

Aug. 18, 1936.

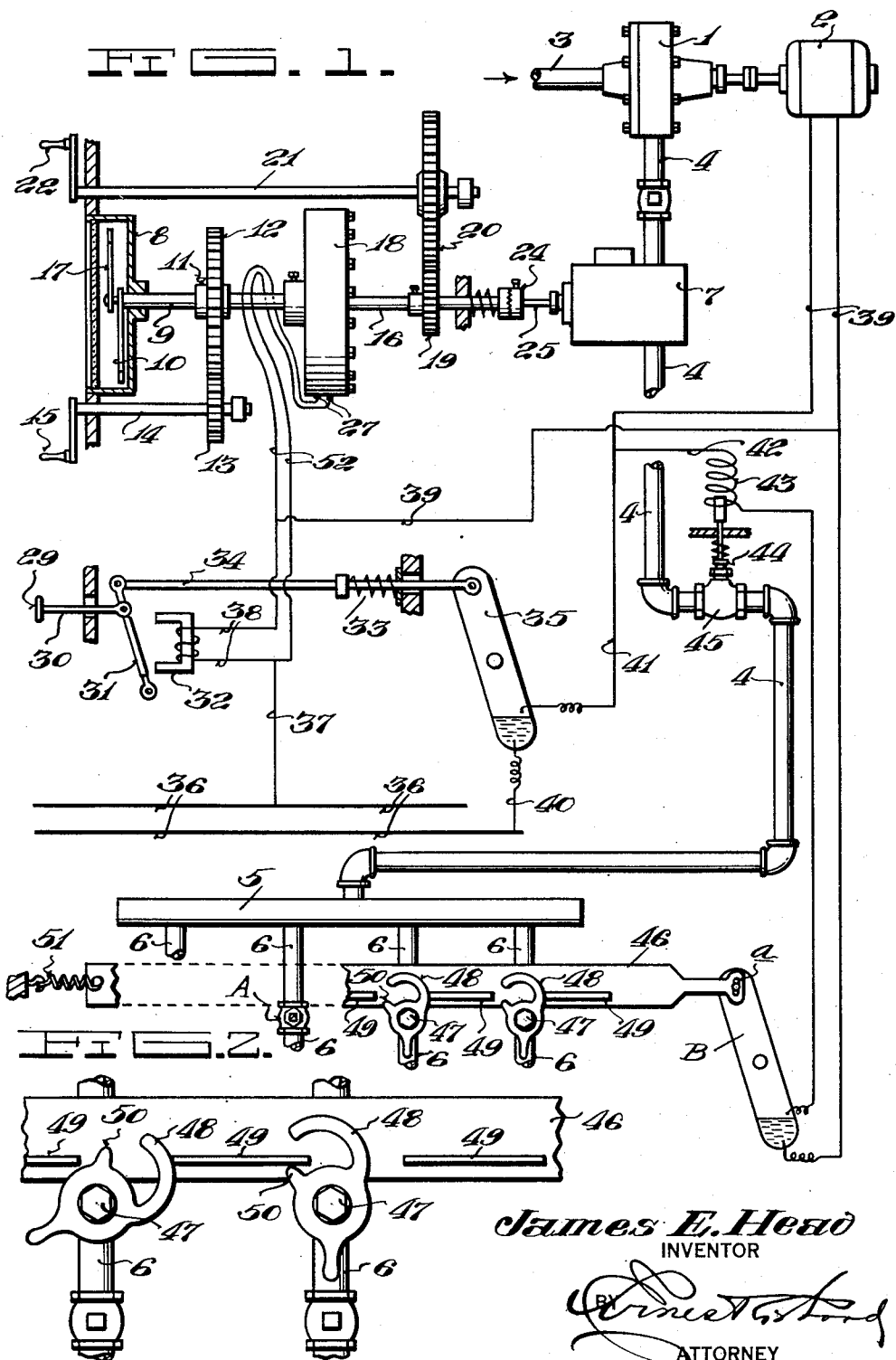
J. E. HEAD

2,051,597

SELF SERVING FILLING STATION

Filed Jan. 3, 1935

4 Sheets-Sheet 1



James E. Head
INVENTOR

BY *Ernest G. Head*
ATTORNEY

Aug. 18, 1936.

