July 16, 1968 A. J. WELLS 3,392,882

COUNTER RESET OPERATING MECHANISM

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FIG. 1

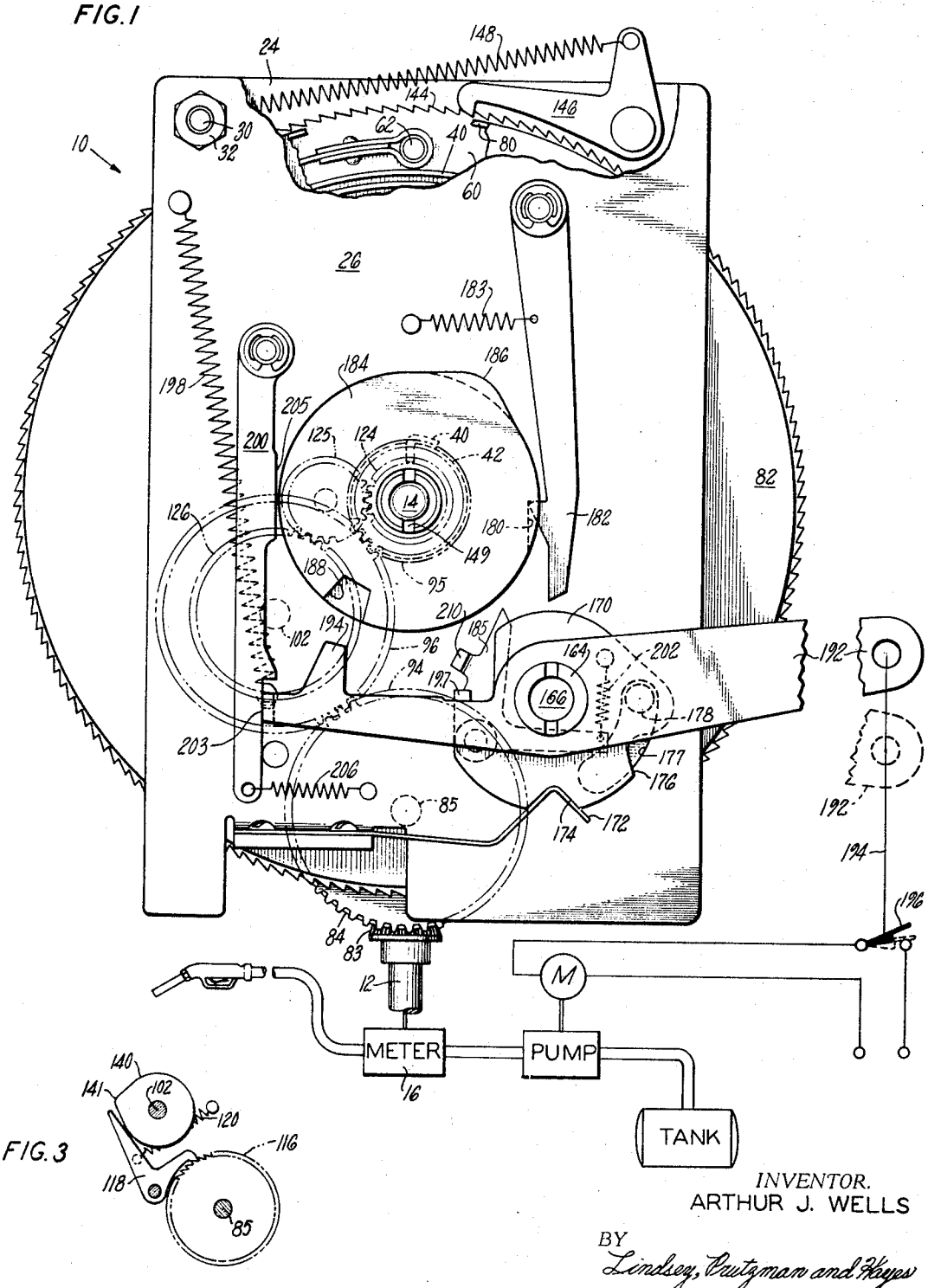


FIG. 3

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FIG 2

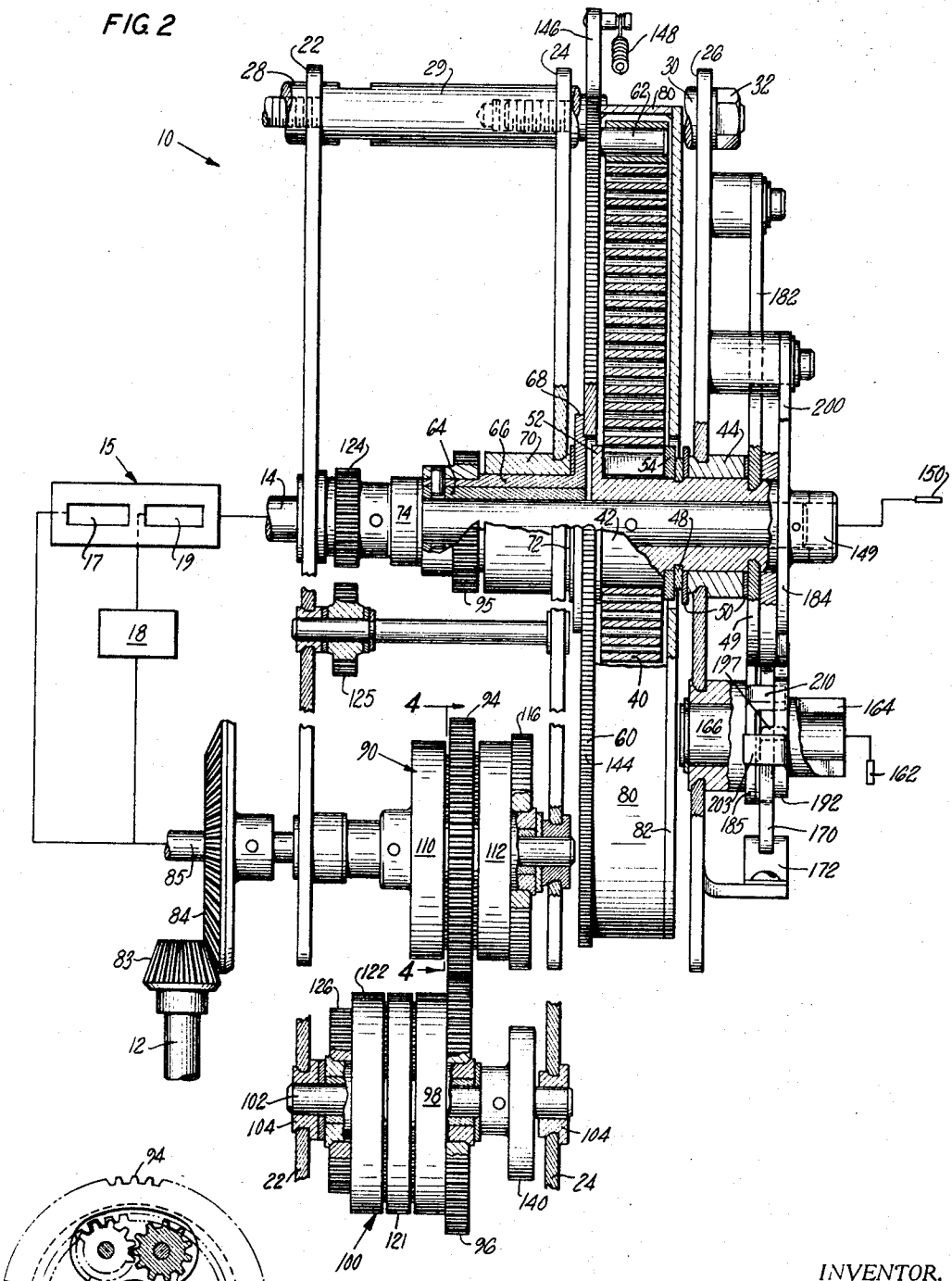


FIG. 4

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COUNTER RESET OPERATING MECHANISM

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ABSTRACT OF THE DISCLOSURE

Fuel dispensing apparatus having a register reset mechanism with a spiral reset spring having one end connected to be wound by the fuel meter during the delivery of fuel, a winding control mechanism responsive to the winding and unwinding of the spring for disconnecting the reset spring from the meter when it is fully loaded and for reconnecting the reset spring to the meter when it is incompletely loaded, and an interlock for alternatively providing for the delivery of fuel and the operation of the reset mechanism with the reset spring to zeroize the register of the dispensing apparatus.

The present invention generally relates to counter reset mechanisms of the type conventionally employing a reset spring for powering the counter resetting operation, and more particularly relates to a new and improved reset operating mechanism having notable utility for resetting the usual counting mechanism or register of a fuel dispensing system.

It is a principal object of the present invention to provide a new and improved counter reset operating mechanism having a reset spring adapted when fully loaded for powering a plurality of resets, preferably three or more, and which is adapted to be fully loaded in conjunction with the operation of the associated counter. Thus in its principal application for resetting the register of a fuel disepnsing system, the reset spring of the reset operating mechanism is adapted to reset the register preferably at least three times after the spring is fully loaded. Accordingly, where the reset spring is wound in conjunction with the operation of the register during the delivery of fuel, as for example by the usual fluid-operated meter employed in such fuel dispensing systems, the reset spring is adapted to be fully wound during a relatively long fuel delivery to store sufficient energy for resetting the register after following relatively short fuel deliveries during which short deliveries the spring would not be sufficiently wound to reset the register.

It is another object of the present invention to provide a new and improved reset operating mechanism of the type described which is adapted for selectively resetting an associated counter a number of times.

