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E. W. ROBINSON ET AL

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ELECTRICALLY CONTROLLED DISPENSER

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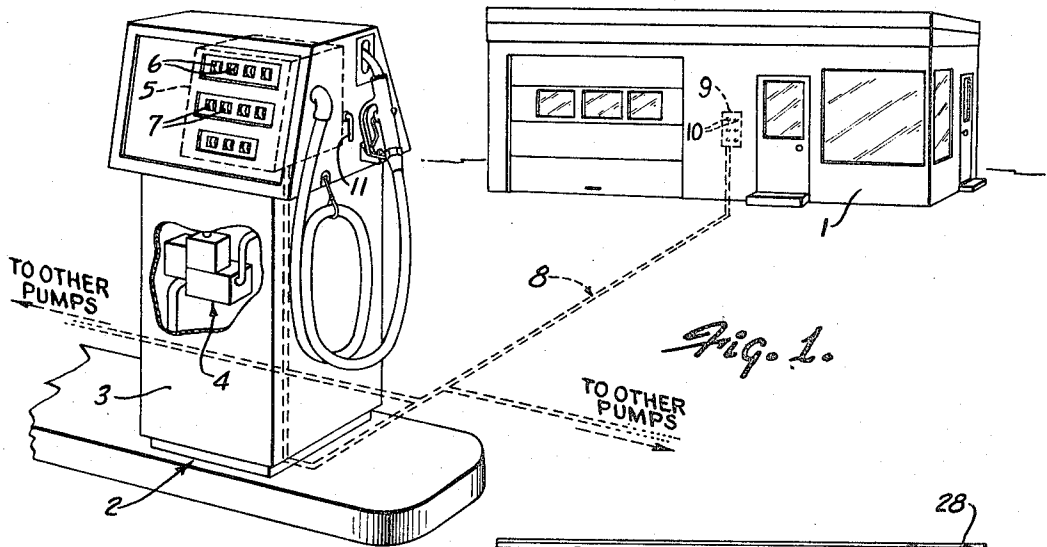


Fig. 2.

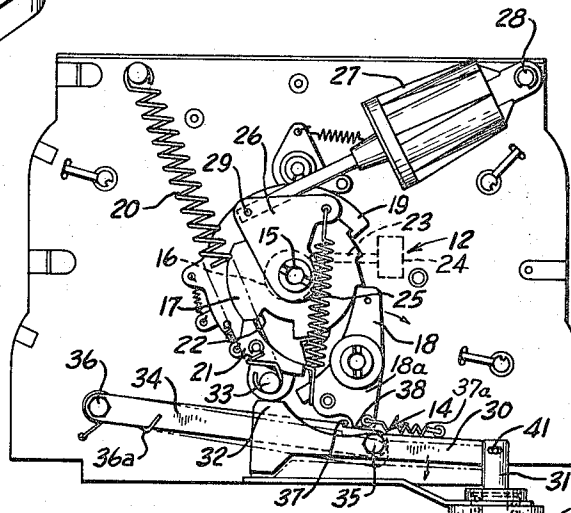
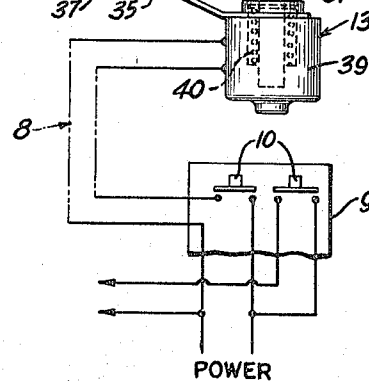
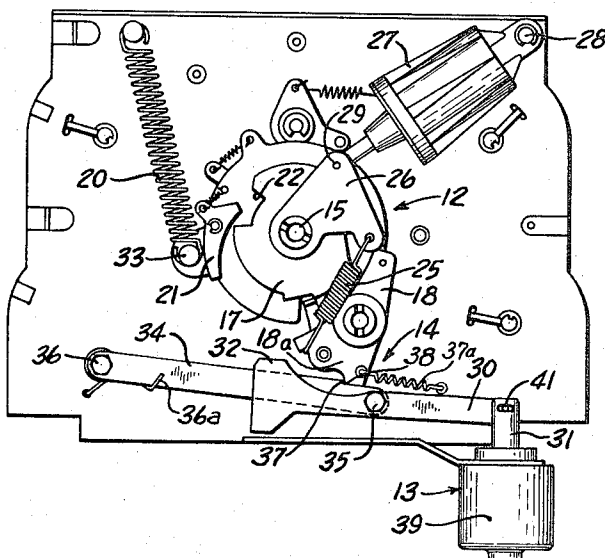


Fig. 3.



