

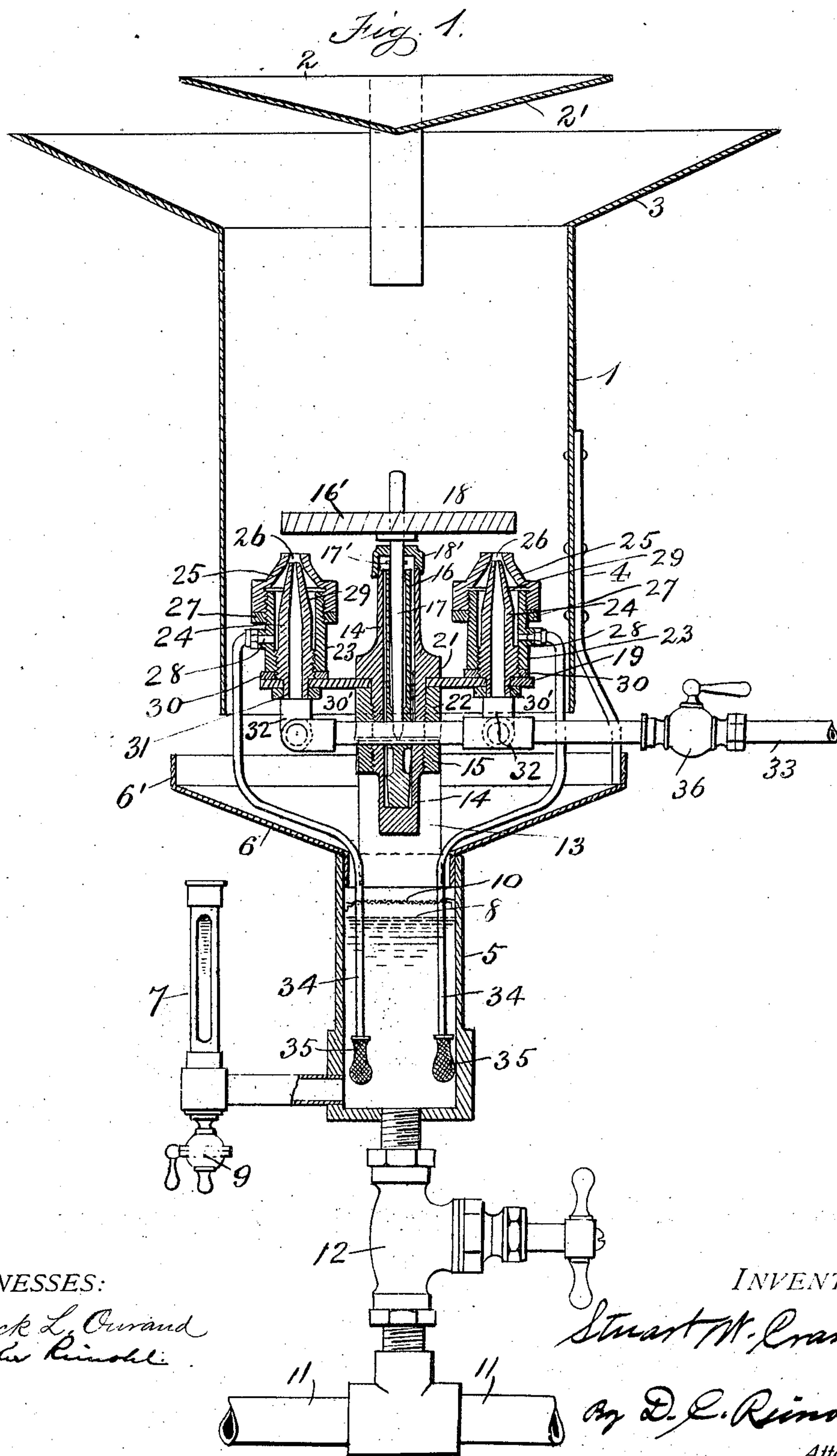
No. 840,916.

PATENTED JAN. 8, 1907.

