

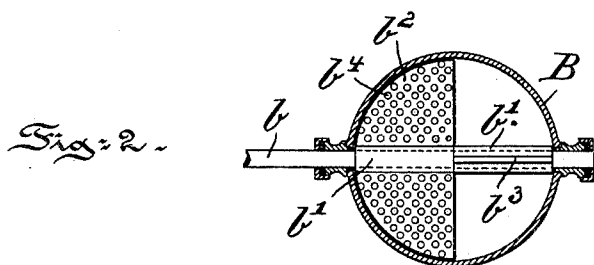
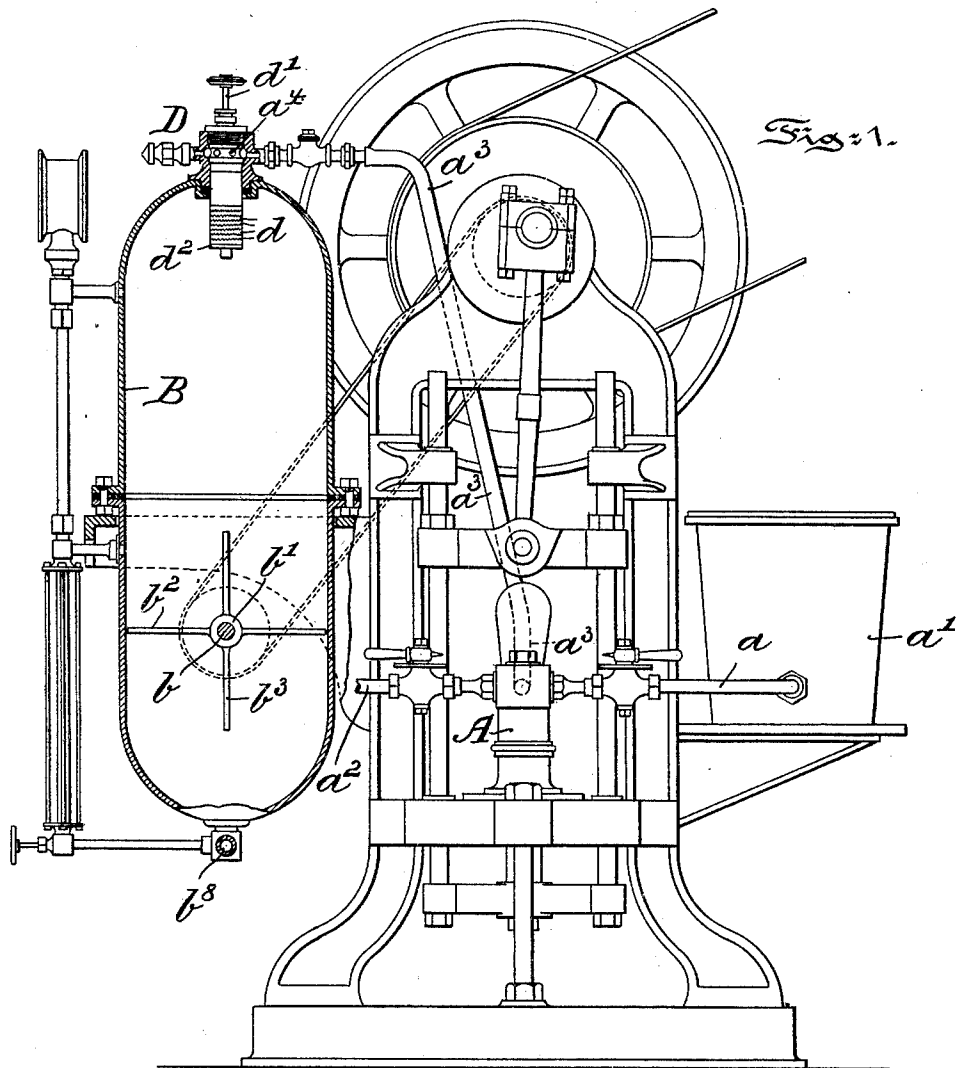
(No Model.)

2 Sheets—Sheet 1.

S. TWITCHELL.
APPARATUS FOR CARBONATING LIQUIDS.

No. 586,577.

Patented July 20, 1897.



Witnesses:
Thomas M. Smith.
Richard C. Massey.

Inventor -
Selden Twitchell,
By J. Walter Douglas,
Attorney.

