Dec. 1, 1936. J. A. MARTOCELLO 2,062,896

VALVE FOR AERATING SYSTEMS

Original Filed Sept. 14, 1931

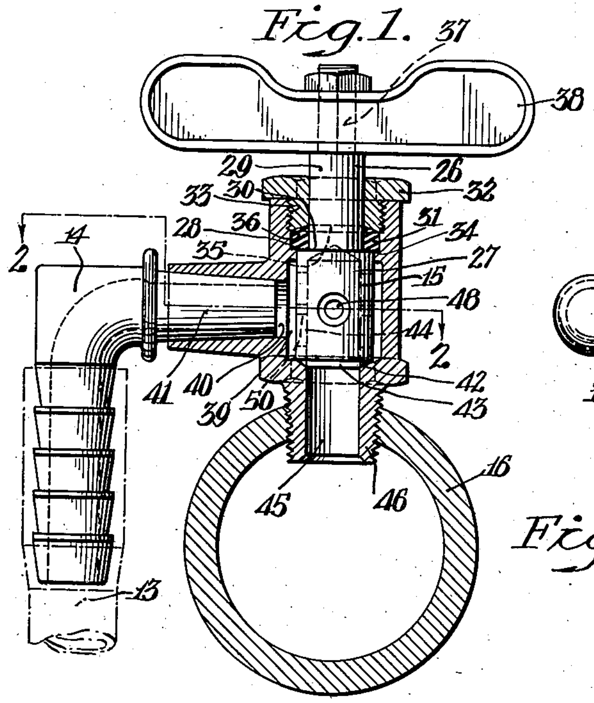
Fig. 1.

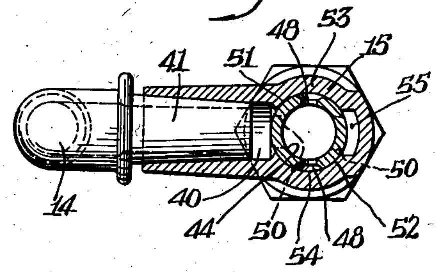
Fig. 2.

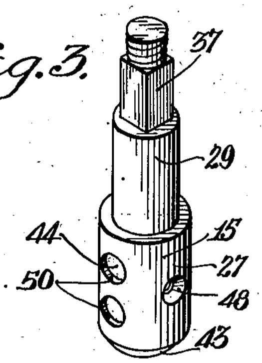
Fig. 3.

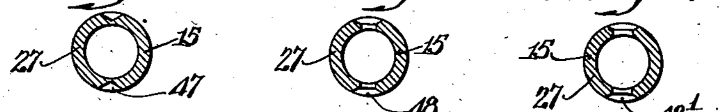
Fig. 4. Fig. 5. Fig. 6.

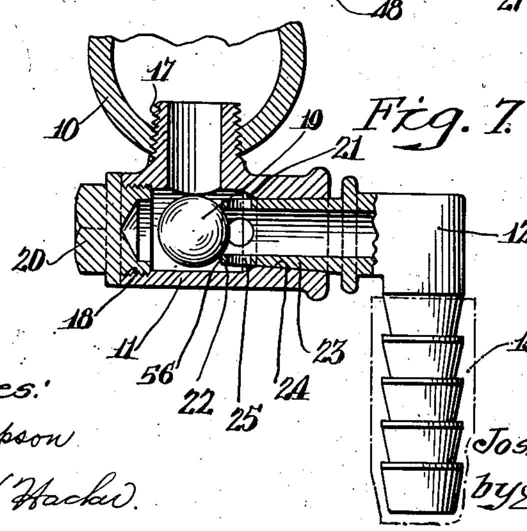
Fig. 7.

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Patented Dec. 1, 1936 2,062,896

UNITED STATES PATENT OFFICE

2,062,896

VALVE FOR AERATING SYSTEMS

Joseph A. Martocello, Philadelphia, Pa.

