

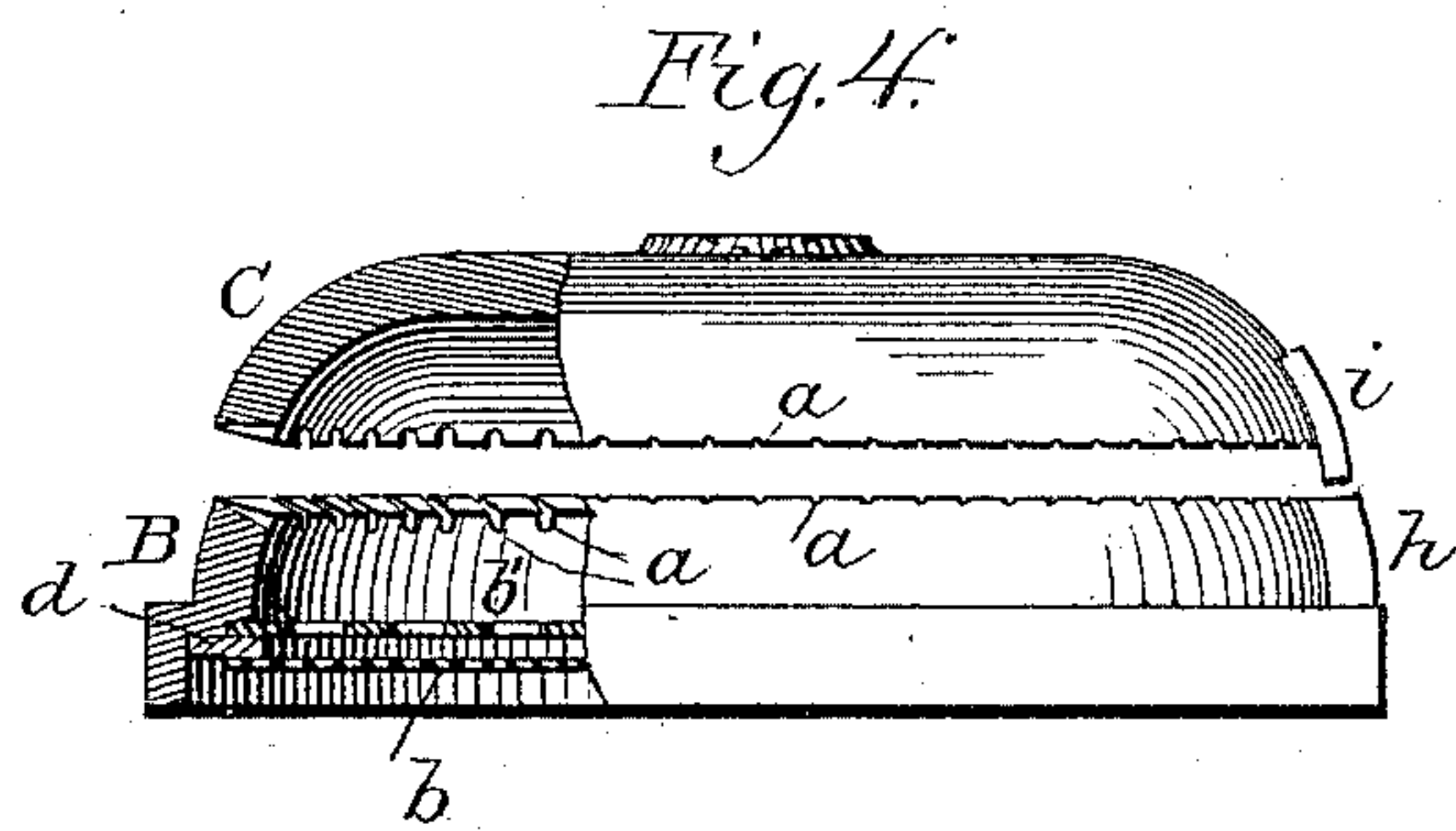