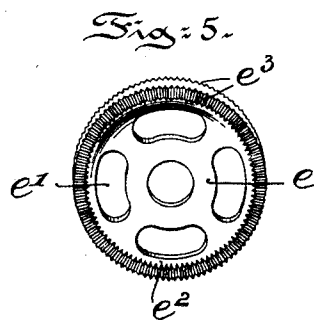
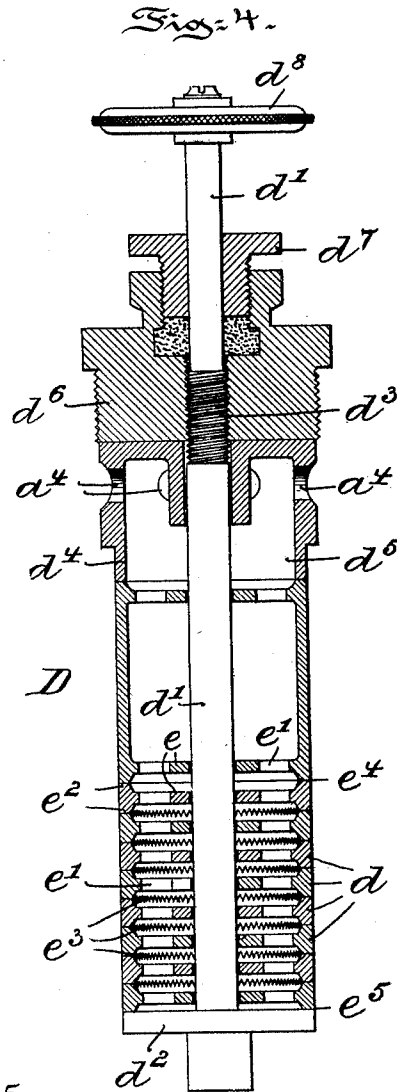
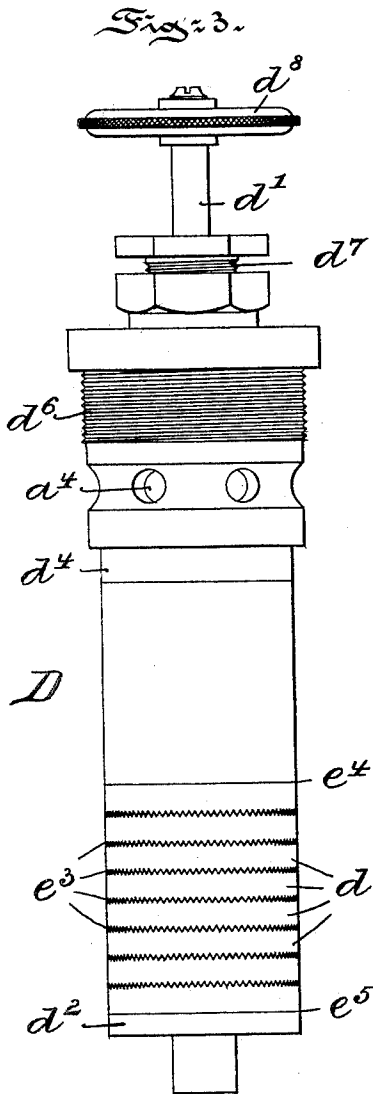
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2 Sheets—Sheet 2.

S. TWITCHELL.
APPARATUS FOR CARBONATING LIQUIDS.

No. 586,577.

Patented July 20, 1897.



Witnesses:
Thomas M. Smith
Richard E. Maxwell

Inventor:
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UNITED STATES PATENT OFFICE.

SELDEN TWITCHELL, OF PHILADELPHIA, PENNSYLVANIA.

APPARATUS FOR CARBONATING LIQUIDS.

SPECIFICATION forming part of Letters Patent No. 586,577, dated July 20, 1897.

Application filed May 3, 1897. Serial No. 634,824 (No model.)

To all whom it may concern:

Be it known that I, SELDEN TWITCHELL, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Apparatus for Carbonating Liquids, of which the following is a specification.

My invention has relation to an apparatus for carbonating liquids of that class wherein a mixture of gas or air and liquid is delivered under pressure from a pump to a spraying apparatus, from which it is sprayed into a receiver, and in such connection it relates to the construction and arrangement of such an apparatus.

The principal object of my invention is to provide in an apparatus for carbonating or aerating liquids a sprayer discharging into a receiver and connected at its upper end with a pipe leading from the pump, delivering a mixture of gas or air and liquid under pressure to the sprayer, the lower end of said sprayer consisting of a series of disks having meeting faces radially notched to permit of the escape of liquid and gas or air in minute films or particles from the periphery of the disks, the body of the disks being perforated to permit the liquid and gas or air to be presented to the notches and connected together in such a manner that they may be drawn toward or separated from each other to permit of a variation in the thickness or minuteness of the films discharged from the sprayer.

My invention, stated in general terms, consists of an apparatus for carbonating liquids, substantially as hereinafter described and claimed.

The nature and scope of my invention will be more fully understood from the following description, taken in connection with the accompanying drawings, forming part hereof, in which—

Figure 1 is a front elevational view of a carbonating apparatus embodying main features of my invention, the receiver being shown in vertical central section to more clearly illustrate the construction and arrangement of the same. Fig. 2 is a horizontal sectional view of the receiver, illustrating in plan the agitating wings or paddles located in the lower portion of the receiver or cylinder. Fig. 3 is

a side elevational view, enlarged, of the spraying device detached from the receiver or cylinder. Fig. 4 is a vertical central section of Fig. 3, and Fig. 5 is a perspective view of one of the disks removed from the spraying device.

Referring to the drawings, A in Fig. 1 represents a mixing-pump of the ordinary type, which is connected by a pipe a with a reservoir a' , containing the liquid or fluid to be carbonated, and also connected by a pipe a^2 with a source of gas or air supply. (Not shown.) From the pump A extends a pipe a^3 , through which the mixed gas or air and liquid or fluid are discharged to a spraying device D, located, preferably, in the upper portion of a receiver or cylinder B.

