

(No Model.)

F. B. COMINS.
HUMIDIFIER.

No. 584,812.

Patented June 22, 1897.

Fig. 1.

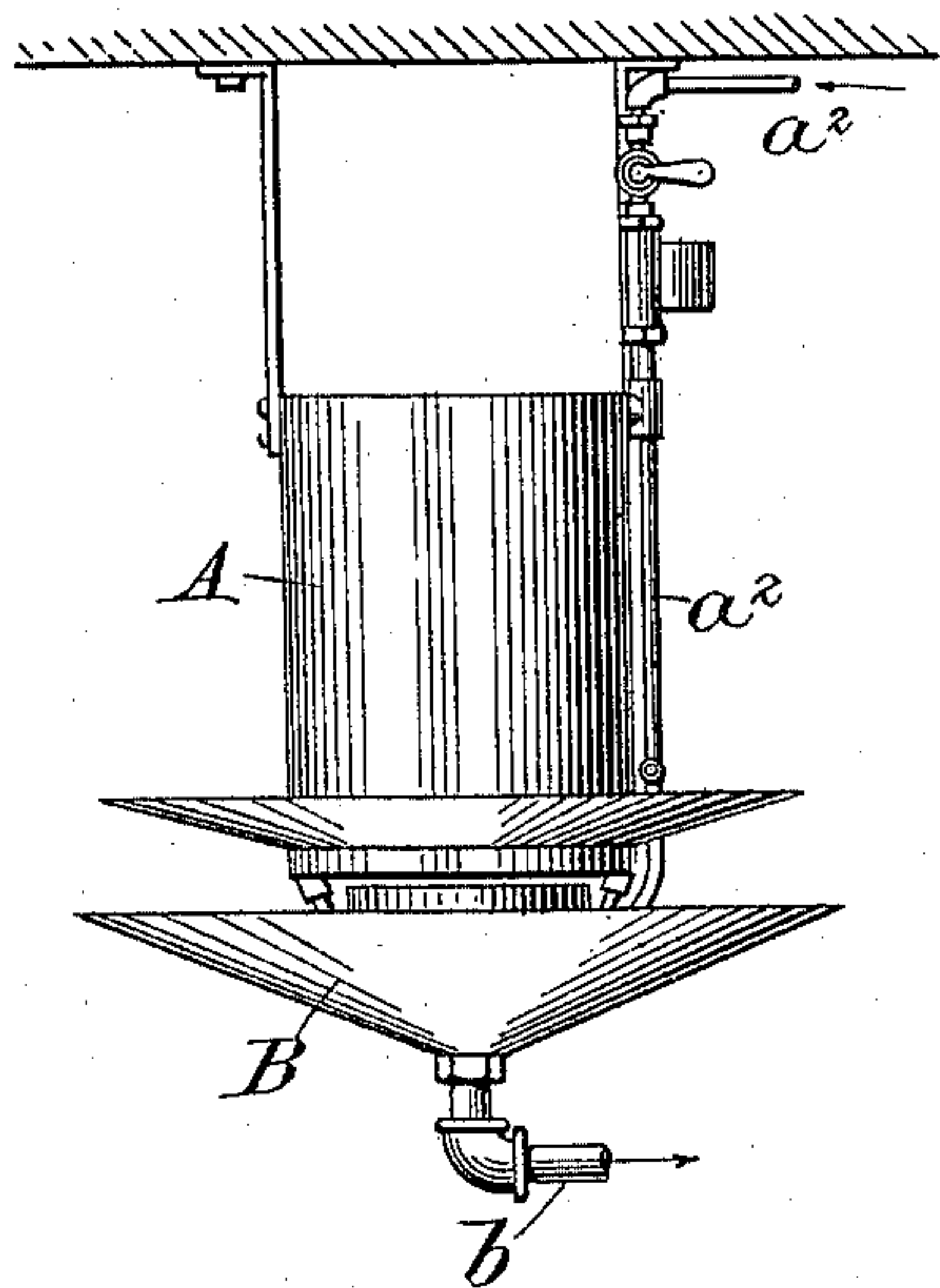


Fig. 2.

