Dec. 1, 1931. C. BRAHY 1,834,765

AUTOMATIC LIQUID FUEL DISPENSER

Filed Oct. 8, 1929 2 Sheets-Sheet 1

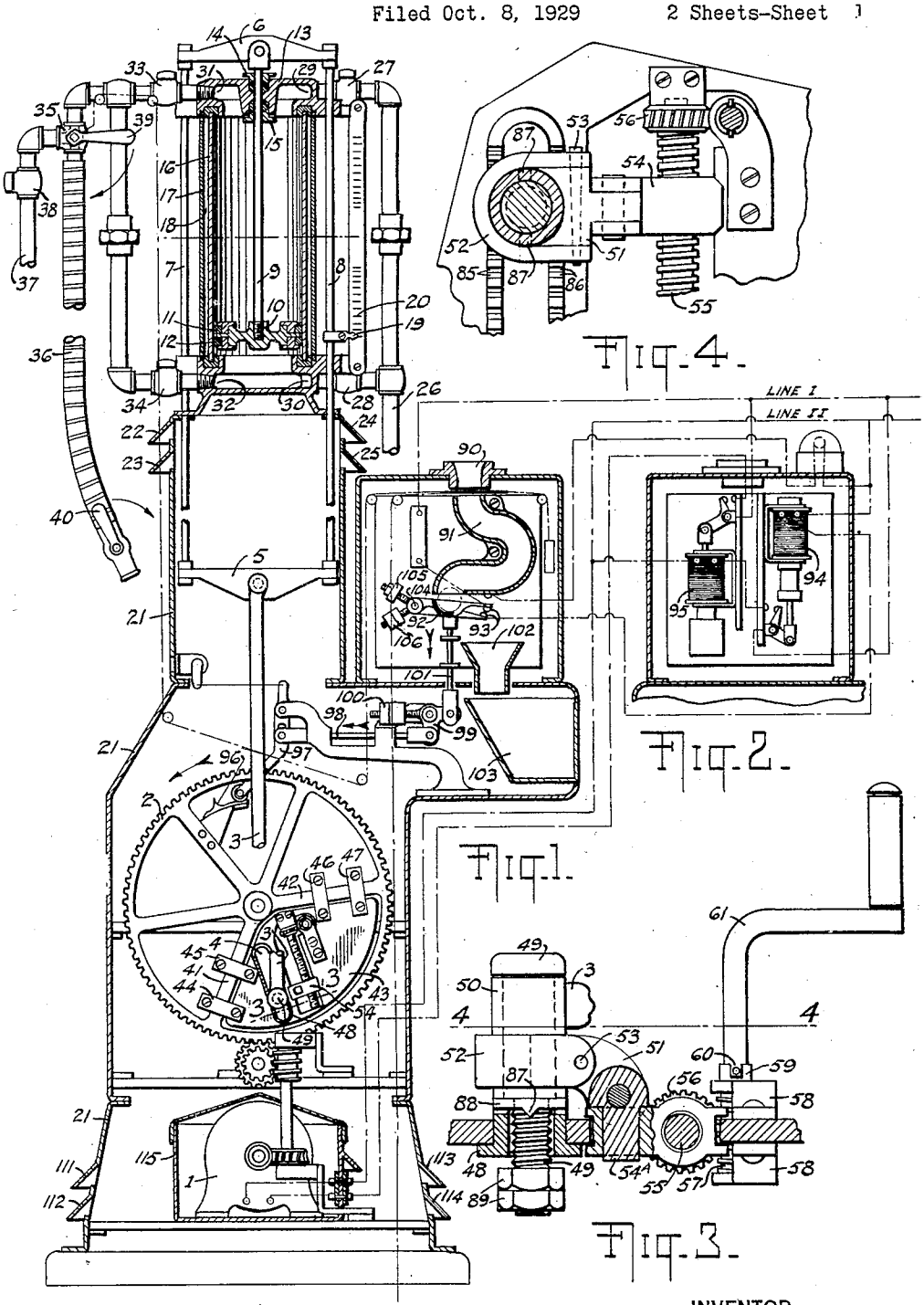


Fig. 1.

