F. B. COMINS.

HUMIDIFIER.

APPLICATION FILED MAR. 22, 1909.

942,712.

Patented Dec. 7, 1909.

2 SHEETS—SHEET 1.

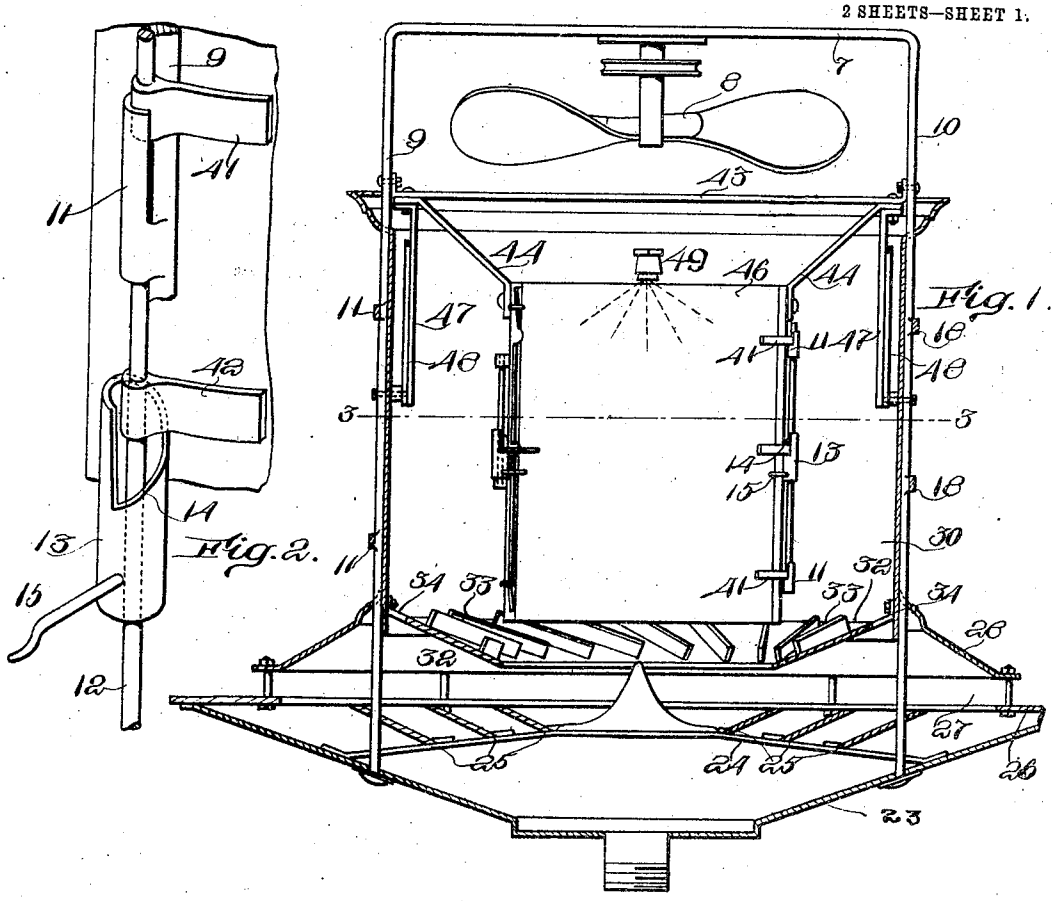

Fig. 1.

Fig. 2.

