Oct. 26, 1965 R. E. DAVIS 3,214,763

DATA RECORDER

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FIG. 1

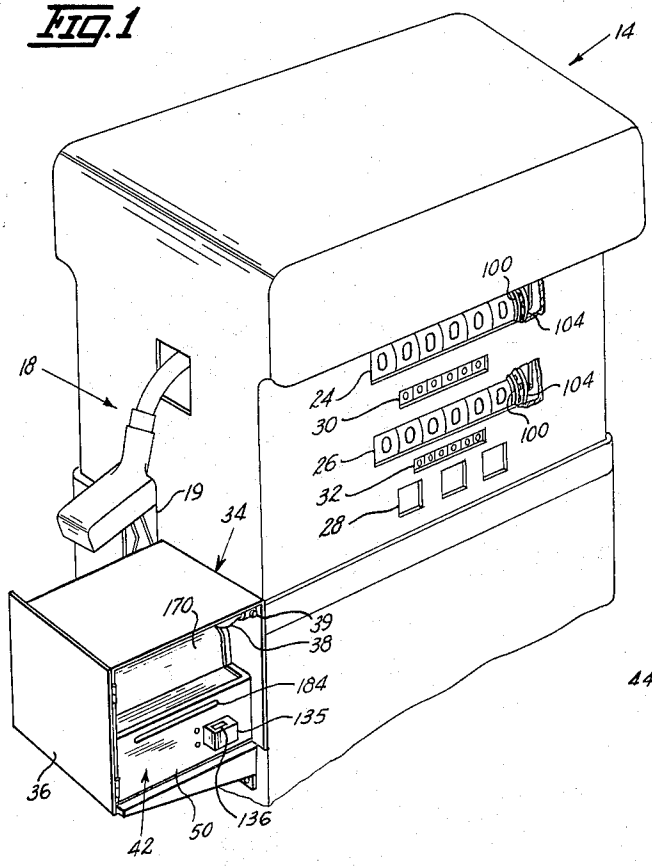


FIG. 2

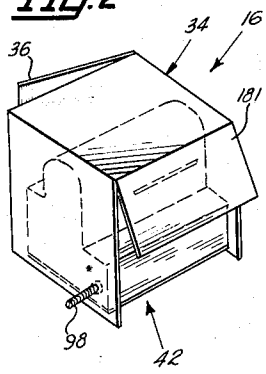


FIG. 3

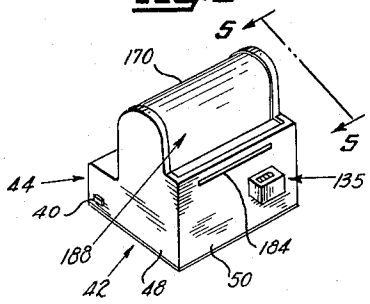


FIG. 8

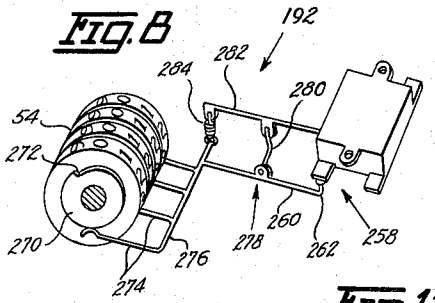


FIG. 10

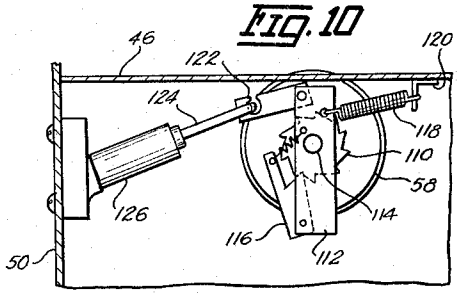
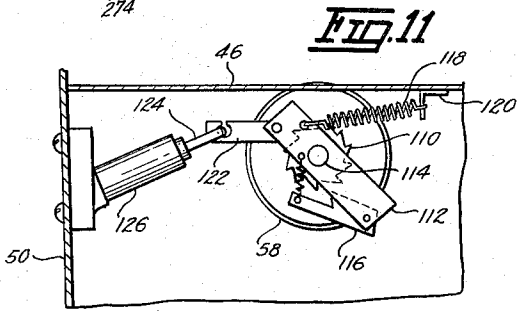


FIG. 11



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FIG. 4

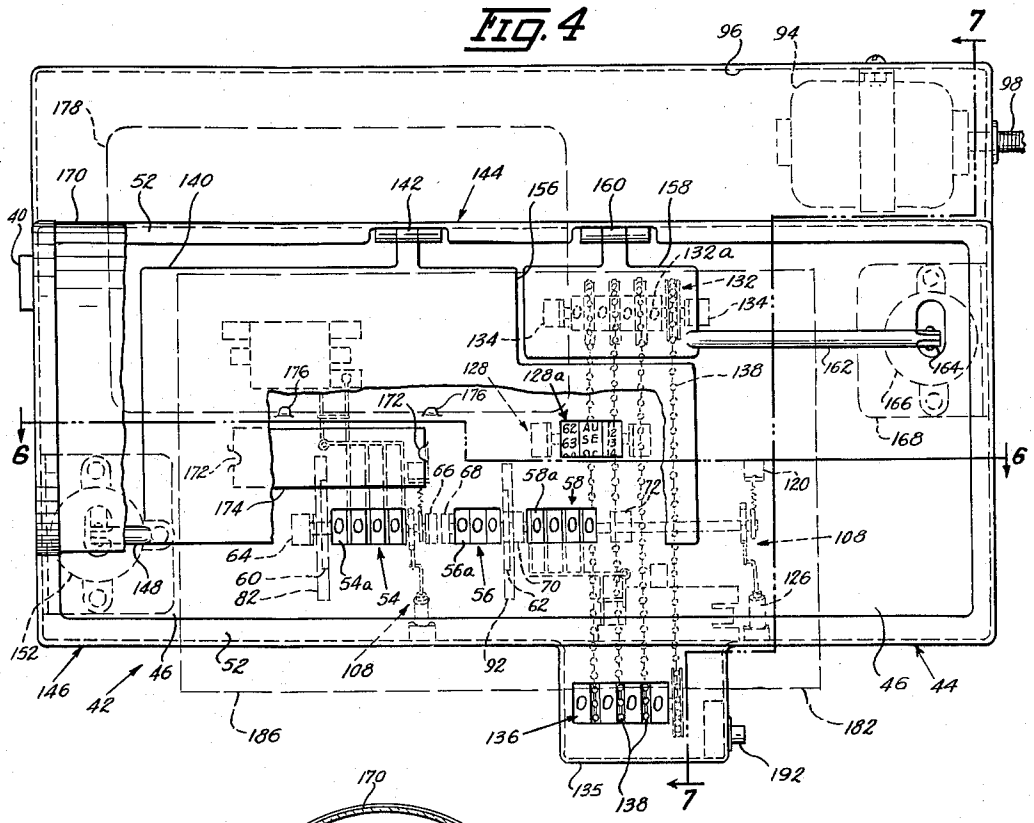
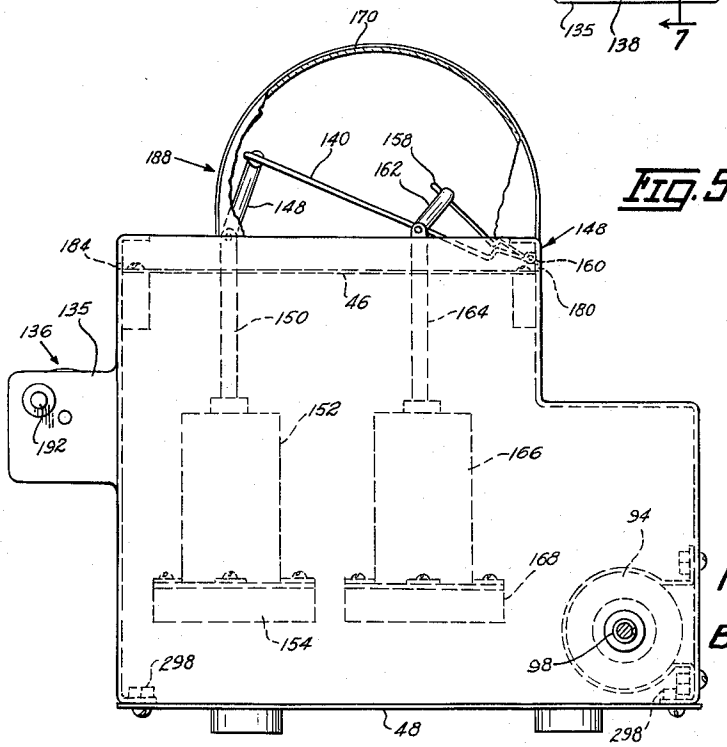


