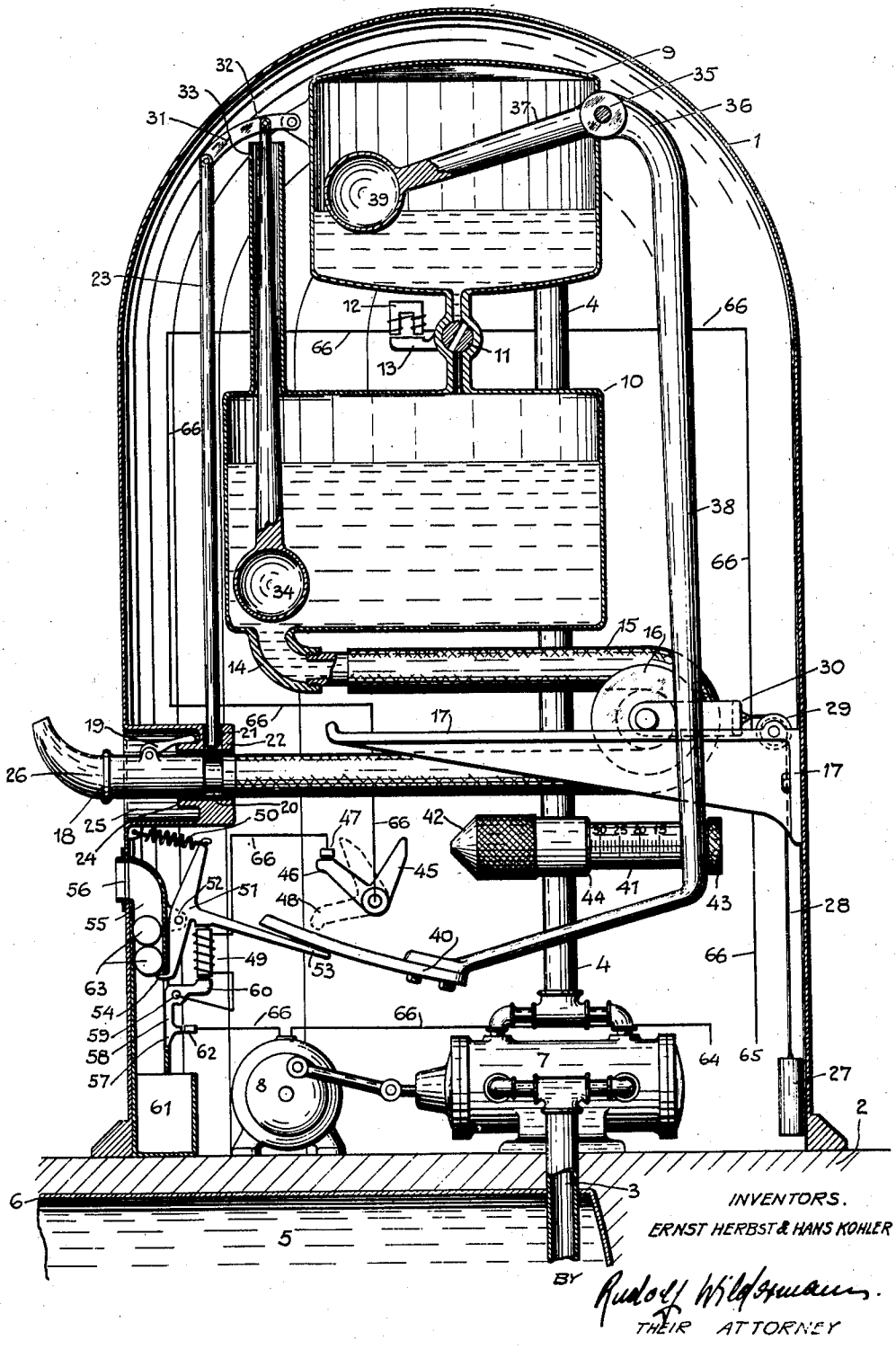
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AUTOMATIC DISPENSER FOR LIQUIDS

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AUTOMATIC DISPENSER FOR LIQUIDS

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Our invention relates to dispensers from which a customer may withdraw, upon insertion of a coin, an equivalent value of liquid fuel, and our objects are:

First.—To provide a fool-proof dispenser which is completely under lock when not in use.

