

No. 671,689.

Patented Apr. 9, 1901.

R. COLLINGS & A. C. GRISCOM.  
CARBONATOR.

(Application filed Sept. 18, 1900.)

(No Model.)

Fig. 1.

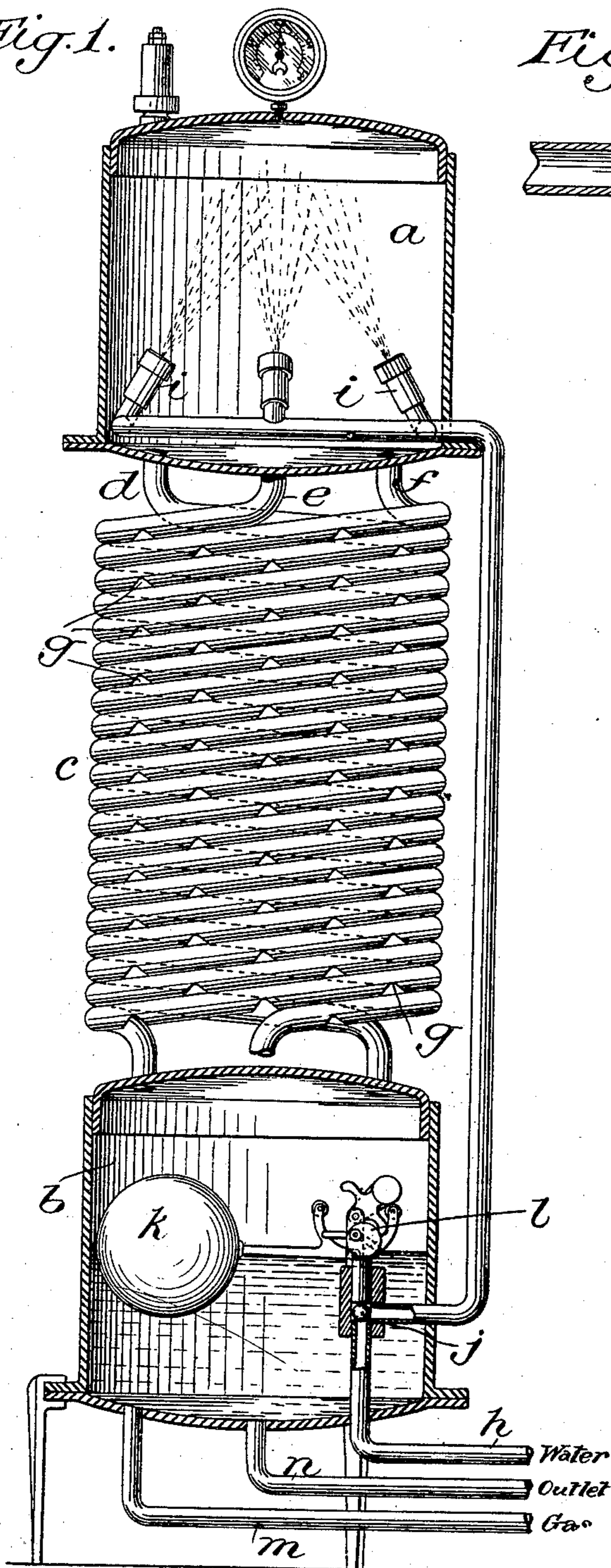


Fig. 2.