S. W. CRAMER.
HUMIDIFIER OR AIR MOISTENING APPARATUS.

APPLICATION FILED FEB. 13, 1906.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 2

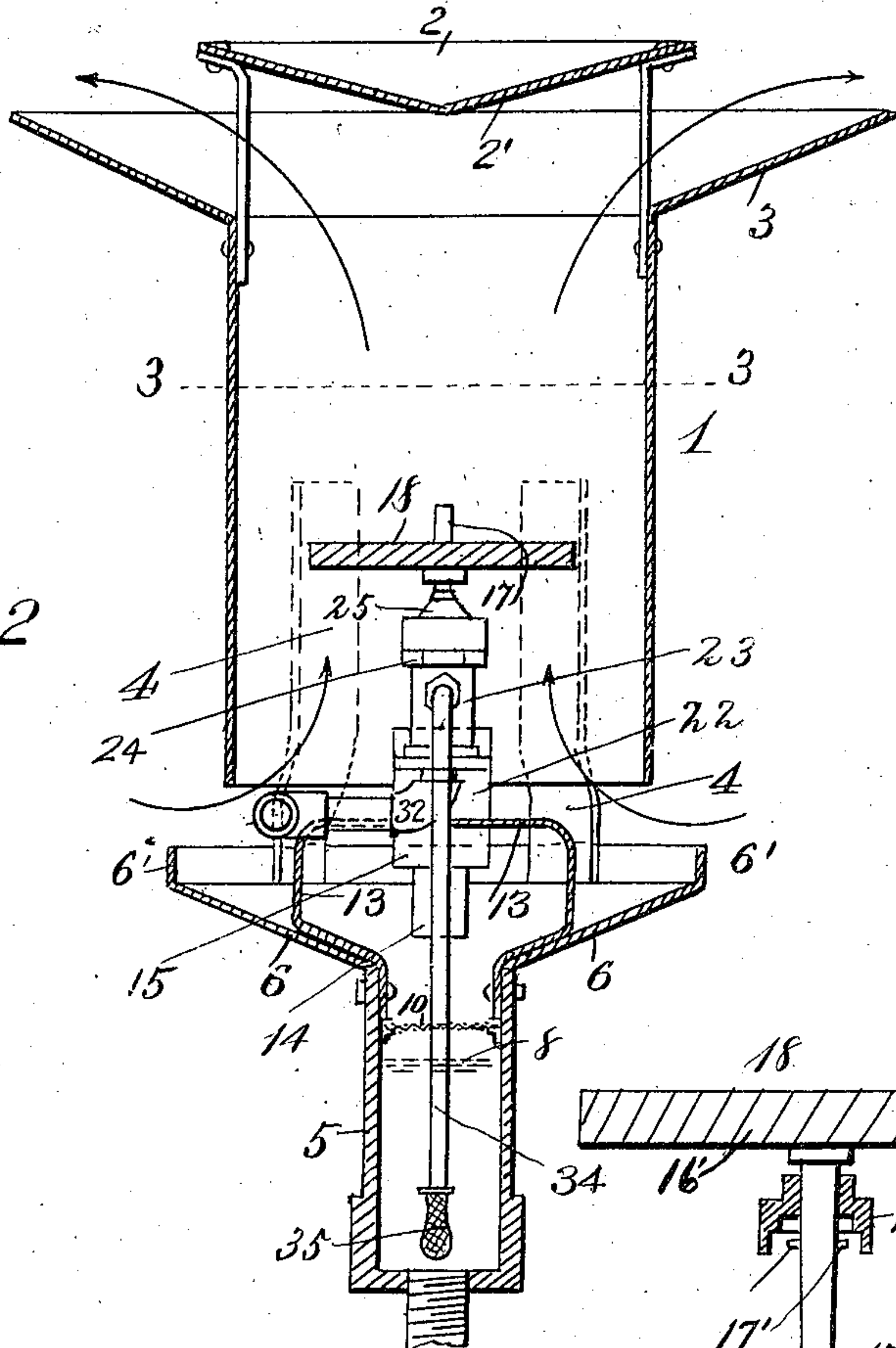


Fig. 3.

