Nov. 9, 1965 E. C. AMBLER ETAL 3,216,659

RESETTING CONTROL MECHANISM FOR COUNTING DEVICE

Filed Dec. 6, 1963 6 Sheets-Sheet 1

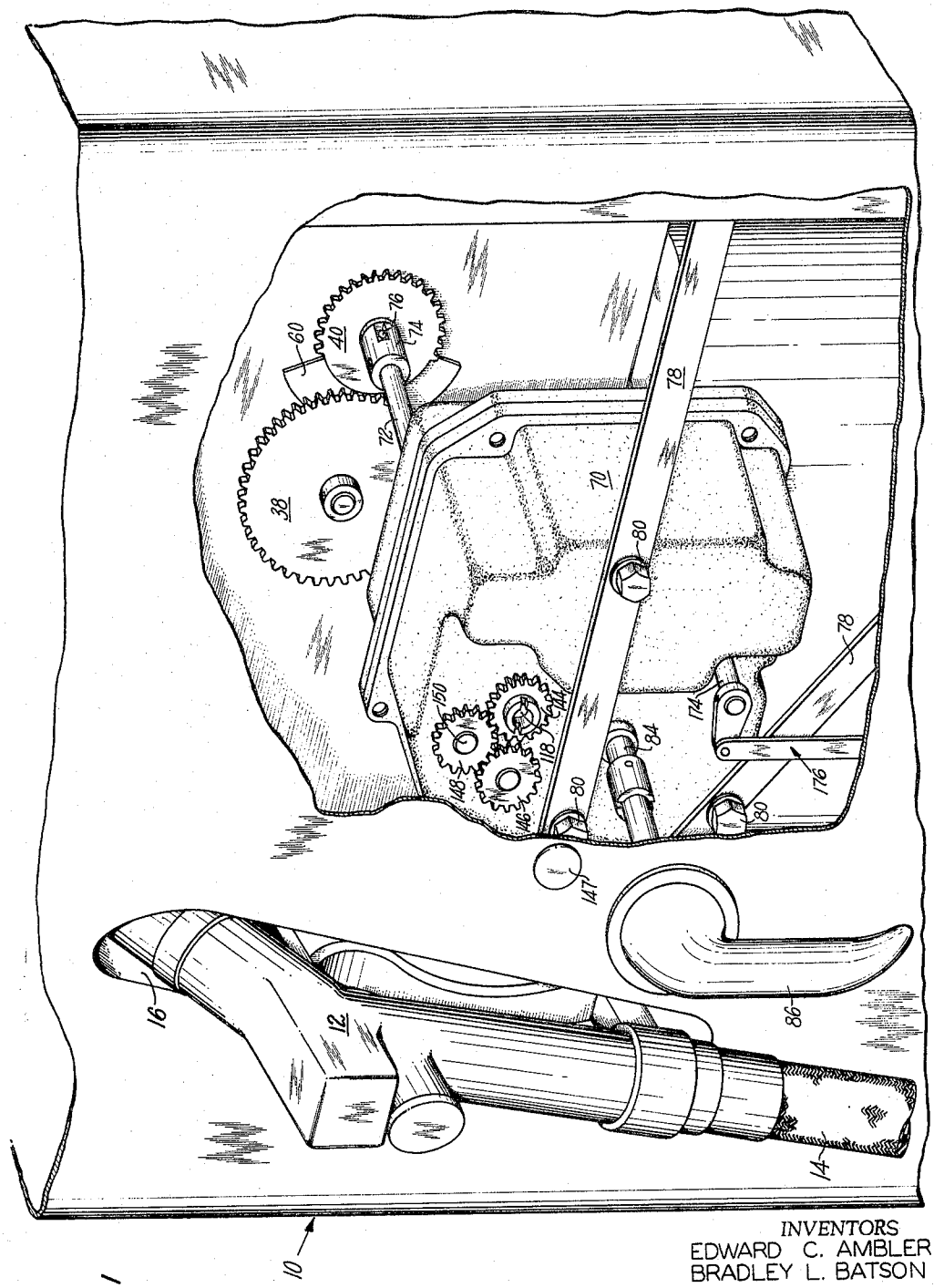


FIG. 1

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Filed Dec. 6, 1963 6 Sheets-Sheet 2