It is another object of the present invention to provide a new and improved reset operating mechanism for a register of a fuel dispensing system which may be controlled with a single lever to activate and de-activate the fuel dispensing system, reset the register, and appropriately sequence the fuel dispensing and resetting operations to ensure that the register is reset after the completion of a preceding delivery and before the initiation of a following fuel delivery.

It is a further object of the present invention to provide a new and improved reset operating mechanism which is driven during the operation of an associated counter to accumulate energy for subsequently powering the reset and which during a predetermined minimum counter operation accumulates sufficient energy for resetting the counter at least three times. Thus, when employed for resetting the register of a fuel dispensing system the reset operating mechanism provides for storing during a long delivery of

fuel, for example three gallons, sufficient energy for resetting the register, for example three times (and therefore for storing sufficient energy for one reset for each gallon of fuel delivered). Consequently, the reset operating mechanism would have sufficient energy for resetting the register after the "long delivery" and for resetting the register after at least two following "short deliveries."

It is a further object of the present invention to provide a new and improved reset operating mechanism for the register of a fuel dispensing system which employs a reset spring as an energy accumulator that is loaded by the usual fluid meter conventionally employed in fuel dispensing systems and which provides for terminating the loading operation of the accumulator by the meter after the accumulator has been fully loaded.

It is another object of the present invention to provide in a counter reset operating mechanism of the type having a powered reset shaft for resetting the counter a new and improved control mechanism for selectively activating and de-activating the counter and for selectively resetting the counter by permitting limited rotation of the reset shaft.

It is a further object of the present invention to provide a new and improved reset operating mechanism for the register of a fuel dispensing system, and having an accumulator for storing energy for resetting the register which is loaded by the fluid metering mechanism employed in the system and which can be loaded by the metering mechanism with relatively low torque and therefore without harmfully affecting the accuracy or service life of the metering mechanism.

Other objects will be in part obvious and in part pointed out more in detail hereinafter.

The invention accordingly consists in the features of construction, combination of elements and arrangement of parts which will be exemplified in the construction hereafter set forth, and the scope of the application of which will be indicated in the appended claims.

In the drawings:

FIG. 1 is a partial showing of a fuel dispensing system employing an embodiment of a reset operating mechanism of the present invention which includes an end elevation view, partly broken away, of the reset operating mechanism;

FIG. 2 is another partial showing of the fuel dispensing system which includes an axial section view, partly broken away and partly in section, of the reset operating mechanism;

FIG. 3 is a reduced transverse section view of the reset operating mechanism showing a control cam and ratchet mechanism employed in the reset operating mechanism; and

FIG. 4 is a partial transverse section view, partly broken away and partly in section, taken generally along line 4—4 of FIG. 2.

Referring now to the drawings in detail, an embodiment of a reset operating mechanism **10** incorporating the present invention is shown having an input shaft **12** and on output or reset shaft **14** connected to an associated counting mechanism **15** for resetting the usual number wheels of the counting mechanism, as for example as shown in United States Patent No. 3,142,442 of Otto Wild, Jr., dated July 28, 1964 and entitled Resetting Mechanism for Counters. Thus, by revolving the output or reset shaft **14** one complete revolution, for example, the number wheels can be disengaged, reset and re-engaged for a subsequent count. In accordance with the principal application of the reset operating mechanism of the present invention wherein the reset operating mechanism is installed as shown somewhat schematically in the drawings for resetting the counting device or register

15 of a fuel dispensing system, the input shaft 12 is preferably driven by the fluid metering mechanism 16 employed in such fuel dispensing apparatus to provide an output which is proportional to the volume or quantity of the fuel delivered. Thus, the shaft 12 may be the usual quantity or "gallons" shaft driven by the metering mechanism 16 and which is also used to drive the volume counter 17 of the register and the usual cost computer 18 and cost counter 19. As is well known, it is particularly desirable to minimize the restraining torque on the output shaft of the metering mechanism in order to increase the service life and accuracy of the metering mechanism. Thus, in the shown application of the reset operating mechanism of the present invention wherein the mechanism is driven by the metering mechanism, it is important to minimize the torque required to operate the reset mechanism.

Referring to the particular embodiment disclosed in the drawings, the reset operating mechanism is shown compactly constructed and supported on three parallel plates 22, 24, 26 which function as the supporting frame for the mechanism. These plates are suitably secured together by the posts 28, 29, 30 having threaded connections and by suitable nuts 32 threaded on the outwardly projecting studs of the posts 30. Thus, the reset operating mechanism may be conveniently mounted on the frame of an associated register, for example, by employing the usual end plate of the register as the plate 22.

The reset operating mechanism employs a coil torsion spring 40 which encircles the reset shaft 14, and the inner end of the torsion spring 40 is suitably secured to a sleeve 42 which is pinned to the shaft so that the torsion spring is connected for rotating the shaft to reset the register. Of course, where desired a dashpot or other damper (not shown) may be connected to the reset shaft to maintain the rotational speed of the reset shaft within an acceptable limit.