Second.—To have no fuel in the dispenser when not in use.

Third.—To provide a simple adjustment by which the apparatus may be set to dispense with the exact quantity of fuel, corresponding, at the market value of the day, to the value of the inserted coin.

Fourth.—To facilitate the withdrawal of several coins' value of fuel at a time.

Fifth.—To measure the next quantity of fuel while one quantity is withdrawn.

We attain these objects be the mechanism illustrated in the accompanying drawing, in which a sectioned side elevation of our improved dispenser is shown. The electrical parts are inserted diagrammatically. Similar numerals refer to similar parts thruout the drawing.

The parts of our improvement are accommodated in housing 1, which represents a full enclosure arising from a suitable base 2.

By way of pipes 3 and 4, the liquid 5 is pumped from storage tank 6, which is located below the base, through a suitable pump, 7, driven by electric motor 8, to the measuring tank 9. Tank 9 is mounted above the dispensing tank 10 and is connected to it by a cock 11 which is operated by the electric relay 12. When this relay is energized the cock is closed, as shown; normally it is held open by gravity, due to the weight of lever 13 which may be supplemented by suitable spring tension.

To the elbow outlet at the lowest point of the dispensing tank 10, 14, is fitted the hose 15, which is slung over the sheave 16 slidably arranged on wall bracket 17. The hose terminates in the nozzle 18 with handcock 19. At the point where the nozzle passes through the wall of housing 1, it has a groove 20 on the outside, which, in the position shown, lines up with a hole 21 in hub 22 on the inside of the housing. When rod 23, which slidably fits that hole, is down, it engages that groove and locks the nozzle in position. At the same time, the handle of cock 19 is locked in the closed position, since it rests on a rim 24 on the inside of hole 25, countersunk from the outside of housing 1 into the hub 22. But in the figure the rod 23 is shown disengaged from groove 20, and the nozzle may be gripped at the neck 26, and the hose 15 may be pulled out of the housing, sheave 16 sliding along bracket 17, against the reaction of the counterweight 27; this weight, by means of rope 28 running over pulley 29, is attached to the back of fork 30, which is hinged upon the shaft of sheave 16.

The upper end of rod 23 is hinged to lever 31. That lever is fulcrumed to the wall of the tank 9 and operatively connected to the rod 32 which is slidably guided by the tubular extension 33 on tank 10. It carries, at the lower end a ball float 34 which when submerged, as shown, has a tendency to rise and by means of the lever connection, holds up the rod 23 so that its end clears the groove 20. But when that tank 10 is empty, the weight of the parts hinged to lever 31 pulls down rod 23 so that its end rests, through the hole 21, upon hose 15 or nozzle 18, and will drop into the groove 20 when the hose is pulled all the way into the housing, by weight 27, as shown.

Fulcrumed at 35 in the wall of tank 9, is an angle lever 36 with arms 37 and 38. Arm 37 terminates in ball float 39, and the other arm 38 carries at the end an extension 40 which is bent in an arc concentric around fulcrum 35. That lever arm 38 has also, extending from its side, a round hub 41, threaded on the inside, into which fits a screw with knurled head 42 and a nut 43 at the other end, by which it is locked in position. Head 42, extending up to edge 44, is counterbored to fit over hub 41, whereby this part obtains the appearance of a micrometer adjustment.