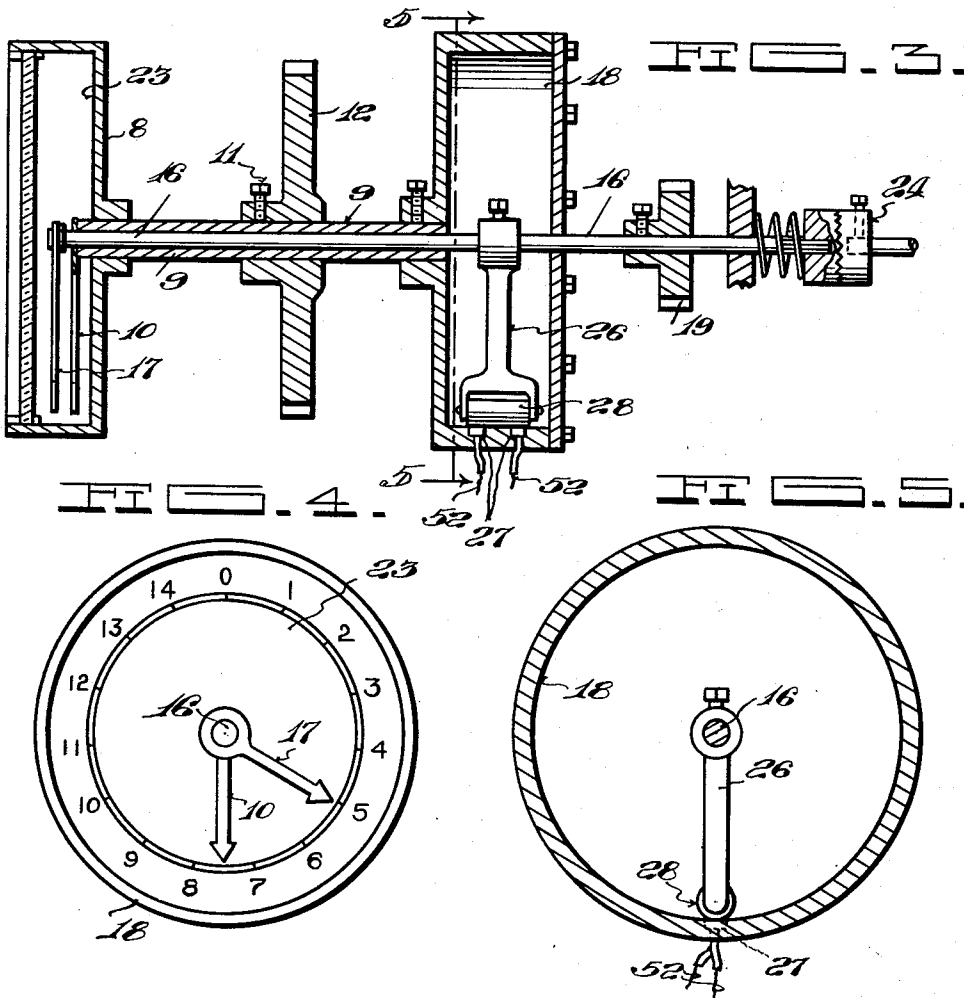
J. E. HEAD

2,051,597

SELF SERVING FILLING STATION

Filed Jan. 3, 1935

4 Sheets-Sheet 2



James E. Head
INVENTOR

BY *Ernest W. Ford*
ATTORNEY

Aug. 18, 1936.

