

May 11, 1937.

H. V. CLIFTON

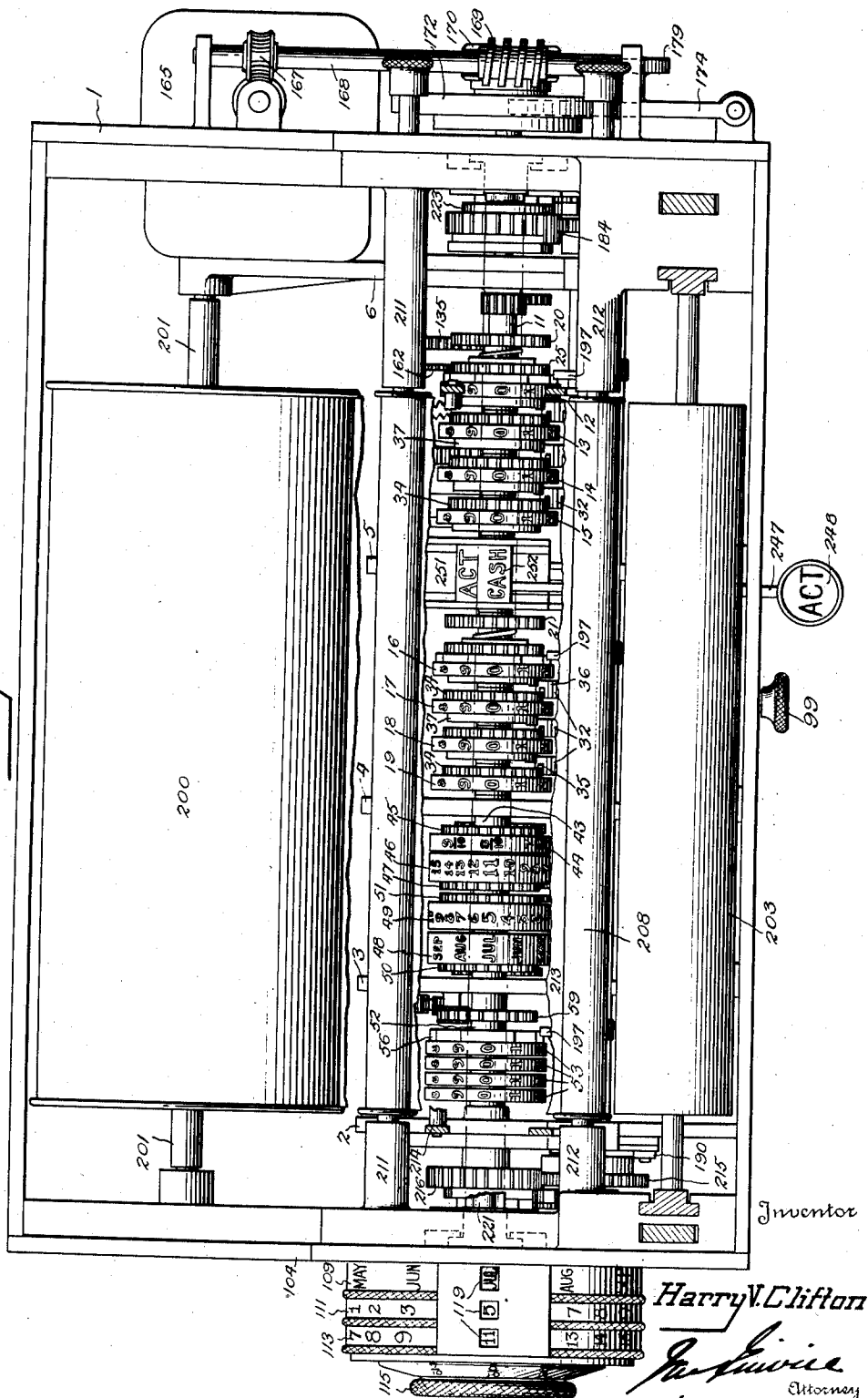
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Filed April 19, 1933

9 Sheets-Sheet 1

Fig. 1.