The liquid rising in measuring tank 9 raises ball float 39, swinging lever 36 clockwise, so that head 42 moves in an essentially horizontal direction to the left until it strikes lever 45, which is one of the arms 45 and 46 of an angle lever which represents a switch of the

type of toggle switches, by which the current is snapped on when the lever is turned in clockwise direction, and turned off when the lever swings the opposite way. In the drawing, for simplicity's sake, the lever is shown as making and breaking the current directly, at the point where it rests upon contact point 47. The dotted line indicates the switch in open position (48). This switch controls the current in motor 8, i. e. the pumping operation is stopped when the head 42 strikes lever 45, moves it over to the left and shuts off the current.

By adjusting head 42 over or away from the hub 41, the shutting off of the current is caused to occur later or sooner respectively, and, respectively, more or less liquid is pumped into the measuring tank before the current is shut off. Therefore the setting of the head 42 regulates the quantity of fuel measured off into the measuring tank.

In the arrangement of the scale on hub 41 it is assumed that, for this particular machine, the coin by which the mechanism is to be set into motion is to be a quarter, 25¢. If the market price of the fuel per unit is 25¢, the head 42 is adjusted,—in micrometer fashion,—to division point 25, and, after one unit is measured off in the measuring tank 9, the pumping operation stops, upon the breaking of the current in the manner described above. If the unit price is 32¢, the head is accordingly adjusted, (position of the drawing) and less liquid than before is pumped into the measuring tank. The scale is arranged so that this quantity is 25/32 of a unit, which is the quantity worth 25¢ at a market price of 32¢ per unit. Correspondingly the rest of the scale is arranged so that with the respective settings a corresponding amount of liquid is pumped into the measuring tank, before the pumping motor is shut off. By the stopping of the pump in the pipe line, the back flow of liquid from the dispensing tank into the original storage reservoir 6 is prevented. The figure X of a certain market price is marked off on the scale, at the point where under the respective setting, the current is shut off after the fraction 25 divided by X of a unit has been pumped into the measuring tank.

Normally, when relay 49 is not energized and when extension 40 on lever 36 is swung over to the right, tension spring 50, on lever 51, which is rotable around fulcrum 52, pulls that lever to its extreme position in counter-clockwise direction. In that position of lever 51, the end of its arm 53 rests against lever arm 46 keeping that switch closed at 47, and the third lever arm 54 clears the slot 55 of the coin mechanism, so that a coin inserted by the operator at entrance 56 will strike the lever 58, pivoted in 59, at the end of its lower arm 57, which normally is in the extreme position in clockwise direction, (arm 57 blocking the slot), due to the weight of its horizontal arm with the pole piece 60, facing relay 49.

When arm 57 of lever 58 is thus struck by the coin, (the operation which starts the operation of the machine), it is swung into the position shown in the drawing, and the coin drops into the coin receiving box 61. The lever does however not drop back in clockwise direction, but since it has closed the electric circuit by touching contact point 62 whereby all electric devices of our apparatus are energized, the attraction of pole piece 60 by relay 49 holding the lever 58 in the position shown. That relay also attracts the pole piece on lever 51 so that arm 54 enters upon slot 55 and blocks such coins 63 which had been inserted into the slot, after the mechanism had been set into operation by the first coin.

The source of electric current, by which the apparatus is to be operated, is applied at terminals 64 and 65. That source may be an electric lighting or power system, or a set of batteries forming part of the apparatus, might be utilized to energize a fractional-horse-power motor 8 which would have but small current consumption; the latter arrangement is of advantage where our fuel dispenser is set up at an isolated spot, far removed from a public or private electric power supply.

Having set the mechanism of our improvement into operation, as explained above, electric contact at 62 closes the circuit in all the lines 66, which comprises all the electric apparatus in series connection. The rockable switches or contact members, made up of arms 45 and 46, and 57 and 58, respectively, are incorporated in the circuit of the conductor 66, by having that conductor connected to the respective pivots upon which these switches are mounted. In addition to relay 49 relay 12 is energized, closing cock 11, motor 8 is started up and the pump fills tank 9 with fuel. At this time there is no fuel in the tank 10, in all other respects the apparatus is however, at this stage of the operation, in the position shown in the drawing.

