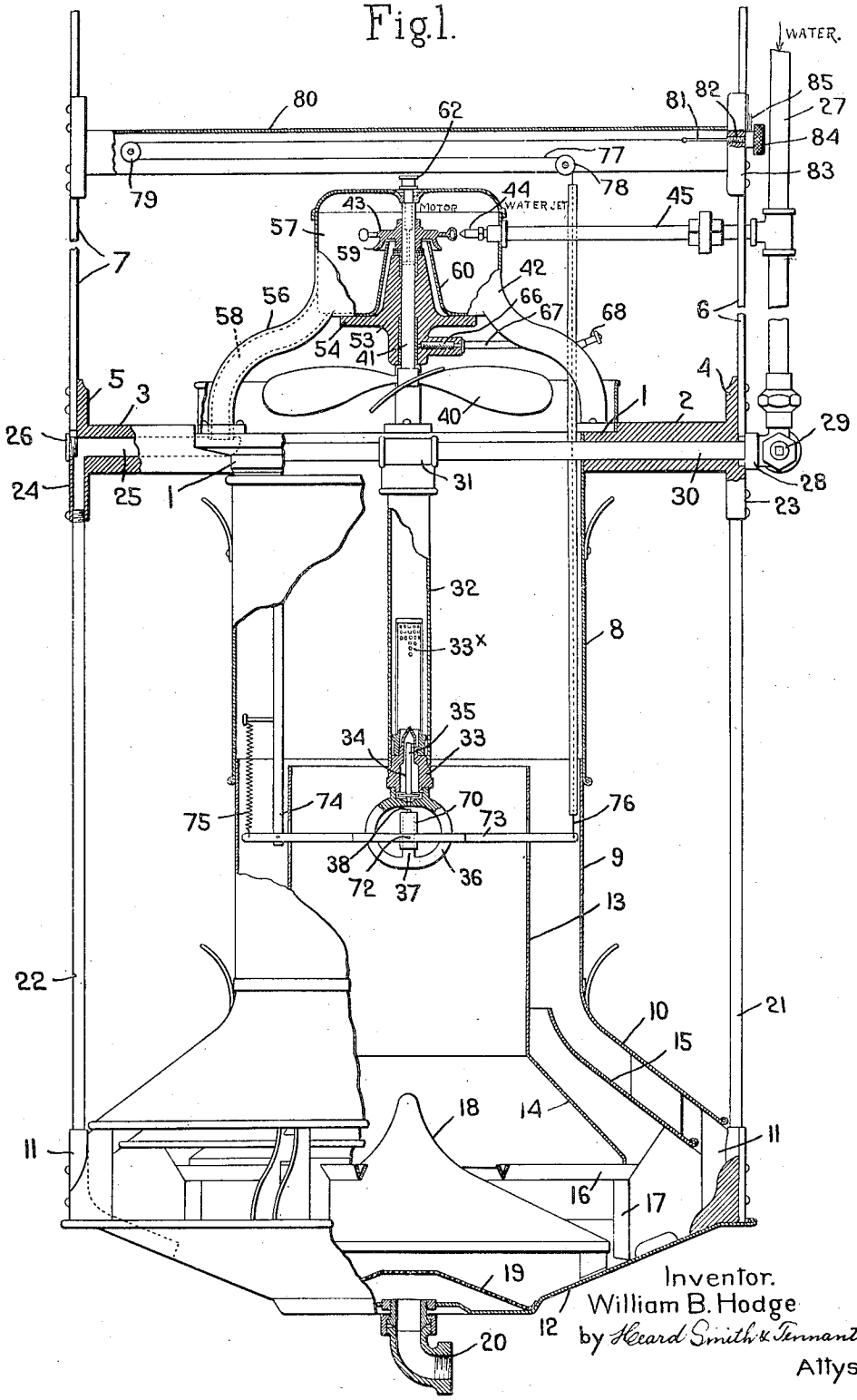
Jan. 19, 1926. 1,569,860

W. B. HODGE

HUMIDIFIER

Filed Dec. 17, 1920 2 Sheets-Sheet 1

Fig. 1.



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HUMIDIFIER

Filed Dec. 17, 1920 2 Sheets-Sheet 2

Fig.2.