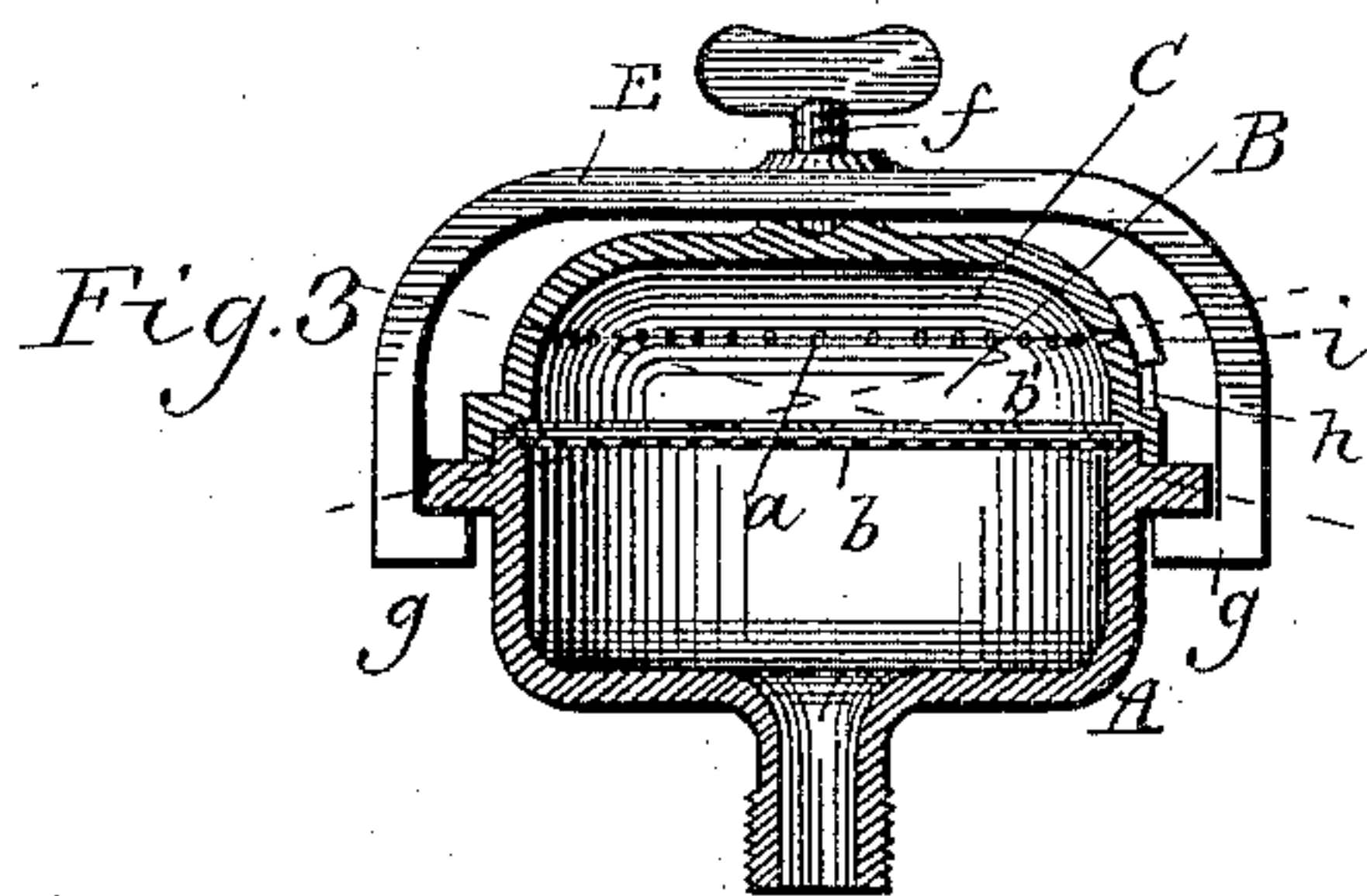
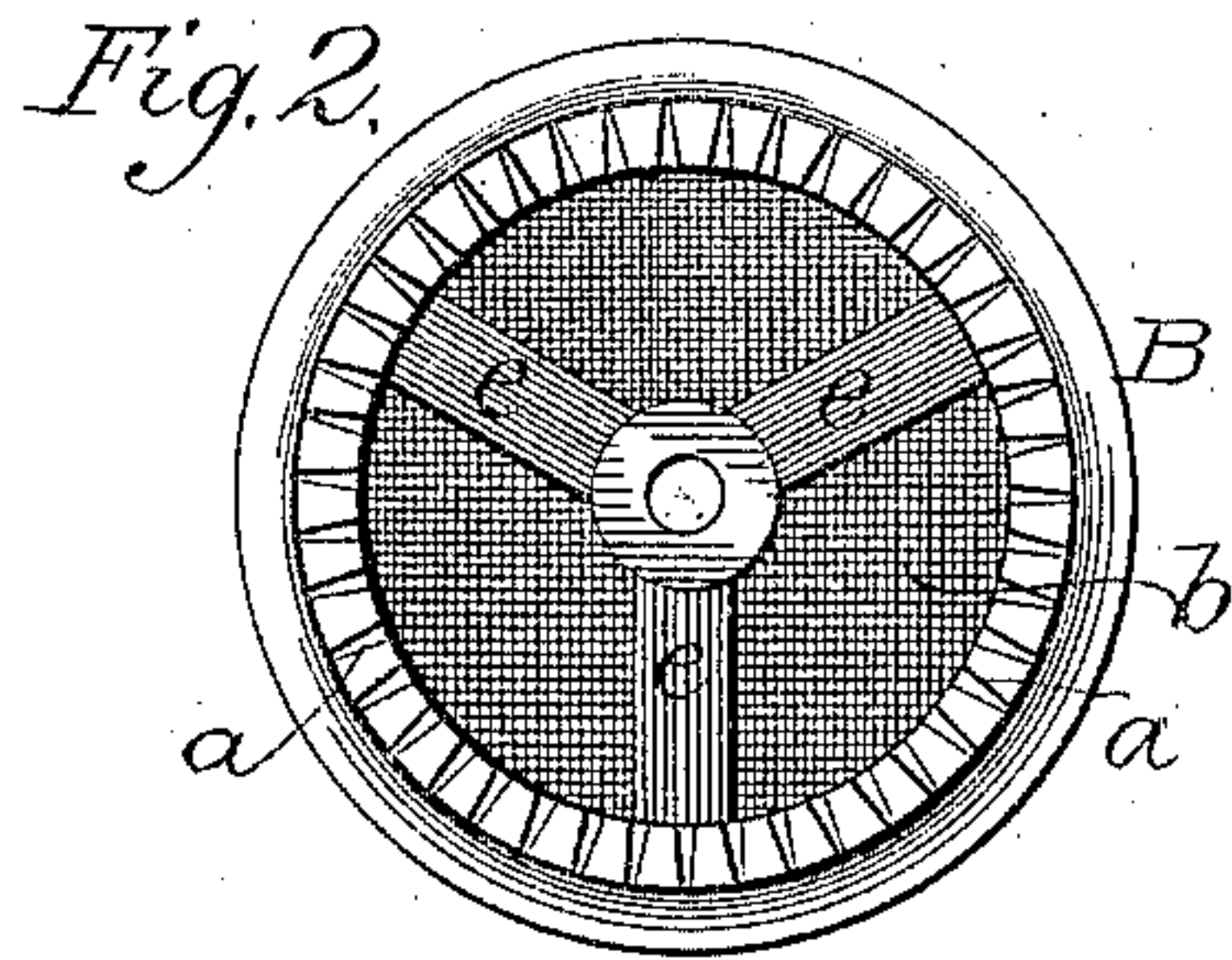