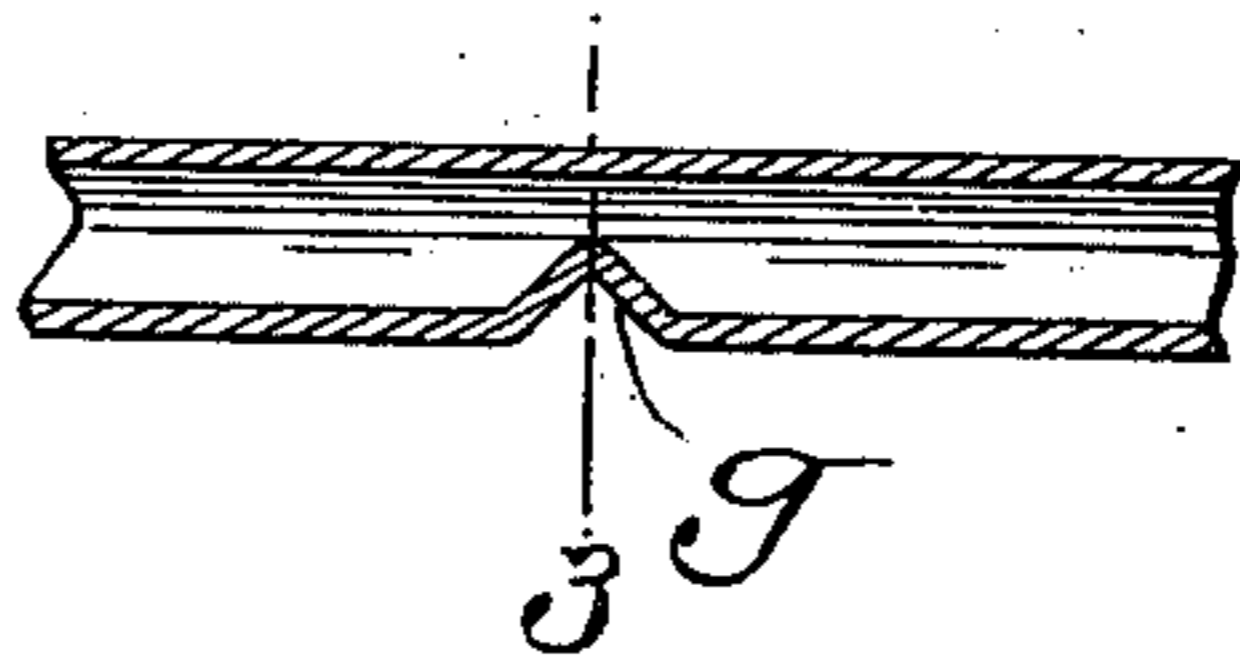


Fig. 3.



Fig. 4.

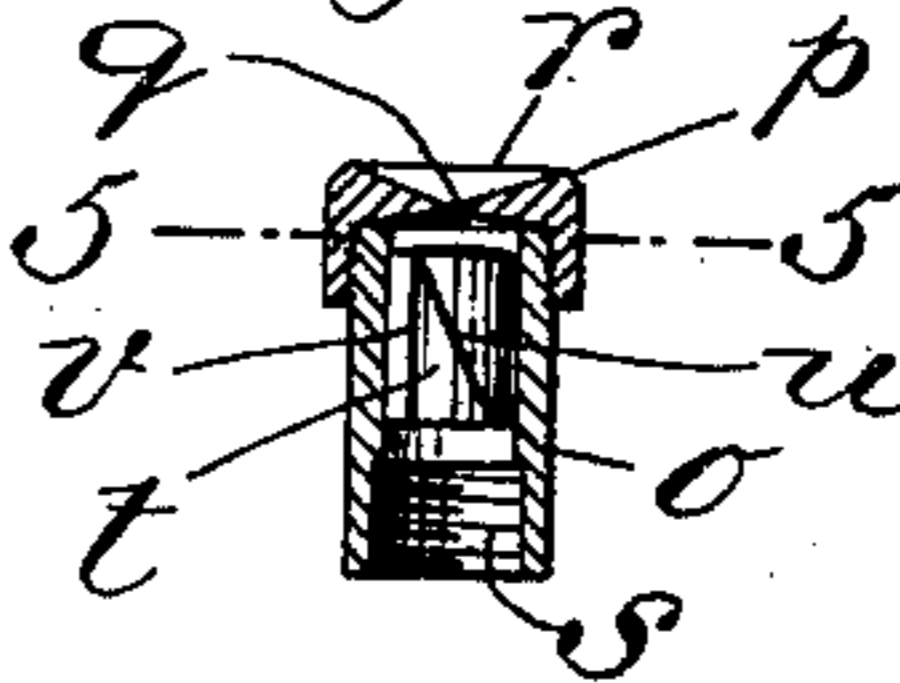


Fig. 5.