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ELECTRICALLY CONTROLLED DISPENSER

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2 Claims. (Cl. 222-33)

ABSTRACT OF THE DISCLOSURE

An automatic remote control for a gasoline pump includes a computer resetting mechanism which is spring loaded by turning of an external crank which also actuates the switch for the motor pump unit. The resetting mechanism includes a rotating reset cam which is spring loaded to drive the wheels to zero. It is held in the loaded condition by a pivotal latch interengaging a ratchet wheel which is held against rotation by a latch lever. A spring is connected to the latch lever and to a crank secured to rotate with the reset cam. An interfering double link or arm is mounted beneath the latch lever with one of the arms pivotally mounted in interfering relationship to the lever. The other arm is interconnected to a solenoid such that energization of the solenoid pivots the connected second arm and forces the first arm to pivot from the interfering engagement to release the latch lever which pivots as a result of the spring connected thereto. This permits the wheels to be reset and simultaneously releases the final control lever to permit turning on of the motor pump unit.

This invention relates to a remote electrically controlled dispenser and particularly to an electrically responsive reset mechanism for resetting of a computer on a gasoline dispensing pump or the like.

Generally, gasoline and the like petroleum products are sold at retail through service stations having several dispensers or pumps for each of the available grades of gasoline or the like. Each of the dispensers includes a computer driven in response to the discharge of gasoline to record the volume and the dollar amount for each individual delivery. Highly satisfactory systems have been devised for insuring that the computer mechanism is always reset to zero at the start of any given delivery in order to insure that a customer is not fraudulently or inadvertently charged for more than the gasoline actually received. For example, a highly satisfactory system is shown in U.S. Patents 2,874,874 and 2,874,875 which issued Feb. 24, 1959, to N. Markoff in which the dispenser start mechanism requires manual actuation of a pair of levers or the like provided on the exterior of the dispenser. As more fully disclosed therein, a resetting cam in combination with an interlocking ratchet wheel is provided for actuating the mechanism whereby the operator first actuates a trip lever to place the motor start mechanism in a position or state for final start operation and resets the counter wheels to a zero or reference position and then rotates a crank through 90° to start the motor. An interlock is provided which prevents closing of the switch until after the wheels have been reset to zero. Further, the second lever cannot be actuated as long as the first lever has not been tripped to release the computer mechanism and interengage the resetting system. The resetting mechanism includes a spring loaded cam which is loaded during the turnoff cycle to condition the device for resetting of the computer.

The present invention is particularly directed to an improved means permitting remote actuation of the reset mechanism to permit control of a plurality of pumps from a single central control station. For example, a service

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station could have a large number of dispensing pumps controlled in accordance with the present invention from a central station. Whenever gasoline were to be dispensed, the dispenser operator contacts the central station and requests a release of that particular pump. The remote operator triggers a release control to reset the particular dispenser after which the operator actually starts the dispenser by actuation of a lever at the dispenser, dispenses the desired quantity and then returns the spring loaded cam of the computer through returning of the lever to the initial position. Although remote control systems utilizing motors and control switches have been suggested to achieve the desired result, the present invention is directed to a very simple and reliable means to trigger the resetting mechanism.

Generally, in accordance with the present invention, a resiliently loaded trip means is provided and connected to the mechanism to initially release the reset and starting mechanism. The trip means is loaded by the resetting of the dispenser to the off or standby condition. The trip means is released by an electrical, pneumatic or similar control unit which is remotely actuated from the central station. This system thus insures that the dispenser has been previously placed in a position or state for resetting of the computer. If this interlock is not provided, the dispenser operator, fraudulently or accidentally, might dispense gasoline without resetting of the computer and thereby overcharge a customer.

In a preferred construction, a latch lever within the dispenser holds the computer resetting mechanism in standby. The lever is resiliently loaded and biased to a released position by a spring means which is loaded during the reset or turnoff action of the dispenser control by the operator. A solenoid operated mechanism is coupled to the latch lever to hold the lever in the standby position against the force of the loaded spring. To reset the computer, the remotely located operator actuates a switch to energize the solenoid which disengages the mechanism from the latch lever and releases the energy in the loaded spring which trips the latch lever. Thereafter, the resetting mechanism operates under its own spring force to effect the actual resetting condition. The operator then turns the dispenser on in the normal manner.