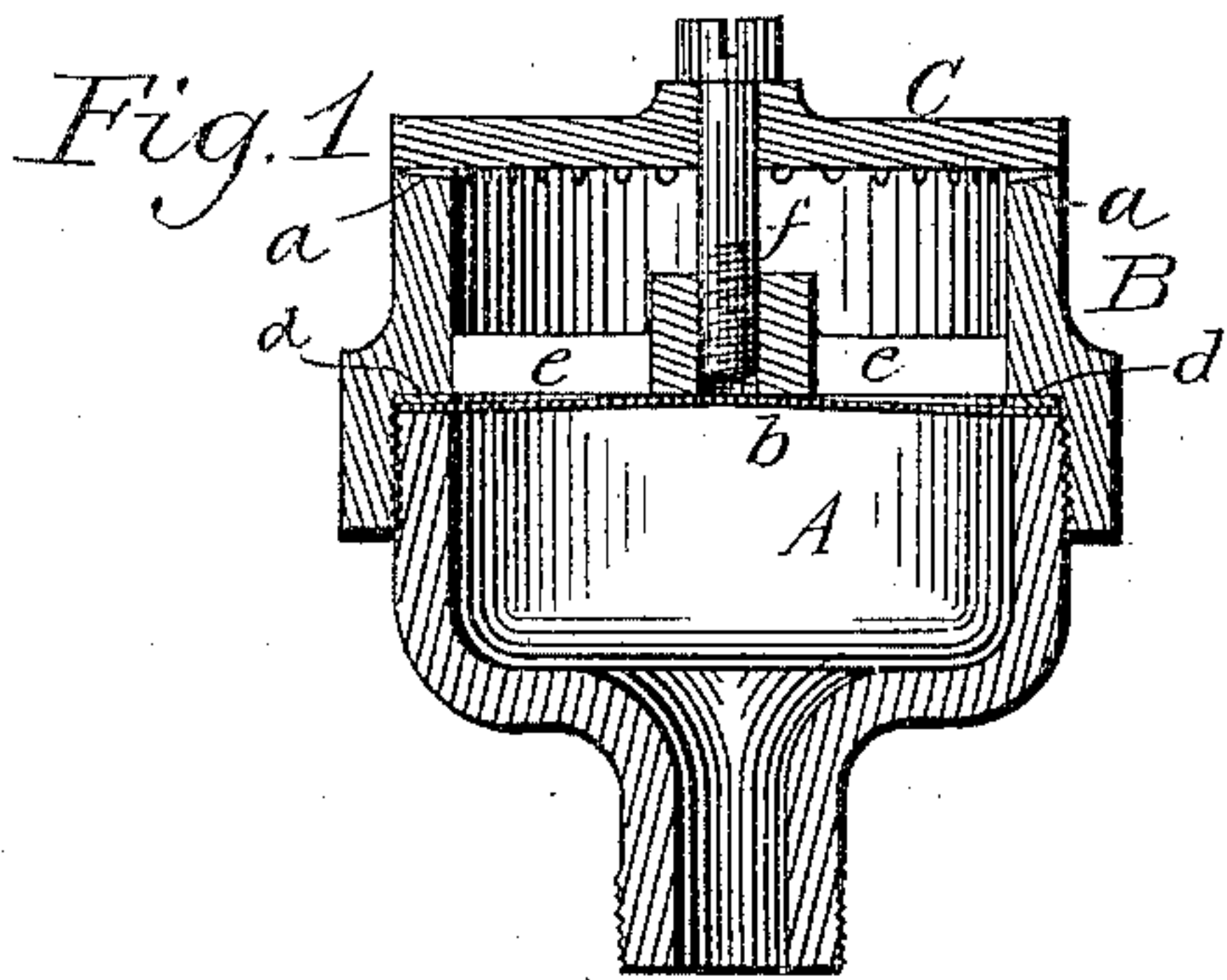
(No Model.)

