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W. E. SPLAIN ET AL.

GASOLINE DISPENSING DEVICE

Filed Jan. 21, 1924

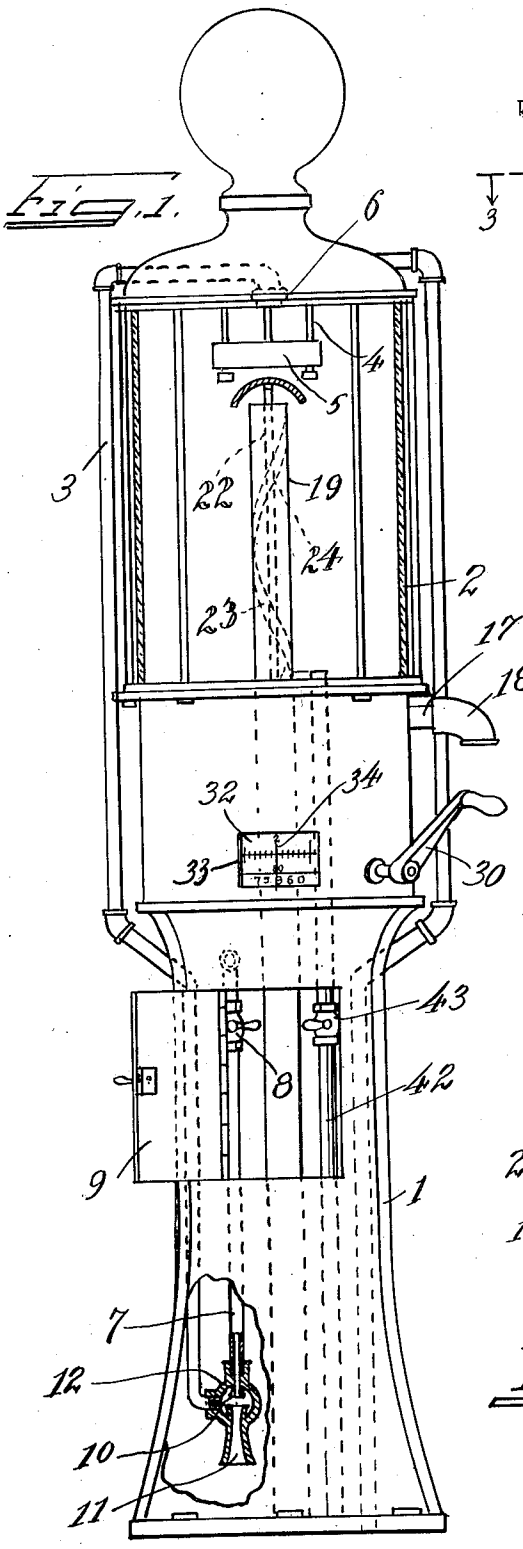



Fig. 1.

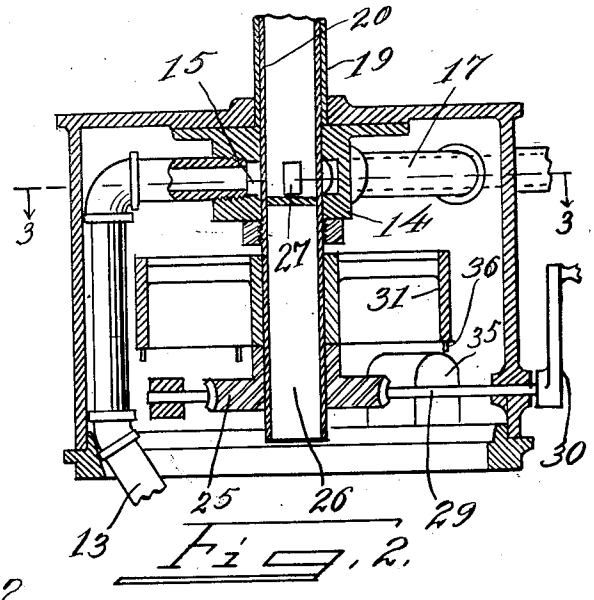



Fig. 2.

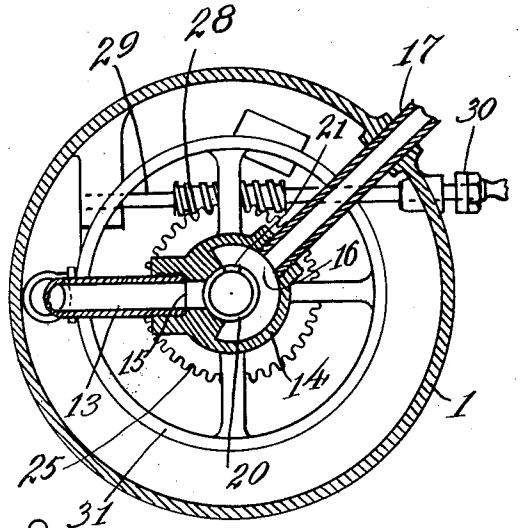



Fig. 3.