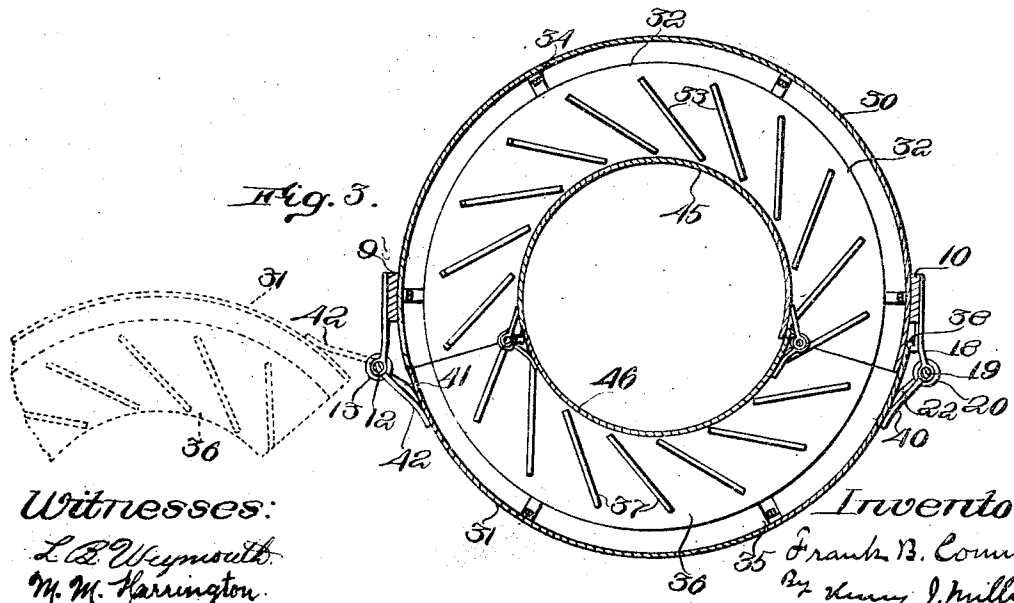

Fig. 3.

Witnesses:

L. B. Weymouth.

M. M. Harrington.

Inventor:

Frank B. Comins

By Henry J. Miller

Atty.

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2 SHEETS—SHEET 2.

Fig. 4.

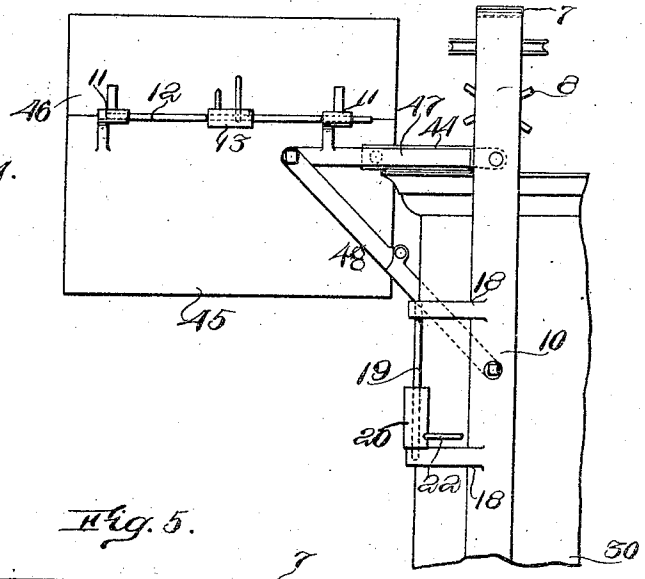
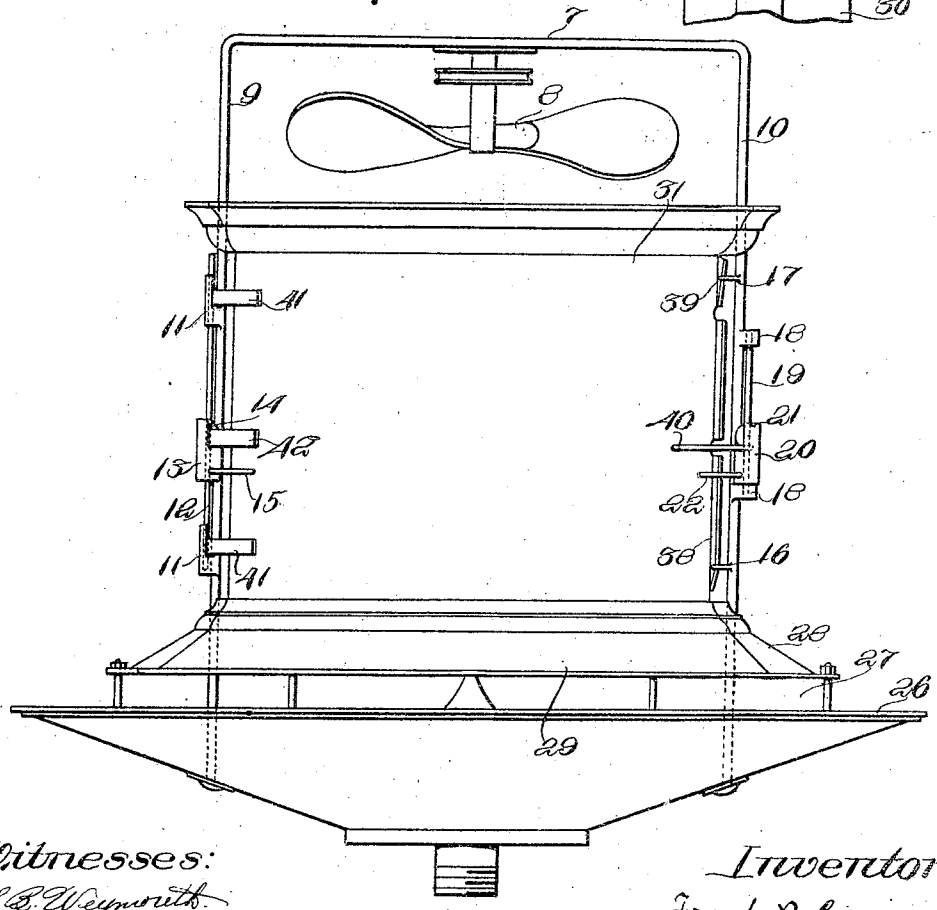


Fig. 5.