3 Sheets—Sheet 1.

E. H. C. OEHLMANN.
AIR MOISTENING APPARATUS.

No. 444,940.

Patented Jan. 20, 1891.



WITNESSES

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(No Model.)

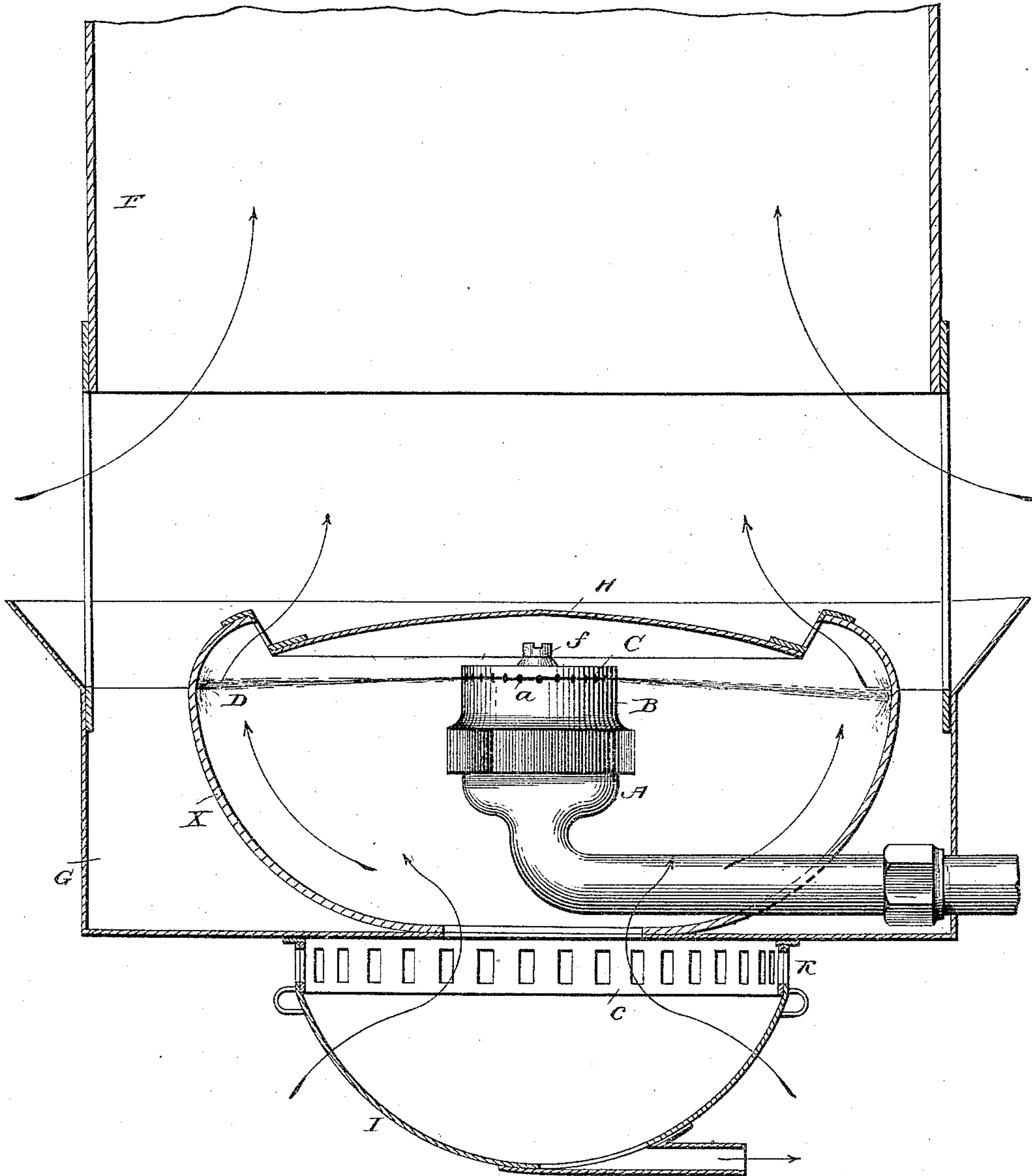
3 Sheets—Sheet 2.