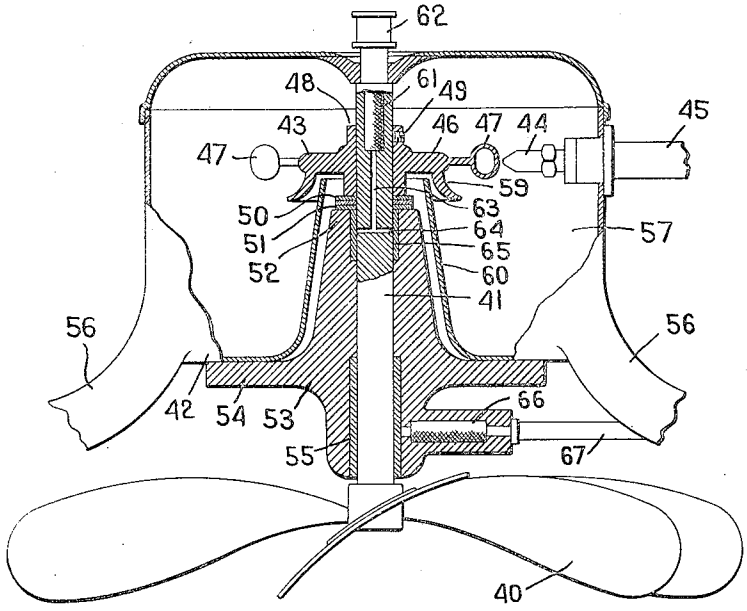


Fig.3.

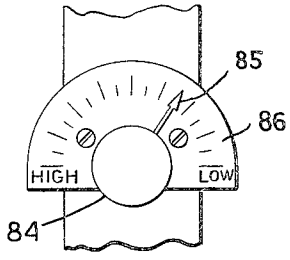


Fig.4.

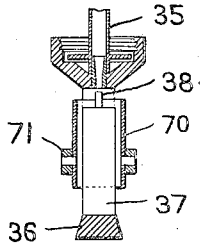
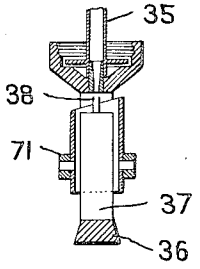


Fig.5.



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Patented Jan. 19, 1926. 1,569,860

UNITED STATES PATENT OFFICE.

WILLIAM B. HODGE, OF CHARLOTTE, NORTH CAROLINA, ASSIGNOR TO PARKS-CRAMER COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

HUMIDIFIER.

Application filed December 17, 1920. Serial No. 431,521.

To all whom it may concern:

Be it known that I, WILLIAM B. HODGE, a citizen of the United States, and resident of Charlotte, county of Mecklenberg, State of North Carolina, have invented an Improvement in Humidifiers, of which the following description, in connection with the accompanying drawing, is a specification, like characters on the drawing representing like parts.

This invention relates to improvements in humidifiers of the type in which a current of air is projected through a cloud of spray produced in any suitable manner, the current of air, after absorbing moisture from the spray, being delivered into the enclosure to be humidified, while the water which is not vaporized or atomized is collected and preferably recirculated through the spraying device.

The usual type of apparatus commercially used is exemplified in Patent No. 996,217 granted June 27, 1911, to Stuart W. Cramer and myself which illustrates a humidifier comprising a casing suspended from the ceiling of the enclosure having a downwardly directed nozzle for producing a spray with a fan superposed above the same to project a current of air through the spray with means below the casing for diverting the moisture-laden air laterally into the enclosure, and a pan being provided beneath the casing to collect the water which is not vaporized.

One of the objects of the present invention is to provide a humidifier of this type, of simplified construction, in which the initial cost of production and installation will be decreased and which can be more economically operated than humidifiers heretofore produced.

A further object of the invention is to provide a humidifier of this type which will have an increased capacity and which will be capable of discharging moisture over more extended areas than those of previous construction.

In humidifiers of relatively large capacity heretofore constructed, the fan for projecting the current of air through the spray has been actuated by a belt-driven pulley carried by the fan shaft, or by an electric motor, the rotor of which is connected to the fan shaft. Such installations require, in one case, a considerable amount of undesirable shafting and power transmitting mechanism and in the other case the use of an electric motor which is not only initially expensive, but also costly to operate.