As seen in FIG. 2, the sleeve 42 is rotatably supported within a bushing 44 secured within an opening in the end plate 26 and is held against axial displacement within the bushing by a suitable retaining ring 48, a generally circular plate 49 secured to the sleeve 42 and a pair of intermediate washer bearings 50. The sleeve 42 is provided with an annular flange 52, and a washer bearing 54 is mounted on the sleeve intermediate the retaining ring 48 and the coil spring to maintain the coil spring in alignment on the sleeve.

The outer end of the torsion spring 40 is connected to a drive plate 60 by an axially projecting pin 62 fixed to the drive plate. The drive plate is rotatably mounted on the reset shaft 14 by a bushing 64 receiving the reset shaft and an intermediate sleeve 66 having an outer annular flange 68 to which the drive plate 60 is affixed. The sleeve 66 is also rotatably supported within a bushing 70 fixed within an opening in the intermediate plate 24, and a washer bearing 72 is interposed between the bushing 70 and the annular flange 68, and the reset shaft 14 is provided with a collar 74 to axially position the sleeve 66 on the shaft. The torsion spring 40 is substantially full enclosed by an annular ring 80 fixed to the drive plate 60 and surrounding the torsion spring, and by a side plate 82 fixed to the annular ring and having a central opening receiving the washer bearing 54.

The drive plate 60 is rotated, in the clockwise direction as viewed in FIG. 1, by the input or "gallons" shaft 12 through the bevel gearings 83, 84, the shaft 85, and a planetary gear train or differential generally denoted by the numeral 90 having a planetary carrier 92 with an output gear 94 that is adapted to drive a gear 95 through an intermediate gear 96. The gear 95 is pinned to the sleeve 66 and bushing 64, and the intermediate gear 96 is fixed to a ring gear 98 of a second planetary gear train or differential, generally denoted by the numeral 100. This second differential 100 is supported on an intermediate shaft 102 which is rotatably mounted on the plates 22, 24 by the bushings 104.

The differential 90 comprises a pair of ring gears 110, 112 and suitable cooperating planetary pinions 114 rotatably supported on the carrier 92 for engagement with the ring gears 110, 112, respectively. The ring gear 110 is mounted for rotation by the shaft 85, whereas a ratchet wheel 116 fixed to the ring gear 112 and a suitable ratchet pawl 118 (FIG. 3) urged by a tension spring 120 into engagement with the ratchet wheel provides for locking the ring gear against rotation and thereby activate the drive through the differential 90 from the shaft 12 to the reset spring 40 to connect the metering mechanism 16 for loading the reset spring during the delivery of fuel.

The differential 100 is of similar construction and includes a carrier 121 which drives the differential supporting shaft 102, the ring gear 98 which is driven by the intermediate gear 96, and a ring gear 122 which is driven by the reset shaft 14 by a gear 124 fixed to the reset shaft, an idler gear 125 and a gear 126 fixed to the ring gear 122. It can be seen therefore that the angular rotation of the ring gear 98, in the counterclockwise direction as viewed in FIG. 1, is a function of the angular rotation of the drive plate 60 by the meter shaft 12 or the winding rotation of the outer end of the reset spring 40, and the angular rotation of the ring gear 122, in the clockwise direction as viewed in FIG. 1, is a function of the angular rotation of the reset shaft by the reset spring or the unwinding rotation of the inner end of the torsion spring. Thus, the angular position of the carrier 121 or its supporting shaft 102 is a function of the extent to which the reset spring 40 is wound. For example, as the shaft 85 is rotated to wind the reset spring, the ring gear 98 will be rotated, in the counterclockwise direction as viewed in FIG. 1, and the carrier 121 and its supporting shaft 102 will be rotated in the counterclockwise direction; whereas when the reset shaft 14 is rotated by the torsion spring 40, the ring gear 122 will be rotated, in the clockwise direction as viewed in FIG. 1, and the carrier 121 and its supporting shaft 102 will be rotated in the clockwise direction.