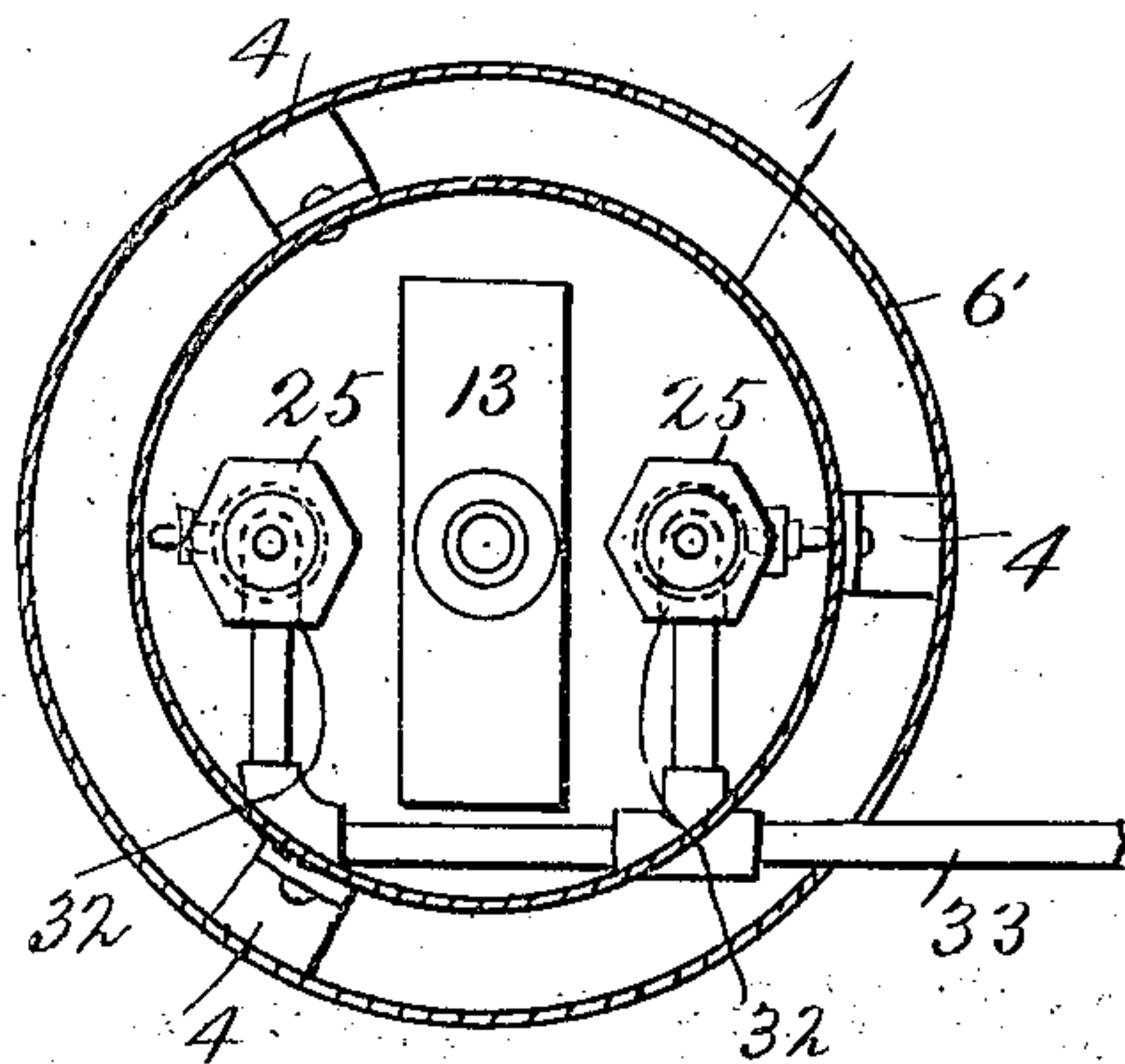


Fig. 4