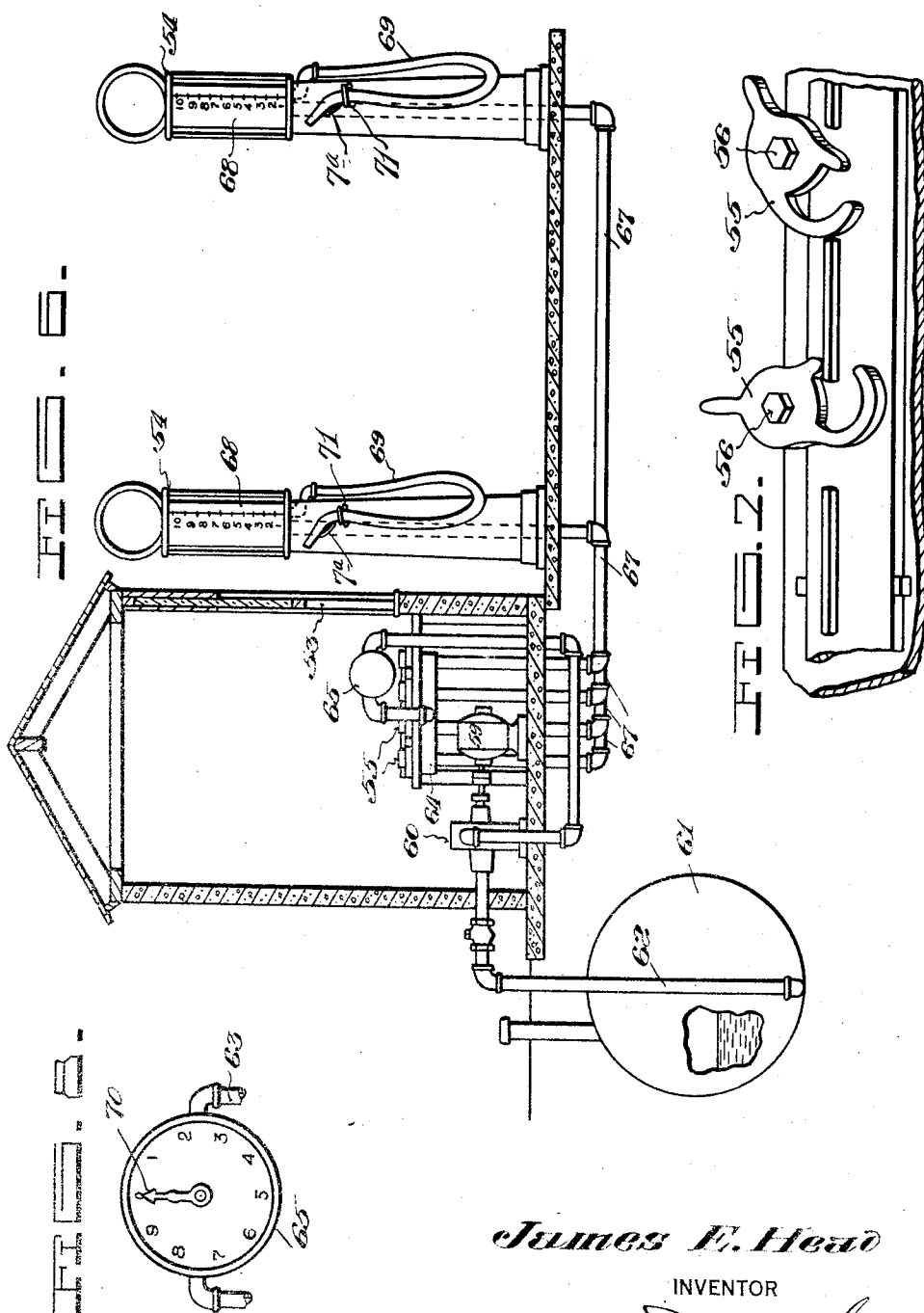
J. E. HEAD

2,051,597

SELF SERVING FILLING STATION

Filed Jan. 3, 1935

4 Sheets-Sheet 3



James F. Head

INVENTOR

BY *James F. Head*
ATTORNEY

Aug. 18, 1936.