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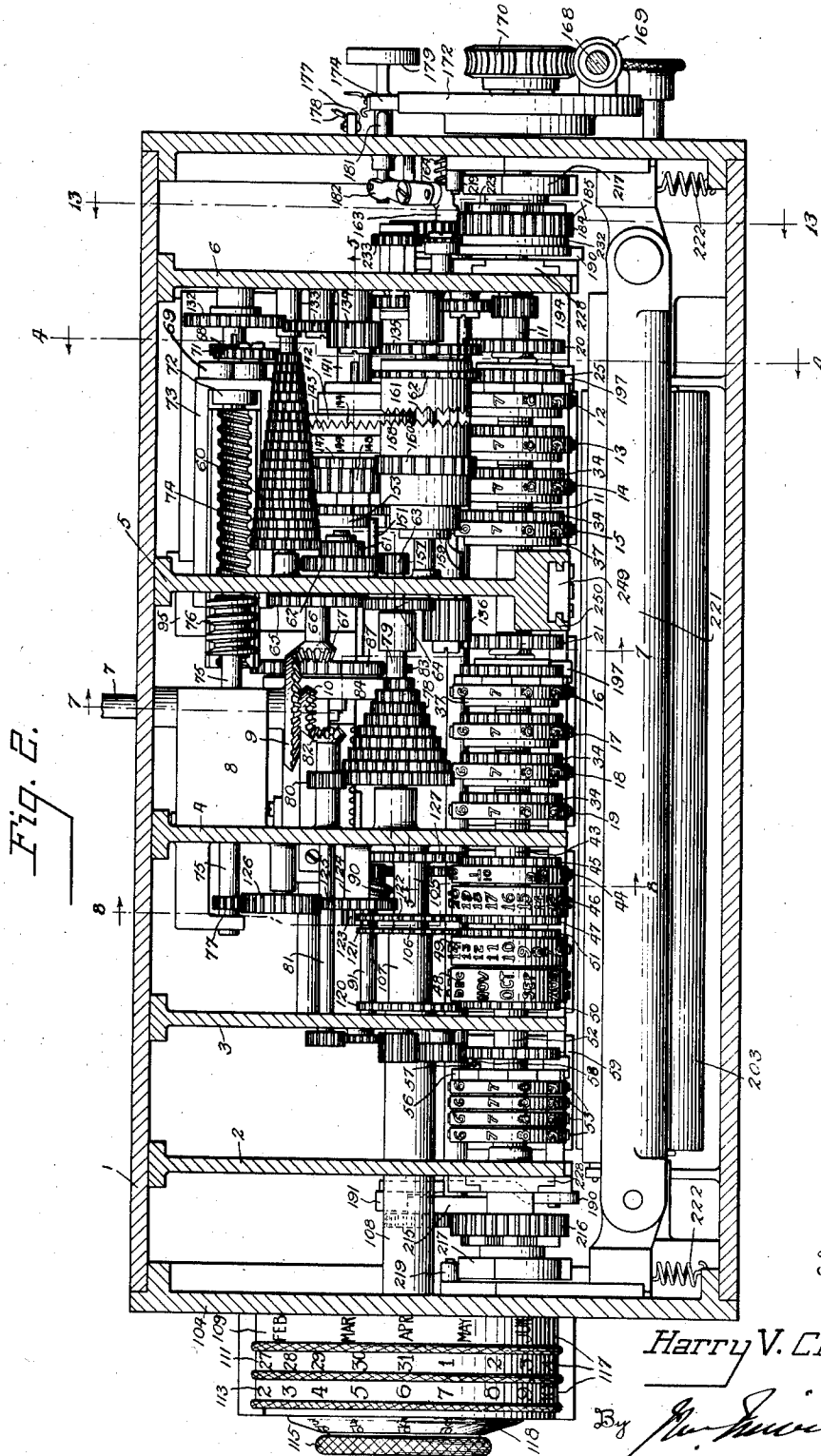
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9 Sheets-Sheet 2



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By *J. H. Swine*
Attorney

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Fig. 3.