The specific mechanism shown provides, for example, for winding the reset spring one revolution, and thus for loading the reset spring sufficiently for a full reset, for each gallon of fuel delivered. This mechanism consequently uses a spring loading drive which requires relatively low torque in comparison, for example, with the conventional meter-operated reset mechanism wherein the spring is loaded for a reset during a delivery of a fraction of a gallon of fuel. Also, the reset operating mechanism provides, for example, for rotating the shaft 102 one-fifth of a revolution, in the counterclockwise direction as viewed in FIG. 1, for each full revolution the reset spring 40 is wound and one-fifth of a revolution, in the clockwise direction as viewed in FIG. 1, for each full revolution of the reset shaft 14. For disengaging the spring loading drive through the differential 90 after the reset spring is fully wound, a control cam 140 fixed on the shaft 102 is provided for pivoting the ratchet pawl 118 out of engagement with the ratchet wheel 116 when the spring is fully loaded. For this purpose the cam 140 is provided with a lobe 141 that is adapted to oscillate or reciprocate back and forth as the spring is unwound and wound and is adapted for engagement with the pawl 118 for releasing the ratchet mechanism when the spring has been fully loaded. When the pawl 118 is actuated by the cam 140 to release the ratchet wheel 116 the ring gear 112 of the differential 90 is released to rotate freely. In this condition the input shaft 85 will rotate the ring gear 112 and as a result no torque or motion will be transmitted through the gear 94 to the spring 40 and the spring will not be wound up as shaft 85 rotates. As spring 40 thereafter unwinds, the ring gear 122 of the differential 100 will be rotated to rotate the cam 140 to release the ratchet pawl 118 for re-engagement with the

ratchet wheel **116**. In this condition the ring gear **112** is held against rotation and the gear **94** is adapted to be driven by the shaft **85** through the differential **90** to wind up the spring **40**. For restraining the drive plate **60** against return movement, in the counterclockwise direction as viewed in FIG. 1, when the spring loading drive is disengaged, the drive plate **60** is provided with a ratchet edge **144**, and a ratchet pawl **146** pivotally mounted on the plate **24** is maintained in engagement with the ratchet edge **144** by a tension spring **148**. This arrangement therefore prevents reverse rotation of the drive plate while permitting the drive plate to be rotated, in the clockwise direction as viewed in FIG. 1, for winding the reset spring.

Thus, the reset operating mechanism provides for discontinuing winding the reset spring only after the reset spring has been fully wound and therefore wound to provide sufficient energy for resetting the register a preselected number of times, in the present example—three. Consequently, the register could be reset three times without further winding the reset spring, and therefore for resetting the register after the "long delivery" during which the reset spring is fully loaded and for at least two following "short deliveries" during which the reset spring is insufficiently wound to store energy for even one reset. Of course, during the two following "short deliveries" the reset spring is wound in part, such loading being dependent upon the volume of fuel delivered and, for example, where each of the "short deliveries" were one-half of a gallon the reset spring **40** would be wound an additional full revolution during the two short deliveries to sufficiently load the spring for another full reset. Thus, it can be seen that the amount of energy stored in the reset spring depends upon the fuel delivery history and when the reset spring is fully wound there is sufficient energy accumulated in the reset spring for at least three resets. Also, when the reset spring is fully wound the drive from the fluid metering mechanism is automatically disengaged to eliminate the torque required of the meter shaft to wind the spring beyond the full load condition.

If the torsional bias of the reset spring were insufficient due to a number of successive "short deliveries," the reset shaft **14** could be manually rotated, in the clockwise direction as viewed in FIG. 1, to manually reset the register, and for this purpose the end of the shaft **14** may be provided with a suitable coupling **149** for connecting a handle **150**, shown schematically in FIG. 2. Manual operation of the reset shaft would provide for unwinding the reset spring further and thus the reset spring would be wound an additional revolution during a following "long delivery." Where however the reset spring is completely unwound, as for example after the reset shaft were manually reset several times in succession, manual operation of the reset shaft would provide for rotating the drive plate, in the clockwise direction as viewed in FIG. 1, and for rotating the ratchet wheel **116**, in the clockwise direction as viewed in FIG. 3. In this instance, the cam **140** would remain stationary as the ring gears **98**, **122** of the planetary gear train **100** would rotate equally in opposite angular directions.

Referring now particularly to FIG. 1, the reset operating mechanism of the present invention includes a reset control mechanism for sequencing the delivery and reset functions of the dispensing system. This reset control mechanism is shown in FIG. 1 in the position the various parts would occupy after a fuel delivery has been completed and after a manual control lever **162**, shown schematically in FIG. 2, is pivoted to its "OFF" position, as for example to permit placing the fuel delivery nozzle in the usual nozzle receptacle or boot (not shown) conventionally provided in the fuel dispensing apparatus. For resetting the register, the fuel delivery nozzle is removed from its receptacle and the control lever **162** is pivoted approximately 45°, in the clockwise direction as viewed in FIG. 1. The control lever **162** is connected through a coupling **164** to a stub shaft **166** which is suitably mounted for rotation on the end plate **26**, and a plate **170** fixed to the stub shaft **166** is thereby angularly rotated. A spring detent **172** mounted on the end plate **26** is adapted to be received within slots **174**, **176** in the plate **170** to provide a detent arrangement for maintaining the control lever in its "OFF" and "ON" positions, respectively, and a slot **177** and pin **178** arrangement is provided for limiting the pivotal movement of the plate **170** and therefore the control lever.