FIG. 5



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FIG. 6

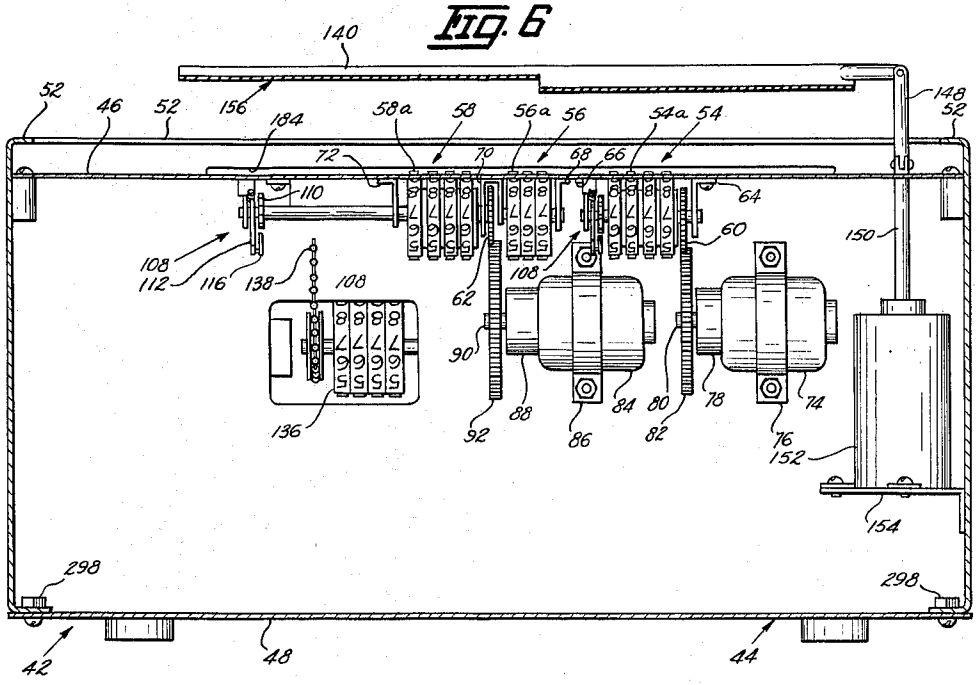


FIG. 9

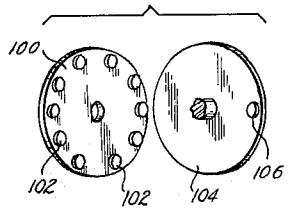
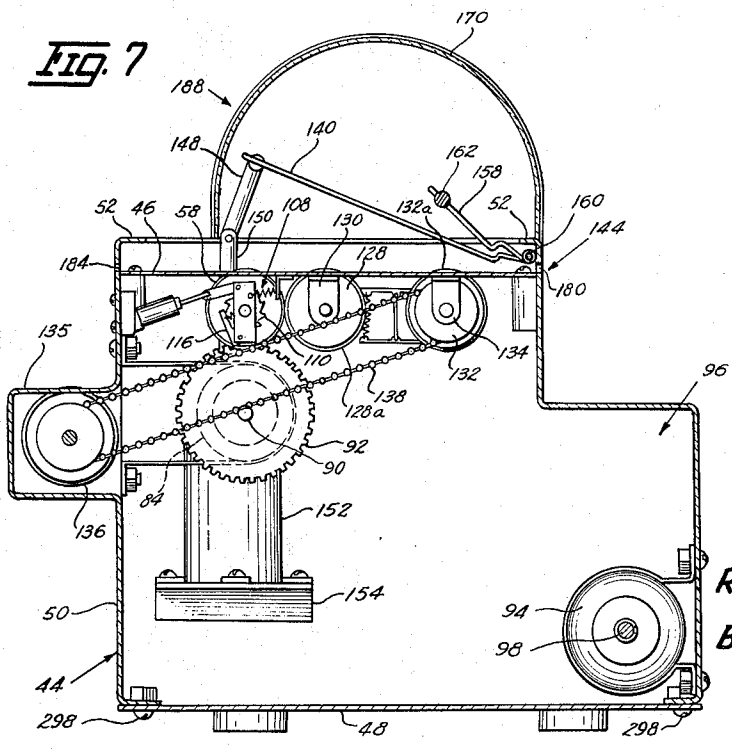


