No. 721,723. PATENTED MAR. 3, 1903.

J. C. MURPHY.

CARBONATING APPARATUS.

APPLICATION FILED JUNE 22, 1901.

NO MODEL. 3 SHEETS—SHEET 1.

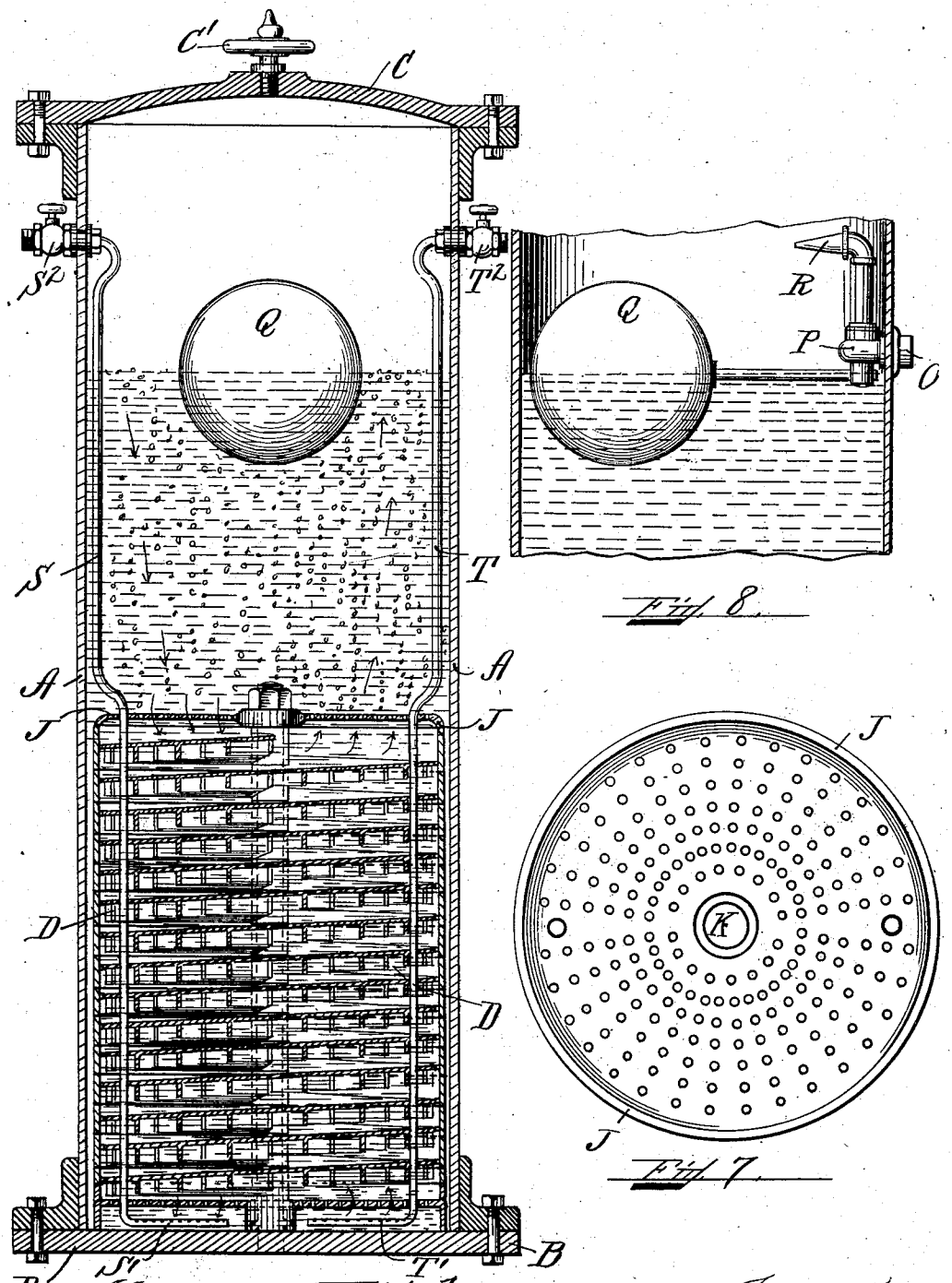


Fig 1.

