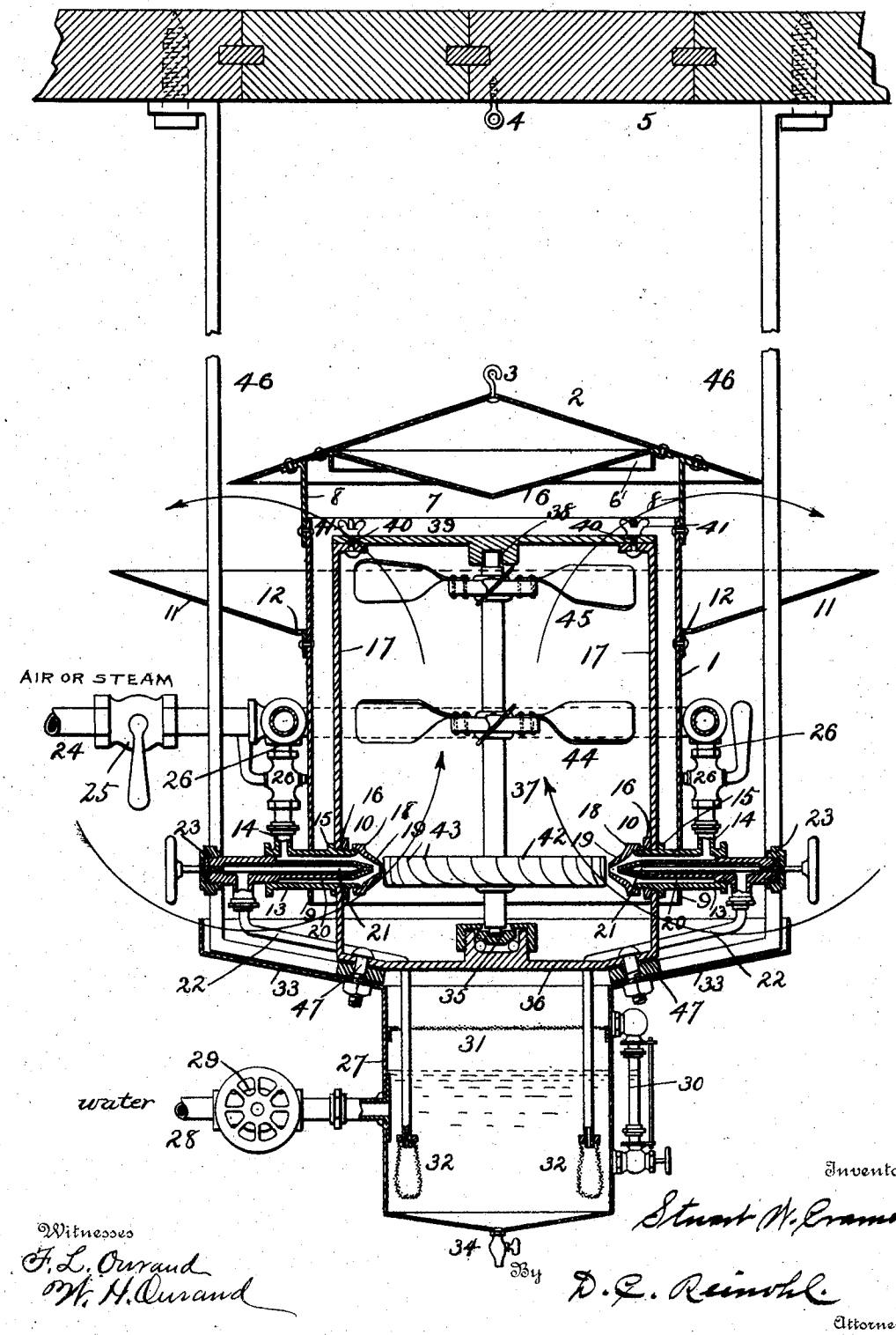
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S. W. CRAMER.

HUMIDIFIER OR AIR MOISTENING APPARATUS.

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NO MODEL.



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UNITED STATES PATENT OFFICE.

STUART W. CRAMER, OF CHARLOTTE, NORTH CAROLINA.

HUMIDIFIER OR AIR-MOISTENING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 778,172, dated December 20, 1904.

Application filed June 25, 1904. Serial No. 214,147.

To all whom it may concern:

Be it known that I, STUART W. CRAMER, a citizen of the United States, residing at Charlotte, in the county of Mecklenburg and State of North Carolina, have invented certain new and useful Improvements in Humidifiers or Air-Moistening Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to means for moistening the air in a room or factory, and has for its object to provide an apparatus which shall keep the air constantly supplied with any preferred amount of moisture and diffuse such moisture throughout the room and at the same time incidentally therewith cool or warm the air, as may be desired.

The invention consists in certain improvements in construction, which will be fully disclosed in the following specification and claims.

In the accompanying drawings, which form part of this specification, the invention is shown in vertical section with some of the parts in side elevation for the purpose of illustration.

Reference being made to the drawings and the designating characters thereon, the numeral 1 indicates the casing of the humidifier, which is vertically movable, so that it can be raised above the impulse or motor wheel and fan, is provided with a cover or top 2, on which is a hook 3, by which the casing can be suspended on an eyebolt 4 in the ceiling 5 or attached to other support, and on the lower side of the cover is a conical deflector 6 for directing the atomized spray outward over the upper edge 7 of the casing, and an annular vertical flange 6′ for arresting and returning liquid to tank 27. The cover is supported on vertical stays 8, which are secured to the casing and the cover, and near the lower end of the casing are vertical slots 9 to allow the casing to extend down below the spray head or nozzle 10 and rest thereon.

