June 18, 1940.

H. S. RYAN ET AL

2,204,998

WATER ELIMINATOR

Filed Sept. 6, 1938

Fig. 1.

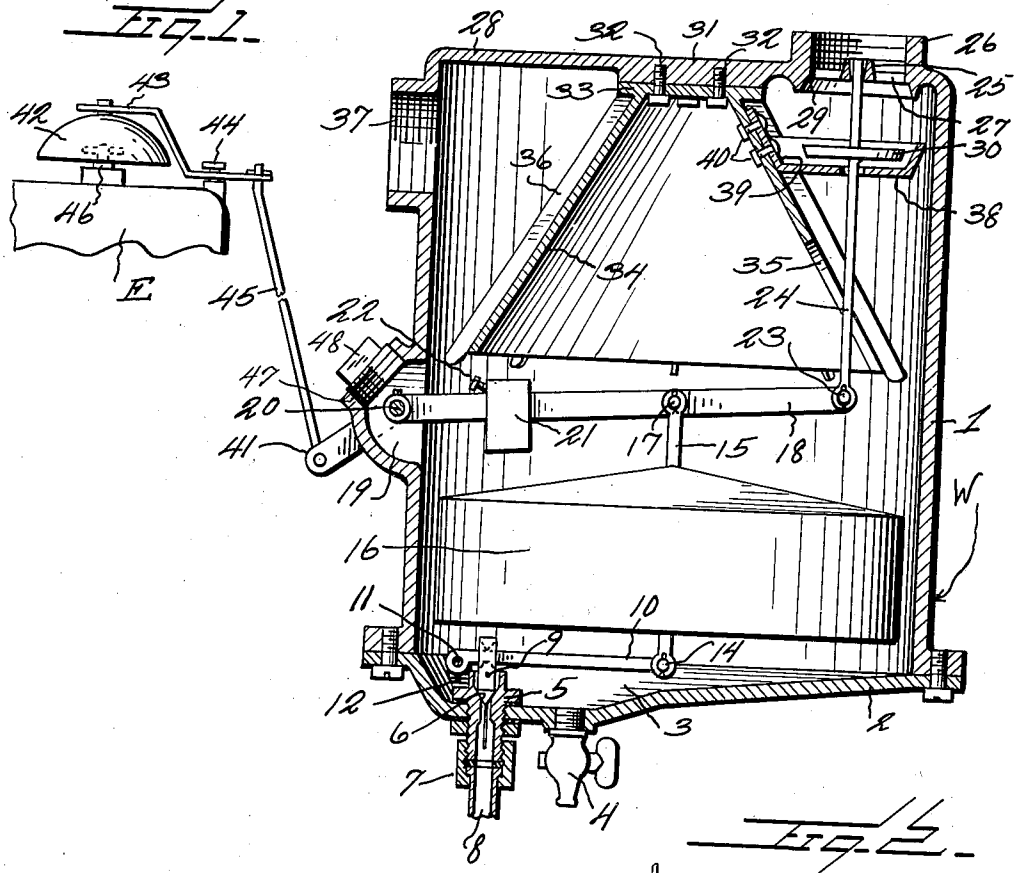


Fig. 2.

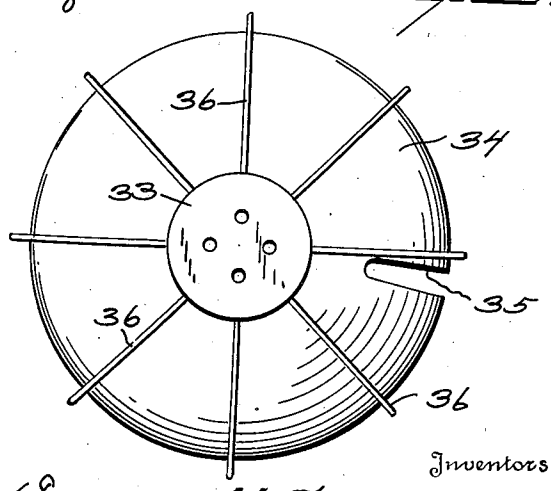
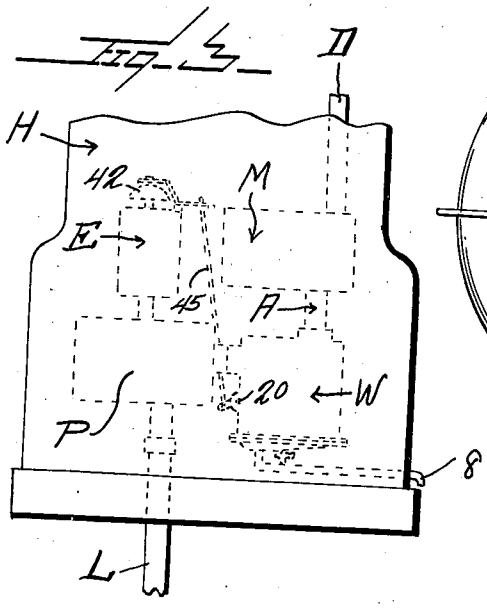


Fig. 3.