FIG. 7



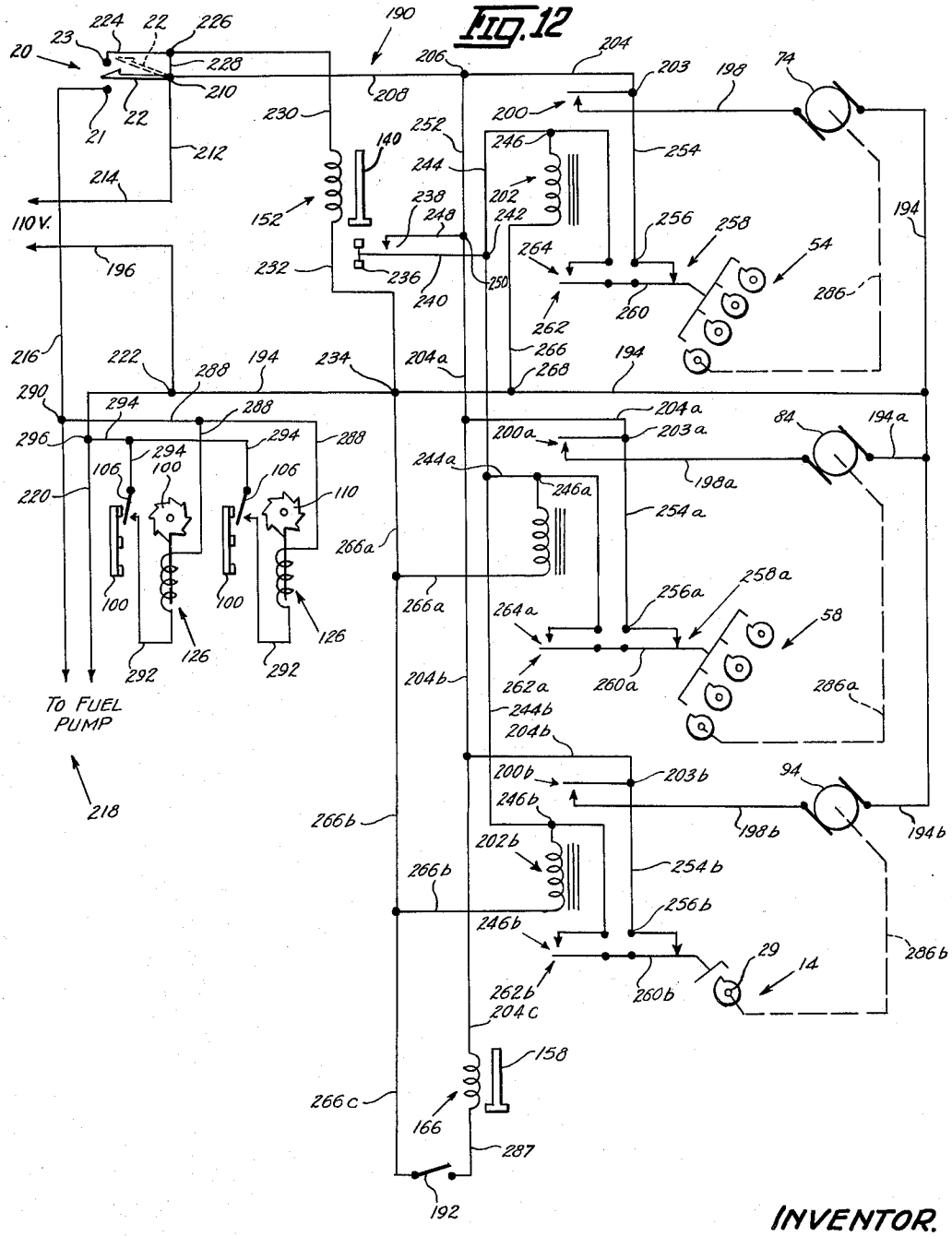
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FIG. 12



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3,214,763

DATA RECORDER

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Filed Mar. 28, 1962, Ser. No. 183,131
8 Claims. (Cl. 346—43)

This invention relates to a novel apparatus for recording and making a permanent record of credit or cash sales, and in its preferred embodiment, as will be described in detail, it is particularly designed for adaptation to presently used fuel or gas pumps as used by filling stations, garages, docks and the like. It is also contemplated that it may be employed on fuel tank trucks and in other comparable situations where a permanent and accurate record of fuel dispensed or received is required or desired. This invention is also a continuation-in-part of my co-pending applications under the same title, respectively filed April 6, 1961, and June 30, 1961, and assigned the respective Serial Nos. 101,228 and 121,245.

The term "fuel pump" as used herein refers to the usual pump apparatus from which fuel tanks of vehicles are filled at a filling station, which are known in the trade as gas pumps, and to pumping apparatus for delivering fuel from a tank truck to a storage tank in a filling station, or elsewhere as the nature of the fuel and the situation may indicate.

Fuel pumps as presently used are provided with certain odometer-like devices for registering the monetary value of fuel pumped and the quantity thereof, and one set of such devices provides the designated information for each sale while another set maintains a permanent continuing and cumulative total of such information. The devices for registering the per sale data are synchronized with a reset mechanism manually operated by the attendant prior to each new sale so that such devices will be at zero readings for successive sales. In this respect most fuel pumps in use have an automatic locking apparatus preventing further dispensing of fuel once the nozzle has been replaced on its cradle until the reset mechanism is operated, although it is possible and has happened, that such automatic locking apparatus is at times ineffective if not in proper working order.

The registering devices indicated above provide only a visual record and all data on the individual sale resettable registering devices is of course lost once the reset mechanism has been operated, except as it may have been written on a credit sales slip. From the standpoint of a filling station owner, it might appear that the continuous registering device would furnish an accurate check of fuel dispensed relative to total fuel on hand and received during a given period, but experience has demonstrated quite clearly that too frequently such records do not balance and that sizeable quantities of fuel paid for are unaccountably missing from what should have been available for sale.

Whatever the reasons for this situation may be, it can be pointed out that such fuel pumps also contain adjustable visible indicia to indicate the unit sale price of the fuel, as per gallon, for example, and in the case of price changes, access to such indicia is available to attendants for making proper corrections. It is also possible to manually manipulate the registering devices referred to so that an accidental or intentional realignment of the same could have a material effect upon computations made later from figures then visible.

