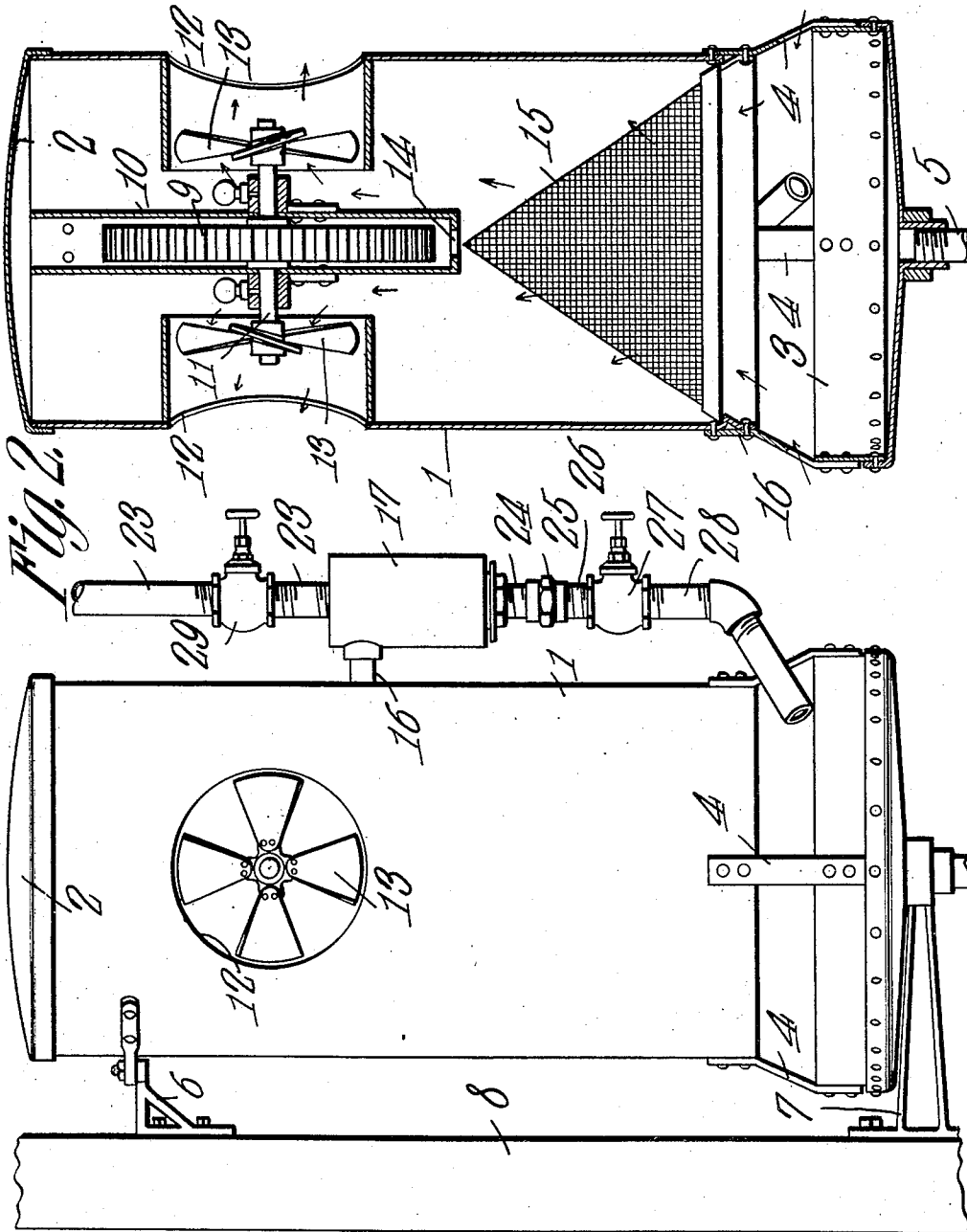


A. R. CLARKSON.
HUMIDIFIER.
APPLICATION FILED JUNE 5, 1908.

921,365.