When the quantity of fuel corresponding to the value of the coin has been pumped into the tank 9, ball float 39 has turned lever 36 so far in clockwise direction, that head 42, striking 45, opens the circuit at 47, whereby the two relays are de-energized and the motor comes to a stop. To make this stop instantaneous, so that no additional fuel is pumped into the measuring tank, a brake is provided on the motor, as commonly known in the art of electric power drives. Relay 12 has released the cock lever, so that the cock 11 is open and the quantity of fuel measured before, drains into dispensing tank 10, lifts float 34, and thus rod 23 disengages from groove 20, so that the operator can

withdraw the nozzle from the housing, and draw fuel from the dispensing tank 10 by the operation of cock 19. When all the contents of that tank have been drained, rod 23 comes down and rests upon the hose 15. It will slide along the surface of that hose and the connecting nozzle, when the operator has let go the end of the nozzle, and hose and nozzle are pulled back into the housing by the counterweight 27, and, in the end, the end of the rod will engage the groove 20 and lock the nozzle in place.

When the circuit was opened, the relay 49 released levers 51 and 58; whereas the latter drops into its position of rest, the former is held in the position of the drawing, piece 40 at the end of lever 36 intercepting the arm 53, thus preventing the return of that lever into its normal position. But while the fuel drains from tank 9 into tank 10, float 39 follows its top level, and piece 40 swings to the right due to the counter-clockwise rotation of lever 36. When the tank 9 has been completely drained, piece 40 has swung so far over to the right, that the end of lever 53 trips over the end of that piece 40, striking lever 46, which then is in the position 48, and swinging it in clockwise direction, until it comes to a stop with the circuit closed at 47. Simultaneously the lever arm 54 has been withdrawn from the coin slot, and the next coin 63 is released, starting the operation of the mechanism anew. Of course, the fuel does not have to be drawn from the dispensing tank each time a quantity of fuel has been discharged into it from the measuring tank, but several such quantities of fuel may be held by it before the operator withdraws them; he being at liberty to do so as long as there is fuel enough in the tank 10 to keep the rod 23 disengaged from groove 20.

The coin-mechanism may be provided with protective devices of the type commonly known to those familiar with the art of automatic devices which serve to prevent the use of slugs, or the use of other fraudulent means, for the withdrawal of fuel from our improved dispenser.

A plurality of coin mechanisms and measuring levers may be used in combination on our dispenser, to allow the use of different coins, and to measure off correspondingly different quantities of fuel.

The part sectioned away from the side of the housing 1 in the drawing is provided with one or more suitable doors, through which access to the inside of the apparatus may be had for the setting of the measuring adjustment, withdrawal of the coin, or attendance to the motor or pump.

Such protection against the collection of explosive vapors in the top of the housing 1, as may be required by common sense or safety codes, can readily be provided for by suitable vents or other ventilating provisions.

Ball float 34 may be arranged in such a way as to normally seat upon outlet 14, thus closing that outlet. This would prevent the occurrence of an explosion in the tanks, if accidentally the fuel or its gas had been set on fire at the spout of nozzle. But cock 19 provides sufficient protection against such possibilities, and we prefer to have the ball float clear the outlet at all times, so that the fuel may be completely drained from that tank. Similarly, we prefer to have float 39, at its lowest position, fit into suitable hemispherical pocket in the bottom of tank 9, drained towards the cock 11, and to have 53 trip over 40 accordingly, so that tank 9 is normally empty.

We claim:

1. In combination with the apparatus described, a housing completely covering said apparatus, and having a hole therein, a dispensing hose passing through said hole, a shiftable sheave in said housing, over which passes said hose, means pulling said sheave away from said hole and means normally locking said hose in said hole.