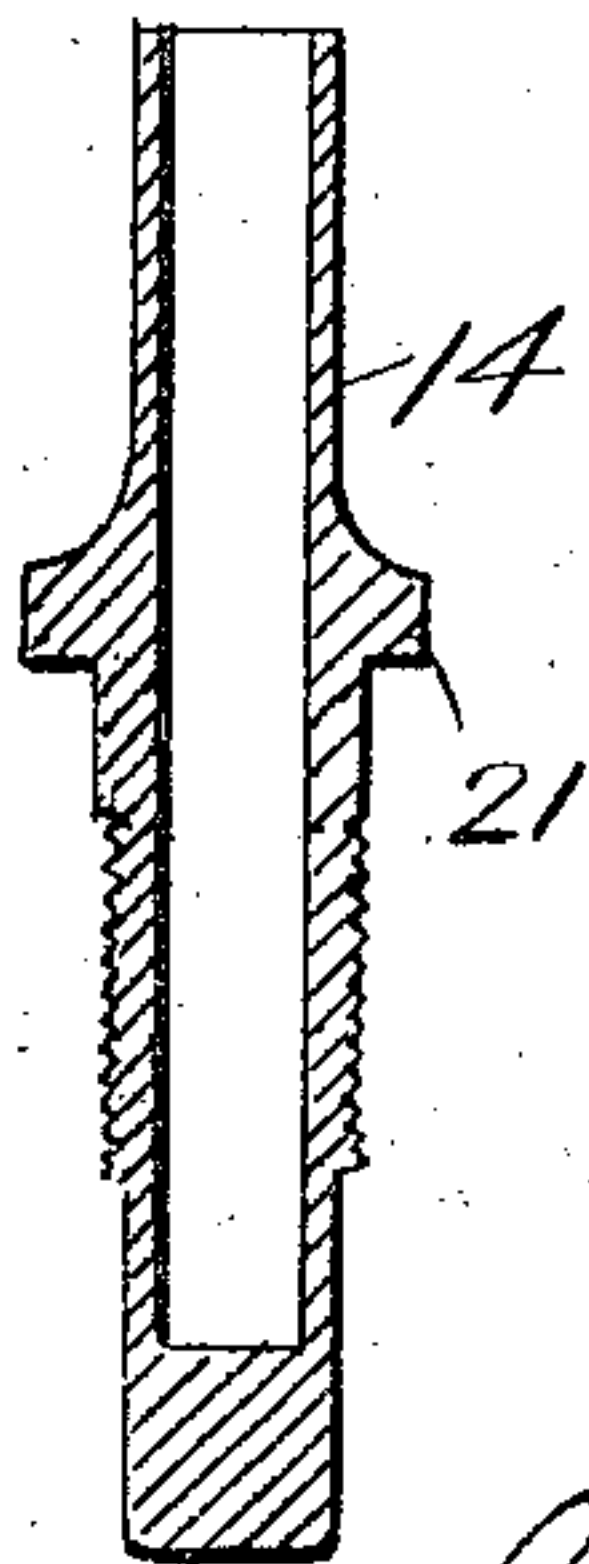


Fig. 6

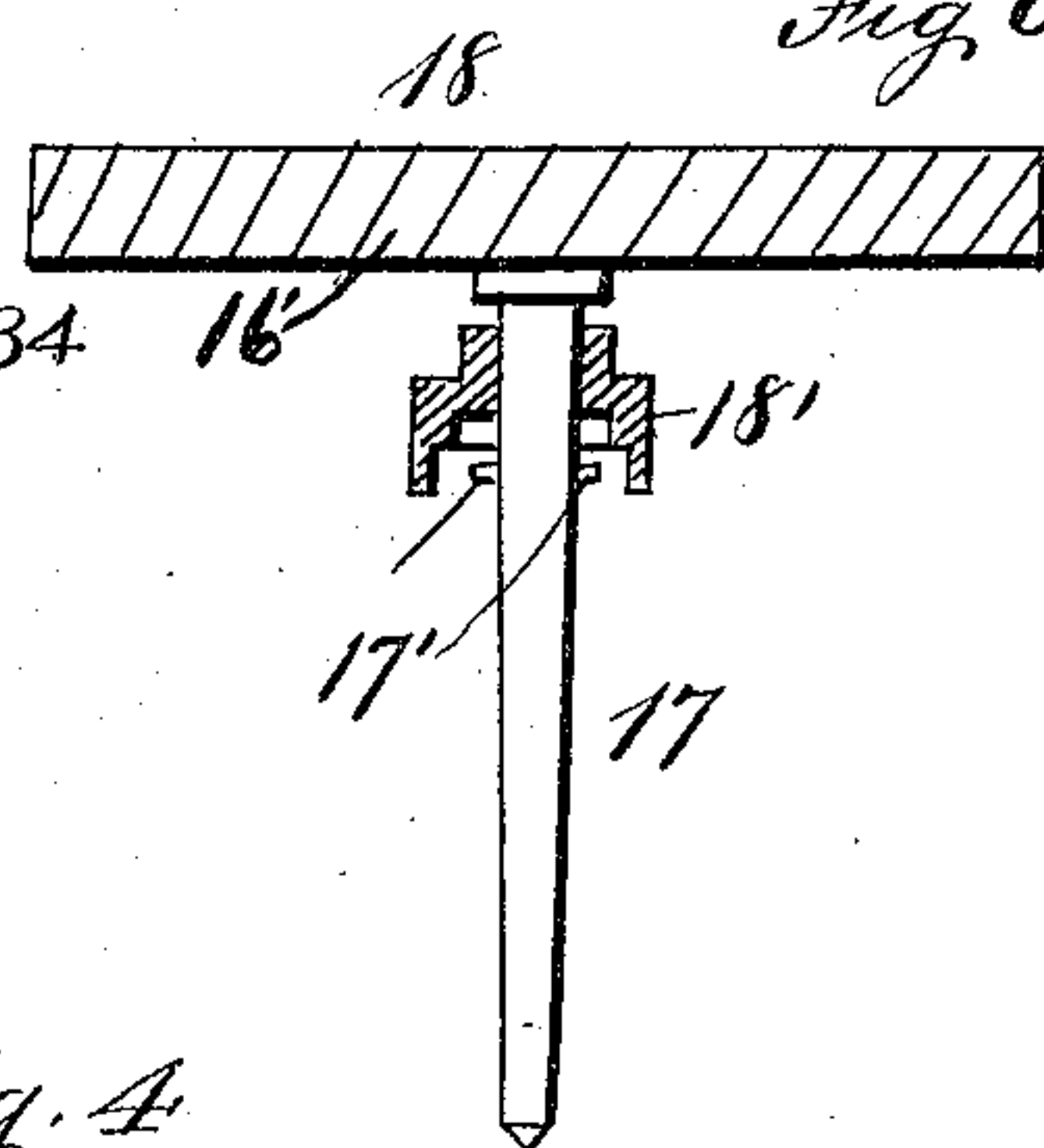
