Jan. 30, 1968 S. SHERMAN ET AL 3,366,967

APPARATUS FOR RECORDING LIQUID DELIVERY DATA

Filed Aug. 17, 1965 3 Sheets-Sheet 1

Fig. 1.

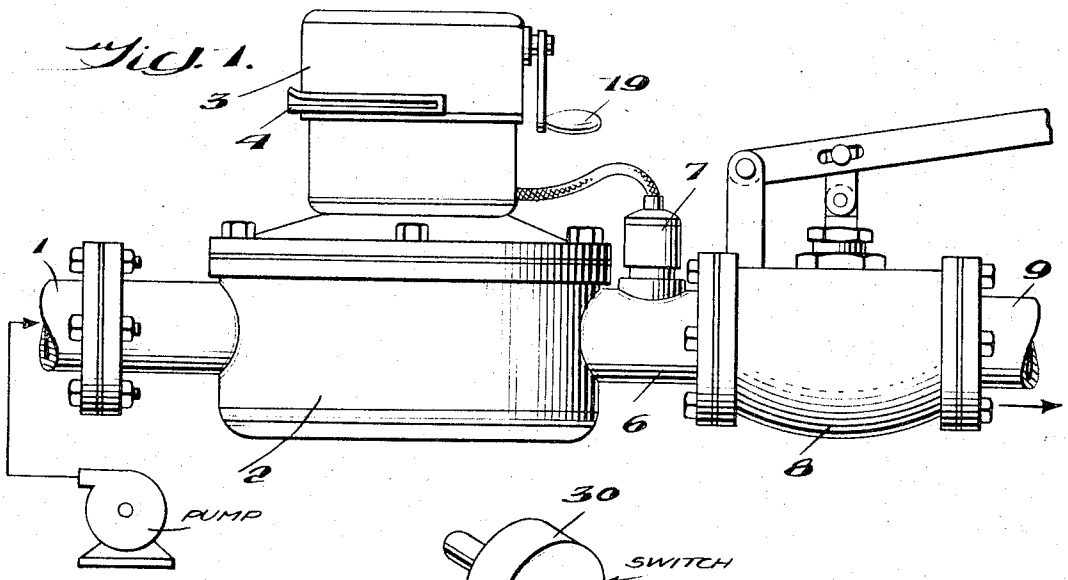
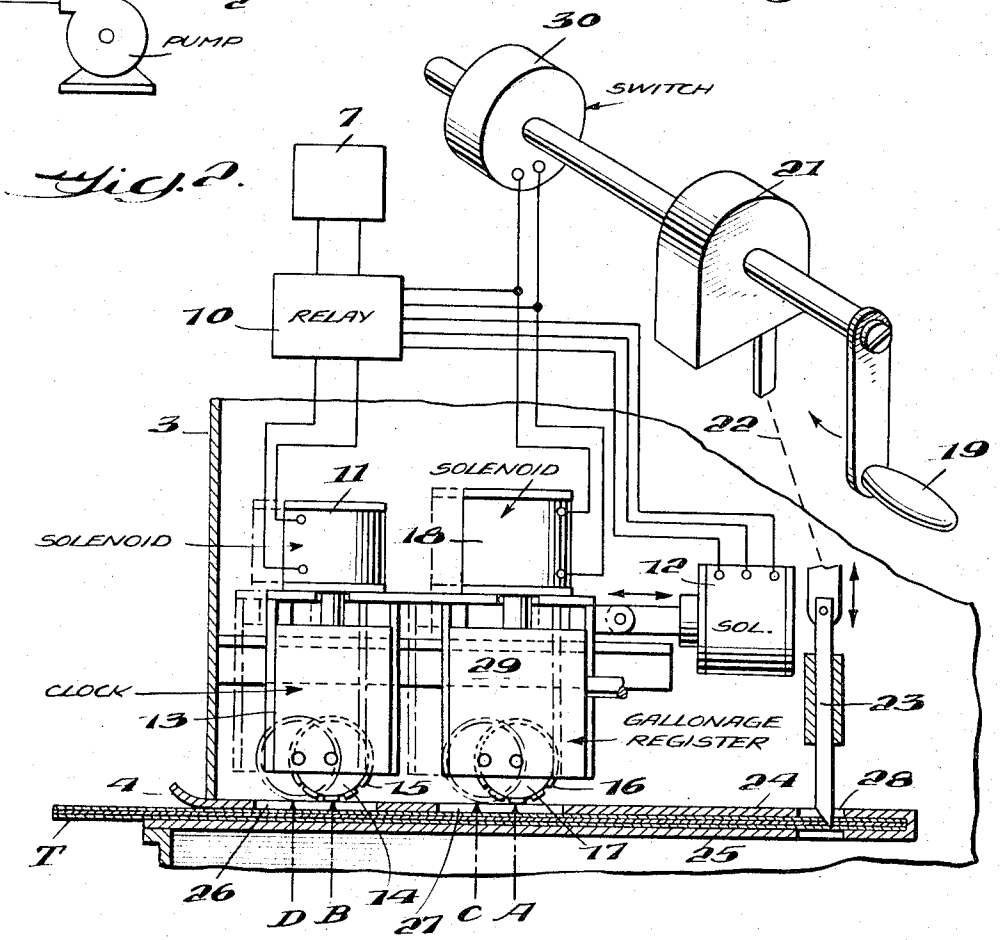