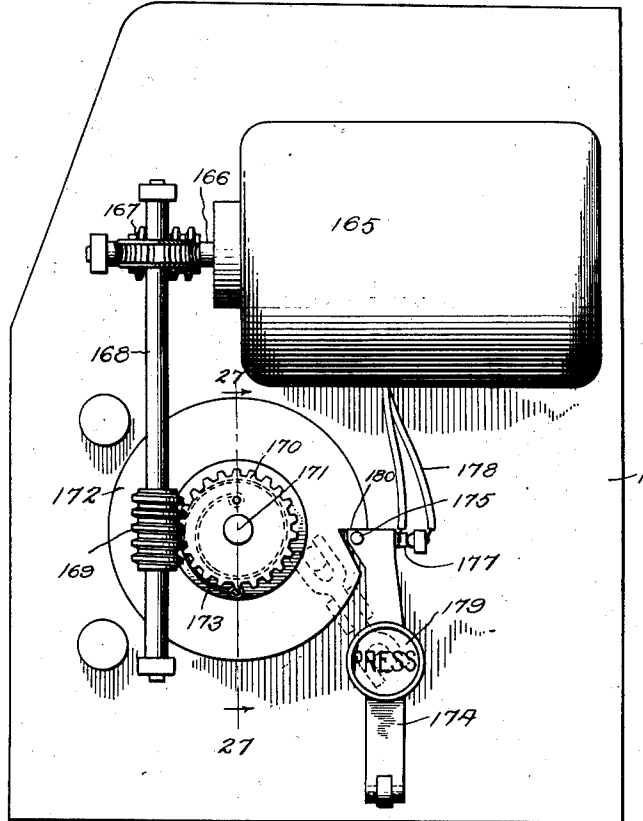
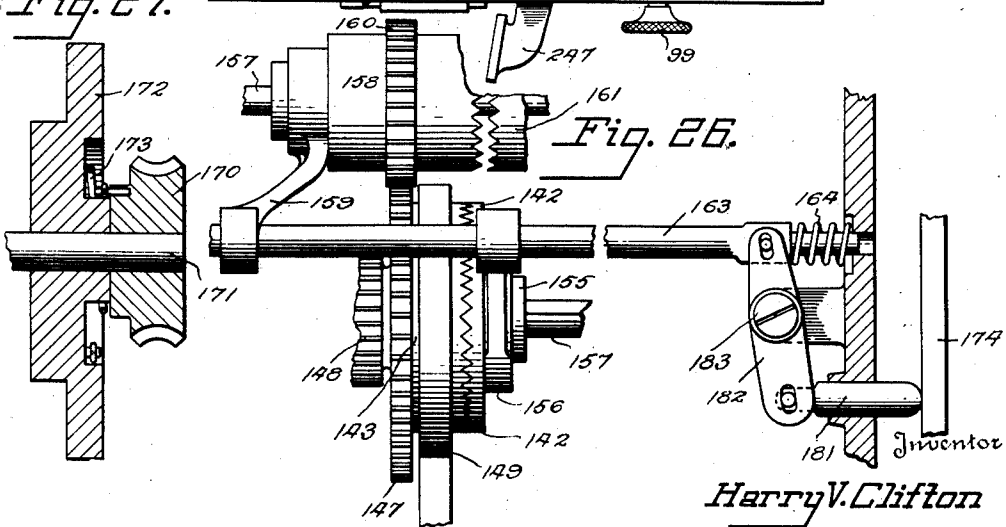


Fig. 27.



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Fig. 9.

