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S. W. CRAMER.

HUMIDIFIER AND AIR MOISTENING APPARATUS.

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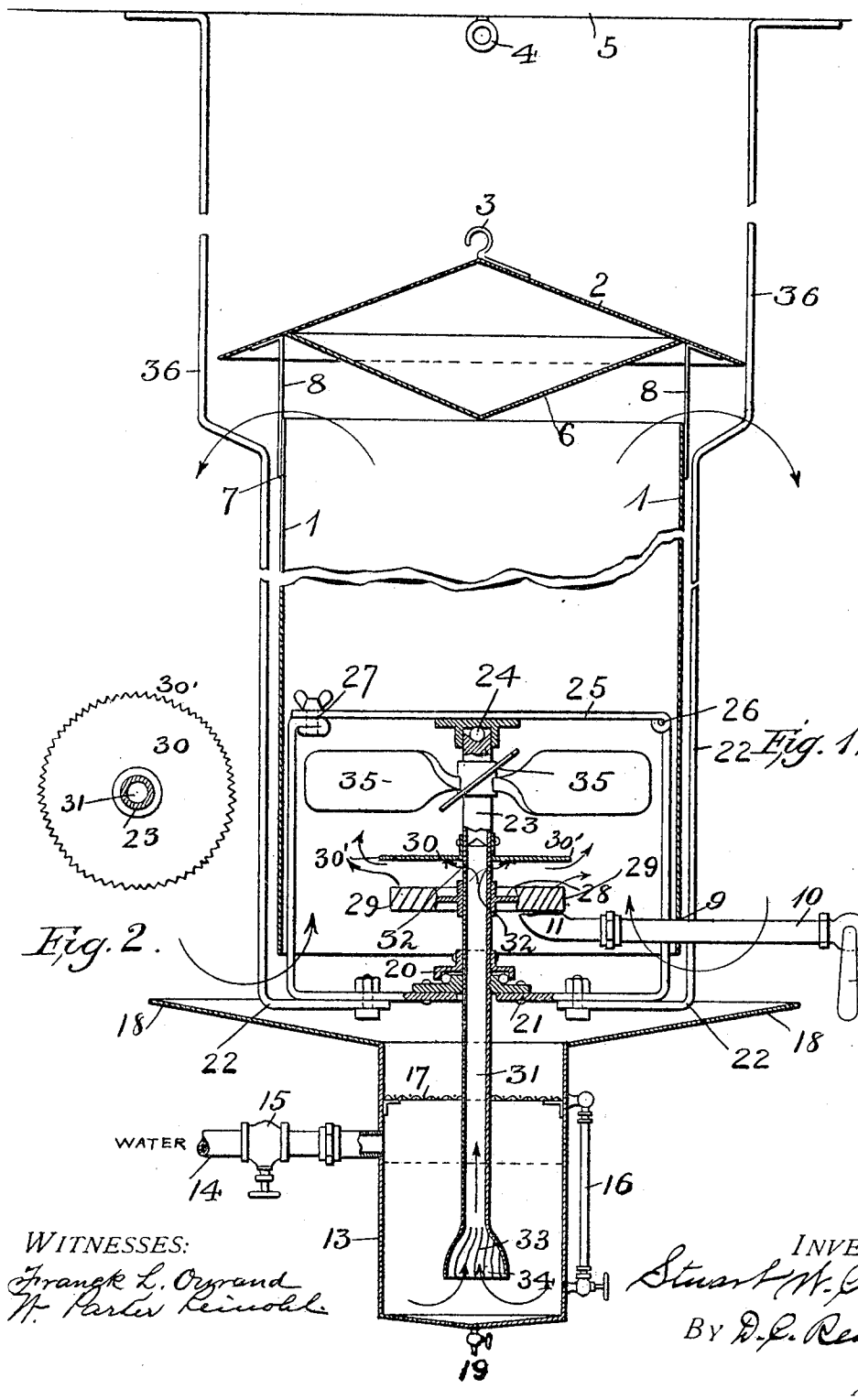

Fig. 1.

Fig. 2.

WITNESSES:

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HUMIDIFIER AND AIR-MOISTENING APPARATUS.

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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 and 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 through 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, Figure 1 shows the invention in vertical section with some of the parts in side elevation, and Fig. 2 represents a plan of the spraying-disk.