Such fuel pumps as referred to may be operated for successive sales without resetting the individual sale registering device to zero if the automatic locking apparatus is not functioning or if there is no such apparatus and if this does happen, the registered gallonage and dollar value of the succeeding sale would reflect on obvious overcharge and excess gallonage by the amount of the prior

readings which were not reset. For example with a prior paid for sale of $6.00 and no reset to zero, an additional $10.00 worth of fuel would show $16.00 on the pump. Thus it is possible for a $16.00 receipt to be given when only a $10.00 payment is required and for some who are obligated to pay for traveling expenses of others upon the basis of proffered paid receipts, what has appeared as excessive fuel expenditures in relation to calculated miles traveled indicates that an accurate fuel recording device would have many advantages.

In the use of credit card sales which is increasing continually, a filling station attendant is expected to manually record on the multicopy sales ticket the gallonage per sale and total amount, and while a cumulative total of such individual slips should aid the station owner in reconciling his figures, the disadvantages of present pumps as outlined above are still present together with the fact that the only amounts appearing on the sales slip are those manually written in by someone.

With the above observations in mind, it is an important object of this invention to provide a data recording device for association with a fuel pump that will automatically print on a suitable sales slip a record of each individual sale of fuel passing through the pump.

Another object herein is to provide with such a data recorder in addition to information as to gallongage and total price therefor, additional data for imprinting which includes the month, date, and year, station designation, and means for manually inscribing data relative to the sale of items other than fuel.

More particularly this invention contemplates the use of separate registering devices for indicating gallons of fuel pumped, together with the total price therefor which are synchronized with the respective corresponding devices on a fuel pump, and from which separate devices a printed impression is made by an electrically operated printing plate that is automatically actuated when the fuel pump nozzle is replaced on its supporting cradle.

This invention also contemplates means for the automatic resetting to zero readings, after each printing, of the registering devices for gallonage and cash total from which the printed impressions are made together with the automatic resetting to zero readings of the corresponding registering devices on the fuel pump, all of such reset mechanisms being electrically operated and actuated by the printing plate after the printing impression is made.

A further feature of this invention resides in its adaptability to utilize the conventional multi-copy sales slip now used for sales of gasoline, oil, etc., and to provide with the use of such sales slips for a manually written addition to a recorded sale. In this respect it will be apparent that the ultimate total of a customer's purchase may, or may not, be the same as the automatically printed amount for fuel dispensed from the pump, and thus, if additional purchases, for oil, tires, batteries, or the like, are made, the total of the fuel sale must be increased thereby to obtain the grand total. I have therefore provided a separate manually operated printing mechanism which can be manually set to reflect the grand total of each purchase and which is so disposed as to print such total on the sales slip. In addition, since many oil companies are using electronic computer devices in their record keeping departments, the grand total of each sale can be placed on the sales slip at any location suitable to a particular user for computation by their already established computer devices.

Other objects and advantages of this invention reside in the details of construction and correlation of the various parts and will be apparent as the description proceeds.

To attain these objects and such further objects as may appear herein, or be hereinafter pointed out, I make

reference to the accompanying drawings forming a part hereof, in which:

FIG. 1 is a fragmentary front perspective view of the upper portion of a fuel pump showing my data recorder mounted thereto and ready for use,

FIG. 2 is a rear perspective view of this invention,

FIG. 3 is a front perspective view thereof with the outer cover removed,

FIG. 4 is a top view with both the outer and inner cover removed and with portions of the printing plate broken away to more clearly illustrate the printable indicia,

FIG. 5 is an enlarged side view, partly in section taken from the line 5—5 of FIG. 3,

FIG. 6 is a cross sectional view taken on the line 6—6 of FIG. 4,

FIG. 7 is a cross sectional view taken on the line 7—7 of FIG. 4,

FIG. 8 is an enlarged perspective view illustrating one of the like automatic deactuating mechanisms used in the resetting of the various registering devices,

FIG. 9 is an exploded view of the switching means on the registering devices on the pump to electrically effect synchronized operation therewith of the registering devices on this invention,

FIGS. 10 and 11 are respective enlarged side views of the open and closed position of the mechanism for operating the registering devices of this invention, and

FIG. 12 is a wiring diagram showing the circuitry used with this invention.

Referring to the drawings the upper portion of a fuel pump is designated by the numeral **14** to illustrate one environment in which my data recorder **16** is used. The term fuel pump as used herein and which has been defined earlier will be understood as connected to a fuel supply tank (not shown) and to include electrically operated pump mechanism (not shown) for dispensing the fuel through nozzle assembly **18**. According to conventional fuel pump construction, a cradle **19** on pump **14** supports the nozzle assembly **18** when it is not in use and a switch element **20** (FIG. 12) is associated with the pumping mechanism for pump **14** so that removal of the nozzle assembly **18** from the cradle **19** closes the circuit to the pumping mechanism at contact **21** and fuel can be dispensed by pressing a finger actuated lever or trip **22** on the nozzle assembly **18**. Switch element **20** opens contact **21** to the pumping mechanism when the nozzle assembly **18** is replaced on the cradle **19** and momentarily closes contact **23** of switch **20** for setting in motion certain other electrically actuated equipment which will be referred to later in more detail. In addition to the fuel pump structure indicated, such pump **14** includes several registering devices which are rotating cylinders of an odometer type arrangement. One such device **24** indicates the monetary value of fuel dispensed, device **26** registers the amount of fuel dispensed as in gallons, for example, and member **28** is an indicator for showing the unit price per gallon or the like of the fuel. Member **28** is manually adjustable so as to be changeable to reflect the current price and members **24** and **26** are connected in a well known manner to the pumping mechanism of pump **14**. Both members **24** and **26** have reset apparatus of well known construction which are simultaneously operated by a manual crank. Such crank per se is not shown since in this invention it is not used but the crank shaft is identified by the numeral **29** in the wiring diagram of FIG. 12 and my recorder **16** automatically performs the function of the crank as will later appear in detail.

In addition to members **24**, **26** and **28**, pump **14** generally contains a permanent cumulative total registering device **30** for the monetary values registered on member **24** and a similar cumulative total device **32** for the readings on member **26**. No invention is claimed in pump **14** so far described as such construction and the operation thereof is quite generaly standardized and well understood.

With reference now to the principal aspect of this invention represented by recorder **16**, an outer box-like cover or rain shield **34** is attached to the side of pump **14** near nozzle assembly **18** in any suitable manner and includes a hinged door **36** and light **38**, such light being of the type which is illuminated when door **36** is open, and is off when door **36** is closed by action of the door against switch **39**. Magnet means **40** on one side of cover **34** may be used to hold door **36** in open position.