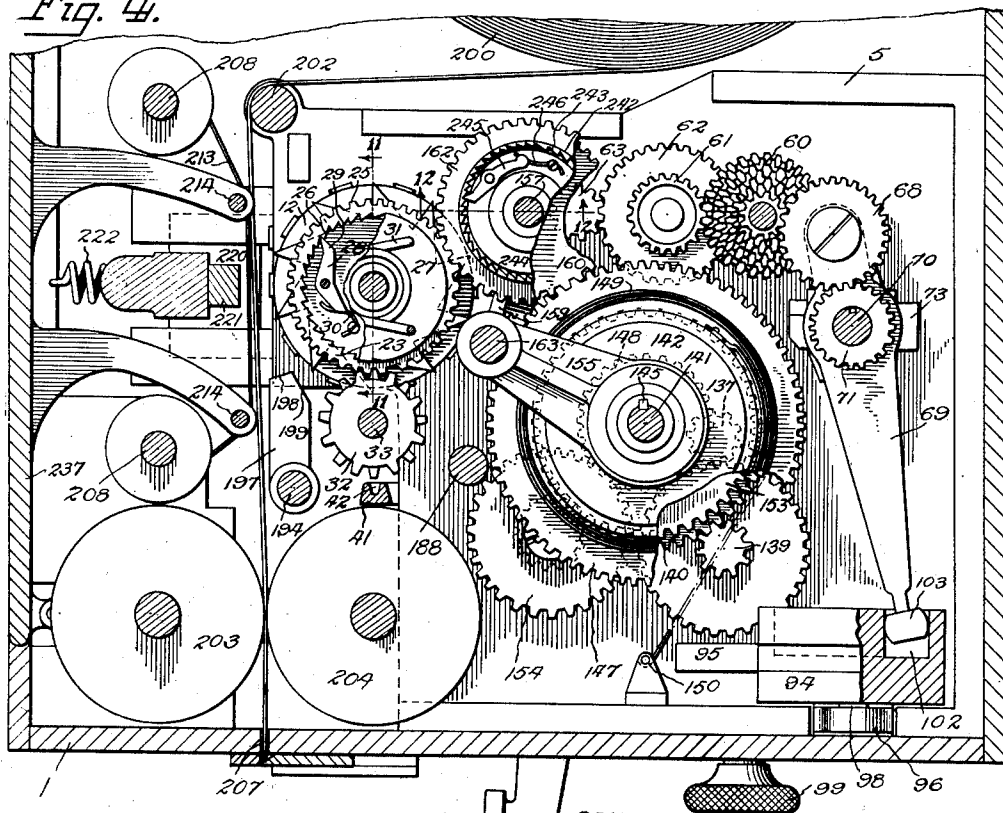


Fig. 10.

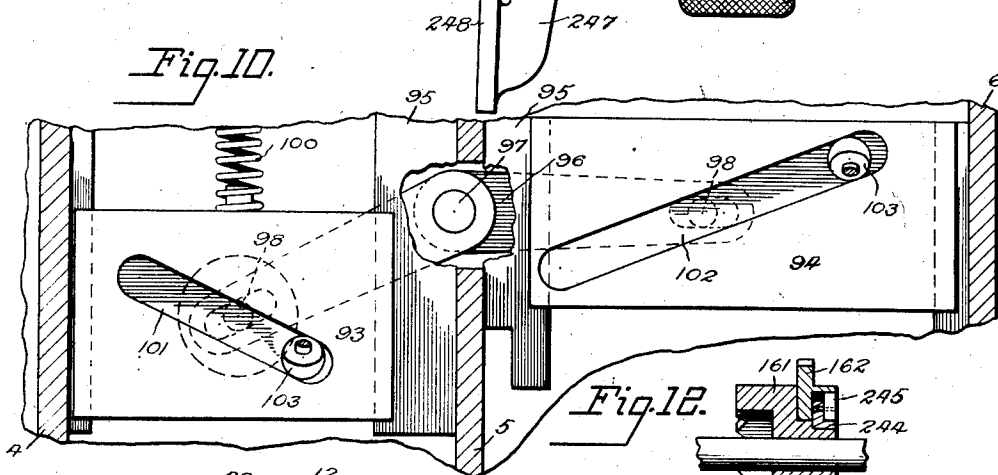


Fig. 11.

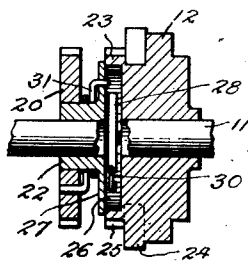
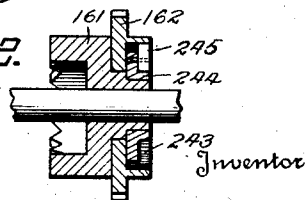


Fig. 12.