Fig 8.

Fig 7.

Witnesses.
A. L. Wesser
C. A. Stewart.

Inventor
John C. Murphy
By J. S. Rusk
Atty

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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NO MODEL. 3 SHEETS—SHEET 2.

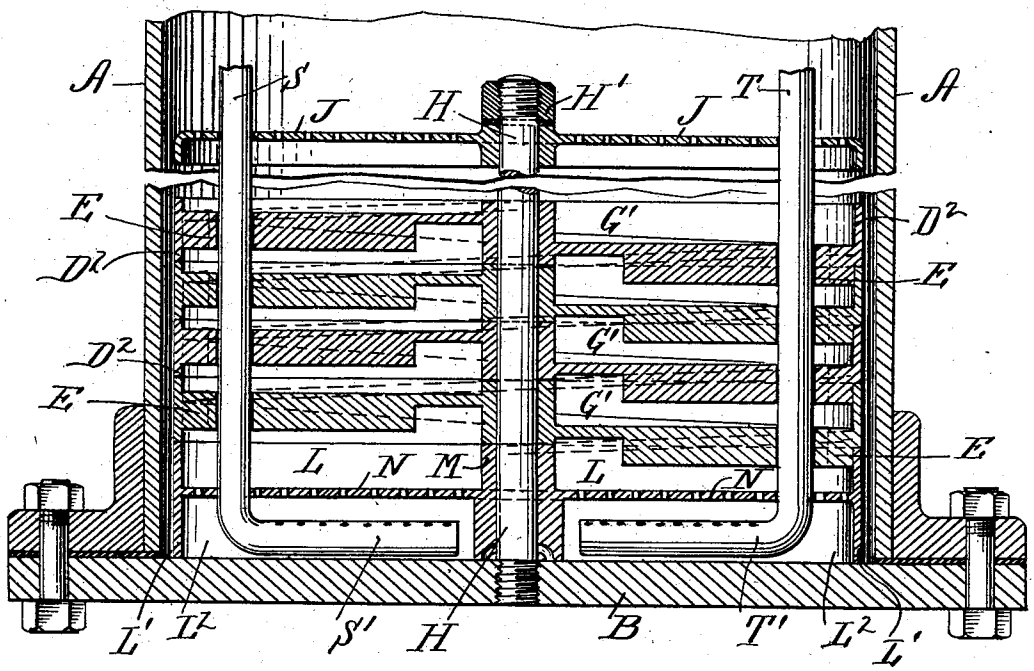


Fig. 2.

Witnesses:
A. L. Wesner
C. A. Stewart.

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John C. Murphy
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NO MODEL. 3 SHEETS—SHEET 3.