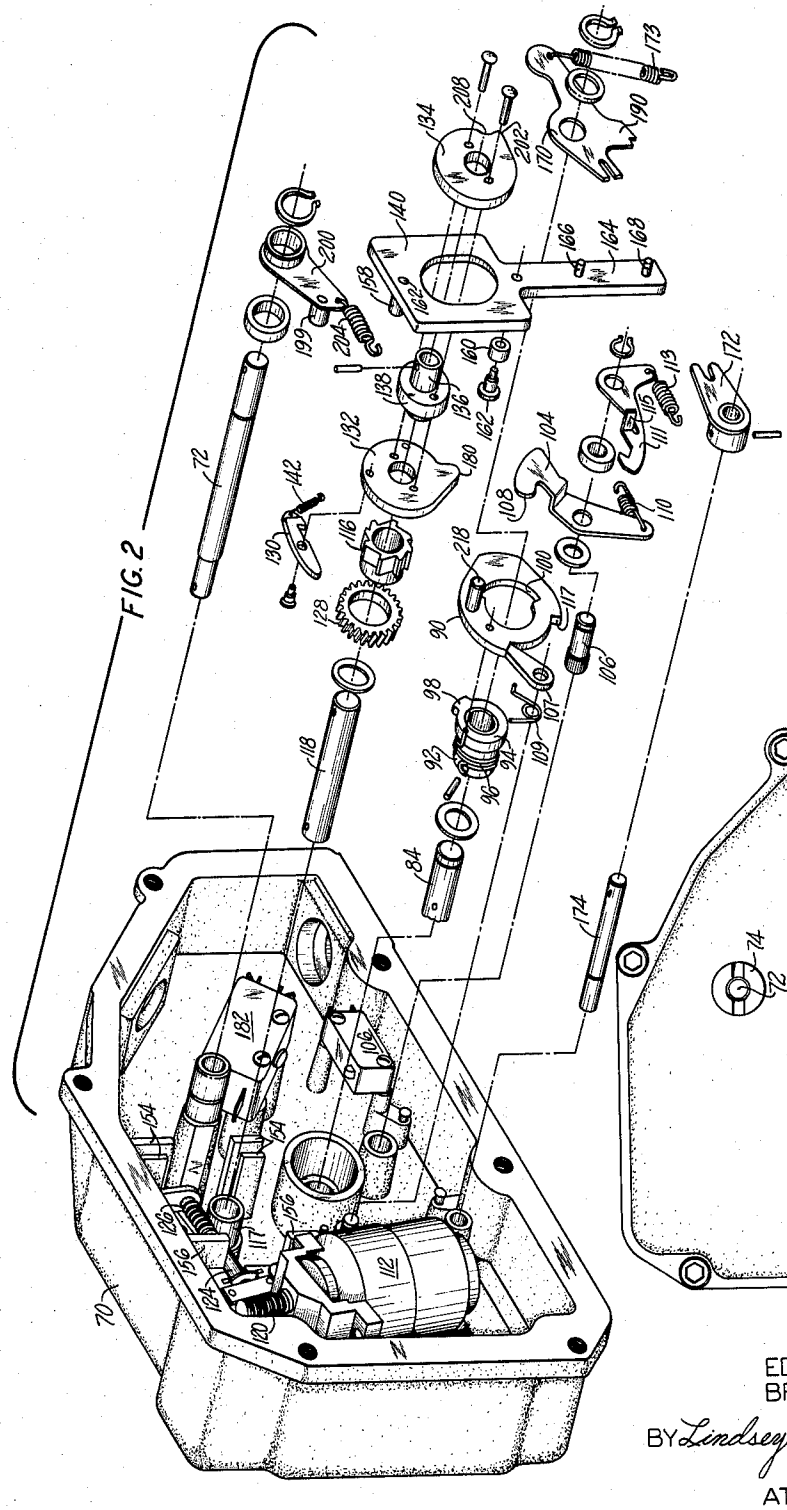


FIG. 2

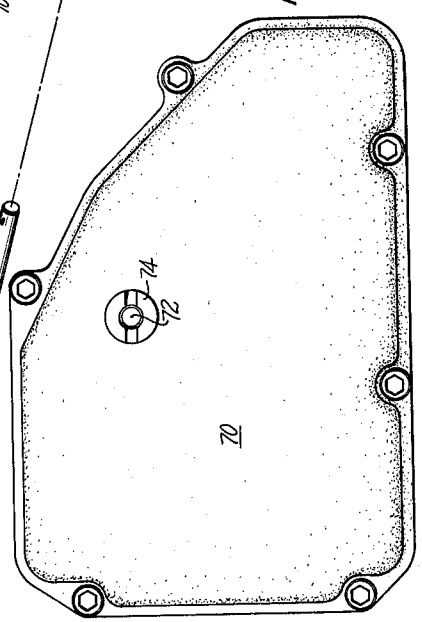


FIG. 3

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RESETTING CONTROL MECHANISM FOR COUNTING DEVICE

Filed Dec. 6, 1963 6 Sheets-Sheet 3

FIG. 4

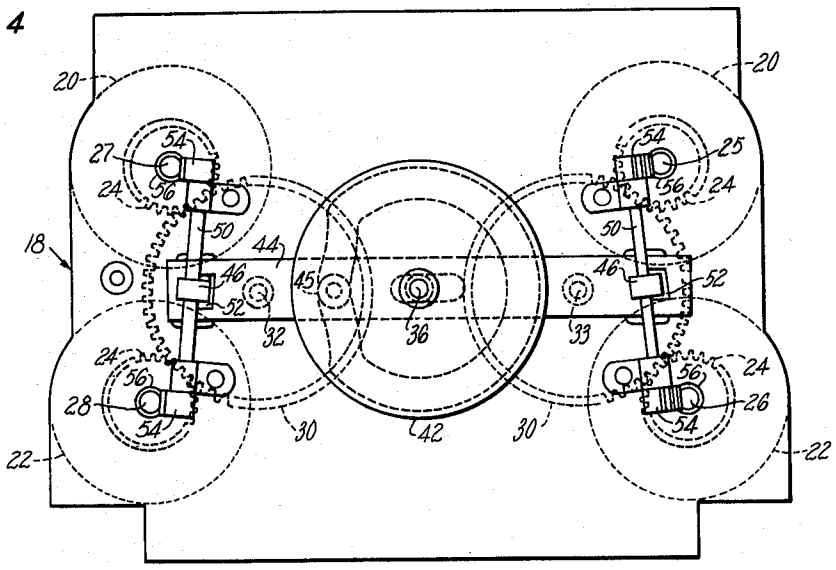
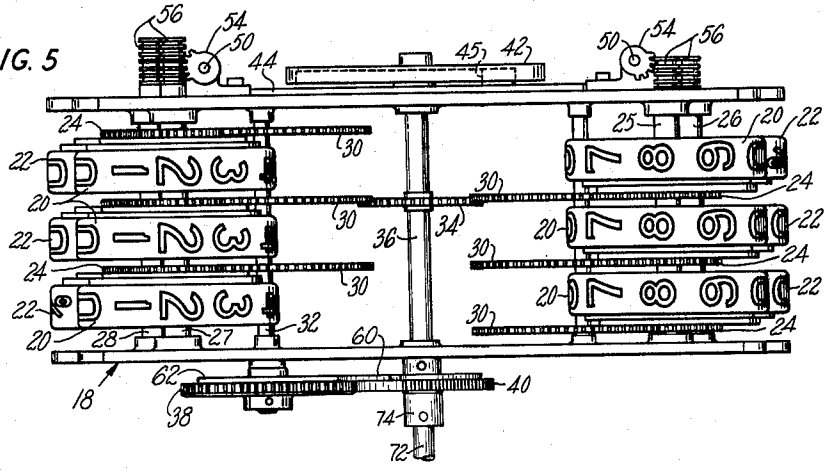


FIG. 5



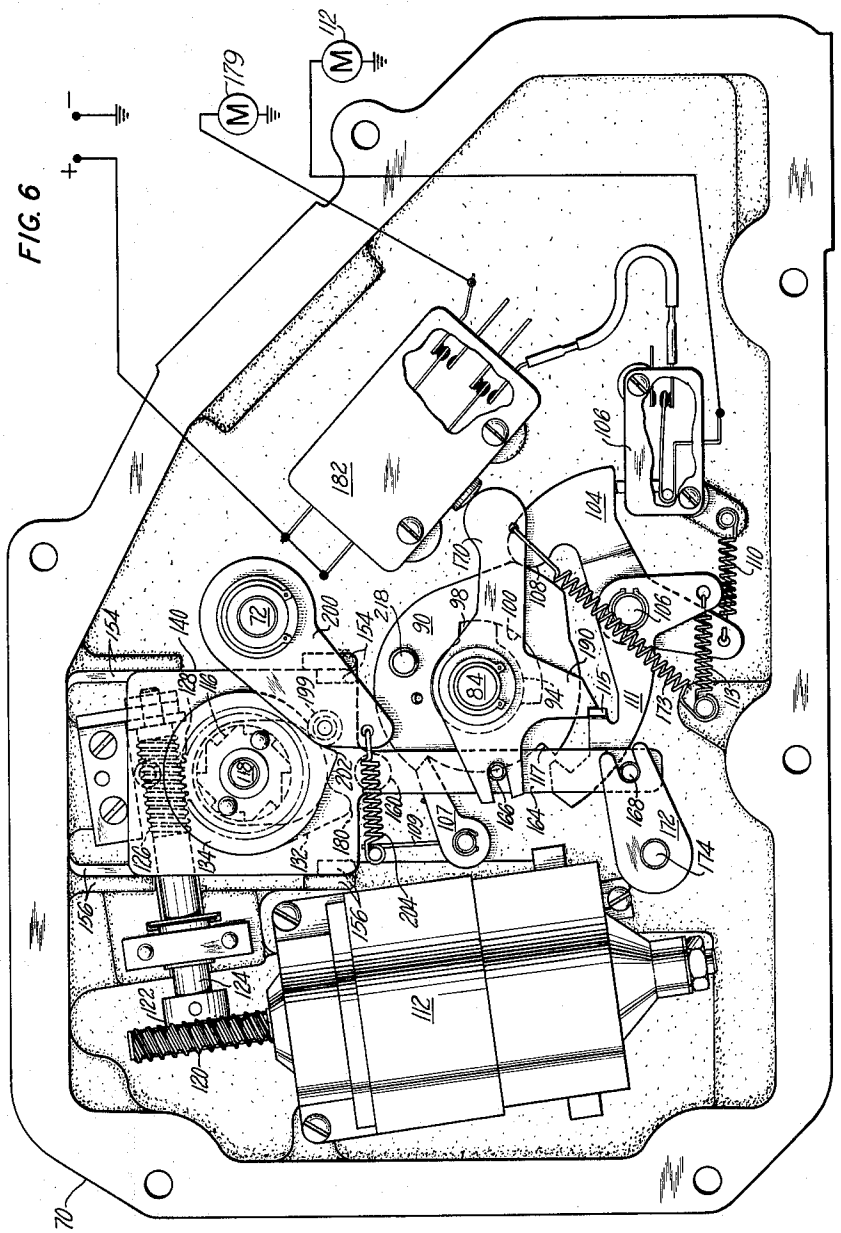
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RESETTING CONTROL MECHANISM FOR COUNTING DEVICE