The present invention contemplates the production of the power required to operate the fan by means of a water motor which may be operated by a jet of water supplied from the same source as that which supplies the spray producing means, the fan being located between the water motor and the spray producing means. Such a construction requires substantially no additional expense of installation and the cost of maintenance is reduced to a minimum.

A further object of the invention is to provide a novel and improved means for regulating the amount of moisture delivered by the humidifier in correlation to the requirements necessary to maintain the air of the enclosure at a desired uniform degree of humidity. Humidifiers of this general type have heretofore been regulated by intermittently cutting off and turning on the water supply, or by arresting and resuming the actuation of the fan which produces the current of air through the humidifier casing, or by combining such regulating means.

A further object of the present invention is to provide means by which the amount of moisture delivered by the humidifier may be controlled either by graduating the amount of spray presented in the path of the current of air or if necessary by wholly interfering with the production of the spray.

A further object of the invention is to provide means for automatically controlling the amount of spray produced by regulating means comprising a member sensitive to moisture so located as to be influenced by the moisture content of the air of the enclosure, or by the moisture content of the air entering the humidifier. Such regulating means may be employed either to control the operation of a single humidifier or a plurality of humidifiers placed at different positions in the enclosure.

A further object of the invention is to provide a novel bearing mechanism for the motor and fan shaft comprising means for preventing water from entering the bearing, a novel bearing lubricating means and an effective anti-friction thrust bearing

adapted to support the weight of the motor and fan.

Other objects and features of the invention will more fully appear from the following description and the annexed drawings and will be pointed out in the accompanying claims.

A preferred embodiment of my invention is illustrated in the accompanying drawings as embodied in a humidifier which is suspended from the ceiling of an enclosure, but it will be understood that the features of the invention may also be embodied in humidifiers which are supported in a different manner, as for example in a horizontal position which is sometimes desirable where the humidifier is to be employed in a low posted room.

In the drawings:

Fig. 1 is a side elevation of a humidifier embodying my invention, certain portions being broken away and others illustrated in cross section;

Fig. 2 is an enlarged view, partly in section, of the fan, the water motor for actuating the same and the novel type of bearing for the fan and motor shaft;

Fig. 3 is a detail view of the dial mechanism which indicates the adjustment of the humidifier regulating device;

Fig. 4 is a detail vertical sectional view of a portion of the spray-producing mechanism showing one means of controlling the amount of spray delivered in the path of the current of air passing through the humidifier casing; and,

Fig. 5 is a similar view of a modified form of regulating means which is adapted to be so adjusted as to divert a part or the whole of the jet of spray which is normally presented in the path of the current of air in the humidifier casing.

A preferred embodiment of the invention is disclosed herein as applied to a humidifier which is suspended vertically from the ceiling of an enclosure to be humidified, but it will be understood that whereas the following description is specifically addressed to this particular embodiment of the invention it is not restrictive and that the various novel features of the invention may be employed also in humidifiers having other arrangements and also in other types of humidifiers to which the invention may be adapted.

As illustrated herein the humidifier comprises a supporting frame which desirably is in the form of a ring 1 formed of cast iron or other metal, provided with a pair of oppositely extending hollow arms 2, 3 having flanges 4, 5 by which they are secured to and form rigid parts of the lower ends of hangers 6, 7 which may be supported from the ceiling of the enclosure or from any other suitable support.

The humidifier comprises an outer, preferably cylindrical, casing which desirably is constructed in two telescoping sections 8, 9, the upper section 8 of which is secured within the ring 1, while the lower section 9 is provided with an outwardly-flanged lower end 10 which is connected by suitable brackets 11 to a pan 12 which receives and collects the excess of water supplied to the humidifier.

The humidifier also comprises an inner casing 13 of smaller diameter and concentric with the lower section of the outer casing, said inner casing also having a divergent lower portion 14 which is supported above the pan 12. A deflector 15 is also provided intermediate of the lower portions 10 and 14 of the outer and inner casings. The lower end of the inner casing 14 is located above a gutter 16 which is supported upon a hollow bracket 17 providing a passage for water and leading to the pan 12. A suitable conical deflector 18 is located axially of the inner casing and serves to deflect the blast of air through the humidifier outwardly in a substantially horizontal direction through the space between the lower ends of the casing members and the pan.

