No. 859,649. PATENTED JULY 9, 1907.

J. W. FRIES.

HUMIDIFYING MACHINE.

APPLICATION FILED OCT. 23, 1906.

2 SHEETS—SHEET 1.

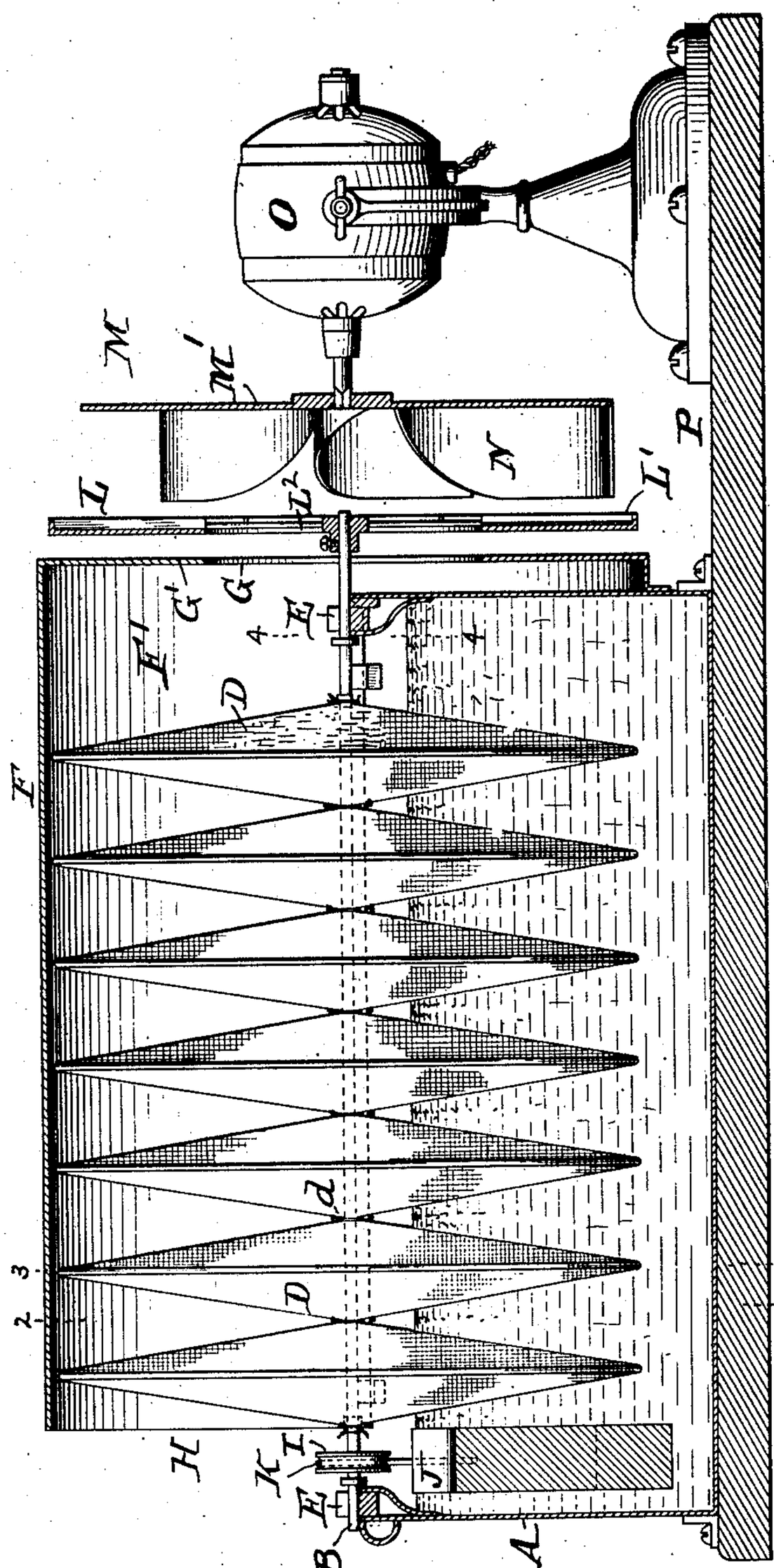

FIG. 1