Fig. 4.

Fig. 2.

Fig. 3.

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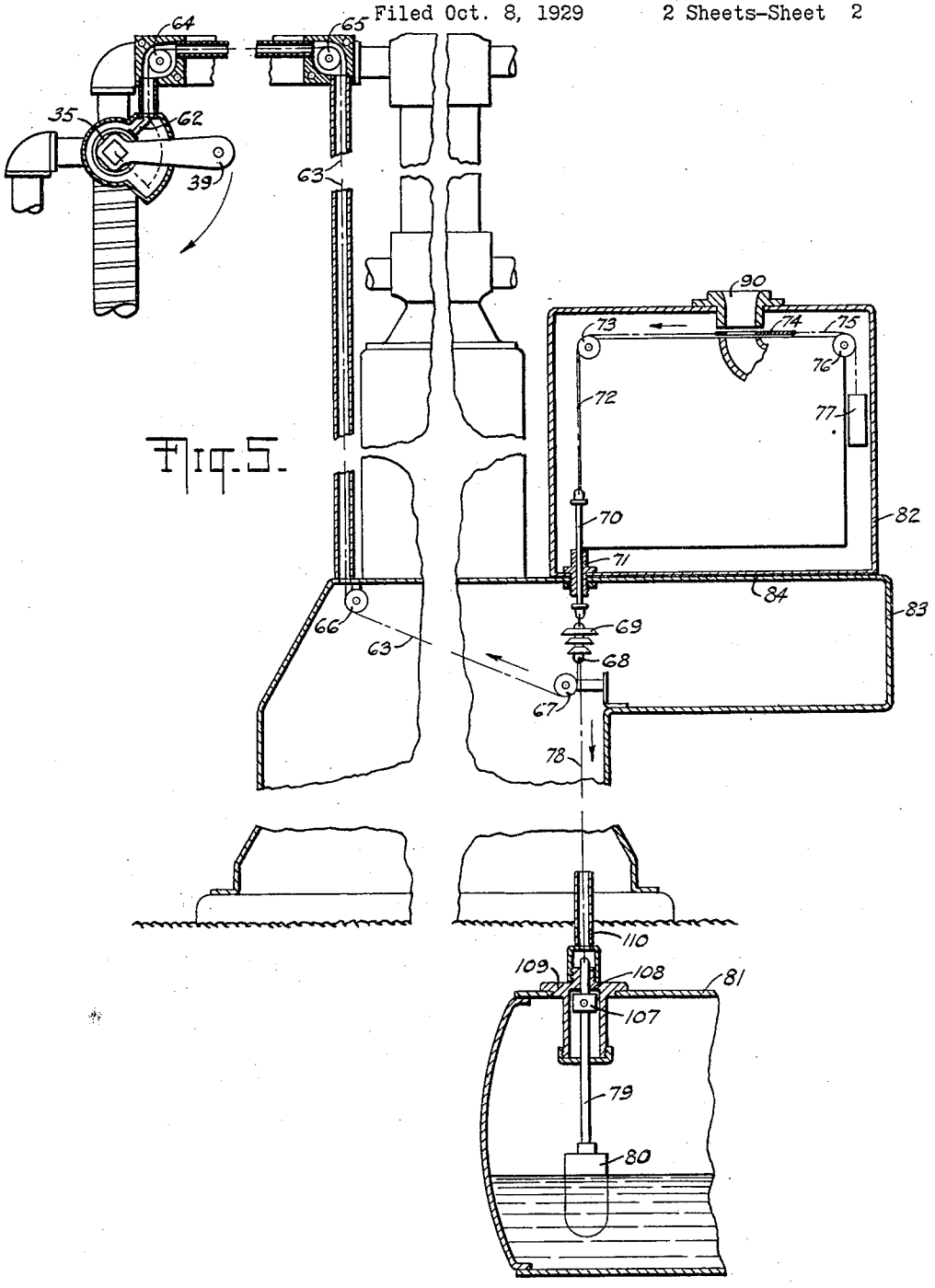


Fig. 5.