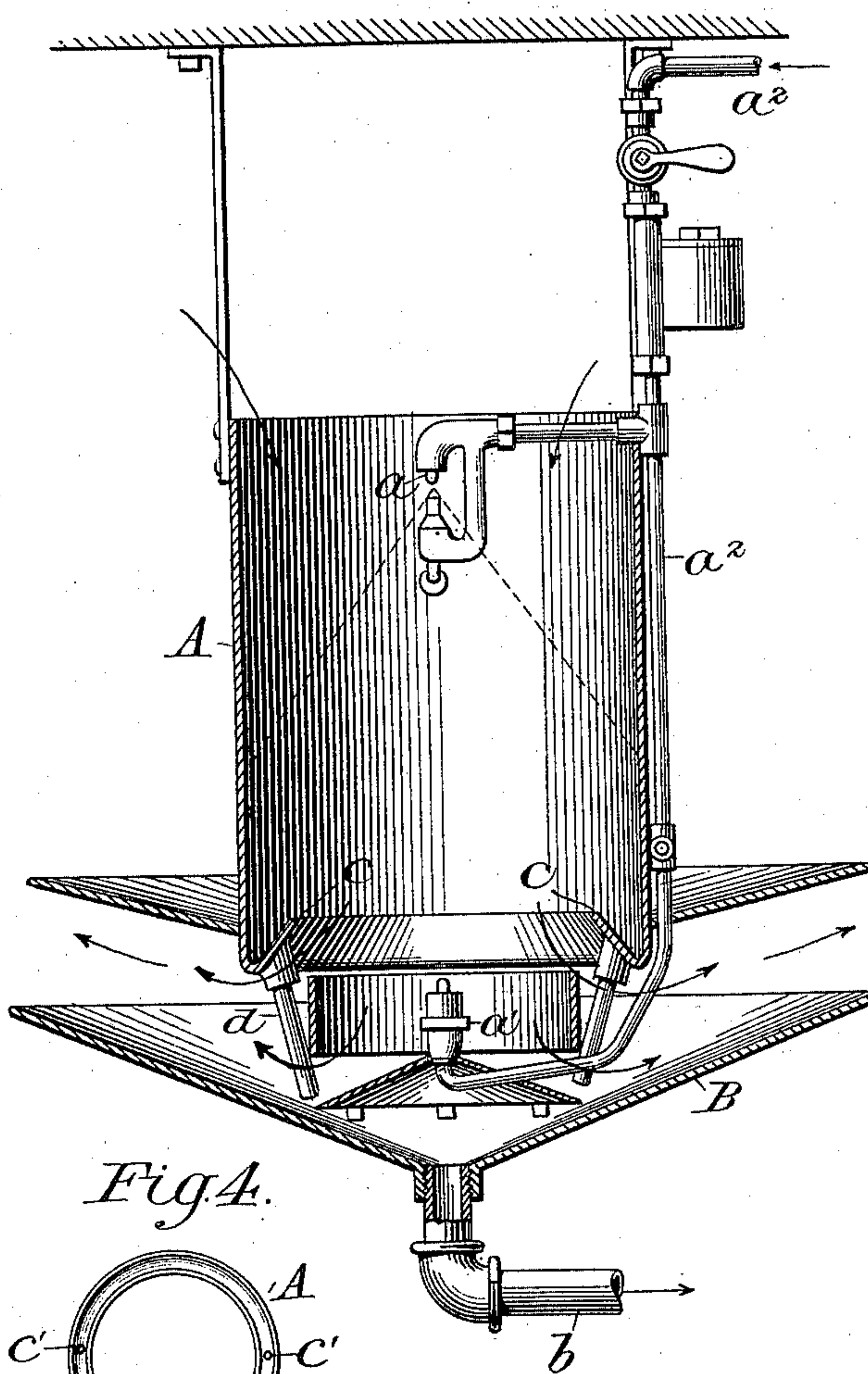


Fig. 3.

