

UNITED STATES PATENT OFFICE.

DAVID MUELLER, OF HOBOKEN, NEW JERSEY.

ATOMIZING-HEAD FOR CARBONATING LIQUIDS.

SPECIFICATION forming part of Letters Patent No. 496,579, dated May 2, 1893.

Application filed December 19, 1892. Serial No. 455,697. (No model.)

To all whom it may concern:

Be it known that I, DAVID MUELLER, a citizen of the United States, and a resident of Hoboken, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Atomizing-Heads and their Application for Carbonating Liquids, of which the following is a specification.

The object of this invention is to improve the carbonating apparatus to effect a superior impregnation and atomizing and mixing of the carbonic acid gas with the liquid, with a novel applied and constructed atomizing head hereinafter specified.

In the annexed drawings forming part of this specification:—Figure 1, represents a vertical section through the receiver or carbonating chamber and through my improved atomizing head applied thereto. Fig. 2, is a detached vertical section of my atomizing head on a larger scale than in the former figure. Fig. 3, is a detached side view of the cap of the head. Fig. 4, is a detached side elevation of the head with the cap of the same shown removed.

The letter of reference A, indicates the receiver or carbonating chamber of a liquid carbonating apparatus in which the liquid ordinarily occupies the lower half and the gas the upper half of its space.

B., represents my atomizing and impregnating head, which consists of the main perpendicular hollow body C, the cap D over the portion within the chamber A and the screw nut E and washer F over the shank of the body C projecting down and outside of said chamber A. Said body is threaded on the bottom of the shank for connecting by a coupling the pipe from the liquid pump to charge the receiver. The body C has the flange shoulder G to match the inner surface of the receiver from which its shanks project down through the receiver and said shank is threaded and provided with the screw nut E over it, and the suitably fitted washer F furnished between said nut and the outer surface of the receiver, so that by this means with suitable packing the body C or head is tightly screwed to the receiver. Said body C projects up from the shoulder tubular into the receiver vertically and to a suitable height and terminating with a semi-spherical closed top end. Close on the upper side of

the shoulder G is formed a short shoulder *i* which is threaded and is of a larger diameter than the diameter of the tubular or cylindrical portion of the body C above; over which is employed the cap D with its lower end properly fitted over said threaded shoulder *i* and provided with a six sided rim *t* for turning the same by means of a suitable wrench. The top end of said cap D terminates semi-spherical and the body from the top end to the rim *t* is cylindrical with an inner diameter for an even suitable space between its inner periphery and the outer periphery of the cylindrical and semi-spherical surface of the body C which it covers. The bore of the body C is equal throughout from its bottom end to opposite its outside spherical portion, from which portion, said bore terminates spherically like the outside, and into the upper half portion of the cylindrical part of the body C are cut or sawed a suitable number of vertical radial fine slits *k* from its outer periphery to its bore as shown, the only escape from the bore for the liquid and gas charged into the head. And the cap D has also a suitable number of fine slits *x* cut from its outer into its inner periphery, which slits are made into the portion of the cap near its rim *t* all below the lowest end of the slits *k* and cut in a spiral lateral direction through the cylindrical body of the cap. The width of the slits *k* and *x* are made narrow and much finer than round holes, could practically be drilled, without great difficulty and undue expense. This follows by reason that a very narrow slit can be easily and cheaply sawed through the atomizer walls, and since these slits are placed diagonally to each other, they serve to break up the gas into very minute bubbles. To drill holes sufficiently fine to accomplish the same result would not only be very difficult, but also very expensive, and a very slow process. The slits *k* and *x* are equally distributed around the peripheries of the cap D and body C and as close as practical without unduly reducing the required strength of the metal between them. The length of the slits is made sufficient for the volume of liquid to pass without unduly increasing the pressure against the pump.

From the pump the roughly mixed carbonated liquid is charged into the bottom inlet of the body A from which it passes to and

finally through the slits *k* into the space between the outer surface of the cap D and finding no outlet above, is obliged to turn down to the slits *x* and there passes through them into the liquid contained in the receiver as shown by the arrows in Fig. 1. By passing the liquid through the slits *k* and then down and through the slits *x* and finally through the liquid contained in the receiver, the atomizing and mixing process is multiplied, a greatly more minute globular formation of the gas is obtained. Consequently a closer combination of the gas with the liquid is obtained.

By the construction of the atomizing head as shown with the very fine vertical slits, *k*, in the body, C, and the oblique or diagonal slits, *x*, in the body or cap, D, the gas is cut up in very small bubbles passing through the atomizing head, so that the buoyancy of each bubble is greatly reduced and amounts to very little over the friction of it in moving upward in the liquid, when the pressure is re-

moved as in pouring the beverage into a glass for drinking.

I prefer to apply the atomizing head B at the bottom of the receiver but it may be applied as shown in dotted line at the top of the receiver with almost as good result.

What I claim as my invention, and desire to secure by Letters Patent, is—

In apparatus for carbonating liquids, the combination with the receiver, A, of the atomizing head, B, consisting of the inner body, C, having the narrow longitudinal slits, *k*, and the outer cap, D, having the narrow diagonal or oblique slits, *x*, to the slits *k*, substantially as and for the purpose herein set forth.

Signed at New York, in the county of New York and State of New York, this 12th day of December, A. D. 1892.

DAVID MUELLER.

Witnesses:

J. H. SIMMS,
R. BOECKLEN.