Within cover **34** is mounted the actual recording device indicated generally by the numeral **42** and contained within a suitable housing **44** which includes a top plate **46**, a removable bottom **48** and a plate **50** at the front. The sides and ends of plate **46** are enclosed or framed by the relatively narrow inwardly extending lip **52** spaced slightly above the plate **46** uniformily as shown in FIGS. 4 and 6. Contained within housing **44** are several odometer type recording devices of standard construction and which include member **54** for indicating the amount of fuel pumped as in gallons, for example and corresponding to member **26** of FIG. 1; member **56** indicating the unit price and manually adjustable and corresponding to member **28** of FIG. 1, and member **58** for recording the monetary value and corresponding to member **24** of FIG. 1. Members **54** and **58** both have the usual reset mechanisms (normally manually operated) represented here by the resepective reset gears **60** and **62** and thus far described there is no invention claimed in members **54**, **56**, **58**, **60** and **62** as they are of well known construction and in commercial use. Members **54** and **58** are arranged for synchronized operation respectively with members **26** and **24** on pump **14** as will be later referred to in more detail.

All members **54**, **56** and **58** are provided with raised characters or numbers projecting slightly above plate **46** and designated respectively by the numerals **54***a*, **56***a* and **58***a*. Such numbers function to make a printed impression as will later appear. Suitable bracketing or bracing **64**, **66**, **68**, **70** and **72** is used for supporting members **54**, **56**, and **58** from plate **46** in the relative positions shown in FIG. 6.

An electric motor **74** (FIG. 6) attached by a bracket **76** to housing **44** includes a gear reduction box **78** and shaft **80** on which there is a gear wheel **82** for meshing engagement with the reset gear **60** on member **54**. A similar arrangement for member **58** includes the electric motor **84** on support **86**, the gear reduction box **88**, shaft **90**, and gear wheel **92** in meshing relationship with the reset gear **62** of member **58**. A third motor **94** is disposed within compartment **96** projecting from the rearward side of housing **44** and connects by the flexible shaft **98** to shaft **29** of the pump unit **14**. The wiring connections for these motors and other parts to be indicated will be fully described later after the various elements involved and their relative positions and purpose have been set forth.

As indicated earlier, member **54** on recorder **16** is synchronized with member **26** on pump **14** and member **58** on the recorder is similarly arranged relative to member **24** on the pump. This is accomplished electrically as follows. A disc on wheel **100** (FIG. 9) is carried by each member **24** and **26** for rotation therewith and are mounted at the right end of members **24** and **26** as viewed in FIG. 1 so that wheel **100** for member **24** rotates with the one cent indicator and wheel **100** for member **26** rotates with the tenth of a gallon indicator. Each wheel **100** includes the concentrically arranged spaced bosses or switch trip members **102** which are of a like number and correspondingly located to their respective adjacent odometer like wheels on members **24** and **26**.

In juxtaposition to each wheel **100** there is suitably mounted a fixed switch plate member **104** preferably in disc form (FIG. 9), which includes a fixed normally open switch element **106**. Plate **104** is so arranged that as wheel **100** rotates, the members **102** will successively

engage element 106 to alternately close and open the same. Each switch element is electrically connected to a separate like solenoid operated ratchet mechanism designated generally at 108 (FIGS. 10 and 11) for operating members 54 and 58 in recorder 42. Since members 108 are identical, only one has been shown and will be described relative to member 58 as seen in FIG. 7.

A ratchet wheel 110 is secured to the one cent disc of member 58 for rotation therewith and the ratchet teeth are spaced correspondingly to the ten digtis on such disc. A bar or lever 112 is in juxtaposition to the ratchet wheel 110 and is pivotally mounted at its center on shaft 114 which may be an extension of the shaft carrying member 58. One end of lever 112 carries a spring loaded pivotal pawl member 116 and the opposite end of lever 112 is yieldingly connected by spring 118 to a bracket 120 secured to plate 46 whereby lever 112 is urged to the position shown in FIG. 10. A notched link 122 is pivotally secured to lever 112 so as to extend opposite to the direction of pull of spring 118 and the notched end is connected to an arm 124 of a solenoid 126 which is secured to the wall 50 of housing 44. The open position of solenoid 126 and arm 124 is shown in FIG. 10 and the closed position is shown in FIG. 11. By this arrangement, as switch element 106 is alternately closed and opened, the solenoid 126 is alternately actuated and deactuated to effect oscillation of lever 112 whereby the pawl 116 successively engages the teeth on wheel 110 to operate member 58 simultaneously with member 24 on the pump. Member 54 will, of course, be operated in the same manner relative to member 26 on the pump.

In addition to members 54, 56 and 58, information as to the month, day and year is provided in the form of a manually operated cylinder type device 128 having raised indicia 128*a* and preferably secured to plate 46 by a bracket 130 above member 58 as viewed in FIG. 4. Also above member 128 (FIG. 4) is the manually operable cylinder type indicator 132 carried by bracket 134 on plate 46 which includes numeral indicia 132*a* for indicating dollar and cents totals. In a compartment 135 on the outside of housing 44 on wall 50 there is a manually operated cylinder device 136 that is a duplicate of device 132 and each cylinder on device 136 is connected by a chain drive means 138 with the corresponding cylinder in device 132. The position of the indicia on devices 132 and 136 are corresponding so that an operator by manually setting device 136 to a given total dollar and cents reading, will correspondingly set device 132 to the same reading.

It will be understood that the raised characters or numerals 54*a*, 56*a* and 58*a* on members 54, 56 and 58 respectively together with similarly raised indicia 128*a* and 132*a* on members 128 and 132 are all on the same plane as one of the objects herein is to obtain a printed impression of the respective readings at selected times. For describing the printing mechanism used with this invention reference is made more particularly to FIGS. 4, 5, 6 and 7 where plate 46 is shown mounted in housing 44 in spaced above relationship to bottom 48. Plate 46 does not extend into compartment 96 and is provided with suitable openings for registering with the indicia on members 54, 56, 58, 128 and 132.

A printing plate 140, preferably of rubber or the like, is hinged 142 at a central point along one of its longitudinal edges to the rearward side 144 of plate 46 as viewed in FIG. 4, and near the forward end 146 of plate 46, one end of plate 140 is attached by an L shaped arm 148 to the operating arm 150 of a solenoid 152 which is mounted to bracket 154 within housing 44. Plate 140 is arranged to extend over the major portion of plate 46 from the rear 144 to the front 146 thereof sufficiently so as to be able to be impressed against the various indicia 54*a*, 56*a*, 58*a* and 128*a*. It will be noted that printing plate 140 does not engage indicia 132*a*, such plate being notched as at 156 so as not to extend over the device 132. A second printing plate 158 of a size to match the notch 156 in plate 140 is disposed relative to such notched area (FIG. 4) for being impressed against indicia 132*a* and is hinged 160 to plate 46 similarly to plate 140. One end of plate 158 is attached by arm 162 to the operating arm 164 of a second solenoid 166 mounted to bracket 168 with housing 44. Solenoid 152 is automatically actuated by operation of plate 140 and plate 158 is manually actuated as will later appear in more detail. The area of plate 46 covered by the printing plates 140 and 158 and including such is enclosed in a transparent arcuate cover or dome 170.