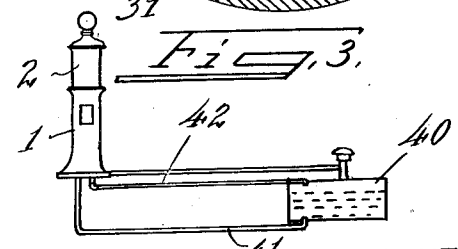



Fig. 4.

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# UNITED STATES PATENT OFFICE.

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## GASOLINE-DISPENSING DEVICE.

Application filed January 21, 1924. Serial No. 687,412.

Our invention relates to gasoline dispensing devices of the gravity type, wherein the liquid is dispensed from an overhead tank, preferably of glass, so as to permit the customer to see what he gets.

It is our object to provide a simple and effective mode of drawing the gasoline into the overhead tank, same to operate without moving parts, from the air pressure system of the garage owner.

It is our object to provide a simple device for moving the service port within the overhead tank, through a path which controls the amount of liquid that will be delivered to the customer, and in connection with this device to operate an indicator, to the end that the liquid can be dispensed on a price basis as well as a quantity basis. Thus it is our object to move the dispensing port by other than definite steps so that any fraction of quantity can be delivered as determined by a price scale.

It is our object to provide specifically for an ejector, as a power means for setting up a vacuum in the overhead tank. One great advantage in addition to simplicity and freedom from moving parts in this device, is that when the air under pressure is turned off, the suction at once ceases and atmospheric pressure is established in the suction pipe and overhead tank, thereby permitting ready gravity flow without the use of any relief valve. Furthermore, we use compressed air as a power means, which is always present in garages for use in filling tires, and we effect a very great economy by eliminating the expensive and troublesome vacuum pumps, now customarily used in gravity dispensing machines for gasoline.

We do not claim to be the inventors of the general mechanism of air pressure controlled ejectors, but do claim that the adaptation of such a device to set up low air pressure in a gravity dispensing tank for gasoline or the like, is novel with us, and forms a decided contribution to the art.

Another object of our invention is to use the device which opens the dispensing port to the delivery hose of the mechanism, for closing and opening the inflow pipe. By this means, it is not possible for the tank to be filling and draining at the same time, and the accidental failure to shut off the air valve while dispensing will not permit of influx of liquid during the draining operation. To prevent the ejector from drawing gasoline out of the top of the overhead tank, we provide a simple float, and valve controlled thereby.

Specifically, we employ as a movable port device a sleeve within a pipe, the one having a spiral groove therein and the other a straight groove. This sleeve and pipe we also use as a fill pipe, thereby greatly simplifying the structure of the machine, and in addition making very simple the joint control of inflow and outflow of gasoline by manipulation of the controlling mechanism for the sleeve.

We accomplish our objects by that certain construction and arrangement of parts to be hereinafter more specifically pointed out and claimed.

In the drawings:

Figure 1 is a part section and part elevation of the complete device.

Figure 2 is a detail vertical section through the operating parts for the two-way valve, sleeve and chart.

Figure 3 is a section on the line 3—3 of Figure 2.

Figure 4 is a small scale diagram of the mode of conducting liquid to the device.

We show a framework or column 1, on which is held a glass tank 2, preferably cylindrical. The air suction pipe 3 enters at the top of the tank 2, which is air tight, and mounted on guide rods 4, is a float 5, within the tank, which operates a safety valve 6 for stopping off the pipe 3, when the float is raised.

Air under pressure from the pressure tank of the compressor, normally found in public garages for filling pneumatic tires, enters the device through the pipe 7, in which is a control valve 8, access to which is had through the door 9 in the column. By means of this door the device is locked against unauthorized operation.

The ejector is shown in this pipe, having inlet tube 10, outlet tube 11, and suction body 12. The suction pipe 3 extends from the suction body 12 to the top of the tank, as has been indicated. By careful tests we have established that a moderate pressure of air passing through the ejector will set up sufficient low pressure in the overhead tank to permit the atmospheric pressure in an un-

derground storage tank to force up liquid rapidly into the overhead tank.

The inflow of liquid passes into the tank through a pipe 13, which extends up into a valve body 14, terminating in a port 15 of said body. This valve body also has a delivery port 16, from which the pipe 17 extends to a suitable hose connection 18. From the valve body a pipe 19 extends up into the overhead tank. Within the valve body and the pipe 19 is a sleeve or cylinder 20 which has a port 21 therein. The revolution of the sleeve will bring the port to a position of opening up port 15 for inflow of liquid, or port 16 for outflow thereof. The valve body is such, however, that the port in the sleeve cannot take a position of opening both ports at the same time.