The pan 12 may be and is provided with the usual strainer 19 and outlet pipe 20 which may lead to a pump to provide for the recirculation of the water to the humidifier nozzle, and water motor which will hereinafter be described.

The pan 12 and the casing members carried thereby are supported by hanger members 21, 22 which are connected at their lower ends to the brackets 11 and at their upper ends to downwardly projecting bosses 23, 24 upon the arms 2 and 3 of the supporting frame 1 of the humidifier. The boss 23 desirably may be in the form of a socket to receive the upper end of the rod 21, suitable set-screws being provided for securing the rod therein. The boss 24 desirably is hollow and communicates with a conduit 25 in the arm 3 to provide a passageway for the waste water from the motor as will hereinafter be described. The end of the conduit 25 may be provided with a suitable plug 26 to close the opening therein, the opposite end of the conduit 25 being closed in any suitable manner.

The hanger member 22 desirably is a pipe having at its upper end screw threaded connections with the boss 24 and at its lower end suitably secured to the bracket 11 and extending beyond the same along the wall of the pan so that the waste water from the motor will be conducted through said supporting hanger to the pan of the humidifier.

In this type of humidifier means are provided for producing a conoidal jet or spray of water within the casing and a fan, located in the upper part of the casing or above

the casing, serves to force a current of air through the spray thus produced and to distribute the same through the opening at the lower end of the casing just above the pan.

In the apparatus heretofore constructed the fan has been supported upon a shaft located axially of the casing above the spray nozzle and driven by a belt or by an electric motor. One of the principal features of the present invention consists in providing a water motor for the fan, located upon the suction side of the fan, and actuated from the same source of supply as that which furnishes water to the spray nozzle.

In the preferred construction illustrated herein water under high pressure, as for example 150 pounds per square inch, is supplied to a pipe 27 having a connection 28 provided with a suitable valve 29 leading to a pipe 30 which extends through the hollow arm 2. The pipe 30 is connected at its opposite end by a suitable T 31 the downwardly extending branch of which is connected at its lower end to the upper end of a pipe 32 which supports at its lower end a nozzle adapted to produce a conoidal jet of spray. The form of nozzle, which is illustrated herein, is so constructed that stoppage, due to the accumulation of particles of dirt and other foreign matter, will be prevented. It comprises a body portion 33 which supports at its upper end a cylindrical screen 33x, the body portion 33 being provided with passageways which serve to cause the water to pass through a sinuous course to a chamber 34 which, by reason of the slow circulation of the water therein, receives and holds the particles which otherwise might stop the nozzle. The water passes from the chamber 34 into the upper end of a stand pipe 35 and is delivered from the lower end thereof through a restricted nozzle in the form of a small jet. A ring 36, which is secured to the lower end of the body 33, has a diametrically positioned vertical standard 37 which carries a pin 38, the upper flat end of which is located closely adjacent to the aperture of the nozzle and serves, when water is projected through the nozzle, to produce a conoidal film-like jet which breaks into a finely divided spray upon reaching the wall of the inner casing.

Means, which will hereinafter be more fully described, are provided for diverting the jet or restricting the effective amount of spray presented in the path of the current of air which passes through the inner humidifier casing.

The fan 40, for projecting the current of air through the casing, is fixedly secured upon a shaft 41 which is journalled in suitable bearings carried by a standard 42 which is secured to the supporting frame or ring 1. A water motor, preferably of the "Pelton" wheel type, is located upon the suction side of the fan so that the fan is positioned between the water motor and the spray-producing means.

As illustrated herein, the rotor 43 of the motor is secured directly to the fan shaft and is actuated by a jet of water delivered through a nozzle 44 upon the end of a pipe 45 which leads from the main supply pipe 27.