The plate **49** has a circular periphery coaxial with the shaft **14** excepting for a peripheral notch **180** therein which is adapted to receive a detent finger **182** pivotally mounted on the end plate **26** and biased into engagement with the plate **49** by a tension spring **183**. Thus, as viewed in FIG. 1 the detent finger **182** is adapted to hold the shaft **14** against rotation in the clockwise direction. The detent finger **182** is pivoted to release the reset shaft when the manual control level **162** is pivoted to its "ON" position by a trip finger **185** pivotally mounted on the plate **170** and biased to its extended position shown in FIG. 1 by a tension spring **202**.

A second generally circular plate **184** having a cam lobe **186** and a peripheral notch **188** is fixed to the sleeve **42** in axially spaced relationship with the plate **49**. A switch lever **192** pivotally mounted on the stub shaft **166** is suitably connected via the linkage **194**, shown schematically in FIG. 1, to operate a switch **196** for the pump motor, the lever **192** being shown in its "OFF" or withdrawn position to de-energize the motor. Alternatively, the lever **192** could be connected to operate a suitable valve (not shown) in the fuel line for activating and deactivating the dispensing apparatus. The switch lever **192** is pivoted to its withdrawn position against the bias of a tension spring **198** by a lug **197** upstanding from the plate **170** when the control lever **162** is pivoted to its "OFF" position. The switch lever **192** is provided with a finger or projection **194** that is adapted to be received within the peripheral recess **188** of the plate **184** when the shaft **14** is held by the detent **182**, thus allowing the lever **192** to be pivoted, clockwise as viewed in FIG. 1, to energize the pump motor when the control lever is placed in its "ON" position and the recess **188** in the plate **184** is aligned for receiving the finger **194**. A detent finger **200** is pivotally mounted on the plate **26** and urged by a tension spring **206** into engagement with an inwardly projecting lug **203** on the outer end of the switch lever to keep the switch lever withdrawn when the control lever is initially placed in its "ON" position. However, after approximately 240° of rotation of the reset shaft **14**, the cam lobe **186** engages a follower portion **205** of the detent **200** to release the switch lever **192** for engagement with the edge of the plate **184**. Thus, after the reset shaft **14** has completed one full revolution and the detent finger **182** again restrains the shaft against further rotation, the switch arm **192** is pivoted to energize the pump motor. Consequently, the pump motor is energized (or alternatively the fuel valve [not only] is opened) for delivering fuel only after the register has been fully reset.

It can be seen that upon pivoting the control lever **162** in the clockwise direction as viewed in FIG. 1, the detent finger **182** is engaged by the trip finger **185** to release the reset shaft as the control lever is moved through a position intermediate its "ON" and "OFF" positions. When the handle is pivoted to its "ON" position, the detent finger **182** is released to enable the detent to re-engage the plate **49** and to restrain the plate after one full revolution of the reset shaft. As it is possible to place the control lever **162** in an intermediate position where the detent finger **182** is held withdrawn by the trip finger **185**, the trip finger **185** is provided with a lug **210** that is engageable by the cam lobe **186** as the reset shaft rotates to withdraw the trip finger and thereby release the detent finger **182** before the reset shaft completes a full revolu-

tion. Thus, the detent finger **182** is assured of being in operative position for holding the reset shaft against an additional revolution even though the control lever **162** is incompletely turned.

Thus it can be seen that the reset operating mechanism of the present invention provides for storing sufficient energy in an accumulator for resetting a register or other counting mechanism a number of times and with which the accumulator can be loaded during the operation of the counter and by the meter conventionally employed in fuel dispensing apparatus. Additionally, the reset operating mechanism of the present invention can be geared to be driven by the usual meter of a fuel dispensing system to minimize the restraining torque on the meter and thus to be driven by the meter without harmully affecting the service life and accuracy of the meter. Further, the reset operating mechanism of the present invention provides for terminating the accumulator loading operation when the accumulator is fully loaded and for sequencing with a singe control lever the reset and counting functions.

As will be apparent to persons skilled in the art, various modifications and adaptations of the structure above described will become readily apparent without departure from the spirit and scope of the invention, the scope of which is defined in the appended claims.

I claim:

1. In a fluid dispensing system having a register operative to provide a readout in accordance with the quantity of fluid delivered and a resetting mechanism for resetting the register, the improvement wherein the resetting mechanism comprises an energy accumulator capable and when completely loaded for storing sufficient energy for resetting the register a multiple of at least three times, disengageable drive means for loading the accumulator during the delivery of fluid in conjunction with the operation of the register, drive control means responsive to the actual loading of the accumulator for disengaging the drive means when the accumulator is completely loaded and for re-engaging the drive means when the accumulator is incompletely loaded, and resetting control means for selectively resetting the register with the accumulator whereby during a relatively long delivery of fluid the accumulator will be completely loaded for at least three resets for subsequently resetting the register after the said relatively long delivery and after at least two following relatively short deliveries of fluid during which the accumulator is insufficiently loaded to store energy for resetting the register even once.