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WATER ELIMINATOR

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3 Claims. (Cl. 210—54)

This invention relates to a water eliminator and it is a particular object of the invention to provide a device of this kind to be employed with a gasoline pump to separate water that may be in the gasoline.

It is also an object of the invention to provide an eliminator wherein the gasoline being delivered passes through the eliminator before being discharged into the automobile tank and preferably before the gasoline passes through the metering device.

Another object of the invention is to provide a device of this kind which will effectively separate any mixture of gasoline and water that may pass therethrough and wherein the separated water is automatically ejected.

The invention also has for an object to provide a device of this kind which comprises a float which controls the automatic discharge of the water separated from the gasoline, together with a mechanism to stop the flow of the gasoline through the device until the water has been ejected and also wherein the float provides means for operating a signal to warn of water.

The gasoline dispensing unit generally in use comprises a pump for delivering gasoline from an underground storage tank, through a metering device, and through a flexible hose to the tank of an automobile. In the underground tank, various amounts of water is usually present due to condensation, faulty insulation, broken pipes, leaky tanks, defective fill pipe cap, etc. A part of this water is sometimes pumped through the meter into the customer's tank with resultant disadvantages. This water is particularly detrimental to meter parts especially leather parts and small valves causing inaccuracy and other troubles. It is the purpose of the present invention to eliminate such disadvantages.

The invention consists in the details of construction and in the combination and arrangement of the several parts of our improved water eliminator whereby certain important advantages are attained and the device rendered simpler, less expensive, and otherwise more convenient and advantageous for use, as will be hereinafter more fully set forth.

The novel features of our invention will hereinafter be definitely claimed.

In order that our invention may be the better understood, we will now proceed to describe the same with reference to the accompanying drawing, wherein:

Figure 1 is a view in section taken through a water eliminator constructed in accordance with an embodiment of our invention, portions being in elevation and diametrically illustrated.

Figure 2 is a view in top plan of the baffle cone as herein employed unapplied.

Figure 3 is a fragmentary elevational view and of a diametric character illustrating a preferred location of the water eliminator with respect to a gasoline dispensing unit.

As illustrated in Figure 3, H denotes the lower portion of a pump housing for a gasoline dispensing unit and in which is arranged a conventional pump P in communication through the line L with an underground storage tank. The pump P is driven by the motor E preferably of an electrical type. The delivery line D leads from a conventional metering device M. Our improved water eliminator W is preferably interposed in the line A leading from the pump P to the metering device M.

Our improved water eliminator, as herein disclosed, comprises a casing 1 of desired dimensions and cubic capacity having a removable bottom wall 2 so constructed and arranged to provide a draining well 3. In communication with the lower portion of the well 3 is a conventional drain cock 4. Also in communication with the well 3 and extending from above through the bottom wall 2 is a discharge nipple 5 formed to provide an internal valve seat 6. This nipple 5 has an extended portion to which is suitably coupled, as at 7, an ejector tube 8 leading to a suitable point of discharge exteriorly of the pump housing H.

Coacting with the valve seat 6 of the nipple 5 is a needle valve 9 carried by a rock lever 10. This lever 10 has one end portion hingedly connected, as at 11, to an upstanding bracket 12 carried by the nipple 5. It will be obvious, however, that this lever 10 may be otherwise mounted it only being necessary that this lever 10 be free for up and down movement. This lever 10 is also pivotally connected, as at 14, with the lower end portion of a vertically directed rod 15 disposed through the axial center of a bouyant body or float 16. This body or float 16 is of a specific gravity heavier than gasoline but lighter than water, so that normally this buoyant member or float 16 will be at the limit of its downward movement with the valve 9 in contact with its seat 6 and thereby closing discharge through the nipple 5 and out through the ejector tube 8.

