

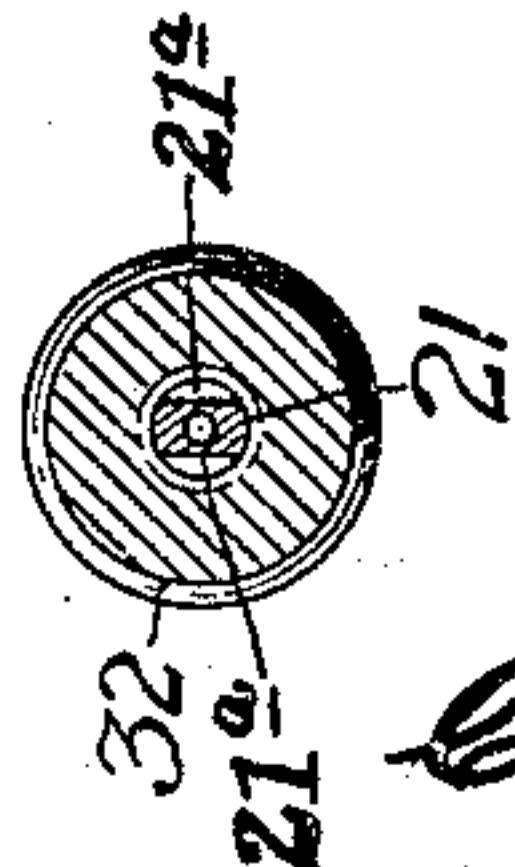
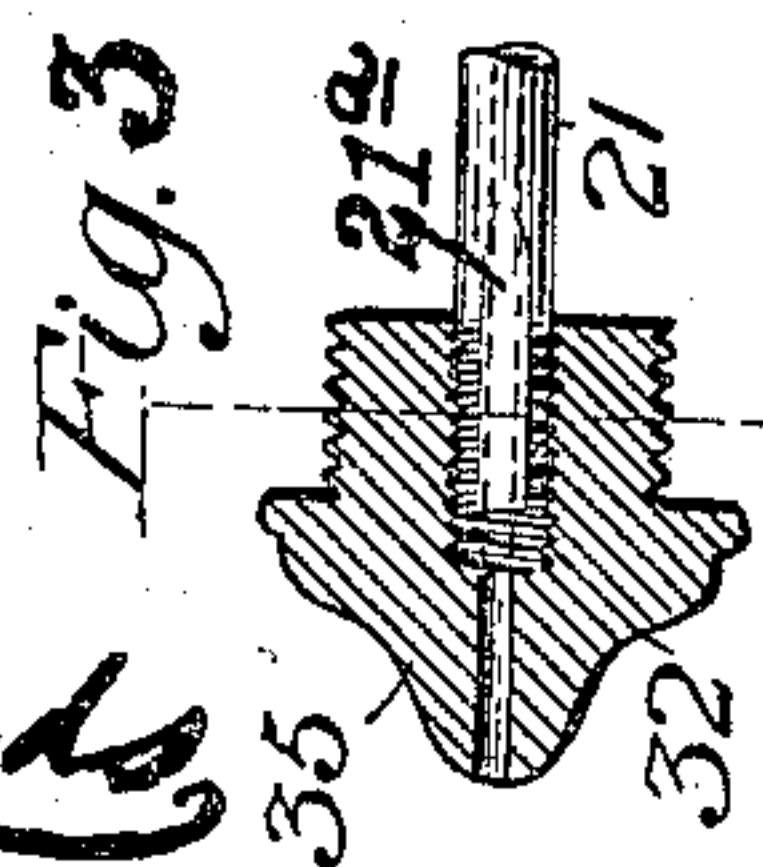
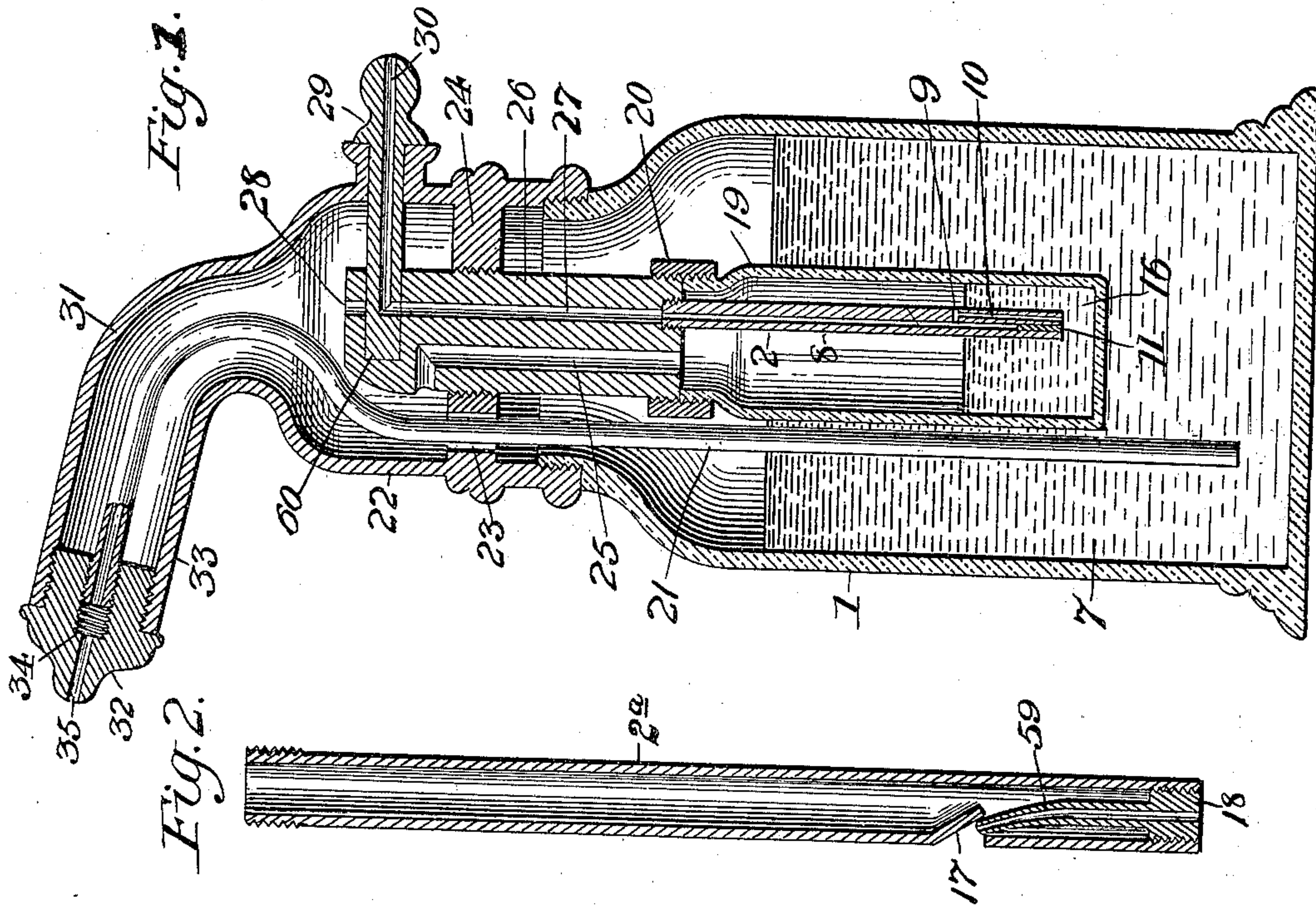
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C. J. SELTZER.
ATOMIZER AND NEBULIZER.

