Jan. 28 1941 J. D. MORGAN 2,230,004

ART OF INHIBITING RUST FORMATION

Filed April 23, 1938

Fig. 1.

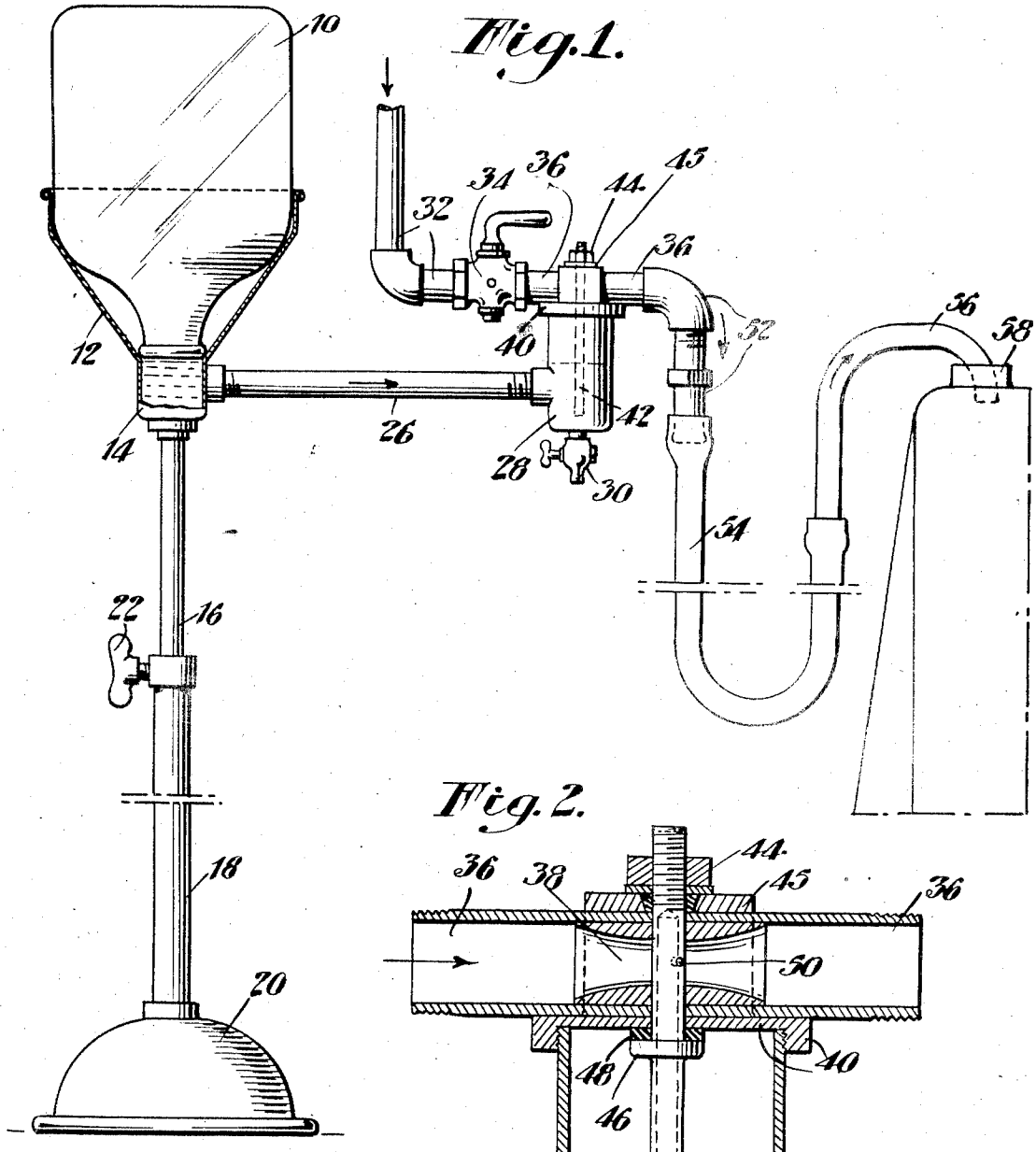


Fig. 2.