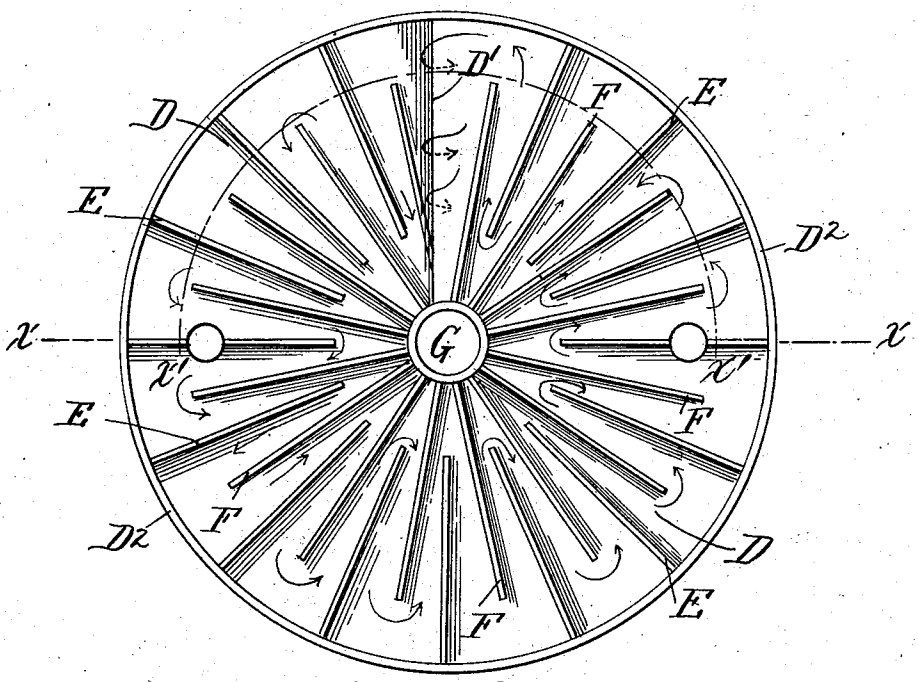


Fig. 3.

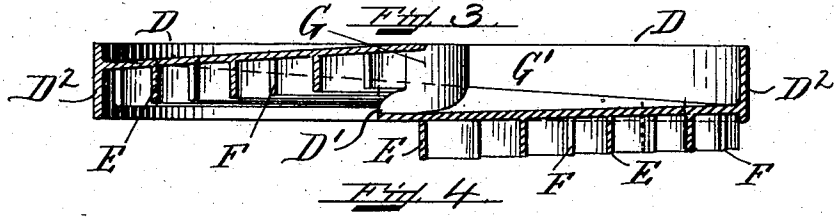


Fig. 4.

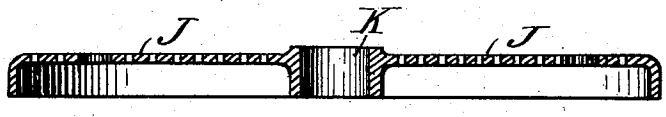


Fig. 5.

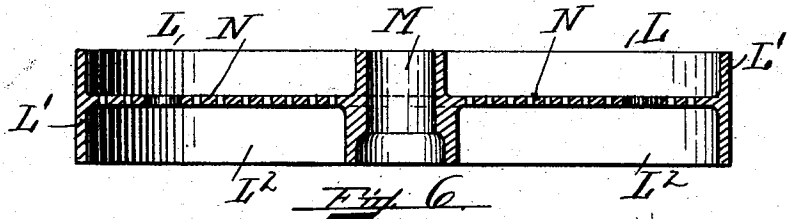


Fig. 6.

Witnesses:
C. L. Wenner
C. A. Stewart.

Inventor:
John C. Murphy
By J. S. Rusk
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN C. MURPHY, OF CHELSEA, MASSACHUSETTS.

CARBONATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 721,723, dated March 3, 1903.

Application filed June 22, 1901. Serial No. 65,553. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. MURPHY, of Chelsea, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Carbonating Apparatus, of which the following is a specification.

My invention relates to new and useful improvements in carbonating water or other liquids; and its object is to produce an efficient apparatus which shall cause a thorough mechanical combination of the liquid to be carbonated and the carbonic-acid or other gas.

My invention consists of certain novel features hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, which illustrate a construction embodying my invention, Figure 1 is a vertical sectional view through my improved apparatus. Fig. 2 is a sectional view of the lower part of the apparatus on the line X X, Fig. 3. Fig. 3 is a plan view of the under side of one of the sections. Fig. 4 is a sectional view of one of the sections on the line X′ X′, Fig. 3. Fig. 5 is a sectional view through the upper plate. Fig. 6 is a sectional view through the base-section and its perforated plate. Fig. 7 is a plan view of the upper plate. Fig. 8 is a detail view of the usual water-feed device controlled by a valve operated by a float.

Like letters of reference refer to like parts throughout the several views.