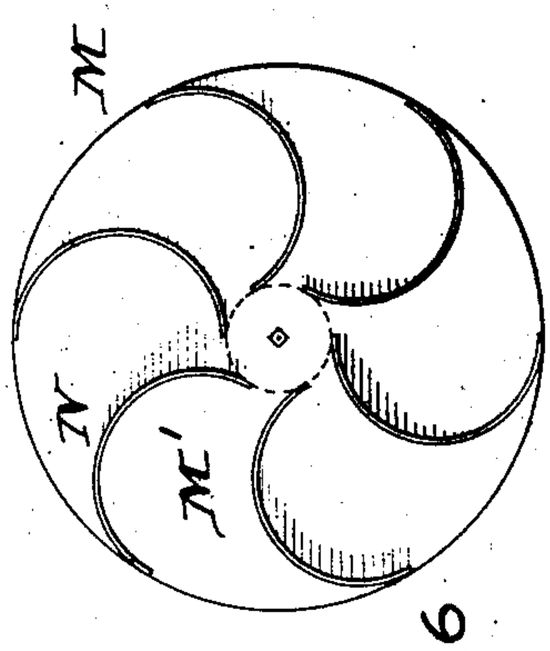

FIG. 6

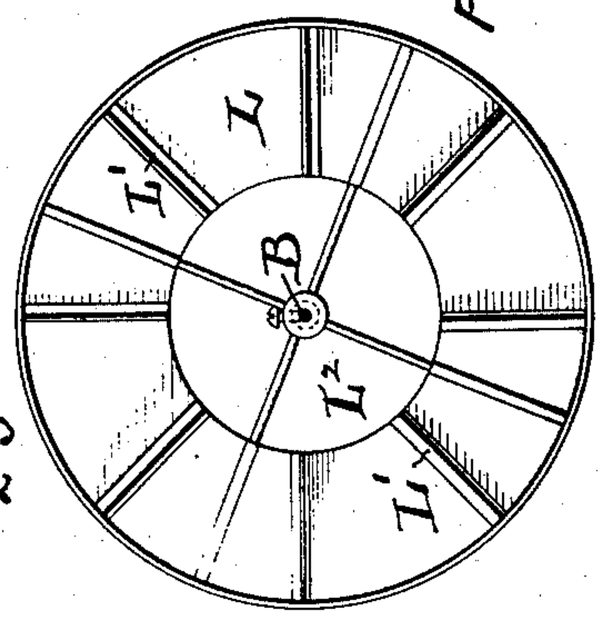

FIG. 5

WITNESSES:

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2 SHEETS—SHEET 2.