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UNITED STATES PATENT OFFICE

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AUTOMATIC LIQUID FUEL DISPENSER

Application filed October 8, 1929. Serial No. 398,161.

This application is a continuation in part of my application for automatic liquid fuel dispensers filed concurrently herewith, as well as of my application filed March 28th, 1928, Serial No. 265,257, and of my application filed August 28th, 1929, Serial No. 388,956,—the scope of this application covering improvements in the pump control and dispensing features of my invention.

One of the objects of this invention is to provide a coin actuated liquid fuel dispenser provided with hand controlled adjusting means to vary the quantity of fuel dispensed to correspond with fluctuations in fuel prices. Another object of this invention is to provide means for automatically shutting the coin deposit slot when the flow of fuel through the outlet hose is stopped, and also when the supply of fuel in the storage tank is less than a predetermined amount. A further object is to provide means to cause the return of the fuel to the storage tank when the flow through the outlet hose is stopped. Still another object of this invention is to provide a heat insulating air chamber around the pump cylinder to maintain an even temperature of the fuel stored therein. Another object is to provide proper ventilation in apparatus of this kind, to prevent the excessive accumulation of combustible vapors around such electrical elements as are subject to sparking. A further object of my invention is to provide a simple method of indicating the amount of fuel dispensed during each stroke of the pump piston. And still a further object is to provide a construction enabling easy access to be had to the piston rod stuffing box and to the piston, so that repairs and replacements can be readily made.

Other objects will appear from the description hereinafter given.

Referring to the drawings:

Fig. 1 is a front sectional elevation of my invention, showing the construction and general arrangement of the parts.

Fig. 2 is a sectional rear view of the back portion of the coin control box, showing the switch controlling solenoids and the wiring diagram.

Fig. 3 is a fragmentary section along line 3—3 of Fig. 1, showing a side view of the adjusting mechanism to vary the length of the piston stroke, the bracket 51, strap 52 and member 54A being shown here, although omitted in Fig. 1.

Fig. 4 is a fragmentary sectional plan taken along line 4—4 of Fig. 3.

Fig. 5 is a fragmentary and partial sectional elevation of my invention, showing the arrangement of the coin slot shutter mechanism as controlled by the hand outlet valve, and by the float in the fuel supply tank.

In the drawings, the motor 1 connects with the gear wheel 2 through the medium of a series of speed reducing gears as shown. The connecting rod 3 is adjustably fixed along the slot 4 and is pivotally attached to the beam 5. Attached to the ends of beam 5 and beam 6 are the guide rods 7 and 8; the piston rod 9 being secured to the middle of beam 6. The piston 10 is provided with two piston rings 11 and 12 as shown, and the cylinder head 13 is provided with two stuffing boxes 14 and 15. The cylinder 16 is surrounded by another cylinder 17, whereby a heat insulating air chamber 18 between the two said cylinders is formed. Carried by the rod 8 is the indicator 19, behind which is the scale 20 calibrated to indicate the amount of fuel dispensed during each stroke of the piston. The casing 21 is provided with the air vents 22, 23, 24 and 25, for ventilating purposes.

The pipe 26 leads from the main supply tank through the one-way valves 27 and 28 and into the intake ports 29 and 30 respectively; and the outlet ports 31 and 32 communicate through one-way valves 33 and 34 respectively, and through the three-way valve 35, with the hose 36. Connected to the said three-way valve 35 is the return line 37 to the fuel supply tank, said line having the one-way pressure relief valve 38 thereon. Handle 39 permits manual operation of valve 35, and handle 40, attached to the nozzle 36 serves a similar purpose.