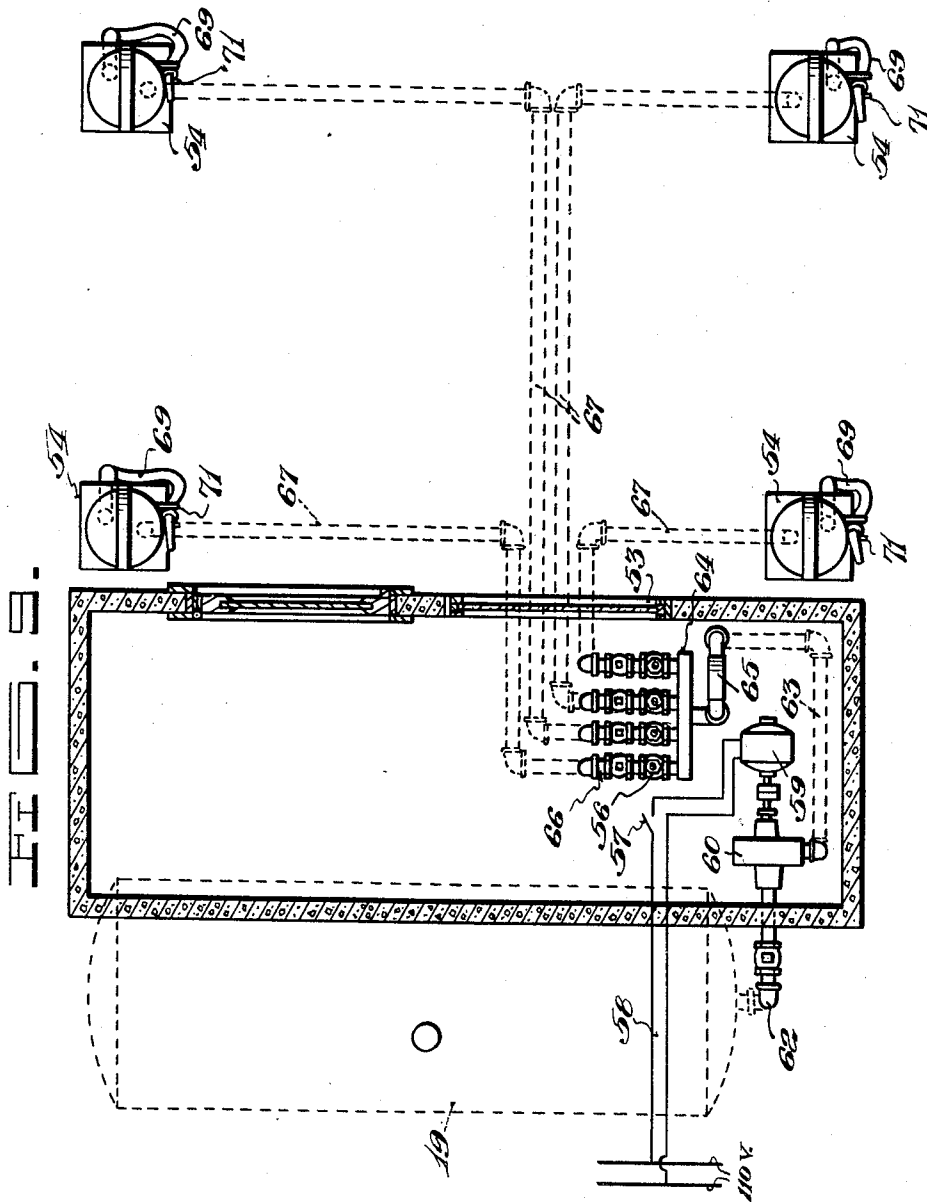
J. E. HEAD

2,051,597

SELF SERVING FILLING STATION

Filed Jan. 3, 1935

4 Sheets-Sheet 4



James E. Head

INVENTOR

Ernest S. Head

ATTORNEY

UNITED STATES PATENT OFFICE

2,051,597

SELF-SERVING FILLING STATION

James E. Head, El Dorado, Ark.

Application January 3, 1935, Serial No. 225

2 Claims. (Cl. 221-101)

This invention relates to a system and apparatus for dispensing gasoline and other liquids and it has particular reference to a vehicle service station in which the customer serves himself.

5 The principal object of the invention is to minimize the cost incident to the transfer of gasoline from the service station tanks to the vehicle tanks of the automobile and while this operation is manual, the operation of supplying a reservoir with a predetermined amount of fuel is wholly automatic, either electrical or mechanical and may be accomplished by a single attendant where otherwise several would be required with no increase in service rendered by a considerable increase in the cost of the product to the purchaser.