Original application September 14, 1931, Serial No. 562,671, now Patent No. 1,965,081, dated July 3, 1934. Divided and this application May 13, 1932, Serial No. 611,096

1 Claim. (Cl. 251—95)

My invention relates to aerating connections for ice cans and to controlling valves for can basket units or for a series of cans which are used individually in the manufacture of ice, the present application being a divisional of my copending application, Serial No. 562,671, entitled "Ice making method and apparatus", filed Sept. 14, 1931, now Patent No. 1,965,081, granted July 3, 1934.

One purpose of my invention is to provide special valves at the inlet and outlet ends respectively of a removable and preferably flexible pipe connection between a main air lateral and a supplemental lateral for supplying air to the cans of an ice can basket and the said valves having in combination a character to effectively meet special requirements for an economical air feed to the said cans.

A further purpose is to provide novel valve mechanism to reduce the volume of air required after the cores have been pumped from the block of ice during their freezing period to eliminate ragged edges of ice formation at the top of the block.

A further purpose is to provide aerating systems used in the manufacture of ice with controlling valves to regulate the predetermined amount of air required after the core has been pumped and refilled with fresh water.

A further purpose is to provide a spindle for a valve adapted to different size drilling of orifices, by previously spot drilling the spindle, to accommodate variation in air supply to aerating systems for the manufacture of ice.

A further purpose is to provide an automatic L-shaped check valve for an aerating system in the manufacture of ice.

Further purposes will appear in the specification and in the claim.

I prefer to show one form only of my invention, selecting a form which is practical, efficient, reliable and inexpensive and which at the same time well illustrates the principles of my invention.

Figure 1 is a sectional view of an air-controlling valve for use at the outlet of an air supply pipe removably connected into the inlet of an air pipe adapted to feed air to a plurality of ice cans, usually the cans of an ice basket.

Figure 2 is a sectional plan view of Figure 1 taken on the line 2—2 thereof.

Figure 3 is a detached perspective view of a valve stem comprising a detail of the structure of Figures 1 and 2.

Figures 4 to 6 inclusive are sectional views of the valve stem of Figure 3 and show different drillings that may be used to accommodate needed requirements of the controlling valve.

Figure 7 is a side elevation partly in section of a check valve between a main air lateral and the inlet of the air supply pipe removably connected into a second air lateral adapted to feed the cans of an ice basket.

In all figures like numerals refer to like parts.

Describing in illustration, but not in limitation and referring to the drawing:—

Air is supplied by an air header (not shown) to the main air lateral 10, through check valve 11, fitting 12, flexible connection 13, fitting 14 and valve 15 into the supplemental lateral 16 from which it is supplied to the ice cans. The body of the valve 11 terminates in a threaded tap 17 fitting into the lateral. An opening 18 in the end of the body admits a ball valve 19 but is then closed by a threaded plug 20.

The valve closes against a seat 21, as a check valve except when the fitting 12 is inserted, at which time the ball valve is opened by the end 22 of a tapered sleeve 23. The sleeve fits into a corresponding tapered seat 24 and the end 22 is laterally notched or otherwise relieved at 25 to permit air passage. The fitting 12 has a shank connecting into the inlet end of the flexible tube 13.

After a certain amount of freezing, the core removal takes place and as the continuation of aeration or agitation is desired, I provide for a reduction of air volume pressure and for adjustment of the extent of variation also in many instances. This is effected by the controlling valve shown in Figures 1–6.

The purpose of the controlling valve 15 is to throttle down the amount of air used for aeration, after the core has been pumped. The reduction in the amount of air is the more desirable as the water freezes because there will then be less water agitated. An excess amount of air after the core has been pumped causes a considerable amount of splashing of the water remaining in the can, builds a ragged edge of ice on the ice block and also leaves an objectionable hole in the center.

The air valve shown will allow for more uniform freezing at the top of the block of ice, thereby causing a more even surface to be produced and reducing the final freezing time of the block.

The valve stem 26 is enlarged at 27 centrally within a bore 28 in the valve 15. The stem is reduced in diameter at 29 to form a shoulder 30 against which packing 31 is forced by a plug 32.