Surrounding the casing is a flaring flange 11, inclined inward to arrest any water which may fall outside the casing and conduct it toward the casing, and said flange is provided with openings 12, of which there may be any preferred number, for the escape, if any, of the water which flows down the outside of the casing and is collected in the receptacle below the casing.

The spray-heads 10 may be of any desired number and comprise a body 13, provided with a fluid-supply pipe 14, a collar 15, and a nut 16, by which the spray-head is secured to a metallic frame or stirrup 17, and on the end of the body is a cap 18, having a combining-nozzle 19, and is adjustably attached to the body to be readily detached for cleaning the head or removing any solids that may accumulate in the head and for regulating the discharge of air and water from the head. Within the body 13 is a nozzle 20, which extends near the discharge-orifice of the combining-nozzle and is provided with a needle-valve 21 for regulating the quantity of water discharged through said nozzle. The nozzle is screwed into the rear end of the body 13 and is provided with a water-supply pipe 22 and a cap or cover 23, forming a stuffing-box for the rod of the needle-valve.

Elastic fluid under pressure, such as air or steam, is supplied to the spray-heads 10 through a main pipe 24, provided with a stop-cock 25 and branches 26, leading from the main pipe to each spray-head 10, which branches are provided with stop-cocks 26 for regulating the supply of air or steam to the spray-head.

The water may be supplied from any suitable source, such as a water-service pipe or a tank or reservoir in the usual manner, or a supplemental tank 27 may be provided for each humidifier and the several supplemental tanks connected to a main tank (not shown) by a pipe 28, provided with a valve 29, and control the supply of water to the several supplemental tanks by a float in the usual manner of distributing a supply of water from a main to supplemental tanks and maintain a predetermined level in the supplemental tanks. The supplemental tank 27 can be provided with a sight-gage 30 for indicating the level of the water in the tank, and in the tank a diaphragm 31, preferably of wire-gauze, placed to pre-

vent fine particles of cotton or other material getting in the water, and on the ends of the water-supply pipes 22 are foraminous strainers 32 to arrest any solids and prevent their being conducted into the spray-heads 10.

The upper end of the tank 27 is provided with a flange or pan 33, which extends out considerably beyond the casing 1 to collect any water which may be thrown off by the motor-wheel while the spray-heads are being adjusted to take up only enough water to form an aqueous vapor or finely-attenuated spray, and at the bottom of the tank is a cock 34 for drawing off the water from the tank when desired.

Within the casing, with its lower end resting on a ball-bearing step 35 on the lower transverse bar 36 of the stirrup 17, is a vertical shaft 37, whose upper end is secured in a seat 38 on the upper transverse bar 39 of said stirrup, which bar is detachably secured by bolts 40 and thumb-nuts 41, and on said shaft is an exposed motor-wheel 42, provided with tangential blades 43, curved to discharge the water and the air or elastic aqueous vapor from the heads 10 upward toward the center of the casing 1 and above wheel 42. Secured to the shaft 37 is a propeller 44 for beating the atomized particles of water as they issue from the blades of the wheel to further break up or disintegrate them into finer particles and thoroughly mix them with the current of air passing through the casing and to accelerate the upward passage of the air freighted with moisture. 45 is another propeller on the shaft 37, which exhausts the moistened air from the casing and forces it out over the upper end of the body of the casing.

The structure is shown suspended on rods 46 from the ceiling, and to the lower end of said rods the tank 27 is secured by bolts 47, which extend through the bar 36 of the stirrup 17; but it is obvious that it may be supported in many other ways without departing from the spirit of my invention. It is also obvious that the relative position of the impulse-wheel and the propeller-blades may be changed, thereby practically inverting the construction of the apparatus without departing from the spirit of my invention.

To start the humidifier or humidifiers, the valve 29 is opened and water turned into the tank 27. The casing 1 is then raised and suspended on the hook 3 and eyebolt 4, thus leaving the entire mechanism within the casing exposed. The needle-valves 21 are then closed, shutting off the water from each spray-head 10. The cocks 25 and 26 are opened to admit air to the heads. The valves 21 are then opened sufficiently to produce spray of the required density, the water being raised on the principle of the action of an ejector. When this has been secured and the shaft 37, with the motor-wheel 42, and the propellers 44 and 45 revolving at the proper speed, the casing 1 is returned to its normal position. Air is drawn into the lower end of the casing 1 from the surrounding atmosphere and in its upward passage is thoroughly commingled with the atomic particles of water or elastic aqueous vapor and becomes freighted therewith and is expelled from the upper end of the casing to be diffused in the atmosphere of the room.

Having thus fully described my invention, what I claim is—

1. In a humidifier, a casing, a shaft, an exposed motor-wheel and a propeller supported on said shaft, a plurality of spray-heads provided with means for supplying an elastic fluid under pressure, a liquid-supply pipe, and concentric and detachable nozzles, one of which is adjustable, for producing an elastic aqueous vapor and directing said vapor against the motor-wheel.

2. In a humidifier, a casing, a shaft, an exposed motor-wheel and a propeller supported on said shaft, a supplemental water-tank, spray-heads extending through said casing and provided with means for supplying an elastic fluid under pressure, a liquid-supply pipe communicating with said tank, and concentric and detachable nozzles for producing an elastic aqueous vapor and directing said vapor against the motor-wheel.

3. In a humidifier, a casing provided with a flaring flange near its upper end and having discharge-openings adjacent to the casing, a tank below the casing provided with a flaring flange at its upper end, a shaft provided with a motor-wheel and a propeller, spray-heads provided with means for supplying an elastic fluid under pressure, and a water-supply pipe; and a stirrup or frame within the casing and supporting said shaft and said spray-heads.

In testimony whereof I affix my signature in presence of two witnesses.

STUART W. CRAMER.

Witnesses:
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