

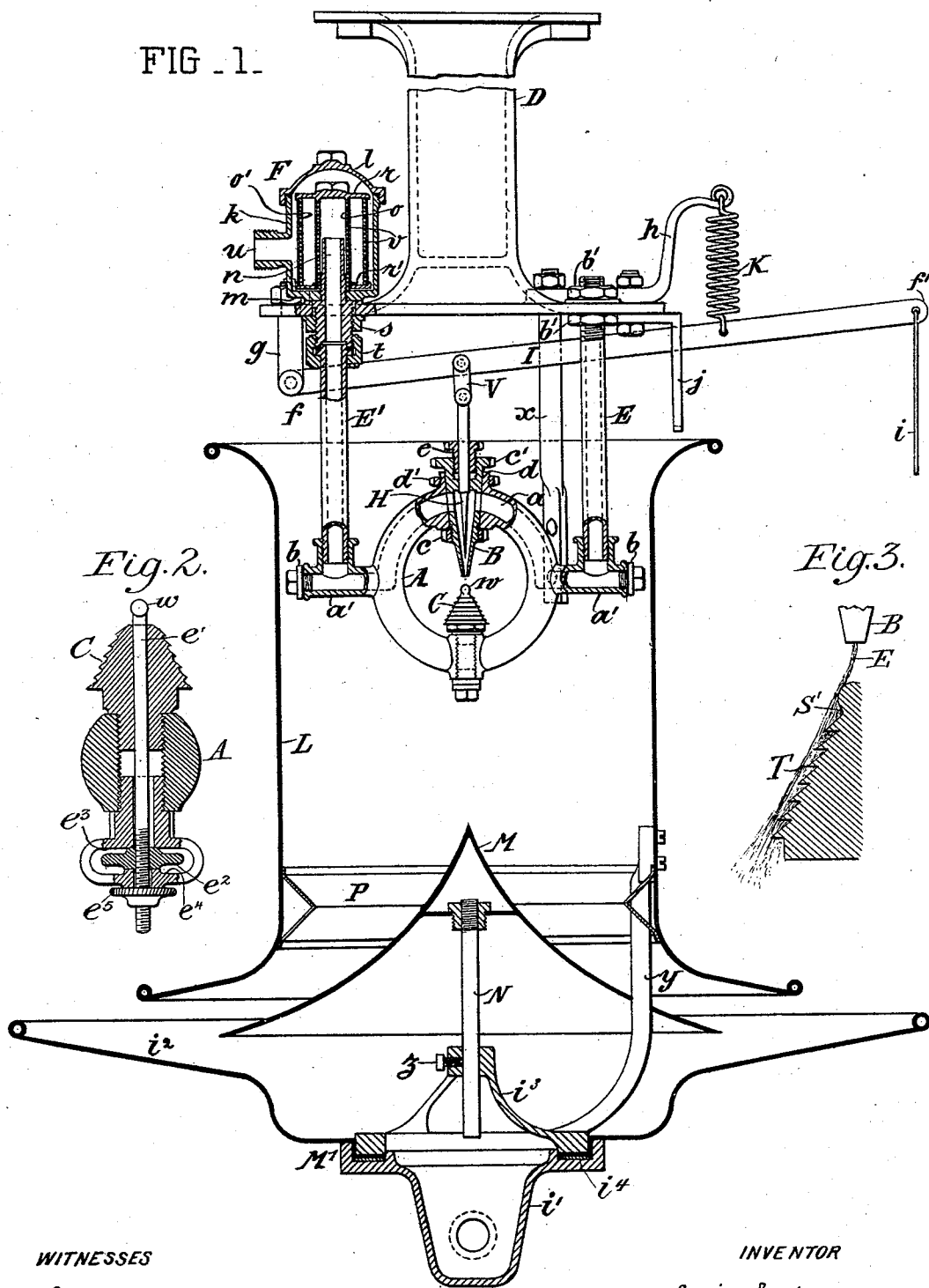
(No Model.)

E. MERTZ.  
APPARATUS FOR MOISTENING AIR.

No. 578,461.

Patented Mar. 9, 1897.

FIG 1.



**WITNESSES**

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# UNITED STATES PATENT OFFICE.

EMILE MERTZ, OF BASLE, SWITZERLAND.