In the drawings, A represents a casing of the carbonating apparatus, preferably in cylindrical form and provided with a base-plate B and an upper plate C, connected to the casing A by suitable bolts, and in the upper plate C is located the usual air-valve C′. Within the casing A there is located a series of sections D, each provided on its upper surface with a spiral water-passage G′ and on its under surface with a series of ribs E, extending inwardly from the flange D^2, and a series of ribs F, extending outwardly from the hub G. In each section there is provided an opening D′, through which the water passes downwardly from the water-passage G′ of one section to the water-passage G′ of the lower section, and through the opening D′ the gas-bubbles pass upwardly from the bottom of each section after traversing a zigzag course around the ribs E and F, as indicated by arrows, Fig. 3.

The assembling of the sections for carbonating water or other liquids is shown in Fig. 2, the flanges D^2 resting upon one another, as shown, and the flange D^2 of the lowest section D rests upon the flange L′ of the base-section L, provided with a perforated plate N, extending from the hub M outwardly in all directions to the flange L′, so as to form a permeable barrier and retard the upward and downward movement of the gas and water. On the top of the upper section D the perforated plate J rests, as shown in Fig. 1, which likewise retards the upward and downward movement of the gas and water and is provided with a central hub K To connect the sections together, they are arranged as shown in Figs. 1 and 2, and a suitable bolt H passes through the hubs K, G, and M and is screwed into the base-plate B, and a suitable nut H′ is screwed onto the upper end of the bolt H, and the sections are thus secured together and form a compact mixing-chamber for the liquid and gas.

The liquid to be carbonated passes through the water-inlet O, controlled by a suitable valve P, adapted to be opened by the float Q as the water falls and to be closed by the float Q as the water rises, and when the water falls fresh water to be carbonated enters through the inlet O and through the spray-nozzle R, so that the water is automatically fed as the accumulation reduces. The gas for carbonating the water or other liquid enters through the pipe S, controlled by a suitable valve S^2, and enters the chamber L^2 in the base-section L below the perforated plate N and passes up through said plate N to the first section D, where it takes a zigzag course around the ribs E and F of the lower section D and passes up through the opening D′ of the lower section into contact with the bottom of the next section and then passes around the ribs E and F of that section, and so on to the top, meeting in its upward course the water which is passing down, so that the water and gas meet, passing in opposite directions, and are constantly in contact. The water takes a downward spiral course from the top section D to the base-section L, while the gas takes an upward spiral course

from section to section and also a zigzag course under the bottom of each section. The perforated plate J and the perforated plate N in the section L break up the gas into minute globules upon its introduction through the pipe S into the chamber L^2 through the perforated end S', and its travel is retarded and lengthened by taking a zigzag course around the ribs on the bottom of each section and a spiral course from one section to another. The carbonated liquid is delivered for use through the pipe T, having its lower end T' perforated, and said pipe is controlled by a suitable valve T^2 on the outside of the casing A. By this construction new volumes of water are brought into contact with new gas traveling in the opposite direction to give time for absorption and lengthening the time and distance the gas and water travel. The water is minutely divided by the upper plate J and lower plate N, and the gas is more readily absorbed by large quantity of water, the sections increasing the length of time of passage from the bottom to the top of both the water and gas, which circulate and thus form a thorough mechanical combination within the apparatus and give a better and more complete absorption of the gas by the water.

I do not limit myself to the arrangement and construction shown, as the same may be varied without departing from the spirit of my invention.

Having thus described the nature of my invention and set forth a construction embodying the same, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In an apparatus of the class described, a liquid-inlet, a gas-inlet, a series of connected sections forming a mixing-chamber for the liquid and gas, each section having its bottom formed in the shape of a spiral and a series of ribs projecting from the under side of the bottom, and an outlet for the carbonated liquid.

2. In an apparatus of the character described, a liquid-inlet, a gas-inlet, a series of connected sections forming a mixing-chamber for the liquid and gas, each section having its bottom formed in the shape of a spiral, a set of radial ribs projecting from the under side of the bottom and extending from the center toward the periphery of the section and a second series of ribs projecting from the under side of the bottom and extending from the periphery of the section toward its center, and an outlet for the carbonated liquid.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 18th day of June, A. D. 1901.

JOHN C. MURPHY.

Witnesses:
A. L. MESSER,
C. A. STEWART.