Patented May 11, 1909.

2 SHEETS—SHEET 1.



Witnesses
E. J. Smith
F. T. Chapman

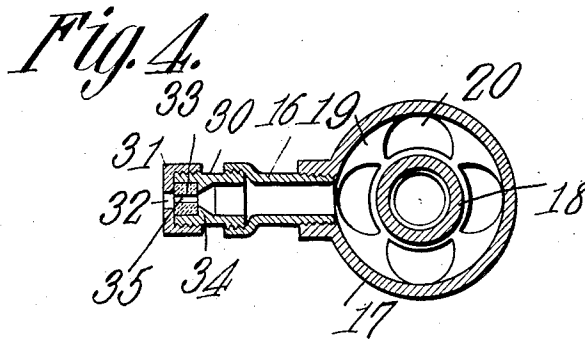
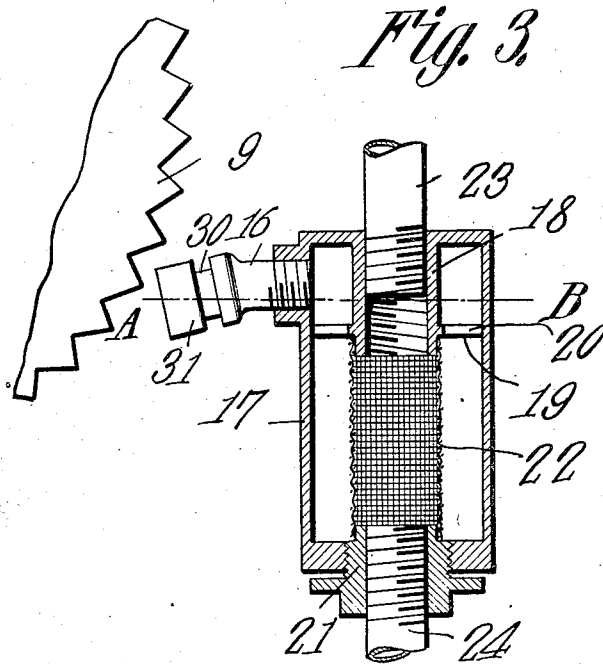
Fig. 1.

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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

ALFRED R. CLARKSON, OF BIRMINGHAM, ALABAMA, ASSIGNOR OF FOUR-FIFTHS TO ALFRED CLARKSON, OF FALL RIVER, MASSACHUSETTS.

HUMIDIFIER.

No. 921,365.

Specification of Letters Patent.

Patented May 11, 1909.

Application filed June 5, 1908. Serial No. 436,968.

To all whom it may concern:

Be it known that I, ALFRED R. CLARKSON, a citizen of the United States, residing at Birmingham, in the county of Jefferson and State of Alabama, have invented a new and useful Humidifier, of which the following is a specification.

This invention has reference to humidifiers, and its object is to provide means whereby air may be made humid or moist for various purposes.

The invention comprises means whereby water used to moisten or humidify the air is itself utilized for the blowing mechanism, whereby air currents are set up so that the air is drawn through a moistening chamber and then distributed to the point of utilization.

In the practical embodiment of the invention there is provided a suitable casing in which is located a water motor-driving fans which are used for the purpose of propelling the air to distribute the same about the room or compartment where the air is to be kept in a humid or moistened condition. The water after being used to drive the water motor is caused to traverse the in-coming air current in thin streams or sheets so that the air before reaching the propelling means driven by the water motor will come in contact with the escaping water and thus be thoroughly moistened or humidified. After the water has passed through the motor and through the incoming air stream it is permitted to escape through a suitable drain.

In accordance with the present invention provision is also made for insuring the passage of clean water only to the motor and the humidifying portion of the device by providing suitable screens or filters. In this connection provision is made for the cleansing of these screens or filters from time to time to prevent the latter from becoming clogged.