Fig. 2.

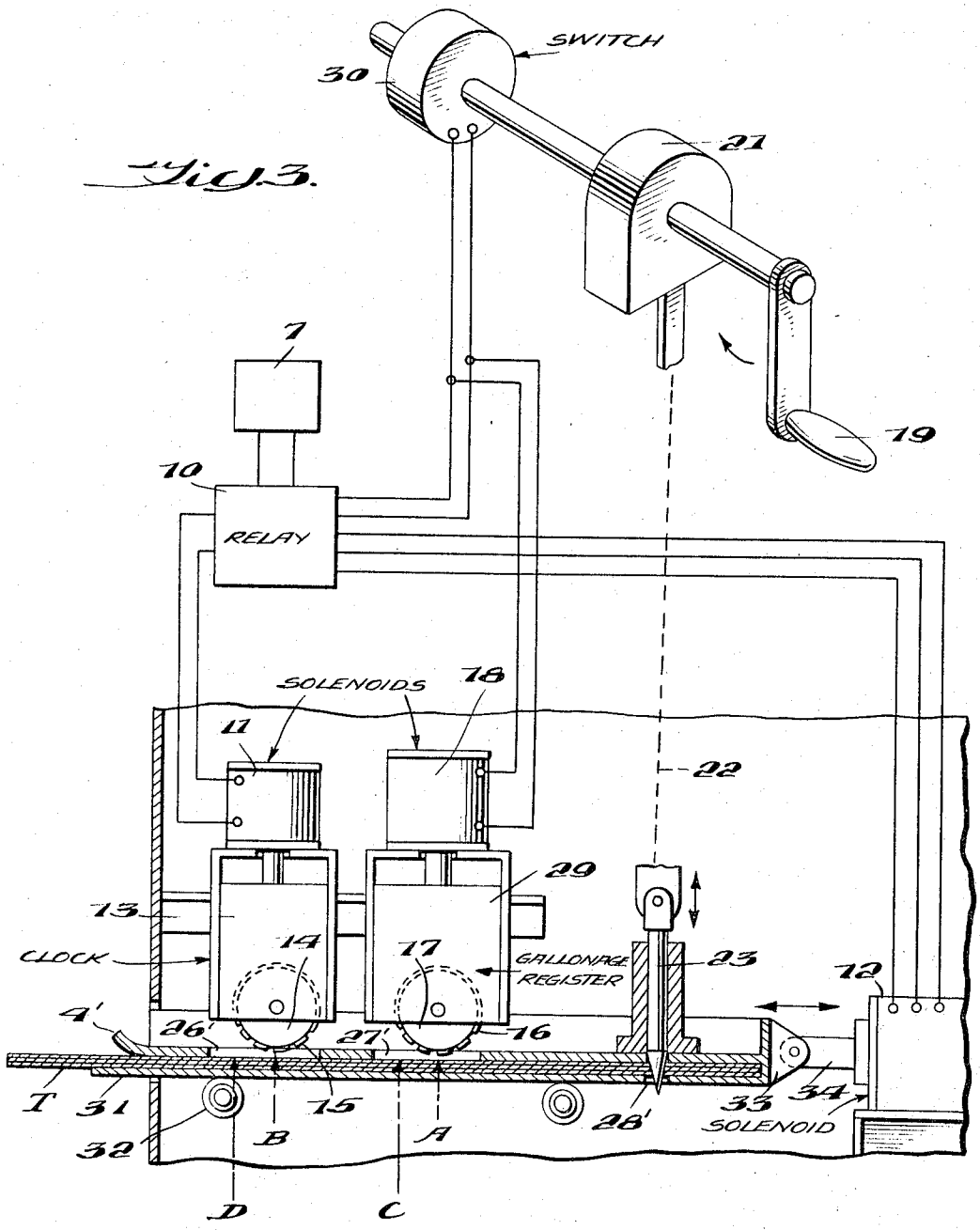


Jan. 30, 1968 S. SHERMAN ET AL 3,366,967

APPARATUS FOR RECORDING LIQUID DELIVERY DATA

Filed Aug. 17, 1965 3 Sheets-Sheet 2

Fig. 3.