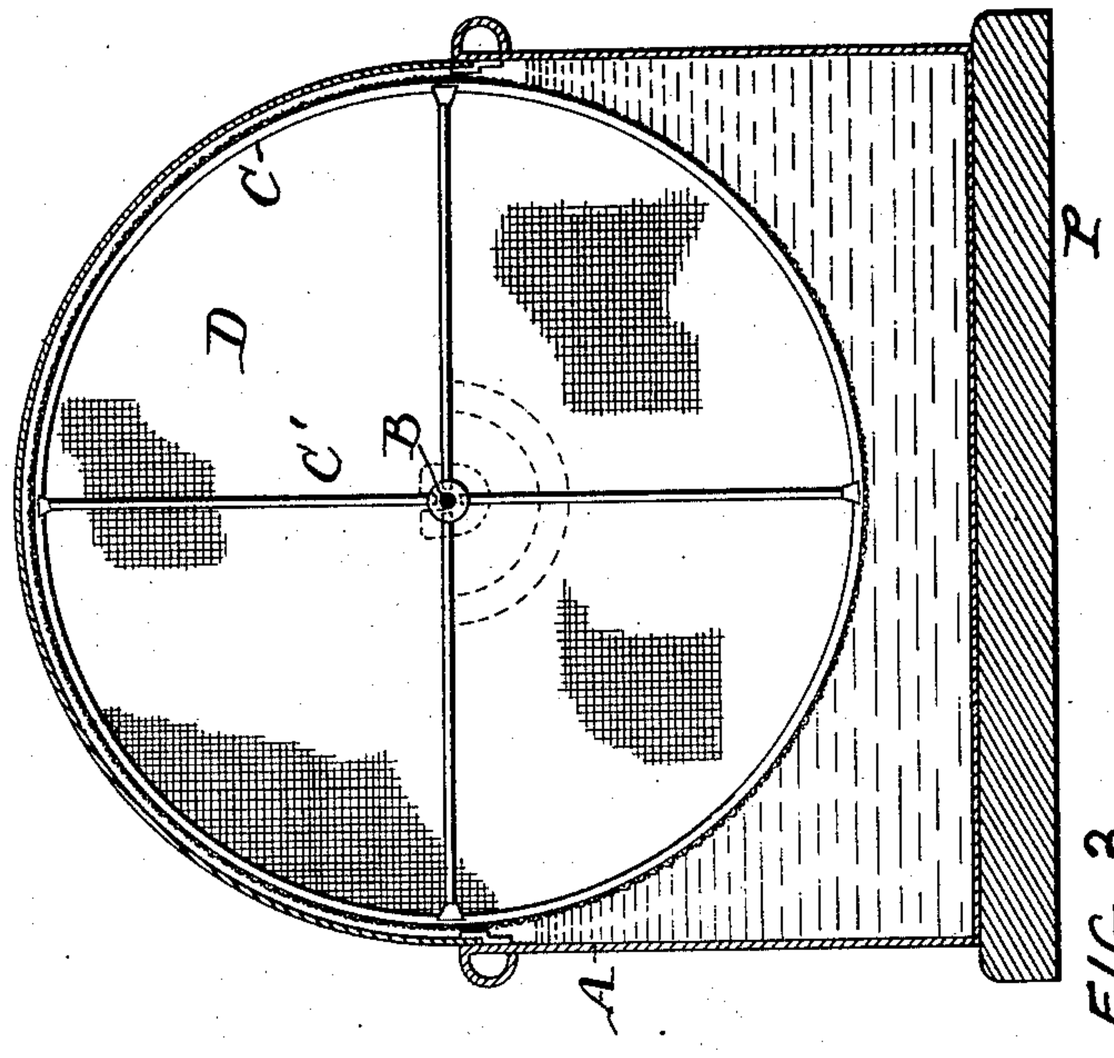

FIG. 3

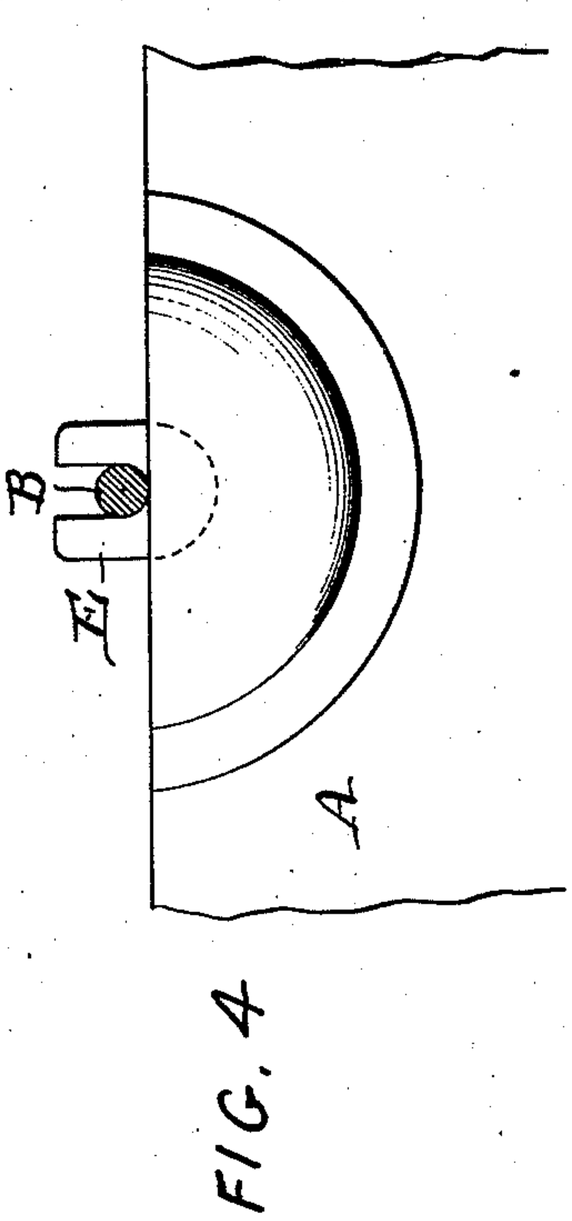

FIG. 4

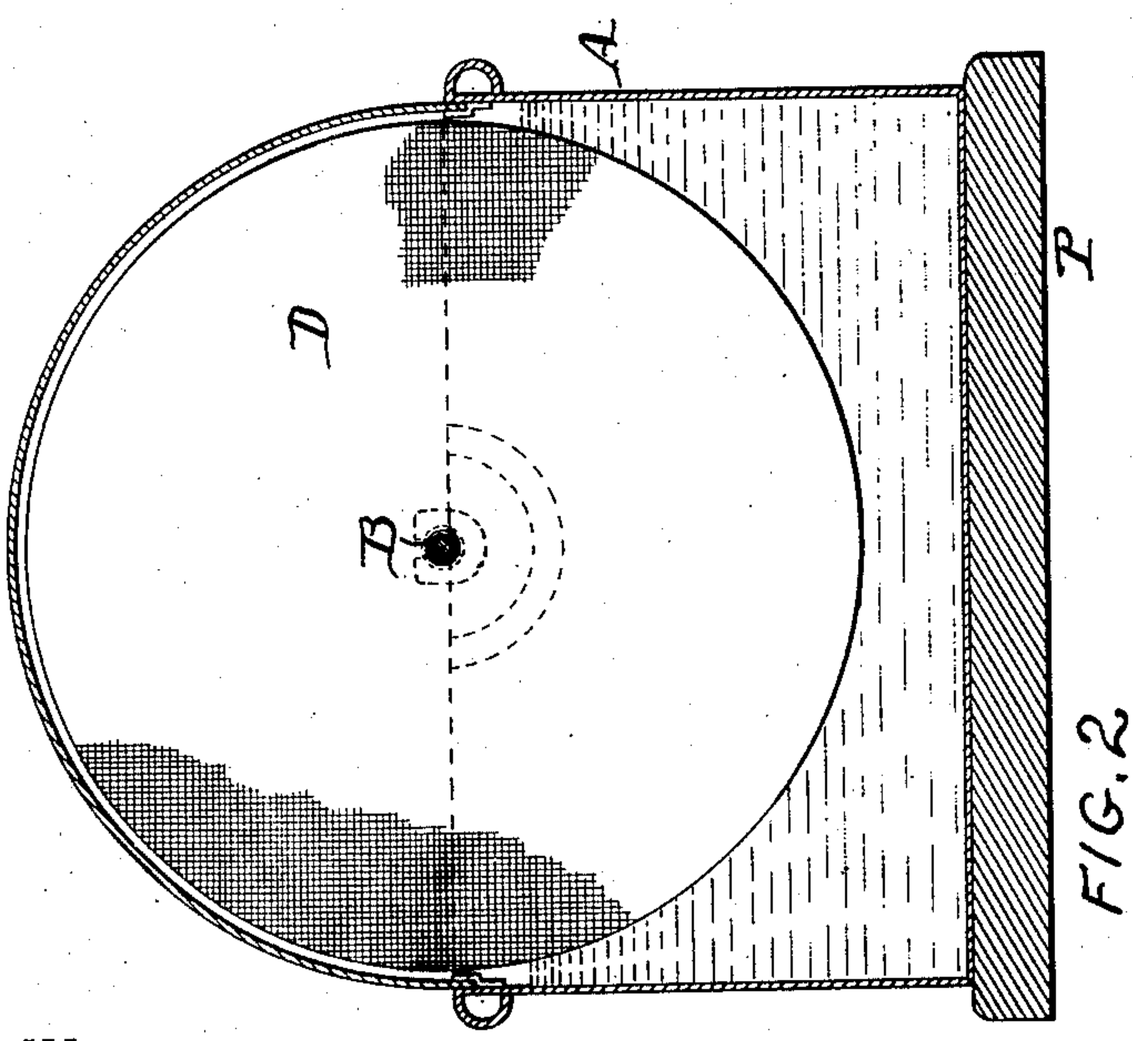

FIG. 2

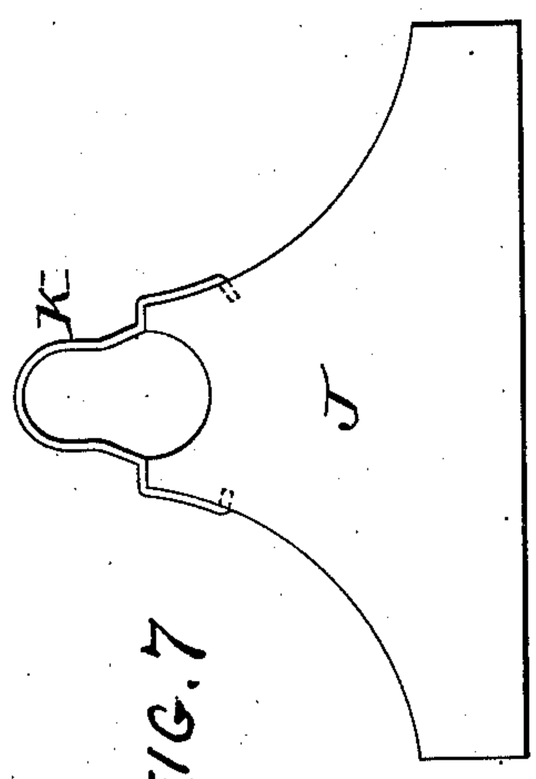

FIG. 7

WITNESSES:

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UNITED STATES PATENT OFFICE.

JOHN W. FRIES, OF WINSTON SALEM, NORTH CAROLINA.

HUMIDIFYING-MACHINE.

No. 859,649. Specification of Letters Patent. Patented July 9, 1907.

Application filed October 23, 1906. Serial No. 340,124.

To all whom it may concern:

Be it known that I, JOHN W. FRIES, of the city of Winston Salem, county of Forsyth, State of North Carolina, have invented an Improvement in Humidifying-Machines, of which the following is a specification.

My invention has reference to humidifying machines and consists of certain improvements which are fully set forth in the following specification and shown in the accompanying drawings which form part thereof.

The object of my invention is to provide a simple and efficient construction of machine which shall have capacity for humidifying, cleansing and cooling air, such as may be required in factories and buildings generally.

My object is also to provide such construction in my machine that it may also be employed in disinfecting or purifying effete or impure air.

