April 3, 1928. 1,664,780

W. E. LEIBING

CARBONATED WATER COOLER

Filed July 20, 1925

Fig. 1.

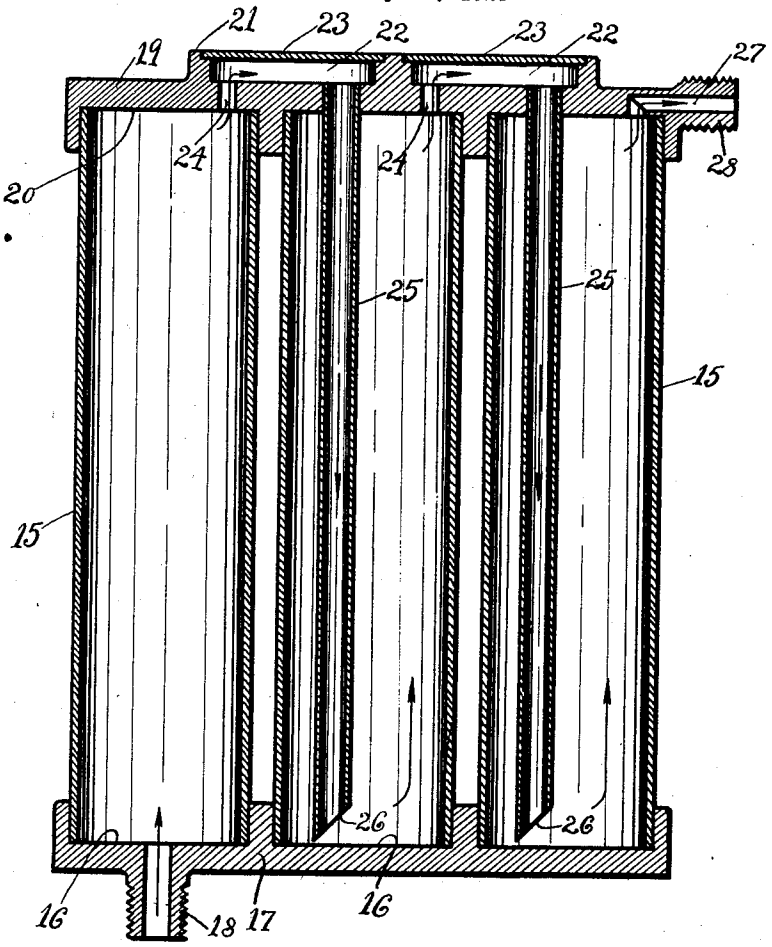
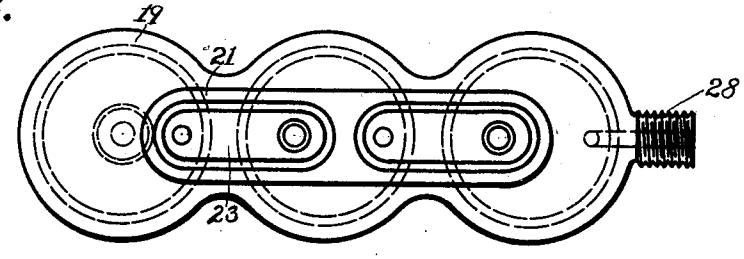


Fig. 2.



William E. Leibing INVENTOR.

BY

Harry F. Potter ATTORNEY.

Patented Apr. 3, 1928. 1,664,780

UNITED STATES PATENT OFFICE.

WILLIAM E. LEIBING, OF OAKLAND, CALIFORNIA, ASSIGNOR TO MAGNUS FRUIT PRODUCTS CO., OF SAN FRANCISCO, CALIFORNIA, A CORPORATION OF CALIFORNIA.

CARBONATED-WATER COOLER.

Application filed July 20, 1925. Serial No. 44,787.

This invention relates to improvements in a cooling apparatus for carbonated water in soda fountains, etc., and more particularly to an apparatus so formed that the mixture of gas and water is maintained at all times in said cooler.

One of the objects of said cooler is to form a reservoir of carbonated water in the refrigerating chamber and to eliminate from said reservoir all pockets now usually present and in which gases separating from the water accumulate.

A further object is to so arrange a plurality of said chambers that during the time the outlet from said chambers is open and a flow of liquid through the device is established, all gases liberated by such flow will be successively projected and intermingled in each succeeding chamber in a manner to thoroughly intermingle said escaped gases and project them back into the water again.

A further object of the invention is to so arrange the above mentioned chambers that the necessity of "snifting" any of these chambers is eliminated.

Another object of the invention resides in providing a device having a plurality of chamber forming members which are assembled with retaining parts to form a plurality of closed intercommunicating chambers between an inlet and an outlet having means therein for delivering fluid from the top of one chamber to the bottom of the next throughout all of the chambers for producing an upward flow of the fluid in each chamber in order that a plurality of fluids flowing through said chambers will be thoroughly comingled and prevented from separation due to difference in specific gravity.