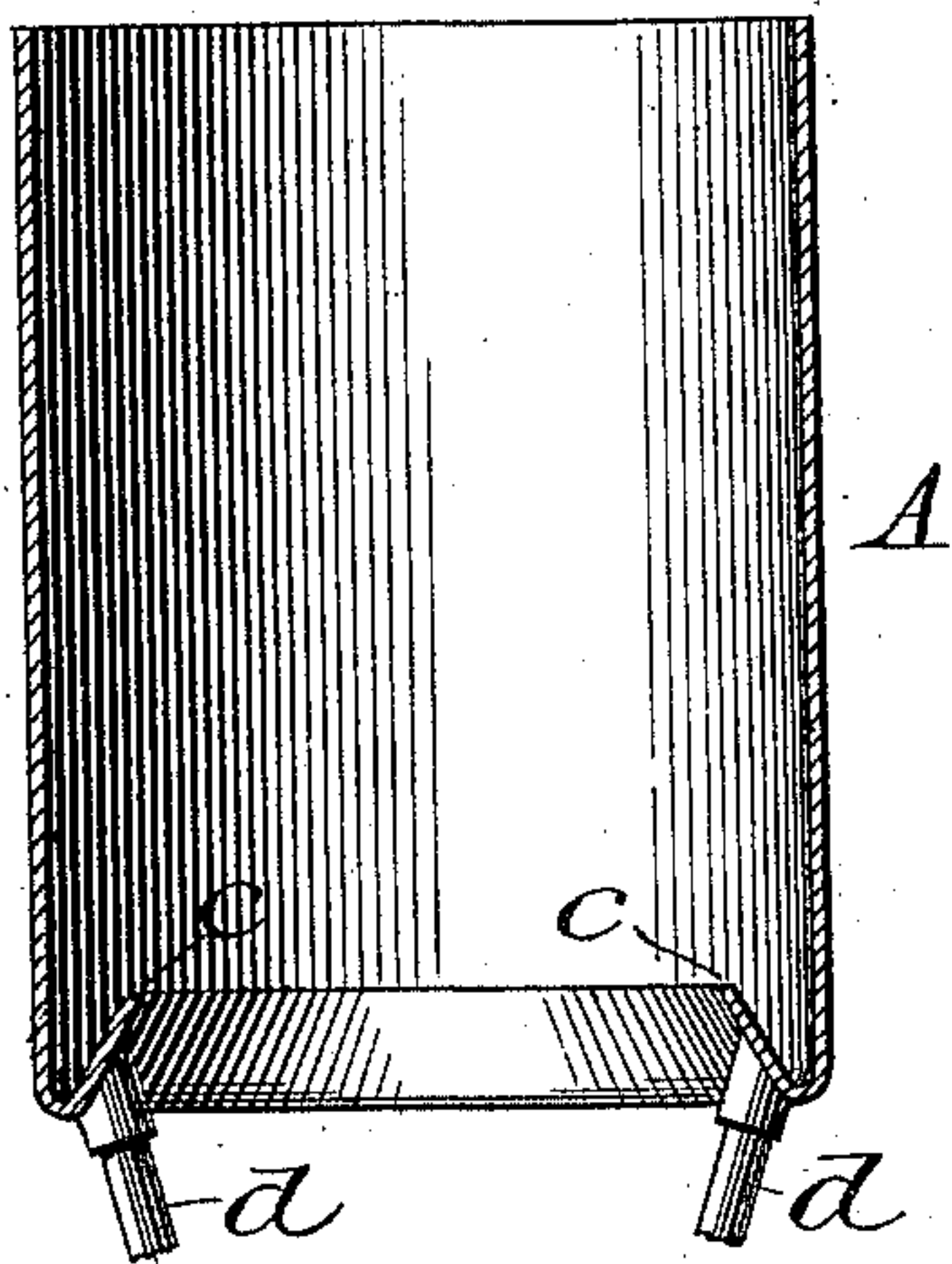
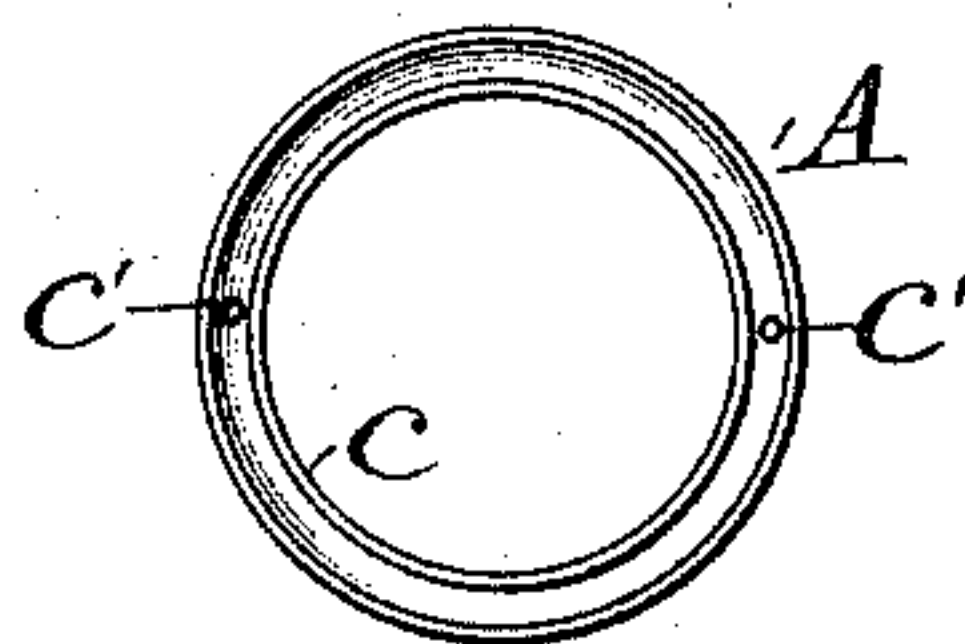