Filed Dec. 6, 1963 6 Sheets-Sheet 4

FIG. 6



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RESETTING CONTROL MECHANISM FOR COUNTING DEVICE

Filed Dec. 6, 1963 6 Sheets-Sheet 5

FIG. 9

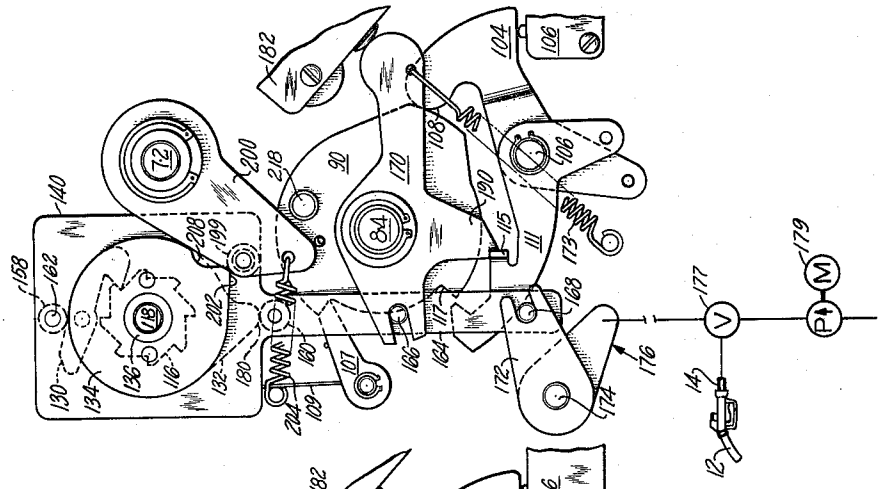


FIG. 8

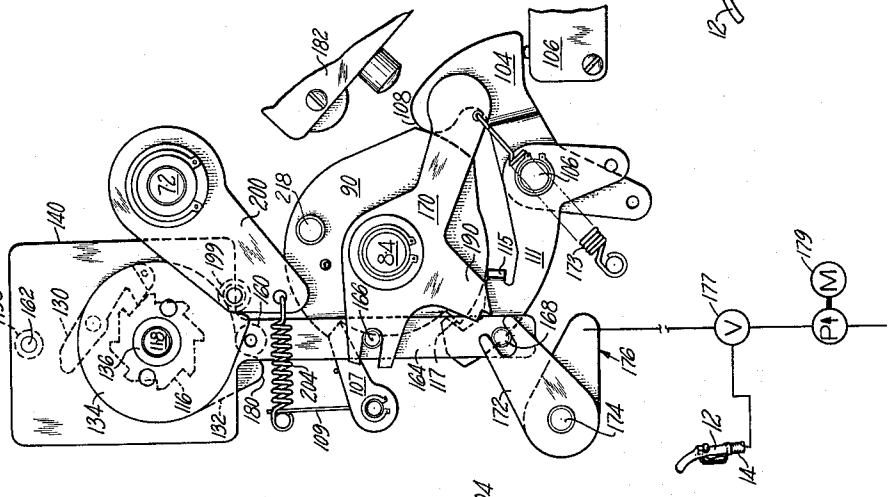
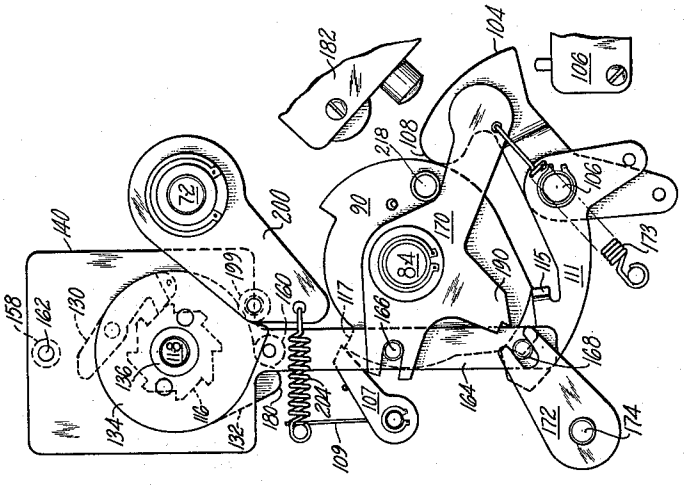