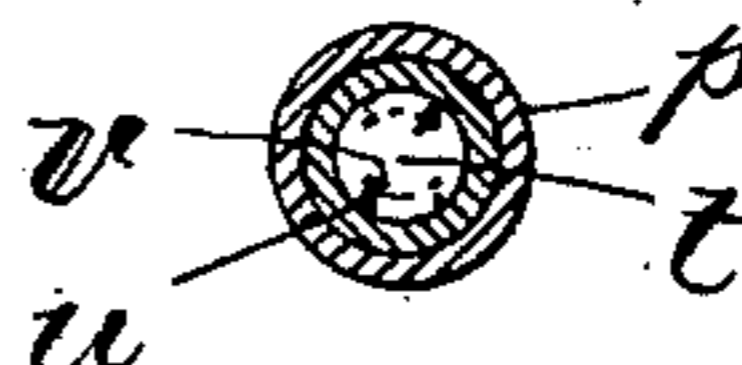
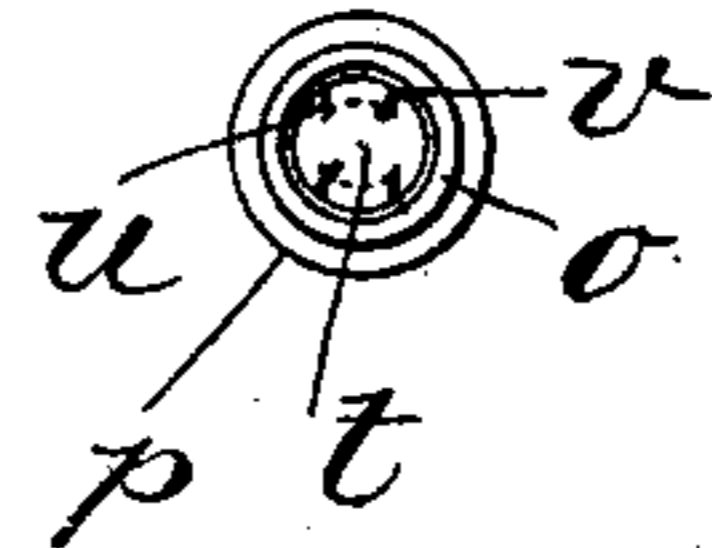


Fig. 6.



Witnesses: { George Barry Jr.  
Edward P. Fisher.

Inventors:-  
Richard Collings  
& Alfred C. Griscom  
by attorney  
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# UNITED STATES PATENT OFFICE.

RICHARD COLLINGS AND ALFRED C. GRISCOM, OF NEW YORK, N. Y.

## CARBONATOR.

SPECIFICATION forming part of Letters Patent No. 671,689, dated April 9, 1901.

Application filed September 18, 1900. Serial No. 30,398. (No model.)

*To all whom it may concern:*

Be it known that we, RICHARD COLLINGS and ALFRED C. GRISCOM, citizens of the United States, and residents of the borough of Manhattan, in the city and State of New York, have invented a new and useful Improvement in Carbonators, of which the following is a specification.

Our invention relates to an improvement in carbonators for general use in charging liquids with carbonic-acid gas.

The object is to provide simple and efficient means for thoroughly impregnating the water or other liquid with the gas and maintaining a supply of the charged liquid ready for use.

A practical embodiment of our invention is represented in the accompanying drawings, in which—

Figure 1 is a view of the carbonator in side elevation, partly in section, showing the arrangement of the several compartments as they appear in use. Fig. 2 is an enlarged view in detail of a portion of the interrupted pipe-coil, showing the same in longitudinal section. Fig. 3 is a view of the same in transverse section on the plane of the line 3 3 of Fig. 2. Fig. 4 is an enlarged view in detail in longitudinal section of one of the spraying-nozzles. Fig. 5 is a transverse section on the plane of the line 5 5 of Fig. 4, and Fig. 6 is a bottom plan view.

*a* represents what we are pleased to call the "mixing-chamber," *b* the reservoir for the charged liquid, and *c* the intermediate pipe-coil through which the liquid is required to travel in passing from the mixing-chamber *a* to the reservoir *b* under the influence of gravity.

The pipe-coil *c* is composed in the present instance of three pipe-sections, (denoted, respectively, by *d e f*,) which are connected at their upper ends with the bottom of the mixing-chamber *a* and at their lower ends with the top of the receiving-chamber *b*. While we prefer the coil as here presented, it is obvious that the number of pipe-sections might be increased or diminished, if so desired.

An important feature of our invention is the structure of the several pipe-coils for the purpose of causing the liquid as it travels along down the coil from the mixing-chamber to the reservoir to become exposed to the up-

ward-flowing current of gas without materially choking the coil.

The pipe-coil is provided at frequent intervals with indentations *g*, preferably formed on the under side of the pipe, which as the water flows along down the pipe under the influence of gravity obstruct its flow at frequent intervals, causing the water to pitch over the apex of the ridge *g* and as it does so come into intimate contact with the upward-flowing column of gas.

The amount of water introduced into the mixing-chamber is not intended to be sufficient to fill the several pipe-coils at any one time, and hence there will be at all times a passage-way for the upward-flowing currents of gas through the several pipe-sections.

The pipe *h* for the admission of water or other liquid to be charged to the mixing-chamber *a* enters the reservoir *b* for the purpose of placing the inflow of water under the control of the body of charged liquid in the receiver or reservoir *b* and passes thence upwardly exterior to the coil-section *c* and into the base of the mixing-chamber *a*, where it is provided with several spraying-nozzles, (denoted by *i*.)

