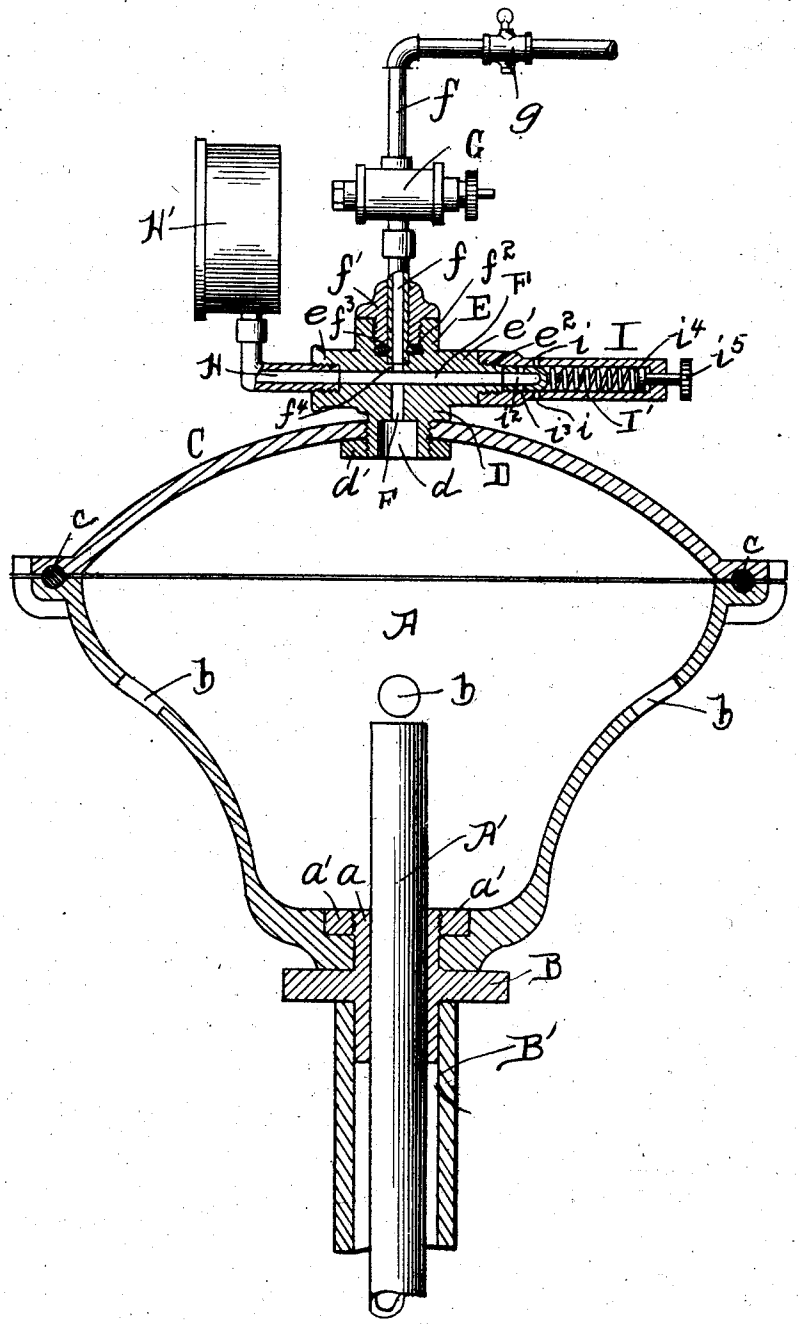
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C. A. CARLSON.

PRESSURE REGULATING DEVICE.

APPLICATION FILED JULY 18, 1903.



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UNITED STATES PATENT OFFICE.

CHARLES A. CARLSON, OF CHICAGO, ILLINOIS.

PRESSURE-REGULATING DEVICE.

SPECIFICATION forming part of Letters Patent No. 790,287, dated May 23, 1905.

Application filed July 18, 1903. Serial No. 166,072.

To all whom it may concern:

Be it known that I, CHARLES A. CARLSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Pressure-Regulating Devices, of which the following is a specification.