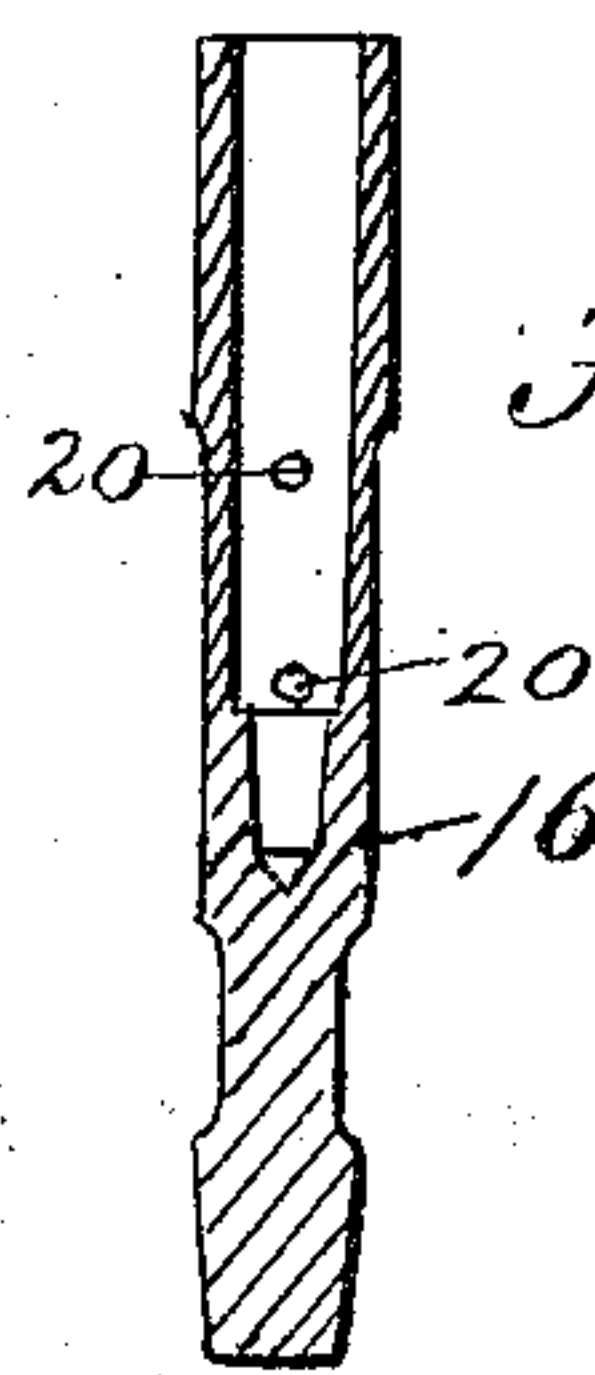