2. In combination with the apparatus described, a housing completely covering said apparatus, and having a hole therein, a dispensing hose passing through said hole, a shiftable sheave, in said housing, over which passes said hose, means pulling said sheave away from said hole, a nozzle on the end of said hose, a cock on said nozzle and means normally locking said nozzle and said cock in said housing.

3. In combination with the apparatus described, including a dispensing tank and a housing covering said apparatus, and having a hole therein, a hose passing through said hole and connected on one end to the bottom of said tank, a cock on the end of said hose, means for pulling said hose into said housing, a float in said dispensing tank and means operatively connected to said float for locking said hose and said cock in the wall of said housing.

4. In combination with the apparatus described, a housing completely covering said apparatus and having a hole therein, a dispensing hose passing through said hole, a shiftable sheave in said housing, over which passes said hose, means pulling said sheave away from said hole, and means normally and automatically locking said hose in said hole and automatically unlocking said hose therefrom.

5. In combination with the apparatus described, a housing completely covering said apparatus and having a hole therein, a dispensing hose passing through said hole, a shiftable sheave in said housing, over which passes said hose, means pulling said sheave away from said hole, and float actuated means

normally and automatically locking said hose in said hole and automatically unlocking said hose therefrom.

6. In combination with the apparatus described, a housing completely covering said apparatus and having a hole therein, a dispensing hose passing through said hole, a shiftable sheave in said housing, over which passes said hose, means pulling said sheave away from said hole, a nozzle at the end of said hose, a normally closed cock on said nozzle, and means normally and automatically locking said cock in said housing.

7. In combination with the apparatus described, a housing completely covering said apparatus and having a hole therein, a dispensing hose passing through said hole, a shiftable sheave in said housing, over which passes said hose, weight actuated means pulling said hose away from said hole, a nozzle on the end of said hose, a cock on said nozzle, and means normally and automatically locking said nozzle and said cock in said housing.

8. In combination with the apparatus described, a pump, a motor connected to said pump, a measuring tank connected to said pump, a dispensing tank connected to said measuring tank, a housing covering said apparatus and having a hole therein, a dispensing hose connected to said dispensing tank and passing through said hole, a shiftable sheave in said housing, over which passes said hose, means pulling said sheave away from said hole, and means normally and automatically locking said hose in said hole until a predetermined quantity of measured liquid has flowed into said dispensing tank, and automatically unlocking said hose upon the flow into said dispensing tank of said measured predetermined quantity of liquid.

9. In combination with the apparatus described, a housing enclosing said apparatus and having an opening therein, a dispensing hose, passing through said opening, shifting means within said housing engaging said hose to draw said hose within said housing, and means normally and automatically locking said hose within said housing.

10. In combination with the apparatus described, a housing enclosing said apparatus and having an opening therein, a dispensing hose passing through said opening, shiftable means within said housing engaging said hose to draw said hose within said housing, a nozzle on said hose, a normally closed cock on said nozzle, and means normally and automatically locking said nozzle and cock within said housing.

11. In combination with the apparatus described, a housing enclosing said apparatus and having an opening therein, a dispensing tank, a hose passing through said opening and connected to said dispensing tank, a normally closed cock in said hose, means to draw said hose into said housing, a float in said dispensing tank, and means operatively connected to said float to automatically lock said hose and cock relatively to said housing.

12. In combination with a dispenser of the kind described, a pump, an electric motor, connected with said pump, a measuring tank connected to said pump, a float in said measuring tank, a circuit breaker in the circuit of said motor, a lever connected to said float, and an adjustable stop on and operated by said lever to actuate said circuit breaker to break said circuit, and a spring operated and pressure restrained lever to actuate said circuit breaker to close said circuit.

13. In combination with a dispenser of the kind described, a pump, an electric motor, connected with said pump, a measuring tank connected to said pump, a float in said measuring tank, a circuit breaker in the circuit of said motor, a lever connected to said float, and an adjustable stop on and operated by said lever to actuate said circuit breaker to break said circuit, and a lever releasable by said first mentioned lever to automatically actuate said circuit breaker to close said circuit.