FIG. 7



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RESETTING CONTROL MECHANISM FOR COUNTING DEVICE

Filed Dec. 6, 1963 6 Sheets-Sheet 6

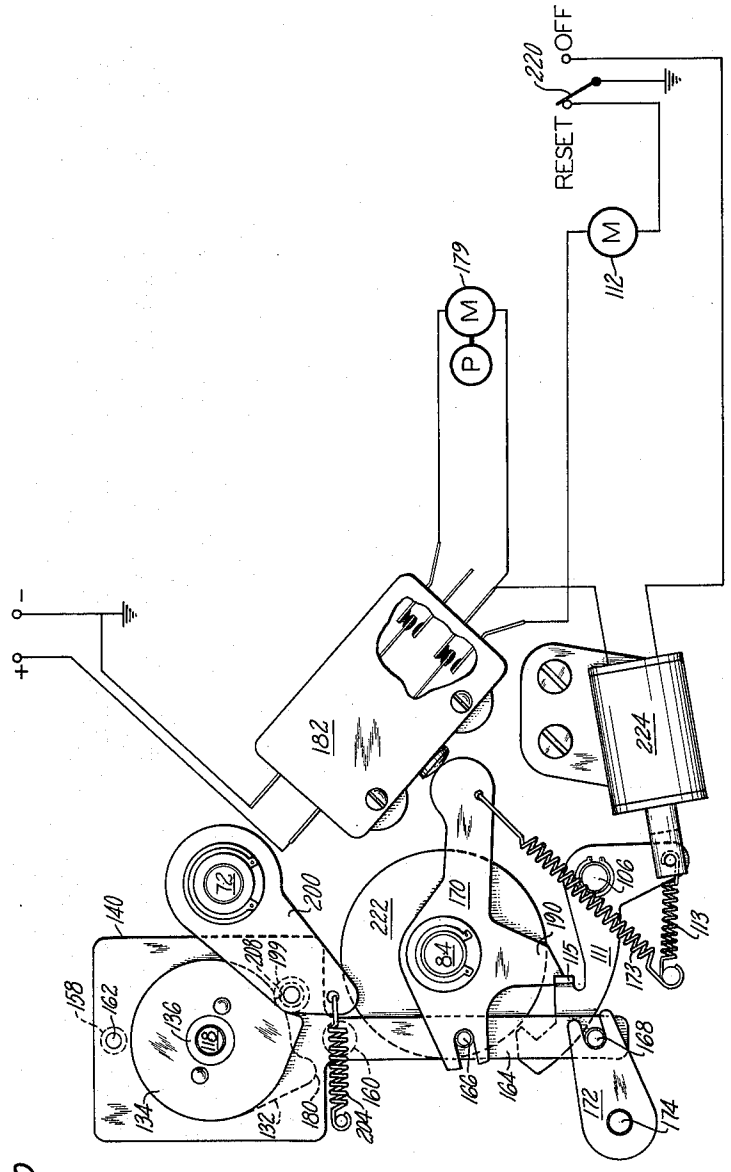


FIG. 10

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United States Patent Office 3,216,659 Patented Nov. 9, 1965

3,216,659

RESETTING CONTROL MECHANISM FOR COUNTING DEVICE

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Filed Dec. 6, 1963, Ser. No. 328,638
21 Claims. (Cl. 235—144)

The present invention relates generally to the resetting of counting devices and is more specifically concerned with a resetting control mechanism having particular utility in connection with counters or registers designed for registering the volume and/or cost of a dispensed liquid, as for example, the conventional volume and cost registers utilized in connection with the dispensing of gasoline.

It is a principal aim of the present invention to provide a new and improved resetting control mechanism particularly useful with and which may be conveniently installed in a typical gasoline pump or dispensing apparatus and which is adapted for automatically conditioning the apparatus for the dispensing of fuel only after the register has been reset. The present invention contemplates a control mechanism whose operation may be initiated manually either by a mechanical linkage or with minimum modification by an electrical switch.

Another aim of the present invention is to provide a novel resetting control mechanism of the type described which is adaptable for use in conventional dispensing apparatus without special modification of the apparatus, which may be easily installed and removed for faciliating initial installation and subsequent servicing and which is therefore designed for immediate acceptance by dispensing apparatus manufacturers.

It is another aim of the present invention to provide a new and improved resetting control mechanism of improved reliability and performance and which is economically constructed with a minimum number of parts operable within minimum space requirements.

It is a further aim of the present invention to provide a compact resetting control mechanism which provides for improved operation for alternately conditioning a register or other counting device for a resetting function and which assures that the apparatus with which the register is associated remains deactivated until the resetting function is complete. After the register has been reset the mechanism automatically activates the associated apparatus and upon subsequent deactivation of the apparatus either through a mechanical linkage or electrical circuitry, the apparatus may not be reactivated until the register is again reset.

It is a further aim of the present invention to provide an improved counter resetting control mechanism whose operation is initiated manually to place a dispensing apparatus in an "off" or deactivated condition, which is operable for resetting the counter and after the resetting is complete to automatically place the dispensing apparatus in an "on" or active condition, and which can be manually operated for placing the apparatus in an "off" condition only after the resetting is completed.

It is another aim of the present invention to provide an improved resetting control mechanism for registers or the like which has a resetting drive shaft that can be driven in either rotational direction in accordance with the particular installation of the mechanism, and which allows for manual resetting as where the automatic features of the control mechanism are inoperative due, for example, to a failure in the electrical power supply to the 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 fragmentary perspective view, partly broken away, of a gasoline dispensing apparatus incorporating an embodiment of a resetting control mechanism of the present invention;

FIG. 2 is a partial perspective view, partly exploded, of the resetting control mechanism;

FIG. 3 is a side elevational view of the housing of the resetting control mechanism;

FIG. 4 is a side elevational view of a register of the dispensing apparatus;

FIG. 5 is a top plan view, partly broken away, of the register;

FIG. 6 is an enlarged side elevational view of the resetting control mechanism with the housing cover removed, showing the principal operating parts in one operative position and additionally showing diagrammatically an electrical control circuit used in connection with the control mechanism;

FIG. 7 is an enlarged partial side elevational view, partly broken away, showing the principal operating parts in another operative position;

FIGS. 8 and 9 are partial side elevational views similar to FIG. 7 showing the principal operating parts in two other operative positions and further showing diagrammatically the fluid system of the dispensing apparatus; and

FIG. 10 is a partial side elevational view similar to FIGS. 7–9 of a modified resetting control mechanism, further showing diagrammatically an embodiment of an electrical control circuit used in connection therewith.

Referring now to the drawings in more detail, wherein like numerals represent like parts, there is shown in FIG. 1 a fragmentary view of an apparatus generally denoted by the numeral **10** conventionally useful for the dispensing and registering of volume and cost of gasoline, and which in a well-known manner is provided with a manually operable dispensing nozzle **12** on the end of a gasoline delivery hose **14**. As seen in FIG. 1, the nozzle **12** is adapted for storage in a recess or receptacle **16** when the dispensing apparatus is not in use. The dispensing apparatus is provided with a volume and cost register, generally denoted by the numeral **18** (FIGS. 4 and 5), having two pairs of cost and volume counters **20**, **22**, respectively, which may be viewed through windows (not shown) on the front and back faces of the dispensing apparatus housing.

As shown, the register **18** is generally of the type disclosed in United States Patent No. 2,814,444 on an invention of Harvey N. Bliss entitled "Register" and will therefore not be described in detail here. Generally, however, the register number wheels are independently released from their normal counter drive mechanism and are drivingly connected to coaxially mounted reset gears **24** by axial displacement of the wheel supporting shafts **25–28**. The wheels are then reset by gears **30** fixed to shafts **32**, **33** which shafts are operatively connected by an idler gear **34** freely mounted on a shaft **36** hereinafter termed for convenience a main reset shaft. For coordinating the wheel disengagement with resetting, the shaft **32** is operatively connected to the main reset shaft **36** by an intermittent drive mechanism including a gear **38** fixed to the shaft **32** and a gear sector **40** fixed for rotation with the main reset shaft **36**. For reference purposes the intermittent drive mechanism is more fully described and claimed in the copending application of Otto Wild, Jr., Serial Number 142,905, filed October 4, 1961, and en-

titled "Resetting Mechanism for Counters", now United States Patent No. 3,142,442, dated July 28, 1964.