2. In a fluid dispensing system having a register operative to provide a readout in accordance with the quantity of fluid delivered, a fluid metering mechanism for operating the register, a resetting mechanism for resetting the register having an energy accumulator for powering the reset, disengageable drive means for connecting the energy accumulator with the fluid metering mechanism for loading the accumulator therewith during the fuel delivery, and control means for disengaging the drive means, the improvement wherein the resetting mechanism comprises a reciprocable control element conneceted to be actuated in one direction in proportion to the accumulator loading and to be actuated in the opposite direction in proportion to the amount the accumulator is loaded to power the reset, and means responsive to the position of the reciprocable control element for disengaging the drive means when the control element is actuated in said one direction a predetermined amount.

3. In a counting mechanism having a counter, counter drive means for driving the counter; and a reset mechanism having a reset spring connected for resetting the counter, disengageable spring loading means for loading the spring with the counter drive means, and control means for disengaging the spring loading means; the improvement wherein the control means comprises a rotary control element connected to be rotated in one angular direction as the spring is loaded and to be rotated in the opposite angular direction as the spring is unloaded to reset the counter, and means for disengaging and reengaging the spring loading means in accordance with the angular position of the rotary control element.

4. In a fluid dispensing system having a register operative to provide a readout in accordance with the quantity of fluid delivered, a fluid metering mechanism for operating the register; and a resetting mechanism for resetting the register having an energy accumulator for powering the reset, disengageable drive means for connecting the energy accumulator with the fluid metering mechanism for loading the accumulator therewith during the delivery of fluid, and control means for disengaging the drive means; the improvement wherein the energy accumulator is capable when completely loaded of powering the reset a plurality of times and wherein the disengageable drive means comprises accumulator loading sensing means responsive to the actual loading of the accumulator by sensing the difference between the amount the accumulator is loaded by the drive means and the amount the accumulator is unloaded for resetting the register, and means operative by the accumulator loading sensing means for disengaging the drive means when the accumulator is completely loaded and for reengaging the drive means when the accumulator is incompletely loaded.

5. In a counter reset mechanism, a reset shaft operative in one angular direction for resetting, said shaft being connected for operation through a predetermined angle of travel in said one angular direction for powering each reset cycle, a reset spring operatively connected for rotating the reset shaft in said one angular direction and capable when fully loaded for rotating the reset shaft through a plurality of reset cycles, disengageable spring drive means operable for loading the reset spring, and drive control means for disengaging the spring drive means when the reset spring has been fully loaded, said drive control means being differentially responsive to the loading of the reset spring by the drive means and to the rotation of the reset shaft in said one angular direction and being adapted to disengage the spring drive means when the reset spring is fully loaded.

6. The counter reset mechanism of claim **5** wherein the drive control means comprises a differential mechanism connected to the spring drive means and to the reset shaft, a drive controller driven in opposite directions by the spring drive means and reset shaft, and means for disengaging the spring drive means in accordance with the position of the drive controller.

7. In a counter reset mechanism, a reset shaft operative in one angular direction for resetting a counter, a reset spring having one end connected to the reset shaft and adapted when loaded for urging the reset shaft in said one angular direction, a rotary input connected to the other end of the reset spring rotatable coaxially with the reset shaft in said one angular direction for loading the reset spring, disengageable drive means for rotating the rotary input in said one angular direction, and drive control means for disengaging the drive means, said drive control means being differentially responsive to the angular rotation of the rotary input and reset shaft in said one angular direction and being adapted to disengage the drive means upon a predetermined difference between the angular rotation of the rotary input and the angular rotation of the reset shaft, and reset control means for restraining the reset shaft against angular movement in said one angular direction and for selectively allowing limited angular rotation to the reset shaft in said one angular direction for resetting the counter.

8. In the counter reset mechanism of claim **7** wherein the reset spring is a coil spring capable when fully loaded for resetting the counter at least three times, and wherein the drive control means provides for disengaging the drive means only after the coil spring is fully loaded.

9. In a counter reset mechanism, a coil reset spring capable when fully wound to provide energy for powering a plurality of reset cycles, coaxial rotary driven and drive members operatively connected to opposite ends of the reset spring and respectively adapted to be rotated in one angular direction for resetting and for winding the spring, disengageable drive means for rotating the drive member in said one angular direction for winding the reset spring, reset control means for restraining the rotary driven member against rotation in said one angular direction and for selectively allowing the driven member to be rotated by the reset spring a limited angle of rotation to power a reset cycle, and drive control means differentially responsive to the rotation of the drive and driven members in said one angular direction for disengaging the drive means after the reset spring has been fully wound.