Within the receiver *b* the water-inlet pipe *h* is provided with a cut-off valve *j* of any well-known or approved form, in the present instance a ball-valve under the control of a float *k* through the intermediate gravity opening and closing mechanism *l* of any well-known or approved form.

The structure is such that when the liquid in the receiver *b* drops below its normal level the valve *j* will be open and water admitted through the pipe *h* to the spraying-nozzles *i* and by them discharged into the mixing-chamber *a*, from which it percolates through the pipe-coils *d e f* into the receiver *b* until the liquid therein reaches its normal level, when the float *k* will operate to close the valve *j* and cut off the further inflow of water.

The supply of gas is admitted to the reservoir *b* through a pipe *m* and after passing through the liquid therein finds its way up through the pipe-coils *d e f* into the mixing-chamber *a*, where it comes into intimate contact with the water as the latter is sprayed from the nozzles *i*.

The charged liquid is withdrawn from the

receiver or reservoir *b* through an outlet *n*, communicating with the bottom of the receiver *b*.

Another important feature of our invention is the specific structure of the nozzle *i*, which sprays the water into the mixing-chamber *a*. It consists of a tube *o*, having screwed over its discharge end a cap *p*, the latter provided with a discharge-opening *q* at the center of the concave *r* in the outer end of the cap. The lower end of the tube *o* is provided with an interior screw-thread *s* for attaching it to the pipe, and intermediate of its point of attachment to the supply-pipe and the cap *p* there is located a plug *t*, free to move to a limited extent longitudinally within the tube and also free to rotate therein. The plug *t* is provided with one or more small diagonal or winding passages *u* for conducting the water from the supply-pipe to the cap *p*, which diagonal passages *u* serve to keep the plug *t* in a constant rotary motion, the effect of which is to discharge the water through the cap *p* in the form of a mist or fog, thereby permitting the gas within the mixing-chamber *a* to come into intimate contact with the minute particles of the water while in this state of mist or fog, and so thoroughly charging it. We find it further desirable to provide the plug *t* with a straight passage *v* along its exterior from end to end for the purpose of causing the liquid passing through it to form a water or other liquid lubricant between its exterior surface and the interior wall of the tube.

The structure as a whole is automatic in its operation, care being used to keep up the supply of liquid to be charged and of gas to charge it with, and the pressure being maintained the liquid will be found to be thoroughly and evenly charged with the gas.

It is obvious that changes might be resorted to in the form and arrangement of the several parts without departing from the spirit and scope of our invention. Hence we do not wish to limit ourselves strictly to the structure herein set forth; but

What we claim is—

1. In combination, a mixing-chamber, a reservoir for the charged liquid, a pipe-coil connecting the mixing-chamber and reservoir,

the said pipe-coil having its interior space interrupted at intervals, means for passing the liquid to be charged in one direction through the said pipe-coil, means for passing the gas in the opposite direction through the pipe-coil and means for withdrawing the charged liquid, substantially as set forth.

2. In combination, a pipe-coil provided with indentations at intervals for partially obstructing its interior space, means for passing gas in one direction through the pipe-coil and means for passing the liquid to be charged in the opposite direction through the pipe-coil, substantially as set forth.

3. The combination with the mixing-chamber, means for supplying gas thereto and means for conducting the liquid to be charged thereto, of a spraying-nozzle attached to the liquid-conducting pipe, the said spraying-nozzle being provided with an interior plug free to rotate and having a winding passage for causing the said plug to whirl while the water is flowing through the nozzle, the said plug being further provided with a straight passageway along its periphery for insuring the lubrication of said plug, substantially as set forth.

4. In combination a mixing-chamber, a receiving-chamber and a plurality of pipe-coils connecting the mixing and receiving chambers, the said pipe-coils having their interior spaces partially interrupted at intervals, means for supplying gas to the receiving-chamber under pressure sufficient to cause it to rise through the interior of the said coils to the mixing-chamber, means for conducting the liquid to be charged to the mixing-chamber and thence downwardly through the pipe-coils to the receiving-chamber, and means for withdrawing the charged liquid from the receiving-chamber, substantially as set forth.

In testimony that we claim the foregoing as our invention we have signed our names, in presence of two witnesses, this 14th day of September, 1900.

RICHARD COLLINGS.  
ALFRED C. GRISCOM.

Witnesses:

FREDK. HAYNES,  
C. S. SUNDGREN.