The "Pelton" wheel, as illustrated herein, comprises a hub 46 which carries at its periphery a series of cup-shaped vanes 47 against which the jet from the nozzle 44 impinges. The hub of the wheel is provided with a central flange 48 which is secured to the shaft 41 by set screws 49. The lower face of the hub rests upon a thrust bearing, preferably composed of alternately disposed washers 50, 51, of hard bronze and oil soaked wood, the lowermost of said washers resting upon the upper end of a conical boss 52 of a bearing member 53 having a laterally extending flange 54 by which it is suitably secured to the stand 42. The lower portion of the bearing member 53 is provided with a journal 55 which serves the purpose of centering the shaft and holding the same in alinement during the rotation of the motor and fan. The thrust bearing above described serves to support the entire weight of the rotating mechanisms including the fan, its shaft and the motor.

The stand 42 is provided with a plurality of legs 56 having flanges at their lower ends which are bolted, or otherwise secured to the supporting frame or ring 1. The upper portion of the stand 42 is formed as a chamber to enclose the water motor and is provided with a removable cover to permit the assembling and removal of the shaft, motor, etc. One of the legs 56 of the stand is made hollow to provide a conduit 58 which leads from the chamber 57 and at its lower end communicates with the conduit 25 in the arm 3 of the supporting member. By reason of this construction the waste water from the motor runs from the chamber 57 through the conduit 58 and leg 56, thence through the conduit 25 in the arm 3 into the hanger member 22 from which it is delivered into the pan of the humidifier. By thus conducting away the waste water from the motor externally of the field of the spray, interference with the regulated amount of water delivered by the spray nozzle is avoided and accurate regulation of the amount of humidified air delivered to the room permitted. If desired the water collected in the humidifier pan may be recirculated to the motor and the humidifier nozzle by a suitable pump not shown.

In order to prevent the water, which is used to actuate the motor, from entering and damaging the bearings of the combined fan and motor shaft, the hub 46 of the water

motor is provided with a downwardly-depending and outwardly-flaring bonnet 59 which tends to deflect outwardly any water which rebounds from the vanes 47 of the motor and would otherwise enter the bearing.

The chamber 57 is provided with an inner conical wall 60 which surrounds the conical bearing member 53 and extends upwardly within and closely adjacent to the bonnet 59 and closely adjacent the under surface of the hub 46 of the motor. By reason of this construction the entrance of water into the bearing is entirely prevented.

A convenient method to lubricate properly the bearings for the shaft 41 consists in providing the upper end of the shaft with a central chamber or oil well 61, which is filled with wicking and is closed by a suitable cap 62, and communicates with a duct 63 which extends axially downwardly in the shaft 41 and communicates with laterally extending ducts 64 leading to an annular bearing member or sleeve 65 of Babbitt metal, or other suitable material, the upper end of which engages the lowermost of the disks 50 and 51 of the thrust bearing.

The lower bearing for the shaft 41 may be conveniently lubricated from an oil well 66 communicating therewith through a suitable duct, the oil well 66 preferably being packed with wicking and supplied from a tube 67 extending outwardly a sufficient distance to be conveniently accessible and provided with a filling cap 68.

One of the most important features of the invention consists in providing means for regulating the amount of spray which is presented in the path of the current of air which passes through the humidifier. Regulating devices for humidifiers of this type heretofore employed have been so constructed as either to shut off or turn on the jet of spray or to stop and start the fan which produces the current of air through the humidifier or to perform both of these operations. The present invention contemplates the provision of regulating means by which a portion or all of the jet of spray may be diverted or intercepted without the necessity of varying the amount of water discharged through the nozzle or the current produced by the fan. The preferred mechanism for accomplishing this purpose comprises a shield, preferably in the form of a cylinder 70, surrounding the post 37 and of sufficiently large diameter to permit the stream of water, when the jet of spray is intercepted or diverted, to flow through the space between the shield and the post.

Suitable means are provided for adjusting the shield relatively to the nozzle in such a manner as to divert a portion or the whole of the spray produced by the nozzle from the path of the air current.

As illustrated in Fig. 4 the regulating means comprises an adjustable cylindrical shield axially disposed with reference to the nozzle and provided with a flat upper end. By moving the shield in such a manner as to cause it to enclose the jet issuing from the nozzle the film of spray, which otherwise would be produced by the jet as it impinges upon the upper end of the pin 38, will be intercepted by the walls of the cylindrical shield and caused to run downwardly into the drip pan. Thus the humidifier will be rendered practically inoperative without modifying the jet of water delivered from the spray nozzle and without varying the air current which is caused to pass through the humidifier.