Fig. 4.



Witnesses:

Ira L. Fish
R. A. Bates.

Inventor:

Frank B. Comins,
By Hilmarth H. Thurston,
Attorney.

UNITED STATES PATENT OFFICE.

FRANK B. COMINS, OF PROVIDENCE, RHODE ISLAND.

HUMIDIFIER.

SPECIFICATION forming part of Letters Patent No. 584,812, dated June 22, 1897.

Application filed June 4, 1894. Serial No. 513,365. (No model.)

To all whom it may concern:

Be it known that I, FRANK B. COMINS, of the city and county of Providence, in the State of Rhode Island, have invented certain new and useful Improvements in Humidifiers; and I do hereby declare the following specification, taken in connection with the accompanying drawings, forming a part of the same, to be a full, clear, and exact description thereof.

10 This invention relates to humidifiers or air-moistening devices for moistening or "tempering" the air in mills, factories, and other buildings. Devices of this character embody a casing, usually cylindrical in shape, said casing being open at the ends. Arranged within this casing and near the entrance end thereof is a nozzle through which a jet of water is delivered into the casing for the purpose of inducing a current of air through said casing. In front of said nozzle a deflector or spreader is placed, usually in the form of an adjustable pin, by means of which the jet of water issuing from said nozzle is caused to be discharged into the casing in the form of a hollow cone and at such an angle as to strike the cylindrical walls of the casing intermediate the ends thereof. In some forms of devices this current-inducing jet-nozzle is the only nozzle employed, said nozzle serving both to induce the necessary current or draft and also to furnish the moisture to be taken up by the air. In other forms of devices the jet-nozzle referred to is employed solely for the purpose of inducing the necessary current, and a second nozzle, commonly called the "spray-nozzle" and arranged at or near the exit end of the casing, is employed for furnishing the moisture to be taken up by the air. In both forms of devices, however, the cone-shaped discharge from the jet-nozzle strikes the cylindrical wall of the casing, and when said casing is arranged vertically a large portion of the water delivered from said jet-nozzle collects upon and runs down said wall and falls or flows in drops or large particles or in the form of a more or less continuous sheet off the bottom edge or rim of said casing throughout the entire circumference thereof. Arranged in front of the exit or discharge end of said casing is a deflector of considerably larger diameter than that of the casing and usually of a cone shape, by

means of which deflector the current of moistened air issuing from said casing is deflected laterally in all directions at a greater or less angle with the axis of the casing and across the path of the water falling from the bottom edge of the wall of the casing. By reason of the fact that the water thus falls or flows from the bottom edge of the wall of the casing in drops or in the form of a thin sheet throughout the entire circumference thereof, and in such condition falls directly into the path of the current of air, the result is that more or less of this water is carried or forced by the current out into the room in the form of large particles, which is very objectionable. This objection has been heretofore recognized and an attempt made to overcome it, as in the patent to Taylor, No. 517,310. The means employed in said Taylor patent consists of a series of angular plates or deflectors located outside of or beyond the point where the falling water meets the issuing current of air and is taken up thereby, and in the path of the intermingled air and particles of water as they issue from the apparatus, the idea being that the impingement of the intermingled water and air against said angular plates will cause the large particles of water to be more or less broken up into spray, and will also cause such portion of the water as is not thus broken up into spray to be arrested and turned back. It has been found that this arrangement, while an improvement upon the apparatus as previously constructed, does not wholly overcome the objection and does not prevent more or less of the water being discharged into the room in the form of large particles. Moreover, the employment of such angular plates or deflectors is productive of a still further difficulty in that thereby the space for the passage of the air is lessened or obstructed, and so as to materially check or retard the issuing current.