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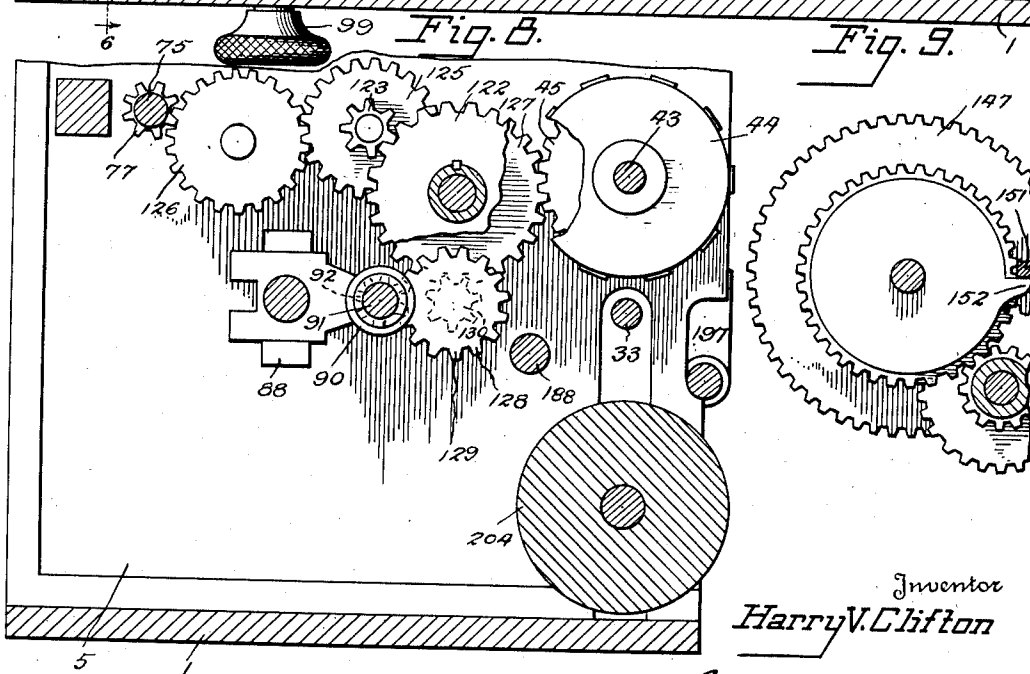
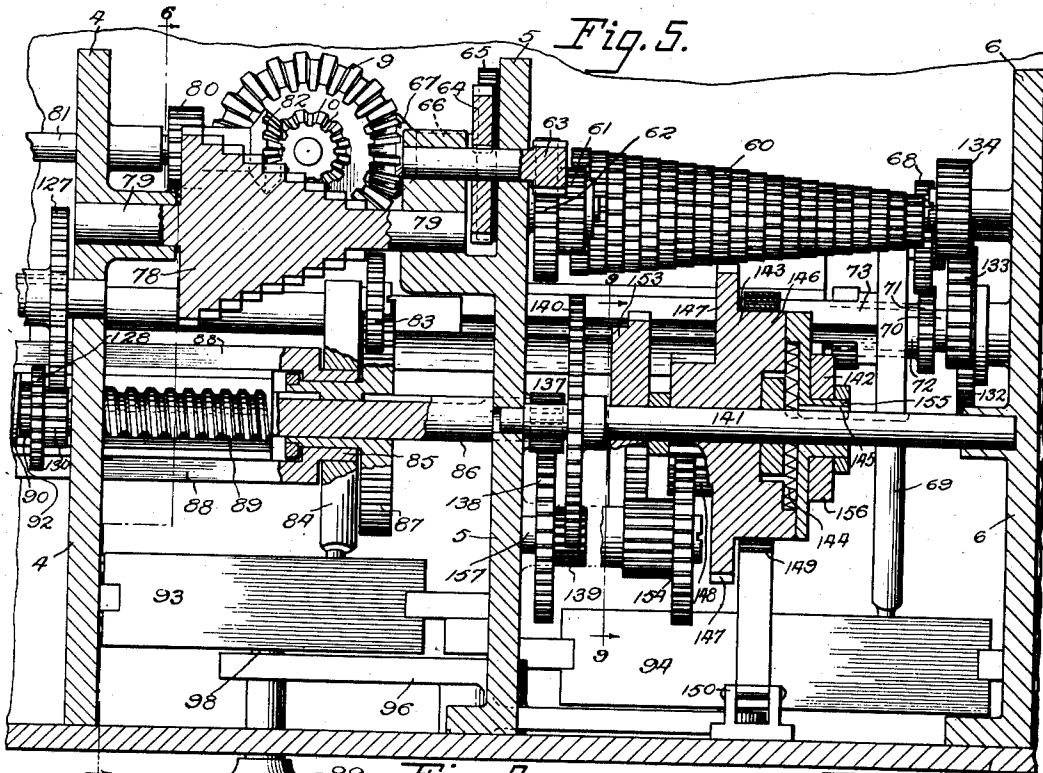
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9 Sheets-Sheet 5