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M. M. Harrington.

Inventor:
Frank B. Comins.
By Henry J. Miller
atty.

UNITED STATES PATENT OFFICE.

FRANK B. COMINS, OF SHARON, MASSACHUSETTS.

HUMIDIFIER.

942,712. Specification of Letters Patent. Patented Dec. 7, 1909.

Application filed March 22, 1909. Serial No. 485,011.

To all whom it may concern:

Be it known that I, FRANK B. COMINS, of Sharon, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in Humidifiers, of which the following is a specification, reference being had to the accompanying drawings, forming part thereof.

This invention has reference to improvements in humidifiers or air moistening machines.

One object of the invention is to so construct a humidifier that an extremely large volume of air may be passed therethrough and completely saturated with moisture without carrying from said machine free moisture capable of being condensed into drops in the atmosphere under normal conditions of use.

Another object of the invention is to so construct a humidifier comprising duplex air moistening means that the separate bodies of air may be brought together and thoroughly mixed and that free moisture therein may be condensed and deposited before the humid air passes from the machine.

Another object of the invention is to so construct a duplex air moistening machine that all parts of the same may be readily accessible for cleaning purposes.

Other objects of the invention will appear from the following description.

The invention consists in certain peculiar features of construction and combinations of parts and of groups of parts as shall hereinafter be more fully described and pointed out in the claims.

Machines of the general character referred to herein are designed and intended for use in textile and other manufactories in order to purify the air and render the same humid to any desirable degree. In ordinary use one or more of these humidifying machines is suspended in a room and currents of air, carrying impurities and light particles of foreign matter are induced to flow through the machine or machines where such air is subjected to the direct action of moisture by which the air is so saturated that the particles of foreign matter are washed therefrom and the air is rendered humid. After continued use the impurities and particles of foreign matter carried to the machine by the air passing therethrough accumulate in the machine to some extent and it sometimes becomes desirable to clean all parts of the machine, and this is particularly the fact when the machine is adapted to moisten large amounts of air, as in the machine of the class herein specially shown and described.

Figure 1, represents a vertical sectional view of the improved humidifier. Fig. 2, represents a detail view of one of the door hinging and lifting devices. Fig. 3, represents a cross sectional view taken on line 3—3 Fig. 1. Fig. 4, represents a side elevation of parts of the humidifier showing details of construction and illustrating the manner in which the inner casing may be swung out of the outer casing and sustained in position to permit access to the rear portion of said outer casing. Fig. 5, represents a front elevation of the improved humidifier in the closed position.

Similar numbers of reference designate corresponding parts throughout.

In carrying this invention into practice I provide a hanger having the cross bar 7, on which the bearing for the usual fan 8 may be mounted if desired, and from said bar 7 I extend downward the arms 9 and 10 adapted to carry the weight of the humidifier. Arm 9 has the vertical guides 11—11 in bearings of which is journaled the rod 12 having the member 13 furnished with the cam edge 14 and having the handle 15. Arm 10 has the hook shaped engaging devices 16 and 17 and the ears 18—18 in which is journaled the rod 19 having the member 20 furnished with the cam edge 21 and having the lever 22.

The lower ends of the arms 9 and 10 are preferably secured to the drip basin 23 having any usual drainage means and furnished with frame 24 having the outwardly inclined plates 25—25 adapted to collect surplus moisture from air passing thereover and to guide said moisture toward the drip basin. The outer edge of the drip basin 23 is formed by the ring 26 which forms the lower member of the annular air outlet 27, the upper member of said outlet being formed by the combined segmental and flared members 28 and 29 of which the member 28 is secured to the said ring 26 and to the segmental outer casing member 30 while the member 29 is secured to the segmental door 31.

At the inner side of the casing member 30 is mounted the segmental concave plate 32 having the baffle plates 33—33, inclined to the radii and the arms 34—34 which latter are secured to said member 30. To the door

member 31 are secured the arms 35—35 of the segmental concave plate 36 which is complemental to the plate 32 and has the baffle plates 37—37 also inclined to the radii of the circle formed by said combined plates. This door member has also the outwardly bent edges 38 and 39, adapted to be engaged by the hook shaped members 16 and 17 of the hanger arm 10, and the rider 40 adapted to ride on the edge 21 of the cam 20 when said door is in the closed position. Said door has also, at the edge nearest the hanger arm 9, the straps 41—41 which are journaled on the rod 12, and are adapted to be engaged by the arms of the guides 11—11, and the rider 42 which bears against the cam edge 14 of the cam 13. This mechanism for supporting the door 31 is more particularly described in Letters Patent No. 931,845 granted to me August 24, 1909.