For axially shifting the wheel supporting shafts **25–28**, the main reset shaft **36** is provided with a cam **42** for reciprocating a slide **44** having a cam follower **45**, the cam and slide being shown in FIG. 4 in their rest position. The reciprocable movement of the slide **44** is translated into reciprocable movement of the wheel supporting shafts **25–28** by pawls **46** fixed to intermediate shafts **50** and extending through an opening **52** in the slide, and a gear sector **54** meshing with a series of circumferential teeth **56** formed on the protruding ends of the wheel supporting shafts. A locking disc segment **60** formed integrally with the gear sector **40** cooperates with a locking plate **62** formed integrally with the gear **38** to lock the resetting gears **30** against rotation until the wheel supporting shafts have been axially shifted to release or disengage the wheels from their normal drive at which point the gear sector **40** engages the gears **38** to reset the register, it being understood that the functions of wheel disengagement, wheel resetting and wheel re-engagement are completed by revolving the main reset shaft **36** through a control cycle of one complete revolution. The reset shaft **36** thereby operates as a rotary controller for alternately conditioning the register wheels for a registering operation and a resetting operation and additionally for resetting the register wheels.

In accordance with the present invention, the main reset shaft **36** is adapted for being selectively rotated one complete revolution for selectively resetting the register **18**. This is accomplished by the resetting control mechanism which is preferably entirely enclosed within an explosion-proof housing **70** having an output or reset drive shaft **72**. The reset drive shaft **72** is drivingly connected to the main reset shaft **36** by a coupling **74** having a bifurcated end which receives a transverse pin **76** fixed to the main reset shaft **36**. The reset control mechanism housing is mounted within the dispensing apparatus housing as by a bracket **78** and fasteners **80** threaded to the housing **70** and is thereby secured for rapid installation or removal.

As seen in FIG. 1, a control shaft **84** extending through the housing **70** is connected to a manually operable handle **86** by a coupling **88** similar to the coupling **74**. In a usual manner, the control handle **86** is shown mounted adjacent the useful nozzle receptacle **16** and in this arrangement must be in the vertical or "off" position, shown in FIG. 1, when the nozzle is received in the receptacle, and is angularly displaced, in the clockwise direction as seen in FIG. 1, when the nozzle is removed for conditioning the dispensing apparatus for resetting of the register and subsequent dispensing of gasoline.

Referring now to FIGS. 2 and 6–9, the control shaft **84** is connected for driving a reset control cam **90** through a sleeve **92** fixed onto the shaft **84**, a drive pawl **94** fixed onto the sleeve **92** and a torsion spring **96** interconnecting the sleeve and control cam. The pawl **94** is of generally cylindrical shape for rotatably mounting the cam **90** and has a radial extension **98** received within a sector opening **100** in the cam **90** whereby the cam has an angular freedom of movement with respect to the pawl **94** of approximately **90** degrees although the torsion spring normally maintains the cam **90** in engagement with the pawl **94** as seen in FIG. 6.

A reset switch actuating lever **104** is pivotally mounted on a pin **106** press-fit within the housing **70** and has a rounded extension **108** in engagement with the reset cam **90**, which engagement is maintained by a tension coil spring **110**. The lever **104** acts as a switch operator for an electrical reset switch **106** when the lever **104** is pivoted against the bias of the spring **110** by the control cam **90**, the switch **106** being electrically connected for energizing the electrical reset motor **112** secured within the explosion-proof housing **70**. Accordingly, angular movement of the control handle **86** angularly shifts the control cam **90** from the "off" position shown in FIG. 7 to the "on" position shown in FIG. 8 to pivot the reset lever **104** for actuating the switch **106** and thereby energize the electrical motor **112**. A pivotally mounted stop pawl **107** provides for limiting the forward angular movement of the control cam **90**, counterclockwise as seen in FIGS. 6–9, for which purpose it is maintained in engagement with the reset cam by a torsion spring **109**. A reverse latch **111** is pivotally mounted on the pin **106** and has an axially extending tab **115** providing a cam follower biased into engagement with the control cam **90** by a tension coil spring **113**. With the control cam **90** in its "on" position in engagement with the stop pawl **107**, the latch **111** is free to pivot, clockwise as seen in FIG. 8, and thereby catch the control cam **90** through engagement with the cam shoulder **117** whereby the control cam **90** is locked against reverse angular displacement.

A speed reducer operably connects the electrical motor **112** with a ratchet **116** freely mounted on an internal housing hub **117** by means of a worm gear **120** and worm wheel **122**, a shaft **124**, a worm gear **126**, and a worm wheel **128** fixed upon a hub of the ratchet wheel **116**. The ratchet wheel **116** is in turn adapted to drive an intermediate shaft **118** through a ratchet pawl **130** pivotally mounted on a reset control or timing cam **132**. The cam **132** and a similar cam **134** are secured to the shaft **118** through an intermediate bushing **136** pinned to the shaft and having a central annular spacer **138** which additionally provides a bearing for a reciprocable sequencing link or slide **140**. The ratchet pawl **130** is normally maintained in operative engagement with the ratchet wheel **116** by a tension coil spring **142** connected to the pawl and to the cam **132** and in such operative position drivingly connects the electrical reset motor **112** with the intermediate shaft **118**.

Referring to FIG. 1, the intermediate shaft **118** is connected to the reset drive shaft **72** by a pair of spur gears **144**, **146** and an intermediate idler gear **148**, the idler gear **148** being rotatably mounted on a stub shaft **150** press-fit within the side of the housing **70**. Accordingly, the electrical reset motor **112** is adapted to drive the reset drive shaft **72**, counterclockwise as seen in FIG. 1, to provide for resetting the register **18**. Where desirable the reset drive shaft **72** may be driven in the opposite rotational direction, as where register resetting is effected in that direction, by elimination of the idler gear **148** and by replacing the spur gears **144**, **146** with spur gears (not shown) of suitable size. Additionally, as where there is an electrical failure within the resetting control mechanism, resetting may be manually performed with a screwdriver, for which purpose the hub of the spur gear **144** is slotted and the housing of the dispensing apparatus is provided with a removable plug **147**, it being understood that during manual reset the one-way ratchet drive is automatically disengaged.

The slide **140** is supported for reciprocable movement within the housing **70** by parallel flanges **154**, **156** formed integrally with the housing and supports a pair of diametrically opposed rollers **158**, **160** by a pair of pins **162** staked to the slide. The roller **160** provides a cam follower adapted for engagement with the cam **132** whereby upon angular rotation of the cam, clockwise as seen in FIGS. 6–9, the slide is displaced from the position shown in FIG. 7 to the position shown in FIG. 9. The slide has an extension **164** with integral pins **166**, **168** that are received within slots formed respectively, in a pump motor operating lever **170** and a valve operating lever **172**. The pump operating lever **170** is freely mounted for rotation on the manual control shaft **84** whereas the valve operating lever **172** is secured to a valve control shaft **174** which is rotatably supported for extension through the side of the housing and having suitable linkage **176** external of the housing for operating a fluid valve **177** (FIGS. 8 and 9) for opening

the fuel line to the delivery hose **14**, as where a single fuel pump is used for more than one fuel delivery nozzle. A tension coil spring **173** is connected to the pump operating lever **170** to urge it clockwise as seen in FIGS. 6–9 and thereby to bias the slide **140** to its withdrawn position, shown in FIGS. 7 and 8, in which position the valve **177** is closed and the pump operating lever is in its "off" position.