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Fig. 5.



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(No Model.)

3 Sheets—Sheet 3.

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Fig. 6.

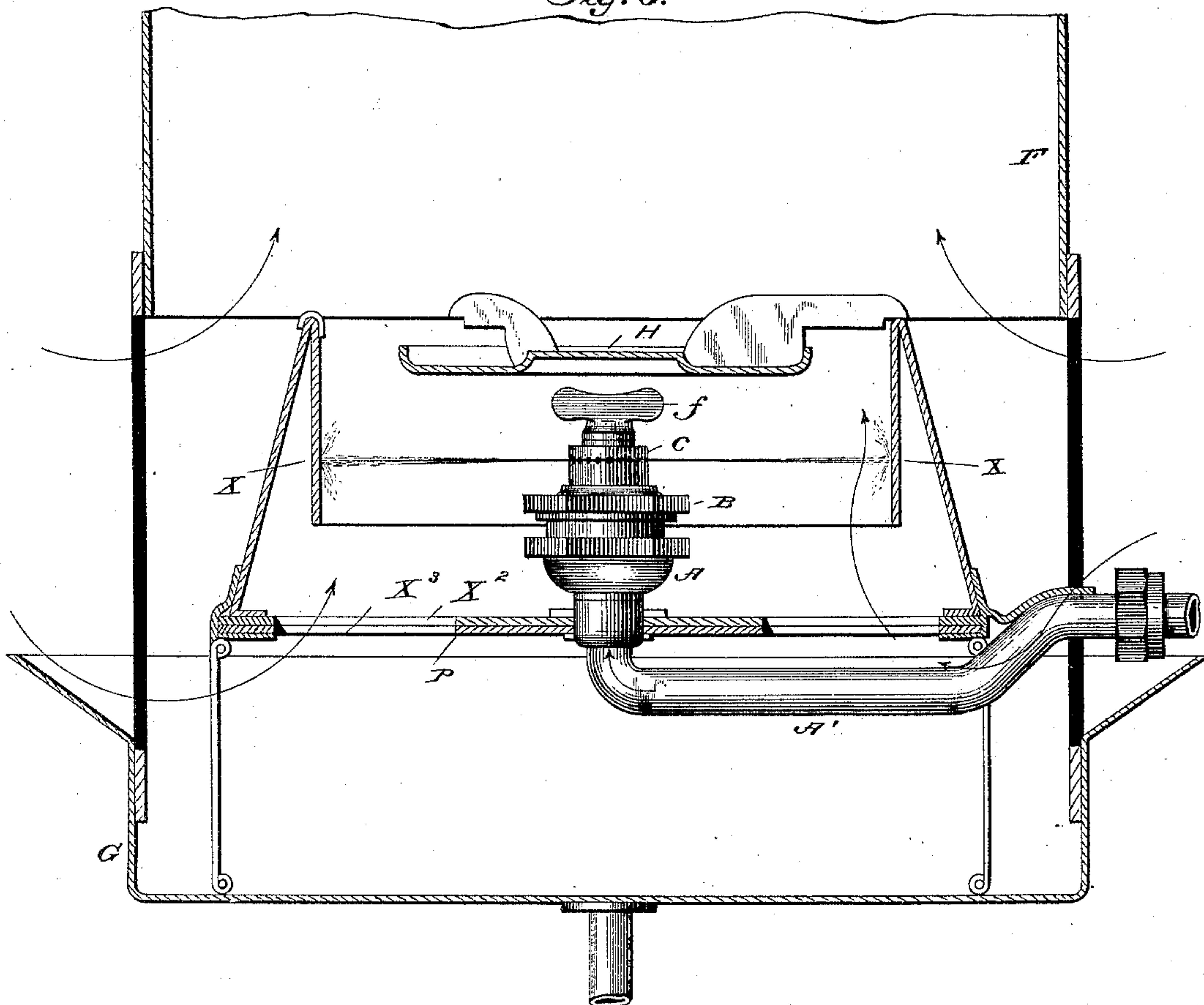


Fig. 7.