The present invention provides a relatively simple and reliable means for remote actuation of dispensers and the like and thus provides a practical remote control for retail gasoline service stations and the like.

The drawing furnished herewith illustrates an embodiment of the invention incorporating the above advantages and features as well as others which will be clear from the following description.

In the drawing:

FIG. 1 is an elevational diagrammatic view of a gasoline dispensing service station with a dispenser pictorially shown with parts broken away;

FIG. 2 is an enlarged side elevational view of a computer illustrating the interlock mechanism incorporating the improvement of the present invention; and

FIG. 3 is a view similar to FIG. 2 showing the tripped position of the interlock mechanism of the present invention.

Referring to the drawings and particularly to FIG. 1, the present invention is shown forming a part of a usual gasoline dispensing service station which includes a central office or building 1 and a plurality of dispensing pumps 2, of which only one is shown. Generally, a substantial number of dispensing pumps 2 are employed, with a number of pumps for each of the various grades of gasoline available. Each of the dispensing pumps includes an outer decorative enclosure or shell 3 within which a well known electrically operated flow pumping and metering unit 4 is provided. A computer 5 is mounted within the shell

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3 above the pumping and metering unit 4 and is operatively coupled thereto as by a suitable gear system, not shown. Computer 5 includes a set of counter wheels 6 which record the volume being dispensed and a set of money wheels 7 which simultaneously record the value or cost of the volume shown by the quantity wheels. An interlocking mechanism shown in FIGS. 2 and 3, is provided to interconnect a reset operating mechanism for wheels 6 and 7 to the switch operating mechanism for unit 4 such that the mechanism must be released before the unit 4 can be started.

In accordance with the present invention, the mechanism for resetting of the wheels 6 and 7 to zero and for starting of the motor unit 4 is actuated by an electrically controlled system presently described through a control line 8 extending from the related pump 2 to a control panel 9 in the building 1. Panel 9 includes a plurality of push button switches 10, one for each pump 2. The pump 2 includes a start crank 11 which is rotatably mounted to the outer side of the wheel and coupled through suitable shafts to the interlocking mechanism 12 shown in FIGS. 2 and 3 and controlled by a solenoid 13 which in turn is controlled by push button switches 10.

In the operation of the system, an attendant at the pump makes a call to an operator in building 1 through any suitable communication system such as a push-button ringing system, a verbal communication system or the like, for release of the corresponding mechanism 12. The operator actuates the appropriate push button switch 10 at the control panel 9 related to the corresponding dispenser or pump 2 from the panel 9. The solenoid 13 is thereby energized and releases the interlock mechanism 12 such that the wheels 6 and 7 automatically reset and the computer crank 11 may be rotated.

When the dispensing operation is completed the operator returns the computer crank 11 to the standby position to reset the locking mechanism 12 and turn off the motor-pump unit 4, generally as a result of the interlock described in the previously referred to patents and referred to hereinafter.

The present invention is particularly directed to the solenoid control and the linkage 14 interconnecting the solenoid to mechanism 12 to provide a simple and reliable means of controlling the operation of dispenser 2 from the panel 9. Consequently, the computer 5 and the part of resetting mechanism 12 which are described in greater detail in the previously referred to patents are only briefly described herein in sufficient detail to clearly illustrate the action of the remote control system of the present invention.

Generally, the illustrated computer is similar to that shown in U.S. Patent 2,874,874. In particular the interlock mechanism 12 generally includes an operating shaft 15 which is connected to the crank 11 for rotation thereby and carries a motor control cam 16. A ratchet wheel 17 is secured to the outer end of shaft 15 and includes a plurality of edge teeth selectively engageable with a latch pawl or lever 18 which is pivotally mounted adjacent the periphery of the ratchet wheel 17. In addition, as shown in the previously referred to Patent 2,874,874, a reset cam 19 is rotatably journaled on the crank shaft 15 with a spring 20 loading the reset cam 19 and continuously urging the cam 19 to a tripped position and holds the mechanism in the loaded position. A reset latch pawl 21 is pivotally mounted to the cam 19 and is spring loaded to bias one end into selective locking engagement with a cam edge portion of a deep reset notch 22 formed in the periphery of the ratchet wheel 17, during reset of the mechanism to the illustrated position. When a trip pawl 18a is rotated, it engages and releases pawl 21. The spring 20 turns the cam 19 in a clockwise direction as viewed in FIG. 2. The pawl 18 engages the end notch or tooth of the ratchet wheel 17 to hold the wheel in a standby position with the cam 19 in the original start or initial position and a motor-pump unit 4 de-energized. The cam

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19 actuates a suitable mechanism, not shown herein, to rotate the wheels 6 and 7 until the zero reading appears in the visual windows of the computer and further cams pawl or lever 18 from the locking position. At that time, a reset element, not shown, will releasably lock the wheels 6 and 7 in position and disengage the resetting mechanism.