Jan. 30, 1968 S. SHERMAN ET AL 3,366,967

APPARATUS FOR RECORDING LIQUID DELIVERY DATA

Filed Aug. 17, 1965 3 Sheets-Sheet 3

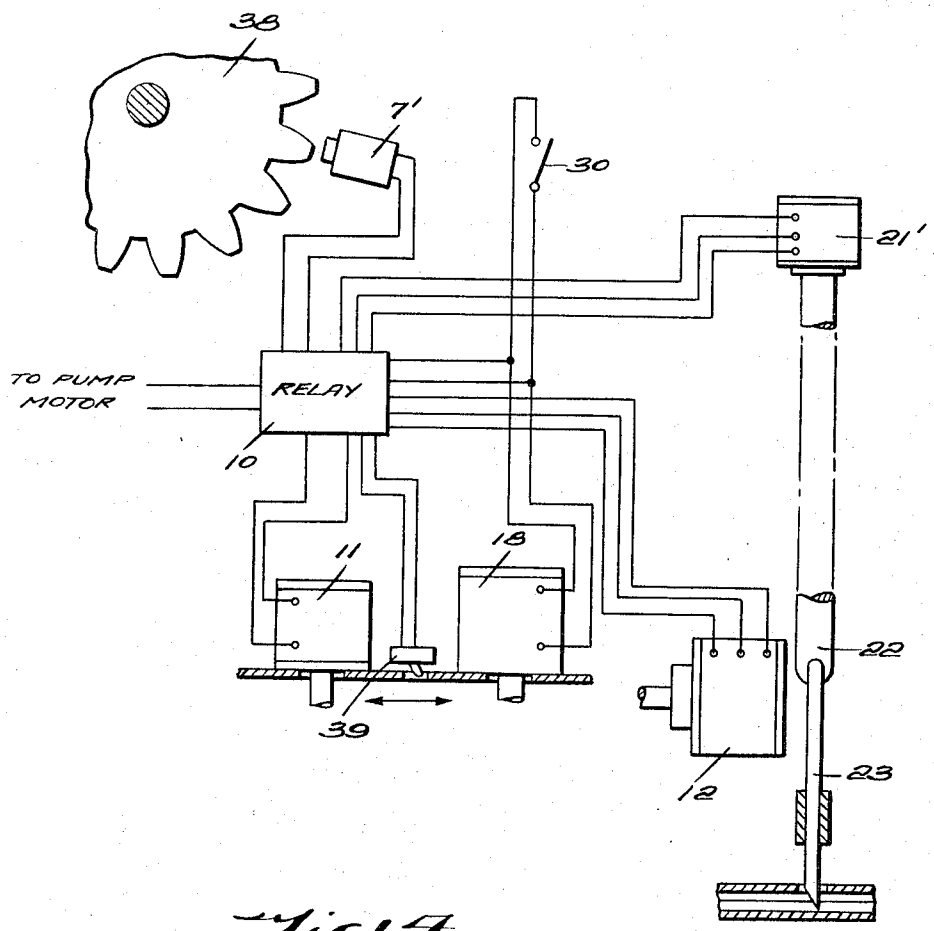


Fig. 4.

United States Patent Office

3,366,967

Patented Jan. 30, 1968

3,366,967

APPARATUS FOR RECORDING LIQUID DELIVERY DATA

Sidney Sherman and Charles Sherman, both of 1046 N. Arlington Ave., Baltimore, Md. 21237

Continuation-in-part of application Ser. No. 333,088, Dec. 24, 1963. This application Aug. 17, 1965, Ser. No. 484,161

4 Claims. (Cl. 346—43)

ABSTRACT OF THE DISCLOSURE

Apparatus for recording liquid delivery data, specifying time of commencement of delivery, time of termination of delivery, and for precluding removal of the data record prior to completion of delivery and for a specified period after the termination of the liquid delivery.