It is intended that certain other data be recorded in addition to that represented by members 54, 56, 58, 128 and 132 described above and for such purposes plate 46 carries suitably arranged clips 172 for retaining a thin plate 174 which will contain raised characters identifying the particular filling station and address concerned with the records kept by recorder 16. In addition other spaced clips 176 on plate 46 serve as stops for positioning a standard filling station credit card 178 as shown in FIG. 4, such card being insertable into housing 44 through a slot 180 at the rear as seen in FIG. 2 which is shielded from the weather by a flap door 181.

The sales slip 182, on which information from members 54, 56, 58, 128 and 132 is to be imprinted may be of any suitable form including the multi-carbon copy forms conventionally used by most all oil companies; Slip 182 is passed through an elongated slot 184 (FIGS. 3 and 6) in wall 50 of housing 44 so as to overlay all of the above indicia from which information is to be recorded when plates 140 and 158 are impressed thereon. A portion 186 of slip 182 will protrude from the front 188 of dome cover 170 toward wall 50 over a portion of plate 46 not enclosd by dome 170 and such protruding portion provides suitable space upon which an attendant can write in information as to the sale of items or articles other than gas which are not reflected in the figures from members 54 and 58.

An electric circuit designated generally by the numeral 190 in FIG. 12 is employed in the operation of the several electrical components referred to as well as others to be yet described but it is believed that a better understanding of such circuitry will be had by first describing the general sequence of operation which this recorder is designed to accomplish.

With recorder 16 constructed as described and attached to a pump 14 as shown in FIG. 1 the circuit to the pumping mechanism of pump 14 is open at switch 20 as long as the nozzle assembly 18 is hung in place as shown in FIG. 1. With a gas customer having a credit card 178, the attendant inserts card 178 through slot 180 where it becomes positioned on plate 46 as described above. Normally the customer will receive a copy of a sales slip 182 (FIG. 4) and these are quite generally of like form having prescribed places where under present practices the data from card 178 will be printed and also having portions where the attendant normally writes in the unit price of fuel, total amount of the sale and total gallons dispensed. Such slip 182 is inserted through slot 184 as previously indicated.

Sequence of operation

With the above accomplished, switch 20 is closed by removing the nozzle 18 from pump 14 and the desired amount of gas is dispensed into the customer's vehicle during which time members 54 and 58 operate in synchronization with members 26 and 24 respectively. When the nozzle 18 is replaced on pump cradle 19, contact 21 of switch 20 is opened and contact 23 is momentarily closed to set in motion the following sequence of operations: Printing plate 140 will impress the slip 182 against the various raised characters of information to be recorded which includes members 54, 56, 58, 128, 174 and 178. As soon as the proper impressions are recorded on

slip 182, the reset gears 60 and 62 for members 54 and 58 respectively are set in operation by the respective motors 74 and 84 to align all cylinders on members 54 and 58 in a well known manner and for stopping such cylinders at a zero reading after each printing, I have used apparatus described in my copending applications referred to above to automatically deactuate motors 74 and 84. Such apparatus is indicated generally by the numeral 192 in FIG. 8, is duplicated in principle for motor 94 and will be referred to in more detail in the description of circuit 190. After the automatic printing of the record from the fuel registering device, it is possible, as will appear, for an operator to manually add further data relating to the purchase of goods other than fuel and to record the total of all sales on the same printed record.

Motor 94 will operate simultaneously wtih motors 74 and 84 to rotate shaft 29 and reset members 24 and 26 on pump 14 to zero readings. As indicated above, members 24 and 26 are of standard construction being so connected to shaft 29 that they are normally reset to zero by manual operation of a crank handle by the attendant as previously pointed out. It will thus be appreciated that this is now accomplished automatically and will not be overlooked as is possible now under some circumstances.

Up to this point the record of fuel pumped into the customer's vehicle as represented on members 54 and 58 has been immediately and automatically recorded on the sales slip 182 when nozzle 18 is replaced on cradle 19 and this is highly desirable for a variety of reasons. However, where there is a sale of items other than gas, the attendant can manually write them on the protruding portion 186 of slip 182 and in totalling such additional amounts, the recorded figures from member 58 are visible through the transparent dome 170 to aid in figuring the total. Having determined such a grand total, the attendant will then set member 136 to correspond thereto and this will correspondingly set member 132 within dome 170. The second or small printing plate 158 is then actuated by the attendant by pressing the button switch 192 on compartment 135 which is in the circuit to solenoid 166 as will later appear, and the information from member 132 will be recorded on slip 182. Obviously, if no sale other than gas is involved, the setting of member 132 will correspond to the printed record from member 58.

The general cycle of operation just described is repeated each time the nozzle 18 is removed and replaced relative to each sale of gas.

With reference now to the circuitry 190 in FIG. 12 it is pointed out that motors 74, 84 and 94 are on parallel like circuits so that the complete circuit to motor 74 will be first described and the circuits to the other motors then related thereto.

One side of motor 74 is connected by lead 194 to one side 196 of the 110 v. source. The other side of motor 74 is connected by lead 198 to a normally open contact point 200 on a holding relay 202, and contact 200 connects through terminal 203 to lead 204 through terminal 206 to lead 208 and through terminal 210 to line 212 which connects to the other side 214 of the 110 v. power. Lead 216 to pump 218 runs to contact 21 of switch 20, through terminal 210 and line 212 to one side of line 214, and the other line 220 to pump 218 runs through terminal 222 to line 196. Contact 23 of switch 20 connects by lead 224 through terminal 226, line 228, and terminal 210 to line 214 and line 230 connects contact 23 to one side of solenoid 152 with line 232 running from the other side of the solenoid through terminal 234, line 194 and terminal 222 to line 196 of the 110 v. source. Thus the momentary closing of switch 20 at contact 23 actuates the solenoid 152 to move the printing plate 140 downwardly and upon the upward movement of plate 140 effected by the usual spring loaded plunger in the solenoid