Pivotally mounted between the hanger arms 9 and 10 is a strengthening frame having the cross member 43 having the depending inclined arms 44—44 or other suitable suspending means for the inner casing comprising the segmental member 45 and its door 46 suitably hinged thereto by a hinging and lifting mechanism similar to that above described. As a means for sustaining such casing 45—46 when swung outward on the pivots of the cross bar 43, as shown in Fig. 4, I prefer to supply said bar 43 with the depending arms 47—47 having at their lower ends the pairs of pivoted links 48—48 which are sustained by pivots extending inwardly from the arms 9 and 10.

Water under pressure is delivered to the nozzle 49 by any suitable means and the fan 8 is operated to force air downward. A portion of said air passing through the inner casing formed by the members 45 and 46 absorbs comparatively a large amount of water in the restricted passage formed by said inner casing. A body of air, of greater volume than that passing through said inner casing is, at the same time, forced by fan 8 downward between the inner and outer casings and this latter air moves at a speed somewhat greater than the speed of the heavier moistened air passing through said inner casing. When now the large volume of comparatively dry air passing downward between the inner and outer casings reaches the deflector plate 32—36 said air is directed inward and, moving in that direction, is guided by the plates 33—37 in a centripetal course with reference to the body of humid air issuing from the lower end of the inner casing whereby said body of humid air is taken up by the embracing volume of comparatively dry and expansive air and a vortex is created in which the dry air is saturated with the humidity of the volume of moistened air. After receiving said moisture the combined volumes of air pass downward over the edges of the plates 32—36 and are directed outward over the central cone of frame 24 passing over the inclined plates 25—25, which tend to condense the free moisture in such air, and through the annular opening 27.

When it becomes necessary or desirable to clean the casings or cylinders, levers 15 and 22 are swung outward from the positions shown in Fig. 5, as indicated in Figs. 2 and 4, and the riders 40 and 42, with the door member 31, will be moved upward by the bearing thereagainst of the cams 13 and 20 until the straps 41—41 are above the ends of guides 11—11 and the lips 38—39 of said door are disengaged from the hook shaped members 16—17, the door member may then be swung outward as indicated in dotted lines in Fig. 3.

If desired the door member 46 of the inner casing may now be opened on its hinges and such parts of both casings as are accessible may be cleaned but, preferably, the inner casing may now be swung outward by hand, on the pivots of the cross bar 43, through the opening between the ends of the casing member 30 approximately to the position shown in Fig. 4 and may be sustained in such position by the pivoted arms 48—48 during the cleaning operation on both casings, it being obvious that said inner cylinder may be cleaned, in such position, without opening its door member.

It is not my desire to limit my invention to the specific hinging means for the door sections and it is evident that the inner casing may be movably mounted with respect to the outer casing in various ways without departing from the spirit of this invention. When pivotally mounted the inner casing need not swing outward to the extent herein shown and when swung outward may be supported in any desired manner.

Having thus described my invention I claim as new and desire to secure by Letters Patent.

1. A humidifier comprising two air passages one embraced by the other, the outer of said air passages having a door opening larger than the diameter of said inner air passage.

2. A humidifier comprising two cylinders, one within the other, of which the outer has a door opening, and a mounting for said inner cylinder on which said inner cylinder may move through the door opening of the outer cylinder.

3. A humidifier comprising an outer cylinder having a door opening, and an inner cylinder pivotally mounted and located within said outer cylinder and adapted to be swung through said door opening.

4. A humidifier comprising an outer cylinder having a door opening, a door for closing said opening, and an inner cylinder

pivotally mounted with respect to said outer cylinder to swing through said door opening, and means for supporting said inner cylinder when swung outward.

5. The combination with a hanger frame having a pair of depending arms, and a segmental casing member secured to said arms, of a cross bar pivotally mounted between said arms, and an inner cylindrical casing carried by said cross bar, as described.

6. The combination with a hanger frame having a pair of depending arms, a drip receptacle secured to said arms, a segmental casing member secured to said arms, and a door for such casing member, of a cross bar secured between said arms and having depending members, and an inner casing secured to said depending members and having a door registering with the door of the outer casing substantially as and for the purpose described.

FRANK B. COMINS.

Witnesses:
CHARLES B. CUMMINGS,
HENRY J. MILLER.