The invention will be best understood from a consideration of the following detail description taken in connection with the accompanying drawings forming a part of this specification, in which drawings—

Figure 1 is an elevation of the device. Fig. 2 is a cross section of the device on a vertical plane in the axis of the motor shaft, the said motor and fans driven thereby being shown in elevation. Fig. 3 is a vertical section through the filter and adjoining parts on a larger scale than shown in Fig. 1, and Fig. 4 is a cross section on the line A—B of Fig. 3.

In the drawings, there is shown a casing 1 of any suitable shape, but preferably cylindrical. This casing is closed at the upper end by a cap or cover 2 and is open at the lower end. Below the lower end of the casing 1 there is a trough or receptacle 3 somewhat larger in diameter than the casing 1 and hung therefrom and spaced by hangers 4 connected to the casing 1 and the trough 3. The bottom of the receptacle 3 inclines toward the center and is there connected with a drain or waste pipe 5.

The device is shown as supported upon brackets 6 and 7, fast to a support or post 8, which may represent the side wall or any portion of the frame of a building, wherein the humidifier is located.

Mounted within the casing 1 near the upper end thereof is a water motor 9 provided with a suitable casing 10. This water motor may be of any of the approved constructions and consequently needs no specific description. The water motor shaft 11 projects through the side of the casing 10 to near the inner wall of the casing 1, which latter at these points is provided with diametrically-opposed through openings 12. The shaft 11 terminates within the casing 1 and at its ends carries fans 13 in close relation to the openings 12 and arranged to drive air out through the said openings, and the bottom of the casing 10 of the water motor has an opening 14 for the escape of water that has been used for actuating the motor. The fans 13 are, of course, right and left hand fans.

The casing 1 below the water motor is a conical screen 15 immediately below the opening 14 and with its base resting on supports 16 at the open end of the casing. These supports 16 may be made by indenting the walls of the casing 1 or may be made in any other manner. The arrangement is such that water escaping through the opening 14 will be caused to flow down the conical screen 15, some water flowing through the screen and some finding its way to the outer edges of the base of the screen and all the water finally gravitating into the receptacle 3 and flowing out through the drain pipe 5.

The fans 13 cause the air to flow into the casing 1 through the lower open end of the same between the said lower end of the casing and the receptacle 3, and the inflowing air streams can only reach the fans 13 by

passing through the screen 15. The inflowing air streams, however, must pass through thin streams of water flowing down the screen 15, and the air will thus absorb more or less water and thereby become moistened or become humidified and forced out through the openings 12.

Water is fed to the buckets of the water motor 9 through a nozzle 16 coming from a casing 17 exterior to the casing 1. The casing 17 is formed at its upper end with a central concentric cylindrical portion 18, and near the lower end of this portion 18 it is connected to the side walls of the casing 17 by a web 19 pierced at regular intervals by openings 20. The lower end of the casing 17 is entered by a bushing 21, and between this bushing 21 and the lower end of the cylindrical member 18 there is confined a cylindrical screen 22 concentric with the casing 17. The upper end of the casing 17 is entered by a pipe 23 and the bushing 21 receives a pipe 24 connected by a union 25 to another pipe 26 leading into a valve 27, from which latter there leads a pipe 28 to the receptacle 3 so as to empty thereinto. The pipe 23 leads from any suitable supply of water under pressure and includes a cut-off valve 29. Suppose, now, that water is admitted through the pipe 23, it finds its way to the interior of the screen 22, and assuming that the valve 27 is shut off the water will flow into the interior of the cylinder 17, and out through the nozzle 16 against the buckets of the water motor 9 setting the latter in motion and thereby propelling the fans 13. As the water is used it escapes through the opening 14 to the screen 15 and ultimately into the receptacle 3. The rotation of the fans 13 causes air currents to be forced out through the openings 12 and air is drawn into the casing 1 through the screen 15, becoming moistened or humidified as before explained.