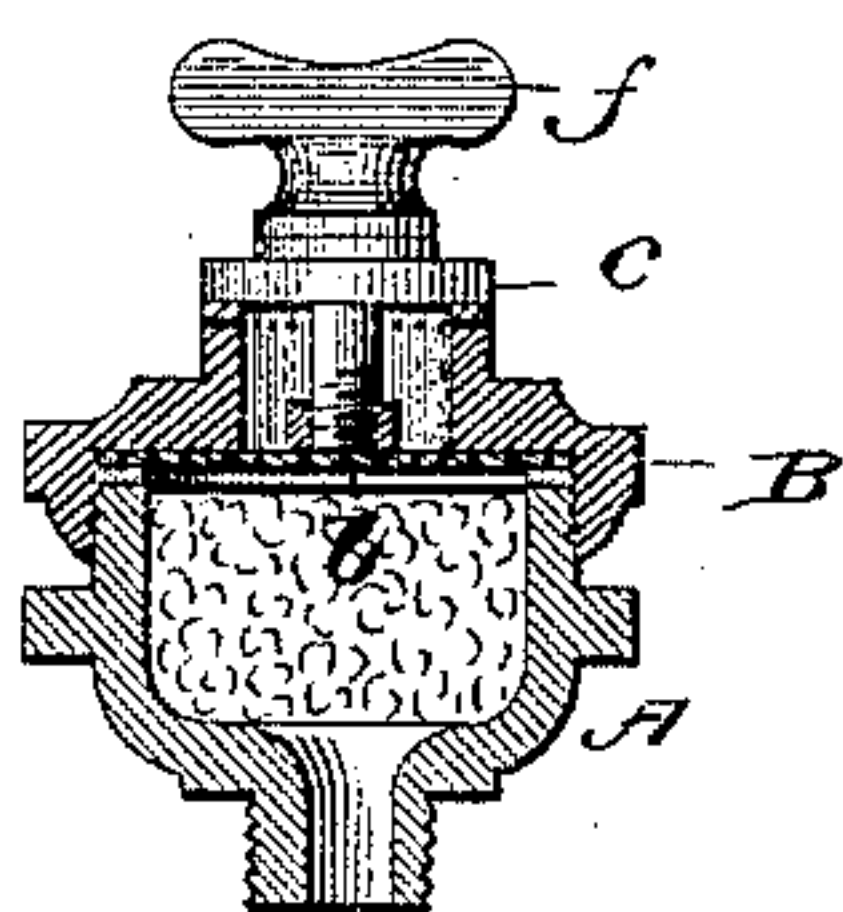
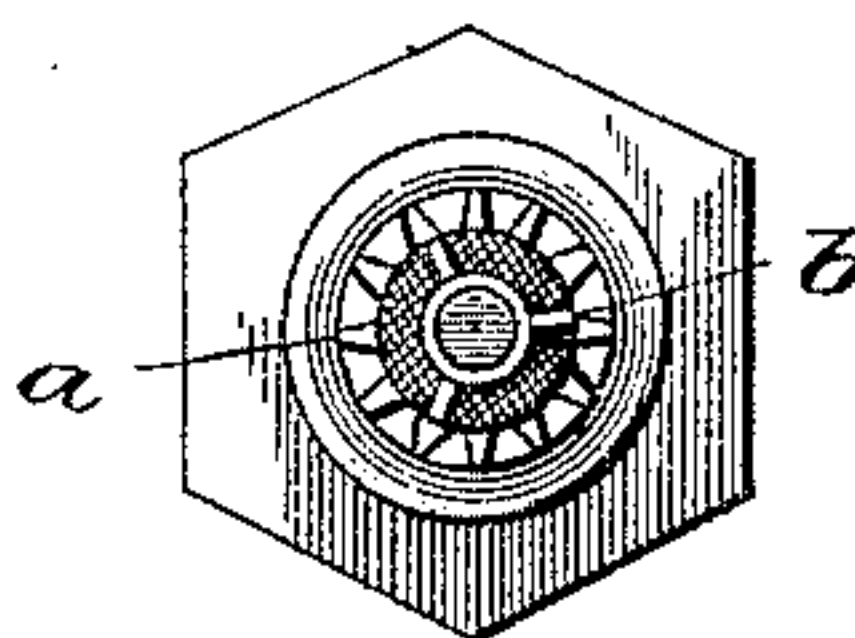


Fig. 8.



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UNITED STATES PATENT OFFICE.

EMIL HEINRICH CONRAD OEHLMANN, OF BERLIN, GERMANY, ASSIGNOR TO
THE UNITED STATES AÉROPHOR AIR MOISTENING AND VENTILATING
COMPANY, OF BOSTON, MASSACHUSETTS.

AIR-MOISTENING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 444,940, dated January 20, 1891.

Application filed May 4, 1888. Serial No. 272,761. (No model.) Patented in England December 28, 1887, No. 17,852; in Belgium January 31, 1888, No. 80,166; in France March 20, 1888, No. 187,976; in Luxemburg April 24, 1888, No. 982; in Spain April 30, 1888, No. 7,787; in Italy May 3, 1888, No. 22,899/462; in Austria-Hungary June 1, 1888, No. 50,479 and No. 11,346; in Germany July 17, 1888, No. 44,744, and in Switzerland January 21, 1889, No. 56.

To all whom it may concern:

Be it known that I, EMIL HEINRICH CONRAD OEHLMANN, of the city of Berlin, in the Empire of Germany, have invented certain
5 new and useful Improvements in Air Moistening and Ventilating Apparatus, (for which I have obtained Letters Patent in Germany, No. 44,744, dated July 17, 1888; in Switzerland, No. 56, dated January 21, 1889; in Austria-Hungary, No. 50,479 and No. 11,346, dated
10 June 1, 1888; in France, No. 187,976, dated March 20, 1888; in Belgium, No. 80,166, dated January 31, 1888; in Italy, No. 22,899/462, dated May 3, 1888; in Great Britain, No. 17,852,
15 dated December 28, 1887; in Spain, No. 7,787, dated April 30, 1888, and in Luxemburg, No. 982, dated April 24, 1888,) of which the following is a specification.

