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AIR INLET FOR TANKS

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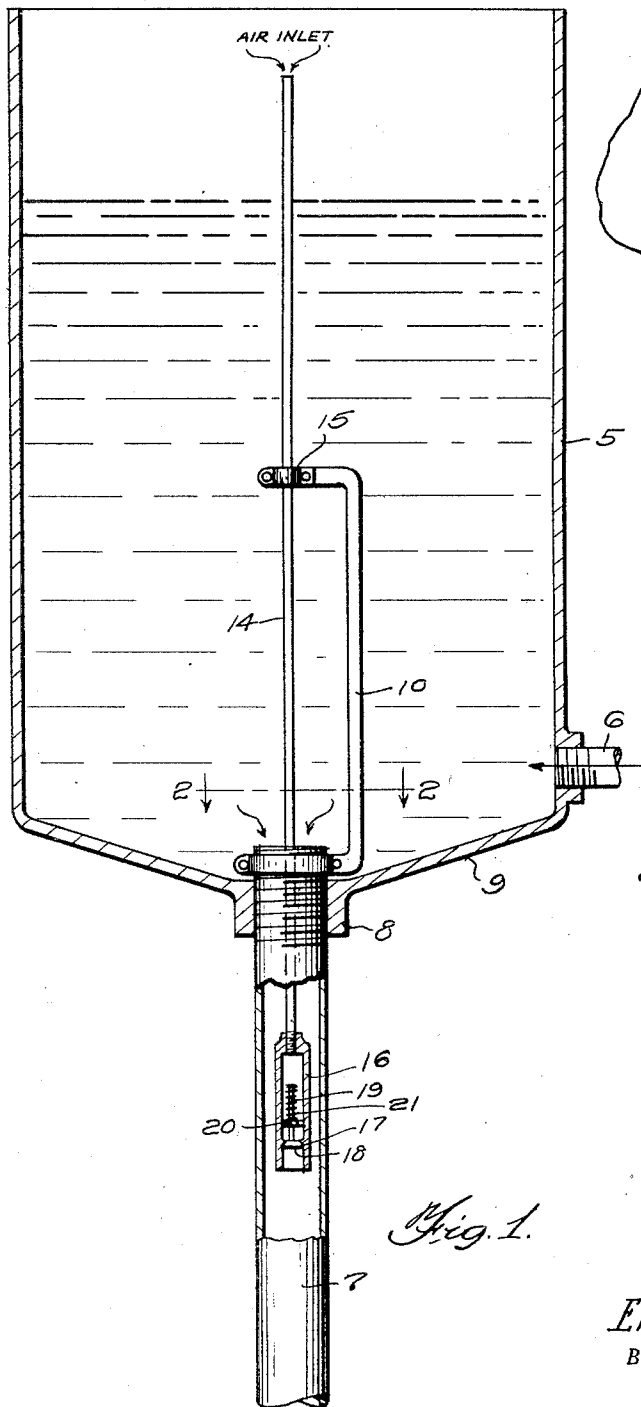


Fig. 1.

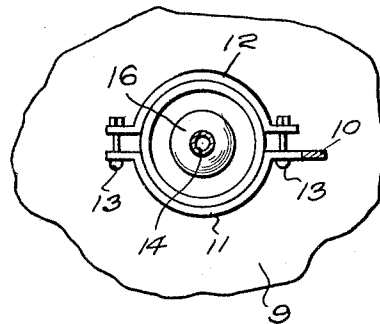


Fig. 2.

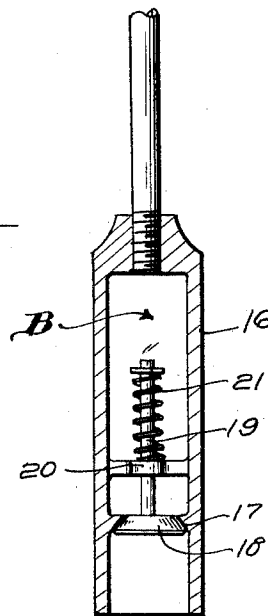


Fig. 3.

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AIR INLET FOR TANKS

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My invention relates to means for supplying air under a body of water held within a tank.

An important object of the invention is to provide a device of the above-mentioned character, which is simple in construction, automatic in operation, strong and durable.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings, forming a part of this specification, and in which like numerals are employed to designate like parts throughout the same,

Figure 1 is a central vertical longitudinal section through a tank having my air supply device applied thereto, the device being shown in elevation, with parts in section,

Figure 2 is a horizontal section taken on line 2—2 of Figure 1,

Figure 3 is a central vertical longitudinal section through the valve device.