Fig. 5.



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UNITED STATES PATENT OFFICE.

STUART W. CRAMER, OF CHARLOTTE, NORTH CAROLINA.

HUMIDIFIER OR AIR-MOISTENING APPARATUS.

No. 840,916.

Specification of Letters Patent.

Patented Jan. 8, 1907.

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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 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 predetermined 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 represents a vertical transverse section, partly in side elevation, of my improved humidifier; Fig. 2, a like view at a right angle to Fig. 1 and on a reduced scale; Fig. 3 a plan view, partly in section, on line 3-3, Fig. 2, the wheel being removed; Fig. 4, a vertical section of the outer casing or body of the wheel or separator shaft-bearing; Fig. 5, a detail view of the loose sleeve of the bearing, and Fig. 6 a side elevation of the wheel or separator and its shaft.

Reference being had to the drawings and the indicating characters thereon, the numeral 1 indicates the casing of the humidifier, which is vertically movable, so that it can be raised above the spray-heads. The casing is provided with a cover or top 2, having a conical deflector 2' on its lower side to deflect radially outward the vapor issuing from the casing, and around the upper end of the casing there is an annular inwardly-inclined flange 3 for arresting or collecting liquid and returning it to the reservoir 5. The casing is supported on vertical stays 4, which are secured to the flared or inclined flange 6 of the reservoir, and said flange extends out beyond the casing 1 and is provided with a vertical member 6' to collect any water which may accumulate upon and gravitate from the wall of the casing.

7 is a water-gage to indicate the level of the water 8 within the reservoir and is provided with a drip-cock 9.

10 is a diaphragm, preferably of wire-gauze, to prevent fine particles of lint or cotton or other material from getting in the water.

11 is the water-supply pipe provided with a valve 12 for the purpose of shutting off the water in case it is desired to detach the apparatus from the supply-pipe for examination or repairs. The whole apparatus is supported by having the reservoir 5 rigidly connected to the water-supply pipe 11, which pipe in turn is supported by straps or like devices (not shown) secured to the walls, ceiling, or columns in a room.

13 is a horizontal metal support resting upon the flange 6 and secured to the reservoir 5 at its upper end, and on said support is a vertical shaft-bearing casing 14, which is secured thereto by a lock-nut 15 on the under side of the support, and within the outer casing of said shaft-bearing is a loosely-fitting sleeve 16 to receive the vertical shaft 17 of the water-wheel or separator 18, which is provided with vanes 16' and forms a yielding bearing or support therefor. The sleeve 16 rests upon the bottom of the casing 14, and the shaft is lubricated with oil from the exterior of the sleeve 16 through small ducts or openings 20 and is thereby supplied with clean oil that is not agitated by the revolution of the shaft. At the upper end of the shaft-bearing casing is a cap or cover 18', and on the shaft 17 is a collar 17', which limits the upward movement of the shaft, the sleeve 16, and the wheel 18.