By providing different forms of shields any desired graduated production of humidity may be attained. In Fig. 5 a cylindrical shield is shown, the upper end of which is beveled obliquely relatively to the axis of the shield so that when the shield is raised toward the nozzle the higher portion will first intercept a portion of the jet and as it is raised further will progressively intercept more of the jet of spray until finally the entire jet may be diverted as aforesaid.

Other forms of shields may be provided since any shield having a tapered, notched or irregular spray-intercepting edge could be so positioned as to divert a predetermined desired amount of spray and thereby render the humidifying action more or less effective.

Any suitable means may be provided for adjusting the spray-diverting member or shield 70. As illustrated herein the shield is provided with laterally extending bosses 71 which receive the ends of studs 72 carried by branches of a lever 73 which is pivotally mounted at one end upon a support 74 and at the other connected by a wire, or other means, to a suitable regulating device which is sensitive to the moisture condition of the air of the enclosure or to that of the air entering the humidifier.

In the present construction the lever 73 is extended beyond the support 74 and is attached to a spring 75 which acts to press the shield below the path of the film of spray formed by the nozzle. The automatic regulating mechanism attached to the opposite end of the lever serves to raise the shield in such a manner as to divert a portion of the spray so that the effective jet of spray supplies to the current of air, passing through the humidifier, an amount of moisture which is correlated to the demand required to maintain the enclosure at a predetermined degree of humidity.

Any suitable regulating means subject to the moisture condition of the air of the enclosure, or to that of the air entering the

humidifier, may be employed as a regulating mechanism. As illustrated herein the end of the arm 73 is connected by a wire 76 to the end of a hygroscopic member 77, such as a thread or threads of fibrous material, which passes over suitable guide rollers 78, 79 carried by a frame 80 which extends between the supporting members 6, 7 of the humidifier. The opposite end of the hygroscopic member is secured to the end 81 of an adjusting screw 82 which is seated in a plate 83 at the end of the frame 80. The screw 82 is provided with a milled head 84 and with an index 85 positioned over a suitable dial 86 which is provided with graduations to indicate the degree of humidity at which the hygroscopic member is set to operate.

The frame 80 may be provided with a surrounding screen to prevent the accumulation of dust upon the hygroscopic member while permitting free access of the air to it.

While the regulating device, which is subject to the condition of the air, is illustrated herein as being located adjacent to the intake end of the humidifier casing and subject to the condition of the air entering the casing, it will be understood that such regulating device may be located anywhere within the enclosure and that such device may be so constructed as to regulate either a single humidifier or several humidifiers within the scope of the present invention.

In the operation of the device water is supplied through the pipe 27 to the water motor and to the nozzle. The water which is discharged from the supply pipe through the pipes 45 and nozzle 44 upon the vanes of the water motor rotates the latter at a high speed which produces a strong current of air through the humidifier casing. The waste water from the motor is discharged through the conduit 58 in the leg 56 thence through the conduit 25 in the arm 3 into the hanger member 22 which conducts it into the pan of the humidifier. Simultaneously the water from the pipe 27 is also admitted through the valve 28 to the spray nozzle and issuing from said nozzle impinges upon the top of the pin 38 which causes the jet to diverge as a conoidal film or spray. Desirably the arrangement is such that the film will break into a spray about the time it strikes the wall of the inner casing. The current of air from the fan, passing through the spray of water thus produced becomes charged with moisture and issues through the aperture between the lower ends of the inner and outer casings and the pan 12.

In this construction a portion of the current of air produced by the fan passes through the space between the inner and outer casings and is caused thereby, and by the deflector 15, to beat down any drops of water which otherwise would be blown out of the humidifier by the portion of the current which passes through the inner casing.

Upon starting the humidifier a current of super-saturated air, carrying also some unevaporated spray, is delivered from the humidifier, the spray being quickly evaporated by the air of the enclosure. As the moisture content of the enclosure reaches the desired point, the action of the hygroscopic member will by means of the regulating mechanism gradually interrupt the spray until the desired degree of humidity is reached, from which time the output of moisture from the humidifier will remain substantially constant until some outside condition causes the moisture content of the enclosure to change, when the regulating mechanism will at once respond to such a change by supplying moisture at a greater or less rate as may be required. In case of unusual humid weather, causing the enclosure from natural causes to reach a condition exceeding that desired, the regulating mechanism will entirely interrupt the production of spray until the moisture content of the air in the enclosure falls below the predetermined desired amount.