14. In combination with a dispenser of the kind described, a pump, an electric motor connected with said pump, a measuring tank connected to said pump, a float in said measuring tank, a dispensing tank connected to said measuring tank, a lever operated circuit breaker in the circuit of said motor, a rockable lever connected to and actuated by said float, and an adjustable stop operatively mounted on said rockable lever, adapted to engage said lever of said circuit breaker and actuate said lever to break said circuit.

15. In combination with a dispenser of the kind described, a pump, an electric motor connected with said pump, a measuring tank connected to said pump, a float in said measuring tank, a dispensing tank connected to said measuring tank, a float in said dispensing tank, means to drain said dispensing tank, means actuated by said dispensing tank float to lock said tank draining means against operation, a lever operated circuit breaker in the circuit of said motor, a rockable lever connected to and actuated by said float in said measuring tank, and an adjustable stop operatively mounted on said rockable lever, adapted to engage said lever of said circuit breaker and actuate said lever to break said circuit.

16. In combination with a dispenser of the kind described, a pump, an electric motor, connected with said pump, a measuring tank connected to said pump, a float in said measuring tank, a dispensing tank connected to said measuring tank, a normally closed valve in the circuit of said motor for draining said measuring tank into said dispensing tank automatically opened by the stopping of said motor and automatically closed by the start-

ing of said motor, a float in said measuring tank, a circuit breaker in the circuit of said motor, a lever connected to said float, an adjustable stop on and operated by said lever to actuate said circuit breaker to break said circuit, and a lever releasable by said first mentioned lever to automatically actuate said circuit breaker to close said circuit, whereby said motor and pump are automatically stopped and started and said valve is automatically, simultaneously, and synchronously opened and closed.

17. In combination with a dispenser of the kind described, a pump, an electric motor connected with said pump, a measuring tank, connected with said pump, a float in said measuring tank, a dispensing tank connected to said measuring tank, a gravity opened and electro-magnetically and normally closed valve in the circuit of said motor for draining said measuring tank into said dispensing tank automatically opened by the stopping of said motor and automatically closed by the starting of said motor, a float in said measuring tank, a circuit breaker in the circuit of said motor, a lever connected to said float, an adjustable stop on and operated by said lever to actuate said circuit breaker to break said circuit, and a lever releasable by said first mentioned lever to automatically actuate said circuit breaker to close said circuit, whereby said motor and pump are automatically stopped and started and said valve is automatically, simultaneously, and synchronously opened and closed.

18. In combination with a dispensing apparatus of the kind described, a housing substantially enclosing said apparatus, a pump, an electric motor connected with and actuating said pump, a measuring tank within said housing and connected to said pump, a float in said measuring tank, a dispensing tank within said housing and connected to said measuring tank, a lever-operated circuit breaker in the circuit of said motor, an adjustable stop operatively connected to said float, said lever on said circuit breaker being interposed in the path of said stop.

19. In combination with a dispensing apparatus of the kind described, a housing substantially enclosing said apparatus, an electrically driven pump, a measuring tank within said housing and connected to said pump, a dispensing tank within said housing and connected to said measuring tank, means for automatically stopping said pump after it has pumped a fixed quantity of liquid into said measuring tank, and means for automatically draining said measuring tank into said dispensing tank after said pump has been stopped.

20. In combination with a dispensing apparatus of the kind described, a housing substantially enclosing said apparatus, an electrically driven pump, a measuring tank within said housing and connected to said pump, a dispensing tank within said housing and connected to said measuring tank, means for automatically stopping said pump after it has pumped a fixed quantity of liquid into said measuring tank, means for automatically draining said measuring tank into said dispensing tank after said pump has been stopped, and means preventing actuation of said pump while said tank is being drained.

Signed at New York, in the county and State of New York, this 18th day of February, A. D. 1928.

ERNST HERBST.
HANS KOHLER.