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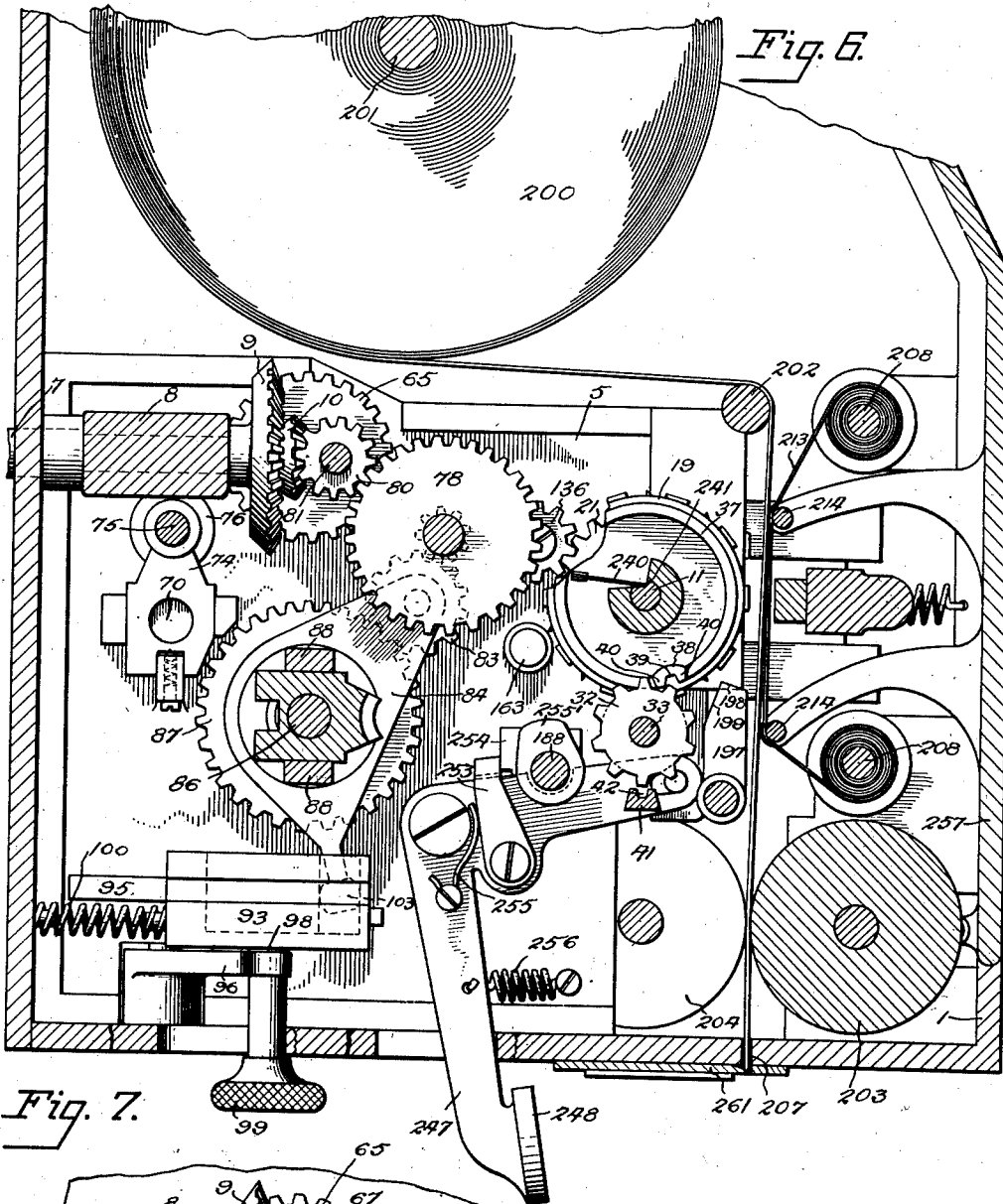
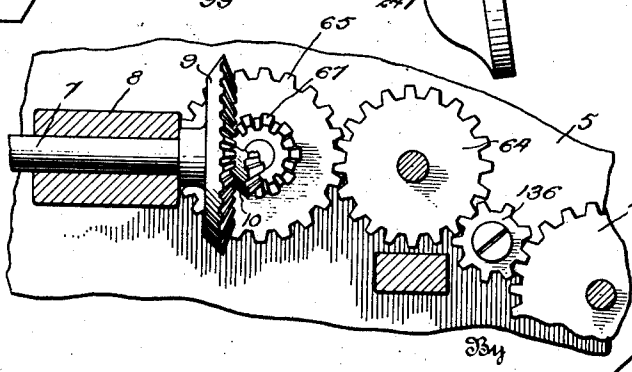


