-casing, a diaphragm forming upper and lower chambers, a branch from the upper chamber leading out through the side of the ring, a valve-seat disposed between said chambers and a valve fitted to said seat, a motor and a pipe running to said motor from said valve-casing.

9. In a water-closet ventilator, a fan-casing having one side removable and the other side provided with openings, a shaft journaled at one end in a bearing on the removable side of the casing and projecting through a flanged opening in the other side thereof, a bushing on said shaft engaging the flanged opening, a fan-wheel on the shaft, a motor-wheel secured on the end of said shaft and consisting of a disk provided with peripheral buckets, a flange on the side of the fan-casing inclosing the motor-wheel, a cap secured to said



flange and having a rectangular chamber provided with jet-openings, a water-pipe, a packing-ring forming a tight joint between and connecting the end of the pipe with the  
5 chamber, an outer casing connected to the side of the fan-casing and inclosing the openings therein and the motor, a pipe extended into the end of said outer casing, and a  
10 mouth portion connected to the said pipe and engaging the rim of the bowl.

10. In a water-closet ventilator, in combination, a fan-casing having a removable side and openings in the opposite side and a tangential flue, legs on the casing for attaching  
15 the same to the wall, a shaft mounted in bearings in the axis of said casing and projecting through the side thereof at one end a fan-wheel on said shaft, a casing for said motor-wheel, a cap on said casing having a  
20 chamber extending laterally and provided with jet-openings, a water-pipe, a packing-ring connecting the cap and the pipe, a screw-threaded flange on the side of the fan-casing inclosing the openings therein and the motor-  
25 casing, an outer casing internally screw-threaded to engage said flange at one end and reduced at its opposite end, a pipe projecting into the reduced end of the outer casing,

a packing-ring connecting the pipe and the said end, a mouth portion engaging the rim 30 of the bowl, a ring-casing connecting the pipe and the mouth portion, a valve-casing connecting the opposite sides of said ring and having an opening to receive the end of the water-pipe, a branch leading laterally out- 35 ward through said ring, a supply-pipe connected to said branch, a valve in said casing, a stem on said valve projecting downward through the lower end of the same, a spring to hold said valve to its seat, a lever pivoted 40 to the lower side of said mouth portion and engaging the valve-stem at one end, a pin projecting upward through an opening in the mouth portion and having an adjusting- 45 screw provided with a head engaging the other end of said lever, a seat having a recess, and a striker-plate secured in said recess and adapted to engage said pin.

In testimony whereof we affix our signatures in presence of two witnesses.

ALBERT DROUILLARD.  
JAS. M. TEAHEN.

Witnesses:

L. GARANT,  
L. BOCK.