Thus by varying the amount of spray delivered into the path of the current of air a predetermined moisture content of the air of the room may be maintained without varying the speed of rotation of the fan or the amount of water delivered from the nozzle of the humidifier.

Where a hygroscopic regulating device of the character above described is employed it is usually desirable that the hygroscopic member shall be of material which corresponds to the material being treated in the particular enclosure in which the humidifier is located. For example, in cotton mills this fibre can conveniently be made of cotton fibre. In woolen or worsted mills the fibre would preferably be made of woolen or worsted thread. In silk mills it would preferably be made of silk so that changes in the humidity of the room which would affect the working of the product itself would in the same way affect the controlling fibre and thereby the changes produced in the fibre would be rectified by the changes in the humidity so that the same fibre being processed elsewhere in the room would be likewise affected.

It will be understood that the embodiment of the invention particularly disclosed herein is not restrictive and that various modifications may be made in form, construction and arrangement of parts. For example, it is in general desirable to suspend humidifiers of this type from the ceiling of enclosures in which they are used, but under certain conditions, especially in low posted rooms, it may be desirable to assemble them on horizontal axes. It is obvious that the entire

construction may be readily adapted for horizontal use by rearrangement of the various supporting members and the omission of the drip pan, the water being collected in the bottom of the main horizontal casing from which it may be delivered by a suitable waste pipe. Furthermore, the conduit for the delivery of moistened air may be made of any desired length to enable the moistened air to be delivered to a desirable portion of the enclosure. Such an arrangement would require merely the application of skill of those familiar with the humidifying art without the exercise of invention.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is:

1. A humidifier comprising regulable spray-producing means, means to project a blast of air through the spray including an enclosed water motor and a fan operable thereby located between said water motor and said spray-producing means and means for conducting away the waste water from the motor externally of the field of spray.

2. A humidifier comprising a casing, regulable spray-producing means within said casing, a fan acting to project a blast of air through the spray, an enclosed water motor for actuating said fan located upon the suction side of said fan and means for conducting away the water passing through said motor externally of said casing.

3. A humidifier comprising a casing, regulable means for producing a conoidal jet of spray within said casing, a fan, having a shaft extending axially of said casing, acting to project a blast of air through the spray, an enclosed water motor of the Pelton type located on the suction side of said fan having its rotor connected directly to said fan shaft, means for delivering water under pressure to said spray-producing means and said water motor from the same source of supply and means for conducting away the waste water from the motor externally of the casing.

4. A humidifier comprising a casing, supporting means therefor, means within said casing for producing a jet of spray, a stand carried by said supporting means having an enclosed chamber, a bearing carried by said stand extending into said chamber, a fan located at the inlet of said casing having a shaft mounted in said bearing, a water motor having its rotor secured to said shaft and located on the suction side of said fan, means for projecting a jet of water upon the vanes of said rotor and means for conducting away the waste water from the motor externally of said casing.

5. A humidifier comprising a suspended supporting means, a casing depending from said supporting means, means within said casing for producing a jet of spray, a stand carried by said supporting means having an enclosed chamber, a bearing carried by said stand extending into said chamber, a shaft in said bearing, a fan secured at the lower end of said shaft and located above said casing, a water motor having its rotor secured to said shaft above said bearing, thrust bearing members between the hub of said rotor and the upper end of said bearing, means for projecting a jet of water upon the vanes of said rotor and means for conducting away the waste water from said motor externally of said casing.

6. A humidifier comprising a casing, supporting means for said casing and means within said casing for producing a jet of spray, a stand carried by said supporting means at the inlet end of said casing and having an enclosed chamber, a bearing carried by said stand extending into said chamber, a fan having a shaft rotatably mounted in said bearing, a water motor within said chamber having its rotor secured to said fan shaft, a bonnet on said rotor having a divergent wall acting to deflect water away from said bearing, a shield forming a wall of said chamber extending into said bonnet and co-operating therewith to exclude water from said bearing and means for projecting a jet of water upon the vanes of said rotor.