The operator then turns the crank 11 through 90° which interconnects the quantity and amount wheels 6 and 7 to the metering system 3 such that all subsequent delivery is recorded by the wheels. Simultaneously, the ratchet wheel 17 and switch cam 16 are rotated with the crank shaft 15. Wheel 17 rotates with the notch 22 moving past pawl 21 to locate the notch 22 for reset of cam 19, as subsequently described. Cam 16 moves a switch follower 23 in the proper direction to close a switch unit 24 and turn on the pump unit 4, thereby permitting the dispensing of gasoline.

The cam 16 and switch unit 24, may be any suitable arrangement and may be otherwise coupled to the mechanism. A practical system employing a cam such as cam 16 is more fully disclosed and described in the copending application of S. Stsenko, entitled Dispensing Control Apparatus, which was filed on May 24, 1965 with Ser. No. 458,151 and is assigned to a common assignee.

In accordance with the illustrated embodiment of the present invention, the latch lever 18a is biased to an unlatched position by a coil spring 25 connected at one end to the latch lever, to the left of the pivot point, as shown in FIG. 2, and at the opposite end connected to a crank arm 26 rotatably mounted on the shaft 15 in common with the cam 19. A dash pot 27 is pivotally mounted to the computer housing as at 28 and is pinned or coupled to the crank 26 and to the cam 19 as at 29 to provide corresponding and simultaneous slow controlled movement thereof. The spring 25 thus normally biases the latch lever 18a to a release position with respect to the ratchet wheel 17 as shown in FIG. 3. The solenoid controlled latching linkage 14 holds the latch lever 18 into latching engagement with wheel 17 as follows.

The linkage 14 includes a first crank arm 30 pivotally secured to an armature 31 of the solenoid 13 and projecting laterally beneath the latch lever 18. The opposite end of the arm 30 is enlarged and defines a locking projection 32 aligned with the attachment pin 33 on the periphery of cam 19, to which the lower end of the cam loading spring 20 is secured. A lever arm 34 is pinned or otherwise pivotally connected to a central pivot point of crank arm 30 as by pin 35 and extends outwardly past the outer end 32 of the arm 30. The outermost end of the arm 34 is secured by a fixed pivot pin 36 to the computer housing. A spring 36a is wound about support 36 terminating under lever 34 and keeping the lever 34 in constant contact with pawl 18 unless forced away by the action of lever 30.

The inner end of the lever arm 34 immediately adjacent the lower end of latch lever 18a includes a detent 37 on its upper surface aligned with and engaged by a projecting lip 38 on the lower end of the latch lever or pawl. In the normal standby position of FIG. 2, the lip 38 is disposed in the latch position engaging detent 37 and the lever 18a is prevented from rotating under the force of the loaded spring 25. The lip 38 is however spaced rearwardly of the forward edge wall portion defining the detent to permit pivotal movement of the lever 18a without movement of the lip from within the detent, as presently described.

The solenoid 13 is of any suitable construction and includes a winding unit 39 suitably supported on the computer 5 with the armature 31 urged outwardly in any suitable manner, as by a spring 40. The armature 31 is mounted for rectilinear movement and is connected to the arm 34 in any suitable manner to permit limited translatory as well as rotatable movement of the arm with respect to armature 31, as by the pin and slot connection 41.

When the solenoid 13 is energized, the armature 31 is withdrawn pulling inwardly on the outer end of the arm 30. The opposite end of the arm 30 tends to move upwardly. However, after a very slight movement, the projection 32 moves into interference with the attachment pin 33 on cam 19. Consequently, the arm 30 then pivots about pin 33 and central portion including pin 35 moves downwardly. The arm 34 which is pivotally fixed at pin 36 pivots, clockwise in FIGS. 2 and 3, with the inner end moving downwardly to partially release the latch lever 18a for rotation within the detent 37. As a result, the power of the spring 25 is released and lever 18 is rotated to release wheel 17. The small projection of the latch lever 18a to which spring 25 is secured pivots upwardly to trip the reset pawl 21 and disengage the cam 19 from wheel 17. The cam 19 is now free to rotate under the force of its own spring 20 to effect the resetting action and also to turn the crank 26 to the position of FIG. 3. In this position, the spring 25 is in the released position with the lever 18a urged to the standby position of the smaller spring 37a, in accordance with the teaching of the previously identified Patent 2,874,874. Subsequently, the operator rotates the outer crank 11 of pump 2 to start the motor-pump unit 4 for dispensing of gasoline.