The invention includes other objects and advantages in thoroughly comingling fluids passing therethrough aside from the structural relation of the parts designed to produce a readily assembled device which may be manufactured economically as more particularly pointed out in the following detailed description and claim directed to the preferred forms of the invention, it being understood, however, that numerous other embodiments of the invention may be made which are within the scope of the invention as herein set forth.

In the drawings forming part of this application,

Fig. 1 is a central vertical longitudinal section of a cylinder construction showing the invention in a preferred embodiment.

Fig. 2 is an end elevation of the same, looking from the top of the structure illustrated in Fig. 1.

Referring to the drawings a plurality of hollow cylinders are indicated by the numeral 15 which are mounted in spaced parallel relation in a substantially horizontal plane and in which are formed the closed chambers. A pair of end sections 17 and 19 are provided for receiving the opposite ends of the cylinders 15 in forming an assembled unit structure. The end section 17 is formed with a plurality of cylindrical recesses 16 as more clearly shown in Fig. 2 for receiving the ends of the cylnders 15 and forming one closed end for the chambers within the cylinders, while the recesses 20 in the end section 19 receive the opposite ends of the hollow cylinders 15 and close the same in liquid tight relation. The connection between the cylinders 15 and the end sections 17 and 19, respectively, may be of any suitable form but is of a rigid character to provide closed gas and liquid tight chambers within each of the hollow cylinders and to form an assembled unit when the parts are in the relation shown in Fig. 1.

The end section 19 is formed adjacent one end thereof and on the upper edge with a threaded projection 28 which forms an outlet connection for the unit while the lower edge of the opposite end is formed with a similar threaded projection 18 providing an inlet connection. The upper edge of the section 19 is also formed with an upwardly projecting body portion indicated by the numeral 21 which is formed with a pair of transfer chambers 22 sealed against the passage of liquid by the cover plates 23. Passages 24 are formed in the end section 19 communicating with the top portion of adjacent chambers formed in the hollow cylinders 15 as more particularly shown in Fig. 1, these passages being at one end portion of the transfer chambers 22, while pipes 25 are mounted in the end section 19 and communicate with the opposite ends of the transfer chambers 22. These pipes 25 extend downwardly to the lower portions of adjacent chambers formed in the hollow cylinders 15 and terminate adjacent the bottom portions thereof, said pipes being provided at their

lower ends with beveled portions indicated at 26. The outlet 28 of the upper end section 19 is formed with an outlet passage 27 of smaller diameter than the inlet pipe 25 and terminating in the threaded extension 28 projecting from the end of said end section. The communicating passages 24 between the cylinders are also of smaller diameter than the inlet pipes 25 and inlet projection 18.

The construction illustrated and described results in effecting the thorough intermingling of a plurality of fluids.

This construction as shown in Figs. 4 and 5 is operated in the same manner as the unit structure above described in that the fluid flows upwardly through each cylinder successively from the inlet to the outlet and is delivered from one chamber to the next adjacent chambers through one of the transfer chambers 22 and one of the pipes 25 to the lower end of the next adjacent chamber where it again flows upwardly in order that a thorough intermingling of the fluids passing therethrough is maintained.

While this unit structure or assembly is designed more particularly for use in connection with a cooling device for carbonated water adapted to maintain the gas intermingled with the liquid and eliminate snifter valves, it is to be understood that it will efficiently operate to maintain any fluids thoroughly intermingled in which some of the fluids have a considerably different specific gravity from the others in view of the specific manner of treating the same in forcing them to travel from the bottom to the top of each closed chamber.

It is to be particularly noted that a relatively simple assembled unit is provided in which the hollow cylinders and the end sections form the main chambers of the structure and in which upon the assembly of the end sections with the cylinders, all of the parts are mounted in assembled operative relation.

Where two liquids of different specific gravity or a gas and a liquid such as charged water used at soda fountains, are used, the fluids are continually and effectively mixed or comingled during their upward flow through the cylinders so that the lighter fluids are prevented from separating from the heavier fluids by being successively delivered at the bottom of each chamber. In this way the lighter fluids flowing upwardly must permeate the heavier fluids so that an intimate intermingling is maintained and all separation thereby prevented.

What is claimed is:—

A device for prevention of separation of gas in a carbonated water cooler, comprising a pair of spaced end sections, a plurality of hollow cylinders mounted in and between the end sections and forming closed chambers therewith, one of said end sections being formed with an inlet, one of said end sections having an outlet, said inlet being of greater area than the outlet, one of said end sections having its normal upper edge portion formed with a plurality of transfer chambers and with inlet and outlet ducts establishing communication through said transfer chambers and between said closed chambers, corresponding inlet ducts of the respective transfer chambers being smaller than the corresponding outlet ducts of said transfer chambers, pipe sections mounted in the outlet ducts of the respective transfer chambers and extending downwardly through said closed chambers establishing communication between said transfer chambers and the bottom portion of the closed chambers, whereby carbonated liquid is maintained in said closed chambers under pressure and is conducted serially through all of said chambers between said inlet and outlet and flows upwardly through all the chambers.

In testimony whereof I have signed my name to this specification.

WILLIAM E. LEIBING.