Another object of the invention is to insure the proprietor of a station against losses growing out of errors in tabulating sales or possibly due to misappropriations of funds by unscrupulous employees, since the invention requires that the customer himself pay to the cashier an amount of money for a predetermined amount of fuel and when said fuel is delivered to a suitable reservoir for transfer to the customer's automobile tank, it is measured and the quantity of fuel dispensed throughout the day is shown on a suitable meter. Therefore, a definite check against possible losses can be made between the cash on hand and the fuel dispensed in a fixed period of time.

With the foregoing objects as paramount, the invention has particular reference to its salient features of construction and arrangement of parts which will become manifest as the description proceeds, taken in connection with the accompanying drawings, wherein:—

Figure 1 is a schematic diagram of a system wherein electrical means are employed for transferring liquid from a service station tank to the vehicle tank of an automobile.

Figure 2 is a detail view of the valve actuating and controlling means employed by the invention.

Figure 3 is a longitudinal section showing the portion of the electrical system comprising the meter dial and the means for predetermining the quantity of liquid dispensed.

Figure 4 is a front view of the dial.

Figure 5 is a view on lines 5-5 on Figure 3 showing in section the switch which is effective in shutting off the flow of liquid after a predetermined amount has passed through the meter.

Figure 6 is a sectional view of a station equipped with a control and metering means embodied in a modified form of the invention.

Figure 7 is a detail view in perspective, showing

ing the type of valve actuating and controlling means employed in the modification.

Figure 8 is a front view of the dial meter employed in the modification, and

Figure 9 is a plan view of the station shown in Figure 6.

In continuing with a more detailed description of the drawings, it may be stated that it is not intended that the invention shall be limited to the position of the bowls, conventionally referred to as pumps, nor the number of such bowls located in front of the service station. Other specific applications are employed for the sole purpose of illumination and should not be regarded as limitations.

Referring to the preferred or electrical system, attention is directed primarily to Figure 1 in which is shown a pump 1, operated by an electric motor 2. A pipe 3 leads to storage while the pipe 4 leads to a manifold 5. The manifold 5 is shown as having in communication therewith four pipes 6. Each of these pipes extends to a liquid reservoir, not shown, and in passing from the pump 1 through the pipe 4, the liquid enters a metering device 7 where the total quantity of liquid dispensed is determined.

It will be understood that the customer first drives his vehicle to a point adjacent a liquid dispensing apparatus in front of the service station and the nozzle of the dispensing hose is placed in the tank opening of his vehicle either by himself or an attendant. The customer then approaches the cashier in the station, orders the required quantity of fuel, pays the cashier and returns to his vehicle. The bowl is then filled with the quantity of gasoline ordered and an attendant or the purchaser actuates the valve 7a carried by the nozzle of the hose to allow the gasoline to flow into the tank.

The cashier or an attendant first sets the hands on a meter dial to indicate the purchase of the customer, moves a valve corresponding to the station at which the vehicle stops and then sets into operation electrically, certain mechanism to operate the gasoline pump. The pump is effective in filling the measuring bowl of the dispensing station and the amount of gasoline transferred to the station is precisely that indicated on the meter dial. After receiving the gasoline the customer or attendant returns the hose to a suitable hook on the dispensing station.

Referring again to Figure 1, it will be observed that the visible meter has a housing 8 into which is extended a hollow shaft 9. Upon the free end of a shaft 9 is affixed a hand or pointer 10 and

which hand or pointer indicates the gallons flowing through the system as will be explained presently. Affixed to the hollow shaft 9 by a set screw 11 is a gear 12 which enmeshes a smaller gear 13 mounted on a shaft 14. A crank 15 is likewise mounted on the shaft 14.

Referring to Figure 3, a shaft 16 extends through the hollow shaft 9 and carries a hand or pointer 17. The shaft 16 continues through a cylindrical shell 18 which will be referred to hereinafter as a switch housing for a reason to be presently set forth.