In the drawings, wherein for the purpose of illustration, is shown a preferred embodiment of my invention, the numeral 5 designates a vertical tank which is to be supported at a suitable elevation. Water may be supplied to this tank through a pipe 6, and may be withdrawn from the bottom of the tank through a discharge pipe 7, having screw-threaded engagement with a boss 8, formed in the bottom 9 of the tank.

The numeral 10 designates a supporting bracket, provided at its lower end with a clamp, including a jaw 11, preferably integral with the bracket 10, and a companion jaw 12, adjustably connected with the jaw 10 by bolts 13, or the like.

The two jaws 11 and 12 are applied to the upper end of the pipe 7, which projects above the bottom 9.

The numeral 14 designates a vertically arranged air supply pipe, the upper inlet end of which is preferably arranged above the normal level of the water within the tank 5. The air inlet pipe 14 also extends downwardly within the discharge pipe 7, in spaced concentric relation thereto. The pipe 14 is supported by the bracket 10 and held in place thereby, and this bracket is equipped at its

upper end with a clamp 15, receiving and rigidly holding the pipe 14.

The lower end of the pipe 14 extends downwardly into the discharge pipe 7, and is connected with a valve casing 16, open at its lower end. This valve casing has a valve seat 17, to engage an upwardly seating valve 18 carried by a vertical stem 19. The stem is slidable within a guide 20 and is moved upwardly to seat the valve by means of a spring 21, as shown. The lower end of the casing 16 is open, as shown, and the valve 18 and valve seat 17, when the valve is seated, produce a closed chamber B, above the valve. When the tank 5 is being filled with water, through the pipe 7, or otherwise, it is obvious that as the level of the water rises in the tank, it enters the lower open end of the casing 16, and would rise in the chamber B, were it not for the valve 18, which is then seated. As the water is withdrawn through the pipe 7, it passes downwardly in close proximity to the casing 16, opening the valve 18 by suction, and since the chamber B is filled with air, with the exclusion of water, the air may freely rush into the pipe 7, breaking any vacuum or back pressure which may exist in the pipe 7, and which would tend to retard the outward flow of the water. It is inherent in the operation of the device, that should water in the tank freeze at the top, then air will pass downwardly through pipe 14 into the pipe 7, thus permitting of the discharge of the water from the tank 5. It is also inherent in the operation of the device, that the pipe 7 may serve as a water supply pipe for the tank.

The pipe 7 is equipped with an ordinary valve (not shown) to regulate the discharge of water.

The operation of the apparatus is as follows:

When the water is being discharged downwardly by gravity or otherwise, through the pipe 7, a suction is created beneath the valve 18, sufficient to unseat the valve, and air then passes downwardly through the pipe 14 and is introduced into the water beneath the tank. The device will operate without the valve device embodying the valve 18, as air will then be drawn downwardly

through the pipe 14 by suction caused by the downward travel of the water adjacent to the end of the air supply pipe.

It is to be understood that the form of my invention, herewith shown and described, is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of parts, may be resorted to, without departing from the spirit of my invention, or the scope of the subjoined claims.

Having thus described my invention, I claim:—

1. In apparatus of the character described, the combination with a tank, of a discharge pipe leading into the bottom of the tank, a substantially straight air supply pipe extending through the tank and having its upper end leading into the top of the tank, and its lower end leading into the upper open end of the discharge pipe and means for supporting the air supply pipe and holding the same in position, a valve casing connected with the lower end of the air supply pipe and having its lower end open and provided with an inner valve seat, and an upwardly seating spring-pressed check valve arranged within the valve casing to engage the valve seat, said valve casing having a closed chamber above the valve seat when the valve is seated, the arrangement being such that the valve is seated when the tank is being filled so that water cannot rise into the closed chamber of the valve casing, and the valve is unseated by suction due to the downward travel of the water within the discharge pipe so that air from the chamber may discharge into said pipe.

2. In apparatus of the character described, a tank to hold water, a substantially vertical pipe leading into the bottom of the tank and having its upper end permanently open, a valve casing arranged within the pipe and having a smaller external diameter than the internal diameter of the pipe to afford a passage between the same, a spring-pressed upwardly seating valve arranged within the valve casing, a straight substantially vertical air supply pipe arranged within the tank and extending to a point near the upper end of the tank with its lower end extending through the upper open end of the first-named pipe and connected with the valve casing, and means for supporting the air supply pipe and holding the same in position.

In testimony whereof I affix my signature.

ERNEST C. GRUMMERT.