## APPARATUS FOR MOISTENING AIR.

SPECIFICATION forming part of Letters Patent No. 578,461, dated March 9, 1897.

Application filed August 29, 1894. Serial No. 521,588. (No model.)

*To all whom it may concern:*

Be it known that I, EMILE MERTZ, engineer, a citizen of the Republic of France, residing at Basle, Switzerland, have invented new and useful Improvements in Apparatus for Moistening Air, of which the following is a clear and complete specification.

The present invention relates to apparatus used for moistening air wherein the water escaping from a nozzle in the shape of a conical surface before striking upon the proper surfaces for pulverizing strikes at first tangentially over a ball arranged on the top of a conus provided with horizontal ribs in such a way that a part of each stream of water is retained by the said ball, from which it runs down in a very thin sheet upon the conus, while the other part of the same stream preventing a lateral escaping of the part of the jet retained by the ball runs down on the ribs of the conus, being thereby exposed to further similar divisions and striking also upon the thin sheet of water running over the conus, so that thereby the water escaping from the nozzle by reason of the fine division obtained by ball and conus comes in contact in a manifold or very intimate way with the air surrounding the conus, being intimately mixed with the same and thereby forming of the water a kind of foam containing a great number of minute air-bubbles. By this formation of the water into foam the volume of the water is increased from the conus toward the surfaces of division, and consequently much air is attracted in a downward direction through the apparatus, (which is open at both ends,) and also much water is given up to the air to be moistened. The ball over the ribbed conus can be so placed as to increase or to diminish its distance from the outlet-opening from the nozzle, so that the jet of water starting from the nozzle can be met more or less by the ball.

In the accompanying drawings, Figure 1 shows the apparatus in vertical section, and Figs. 2 and 3 are illustrations of details.

In Fig. 1, A is a vertical ring to which are secured a conical nozzle B and the conus C, provided with horizontal ribs with the ball *w*. On the top the upper part of this ring A is hollow, *i. e.*, forms a channel *a*, through which the water employed to moisten the air is led

to the nozzle B, from which the water escapes in the shape of a conical sheet constituted by fine and diverging streams. Two hollow arms *a'* are secured to the ring A diametrically opposite each other, being closed at the free ends by a stopper *b*, and which are used to secure the ring A to the cast-iron body D, which can be placed on the ceiling of the room to be moistened. The fastening to the body D is effected by pipes E E' being screwed into the arms *a'*, and of which one, E, is secured to the body D by nuts *b'*, while the others, E', are connected to the filters F on the body D, through which the water under pressure is passed in going to the channel *a* and to the nozzle B. The latter is secured in a bearing on the body A, being conical in correspondence and being held by a nut *c*. Near its upper end the nozzle B is formed with a polygonal portion *c'*, designed to facilitate the removal of the nozzle from the ring A. For this purpose the ring A is provided with a shoulder *d*, over which is screwed a nut *d'*. If after having loosened the nut *c* the nut *d'* be turned in the proper direction to make it rise, it will bear against the polygonal part *c'* of the nozzle B, and if the rotation be continued the nozzle B will be disengaged from its recess in the ring A by lifting the nozzle, so that the nozzle can be withdrawn from the ring A without having to employ a hammer or other tool, the use of which would be liable to injure the mouth of the nozzle.

The filter F, designed to purify the water under pressure before it reaches the nozzle, is formed of a box *k* with a cover *l*, having its bottom *m* traversed by a central tube *n*, screwed therein. On this tube is screwed a cage *o*, having at its upper end a plate *r*. Between this plate *r* and a second plate *r'*, screwed upon the cage *o*, is secured a second cage *o'*, and each of the two cages *o* and *o'* is covered with a wire-gauze jacket *v* of very fine mesh. Upon a threaded part of the tube *n* is screwed a nut *s*, which allows of fixing the filter F to the body D, the latter being clamped between the bottom of the filter F and the said nut *s*. The nut *t* serves to join the tube E' to the tube *n*.

The water entering the filter F through the tube *u* passes radially through the wire-gauze *v* and cages *o o'* to the tube *n*, and thence

through the tube E' into the channel *a* of the ring A.