This application is a continuation-in-part of our copending application Ser. No. 333,088, filed Dec. 24, 1963, and now abandoned.

This invention relates to a ticket stamping device used in connection with the delivery of any liquid from a bulk delivery source, where it is necessary to keep accurate records of the bulk of liquid delivered. By way of particular example, the invention relates to the delivery of oil or like bulk liquids from a tank truck.

The usual fuel delivery truck has a fuel pump in connection with the hose and a fuel metering device which runs a meter or recording device to show the gallonage of fuel through the hose at any time, for example, the gallonage at the start of the pumping operation and the gallonage at the stop of the pumping operation. It is usual to provide apparatus having a device which stamps on a delivery ticket, the starting gallonage and the stopping gallonage of a single delivery.

With usual fuel ticket stamping apparatus there is nothing to prevent the fuel delivery truck driver from stamping gallonage on a ticket delivered to a home or user that does not represent the actual delivery of fuel to the particular customer. The ticket can be inserted and stamped with the gallonage at the alleged start of the fuel delivery, but there is nothing to prevent the operator from moving and making other deliveries and stamping to record a second gallonage which does not truly represent the delivery to a single customer.

Attempts have been made to eliminate controversy between the customer and delivery men by a device in which the ticket is inserted and locked in the apparatus and having the gallonage stamped on the ticket at the time of locking it in place, and again stamping the gallonage when the ticket locking mechanism is released. This is not complete protection since it is possible to leave the ticket in the apparatus while making an unauthorized additional delivery. This practice has caused laws to be enacted to prohibit the truck from moving with a ticket in the apparatus, but such laws are difficult to enforce.

This invention provides a system and apparatus which require that the customer's ticket be inserted in the apparatus and have it show the gallonage and time when that delivery has been started and the gallonage and time when that same delivery has been completed, to show the accurate amount of fuel delivered to a single customer and the time within which the delivery was accomplished.

The present invention has for its object an apparatus into which a ticket can be inserted prior to the delivery to a customer and the ticket cannot be removed until the gallonage flow has been stopped and the ticket stamped with an accurate and reliable difference in gallonage representing the delivery to the customer and of the time for that delivery.

To accomplish this purpose, it is an object of applicants' invention to provide a fuel delivery apparatus wherein the ticket is inserted and stamped with the initial-gallonage and the time the delivery starts, and at the finish of the delivery, the ticket will be stamped with the final gallonage and the time of completion of the delivery. In case of break-down of equipment or if two deliveries are made to the same premises to separate tanks, with intervening set up time, it may be necessary to make the deliveries on two tickets, and successive tickets for the day will show the amount of fuel delivered to a customer and both will show the gallonage and time of starting, and the gallonage and time of stopping of each delivery.

The time stamped on the ticket, requires the truck driver to account for his time for a normal work day, and it insures that the delivery to a single customer is accomplished in a normal period of time. This would certainly discourage any effort to tamper with the tickets or the apparatus to show that the fuel delivery was other than represented by the gallonage on the ticket.

Further and other objects will be apparent from the description of the accompanying drawings, included for purposes of illustrating an embodiment only and in which like numerals refer to like parts.

FIGURE 1 shows the liquid delivery system between the pump and the delivery hose;

FIGURE 2 is a schematic illustration of the ticket and stamping mechanism;

FIGURE 3 is a schematic illustration of an alternate arrangement of the structure of FIGURE 2;

FIGURE 4 is a schematic illustration of the electrically operated ticket lock and single switch control.

In FIGURE 1, the outlet from the pump is shown at 1, feeding into a liquid quantity metering device 2. The ticket and stamping apparatus is housed in casing 3, having a ticket slot 4 and a ticket lock and gallonage stamping handle 19. Outlet 6 from metering device 2 has a switch 7 mounted thereon which gives a signal upon the start and stop of flow in pipe 6. Valve 8 is manually controlled to turn on or off the flow of liquid in delivery hose 9, however, the flow in 9 can also be controlled at a nozzle (not shown) in the conventional manner of flow control nozzles.

The mechanism housed in 3 is shown schematically in FIGURE 2. Flow switch 7 feeds a control signal to relay 10 to control time stamp solenoid 11 and gallonage stamp positioning solenoid 12. An electric clock mechanism is shown at 13 having a plurality of stamping wheels 14 rotated by the clock mechanism to register time by the position of number 15 at position B or D.

