Nov. 8, 1938. W. J. CONERY ET AL 2,135,962

FLUID PRESSURE SYSTEM

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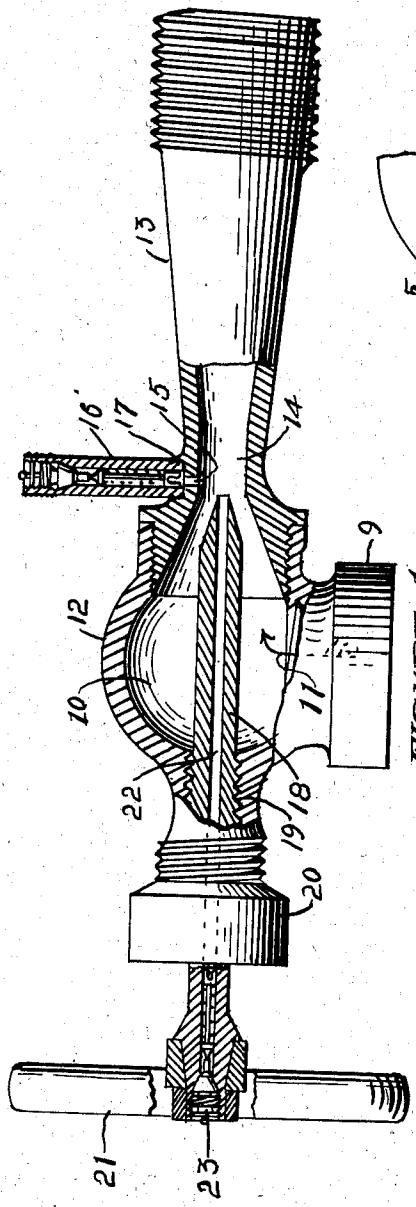


FIGURE 1

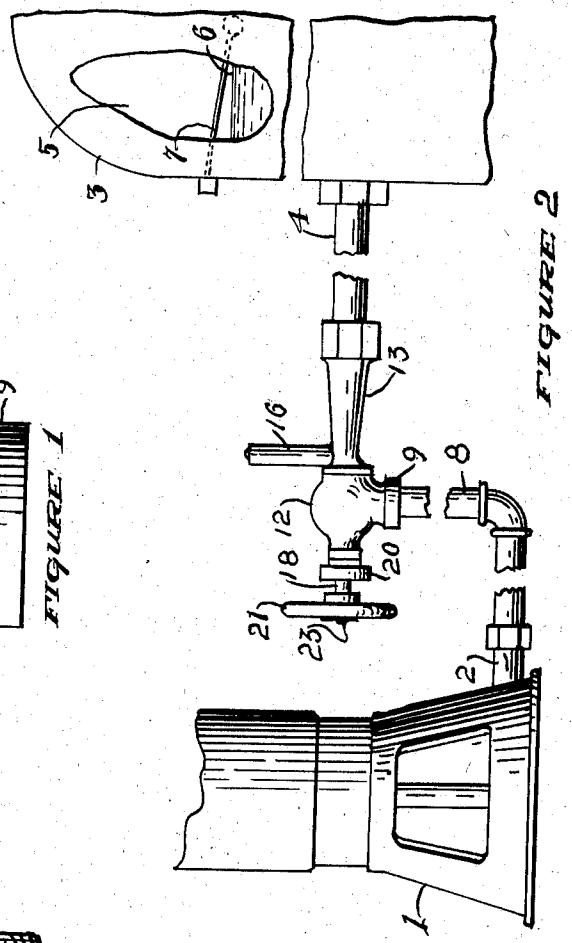


FIGURE 2

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FLUID PRESSURE SYSTEM

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1 Claim. (Cl. 103—6)

The system herein disclosed is primarily for the purpose of automatically maintaining water under a given pressure through the medium of an air cushion in a closed tank when the water is supplied to the tank by a centrifugal pump.

It is, therefore, one object of the present invention to provide means whereby a centrifugal pump may be used to supply water to the tank and at the same time automatically maintain the desired air pressure therein.

It is also an object of the invention to provide means of the character indicated that will be economical to manufacture, simple in form and construction, easily assembled, and highly efficient in its practical application.

In the drawing:

Figure 1 is a side elevation of an air charging valve forming a part of said means, partly in section and having parts broken away.

Figure 2 is a side elevation of an assembly embodying our invention, with parts broken away.

In the particular assembly herein disclosed we show at 1 a portion of a centrifugal pump having a discharge at 2, and a portion of a pressure tank at 3 having a water supply pipe at 4 and an air cushion chamber at 5 above the water level 6, an automatic excess pressure air exhaust being indicated at 7.

In the pipe line 8 connecting the pump discharge 2 and the tank inlet 4 is inserted a valve structure 9. This valve structure comprises a chamber 10 into which the water from the pump passes as indicated at 11. Threaded into one side of the chamber wall 12 is a Venturi tube 13 connected to the supply pipe 4.

In the throat 14 of the Venturi tube is formed a passage 15 communicating with an air inlet valve 16 threaded into the side of the tube as at 17. The valve 16 as shown is a commercial product known as the Schrader valve and is adjusted to readily permit air to be drawn into the tube 13 but will effectually prevent the discharge of air or water therefrom.

At 18 is a needle extending into the throat 14 and axially adjustable relative thereto through the medium of its threaded engagement at 19 with the wall 12. Leakage is prevented at this point by the packing nut 20.

The needle 18 is provided with a handle 21 by means of which it may be operated, and it is also provided with a passage 22 extending lengthwise therethrough and fitted with a Schrader valve in its outer end as at 23.

When the water delivered by the centrifugal pump 1 passes through the throat 14 its velocity is increased, of course, and an aspirator is formed by means of which air is introduced into the tube and tank through the valve 16. The velocity of the water, and consequently the amount of air introduced through valve 16, is governed or controlled by adjustment of the needle 18 in throat 14.

It should now be clear that the adjustable features of the system may be so set that a desired pressure can be maintained in tank 3 at all times. When the pressure in the tank is built up to the higher limit the back pressure will hold the Schrader valve closed and no air can be introduced, and of course excess air will discharge at 7. When the pressure in the tank drops below the lower limit the internal pressure on the Schrader valve is reduced and air is introduced as described. In a system of this kind some variation in pressure is permitted of course, say a differential of some ten pounds between the high and low pressure limits.

While two Schrader valves are herein shown as supplying air to the tube and tank either one may be dispensed with and one alone used.

It is to be understood of course, that while we have shown but one specific embodiment of the invention, changes in form, construction, and method of assembly and operation may be made within the scope of the appended claim.

We claim:

In a system of the character described, the combination with a centrifugal pump, a water tank having an air cushion chamber therein, and a pipe leading from the pump to discharge into the tank; of an automatic spring-pressed-valve controlled air aspirator inserted in the pipe whereby reduction of air pressure in the tank below a predetermined point will increase the velocity of flow of water through the aspirator and thereby induct air through the valve into the pipe and tank, and increase of air pressure in the tank to a predetermined point will build up a back-pressure of water in the pipe to close the valve.

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