A gear 19 is carried by the shaft 16 and as apparent in Figure 1, enmeshes a gear 20, carried on a shaft 21 which is likewise actuated by a crank 22. Since it is necessary that the liquid itself is required to rotate the shaft 16 to visibly indicate the quantity of fuel on the dial 23 and due to the fact that the point 17 must be reset against a possible pressure of liquid in the pipe 4, a suitable clutch combination 24 is provided on the shaft 16, forming a connection between this shaft and a short shaft 25 entering the meter 7.

To clarify, it is pointed out that the operator first sets the pointer 17 at zero and moves the companion pointer 10 to the desired number of gallons of gasoline ordered and after the pump 1 has been set into operation as will be presently explained, the shaft 16 is rotated, which will likewise rotate the arm 26, disposed in the switch housing 18 shown in Figure 3. The switch housing 18 is required to rotate but one revolution irrespective of the quantity of liquid dispensed and it is provided with a pair of contact points 27. Since the drum 18 is in fixed relation to the hollow shaft 9 and pointer 10, it is required to rotate synchronously with the said pointer 10. Accordingly, the contact points 27 are always in fixed relation to the position of the pointer 10 on the dial 23.

From the foregoing it will be understood that when the pointer 10 is first set to the required number of gallons ordered and the pointer 17 set at zero, the liquid passes through the meter 7, and rotating the shaft 16 will likewise rotate the pointer 17 and the arm 26 and when the roller 28 reaches the contacts 27 in the drum 18, a bridge is made between the contacts 27 to close a circuit and prevent further operation of the motor 2 and pump 1. Accordingly, the flow of liquid through the pipe 4 from storage to the dispensing station ceases, after which the pointers 10 and 17 are reset by the cranks 15 and 22.

The foregoing description deals generally with the operation of the metering device and the operations required in setting the pointers to secure a predetermined amount of gasoline. The electrical actuating and controlling means will now be described.

When the attendant sets the indicating pointer 10 on the dial 23 by rotating a crank 15, he presses the button 29, shown in Figure 1, forcing the plunger 30 inwardly and actuating the lever 31 to move the same against the magnet 32. The spring 33 on rod 34 resists this action since the function of the spring 33 is to break the contact between the lever 31 and magnet 32. When lever 31 is moved to engaged position with magnet 32 a switch 35 is actuated and which is preferably of the mercury type. Current then flows from the 110 A. C. house circuit 36 through wires 37 and 38, energizing magnet 32, thence through wire 39 to the motor 2, thereby setting the same in operation to actuate the pump 1.

The system is now ready for the passage of

liquid from storage to the measuring bowl of an automobile but it is not permitted to flow until a selective valve A is manually opened. When the selective valve A is opened in a manner to be presently explained, mercury switch B is actuated to close the circuit from the 110 v. housing circuit through wires 40, 41 and 42 to energize solenoid 43 and thereby lift valve stem 44 of the valve 45 to open the same. Gasoline is now enabled to flow by pressure of the pump 1 from storage through pipe 3, thence to the manifold 5 through pipe 4 and valve 45, thence to the measuring bowl of the station through a selected one of pipes 6 through the opened valve A.

Referring to the manner in which control of the valve A is accomplished, reference is made to Figure 2 wherein is shown a plate 46 which overlies the pipes 6 of the manifold 5. On each of the stems 47 of the valves A are quadrants or valve handles 48 and they have the peculiar shape shown in Figures 1 and 2.

The circular portions of the quadrants 48 are adapted to engage lugs 49 disposed longitudinally of the plate 46. The arrangement described prevents the opening of more than one valve at a time as exemplified in Figure 2 since by rotating the quadrant of one valve the circular portion thereof will engage one end of an adjacent lug 49, thereby moving the plate 46 longitudinally until the opposite end of the lug in question slides into such position relative to an adjacent quadrant that it will overlie a protuberance 50 also carried by the quadrant. It will be noted that one end of the bar or plate 46 is connected at a to the mercury switch while its opposite end has connected thereto a spring 51. The function of this spring is to return the plate 46 to its initial position when the opened valve A is closed.