The object of the present invention is to more effectually prevent the discharge of the water from the apparatus in the form of large particles and to do this without materially checking or retarding the air-current.

To this end the invention consists, primarily, in providing a humidifier of the character referred to with means for preventing the water which runs down the walls of the

casing from being taken up by the current of issuing air and being thereby carried in the form of large particles out into the room.

Referring to the drawings, Figure 1 is a side elevation of a humidifier or air-moistening device embodying my invention. Fig. 2 is a central vertical section thereof upon an enlarged scale. Fig. 3 is a corresponding section of the casing provided with my improvements, and Fig. 4 is a plan view of the casing.

The device shown in the drawings is a two-nozzle device—i. e., a device in which an upper or jet nozzle for inducing the current and a lower or spray nozzle for supplying the spray or moisture are employed. It will be understood, however, from what has been said that the present invention is equally applicable to a device in which only a single nozzle serving both of the above purposes is employed.

In the drawings, A represents the cylindrical casing, *a* the upper or jet nozzle, *a'* the lower or spray nozzle, *a''* the water-pipe for supplying said nozzle, B the deflector, arranged in front of the discharge end of the casing, and *b* the waste-pipe, all constructed and arranged substantially as heretofore.

For the purpose of carrying out the present invention the lower end of the casing A is provided with an inner upturned annular flange *c*, which said flange may either be formed integral with the casing or made separate from and attached to the casing. The flange *c* thus forms a sort of trough at the lower end of said casing on the inside thereof, said trough being closed at the bottom. Through the bottom of the trough at one or more points is formed a hole or aperture *c'*, into which may be secured a pipe *d*, leading downward therefrom and extending across or partially across the path of the current of issuing air and terminating in an open end *d'*. In the drawings two such apertures and two pipes *d* are shown, but one is sufficient, while, on the other hand, more than two may be employed, if desired.

By the employment of the flange *c* and the trough formed thereby it will be seen that the water which runs down the walls of the casing is caught and collected in said trough and flows through the hole or holes formed in the bottom of said trough in one or more compact and isolated streams instead of falling from the bottom edge or rim of the casing in drops or in a thin sheet around the entire circumference thereof, and by the employment of the pipe or pipes *d* such stream or streams are conducted across or partially across the path of the current without being in any way exposed to the action of the current. While I prefer to employ the pipe or pipes *d* to thus conduct the water across or partially across the path of the current, so as to more completely protect the same from the action of the current, such pipe or pipes are not necessary and very good results may be

obtained without them, and for the reason that the water as it flows from the trough of the casing is in the form of one or more compact and isolated streams, which streams as they fall in this compact and isolated condition across the path of the current will not be materially affected by the current and no material portion thereof will be taken up or blown out into the room. The water as it flows from the pipes *d* or falls directly from the apertures in the flange *c* falls upon the deflector B, and thence to the waste-pipe *b*.

By the arrangement above described, either with or without the employment of the pipes *d*, the water which runs down the walls of the casing is prevented from running off the bottom edge or rim of said casing around the entire circumference thereof, and is consequently prevented from falling thence into the path of the current in drops or in the form of a thin film or sheet, and so as to be readily taken up to a greater or less extent by the current and blown therewith out into the room in the very objectionable form of large particles. Moreover, this desirable result is accomplished without materially lessening the space for the passage of the current of air and without materially checking or retarding said current.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a humidifier, the combination with a casing, a nozzle for inducing a current of air through said casing, and a deflector in front of said casing to deflect said current laterally, of means for preventing the water which runs down the walls of said casing from being taken up by the current of air as it issues past the edge of said casing, substantially as described.

2. In a humidifier, the combination of a casing, a nozzle for inducing a current of air through said casing, and a deflector in front of said casing to deflect said current laterally, said casing being provided with a trough at its exit end for collecting the water which runs down the walls of said casing, and thereby preventing such water from being taken up by the current of air as it issues past the edge of said casing, substantially as described.

3. In a humidifier, the combination, with a casing, a nozzle for inducing a current of air through said casing, and a deflector in front of said casing to deflect said current laterally, of a trough at the exit end of said casing for collecting the water which runs down the walls thereof, and means for carrying away the water collected in said trough without its being taken up by the issuing current of air, substantially as described.

FRANK B. COMINS.

Witnesses:

W. H. THURSTON,
S. J. MURPHY.