The plug 32 is screwed into a threaded aperture 33 thereby forcing the packing downwardly

against the shoulder 30 of the valve stem and a shoulder 34 of the valve body by the lower surface 35 of the plug 32, and outwardly against the interior wall 36 of the valve body as clearly shown in Figure 1.

Above the plug 32 the stem is further reduced at 37 for the reception of a stem-operating handle 38.

The bore 28 in the valve body forms a chamber 39 into which air is admitted from the hose connection and coupling through an opening 40 in the valve body and into which the tapered end 41 of the coupling 14 is inserted. The bottom of the chamber 39 within the valve forms a seat 42 into which the lower end 43 of the valve stem is placed.

I provide the enlarged portion 27 of the valve stem with an interior bore 44 which communicates with a discharge or outlet opening 45 within a downwardly directed threaded nozzle 46.

The enlarged portion 27 of the valve stem is initially provided with a drill spot 47, Figure 4, in order that exact location may be made for the placing of the valve stem in the valve and also as a convenient means of allowing the openings 48 in the valve stem to be drilled to any desired size to suit any volume of air and at any pressures required after the core water has been removed.

The holes 48, 48' are so proportioned to the quantity of air required as to give a predetermined minimum aerating flow within the can basket lateral 16. For example, if there be but four cans to a basket—and therefore to a lateral—these holes will be made smaller than would be the case if there were six cans to a basket.

For the normal full flow of air much larger openings are desirable. Since the space across the inlet at 40 is narrow, I prefer to use two or more openings 50 in line lengthwise of the valve, which in one valve position are sealed by the shell from edge 51 to edge 52 (Figure 2) with the valve in a position turned a quarter turn from that of Figure 2 to close air off entirely at the valve.

As will be seen the valve when opened will normally present full openings 50 for air flow, the flared openings 48 and 48' being closed against bearing faces 53 and 54 of the valve body. With the quarter turn in either direction one of the openings 48 will be exposed for air inlet to the bore of the tubular valve and the other will be exposed to the dead space 55.

In operation the air is automatically turned on when the fitting 12 is inserted within the body 11 pushing the ball valve 19 to position seen in Figure 7. Because the end of this fitting forms a complete ring at 56 not substantially interrupted by lateral apertures 25, there is very little tendency to pit the ball valve and substantially no wire drawing takes place. The flow of air is removed from the surface of the ball and is carried beyond it to the lateral openings instead of initially taking place along the surface of the ball as would be true if the tapered end of the fitting terminated in a serrated or notched surface. This avoidance of air passage along the surface of the ball is regarded as of considerable value.

It will be evident that the connection from the header through a general lateral valve to the can basket lateral has its advantages in separate control of the flow of air independently of the flow of a predetermined quantity of air, but that with the use of a quantitative control valve, such as that shown in Figures 1 and 2, the additional lateral and the general shut-off valve can be omitted, using the valve of Figures 1 and 2 for the double purpose of a shut-off valve and quantity-control valve. However, the value of the valve of Figure 7 as a check valve automatically operated is then lost.

In view of my invention and disclosure variations and modifications to meet individual whim or particular need will doubtless become evident to others skilled in the art, to obtain all or part of the benefits of my invention without copying the structure shown, and I, therefore, claim all such in so far as they fall within the reasonable spirit and scope of my invention.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

A valve for aerating systems comprising a valve body having an axial bore open at one end thereof, said body having a lateral opening formed therein, an annular shoulder upon said body and located at a distance from said lateral opening, an annular valve seat upon the body and located at a distance from the opposite side of said lateral opening relatively to said shoulder, a valve stem rotatably mounted within the annular shoulder and sealed upon said seat, cylindrical bearing surfaces upon the body and extending between said shoulder and said seat and sealed by said stem, said body having an inner wall offset from said bearing surfaces and through which wall said lateral opening of the body extends, said wall extending lengthwise of the bore of the body from said shoulder to said seat and forming an elongated chamber located adjacent to the stem, said stem having a hollow axial core communicating at one end with the open end of the body through said seat, and said stem having lateral openings of different sizes formed therein and arranged to communicate with said chamber for a full or restricted flow of fluid through the valve.

JOSEPH A. MARTOCELLO.