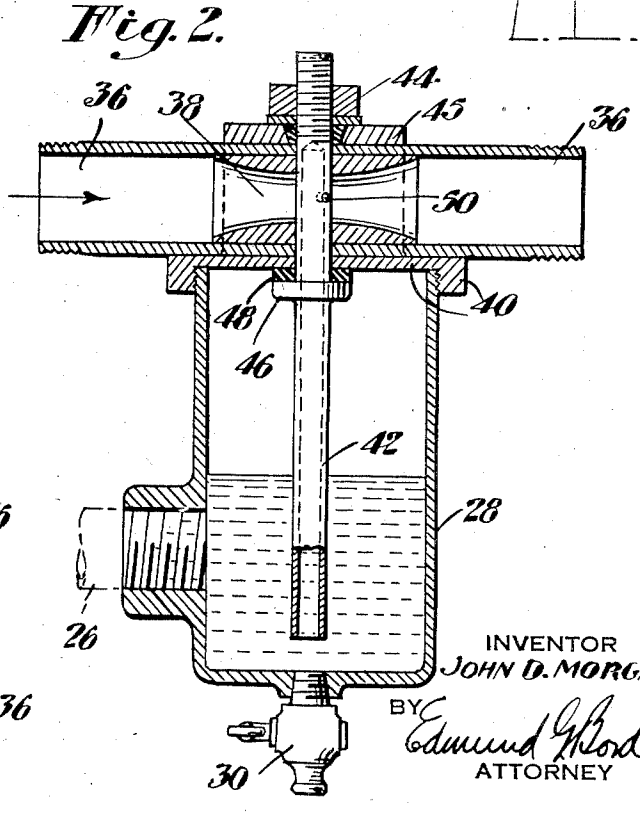
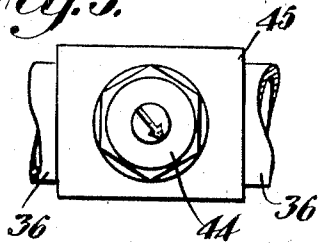


Fig. 3.



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ART OF INHIBITING RUST FORMATION

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Application April 23, 1938, Serial No. 203,800

1 Claim. (Cl. 210—31)

The present invention relates to a dispenser, and more particularly to a dispenser suited for supplying chemically treated water into the radiator of an automobile.

For many years, one serious difficulty in the operation and servicing of automobiles has been the problem of corrosion and rusting of parts of the radiator and cooling systems, which is due to the corrosive action of the water put into the radiator. While many chemical treating inhibitors and anti-rust agents have been put on the market, so far as I am aware no suitable or accurate apparatus for adding such anti-rust agent to the radiator water has been put in use. Heretofore service station attendants have been instructed to pour the anti-rust agent directly into the radiator of the car, which might result in the correct amount being mixed with the water, but is more often apt to result in having too much put in with resulting loss and waste. By this method also too little might be put in with the result that no benefits would accrue.

The primary object of the present invention is to provide an apparatus by which water flowing through a hose prior to its introduction into an automobile radiator will be combined with an anti-rust agent at a predetermined ratio.

Another object of the invention is to avoid any necessity of measuring either the amount of water or the amount of the anti-rust agent introduced into a car radiator.

Accordingly, an important feature of the present invention is an apparatus adapted to supply a predetermined proportion of a chemical treating agent or rust inhibitor preferably in solution, to a stream of water being delivered to a car radiator, and to utilize the stream of water to draw the chemical from a holder therefor.

With the above and other objects and features in view the invention comprises an improved dispenser which is hereinafter described and more particularly defined in the accompanying claim.

The invention can best be understood from the following description taken in connection with the drawing in which:

Figure 1 is a side view of the apparatus.

Figure 2 is an enlarged cross-sectional view of a part of the apparatus.

Figure 3 is a top plan view of the structure shown in Figure 2.

Referring to Figure 1, a bottle 10 serves as a storage reservoir for the rust inhibitor solution to be introduced into the car radiator with water from a water supply main. Any standard or commercially acceptable rust inhibitor can be used in the apparatus. Particularly effective are the chromate and dichromate salts such as sodium and potassium dichromate. The bottle 10 is held in inverted position by a funnel shaped support 12 which is mounted on a small vessel 14 into which the solution flows from bottle 10. The vessel 14 is supported on a tubing member 16 which telescopes into a length of hollow tubing 18 which is fixed in a weighted base 20. A wing set screw 22 holds tubing 16 at any desired height. The rust inhibitor flows from the vessel 14 through a horizontal conduit 26, into a chamber 28. The level of the rust inhibitor solution in the chamber 28 will always be at the level maintained in vessel 14 because of the position of the mouth of the bottle 10. The chamber 28 is provided with a drain cock 30 for sampling or for cleaning the apparatus.