which is only momentarily actuated, a trip means 236 on plate 140 momentarily closes switch 238 to energize the holding relay 202. This is accomplished by lead 240 on switch 238 running to terminal 242 which is connected by lead 244 to terminal 246 at one side of relay 202. Lead 248 of switch 238 extends to terminal 250 and then through lead 252 to terminal 206 through lead 204 to terminal 203 and through lead 254 to terminal 256 at the other side of relay 202 where it is connected through the normally closed switch 258 to a switch breaker arm 260. Arm 260 at end 262 provides the normally open contact 264 at said other side of relay 202, and from such side, relay 202 connects by lead 266 to terminal 268 in lead 194. Thus the momentary closing of switch 238 energizes relay 202 by closing contacts 200 and 264 and motor 74 starts operation, being connected to line 214 through lead 208 terminal 206, lead 204, switch 200 and lead 198, and to line 196 of the 110 v. source through lead 194. Relay 202 remains energized after opening of switch 238, being connected from line 214 through lead 212, terminal 210, lead 208, terminal 206, lead 204, terminal 203, through lead 254 to terminal 256 contact 258, line 260, switch 264 and lead 266 to terminal 268 in lead 194. Deactuation of motor 74 is effected by the opening of contact 258 which breaks the circuit to relay 202 and opens contacts 200 and 264. Contact 258 is opened as follows with reference being made particularly to FIG. 8 and the circuit of motor 74 in FIG. 12.

On one side of each cylinder of member 54 I have provided a cam means 270 which includes a detent 272 to provide an abrupt drop or depression in the cam surface as shown. Cam 270 may be in the form of an integral shoulder-like projection or a separately attached member so long as it is designed to rotate with the respective cylinders of member 54. The detents 272 are arranged so that they are all in alignment when the corresponding numerals on the cylinders of member 54 are aligned. Each cam 270 is engaged by a respective finger 274 and all of said fingers are attached to a common support bar 276 which is secured to one end of the switch breaker arm 260. The other end 262 of arm 260, as described above, serves to maintain switch 258 in a normally closed position and this is accomplished as follows. Arm 260 is pivotally or rockably mounted intermediate its end to a pivot point 278 on rod 280 supported by a bar or the like 282 secured to relay 202. As shown in FIG. 8, fingers 274 engage the cams 270 from the bottom side and thus I use a spring 284 extending from the outer end of member 282 to arm 260 intermediate support 276 and pivot point 278 to normally urge the fingers 274 into contact with the cams 270. By this arrangement it will be appreciated that as motor 74 operates it will eventually align all corresponding numerals on member 54 because of the nature of the conventional reset mechanism. This will also align all detents 272 which as shown are substantially diametrically opposite to the zero settings since fingers 274 are preferably at the bottom and accordingly when the aligned detents 272 reach fingers 274, such fingers are all urged into the depressions adjacent the detents. This causes arm 260 to rock on pivot point 278 which opens switch 258 breaking the circuit to relay 202 and opens contact 200 (also 264) to stop motor 74. The dotted line 286 in the circuit for motor 74 (FIG. 12) merely designates the drive connection between motor 74 and member 54. As soon as member 54 starts operation, the movement of cam 270 on the one cylinder at the right end will act on one finger 274 to move it from its switch breaking position and since all fingers 274 are connected to the common support 276, all fingers are moved by arm 260 rocking on point 278 to close switch 258. It will be understood that fingers 274 may contact cams 270 at a different relative position than that described whereby detents 272 would be correspondingly relocated without in any way departing from the principle here disclosed. For example if fingers 274 were at the top of the cams they could drop by gravity into

the cam depressions without requiring a spring **284**, but I prefer the embodiment described for more accurate and position action.

Further referring to FIG. 12 it is pointed out that the circuitry relative to motors **84** and **94** for starting and stopping such motors is a duplicate of the circuit described for motor **74** and by suitable leads are connected to corresponding sides of the 110 v. source and to corresponding sides of switch **238**. Consequently to avoid unnecessary repetition of circuit description, the leads and contacts in the circuit for motor **84** are given the same numerals as for the motor **74** followed by the letter *a* and followed by the letter *b* for motor **94**. Also since the operation of the reset mechanism for member **58** and pump **14** and the circuitry therefor is the same as for member **54**, like numerals are given in FIG. 12 for member **58** followed by *a*, and for member **14** followed by *b*. It will be noted, however, that from line **214** of the 110 v. source lead **212** through terminal **210** through lead **208** to terminal **206** are common to the circuits for all motors.

Solenoid **166**, which operates the smaller printing plate **158** is connected on one side (FIG. 12) by lead **204***c* through leads **204***b*, and *a* to lead **204** at terminal **206** and to one side **214** of the 110 v. power through leads **208, 210** and **212**. The other side of solenoid **166** connects by lead **287** to one side of the manually operable switch **192**, and the other side of switch **192** connects by lead **266***c* through leads **266***b* and *a* to terminal **234** and to the other side **196** of the 110 v. power through lead **194** and terminal **222**.

With reference now to the ratchet members **110** shown in FIG. 12, it will be understood that a separate solenoid **126** and ratchet **110** assembly as earlier described is used to connect pump member **24** with recorder member **58** and to connect pump member **26** with recorder member **54** and since the circuitry is the same, like numerals are given to like parts. In this respect, one side of solenoid **126** connects by lead **288** to terminal **290** in lead **216** to pump **218**. The other side of solenoid **126** connects by lead **292** to one side of the normally open switch element **106**, and the other side of element **106** connects by lead **294** to terminal **296** in lead **220** to pump **218**. In this way, members **126** and **110** are susceptible to actuation only when pump **218** is in operation by the closing of switch **20** with contact **21**.

In the event access to the interior of housing **44** is necessary for repairs or maintenance, the bottom **48** may be easily removed by the removal of screws **298**.

It will be understood that the phraseology employed herein is for the purpose of description and not for limitation and that modifications and changes in the construction and arrangement of this invention can be made within the scope of what is claimed, without departing from the spirit and purpose thereof. It is thus intended to cover by the claims, any modified forms of structure or mechanical equivalents which may be reasonably included within their scope.

I claim:

1. In a fuel pump having registering devices for indicating the amount of fuel pumped and the monetary value therefor and including a reset mechanism for returning said registeriing devices to zero readings, the combination therewith of a data recorder comprising:

(a) a first means actuated by said fuel pump for automatically effecting a printed record of the readings on said registering devices,

(b) means for manually recording sales data and prices therefor on said printed record which is not reflected by said registering devices,

(c) a separate registering device for manually setting the monetary totals of said first two mentioned means,

(d) a second manually actuated means for effecting a second printed record on said first mentioned printed record of the readings on said separate registering device,

(e) means actuated by said first means for automatically operating said reset mechanism, and

(f) said first and second means for effecting printed records each include substantially rectangular platens wherein the platen of the second means utilizes a corner area of the first.