Accordingly, the electrical reset motor **112** operates to rotate the cams **132**, **134** from their rest position, shown in FIG. 7, in conjunction with the operation of the reset drive shaft **72**, and after the resetting function has been completed during approximately the first 330 degrees of angular travel of the intermediate shaft **118** a lobe **180** on the cam **132** operates through the follower **160** to displace the slide **140** against the bias of the tension spring **173**, whereupon a double pole double throw switch **182** is actuated by the pump control lever **170**, as best seen in FIG. 9, to energize the fuel pump motor **179** (FIGS. 8 and 9) and to de-energize the reset motor. At the same time the valve control lever **172** is operated to open the valve **177** for delivering fuel to the nozzle **12**. Where desired, however, the valve operating mechanism could be replaced by a solenoid (not shown) controlled by the switch **182** in conjunction with the control of the pump motor **179**.

As the pump operating lever **170** is pivoted, counterclockwise as seen in FIGS. 6–9, to energize the pump motor a radial extension **190** of the lever engages the latch follower **115** and thereby operates to release the control cam by pivoting the latch **111** against the bias of the tension spring **113** with the result that the mechanism is conditioned for manual shut-off by the handle **86**. As further seen in FIG. 9, when the slide **140** reaches its fully extended position, the pump operating lever **170** is pivoted to a position where a slotted corner of the lever extension **190** receives the follower **115** whereby the follower **115** provides a detent or latch for retaining the lever **170** and the slide **140** in their extended positions against the bias of the tension spring **173**.

With the slide **140** fully extended, as shown in FIG. 9, the roller **158** thereon is substantially in engagement with a cylindrical portion of the cam **132** and as a result is located in the path of travel of the outer end of the ratchet pawl **130**. The ratchet pawl **130** is preferably positioned so that it engages the roller **158** to disengage or declutch the ratchet drive a few degrees past the position where the cam **132** has fully extended the slide **140** thereby terminating the mechanical drive between the electrical reset motor **112** and the intermediate shaft **118** after the slide has been fully extended. As the electrical reset motor **112** has thereby been de-energized by the switch **182** at a position a few degrees prior to the disengagement of the ratchet drive, the inertia or coasting of the electrical reset motor and the ratchet wheel drive mechanism is relied upon to carry the cam **132** and therefore the ratchet pawl **130** from the angular position where the electrical reset motor is de-energized to the angular position where the ratchet drive is disengaged. After the ratchet drive is disengaged, the intermediate shaft **118** and the cams **132**, **134** are revolved a few degrees further to their rest position, shown in FIG. 6, by their own inertia and by the angular force presented on the cam **134** through a detent follower **199** rotatably mounted on a detent pawl **200**, for which purpose the cam **134** is provided with a cam lobe **202** for pivoting the detent pawl **200** outwardly against the bias of a tension coil spring **204** and an adjacent recess **208** (FIG. 9) for receiving the follower **199** when the cam **134** is in its rest position. Accordingly, for each resetting cycle, the cams **132**, **134** are angularly displaced one complete revolution and the reset drive shaft **72** is similarly displaced one complete revolution for fully resetting the register.

In the usual manner, with the fuel pump motor "on" and the valve **177** open, fuel can be delivered with the delivery nozzle **12** and the register is suitably driven to indicate the volume and cost of the delivered fuel. When the delivery is complete and prior to restoring the nozzle **12** to the receptacle **16**, the manual control handle **86** must be revolved, counterclockwise as seen in FIG. 1, which results in clockwise rotation of the reset control cam **90**, as seen in FIGS. 6–9. This clockwise motion of the reset control cam **90** provides for pivotal withdrawal of the reset switch operating lever **104** by the spring **110** to break the circuit through the reset switch **106** and for subsequently releasing the pump operating lever **170** through the engagement of the cam lobe with the follower **115**, thereby enabling the slide **140** to return to its withdrawn position under the bias of the tension spring **173** to fully deactivate the dispensing apparatus. The return of the slide **140** to its fully withdrawn position is assisted by a stop pin **218** mounted on the reset control cam **90** which pin also provides for limiting the angular freedom of movement of the control cam **90**. As should be understood, the dispensing apparatus is not again activated by the return of the slide to its extended position until after a subsequent resetting of the register has been completed.

For a subsequent fuel delivery, the control handle **86** is revolved to its position shown in FIG. 1 to initiate another resetting cycle, or where desirable, between deliveries and without restoring the fuel nozzle to the receptacle **16**, the register may be conveniently reset merely by cycling the manual control handle **86**.

Referring to FIG. 10, the reset control mechanism of the present invention can be readily modified to provide remote control of the reset as by a single pole double throw switch **220** having a "reset" or "on" position and an "off" position. Such remote control is useful as where the register is located remotely from the pumping station for which purpose the manual control handle **86** and the coupling **88** can be eliminated, and the reset control cam **90** can be conveniently replaced by a conventional washer **222**. Although the latch **111** therefore no longer functions as a reset control cam latch, it nevertheless still functions to latch the pump operating lever **170**. In this embodiment the latch **111** is actuated for releasing the lever **170** and slide **140** by an electrical solenoid **224** which may be conveniently mounted within the explosion-proof housing **70** substantially in the position of the removed reset switch **106**. As can be seen upon reference to the circuitry diagrammatically shown in FIG. 10, the control switch **220** in its "reset" or "on" position provides for energizing the reset motor **112** and thereby provides for resetting the register **18** and subsequently actuating the slide **140** to its extended position for operating the switch **182**. The switch **182** thereby de-energizes the reset motor **112** and energizes the pump motor **179**, with the valve **177** being opened by the slide **140** as in the embodiment of FIGS. 6–9.

After a fuel delivery is completed, the pump motor **179** can be de-energized merely by moving the switch **220** to its "off" position. The solenoid **224** is thereby energized to release the latch **111** with the result that the slide **140** is returned to its withdrawn position under the bias of the spring **173**. This operates to de-energize the pump motor **179** and to concomitantly de-energize the solenoid **224**.

Thus it can be seen that the resetting control mechanism of the present invention provides for resetting the register of the dispensing apparatus while maintaining the fuel valve closed and the fuel pump de-energized, and for activating the dispensing apparatus only after the resetting cycle is completed. These functions are provided with a highly reliable mechanism which can be economically manufactured with a minimum number of parts. Moreover, the control mechanism of the present invention is adapted for mechanical control as through a manually operable handle or for electrical control by a switch which may be located remotely from the register.

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.

We claim:

1. In combination with a counter having a plurality of number wheels and a resetting control element operable for conditioning the number wheels alternately for a registering operation and a resetting operation, a resetting control mechanism comprising, a reset motor, transmission means including a disengageable clutch operably connecting the reset motor and resetting control element, a sequencing slide reciprocable between a retracted position and an extended position, means for automatically actuating the sequencing slide to its extended position after predetermined operation of the control element, means operable with the sequencing slide in its extended position only for disengaging the clutch, means operable with the sequenching slide in its extended position only for deactivating the reset motor, and manually operable means for alternatively activating the reset motor and returning the slide to its retracted position.

2. The resetting control mechanism of claim 1 wherein the manually operable means comprises a latch for automatically retaining the sequencing slide in its extended position, spring means for biasing the slide to its retracted position, a switch operable for activating the reset motor, and manual control means for alternatively releasing the latch and operating the switch.

3. The resetting control mechanism of claim 1 wherein the manually operable means comprises a latch for automatically retaining the slide in its extended position, spring means for biasing the sequencing slide to its retracted position, electromagnetic means for releasing the latch, and manually operable switch means for alternatively activating the electromagnetic means and energizing the reset motor.