This invention is primarily intended for use in connection with rotary pressure-tanks for bottle-filling machines; and the invention consists of the means employed for introducing compressed air or gas into the rotary tank above the liquid while the tank is being rotated, thereby enabling the liquid to be injected into the tank from the bottom while the pressure is introduced from above, which arrangement obviates the necessity for introducing the pressure and liquid through the same pipe, as has heretofore been the case.

The object of the present invention is to prevent foaming of the liquid and at the same time provide means by which the amount of pressure may be automatically regulated and controlled.

The invention consists in the features of construction and combination of parts hereinafter described and claimed.

The drawing is a sectional view of a rotary tank with the apparatus of the present invention partly in section.

As shown, the pressure-regulating device is applied to a rotary tank A of any suitable formation. A liquid-supply pipe A′ extends upwardly through the bottom of the tank and is surrounded by a sleeve *a*, screw-threaded at its upper end and secured in place by means of a screw-threaded collar *a′*, arranged to lie flush with the bottom of the tank. The sleeve is provided with an annular flange or ledge B, located about midway of the sleeve, which flange or ledge abuts against the upper edge of a hollow supporting-post B′, mounted upon any suitable support. (Not shown.) This arrangement is one which allows the tank to rotate around the liquid-supply pipe, and the flange or ledge serves as a bearing or support for the tank during its revolution. The present invention, however, does not relate to the method of constructing or mounting the tank, and the above-described tank serves merely for purposes of illustration. In the wall of the tank are a series of openings *b* of any suitable number adapted to receive a plurality of filling-valves. (Not shown.) The tank is provided with a rounded top or cover C, and between the tank and cover is a ring *c*, of packing material, for the purpose of rendering the joint air-tight.

In the center of the rounded cover is located the pressure-regulating device which forms the subject of the present invention. The regulator is formed to have a T-shaped body or casing D, provided with a downwardly-extending screw-threaded neck *d*, which neck is screwed through the center of the top of the cover and is held in place by means of a collar *d′*, screw-threaded onto the end of the neck and abutting against the inner face of the top or cover. The shell or casing D is provided on its top with an upwardly-extending inwardly-screw-threaded neck E and is further provided with laterally-extending members *e* and *e′*, the member *e* being inwardly screw-threaded, and the member *e′* being provided with a screw-threaded nipple e^2. The shell or casing is provided with a transversely-extending passage F and a vertically-extending passage F′, the two passages being in communication with one another at their point of intersection. Into the upwardly-extending neck is inserted a pressure-supply pipe *f*, which pipe is in alinement with the vertical passage F, and around the pipe is a screw-threaded plug *f′*, which plug is screwed down to compress a packing-ring f^2, which ring is fitted around an annular groove f^3 in the wall of the pressure-supply pipe. The lower end of the pressure-supply pipe rests upon a shoulder f^4, so that when the screw-threaded plug has been screwed down to compress the packing-ring and force the packing into the annular groove in the pressure-supply pipe the latter will be held in firm contact with the shoulder f^4, which serves as a bearing and allows the casing D and members attached thereto to be rotated with the rotation of the pressure-tank while the pressure-supply pipe is held in fixed relation.

Suitably located in the pressure-supply pipe above the shell or casing is a pressure-regu-

lator G of any suitable and well-known construction which regulates or enables the quantity of pressure admitted through the pressure-pipe to be regulated to suit the requirements of the intended use, and above the pressure-regulator is a petcock g for regulating the passage of pressure through the pipe. The pressure-supply pipe leads to any suitable source of pressure and is held in fixed relation to the rotary pressure-tank for containing liquid.