The gallonage register 29 is connected to be driven by a gear train or the like from metering device 2. The gallonage is shown by the position of numbers 16 on a plurality of wheels 17 at positions A or C of the gallonage register of the metering device. The gallonage registry is actuated by solenoid 18.

Crank handle 19 actuates switch 30 to energize solenoid 18 and to actuate a ticket locking mechanism 21. Locking mechanism 21 is interconnected as shown by line 22 to a locking pin 23.

Ticket slot 4 is formed between members 24 and 25. Member 24 is apertured at 26 and 27 to accommodate the positions A–D of stamp wheels 14 and 17 in two positions, and at 28, to accommodate locking pin 23.

In operation, the pump will feed liquid under pressure from its outlet 1, through valve 8 to hose 9. The control of flow of liquid is accomplished either by valve 8 or by a conventional control nozzle on the delivery end of hose 9. The gallonage metered in 2 is fed through a gear train or other means to the gallonage registry 29 and the numbers 16 on wheel 17 register the gallonage.

A ticket T, which may be in the form of multiple

sheets with carbon paper therebetween, is inserted in slot 4. Handle 19 is rotated to actuate mechanism 21 and lock pin 23 through intermediate means 22, which may be electrical or mechanical. Lock 23 pierces the ticket T to retain it in the apparatus. If the ticket is removed before the pin is withdrawn, it would be torn to one edge and questioned in audit. Simultaneously with the locking of pin 23, handle 19 actuates switch 30 which energizes solenoid 18 to stamp ticket T with the gallonage then showing on the gallonage registry 29 at the time by numerals 16 in position A.

When liquid is caused to flow in delivery hose 9, switch 7 energizes relay 10 which first causes solenoid 11 to actuate time stamp 13 to show the time on ticket T, at the start of the flow and then energizes solenoid 12 to move the gallonage registry 29 and clock 13 from positions A and B respectively, to C and D.

When flow in pipe 9 stops, switch 7 through relay 10 causes solenoid 11 to time stamp the ticket in position D. The delivery is then complete on the ticket T and prior to removing the ticket, handle 19 is again rotated to withdraw pin 23 and actuate switch 30 to cause solenoid 18 to stamp the gallonage on ticket T in position C. Switch 30 on the release actuation sends a signal to relay 10 to energize solenoid 12 to move the gallonage registry 29 and clock 13 to positions A and B ready for the next delivery ticket.

In the embodiment shown in FIGURE 3, a ticket T is inserted in slot 4' in carriage 31 which is supported on rollers 32. Solenoid 12 moves carriage 31 by means of bracket 33 secured to carriage 31, and member 34. Ticket lock 23 is mounted to move with the ticket carriage 31. In all other respects the operation and function of the apparatus is as described above in connection with the operation of the structure shown in FIGURES 1 and 2.

The apparatus can be designed to be electrically actuated or mechanically actuated, that is, the arrangement of structure can include solenoid actuated gallonage and time stamps coupled to a solenoid operated ticket lock, or the whole mechanism may be interconnected by mechanical linkages so that when a ticket is locked in place mechanically, all other portions of the system are mechanically actuated.

An advantage of the electrical actuation is that any tampering with the mechanism would show by a difference in time, if the clock had been stopped during the day. However, with the complete mechanical mechanism, there would be no way for the fuel delivery driver to get at the mechanism if a protective casing were provided which could be removed only at the plant or by management and in this way insure an interlock of the essential elements to show the true delivery on the ticket, that is, the record of the gallonage, the record of the time with the locking of the ticket in place until the final gallonage is stamped on the ticket. Essential to either is a fuel delivery pump.

A fuel delivery pump can be of any conventional design normally employed with fuel or gasoline delivery trucks. A positive mechanical connection between the fuel delivery pump, or optionally a fuel metering mechanism inserted in the fuel delivery line, can be mechanically interconnected with the gallonage recorder. The gallonage recorder is a counter meter having a series of rotating discs whereby the combination of numbers on the periphery at any one point indicates the gallonage at that instant that has passed through the fuel delivery meter.

The time stamp means is generally of the same construction as the gallonage stamp means except actuated by a clock which can be either electric or mechanical and under the supervision of the company.