The pipe 19 from the valve body has a longitudinal slot 22 therein, in that portion which extends above the base of the tank. The sleeve has a spiral slot 23 therein, which extends throughout the distance covered by the slot 22. The spiral is such that when the sleeve is turned to a position of opening up the port 15, there is no registry with the lengthwise slot in the pipe 19, but as the sleeve is turned to open the outflow port 16, the spiral traverses the lengthwise slot, as indicated by the exposure 24 (Figure 1), thereby controlling the level of the exposure of the spiral slot within the tank, and thus controlling the amount which will be dispensed therefrom. The spiral, in the form shown, occupies about two thirds of the periphery of the sleeve, i. e. it makes a two thirds turn around the said sleeve. The valve body is formed with the port 16 about two thirds of its circumference.

To revolve the sleeve thereby controlling the direction of flow of liquid in the tank, and also regulating the exact quantity which flows out of the tank, we provide a gear 25 on the projection 26 of the sleeve below the closure 27 therein. This gear is engaged by a worm 28 on the shaft 29, and a handle 30 on the shaft serves to revolve it. The worm drive is well adapted to permit the operator to gradually lower the discharge opening in the pipe and sleeve and make a stop at any desired point.

Attached to the sleeve between the gear 25 and the valve is a drum 31 which has mounted on its periphery a chart 32. This chart shows through a glazed opening 33 in the column, and can be read with regard to a sight line 34. A totalizer indicated at 35 may be driven from the chart by means of pins 36, or some similar device, said totalizer including a ratchet, so that it moves only on rotations of the indicator drum in one direction.

We provide a tank 40 for storage of gasoline, which may be at a remote point from the dispensing device. The feed pipe 41 is brought from the interior of the tank, in a horizontal direction to a point beneath the dispensing device, where it is turned up into the device. The result of this structure is that the level of liquid in the tank will be maintained in the pipe 41 just below the dispensing device, and the suction from the tank will not be called upon to draw the liquid all the way from the tank, but merely from the level in the pipe 41. The drain pipe from the overhead tank of the dispensing device is shown at 42, and has a valve 43 therein. It is conducted to the storage tank, as indicated.

Referring now to the operation of the device: Starting with the overhead tank empty, and all valves closed, the operator opens the valve 8, and moves the handle of the delivery device so as to open the inflow port 15 in the two-way valve thereby permitting the suction set up in the tank through the operation of the ejector to draw the gasoline from the level maintained in the pipe 41 up into the tank. When the tank has been filled, the operator shuts off the air valve 8, or else the safety float valve will shut off the suction. Any excess will then flow back through the fill pipe to the storage tank. If he should turn the control handle 30 to dispensing position, the inflow of gasoline would stop, but if the air valve were to be left on, the suction would prevent any gasoline from flowing out of the tank through the dispensing hose. Thus in any case the operator will have to turn off the air valve, in order to have a successful operation of the device, although if he neglects to do so, no damage will result.

In dispensing the liquid, the operator will watch the chart, and when the chart shows a given quantity or a given price, he will stop revolving the crank. The result of shutting off the air pressure will be to establish atmospheric pressure in the overhead tank, so that a quick drainage by gravity will bring the liquid to the top of the pipe 19. Ordinarily the top of pipe 19 will be at the five gallon point of the tank.

It will naturally be possible to alter the mechanical instrumentalities described above without changing the essential features of our device. Our machine is admirably adapted for dispensing by price, instead of quantity, because of the continuous movement, as distinguished from the usual intermittent movement of the indicator and the control handle, and movable port, resulting from the straight and spiral grooves in the delivery line. The ejector as a power element for filling an overhead tank with liquid very greatly simplifies the device over those of the art with which we are familiar, and wherein expensive suction pumps and elaborate valve controls are used. The safety of operation of our device is ob-

tained by the simple expedient of making it impossible to dispense liquid while feeding it into the tank, by means of a two-way valve in that portion of the feed line common to both. The shutting off of air pressure at once sets up atmospheric pressure in the overhead tank, without valves or the like. Should the air be turned on when the delivery handle has been turned to dispensing position, a mere waste of air would occur, as the gasoline feed line would be shut off.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent, is:—

1. A gasoline dispensing device having a gravity dispensing tank, a pipe in said tank, a sleeve, said pipe and sleeve concentric with each other, and one having a spiral slot and the other a straight slot opening into the tank, and means for revolving said sleeve, said sleeve having communication with a delivery pipe and means for filling the said tank with liquid.

2. A gasoline dispensing device having a gravity dispensing tank, a pipe in said tank, a sleeve, said pipe and sleeve concentric with each other, and one having a spiral slot and the other a straight slot opening into the tank, and means for revolving said sleeve, said sleeve having communication with a delivery pipe, and an indicator driven with said sleeve for indicating the amount of liquid that will flow from the gravity tank upon the movement of the sleeve.

3. A gasoline dispensing device having a gravity dispensing tank, a pipe in said tank, a sleeve, said pipe and sleeve concentric with each other, and one having a spiral slot and the other a straight slot opening into the tank, and means for revolving said sleeve, said sleeve having communication with a delivery pipe, a valve body through which said sleeve passes, said body having two ports therein, said sleeve having a port therein, one of the valve body ports being the communication with a delivery pipe, above noted, and the other port in the valve body being a supply pipe entrance into said body.

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