During the rotation of the cam 19 and the attached crank 26, the solenoid 13 is de-energized and the linkage 14 reset to the normal standby condition with the lowermost end of lever lip 38 engaging the forward wall of the detent 37 as shown in FIG. 3.

After dispensing of the desired quantity, the operator turns off the dispenser 2 in the normal manner by rotating the crank 11 to the initial starting position. This simultaneously causes rotation of the ratchet wheel 17, in a counterclockwise direction as viewed in FIG. 3, and, through the engagement of pawl 21 by the cam edge of slot 22, the cam 19 to also rotate in a counterclockwise direction and return to the initial starting position of FIG. 2. The rotation of the cam 19 to the position of FIG. 2 extends both of the springs 20 and 25 to again load the springs for a subsequent operation.

During the resetting movement, the latch lever 18a is forcibly reset to the standby position of FIG. 2 and locked therein by the linkage 14. The latch lever 18 engages the ratchet wheel 17 to prevent rotation thereof and consequently prevents rotation of the cam 19 under the force of the main spring 20.

The present invention thus provides a reliable electro-mechanical linkage for automatic reset of a computer on a gasoline pump to a zero reading from a remote location in a relatively simple and reliable manner. It can be employed directly as a part of a new computer or can be readily adapted and incorporated into presently existing computer mechanisms by merely removing of the manually operable trip lever and substituting therefor the solenoid and linkage of the present invention. The device therefore provides a highly practical answer to the remote control of service station dispensing units.

Various modes of carrying out the invention are contemplated as being within the scope of the following claims particularly pointing out and distinctly claiming the subject matter which is regarded as the invention.

We claim:

1. An electrically controlled dispenser including a resettable computer with releasable resiliently loaded means for automatic drive of a computer resetting mechanism and final control means at the dispenser for turning of the dispenser on and off and locking means coupling the resetting mechanism to the final control means to prevent operation of the final control means unless the computer

is reset by said computer resetting mechanism, comprising:

reset means for loading of the resiliently loaded means after a release of the latter and including a latch unit having hold position holding the loaded means in a position to drive the resetting mechanism and a spring means connected to said latch unit and connected to continuously urge the latch unit to a release position, the force of said spring means being removed by movement of said loaded means driving the resetting mechanism,

a latch linkage mounted within the computer and movably disposed in the release path of the latch unit, said linkage including a first arm pivotally interconnected centrally of a second arm and extending therefrom at an acute angle, said first arm being fixedly and pivotally mounted at the outer end and including a detent aligned with the latch unit and movable into the path of the latch unit, and

a solenoid connected to the second arm to hold the first arm in holding engagement with the latch unit to selectively hold the latch unit in a latching position and move the first arm from the release path to permit the latch unit to move to a release position and thereby reset the computer and condition the dispenser for product release.

2. An electrically controlled dispenser including a resettable computer and a resiliently loaded means for automatic driving of a computer resetting mechanism, said resiliently loaded means including a rotatable spring-loaded cam having a projection and a first latch member connected to the cam and engaging the reset mechanism for loading of the resiliently loaded means,

a crank rotatably mounted and having means for connection to the cam for simultaneous rotation,

a latch lever mounted to be moved into engagement with said latch member to release said resiliently loaded means,

a spring connected to the crank and to the latch lever to bias the latch lever to a release position, said spring being stressed during the resetting movement of the cam and the crank,

a control solenoid having an armature,

a first arm pivotally secured to the armature and projecting laterally beneath the latch lever and terminating in an offset projection disposed adjacent the projection of the cam,

a second arm pivotally secured to the first arm and projecting outwardly beneath the latch lever and beyond the offset projection, said second arm having a latch portion releasably engaging the latch lever to hold the lever in the latching position,

a fixed pivot secured to the outer end of the second arm, and

a remotely located control means for electrically energizing the solenoid to pivot the armature into interfering engagement with the cam and thereby causing the second arm to pivot from the latch lever whereby the computer resets and sets the dispenser for product release.

References Cited

UNITED STATES PATENTS

2,814,444	11/1957	Bliss	235—94
3,033,421	5/1962	Henderson	222—76 X
3,072,292	1/1962	Haupt et al.	222—33

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