In FIGURE 4, a control circuit is illustrated which is applicable to the ticket printer illustrated in FIGURES 1 to 3. A solenoid 21' is shown to perform the operation of locking and unlocking the ticket T, in response to a signal from relay 10. Switch 30 is manually operated to

control the cycle of the fuel delivery and the printer. The pump has its motor controlled from relay 10 in response to switch 30. The gallonage metering device 2 has a gear train that moves with the flow of fluid therethrough, to drive the gallonage registry 29 in housing 3. A signal generator 7' is so located near the teeth of a gear 38 that it generates or chops an electric signal. It can be of any conventional design of a device to act as a signal generator and its only function is to hold the relay in a predetermined position while fluid is passing through the pump. While gear 38 moves, a signal from 7' will be fed to relay 10. When fluid flow stops, the signal stops. An interlock switch 39 is operated in response to movement of the ticket carriage 31, or the printer wheel carriage. Switch 39 opens the circuit after each full cycle and ensures that a new cycle from the printing on the ticket of the time and gallonage at the start of a delivery to the time and gallonage at the stop of a delivery will take place.

In operation, switch 30 is closed which actuates the relay 10 to lock the ticket by member 23, and print starting time and gallonage on the ticket. It also places the relay in a hold position. The fuel delivery is controlled at the delivery nozzle in the conventional manner. When fuel is being delivered, gear 38 moves and a signal from 7' maintains the relay in the "hold" position during fuel flow. When fuel flow ceases, the signal from 7' decays and the relay moves to a second position which again actuates the time and gallonage stamps to print the end of the delivery data on the ticket and unlocks the ticket. The interlock switch 39 resets the system so that the whole cycle must be repeated from switch 30.

It is to be understood that certain changes, alterations, modifications, and substitutions can be made in the structure shown without departing from the spirit and scope of the appended claims.

We claim:

1. Apparatus for recording on a delivery ticket inserted therein, liquid delivery data, comprising liquid delivery means, means to measure the quantity of liquid delivered by said liquid delivery means, gallonage and time stamp means adjacent said delivery ticket in position in said apparatus, means interconnecting said quantity measuring means and said gallonage stamp means, means to actuate said gallonage and time stamp means to record initial gallonage and time data on said delivery ticket before liquid delivery starts, and means to actuate said gallonage and time stamp means on said delivery ticket when said liquid delivery stops, retaining means to hold said liquid delivery ticket in said apparatus, means to actuate said retaining means when said gallonage and time stamp means are actuated to record said initial data and to release said retaining means when said liquid delivery is stopped, and means interconnecting said quantity measuring means and said gallonage stamp means including a tachometer means to actuate said gallonage and time stamp means when said quantity measuring means stops, for final recording of delivery data.

2. Apparatus for recording on a delivery ticket inserted therein, liquid delivery data, comprising liquid delivery means, means to measure the quantity of liquid delivered by said liquid delivery means, gallonage and time stamp means actuated by said liquid delivery means to record an initial time reading on the ticket when said liquid delivery means is started and to record a final time reading on the ticket when said liquid delivery means is stopped, retaining means to hold the ticket in said apparatus, means to actuate said retaining means before said liquid delivery means is started and to release said retaining means when said liquid delivery means is stopped, and means to displace said gallonage and time stamp data upon stopping of said liquid delivery means on the ticket from the gallonage and time stamp data upon starting of said liquid delivery means.

3. The apparatus as set forth in claim 2, in which

means are provided, actuated by said means to displace said gallonage and time stamp data, to ensure a complete cycle of operation each time the apparatus is actuated.

4. Apparatus for recording on a delivery ticket inserted therein, liquid delivery data, comprising liquid delivery means, means to measure the quantity of liquid delivered by said liquid delivery means, time stamp means, means to actuate said time stamp means to record an initial time reading on the ticket before said liquid delivery is started and to record a final time reading on the ticket when said liquid delivery means is stopped, retaining means to hold the ticket in said apparatus, means to actuate said retaining means before said liquid delivery is started and to release said retaining means after said liquid delivery means is stopped, a gallonage stamp means actuated by said quantity measuring means, and means to actuate said gallonage stamp means before and after actuation of said time stamp means.

References Cited

UNITED STATES PATENTS

2,086,363	7/1937	McMullen	346—95
2,126,256	8/1938	Hazard et al.	346—95
2,127,243	8/1938	Berck	346—95
2,327,584	8/1943	Goldberg et al.	346—95
2,707,577	5/1955	Trotter et al.	222—30
3,188,646	6/1965	Davis	346—43

RICHARD B. WILKINSON, *Primary Examiner.*

J. W. HARTARY, *Assistant Examiner.*