The upper portion of this rod 15 is pivotally connected, as at 17, with an intermediate portion of a relatively long rocker arm 18. This arm 18 has an end portion extending within a recess or

pocket 19 carried at a desired location by the side wall of the casing 1. The end portion of the arm 18 within the pocket 19 is pivotally held to the walls of the pocket 19 by a pin 20. This rocker arm 18 has slidably mounted thereon a poise 21 of desired weight and which is maintained in selected adjustment lengthwise of the arm 18 by a holding screw 22 threading into the poise 21 for proper engagement with the arm 18. The end portion of the arm 18 remote from its pivotal mounting 20 has operatively connected therewith, as at 23, the lower end portion of a stem 24. This stem 24 is vertically disposed and is of a length to have its upper end portion disposed through the guide sleeve 25 held within and at the axial center of the outlet opening 26 by the spider arms 27. This outlet opening 26 is provided in the top end or head 28 of the casing 1 and is defined by an internal valve seat 29. The valve member 30 carried by the stem 24 engages the valve seat 29 to stop flow out through the outlet 26 upon rising of the buoyant member or float 16 a predetermined distance within the casing 1 and which upward movement at the same time raises the needle valve 9 into open position.

The top wall or head 28 as herein disclosed, is of increased diameter at its axial center, as at 31, and bolted, as at 32, or otherwise securely anchored to this portion 31 is the upper top plate 33 of a conoidal baffle 34. This baffle 34 as herein disclosed is of a hollow or shell structure with the side wall or skirt thereof provided with a slot 35 through which the stem 24 freely passes. This slot 35 is required due to the fact that the lower or base diameter of the baffle 34 is such as to extend a major distance across the casing 1. This baffle 31 is provided therearound with the upstanding and equidistantly spaced flanges 36 which extend from the top of the baffle 34 to a point slightly below the lower end thereof.

The baffle 34 intersects the direct line of flow from the inlet 37 to the outlet 26. This inlet 37 is preferably closely adjacent to the top wall or head 28 of the casing 1 and the baffle 34 terminates a material distance below said inlet 37.

Underlying the valve member 30 but positioned closely adjacent thereto is an upwardly facing dished shield 38 for the valve member 30. This shield 38, as is clearly illustrated in Figure 1, completely receives or houses the valve member 30 and the side wall or flange of the shield 38 is so constructed and arranged, as at 39, to permit the shield 38 to be bolted, as at 40, or otherwise securely anchored in proper position upon the baffle 34.

The pin 20 for the rocker arm 18 constitutes a shaft with one end portion of said shaft extending exteriorly of the pocket 19. This extended portion of the pin or shaft 20 carries a rock arm 41 which provides means for operating a suitable alarm or signal upon raising of the buoyant member or float 16 to give warning that there is water in the gasoline as it enters the casing 1. This signal or alarm may be as preferred but, in the present instance, constitutes a bell 42 suspended from an end portion of a vertically swinging rock arm 43. This rock arm 43 is freely mounted, as at 44, upon the upper portion of the motor E. This arm 43 is also operatively connected by a rod 45 with the arm 40 so that as the arm 41 swings upwardly, the bell 42 will be caused to drop into position to be engaged by a suitable beater carried by an upstanding shaft 46 rotating when the motor is in operation.

Under normal conditions, the gasoline as drawn by the pump from the storage tank is delivered within the casing 1 through the inlet 37 and passes out through the outlet 26 to the metering device M and from the metering device M through the delivery line D to the desired point of delivery, such as the tank upon the car of a motor driven vehicle. Under idle conditions, the member or float 16 is at the limit of its downward movement with the valve 19 closed and the valve member 30 in open position. As the member or float 16 is of a specific gravity heavier than that of gasoline, the float will remain in its lowermost position unless water should enter into the casing 1 with the gasoline. Under these conditions the water being of heavier specific gravity than the gasoline will drop to the bottom of the casing 1. This separating action is facilitated by the conoidal baffle 34, the flanges or ridges 36 serving to deflect the flow of the gasoline within the upper portion of the casing 1 and thereby permitting the water to settle to the bottom of the casing 1 and not be swept out through the outlet 26 along with the gasoline. As the separated water collects upon the bottom of the casing 1, the buoyant member or float 16 being of a specific gravity less than that of the water will rise with the water and as a result of such upward movement of the member or float 16, the valve 9 will be raised into open position thus providing an automatic means for the ejection of the water within the casing 1. As the water line within the casing 1 drops, the member or float 16 will correspondingly lower so that upon substantially complete evacuation of the water, the valve 9 will be in closed position, thus preventing waste of gasoline out through the ejector tube 8.

As the water line within the casing 1 rises, the upward movement of the member or float 16 will also cause the valve 30 to engage its seat 29 so that there will be no discharge through the outlet 26 of the water laden gasoline. Also upon the raising of the member or float 16, the signal alarm, such as the bell 42, will be caused to operate and thus give warning of the presence of water in the gasoline as it comes from the storage tank.