4. In combination with a counter having a plurality of number wheels and a rotatable resetting control element operable for conditioning the number wheels alternately for a registering operation and a resetting operation, a resetting control mechanism comprising, an electrical reset motor, transmission means including a disengageable clutch operably connecting the reset motor and control element, a rotatable control cam operably connected for rotation with the control element, a sequencing slide reciprocable between a retracted position and an extended position, said slide having a cam follower engageable by the control cam for actuating the slide to its extended position after predetermined rotary movement of the control element, a latch for retaining the slide in its extended position, said disengageable clutch comprising a rotary ratchet drive wheel and a ratchet pawl pivotally mounted for operative engagement with the ratchet wheel, means operable with the slide in its extended position only for pivoting the ratchet pawl out of operative engagement with the ratchet wheel, and manually operable means for alternatively energizing the reset motor and releasing the latch.

5. The resetting control mechanism of claim 6 wherein the manually operable means comprises electromagnetic means for releasing the latch, and manually operable switch means for alternatively energizing the electromagnetic means and energizing the reset motor.

6. In combination with a fluid dispensing apparatus having a fluid pump, a fluid valve for controlling the dispensing of fluid, and a counting mechanism with a plurality of number wheels and a resetting control element operable through a control cycle for conditioning the number wheels alternately for a registering operation and a resetting operation, a resetting control mechanism comprising an electrical reset motor, means operably connecting the reset motor and control element, a sequencing slide reciprocable between a retracted position and an extended position, means actuating the slide to its extended position after predetermined operation of the control element in its control cycle, latch means for retaining the slide in its extended position, spring means for returning the slide to its retracted position upon release of the latch means, means connected to the slide operable with the slide in its extended position only for activating the fluid pump and opening the fluid valve, and manually operable means for releasing the latch and energizing the electrical reset motor.

7. In a fluid dispensing apparatus having a fluid pump, a resettable register operable in conjunction with the dispensing of fluid, and a resetting control element operable for conditioning the register alternately for a registering operation and a resetting operation, a resetting control mechanism for selectively operating the control element and fluid pump comprising, an electrical reset motor for operating the control element, a rotary control cam manually operable between an OFF position and an ON position, a latch for retaining the control cam in its ON position, a first switch operable for energizing the reset motor, a first level operable by the control cam in its ON position for operating the first switch, a second switch operable for de-energizing the reset motor and for activating the fluid pump, a second switch lever pivotal from a deactive position to an active position operating said second switch, said second lever having means for releasing the latch retention of the control cam upon pivotal movement to its active position, said latch having means for retaining the second lever in its active position, and means for pivoting the second lever to its active position after predetermined operation of the control element, said control cam being oriented for releasing the latch retention of the second lever upon movement to its OFF position.

8. In an apparatus operable for dispensing fluid having a resettable register operable in conjunction with the dispensing of fluid and a resetting control element operable for conditioning the register alternately for a registering operation and a resetting operation, and with the apparatus being deactivated during the resetting operation, a resetting control mechanism comprising an electrical reset motor for operating the control element, a first switch operable for energizing the reset motor, a second switch operable for de-energizing the reset motor and activating the fluid dispensing apparatus, a rotatable control cam manually operable between an OFF position and an ON position, said control cam in its ON position operating the first switch, a latch for retaining the control cam in its ON position, a switch lever pivotal from an inactive position to an active position operating said second switch, said switch lever having means for releasing the latch upon pivotal movement to its active position, and means for pivoting the switch lever to its active position after predetermined operation of the control element.

9. In an apparatus operable for dispensing fluid having a resettable register operable in conjunction with the dispensing of fluid, a resetting control element operable for conditioning the register alternately for a registering operation and for a resetting operation, and with the apparatus being deactivated during the resetting operation, a resetting control mechanism comprising, an electrical reset motor for operating the control element, a first switch operable for energizing the reset motor, a rotatable control cam manually operable between an OFF position and an ON position operating the first switch, pivotally mounted latching means for retaining the cam in its ON position, a second switch operable for de-energizing the reset motor and activating the fluid dispensing apparatus, a switch lever pivotally mounted coaxially with the control cam for movement from an inactive position to an active position operating said second switch, said lever having means for releasing the retention of the control cam upon pivotal movement to its active position, said latching means adapted for retaining the lever in its active position, and means for actuating the lever to its active posi-

tion after predetermined operation of the control element, said control cam being oriented for releasing the retention of the second lever upon movement to its OFF position.

10. In an apparatus having a resettable counting device and a resetting element operable through a cycle for resetting the counting device and wherein the apparatus is deactivated during the resetting of the counting device, a resetting control mechanism comprising an electrical reset motor, transmission means operably connecting the reset motor and resetting element, a reset switch operable for energizing the reset motor, a manually operable control cam rotatable between an OFF position and an ON position operating the reset switch, a control switch operable for activating the apparatus and for de-energizing the reset motor, a sequencing link reciprocable between a retracted position and an extended position, means operable with the sequencing link in the extended position only for automatically operating the control switch, latching means for retaining the control cam in its ON position until the sequencing link is moved to its extended position and for retaining the sequencing link in its extended position until the control cam is operated to its OFF position, and means connected for operation with the resetting element for actuating the sequencing link to its extended position after predetermined operation of the resetting element.

11. In an apparatus having a resettable counting device and a resetting element operable through a cycle for resetting the counting device and wherein the apparatus is deactivated during the resetting of the counting device, a resetting control mechanism comprising an electrical reset motor, transmission means operably connecting the reset motor and resetting element, a reset switch operable for energizing the reset motor, a manually operable control cam rotatable between an OFF position and a reset switch operating position, a sequencing link reciprocable between a retracted position and an extended position, means operable with the sequencing link in the extended position only for automatically activating the apparatus, latching means for retaining the control cam in its reset switch operating position until the sequencing link is actuated to its extended position and retaining the sequencing link in its extended position until the control cam is rotated to its OFF position, and means connected for operation with the resetting element for actuating the sequencing link to its extended position after predetermined operation of the resetting element.

12. In an apparatus having a resettable counting device and a rotary resetting element operable through one revolution for resetting the counting device and wherein the apparatus is deactivated during the resetting of the counting device, a resetting control mechanism comprising an electrical reset motor, transmission means operably connecting the reset motor and resetting element, a manually operable control cam rotatable between ON and OFF positions, a reset switch operable by the control cam in its ON position for energizing the reset motor, a control lever pivotal between an inactive position and an apparatus activating position, a slide reciprocable between a retracted position and an extended position, said slide being operably connected to the control lever for pivoting the control lever to its activating position upon movement to its extended position, latching means for retaining the control cam in its ON position until the control lever is moved to its activating position and retaining the control lever in its activating position until the control cam is roated to its OFF position, means connected for operation with the resetting element adapted for actuating the slide to its extended position after predetermined rotary movement of less than a complete revolution of the resetting element, and means for automatically limiting the rotary movement of the resetting element to one complete revolution.