The screen or filter 22 serves to maintain the incoming water in a clean or pure condition so that there is no danger of contaminating the upper surface of the screen 15. If the incoming water be at all dirty the inner surface of the screens 22 ultimately becomes contaminated, then by opening the valve 27 the water flowing in through the pipe 23 will find its way into the receptacle 3 without first passing to the water motor, and any material which has accumulated upon the inner surfaces of the screen 22 is washed off by the flow of water and ultimately finds its way into the drain pipe 5. The screen 22 may thus be cleansed from time to time, as may be found advisable.

The construction of the nozzle 16 is best indicated in Fig. 4, where there is shown a nipple 30 screwed at one end into the body of the nozzle and at its other end receiving a cap 31 having a central bore or passage 32. The cap 31 confines a glass block 33 in the

corresponding end of the nipple against an annular shoulder 34 formed on the interior of the nipple. Through the block 33 is an axial passage 35 the diameter of which determines the effective size of the bore of the nozzle. The passage 32 in the cap 31 is of such size as to permit the use of blocks 33 having bores of different diameters so that the size of the stream may be varied by changing the blocks 33 without the necessity of changing the cap 31.

The glass block is used because of its resistance to wear and because it may be readily renewed, or changed if it be desired to vary the size of the jet. The structure forming the subject-matter of the present invention provides a means for supplying clean water to the water wheel and from thence to the screen 15. All the air reaching the fans 13 must pass through the body of water passing over and through the screen 15 and therefore the air is thoroughly washed and also cooled by its passage through such body of water.

What is claimed is:—

1. In a humidifier, a casing open at the lower end and provided on diametrically opposite sides with through openings, a water motor within the casing and having a shaft extending in the direction of the through openings in the casing, fans on the motor shaft one in operative relation to each of the two openings in the casing, means for supplying water to the water motor, and means for directing the waste water from the water motor in thin streams through the air entering through the lower end of the casing.

2. In a humidifier, a suitable casing, a water motor and fans located at one end of the casing, and a pervious screen within the casing below the water motor and shaped to direct the waste water from the water motor toward the walls of the casing and across the incoming air stream.

3. In a humidifier, a suitable casing open at the lower end, and a water motor and air fans driven thereby and housed in said casing near the upper end thereof, and a conical screen within the casing having its apex directly below the water motor for deflecting the waste water from the water motor toward the walls of the casing and across the incoming air streams.

4. In a humidifier, means for directing water across air streams, and means for cleansing the water before reaching the air to be humidified, comprising a suitable chamber, a water conduit extending entirely through said chamber and having pervious walls within the chamber constituting a screen, and an outlet from said chamber out of line with the water conduit and screen therein.

5. In a humidifier, means for directing water across air streams, and means for cleansing the water before reaching the air to be

humidified, comprising a suitable chamber, a water conduit entering said chamber, a pervious screen in line with the water conduit, an outlet from said chamber out of line with the water conduit, and a valved outlet for said chamber in line with the water conduit and providing a passage for the water through the chamber without passing through the screen.

10 6. In a humidifier, a casing open at one end and near the other end provided with through openings, a water motor housed in the casing at the closed end thereof and provided with an escape opening for the waste
15 water, fans on the motor shaft in operative relation to the through openings in the casing, means for supplying water to the water motor, a pervious spreader below the escape opening of the water motor, and between the
20 same and the open end of the casing, and a receptacle for the waste water carried by the casing in spaced relation to the open end thereof.

7. In a humidifier, means for producing air
25 currents, a water motor for driving the said means, and a nozzle for directing water to the

water motor comprising a nipple having an interior shoulder forming a seat in said nipple, a removable vitreous block adapted to be lodged in the nipple against the seat
30 therein and having a bore of substantially the same diameter throughout, and a cap confining the block to its seat and provided with a perforation larger than the bore in the block.

8. In a humidifier, a means for producing air currents, a water motor for driving said means, and a nozzle for directing water to the water motor comprising a nipple, a block
40 loosely and removably seated therein and having a bore of substantially the same diameter throughout, and a cap on said nipple confining the block to its seat and provided with a perforation for the passage of water escaping from the bore of the block.

45 In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

ALFRED R. CLARKSON.

Witnesses:

INA D. BURKETT,
G. L. BURKETT.