7. A humidifier comprising a suspended supporting means, a casing depending from said supporting means, means within said casing for producing a jet of spray, a stand carried by said supporting means having an enclosed chamber, a bearing carried by said stand extending into said chamber, a shaft in said bearing, a fan secured at the lower end of said shaft and located above said casing, a water motor having its rotor secured to said shaft above said bearing, thrust bearing members between the hub of said rotor and the upper end of said bearing and a bonnet on said rotor having a downwardly and outwardly divergent wall adapted to deflect water away from said bearing, a shield forming a wall of said chamber extending within said bonnet and co-operating with said bonnet to exclude water from said bearing, means for projecting a jet of water upon the vanes of said rotor and means for conducting away the waste water from said motor externally of said casing.

8. A humidifier comprising a suspended supporting means, a casing depending from said supporting means, means within said casing for producing a jet of spray, a stand carried by said supporting means having an enclosed chamber, a bearing carried by said stand extending into said chamber, a shaft in said bearing, a fan secured at the lower end of said shaft and located above said casing, a water motor having its rotor secured to said shaft above said bearing, alternately disposed washers of bronze and oil-

soaked wood between the hub of said rotor and the upper end of said bearing, a bonnet on said rotor having a downwardly and outwardly divergent wall adapted to deflect water away from said bearing, a shield forming a wall of said chamber extending within said bonnet and co-operating with said bonnet to exclude water from said bearing, means for projecting a jet of water upon the vanes of said rotor and means for conducting away the waste water from said motor externally of said casing.

9. A humidifier comprising a casing, supporting means for said casing, means within said casing for producing a jet of spray, a stand carried by said supporting means having an enclosed chamber, a bearing carried by said stand extending into said chamber, a fan having a shaft journalled in said bearing, a water motor, having its rotor secured to said shaft, within said chamber and means for supplying oil to said bearing including a conduit extending axially of said shaft having a laterally extending duct communicating with said bearing.

10. A humidifier comprising a suspended supporting means, a casing depending from said supporting means, means within said casing for producing a jet of spray, a stand carried by said supporting means having an enclosed chamber, a bearing carried by said stand extending into said chamber, a shaft in said bearing, a fan secured at the lower end of said shaft and located above said casing, a water motor having its rotor secured to said shaft above said bearing, thrust bearing members between the hub of said rotor and the upper end of said bearing, means for supplying oil to said bearing including a well extending axially of said shaft having a laterally extending duct communicating with said bearing below said thrust bearing, means for projecting a jet of water upon the vanes of said rotor and means for conducting away the waste water from said motor externally of said casing.

11. In a humidifier comprising a casing having means for producing a conoidal jet of spray therein and a fan superposed above said casing having a water motor secured to the fan shaft, supporting means for said casing and said fan motor comprising a frame having hollow laterally extending arms, means for supplying water to said spraying means through one of said hollow arms and means for conducting away the water from said motor through another of said hollow arms.

12. In a humidifier comprising a casing having means for producing a conoidal jet of spray therein and a fan superposed above said casing having a water motor secured to the fan shaft, supporting means for said casing and said fan motor comprising a frame having hollow laterally extending arms, means for supplying water to said spraying means through one of said hollow arms, means for conducting away the water from said motor through another of said hollow arms, a pan located beneath said casing, means for suspending said pan from said supporting means including a tubular member connected to said pan and communicating with the hollow arm through which the waste water from the motor is discharged.

13. In a humidifier, the combination with a water motor of a tubular hanger constituting both a support for the humidifier and a conduit for water passing through said motor.

14. In a humidifier the combination with a water motor, a tubular member constituting both a support for the humidifier pan and a conduit for water passing from said motor.

15. A humidifier comprising a casing, spray-producing means within said casing, a pan to receive the excess of water delivered to the spray-producing means, a tubular pan-supporting member, a fan located above said spray-producing means, an overhead water motor for actuating said fan having a tubular support communicating with the tubular pan-supporting member, whereby the waste water from said motor is conducted away from said motor externally of the casing.

In testimony whereof, I have signed my name to this specification.

WILLIAM B. HODGE.