Secured to the arms 41 and 42 of gear wheel 2 is the plate 43, which is held in place by the clamps 44, 45, 46 and 47. The flanged member 48 which is suitably fixed within the aperture in plate 43 contains the slot 4, with-

in which is positioned the bolt 49 attached to the lower end 50 of the connecting rod. Mounted over the unthreaded portion of the shank of the bolt 49 are the bracket 51 and the strap 52, the cotter pin 53 holding said bracket and strap together and in position. Bracket 51 is attached to member 54*a* which is carried by the carriage nut 54, this nut being mounted over and in threaded engagement with the carriage bolt 55. At the end of this carriage bolt is the gear 56, which is in engagement with the worm 57 carried by the bracket 58. The shaft carrying the worm 57 has at its end the socket 59, with which the end 60 of the crank handle 61 is engageable.

The flanged member 48 contains notched surfaces 85 and 86, having tooth-like elements thereon with recesses between them. Adapted to fit into these recesses are the teeth or protruding elements 87 which are integral with the collar 88 slidably mounted over the bolt 49 and positioned adjacent the flanged member 48. At the threaded end of bolt 49 are the lock nuts 89.

Referring to Fig. 5, the pin 62 in the valve 35 and which is movable in the direction of the arrow, has tied to it the end of the cable 63, which is mounted over the pulleys 64, 65, 66 and 67. The end 68 of this cable is attached to the insulator 69, to which is attached the rod 70 which passes through the gland 71 and to which is attached the cable 72 mounted over pulley 73. The coin slot shutter 74 is fastened to cable 72 and cable 75, which is mounted over pulley 76 and attached to the counterweight 77.

Attached to insulator 69 is cable 78, to the lower end of which is attached the float rod 79 which is secured to the float 80, contained within the fuel supply tank 81. The casings 82 and 83 are separated by a sheet of insulation 84.

A detailed description of the coin control mechanism will not be attempted here in view of the fact that this apparatus is substantially the same as that disclosed in the application above referred to and filed concurrently herewith. However, the various parts constituting such mechanism will be hereinafter referred to when it will become necessary to describe the operation of this apparatus.

When a coin is deposited within the coin slot 90, it drops through the coin slide 91 and into the temporary coin receptacle 92, bringing the contacts 93 together. This operates the relay comprising the contact solenoids 94 and 95, thereby closing the circuit through the motor 1 and setting the gear 2 into motion. This motion is transmitted to the pump piston 10 through the cross beams 5 and 6, the rods 7 and 8, and the piston rod 9. The upward movement of the piston will draw fuel from line 26 through valve 28 and inlet 30, into the cylinder 16. Simultaneously with this intake, there will be a discharge of the fuel already stored in the upper part of the cylinder from a previous stroke, through the outlet 31, the valves 33 and 35, into hose 36 and out through the nozzle of said hose. On the downstroke of the piston, the fuel in the bottom of the cylinder is similarly discharged through the outlet 32, valves 34 and 35, and out through the hose; and at the same time fuel is drawn into the cylinder through the pipe 26, the valves 27 and the inlet port 29.

At the end of the downstroke of the piston and at the consequent completion of a revolution of the gear wheel 2, the cam 96 will engage the tripper lever 97, causing a movement of the tripper rod 98 in the direction of the arrow. This motion is transmitted through the lever 99, against the action of the counterweight 100, to the rod 101. The downward movement of this rod is communicated to the said temporary coin receptacle 92, which swings down in a clockwise direction until the coin therein is dropped through chute 102 and into coin deposit box 103. When the said receptacle 92 is relieved of the weight of the coin, it will swing back around the shaft 104 as an axis, due to the action of the counterweights 105 and 106, to its starting position. At this point the contacts 93 will have become separated. This breaks the circuit through solenoids 94 and 95 successively, as well as the motor actuating circuit, so that the motor and pump cease operating.