Fig. 7.



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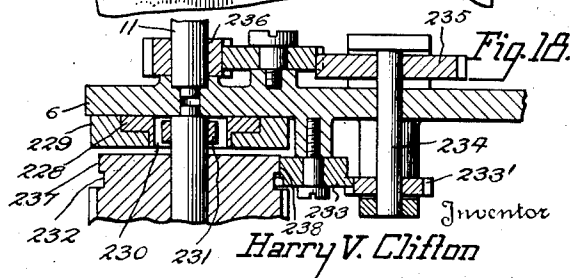
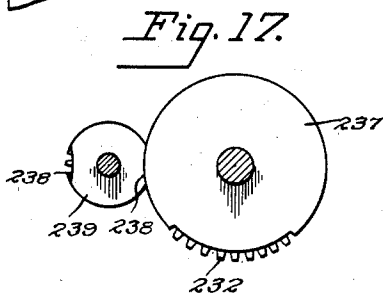
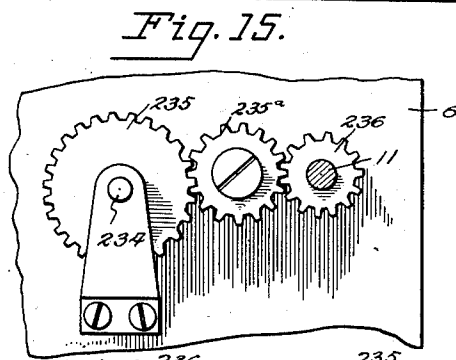
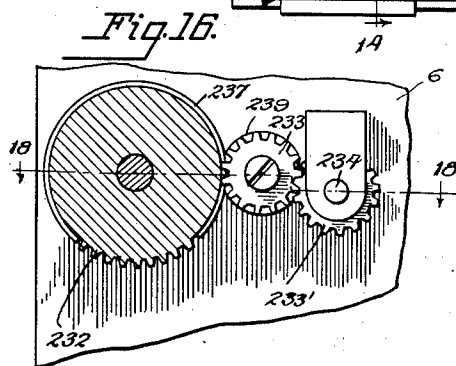
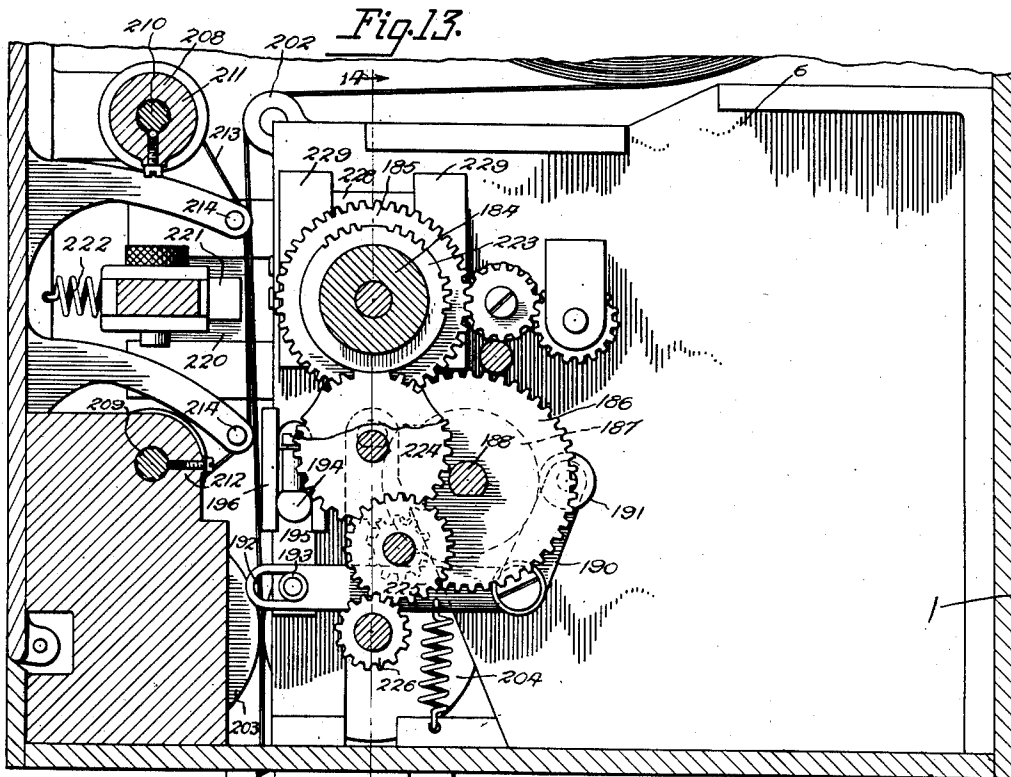
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Fig. 19.