19 is a horizontal bar on the casing 14 of the shaft-bearing, which is clamped to a shoulder or seat 21 by a nut 22 and supports one or more spray-heads for supplying an elastic aqueous vapor to the casing. The spray-heads comprise a body 23, a nozzle 24 within the body, an adjustable cap and combining-nozzle 25 on the upper end of the body and provided with a combining-passage 26, into which the outer end of the nozzle 24 projects, a lock-nut 27 under the cap 25, a water-supply inlet 28, a water-chamber 29, a nut 30, by which the spray-head is secured to the bar 19, a nipple or extension 31 of the nozzle, which extends through the bar 19 and engages the fitting or elbow 32 on the compressed-air-supply pipe 33. Between the end of the elbow and the under side of the

bar 19 an annular washer 30' is interposed to resist the pressure of the nut 30 on the upper side of the bar.

34 is the water-supply pipe leading from the reservoir 5 to the spray head or heads, and its lower end is provided with a foraminous strainer 35 to arrest any solids and prevent their being conducted into the spray-heads.

The air-supply pipe 33 is provided with a stop-cock 36 for controlling the supply of air to the spray-heads.

When it is desired to heat a room or apartment, steam may be supplied through pipe 33 instead of air. In either instance the water is discharged from the spray-heads in the form of an elastic aqueous vapor and is commingled with the atmospheric air which enters the casing 1 between its lower end and the upper end of the reservoir 5, ascends, and is discharged through the upper end of the casing and is diffused in the surrounding atmosphere of the room.

Water may be supplied from any suitable source, such as water-service pipes direct or a tank or reservoir 5, as shown, which in turn would be kept supplied by a supplemental tank (not shown) connected with the water-service main. This supplemental tank would maintain the water at a constant level in the service-reservoir by a float-feed in the usual manner of distributing a supply of water from a main tank to supplemental tanks and maintaining a predetermined level in the supplemental tanks.

In the operation of the apparatus a constant water-level is maintained in the reservoir 5, as already stated. To start the apparatus, the air-cock is opened, thereby producing a fine spray by the commingling of the air and the water within the combining-nozzle 25. The construction of each head is on the well-known ejector principle, by which the water is sucked up through the supply-pipes 34 from the reservoir 5 into spray-heads, from which it issues in the form of an elastic aqueous vapor. This spray or vapor is directed against the lower side of a motor-wheel, which acts simply as a revolving separator, the coarser particles of water being thrown against the side of the casing by centrifugal action, leaving only a fine vapor.

This column of water within the casing is more thoroughly mixed with the air within the casing by the action of the rotary beater 18. The force of the jet of spray issuing from the spray-heads and delivered longitudinally and upward through the casing is such as to induce a strong current of air to enter between the lower edge of the casing 1 and the flared upper edge 6 of the reservoir 5. The column of air and vapor thoroughly mixed within the casing 1 issues radially and forcibly from the upper part of the casing between its flared upper edge 3 and the deflecting-cover 2.

It is obvious that one or more spray-heads may be used in this apparatus; and the particular construction shown may be varied in a number of ways without departing from the spirit of my invention.

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

1. In a humidifier, a casing, a shaft, a wheel on said shaft, a shaft-bearing casing, a support to which the shaft-bearing casing is secured, a loose sleeve-bearing for the shaft within said shaft-bearing casing, a plurality of vertical spray-heads under and adjacent to said wheel, a support for the spray-heads secured to the shaft-bearing casing, means for securing the spray-heads to their supports, a fluid-supply pipe, and a liquid-supply pipe for said spray-heads.

2. In a humidifier, a casing, a shaft, a wheel on the shaft, a vertical shaft-bearing casing, a yielding bearing for the shaft within said casing, means for limiting the upward movement of said shaft, spray-heads under and adjacent to said wheel and each having a nozzle provided with a nipple at its lower end, a horizontal support for the spray-heads secured to the shaft-bearing casing and through which support said nipples extend, a nut on each nipple under said horizontal support, a fluid-supply pipe, and a liquid-supply pipe for said heads.

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

STUART W. CRAMER.

Witnesses:

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