Due to the fluctuations in the price of fuel, it becomes necessary at times to vary the quantity of fuel dispensed to correspond with prevailing prices. This is acomplished by varying the length of stroke of piston 10, which is effected by fixing the lower end of connecting rod 3 in different positions along the slot 4, to correspond with predetermined settings. Thus, if the price of fuel were to go up, it would be desirable to have a smaller stroke, so as to dispense less fuel for a coin of a given denomination, and consequently the position of the lower end of the connecting rod 3 would be moved towards the center of gear wheel 2.

In order to make the adjustment within the slot 4, it is necessary to first back off the nuts 89, so as to release the bolt 49 and the parts mounted thereon from the fixed position within the slot 4. The collar 88 is now moved away from the notched surfaces 85 and 86, thereby releasing the teeth 87 from engagement with the recesses in said surfaces; and the collar is then turned through an angle of about ninety degrees so that the teeth 87 are completely out of engagement with the notched surfaces. The crank handle 61 is now turned so that the worm 57 will actuate gear 56, causing the bolt 55 to turn,

and the carriage nut 54 to move longitudinally along the bolt. As the bracket 51 is secured to the carriage nut 54 by member 54*a*, it will move with the said nut and cause the bolt 49 to move within the slot 4 against the resisting action of the fuel surrounded piston. When the desired position is reached, the collar 88 is turned until the teeth 87 are in engagement with adjacent recesses in surfaces 85 and 86. The nuts 89 are now tightened, so that the connecting rod 3 is in its new position, set and adjusted to provide the proper stroke for the piston to dispense the required amount of fuel.

If for some reason it becomes necessary to stop the flow of fuel through the nozzle, the hand valve 40 is closed by turning it in the direction of the arrow. Any fuel being discharged from the cylinder at such a time will pass through the three-way valve 35, through the one-way pressure relief valve 38, through return pipe 37 and back into the fuel storage tank. This result can also be attained by turning the handle 39 in the direction of the arrow, which operates the three-way valve 35 to close the outlet to the hose 36 and keep the outlet to pipe 37 open. When the handle 39 is so turned, the pin 62 follows the movement of this handle, and carries with it the end of the cable 63. As a result, the cable moves over the pulleys 64, 65, 66 and 67, and causes a downward movement of rod 70. The cable 72 mounted over the pulley 73, moves the shutter 74 in the direction of the arrow, against the action of counterweight 77. This brings the solid portion of shutter 74 underneath the slot 90, and prevents the deposit of a coin therethrough.

The coin slot shutter is also actuated by the float 80, so that should there be no fuel in the supply tank 81, or not sufficient fuel for one dispensing cycle of the pump, the coin deposit slot 90 will become closed. When the float 80 is lowered to a predetermined level, this downward movement is transmitted to cable 72, moving the shutter 74 to the left, to its closed position.

When the tank 81 is filled to capacity, or when the level of fuel therein reaches a predetermined height, the block 107 mounted on the float rod 79, comes into contact with the surface 108 of the flanged cover cap 109, thereby limiting the upward movement of float 80 and in this way preventing an undue slackening of cable 78. The tube 110 serves as a housing for the underground portion of cable 78.

The coin control box 82 is electrically separated from casing 83 by the insulation 84 and the insulator 69. This keeps the entire pump insulated from said coin control box, which is highly desirable in view of the combustible vapors that may be prevalent in the pump portion of this apparatus.

The vents 22, 23, 24 and 25, in the pump casing 21 prevent the excessive accumulation of gaseous vapors within the pump housing, and hence, lessen the danger of these combustible gases coming into contact with such electrical parts as are subject to sparking. The vents 111, 112, 113, and 114, serve a similar purpose; and the motor housing 115 serves as a further precaution against the danger of igniting the gaseous vapors.