My invention consists of a tank containing water or other fluid having a tubular passage above it through which air is forced or sucked as preferred, combined with a frame or drum preferably porous and partly submerged in the liquid, said frame or drum being slowly rotated so as to continually present moist or wet surfaces over, through or against which the air is made to travel, whereby it is brought into intimate contact with the liquid.

My invention also consists in providing a fan for circulating the air in the above described apparatus and means actuated by the air for rotating the partly submerged frame.

My invention further comprehends details of construction which, together with the features above specified, will be better understood by reference to the accompanying drawings which form a part thereof.

In the drawings, Figure 1 is a longitudinal sectional elevation of a machine embodying my invention; Fig. 2 is a cross section of the same on line 2—2; Fig. 3 is a cross section of the same on line 3—3; Fig. 4 is a cross section of a portion of the same on line 4—4; Fig. 5 is an elevation of the driving disk for the rotating partly submerged frame; Fig. 6 is an elevation of the fan for circulating the air and Fig. 7 is an elevation of the brake weight removed.

A is the liquid tank and is open at the top except for the hood F forming a longitudinal passage F^1 above the liquid in the tank. This hood is open one end at H for the entrance of the air and has the other end provided with a plate G^1 made with a cylindrical opening G through which the air is drawn by the suction and centrifugal action of the fan M which may be driven electrically or otherwise. The fan is connected to the tank A by a base P.

B is a longitudinal shaft rotating in bearings E E in the ends of the tank A and immediately above the liquid. This shaft has a series of light frames, preferably of wire and comprising a circular part C and radial arms C^1. These frames rotate with the said shaft B. Stretched over these frames is a piece of tubular knitted fabric which is tied down to the shaft B upon each side of the wire frames C C^1 as at *d* whereby a hollow ribbed drum of textile material D is provided and which rotates, slowly in a half submerged condition in the liquid of the tank. The hood F is curved to approximate the curvature of the drum, so that, in effect, the passage F^1, through which the air passes, is provided with one or more interfering wet textile diaphragms against which the air is caused to travel and by which it is brought into intimate contact with the liquid. If the textile material D is sufficiently open or pervious the air may be caused to pass through the fabric.

The end of the shaft B extends through the opening G to a position in front of the center of the fan M, and is provided with an annular disk L having radial blades L^1 which being acted on by the air put in motion by the fan, causes the disk to slowly rotate and with it the shaft B and textile drum D. In this manner, the textile drum is continually presenting new, moist surfaces to the air flowing through the machine.

By the above described means, the textile diaphragms are enabled to be slowly revolved so as to continually present new wet surfaces and yet avoid all splashing of the water or spraying of it by centrifugal action, and at the same time the fan is driven at a high speed for the purpose of creating a strong circulation of air over the moist diaphragms. In this way all complicated and noisy speed reducing gearing is avoided.

To prevent too rapid a rotation of the drum, the shaft B may be provided with a grooved roller I from which a weight J may be hung by a looped wire K extending over the roller and lying in the groove thereof. This weight acts as a drag or brake on the shaft, whereby the textile drum may be very positively rotated yet at a reasonably slow speed.

The air is drawn or sucked through the open end G in the head of the hood F and through the central aperture L^2 of the annular disk L and then dispersed spirally outward by the blades N of the fan M. The fan, as shown, is formed, with a closed back plate M^1 upon which the spiral blades N are formed. This fan may act to circulate the air by suction or by pressure as preferred.

While I have found it simple and effective to drive the drum by the action of the air put in motion by the fan, yet it is evident that it may be driven in any other convenient manner positively or otherwise.

While I have shown a cheap and excellent form of drum constituting a series of diaphragms to the air and not causing undesirable displacement of the fluid when rotating, I do not restrict myself thereto as the drum may be made in any other convenient form. The textile surface D may also be substituted by a screen of

any other material, and in fact, broadly considered the drum may be formed without a pervious material or surface.