10. In a fluid dispensing system having a fluid metering mechanism driven in proportion to the quantity of fluid delivered, a counting mechanism driven by the fluid metering mechanism in proportion to the fluid delivered, and a reset mechanism including a reset shaft operable for resetting the counting mechanism, the improvement wherein the reset mechanism comprises a coil spring having one end connected to the reset shaft for powering the resetting operation, disengageable drive means connecting the other end of the coil spring to the fluid metering mechanism for winding the reset spring during the delivery of fluid and in proportion to the quantity of fluid delivered; said drive means including a drive planetary gear train having an input driven by the meter, an output connected for winding the coil spring, and a planetary gear train controller; a ratchet wheel connected to the gear train controller and a pivotal ratchet pawl adapted for operative engagement with the ratchet wheel for holding the controller against rotation and thereby engage the drive through the drive planetary gear train to the coil spring; a control planetary gear train having first and second inputs connected respectively to the ends of the coil spring and an output rotated in opposite angular directions by the first and second inputs respectively as the coil spring is wound by the meter and as the coil spring unwinds while powering the resetting operation; a control cam driven by the output of the control planetary gear train operative to pivot the ratchet pawl to disengage the ratchet mechanism and thereby disengage the drive through the first planetary gear train after the coil spring has been wound a predetermined amount, and reset control means for timely resetting the counting mechanism with the reset shaft.

11. In a fluid dispensing system having a fluid pump, a motor operating the pump, a fluid metering mechanism driven in proportion to the quantity of the fluid dispensed, a counting mechanism driven by the meter, and a reset mechanism including a reset shaft for resetting the counting mechanism, the improvement wherein the reset mechanism comprises a reset spring connected for rotating the reset shaft in one angular direction for resetting the counting mechanism; disengageable drive means for loading the reset spring with the fluid metering mechanism during the delivery of fluid having a drive planetary gear train with an input driven by the fluid metering mechanism, an output connected to the reset spring, and a planetary gear train controller for disengaging and engaging the drive through the planetary gear train; locking means for locking and unlocking the controller against rotation, a control planetary gear train having an output and a pair of inputs driven in accordance with the loading and unloading of the reset spring to drive the output in opposite directions; drive control means driven by the output of the control planetary gear train for locking and unlocking the locking means; and a reset control mechanism comprising first detent means for holding the reset shaft against rotation in said one angular direction, a pivotal control element pivotal in one angular direction for momentarily disengaging the first detent means to release the reset shaft for limited angular rotation for resetting the counting mechanism, a lever manually operable for pivoting the control element, a motor switch, a motor switch operating lever pivotally mounted coaxially with the pivotal control element between a switch "OFF" position and a switch "ON" position, means urging the switch operating lever to its "ON" position, means pivotal with the control element in the opposite angular direction for pivoting the lever to its "OFF" position, second detent means for holding the lever in its "OFF" pivotal position, and means operative with the rotation of the reset shaft through its limited angle of rotation to release the second detent means.

12. In a fluid dispensing system having a register driven in proportion to the quantity of fluid delivered; and a counter resetting mechanism having a rotatable reset shaft operative in one angular direction through a limited angle of rotation for resetting the register, a reset spring connected for rotating the reset shaft in said one angular direction, and a reset control mechanism for controlling the operation of the reset shaft; the improvement wherein the reset control mechanism comprises shaft detent means for restraining the reset shaft against rotation in said one angular direction and, when momentarily released, for releasing the reset shaft for said limited angle of rotation, a pivotal trip lever manually pivotal from a withdrawn off position to an extended on position for momentarily releasing the shaft detent means, a fluid dispensing system control lever mounted for pivotal movement for activating and de-activating the dispensing system, said trip lever having lever operating means for pivoting the system control lever to a withdrawn position to de-activate the dispensing system when the trip lever is manually pivoted to its withdrawn off position, spring means urging the system control lever in the opposite pivotal direction to a pivotally extended position to activate the dispensing system, second detent means for restraining the system control lever against pivotal movement to its extended position, cam means on the reset shaft for releasing the second detent means as the reset shaft rotates through said limited angle of rotation, and manual control means for manually pivoting the trip lever to its withdrawn and extended positions.

13. The improvement of claim 12 wherein the trip lever comprises a pivotal support operated by the manual control means, a trip pawl pivotally mounted eccentrically on the pivotal support, and a pawl spring urging the pawl to an extended position for engagement with the shaft detent means when the trip lever is pivoted to its extended position, said cam means being adapted to engage said trip pawl as the reset shaft rotates through said limited angle of rotation to pivot the trip pawl out of engagement with the shaft detent means and thereby assure that the detent means is positioned to restrain the reset shaft after said limited angle of rotation.

14. The improvement of claim 12 wherein the system control lever and trip lever are coaxially mounted and wherein the lever operating means comprises abutting parts on the trip lever and system control lever.

15. The improvement of claim 12 wherein the reset control mechanism further comprises a rotary controller mounted on the reset shaft for rotation therewith and having a peripheral recess for receiving the system control lever after the reset shaft has completed its limited angle of rotation to enable the control lever to be pivoted to its extended position for activating the the dispensing system.

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