In order to moisten the air, as required in
20 spinning-mills, very fine sprays of water projected from several nozzles are caused to impinge against suitable surfaces, and the fine cloud of water particles thus obtained is introduced along with the air from the venti-
25 lator into the work-rooms.

The apparatus hitherto used have serious disadvantages both in the heavy construction of the spraying device and also in the connection of the latter with the ventilating
30 apparatus. The light and speedy cleaning of the nozzles, which should be the case in practice, is not effected, nor is the proper degree of moisture imparted to the air, so that the machinery and other objects in the work-
35 room shall be maintained in an effective state of moisture. All these disadvantages are avoided by the central air-moistening apparatus forming the object of the present invention and in such a manner that, first, any
40 number whatever of nozzle-openings are so united together that the whole of these nozzles is easily accessible and can be cleaned in a short time by brushing them after the lid of the nozzles has been removed, whereas
45 formerly each nozzle had to be cleaned singly by means of a fine needle after the spraying

apparatus had been screwed off; secondly, only the finest spray of water is introduced into the air from the ventilator, for the full current of the latter does not meet the cloud
50 of fine water produced and does not carry away fine and coarse water-spray together and indiscriminately, as has hitherto been the case, but acts upon the dispersed water only partially and with lessened force, so that
55 the air only carries away the finest water particles, while the coarser ones sink down, owing to their gravity, and are collected in a suitable reservoir, and, lastly, it must also be noticed that by reducing the number of noz-
60 zles not only an essential simplification of the apparatus is obtained, but that by the suppression of the cocks that were hitherto necessary a great saving of cost is also ef-
65 fected.

The invention consists in the construction and combination of parts and details, as will be fully described and set forth hereinafter, and then pointed out in the claims.

In the accompanying drawings, Figure 1 is
70 a vertical transverse sectional view of my improved spraying-nozzle. Fig. 2 is a plan view of the same, the cover being removed. Fig. 3 is a vertical transverse section of a modification of the nozzle. Fig. 4 is an en-
75 larged detail side view of parts of the same, parts being broken out and others being in section. Fig. 5 is a vertical transverse sectional view of the air-moistening apparatus provided with my improved nozzle. Fig. 6 is
80 a similar view of a modification of my improved moistening apparatus and nozzle. Fig. 7 is a cross-sectional view of a modification of my improved spraying-nozzle. Fig. 8 is a plan view of same, the corner being removed.
85

Similar letters of reference indicate corresponding parts.

On the body A of the nozzle, Fig. 1, which is connected with the pipe A', bringing the water, is screwed the upper part B, which is
90 closed by the lid C. On the upper edge of said upper part B are arranged the conical

nozzle-openings *a*, each terminating on the outside in a fine aperture, so that after screwing on the lid C small nozzles arranged in a circular line are obtained. The water flowing into the central nozzle issues consequently in fine radial sprays, which strike against stop-surfaces D, Fig. 5, which can be closed or have the shape of a sieve or consist of several plates. These water-sprays are dispersed on striking against these surfaces.

In producing the required fineness of the individual sprays needed to obtain a serviceable dispersing action the apertures of the nozzles are made extremely fine, and it is therefore necessary to retain the impurities which the water under pressure always contains before the latter issues out of the central nozzle. For this purpose there is inserted between the body A of the nozzle and the upper part B a sieve *b*, Fig. 1. This sieve is connected water-tight both with the body A and the upper part B by means of an inlaid packing-ring *d*, Figs. 1, 3, and 4, while the cross-piece *e* in the upper part B takes up the pressure exerted by the water on the sieve and prevents the latter from getting torn. The sieve *b* retains the impurities contained in the water under pressure. If in course of time the nozzle-apertures should become stopped, the lid C, held down by means of the screw *f*, screwed down into the cross *e*, is removed after loosening said screw, and all the nozzle-apertures *a* lie open to examination, so that by means of a brush they can all be easily cleaned at once. The cleaning of all these nozzles does not require any more time than that required formerly to clean one single nozzle. Besides this, the central nozzle requires less room and the cost of its manufacture is far less than that of the dispersing contrivances generally used to produce fine water-sprays, in which a nozzle is required for each spray.

The cleaning of the sieve *b* is effected as easily as that of the nozzle-apertures *a*. For this purpose the upper part B is screwed off the body of the nozzle A. The sieve *b*, which lies now free, can be taken off and brushed off. After replacing the sieve *b* in its former position and screwing on the lid C the central nozzle is again in working order ready for use.