13. The resetting control mechanism of claim **12** wherein the transmission means includes a disengageable clutch and wherein the means for automatically limiting the rotary movement of the resetting element to one complete revolution includes means on the slide operable with the slide in its extended position for disengaging the clutch and a detent mechanism comprising a rotary detent cam operably connected to the resetting element and having a cam lobe and an adjacent cam recess, a pivotal detent follower in engagement with the detent cam, and spring means biasing the detent follower against the detent cam.

14. In a fluid dispensing apparatus having a resettable counting device and a resetting element operable for resetting the counting device and wherein the dispensing apparatus is deactivated during the resetting of the counting device, a resetting control mechanism comprising a rotary timing cam operably connected with the resetting element, an electrical reset motor; transmission means operably connecting the reset motor and resetting element including a ratchet wheel, and a ratchet pawl pivotally mounted on the timing cam for operative engagement with the ratchet wheel, a slide reciprocable between a retracted position and an extended position, spring means biasing the slide to its retracted position, said slide having a first roller providing a cam follower engageable by the timing cam for actuating the slide to its extended position after predetermined angular movement of the resetting element, said slide having a second roller operable with the slide in its extended position to pivot the ratchet pawl out of operative engagement with the drive ratchet for disengaging the drive between the reset motor and resetting element, latch means for retaining the slide in its extended position, means operable by the slide in its extended position for activating the fluid dispensing apparatus, and manually operable means for alternatively energizing the reset motor and disengaging the latch means.

15. In a fluid dispensing apparatus having a resettable counting device and a rotary resetting element operable for resetting the counting device, a resetting control mechanism comprising an enclosed housing, a resetting drive shaft rotatably mounted in the housing with both ends extending externally thereof, one end of said drive shaft being adapted for operative connection with the rotary resetting element, an intermediate shaft rotatably mounted in the housing having one end extending externally of the housing adjacent to the other end of said drive shaft, an electrical reset motor within the housing, transmission means with the housing operably connecting the reset motor and intermediate shaft including a one-way clutch for driving the intermediate shaft in one rotational direction, replaceable gear means exterior of the housing operably connecting said other end of the drive shaft and said one end of the intermediate shaft, said replaceable gear means including an idler gear for driving the drive shaft in one rotational direction and being replaceable for driving the drive shaft in the opposite rotational direction, and control means within the housing for energizing the reset motor and for terminating the operation of the intermediate shaft after predetermined rotary operation thereof.

16. In combination with a counter having a plurality of number wheels and a resetting control element operable for conditioning the number wheels alternately for a registering operation and a resetting operation, a resetting control mechanism comprising, a reset motor, transmission means including a disengageable clutch operably connecting the reset motor and resetting control element, a slide reciprocable between a retracted position and an extended position, means for actuating the slide to its extended position after predetermined operation of the control element, means operable with the slide in its extended position for disengaging the clutch, and manually operable means for alternatively activating the reset motor and returning the slide to its retracted position, said manually operable means comprising a latch for automatically retaining the slide in its extended position, a switch operable for activating the reset motor, and manual control means for alternatively releasing the latch and

operating the switch, said manual control means comprising a rotatable control cam, a manually operable handle connected for operating the control cam and a lever for operating the switch, the control cam, latch and lever being oriented whereby the latch is released by the cam in one angular position thereof and the lever is actuated by the cam to operate the switch in another angular position thereof.

17. In combination with a counter having a plurality of number wheels and a rotatable resetting control element operable for conditioning the number wheels alternately for a registering operation and a resetting operation, a resetting control mechanism comprising an electrical reset motor, transmission means operably connecting the reset motor and control element, a rotatable control cam operably connected for rotation with the control element, a sequencing link operable between a retracted position and an extended position, said sequencing link having a cam follower engageable by the control cam for actuating the sequencing link to its extended position after predetermined rotary movement of the control element, means operable with the sequencing link in its extended position only for automatically terminating the operation of the control element, releasable retaining means for retaining the sequencing link in its extended position, and manually operable means for alternatively energizing the reset motor and for releasing the retaining means.

18. In combination with a counter having a plurality of number wheels and a rotatable resetting control element operable for conditioning the number wheels alternately for a registering operation and a resetting operation, a resetting control mechanism comprising, an electrical reset motor, transmission means including a disengageable clutch operably connecting the reset motor and control element, a rotatable control cam operably connected for rotation with the control element, a slide reciprocable between a retracted position and an extended position, said slide having a cam follower engageable by the control cam for actuating the slide to its extended position after predetermined rotary movement of the control element, a latch for retaining the slide in its extended position, said disengageable clutch comprising a rotary ratchet drive wheel and a ratchet pawl pivotally mounted for operative engagement with the ratchet wheel, means operable with the slide in its extended position for pivoting the ratchet pawl out of operative engagement with the ratchet wheel, and manually operable means for alternatively energizing the reset motor and releasing the latch, said manually operable means comprising a second rotatable control cam, means for manually operating said second control cam, a switch operable for energizing the reset motor, and a lever for operating the switch, the second control cam, latch and lever being oriented whereby the latch is released by the second control cam in one angular position thereof and the lever is actuated by the came to operate the switch in another angular position thereof.

19. In combination with an apparatus having a counting mechanism with a plurality of number wheels and a resetting control element operable for conditioning the number wheels alternately for a registering operation and a resetting operation, and with the apparatus being deactivated during the resetting operation, a resetting control mechanism comprising a sequencing link operable between a retracted position and an extended position, spring means biasing the sequencing link to its retracted position, means actuating the sequencing link to its extended position after predetermined operation of the control element, means operable with the sequencing link in its extended position only for deactivating the control element, latch means for retaining the sequencing link in its extended position, means operable with the sequencing link in its extended position only for activating the apparatus, and manually operable means for releasing the latch means.

20. In combination with a fluid dispensing apparatus having a fluid pump and a counting mechanism with a plurality of number wheels and a resetting control element operable through a control cycle for conditioning the number wheels alternately for a registering operation and a resetting operation, a resetting control mechanism comprising an electrical reset motor, means operably connecting the reset motor and control element, a sequencing link operable between a retracted position and an extended position, means actuating the sequencing link to its extended position after predetermined operation of the control element in its control cycle, latch means for retaining the sequencing link in its extended position, means for returning the sequencing link to its retracted position upon release of the latch, means connected to the sequencing link operable with the sequencing link in its extended position only for automatically activating the fluid pump, and manually operable means for releasing the latch and energizing the electrical reset motor.

21. In combination with a fluid dispensing apparatus having a fluid pump, a fluid valve for controlling the dispensing of fluid, and a counting mechanism with a plurality of number wheels and a resetting control element operable through a control cycle for conditioning the number wheels alternately for a registering operation and a resetting operation, a resetting control mechanism comprising an electrical reset motor, means operably connecting the reset motor and control element, a slide reciprocable between a retracted position and an extended position, means actuating the slide to its extended position after predetermined operation of the control element in its control cycle, latch means for retaining the slide in its extended position, means for returning the slide to its retracted position upon release of the latch, means operable with the slide in its extended position for activating the fluid pump and opening the fluid valve, and manually operable means for releasing the latch and energizing the electrical reset motor, said manually operable means comprising a manually operable rotatable cam, a switch for the reset motor, and means operable by the cam in one angular position thereof for actuating the switch, said cam in another angular position adapted for disengaging said latch means.

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