The water to be supplied to the car radiator is preferably drawn from a pressure main, as for example through a line 32, provided with a control valve 34, and passed at considerable velocity through a conduit section 36 containing a venturi, in which a predetermined proportion of the solution from chamber 28 is mixed with the stream of water. The resulting mixture is conducted from the conduit section 36 through suitable pipe connections 52, a section of flexible hose 54, and a spout 56, into a car radiator 58.

The structural connections between the conduit section 36 and chamber 28 are shown in enlarged detail in Figure 2 of the drawing, in which it will be noted that chamber 28 is provided with a cap 40 to which the conduit section 36 is mounted and welded. The venturi in the conduit section 36 may comprise an insert such as 38. The solution from the chamber 28 is drawn into the venturi 38 through a suction tube 42 provided with a port 50 of predetermined relatively small diameter. One end of the suction tube extends below the liquid level in the chamber 28 and the other end extends centrally through cap 40, the conduit 36, and the venturi 38. The suction tube 42 is provided with a shoulder 46 and is secured firmly in the desired position by means of a lock nut 44. The suction tube 42 is sealed with respect to the cap 40 by means of a gasket 48 which rests on shoulder 46. The nut 44 is preferably put on over a clamping bracket 45 that is welded to cap 40.

The suction tube 42 is set in the Venturi section 38 with the port 50 on the downstream side of the Venturi throat, so that the suction caused by the water passing through the venturi will draw solution from the chamber 28 through the

suction tube **42** and the port **50**. The location of the port **50** on the axis of the conduit **36** will provide the maximum proportion of solution in the water for the car radiator. If the port **50** is set either to the right or left of the axis of the conduit **36**, the proportion of the solution drawn from the chamber **38** will be reduced accordingly. The top of the suction conduit **42** is of course sealed off, as for example with a welded cap, and is preferably provided with an arrow-shaped groove **60** pointing to the position of the port **50**, as shown for example in Figure 3. The port **50** therefore can be placed in any position to give the desired proportion of anti-rust solution by merely loosening the nut **44** and turning the suction tube **42** to the desired position by means of a screw driver, and again tightening the nut **44**.

In the operation of the apparatus valve **34** is opened causing a flow of water under pressure through conduit **36** and venturi **38**. This will create a suction based on the rate of flow of the water, and this suction working against a constant liquid level in the chamber **28** will draw a definite proportion of rust inhibitor solution from container **28** through the suction tube **42** and port **50** into the flowing stream of water in the conduit **36**. The resulting mixture containing the desired proportion of inhibitor is passed into the car radiator.

The apparatus described in connection with the present invention is particularly suited for providing rust inhibited water for maintaining the water in car radiators in a condition to prevent rust formation. Where a car radiator is initially filled with rust inhibiting water in accordance with the features of the present invention, the water in the car radiator may be readily maintained free from rust formation by regular additions of rust inhibited water as loss from vaporization and other causes may occur. Even the addition of rust inhibited water to untreated water in a car radiator will give some protection against rust formation. In these cases there is also an improvement in the anti-rust condition in the car radiator and cooling system. On the other hand the addition of hard water and uninhibited water to a car radiator containing anti-rust treated water will decrease the effectiveness of the treating agent and often cause precipitation of undesirable constituents.

When the apparatus is used in cold weather, it may be necessary to add an amount of anti-freeze, such as alcohol, to the rust inhibitor solution to prevent the freezing thereof. If this be the case, port **50** can be so positioned as to permit a relatively larger proportion of inhibitor solution to be drawn into the flowing stream of water for the car radiator.

Having thus described the invention, what is claimed as new is:

An apparatus for delivering a proportional mixture of two liquids comprising, a chamber for holding one liquid, means for maintaining a constant level of liquid in said chamber, a pipe with a Venturi throat through which the other liquid flows, means for controlling the flow of the liquid through the Venturi throat, a suction tube extending from below the liquid level of the constant level chamber upwardly into the Venturi throat of the pipe, a port in the portion of the suction tube extending into the Venturi throat so arranged that by suction alone liquid is drawn up through the tube and mixed with other liquid in the Venturi throat, said suction tube being adjustable to vary the position of the port with respect to the longitudinal axis of the venturi and thereby vary the proportional ratio of the two liquids, and means for indicating the proportional ratio of the liquid mixture.

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