In the central nozzle (shown in section in Fig. 1 and in plan in Fig. 2) the water-jets obtained are directed horizontally. If oblique jets are required, the central nozzle (shown in section in Fig. 3 and in details in Fig. 4 on a larger scale) can be used advantageously. This nozzle consists, likewise, of the body A, the upper part B, and the lid C. The sieve *b* made water-tight by means of the packing-ring *d*, retains likewise the coarser parts or impurities of the water, but does not bear, as in the foregoing construction, against a cross-piece connected with the top part, but against a strong piece of perforated metal *b'*, which take up the pressure of the water and prevents the sieve *b* from getting torn. The

plate *b'* lies on top of the packing-ring *d*, which renders both the body A and upper part B water-tight, so that the water under pressure cannot run around the edges of the sieve *b* and plate *b'*.

In the construction shown in Figs. 3 and 4 the nozzle-apertures *a* are oblique, and the upper edge of the top part B contains one part of the nozzle-apertures, while the lower edge of the lid C contains the other part of the apertures. Thus when the lid C has been removed the parts forming the apertures of the nozzle lie open to view and are easily cleaned by means of a brush. However, as the wear cannot be avoided, and in order that the apertures of the nozzles can be rebored, the direction of the latter is such that after removing the upper part B and the lid C a needle can be introduced in the said apertures, as shown by the dotted lines on Fig. 3.

The body A, the upper part B, and lid C are held together by means of a clamp E, the hooked ends of which rest against the projections *g* of the body A, while the pressure-screw *f'*, passing through the clamp-presses on the lid C.

In order to be able to bring the lid C exactly on the upper part B, so that the parts forming by their reunion the nozzles may be exactly opposite to each other, the upper part B and the lid C are provided with centering-pins or the centering device represented is applied. In the latter case there are arranged on the upper part two flaps *h*, forming a groove. After the openings *a* in the upper part and lid have been worked on, a plate *i*, fitting exactly in the groove left between the flaps *h*, is soldered to the lid C. The plate *i* secures the exact replacement of the lid C on the upper part B always in the same position. The upper part B and the lid C can also be made integral. The nozzle-openings are then not formed in two parts, but bored conical with an acute taper.

In the modification shown at Figs. 5 and 6 the plain screw *f* on the nozzle is replaced by a thumb-screw *f*², which facilitates removing and fastening the cover C. The filling shown at Fig. 10 under the sieve *b* is composed of sponge or other such material, and its function is to assist in retaining the impurities of the water.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a nozzle for an air-moistening apparatus, the combination, with a part surrounding the central passage and having at its top edge an annular flat surface in a plane at right angles to the axis of said passage, of a part having a perfectly flat surface, one of said surfaces having radial grooves, and the said parts or surfaces when compressed together being adapted to form jet-apertures along the lines of the grooves, substantially as shown and described.

2. In a nozzle for an air-moistening appa-

ratus, the combination, with an annular part surrounding the central passage and having a radially-grooved flat surface in a plane at right angles to the axis of the said passage, of a part having a flat surface, said parts or surfaces when compressed together being adapted to form jet-apertures along the lines of the grooves, substantially as shown and described.

3. In a nozzle for an air-moistening apparatus, the combination, with a part surrounding the central passage and having an annular flat surface in a plane at right angles to the axis of said passage, of a top part or cover having a flat surface, one of said surfaces having radial grooves, and of a fastening device adapted to lock the said parts together without causing a grinding of their contacting surfaces, substantially as shown and described.

4. The combination, with the bottom section of a nozzle for an air-moistening apparatus, of a part resting on the same and having an annular flat top surface, of a top part or cover having a flat surface, one of said surfaces being radially grooved, and of a fastening device for locking the bottom section and the upper parts all together, substantially as shown and described.

5. In a nozzle, the combination, with a bottom section, of a wire-netting or sieve resting on the top edge of the same, a top part resting on the sieve and having radial grooves in its top edge, and a cover held on said grooved edge, substantially as herein shown and described.

6. In a nozzle, the combination, with a bottom section, of a sieve or wire-netting resting on the top edge of the same, a top section having radial grooves in its top edge, a cover held on said grooved edge, and a fastening device for locking the bottom section, top section, and cover together, substantially as herein shown and described.

7. In an air-moistening apparatus, the combination, with a suitable impingement or stop surface, of a nozzle having two flat surfaces, one of said surfaces being radially grooved.

8. In an air-moistening apparatus, the combination, with a suitable stop-surface, of a nozzle having two flat surfaces, one of said surfaces being radially grooved, together with a fastening device, substantially as described, for holding the two surfaces together.

9. In an air-moistening apparatus, the combination, with a nozzle consisting of two flat surfaces, one of which is radially grooved, of a stop-surface completely surrounding said nozzle, said stop-surface being substantially perpendicular to the spray issuing from said nozzle.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EMIL HEINRICH CONRAD OEHLMANN.

Witnesses:

B. ROI,

ALEX. SCHOLZE.