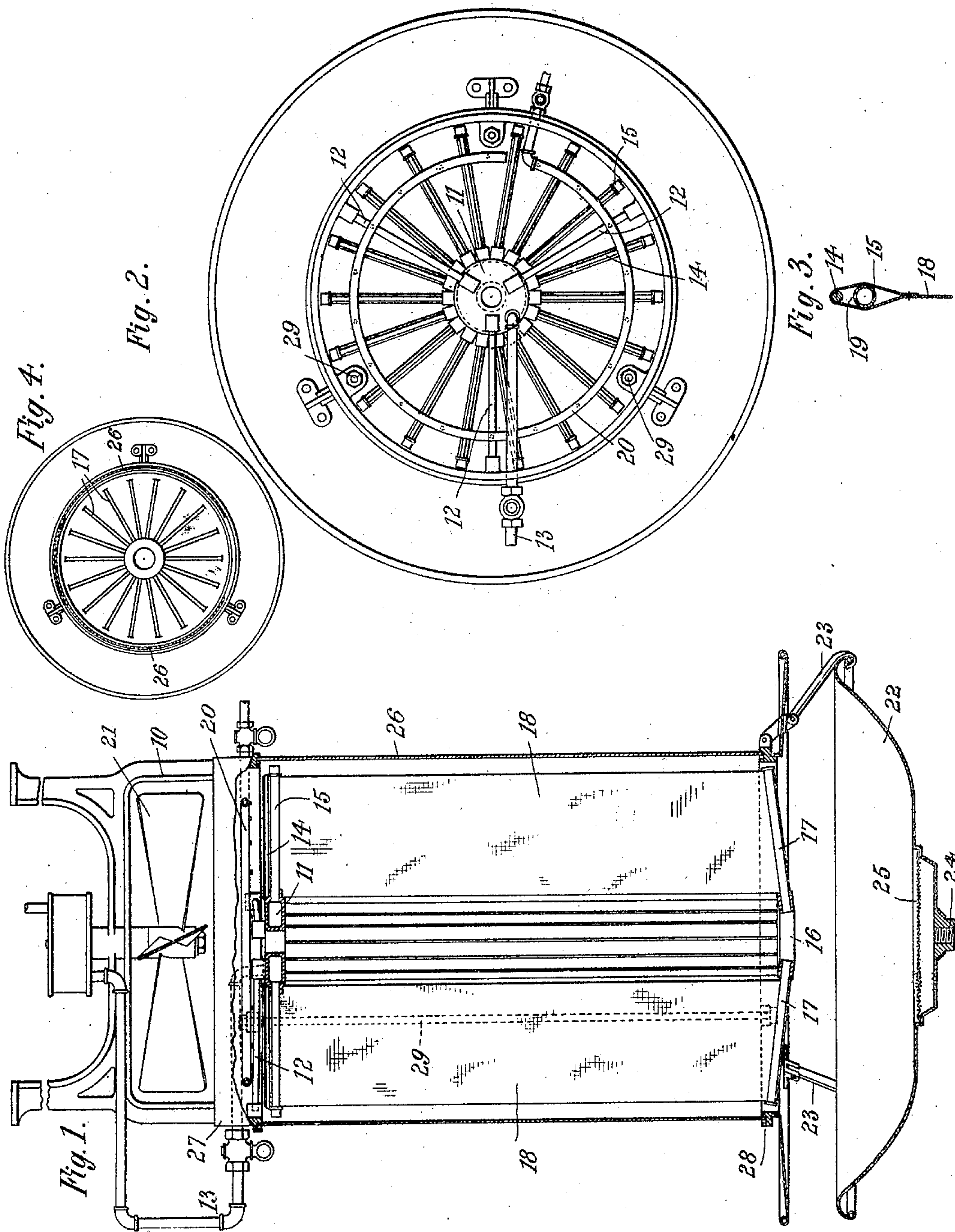


No. 803,022.

PATENTED OCT. 31, 1905.

J. J. SMITH.
HUMIDIFIER.

APPLICATION FILED OCT. 14, 1904.



Witnesses
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UNITED STATES PATENT OFFICE.

JOSEPH J. SMITH, OF NEW YORK, N. Y.

HUMIDIFIER.

No. 803,022.

Specification of Letters Patent.

Patented Oct. 31, 1905.

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To all whom it may concern:

Be it known that I, JOSEPH J. SMITH, a citizen of the United States, residing at New York city, county and State of New York, have invented certain new and useful Improvements in Humidifiers, of which the following specification and accompanying drawings disclose as an illustration one embodiment thereof which I now regard as the best out of the various forms in which the principles of my invention may be applied.

This invention relates to humidifiers of the kind employing moistened evaporating-surfaces, such as cloth sheets or mantles. In a copending application of myself and Louis Bell, Serial No. 201,752, is described an apparatus of this kind wherein the mantles are stretched between upper and lower supports which are substantially in the form of grids—that is, a circular rim and parallel cross-bars connecting the sides of this rim—there being a water header or “tank” of similar grid form over which the upper ends of the mantles are looped. One result of such an arrangement is that the mantles are of different widths, and another result is that some difficulty is experienced in putting them in place and taking them off.

The present invention aims to improve the humidifier by making its mantles of uniform width, so as to somewhat cheapen their manufacture in quantity and securing them at top and bottom and, furthermore, to render it easier to apply and remove the mantles when it becomes necessary to do so. This object is accomplished in the preferred embodiment illustrated herewith by mounting the mantles on a circular series of radial arms having free outer ends over which the mantles may be readily drawn off, the moistening means being of a similar conformation in the shape of a central header with free-ended radial perforated or slotted pipes for distributing the water to the mantles. An improved construction of casing enables any one of the mantles to be reached.