The recess or pocket 19 is provided in the upper part of its wall with an opening 47 which is normally closed by the plug 48 or otherwise, as may be preferred. This opening 47 permits a small amount of anti-freezing solution of any desired character to be put within the casing to assure proper operation of the water eliminator during freezing weather.

From the foregoing description it is thought to be obvious that a water eliminator constructed in accordance with our invention is particularly well adapted for use by reason of the convenience and facility with which it may be assembled and operated, and it will also be obvious that our invention is susceptible of some change and modification without departing from the principles and spirit thereof and for this reason we do not wish to be understood as limiting ourselves to the precise arrangement and formation of the several parts herein shown in carrying out our invention in practice except as hereinafter claimed.

We claim:

1. In an apparatus for separating liquids of different specific gravities, the combination of a casing having a top head and a bottom head, the top head being provided with an outlet for the liquid of lighter specific gravity and the bot-

tom head having an outlet for liquid of heavier specific gravity, said casing in its upper portion having an inlet, a rock lever operatively mounted within the casing at the lower part thereof, a valve member carried by said rock lever for coaction with the outlet in the bottom head of the casing, a second rock lever supported within the casing above the first rock lever, a valve member carried by the second rock lever for coaction with the outlet in the top head of the casing, a rod pivotally connected with both of the rock levers and causing the same to swing in unison and in the same directions, a buoyant body carried by said rod, rising movement of the buoyant body moving the first valve into open position and the second valve into closed position and dropping movement of the buoyant body moving the first valve into closed position and the second valve into open position, said buoyant body being of a specific gravity heavier than the lighter liquid and of a specific gravity lighter than the heavier liquid, and a conoidal baffle secured to the top head of the casing at substantially the axial center thereof, the base portion of said baffle being of a diameter to extend a material distance across the casing, said baffle being positioned between the inlet of the casing and the outlet in the top head thereof, the bottom of the baffle being a material distance below the inlet of the casing.

2. In an apparatus for separating liquids of different specific gravities, the combination of a casing having a top head and a bottom head, the top head being provided with an outlet for the liquid of lighter specific gravity and the bottom head having an outlet for liquid of heavier specific gravity, said casing in its upper portion having an inlet, a rock lever operatively mounted within the casing at the lower part thereof, a valve member carried by said rock lever for coaction with the outlet in the bottom head of the casing, a second rock lever supported within the casing above the first rock lever, a valve member carried by the second rock lever for coaction with the outlet in the top head of the casing, a rod pivotally connected with both of the rock levers and causing the same to swing in unison and in the same directions, a buoyant body carried by said rod, rising movement of the buoyant body moving the first valve into open position and the second valve into closed position and dropping movement of the buoyant member moving the first valve into closed position and the second valve into open position, said buoyant body being of a specific gravity heavier than the lighter liquid and of a specific gravity lighter than the heavier liquid, and a conoidal baffle secured to the top head of the casing at substantially the axial center thereof, the base portion of said baffle being of a diameter to extend a material distance across the casing, said baffle being positioned between the inlet of the casing and the outlet in the top head thereof, the bottom of the baffle being a material distance below the inlet of the casing, said baffle being provided with circumferentially spaced outstanding flanges extending from the top to the bottom of the baffle, said flanges providing means to deflect the flow of the liquid as it enters the casing through the inlet to prevent a direct flow from the inlet to the outlet.

3. In an apparatus for separating liquids of different specific gravities, the combination of a casing having a top head and a bottom head, the top head being provided with an outlet for the liquid of lighter specific gravity and the bottom head having an outlet for liquid of heavier specific gravity, said casing in its upper portion having an inlet, a rock lever operatively mounted within the casing at the lower part thereof, a valve member carried by said rock lever for coaction with the outlet in the bottom head of the casing, a second rock lever supported within the casing above the first rock lever, a valve member carried by the second rock lever for coaction with the outlet in the top head of the casing, a rod pivotally connected with both of the rock levers and causing the same to swing in unison and in the same directions, a buoyant body carried by said rod, rising movement of the buoyant body moving the first valve into open position and the second valve into closed position and dropping movement of the buoyant body moving the first valve into closed position and the second valve into open position, said buoyant body being of a specific gravity heavier than the lighter liquid and of a specific gravity lighter than the heavier liquid, and a conoidal baffle secured to the top head of the casing at substantially the axial center thereof, the base portion of said baffle being of a diameter to extend a material distance across the casing, said baffle being positioned between the inlet of the casing and the outlet in the top head thereof, the bottom of the baffle being a material distance below the inlet of the casing, and an upwardly facing dished shield carried by the upper portion of the conoidal baffle for the second named valve member, said shield housing the valve member when the first valve member is in closed position.

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