In the middle of the nozzle B is arranged a cleaning-needle H, the upper end of which, sliding in a stuffing-box *e*, is connected by a link V to a lever I, being under the action of a spring K, attached thereto, and to an arm *h*, fixed to the body D, and being pivoted at its end *f* to a bracket *g*, fixed to the body D. This lever is provided with a cord or chain *i* at the end *f'*, so that by pulling the same a point of the needle H will pass through the opening of the nozzle.

The ring A is suspended inside of a metal sleeve L, widened at both ends, being carried by three suitable arms *x*, extending from the body D. The lower part M' of the apparatus is supported by three arms *y*, suspended from the sleeve L. This lower part is composed of a pan *i'*, in which the excess of water accumulates and flows off laterally, of a basin *i''*, which prevents the escaping of the drops of water insufficiently divided and not being taken up by the air passing through the apparatus, and of a bearing *i'''*. These three parts are connected in a suitable manner, and an elastic ring *i''''* is interposed between them.

In the bearing *i'''* a rod N can be secured by a screw *z*, carrying a hood M with a curved surface. The fine diverging streams of water issuing from the mouth of the nozzle in the form of a conical sheet strike, as shown in Fig. 3, the ball *w* at first tangentially, so that one part E of each jet is retained by the ball *w* and runs down from the same upon the conus C as a very thin sheet S', while the other part T of the same jet, preventing the lateral escape of the first part retained by the ball, flows down on the ribs of the conus with a greater velocity and is thereby more fully divided, thereby striking repeatedly upon the sheet of water running down the conus, respectively producing a friction upon the same. The water escaping from the nozzle is thus divided very minutely and comes in contact with the air surrounding the ball *w* and the conus C in many points, so that the water is made up in foam, and consequently the jets of water taking up air well—that is to say, they increase in volume and consequently produce a stronger aspirating action on the air which is drawn in by these jets of water at the upper end of the sleeve L. The jets of water containing these small air-bubbles are either deflected from the ring P, secured to the sleeve L, or from this latter or from the hood M, and go up entirely in dust near the lower annular opening of the apparatus, so that the air entering the sleeve L at the top escapes at the bottom of the apparatus charged with a great quantity of moisture.

By loosening the screw *z* the hood M can be raised or lowered, and thus the section of the annular opening *t*, through which the moistened air escapes from the apparatus, can be regulated at will.

The ball *w* above the conus instead of being rigidly connected, as in Fig. 1, can also be movable, as shown in Fig. 2. In this case the ball *w* forms the end of a rod *e'*, the lower end of which is provided with a screw-thread upon which a nut *e''* is screwed, being guided between two fixed surfaces *e'''* *e''''* on the ring A. By turning the rod *e'* in said nut the ball *w* is raised or lowered, the nut having received a slight turn previously to loosen it from the seat *e''*, or by loosening the lower nut *e''* by raising or lowering the ball *w* it can be so adjusted that the jets of water coming from the nozzle B in form of a hollow cone will graze the ball, thus obtaining immediately a division, and that only a small part of each jet be retained by the ball *w*, while the other greater part of the jet is more fully divided on the conus C.

What I claim is—

1. In an air-moistening apparatus, a casing open at both ends, a nozzle for discharging diverging fine streams of water in the form of a conical sheet, and pulverizing-surfaces, in combination with a cone C under said nozzle and having horizontal annular ribs in the path of said streams of water, a ball *w* surmounting said cone, a rod *e'* carrying said ball and vertically adjustable to vary the degree in which it is tangentially struck by the streams of water coming from the nozzle, substantially as described and for the purpose specified.

2. In an air-moistening apparatus, a casing open at both ends, a hollow nozzle, a movable cleaning-needle therein, said nozzle discharging diverging fine streams of water in the form of a conical sheet, and pulverizing-surfaces, in combination with means for moving the said cleaning-needle, consisting of a lever I, a stop *j* therefor, a spring K holding said lever normally toward said stop, a cord connected to said lever for pulling it down, and a link V connecting said lever and needle together, whereby to advance the needle into the nozzle for cleaning it the lever can be pulled down by the cord, and when released the lever will be lifted by said spring and the needle will be returned to its normal position, substantially as and for the purpose set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

EMILE MERTZ.

Witnesses:

GEORGE GIFFORD,  
AMAND RITTER.