Referring to the accompanying drawings, Figure 1 represents a vertical section of the humidifier. Fig. 2 represents a plan view taken below the fan. Fig. 3 represents a cross-section of the upper end of one of the mantles with support and perforated pipe. Fig. 4 represents a horizontal section, in a reduced scale, showing the adjustable casing.

Referring to the construction of the humidifier, 10 is a bracket or frame by which it is

suspended from the ceiling, and 11 is a central water-distributing header suspended from this frame by three radial arms 12. 13 is an induction or supply pipe for conducting water to this header.

Projecting from the header or hub 11 is a circular series of rods 14 and a similar series of pipes 15, which radiate like the spokes of a wheel. The lower part of the casing supports a second hub 16, from which radiate a series of rods 17, having a slight upward inclination to facilitate insertion and removal of the mantles and located in planes with the rods 14 and pipes 15. Cloth mantles or evaporating-surfaces 18 are stretched between the rods 14 and 17 and are looped over the pipes 15, as indicated in Fig. 3, the latter being perforated at 19 on their upper sides to distribute the water from the header 11 to the several mantles. This construction removes strain from the free-ended water-pipes and permits a free flow of water. Being supported at both top and bottom, the mantles are prevented from flapping or clinging together by reason of the fan-draft, which has a partial whirling movement. Steam may also be furnished through a pipe 20 to make up for the local absorption of heat from the atmosphere caused by the evaporation, as described in the aforesaid application.

On the frame 10 is journaled the shaft of a fan 21, which produces a downward flow of air over the moistened evaporating-surfaces. This fan, being axial with the radiating series of mantles, produces uniform downward currents through all of the spaces between the mantles and is therefore of maximum efficiency, since there is no dead-space through which the water can flow without encountering a strong current of air.

At the lower end of the casing and separated therefrom by a space for the exit of the moistened air is a basin 22, removably supported by its rim on pivoted hooks 23 and having an outlet 24 for the exit of waste water, located below a strainer 25, which catches most of the dust and other sediment in the atmosphere.

The body of the casing is cylindrical and formed of two segmental sections 26, mounted in grooved upper and lower guides 27 and 28, the lower guides being supported from the upper guide by means of suspension-rods 29. The segments 26 of the casing are adapted to overlap and slide past each other in a circumferential direction, so that an opening

can be made in the side of the casing at any point. This affords access to any one or more of the mantles 18 for the purpose of inserting or removing the latter. It will be observed that the mantles can be inserted or removed by slipping them onto or off of the free ends of the radial arms 14 17.

I have further shown a feature which consists in supplying power to the fan 21 by means of a water-motor 40, of any suitable type, connected to its shaft and conducting the waste or discharge, or a part thereof, from said motor through the pipe 13 to moisten the mantles 18. In this way I make the system self-contained, dispense with shafting, belting, &c., to run the fans, and also obtain a novel regulating action, for the evaporating power is automatically adjusted to correspond with the amount of water to be evaporated. In case of an increase or decrease in the flow of water to the mantles the water-motor will increase or decrease its speed correspondingly. For night running, or when it is not desired to operate the pump 37, the humidifiers may be supplied with water from a street-main connection 4 and the surplus water run to waste, if desired. I may of course employ belting, shafting, or individual electric or other motors to drive the fans in cases where an abundant supply of water is difficult or expensive to obtain or where other conditions make it inadvisable to employ the water-motors.

It will be observed that when either pair of edges of the casing-segments of the humidifier are separated an opening is left in the side of the casing for giving access to the interior parts, and this opening may by sliding the segments be shifted to any desired point in the circumference of the humidifier, so as to uncover any particular mantle or mantles and its accessories. The movement is therefore a relative one, taking place between the casing and the interior parts. I do not restrict myself to this specific way of effecting the relative movement, as the same result may be accomplished in other ways.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a humidifier the combination of pairs of mantle-supporting rods arranged in an upper and a lower series radiating from two centers, a series of flexible cloth mantles stretched

on the pairs of rods and removable outwardly therefrom by sliding along the rods, means to continuously moisten said mantles, and a rotary fan in proximity to and substantially axial with said series of rods.

2. In a humidifier the combination of pairs of free-ended rods arranged in an upper and a lower series, a series of flexible cloth mantles supported on said rods by their upper and lower edges and removable over the ends thereof, a series of perforated water-pipes adjacent but separate from the upper rods for moistening the mantles, and means for inducing currents of air longitudinally between the mantles.

3. In a humidifier, the combination of a series of free-ended supports, evaporating-webs removable longitudinally of said supports, and a casing wholly surrounding said supports and webs and interposed in the path of withdrawal of the mantles, said casing provided with means forming a shiftable opening adapted to register in succession with the several webs, and a fan adapted to create a current of air axially through said casing.

4. In a humidifier, the combination of a series of radiating evaporating-webs, supports from which the webs are radially removable, and a cylindrical casing surrounding said series and having overlapping segmental sections independently shiftable in a circumferential direction and together forming a complete tubular casing, and a fan for creating an air-current through said casing.

5. In a humidifier, the combination of a series of evaporating-webs and supports therefor, outwardly presented at different points around a circumference, a casing completely surrounding said webs and forming an air-tube for the fan-draft, said casing formed to present an opening opposite a portion of the whole number of webs, a fan at one end of said casing for inducing a current of air there-through, and provisions for relatively shifting said webs and opening circumferentially to expose any desired web.

In witness whereof I have hereunto set my hand, before two subscribing witnesses, this 8th day of October, 1904.

JOSEPH J. SMITH.

Witnesses:

L. T. SHAW,
M. A. MODER.