Into the laterally-extending member e of the shell or casing is inserted a pipe H, carrying a pressure-gage H′ of any suitable and well-known construction, and onto the nipple e^2 is screw-threaded an automatic pressure-discharge valve I for the purpose of permitting the escape of an excess of pressure. The valve I consists of a casing I′, provided with vent-holes i in its walls, and within the casing is arranged a slidable member i^2, provided with vent-holes i^3, adapted to coincide with the vent-holes i in the valve-casing. A spring i^4 is arranged within the valve-casing to abut against the end of the movable valve member and exert pressure thereon, normally holding the member in contact with the end of the nipple, in which position the vent-passages of the valve-casing and movable member are out of alinement with one another. An excess of pressure, however, within the tank serves to force back the movable member against the pressure of the spring until the vent-holes come into alinement with one another, at which point the excess of pressure will be allowed to escape until the pressure is reduced sufficiently to allow the spring to force back the movable member and close the vent-passages. The spring is regulated by means of a thumb-screw i^5 in the end of the valve-casing, which arrangement allows the pressure of the spring against the movable member to be increased or diminished to suit the requirements of the use intended.

The parts composing the apparatus are arranged to coöperate with one another as follows: Pressure is admitted to the pipe f, controlled by the petcock therein, and the amount of pressure admitted through the pipe is controlled by the pressure-regulator, which may be adjusted to admit varying degrees of pressure through the pipe. If, for instance, it is desired to maintain a pressure of six pounds within the pressure-tank, the pressure-regulator will be adjusted until the gage shows a pressure of six pounds, after which the discharge-valve can be regulated so that an excess of pressure above six pounds will be discharged automatically, thereby maintaining uniformity of pressure within the pressure-tank. Hitherto pressure has been admitted through the liquor-passage in the bottom of the tank; but the commingling of liquid and pressure within the liquid-pipe blows the liquid into the tank into a foamy condition and impairs the quality and quantity of the liquid drawn off through the valves. The present arrangement allows of the revolution of the tank and at the same time provides a perfect mechanism for controlling the admission of pressure and at the same time provides a tight joint between the fixed and movable members of the pressure-controlling mechanism.

What I regard as new, and desire to secure by Letters Patent, is—

1. In a pressure-regulating device for use with rotary tanks, the combination of a shell or casing fixedly attached to the top of the rotary tank, a vertically-extending passage through the shell or casing and a transversely-extending passage communicating with the vertical passage, a stationary pressure-supply pipe entered into the shell or casing to communicate with the vertical passage therein and allow the shell or casing to revolve around the pressure-supply pipe, and a gage and pressure-discharge valve located at opposite ends of the transversely-extending passage in the shell or casing, substantially as described.

2. In a pressure-regulating device for use with rotary tanks, the combination of a shell or casing fixedly attached to the top of the rotary tank, a vertically-extending passage through the shell or casing and a transversely-extending passage communicating with the vertical passage, a stationary pressure-supply pipe entered into the shell or casing to communicate with the vertical passage therein and allow the shell or casing to revolve around the pressure-supply pipe, a gage and pressure-discharge valve located at opposite ends of the transversely-extending passage in the shell or casing, and a pressure-regulator in the pressure-supply pipe, substantially as described.

3. In a pressure-regulating device for use with rotary pressure-tanks, the combination of a shell or casing inserted into the top of the pressure-tank and in line with its axis of revolution, a pressure-supply pipe externally supported and entered in the shell or casing and provided with an annular groove around its body, a packing-ring within the shell or casing and a screw-threaded plug provided with a smooth inner face surrounding the pressure-supply pipe and adapted to be screwed downwardly within the shell or casing to compress the packing-ring into the annular groove within the pressure-supply pipe and allow the shell or casing and rotary tank to be revolved around the pressure-supply pipe as an axis, substantially as described.

4. In a pressure-regulating device for use with rotary tanks, the combination of a shell or casing in the top of the rotary tank and in line with its axis of revolution, a passage through the shell or casing, a contact-shoulder formed by enlarging the diameter of the passage, an inwardly-screw-threaded collar around the shoulder, a pressure-supply pipe

adapted to abut against the shoulder in alinement with the passage and provided with an annular groove around its body, a packing-ring surrounding the pressure-supply pipe, a screw-threaded hollow plug provided with a smooth inner face surrounding the pressure-supply pipe and adapted to be screw-threaded into the collar to compress the packing-ring into the annular groove and allow the pressure-supply pipe to serve as an axis for the revolution of the pressure-tank and a shell or casing, substantially as described.

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