When the above action takes place, i. e. the return of plate 46 to its initial position, the switch B is tilted to break the circuit to the solenoid 43 but in the meantime, or simultaneously with the above action, the circuit is broken to the magnet 32 and consequently the motor 2 when the arm 26 in Figure 3 is moved by the flow of liquid through the meter 7 to such a point that the roller 28 carried by the arm 26 will bridge the contacts 27 in the switch housing 18. The circuit comprised of wires 52 (see Figure 1) is completed when the contact points 27 are bridged and since this circuit 52 offers less resistance to the current flowing in the system, magnet 32 loses its magnetism to such an extent that it cannot overcome the resistance of spring 33, therefore the latter urges the rod 34 to the position shown in Figure 1, which action tilts the mercury switch 35, thereby breaking the circuit to the motor 2.

Referring now to Figures 6 to 9 inclusive, a mechanical system is shown which has some of the features present in the electrical system just described. A type of structure shown in Figure 6 is employed having a cashier's window 53 in front of which the attendant or operator sits so that the valve operating mechanism will be accessible.

When a customer approaches the window 53, places his order and pays for the same, the attendant first determines the position of the vehicle relative to the stations 54 and then actuates the corresponding valve by moving the quadrant or actuating lever 55 disposed on the valve stem 56. The operator then closes the switch 57 shown schematically in Figure 9 which closes the circuit 58 from the house circuit to the motor 59. The pump 60 is thus set into op-

eration. Gasoline from the reservoir 61 is lifted by the suction of pump 60 through pipe 62 and is transferred through pipe 63 to the manifold 64 after having passed through the metering device 65. The liquid then passes through one of the pipes 66 in which the valve 66 has been opened and flows through a corresponding pipe 67 to the selected station 54. The bowls 68 being graduated inversely, the quantity of gasoline rising therein is immediately determined. The customer or an attendant having placed the nozzle of the hose 69 in the fuel tank of the vehicle prior to ordering the gasoline, when he returns to the vehicle, the gasoline will have already been introduced into the bowl 68 preparatory to its introduction into the fuel tank. The valves at the bottom of each bowl close the hose 69 until the latter is lifted from its hook while the nozzle valve 7a enables the customer to close the hose against passage of gasoline in event he has purchased more than his tank will hold.

The attendant within the building observes the pointer 70 on the dial of the metering device 65 and when the required quantity of gasoline passes through the meter, the quadrant 55 is actuated to close the valve. It will be understood that the system is usually full of liquid therefore immediately upon actuating the valve and closing the switch to set the pump 60 into operation, the gasoline begins to rise in the bowl 68.

Manifestly, the construction shown is capable of considerable modification and such modification as is considered within the scope and meaning of the appended claims is also considered within the spirit and intent of the invention.

What is claimed is:

1. Apparatus for dispensing liquids comprising in combination with a storage reservoir and a series of dispensing stations, a manifold serving said stations, a conduit effecting communication

between said reservoir and said manifold, a liquid control system comprising a pump and a liquid metering means arranged in said conduit, a motor for operating said pump, a shaft actuated by said metering means and carrying a pointer, a rotatable drum having spaced electrical contacts therein disposed on said shaft and having a hollow shaft in fixed relation therewith embracing a portion of said first shaft, a second pointer carried by said hollow shaft, a common dial serving said pointers, manually operated means for setting said pointers relatively for predetermining the measure of liquid transferred by said pump from reservoir to station, a manually closed circuit for operating said motor and means within said drum and in fixed relation with said first shaft for opening said circuit thereby to suspend operation of said motor and pump.

2. Apparatus for dispensing gasoline comprising in combination with a storage reservoir and a plurality of dispensing stations, a manifold pipe in communication with said stations, a conduit for passing liquid from said reservoir to said manifold, valves in the outlet pipes of said manifold, manually operated means for locking all but a single valve of the assembly against operation at one time, a motor, a pump operated by said motor, a motor circuit, a liquid metering means in said conduit, a shaft operated by liquid passing through said metering means, a pointer carried by said shaft, a second shaft, a pointer carried by said latter shaft, a dial over which said pointers are moved, manual means for closing said motor circuit to operate said pump thereby to supply a selected one of said dispensing stations through said manifold, and means carried by said second shaft to open said motor circuit when the pointer of said second shaft coincides with the first pointer.

JAMES E. HEAD. 40