The spraying device D consists, preferably, of a series of disks d , supported upon a spindle d' , the lower end of which is flanged, as at d^2 , and the upper end threaded, as at d^3 . Above the uppermost disk d of the series is provided an extension d^4 , forming an auxiliary mixing-chamber d^5 , having openings a^4 , into which the pipe a^3 discharges. The spindle d' passes centrally through all the disks d , the extension d^4 , and the chamber d^5 , and is threaded to a cap d^6 , serving to confine the disks, the extension, and the chamber d^5 between the cap d^6 and the flange d^2 . The spindle d' also passes through a gland or stuffing-box d^7 and is provided with a handle d^8 , as clearly illustrated in Fig. 4.

From the above description it will be understood that the disks may be tightened or loosened by means of the spindle d' , which in turning will either cause the cap d^6 and flange d^2 to approach each other to clamp the disks more tightly together or will cause the cap and flange to separate to thus permit the disks to separate when subjected to internal pressure. Each disk has its web or body e perforated, as at e' , for the passage of the mixed liquid and gas or air from disk to disk and from the extension d^4 to the first disk in series. With, by preference, the exception of the first and last disk in the series each disk d has on both its upper and lower faces an annular rim or flange e^2 , having a series of teeth or notches e^3 , arranged radially around the periphery of the disk, the teeth of contiguous disks meshing with each other, as

illustrated in Fig. 3. The uppermost and lowermost disks in the series have each one face which is not provided with teeth or notches, as indicated at e^4 and e^5 , the unnotched face e^4 of the upper disk resting
 5 against the lower face of the extension d^4 , while the unnotched face e^5 of the lower disk rests upon the flange d^2 of the spindle d .

Through the lower portion of the receiver or cylinder B extends a shaft b , adapted to be
 10 rotated in any suitable manner, and to this shaft b is secured a sleeve b' , to which are fastened in any suitable manner two or more semicircular wings or paddles b^2 and b^3 , ar-
 15 ranged in planes preferably at right angles to each other, as illustrated in Fig. 2. Each paddle or wing is perforated, as indicated at b^4 , to permit of the straining and intimate union of the mixed gas or air and liquid when
 20 churned or agitated by the paddles in the receiver or cylinder B.

In operation mixed liquid and gas or air are pumped from the pipe a^3 through the inlets a^4 of the spraying device D into and through the
 25 upper chamber d^5 thereof and thence into and through the extension d^4 when again mixed. From this extension the carbonated or aerated liquid passes to the disk d , from which it is
 30 sprayed by being forced between the notches of the series of disks, and escaping in a very fine film-like mist or spray into the upper portion or air and gas containing space of the receiver or cylinder B, and falling into the
 35 lower portion of the receiver or cylinder B, in which it is collected. During its passage to the lower portion of the receiver or cylinder the perforated paddles b^2 and b^3 agitate the carbonated or aerated liquid, and thereby
 40 more thoroughly commingle or intimately mix the gas or air and liquid together therein. The carbonated or aerated liquid is drawn off from the bottom of the receiver or cylinder B through an outlet b^8 and delivered to a point for use.

45 It will be observed that the spraying and agitating devices used in conjunction with the receiver or cylinder B are adapted to be so employed as to insure a most intimately-united carbonated liquid by reason of the
 50 manner in which the spraying device delivers the carbonated liquid or aerated fluid in

minute film-like form to the cylinder for re-churning or agitation by the perforated wings or paddles of said agitating device, or these devices may be worked independently of each
 55 other anterior to the discharge of the agitated charged liquid in the receiver or cylinder B.

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—
 60

1. In an apparatus of the character described, a spraying device consisting of a series of loosely-supported superposed disks having contiguous faces provided with radially-arranged interlocking notches through
 65 which liquid and gas or air are adapted to be forced under pressure, substantially as and for the purposes described.

2. In an apparatus of the character described, a spraying device consisting of a series of loosely-supported superposed disks having contiguous faces provided with radially-disposed interlocking notches through
 70 which liquid charged with gas or air is adapted to be forced under pressure, and means for clamping said disks more or less closely together, substantially as and for the purposes
 75 described.

3. In an apparatus of the character described, a spraying device provided with a
 80 spindle having a flanged base, a series of superposed disks loosely supported on said spindle by said base, an extension located on said spindle above said disks and communicating therewith, an inlet-chamber located on the
 85 spindle above said extension and in communication therewith, a cap threaded to said spindle, and means for rotating said spindle in said cap, whereby the disks, extension and inlet-chamber may be clamped more or less
 90 closely together, said disks being provided on contiguous faces with interlocking notches through which charged liquid with gas or air is forced under pressure, substantially as and
 95 for the purposes described.

In testimony whereof I have hereunto set my signature in the presence of two subscribing witnesses.

SELDEN TWITCHELL.

Witnesses:

J. WALTER DOUGLASS,
 THOMAS M. SMITH.