Reference being had 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 revolving members. It is also provided with a cover or top 2, on which is a hook 3, by which the casing can be suspended from 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 outward over the upper edge 7 of the casing the current of moistened air as it issues from the casing. The cover is supported on vertical stays 8, which are secured to the casing and the cover. Near the lower end of the casing is a vertical slot 9 to allow the casing to extend down below the pipe 10. Elastic fluid under pressure, such as air or steam, is supplied to nozzle 11, of which there may be any desired number.

12 is a stop-cock for regulating the supply of elastic fluid to the nozzle 11.

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 13 may be provided for each humidifier and the several supplemental tanks connected to a main tank (not shown) by a pipe 14, provided with a valve 15, and the supply of water to the several supplemental tanks controlled by a float-feed in the usual manner of distributing a supply of water from a main to supplemental tanks to maintain a predetermined level in the supplemental tanks. The supplemental tank 13 may be provided with a sight water-gage 16 for indicating the level of the water in the tank. It may also be provided with a diaphragm 17, preferably of wire-gauze, to prevent fine particles of cotton or other material from getting into the water. The upper end of the tank 13 is provided with a flange or inclined pan 18, which extends out considerably beyond the casing 1 to collect the drip from the apparatus. At the bottom of the tank is a cock 19 to draw off the water from the tank when desired for cleaning or other purposes.

Within the casing with its lower end resting on a ball-bearing step 20 on the lower transverse bar 21 of the stirrup 22 is a vertical shaft 23, whose upper end is secured in a ball-bearing 24 on the upper transverse bar 25, which bar is detachably secured by a hinge 26 and a thumb-screw clamp 27. On said shaft is an exposed motor-wheel 28, provided with blades 29 of the shape and form usual in small turbines driven by elastic fluids. The air or elastic fluid is applied to the under side of said blades, from which it is discharged upward and toward the revoluble circular disk 30. This circular disk, like the motor-wheel, is secured to the shaft 23 and serves the purpose of a centrifugal sprayer by throwing off at its outer serrated edge 30′ in finely-comminuted particles the water drawn up from the supplemental tank 13 through the hollow part 31 of the shaft 23, from which the water is discharged against the under side of said disk through slots or openings 32. The openings 32 are of proper dimensions to supply only sufficient water to produce an aqueous vapor as it is thrown off from the disk 30.

The lower end of the hollow part 31 of the shaft 23 is provided with a flaring opening 33, inside of which are secured spirally-curved vanes 34, arranged so that the revolving of the shaft 23 causes the water in the supplemental tank to enter the lower end of the shaft, from which it is forced upward by the screw-like motion of the vanes 34 and discharged through the openings 32. Secured to the shaft 23 above the disk 30 is a fan-propeller 35, which in revolving draws or propels a current of air through the casing 1,

which air passing through the fine spray or aqueous vapor delivered by the centrifugal sprayer becomes thoroughly saturated with moisture, so that there issues from the top of the apparatus over the edge 7 of the casing 1 a current of saturated air.

The apparatus is suspended from the ceiling 5 on rods 36, which are extensions of the supporting-stirrups 22; but it is obvious that it may be supported in many ways without departing from the spirit of my invention. It is also obvious that the relative position of the members constituting the revolving part of the apparatus may be changed, as well as other details of the apparatus, without departing from the spirit of my invention, and it is also evident that the vertical shaft 23 can be extended through the cover and driven by a pulley (not shown) instead of by a motor-wheel, as shown. Preference is given, however, to the construction shown for the reason that it is a more flexible system and is more susceptible of being controlled by an automatic device.

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

1. In a humidifier, a casing, a frame or stirrup within the casing, a shaft through which liquid is supplied and supported on said frame, a centrifugal sprayer on the shaft, openings in the shaft below the sprayer, a fan-propeller above the sprayer, and means for revolving the shaft, the sprayer and the fan-propeller.

2. In a humidifier, a casing, a frame or stirrup within the casing, a shaft through which liquid is supplied and supported on said frame, a motor-wheel, a centrifugal sprayer above and adjacent to said motor-wheel, openings in the shaft below the sprayer, a fan-propeller above the sprayer, and a pipe for supplying an elastic fluid to the motor-wheel.

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

STUART W. CRAMER.

Witnesses:
J. H. MAYES,
C. L. MCLEAN.