The liquid in the tank is usually water, but may be a disinfectant or other chemical compound for purifying or washing the air, as I do not restrict myself as to the use of my machine.

While I prefer the construction shown, the details thereof may be modified without departing from the spirit of my invention.

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

1. In a machine for treating air, the combination of a tank to contain the liquid, a rotating, horizontal drum having a series of opposed conical porous surfaces partly submerged in the liquid of the tank, a hood inclosing the drum and through which the air is caused to flow so as to be brought in contact with the fluid on the drum, and a power driven fan arranged at one end of the tank and hood for circulating the air.

2. In a machine for treating air, the combination of a tank to contain the liquid, a rotating, horizontal drum partly submerged in the liquid of the tank, a hood inclosing the drum and through which the air is caused to flow so as to be brought in contact with the fluid on the drum, a power driven fan arranged at one end of the tank and hood for circulating the air, and means outside of but secured to the drum and adapted to be acted upon by the circulating air to cause the drum to rotate.

3. In a machine for treating air, the combination of a tank to contain the liquid, a rotating, horizontal drum partly submerged in the liquid of the tank, a hood inclosing the drum and through which the air is caused to flow so as to be brought in contact with the fluid on the drum, a power driven fan arranged at one end of the tank and hood for circulating the air, means secured to the drum and adapted to be acted upon by the circulating air after leaving the drum to cause the drum to rotate, and a brake to retard the rotation of the drum so that it moves slowly.

4. In a machine for treating air, the combination of a tank to contain the liquid, a rotating, horizontal drum partly submerged in the liquid of the tank, a hood inclosing the drum and through which the air is caused to flow so as to be brought in contact with the fluid on the drum, a power driven fan arranged at one end of the tank and hood for circulating the air, and an annular disk having radial blades arranged between the fan and opening in the hood and connected with the shaft of the drum to rotate it under the action of the air put in motion by the fan.

5. In a machine for treating air, the combination of a tank to contain the liquid, a rotating, horizontal drum partly submerged in the liquid of the tank, and consisting of a central shaft having a series of rings and a textile covering stretched over the rings and tied down toward the shaft intermediate of the rings to form a series of diaphragms, a hood inclosing the drum and through which the air is caused to flow so as to be brought in contact with the fluid on the drum, and a power driven fan arranged at one end of the tank and hood for circulating the air.

6. In a machine for treating air, the combination of a tank to contain the treating fluid and having removable curved hood above it forming a passageway above the liquid, moisture carrying means moving in the tank and passageway to present moist surfaces to the air in the passageway, means independent of the moisture carrying means to move it so as to present in succession new moist surfaces, and a power driven fan to circulate air through the passageway.

7. In a machine for treating air, the combination of a tank to contain the treating fluid and having a passageway above the liquid, moisture carrying means moving in the tank and passageway to present moist surfaces to the air in the passageway, a motor frame exterior to the moisture carrying means adapted to be air driven for moving the moisture carrying means, and a power driven fan for circulating the air through the passageway and also for operating the motor frame of the moisture carrying means.

8. In a machine for treating air, the combination of a tank to contain the treating fluid and having a passageway above the liquid, moisture carrying means moving in the tank and passageway to present moist surfaces to the air in the passageway consisting of a metallic frame covered with textile material arranged in parallel circumferential ribs, means to move the moisture carrying means so as to present in succession new moist surfaces, and a power driven fan to circulate air through the passageway.

9. In a machine for treating air, the combination of a tank to contain the treating liquid and having a passageway above the liquid, moisture carrying means moving in the tank and passageway to present moist surfaces to the air in the passageway, consisting of a metallic frame covered with textile material and presenting a series of transverse hollow diaphragms, means to move the moisture carrying means so as to present in succession new moist surfaces, and a power driven fan to circulate air through the passageway.

In testimony of which invention, I hereunto set my hand.

JOHN W. FRIES.

Witnesses:
CHAS. L. CREECH,
E. C. BARTLETT.