(Application filed Apr. 17, 1899.)

(No Model.)



Witnesses:
Chas. A. Edwards
John G. Butler

Inventor:
C. J. Seltzer
Edw. Myers, atty

UNITED STATES PATENT OFFICE.

CYRUS JAY SELTZER, OF PHILADELPHIA, PENNSYLVANIA.

ATOMIZER AND NEBULIZER.

SPECIFICATION forming part of Letters Patent No. 638,481, dated December 5, 1899.

Application filed April 17, 1899. Serial No. 713,273. (No model.)

To all whom it may concern:

Be it known that I, CYRUS JAY SELTZER, of the city of Philadelphia and State of Pennsylvania, have invented a new and useful
5 Combined Atomizer and Nebulizer, of which the following is a specification.

My invention relates to a combined atomizer and nebulizer—that is to say, to an apparatus from which liquid may be ejected
10 either in the form of a jet of spray or in a nebulous or cloudy condition; and it consists in the mechanism as hereinafter described and claimed.

In the accompanying drawings, forming
15 part of this specification, Figure 1 is a central vertical sectional view of my combined atomizer and nebulizer. Fig. 2 shows, on an enlarged scale, a modification of the tube constituting a part of the nebulizer. Fig. 3
20 shows in longitudinal and transverse section my improved atomizing-tip.

Like figures of reference indicate like parts in each.

My combined atomizer and nebulizer consists of an outer receptacle 1 for the liquid to
25 be atomized, an inner receptacle 19 for the liquid to be nebulized, and their coöperating parts.

26 is a block of any suitable material provided with the passages or channels 25, 27, 28,
30 and 60. The nebulizer-tube 2, of hard rubber, metal, or other suitable material, is secured to the lower end of the block 26, with its channel 8 in communication with the chan-
35 nel 27, and the receptacle 19 is secured to the block 26 in such manner that the channels 25 and 27 are in communication with its interior. As shown, the elements 19 and 26 are
40 secured together by means of a screw-threaded sleeve 20; but it is obvious that other suitable securing means may be employed. The tube 2 is provided with a central passage 8,
45 and a jet-passage 9 is drilled through one wall of the tube at a suitable point in its length, and the passage 10 is drilled from the bottom of the tube to the jet-passage 9. The bottom of the passage 8 is closed by a plug
50 11, of any suitable material, which may be secured in place in any desired manner, as by screwing in, driving in, cementing, &c.

21 and 31 are respectively the usual inner

or liquid tube and the outer tube of an atomizer.

22 is a cap attached to the top of the receptacle 1 and provided with a portion 24. 55

23 is an aperture through the portion 24, through which passes the tube 21. The aperture 23 is made larger than said inner tube 21 to afford an air-passage between the exterior of the tube and the walls of the aper-
60 ture.

29 is a device, in the nature of a three-way cock or valve, mounted in the passage 60, extending through the wall of the cap 22.

32 is my improved form of tip for use when
65 the device is to be used as an atomizer. It is secured in place by screw-threads 33 and 34, engaging, respectively, corresponding threads on the interior of the tube 31 and the exterior of the tube 21. It will be noticed
70 that the tube 21 extends some distance within the tube 31 and that its end is flattened on opposite sides, as shown at 21^a in Fig. 3.

The operation of the apparatus is as follows:
When it is desired to employ it as a nebulizer
75 to nebulize the liquid 16 in the receptacle 19, the tube or tip 32 is removed and the cock 29 is turned to the position shown in the drawings, with the passage 30 communicating, re-
80 spectively, at its ends with the air-supply and the passage 27. Air is then forced through the passages 30 and 27 into the passage 8 and is deflected outwardly with considerable velocity through the jet-passage 9. This cur-
85 rent of air flowing across the top of the liquid-passage 10 produces a partial vacuum or reduction of pressure therein, which causes the liquid to rise through said passage into the jet-passage 9, whence it is ejected, with
90 the air-current, in the form or condition of fine spray. The jet-passage is arranged to cause the issuing jet of spray to impinge against the adjacent interior wall of the receptacle 19, thus further disintegrating or dividing the
95 particles of liquid composing the spray and causing them to assume the form or condition of an exceedingly fine mist, vapor, or cloud. This nebulized liquid escapes from the upper portion of the receptacle 19 through the pas-
100 sage 25 and issues from the mouth of the tube 31.