2. In a fuel pump having registering devices for indicating the amount of fuel pumped and the monetary value therefor, the combination therewith of a data recorder comprising:

(a) a housing.

(b) a first registering device in said housing for automatically duplicating the readings of said fuel pump registering devices.

(c) a first printing means including a substantially rectangular platen actuated by said fuel pump for recording the readings of said registering devices.

(d) means in said housing for manually recording sales data and prices therefor on goods other than fuel and not reflected by said registering devices.

(e) a second manually operable registering device in said housing.

(f) a second printing means including a substantially rectangular platen utilizing a corner area of the platen of said first printing means and manually actuated for recording the readings of said second registering device, and

(g) means in said housing for supporting said first and said second printing means for independent operation and permitting the readings of said registering devices to be printed on the same record.

3. A device as defined in claim **2** wherein said fuel pump includes a reset mechanism for returning said registering devices to zero readings and said data recorder includes means actuated by said first printing means for automatically operating said reset mechanism.

4. In a data recorder for use with a fuel pump of the class having registering devices for indicating the amount of fuel pumped and the monetary value thereof and including a reset mechanism for returning said registering devices to zero readings, said data recorder comprising in combination therewith of:

(a) separate registering devices corresponding to the registering devices on said fuel pump,

(b) means connecting said separate registering devices to corresponding registering devices on said fuel pump for synchronized operation therewith,

(c) another manually operable registering device for indicating manually selectable monetary totals,

(d) a first printing means to effect a printed record of the readings on said separate registering devices,

(e) means actuated by said first printing means to operate said reset mechanism for said fuel pump,

(f) separate reset mechanisms for said separate registering devices,

(g) separate means actuated by said first printing means to operate said separate reset mechanisms, and

(h) a second printing means to effect a printed record of the readings on said manually operable registering device.

5. In a data recorder for use with an electrically operated fuel pump of the class having registering devices for indicating the amount of fuel pumped and the monetary value thereof and including a reset mechanism for returning said registering devices to zero readings, said data recorder comprising in combination therewith of:

(a) separate registering devices corresponding to the registering devices on said fuel pump,

(b) means electrically connecting said separate registering devices to corresponding registering devices on said fuel pump for synchronized operation therewith,

(c) another registering device for indicating manually selectable monetary totals,
(d) a first electrically operated printing means actuated by operation of said fuel pump to effect a printed record of the readings on said separate registering devices,
(e) means actuated by said first printing means to operate said reset mechanism for said fuel pump,
(f) separate reset mechanisms for said separate registering devices,
(g) separate means actuated by said first printing means to operate said separate reset mechanisms,
(h) a second electrically operable printing means to effect a printed record of the readings on said other registering device, and
(i) a manually operable switch means to effect actuation of said second printing means.

6. In a fuel pump of the class having an electrically operated pump with a dispensing nozzle connected thereto, a pump switch, a cradle for said nozzle adapted to operate said pump switch, registering devices operably associated with said pump for indicating the amount of fuel pumped and the monetary value therefor, and including a rest mechanism for returning said registering devices to zero readings, the combination therewith of a data recorder comprising:
(a) a housing secured to said pump,
(b) an electric circuit in said housing,
(c) said fuel pump and pump switch being connected to said circuit,
(d) means in said housing connected to said reset mechanism for operating the same,
(e) first electric means in said circuit and connected to said means for operating said reset mechanism to actuate the same,
(f) a first printing means in said housing for printing a duplicate reading of the readings on said registering devices,
(g) said first printing means being electrically connected in said circuit and actuated by said pump switch,
(h) the actuation of said first printing means effecting actuation of said first electric means,
(i) means for manually recording sales data and prices therefor on goods other than fuel and not reflected by said registering devices,
(j) manually operable means in said housing for indicating totals of said registering devices and said manually recorded data,
(k) a second printing means in said housing for effecting a printed record of said totals, and
(l) a second manually actuated electric means in said circuit connected to said second printing means for actuating the same.

7. In a fuel pump of the class having an electrically operated pump with a dispensing nozzle connected thereto, a pump switch, a cradle for said nozzle adapted to operate said pump switch, registering devices operably associated with said pump for indicating the amount of fuel pumped and the monetary value therefor, and including a reset mechanism for returning said registering devices to zero readings, the combination therewith of a data recorder comprising:
(a) a housing secured to said pump,
(b) an electric circuit in said housing,
(c) said fuel pump and pump switch being connected to said circuit,
(d) means in said housing connected to said reset mechanism for operating the same,

(e) first electric means in said circuit and connected to said means for operating said reset mechanism to actuate the same,
(f) a first printing means in said housing for printing a duplicate reading of the readings on said registering devices,
(g) said first printing means being electrically connected in said circuit,
(h) said pump switch being a double contact switch whereby removal of said nozzle from said cradle closes the circuit to said fuel pump and opens the circuit to said first printing means and replacement of said nozzle on said cradle opens the circuit to said fuel pump and closes the circuit to said first printing means to actuate the same,
(i) the actuation of said first printing means effecting actuation of said first electric means,
(j) means for manually recording sales data and prices therefor on goods other than fuel and not reflected by said registering devices,
(k) manually operable means in said housing for indicating the totals of said registering devices and said manually recorded data,
(l) a second printing means in said housing for effecting a printed record of said totals, and
(m) a second manually actuated electric means in said circuit connected to said second printing means for actuating the same.

8. In an electrically operable pump having registering devices for indicating the amount of fuel pumped and the monetary value therefor and including a reset mechanism for returning said registering devices to zero readings, the combination therewith of a data recorder comprising:
(a) a housing secured to said pump,
(b) recording means in said housing for duplicating the readings on said registering devices,
(c) means electrically connecting said recording means to said registering devices for synchronized operation therewith,
(d) a first eletcrically operable printing means in said housing to effect a printed record of the readings on said recording means,
(e) means electrically connecting said first printing means to said pump for actuation thereby,
(f) means actuated by said first printing means to operate said reset mechanism for said fuel pump,
(g) separate reset mechanisms in said housing for said recording means,
(h) separate means actuated by said first printing means to operate said recording means,
(i) a separate manually operable registering device in said housing for indicating manually selectable monetary totals, and
(j) a second manually actuated means in said housing for effecting a printed record of the readings on said separate registering device.

References Cited by the Examiner

UNITED STATES PATENTS

2,360,273	10/44	Pritchard.	
2,538,243	1/51	Hazard et al.	
2,608,156	8/52	Gilthorpe	346—78 X
2,612,428	9/52	Vroom	346—43 X
2,840,312	6/58	Vroom	235—94
3,083,641	4/63	Childs et al.	101—269

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