The arrangement of cross beams 5 and 6 and rods 7 and 8 is such as to have the piston rod 9 extend through the top of the pump, the stuffing boxes 14 and 15 being situated in the cylinder head 13. Access can thus readily be had to the stuffing boxes and the piston, and repairs and replacements made without difficulty; and at the same time leakage down into the pump body is prevented. This arrangement also permits the use of indicator 19 and gage 20, providing an extremely simple, yet accurate method of measuring the quantity of fuel dispensed.

In view of the fact that fuel may be stored in the cylinder 16 for a considerable period of time before being dispensed, a concentric heat insulating cylinder 17 is provided around cylinder 16. This cylinder, together with the air space 18 between the two said cylinders, is effective in keeping the temperature of the fuel within cylinder 16 comparatively constant.

The particular form of apparatus disclosed in the drawings and in the description herein given, consitutes but one of many different mechanical forms that can be embodied in my invention.

What I claim is:

1. In an automatic liquid fuel dispenser, the combination of a reciprocating fuel pump, and adjusting means adapted to vary the length of stroke of the pump piston in such manner as to maintain an equal displacement on each side of the transverse center line of the cylinder, the said adjusting means comprising the combination of a connecting rod, a wheel, a slotted aperture radially disposed on said wheel, hand-controlled geared means to move the lower end of said connecting rod longitudinally along said aperture, and means to pivotally lock said lower end at a predetermined position along said slotted aperture.

2. In an automatic liquid fuel dispenser, a pump piston, adjusting means adapted to vary the length of stroke of said piston, comprising a connecting rod adapted to actuate the piston, a slotted aperture having notched surfaces thereon, a bolt extending through said aperture and pivotally attached to the lower end of said connecting rod, a carriage nut mounted on a suitably positioned carriage bolt hand-controlled means to cause said carriage bolt to rotate and effect a movement to said carriage nut longitudinally thereon and in a direction parallel to said slotted aper-

ture, connecting means to transmit the motion of said carriage nut to the said lower end of the connecting rod, means to engage said notched surfaces at a predetermined position, and means to pivotally lock said lower end at such position.

3. In an automatic liquid fuel dispenser, the combination of a piston having its piston rod extending through the top of the pump cylinder, a motor actuated connecting rod, means for transmitting the movement of said connecting rod to said piston rod, said means being positioned outside said cylinder and having fixed thereto indicating means cooperable with a suitably positioned gage for indicating the displacement of the piston.

4. In an automatic liquid fuel dispenser, a reciprocating pump, a piston having its piston rod extending through stuffing boxes positioned in the cylinder head of said pump, a motor actuated connecting rod, two cross beams one of which is attached to the upper end of said piston rod and the other to the upper end of said connecting rod, a plurality of rods connecting said cross beams and positioned outside of the pump cylinder, one of said rods carrying an indicator cooperable with a suitably positioned gage for disclosing the relative positions of the piston within the cylinder.

5. An automatic liquid fuel dispenser comprising a reciprocating liquid fuel pump having its cylinder surrounded by and separated from a concentrically disposed heat insulating cylinder; rotary driving means for actuating said pump; a connecting rod adapted to actuate the piston of said pump, the lower end of said connecting rod being adjustably fixed in a position eccentric to the center of said rotary means; means to vary the distance of said adjustably fixed end from the center of said rotary driving means; a ventilated casing enclosing said connecting rod and said driving means; and coin actuated means to bring said driving means into operation.

6. An automatic liquid fuel dispenser comprising a coin-actuated reciprocating pump, suction lines connected to both ends of the cylinder of said pump, a one-way valve attached to each of said suction lines, discharge lines connected to both ends of the cylinder of said pump, a one-way valve attached to each of said discharge lines, a return line, an outlet hose, and a three-way valve connected to said discharge and return lines and said hose, and adapted to divert the flow of fuel from said discharge lines to either said return line or said hose.

In testimony whereof, I affix my signature.

CHARLES BRAHY.