When it is desired to employ the apparatus

as an atomizer, the tip 32 is secured in position, as shown in the drawings, and the cock 29 is turned through an angle of one hundred and eighty degrees, bringing the passage 30 into communication with the passage 28. Air is then forced through the passages 30 and 28 into the interior of the cap 22. Here a portion of the air escapes through the tip 32 by means of the small passages 21^a, provided by the flattened sides of the end of the tube 21, and the other portion of the air passes through the aperture 23 into the receptacle 1, where it exerts sufficient pressure on the surface of the liquid 7 contained therein to force a portion of it up through the tube 21 into the tip 32. The air passing through this tip, as just described, sprays the liquid in the usual manner, the spray issuing from the small orifice 35.

Fig. 2 illustrates a modification of the nebulizer-tube in which the tube 2^a is formed of any suitable material, as hard rubber, metal, glass, paraffined fabric, &c. A slit is made through the wall of the tube of sufficient size to permit the inclined lip 17 to be formed. The lip 17 is then bent inwardly substantially to the position shown, the material composing the tube being heated or otherwise suitably manipulated in bending, if necessary. A plug 18, carrying a tip 59, is then secured in the bottom of the tube 2^a by screw-threads, cement, &c. The plug 18 is arranged to bring the end of its tip in a position relatively to the bottom edge of the lip 17 substantially as shown. A continuous channel is formed throughout the length of the plug and its tip and opens at the end of the tip and the bottom of the plug, as shown. The tube just described is secured in the block 26 in the same manner as is the tube 2. (Shown in Fig. 1.)

Other modifications may be made in the form and dimensions of the various parts without departing from the spirit of the invention or sacrificing any of its advantages.

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

1. A nebulizer-tube consisting of a rod, an air-passage of substantially large diameter extending from the top of the rod nearly to its bottom, an inclined lip formed by deflecting a portion of the wall, or periphery, of said rod inwardly into said air-passage at a suitable distance above the bottom of the air-passage, a projection located entirely within said air-passage and extending upwardly from the bottom thereof, said projection arranged with

its upper end outside of said inclined lip, and a passage for the liquid extending through said projection and through the bottom of said rod, substantially as described.

2. A combined atomizer and nebulizer consisting of an outer receptacle for containing the liquid to be atomized, an inner receptacle containing the liquid to be nebulized, an atomizer means contained in said outer receptacle, a nebulizer-tube contained in said inner receptacle, and means for conveying air from a suitable supply source to either the inner tube or the outer receptacle, substantially as shown and described.

3. A combined atomizer and nebulizer consisting of a receptacle 1 for the liquid to be atomized, a receptacle 19 for the liquid to be nebulized located within the before-specified receptacle, a cap 22 closing the top of the receptacle 1 and provided with a portion 24, a discharge-tube 31 carried by said cap and communicating therewith above said portion 24, an aperture 23 in said portion 24, a liquid-tube 21 of smaller external diameter than the aperture 23 and arranged to pass through said aperture, said tube 21 arranged with its lower end suitably located within receptacle 1 and its upper portion extending within the outlet-tube 31 the upper end of tube 21 being located adjacent to the upper end of tube 31 and provided with flattened portions, a spray-tip 32 detachably secured to the adjacent upper ends of the tubes 21 and 31 and constructed to provide a communication along the flattened portions of tube 21 between the interior of tube 31 and the discharge-orifice of said tip, a second aperture in the portion 24 of said cap, a block 26 extending through said second aperture and secured therein by an air-tight joint, means for securing receptacle 19 to said block, passages 25 and 27 in said block communicating at their lower ends with the interior of receptacle 19, a nebulizer-tube located within said receptacle 19 and having its air-passage in communication with passage 27, a passage, or recess, 60 in said block 26 and arranged in communication with the top of passage 27, a two-way cock, or valve, 29 rotatably mounted in said recess 60 and provided with a passage 30, a passage 28 in block 26 arranged in line with the passage 27 and communicating at its lower end with the recess 60, substantially as described.

CYRUS JAY SELTZER.

Witnesses:

MALCOLM LLOYD, Jr.,
EDWARD S. LOWER.