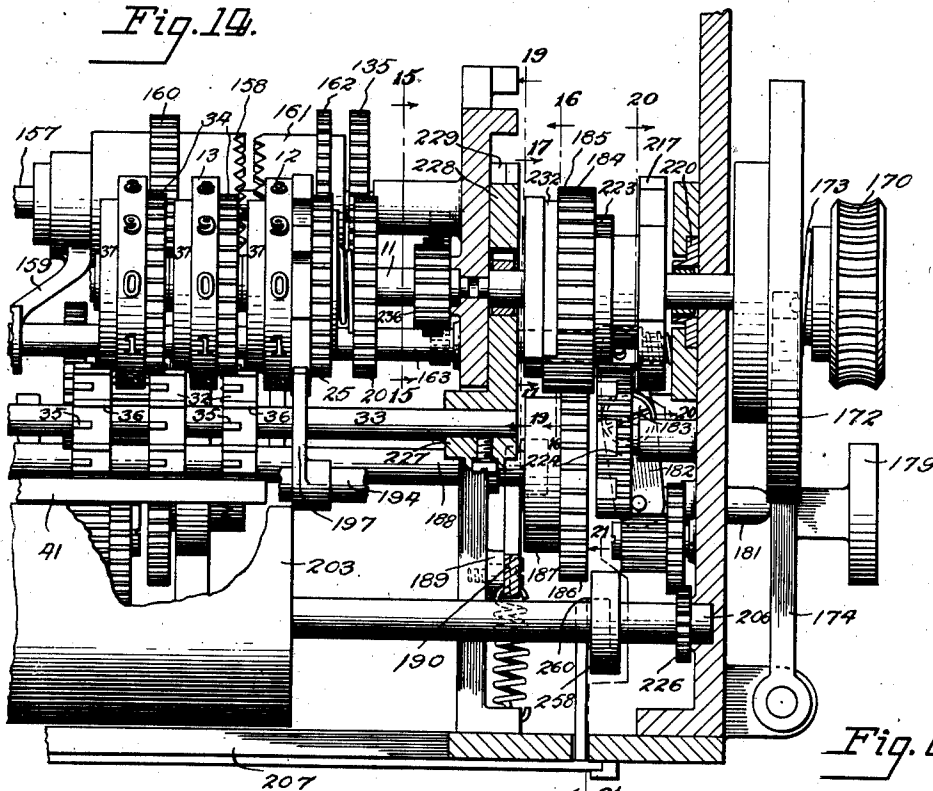


Fig. 20.

Fig. 19.

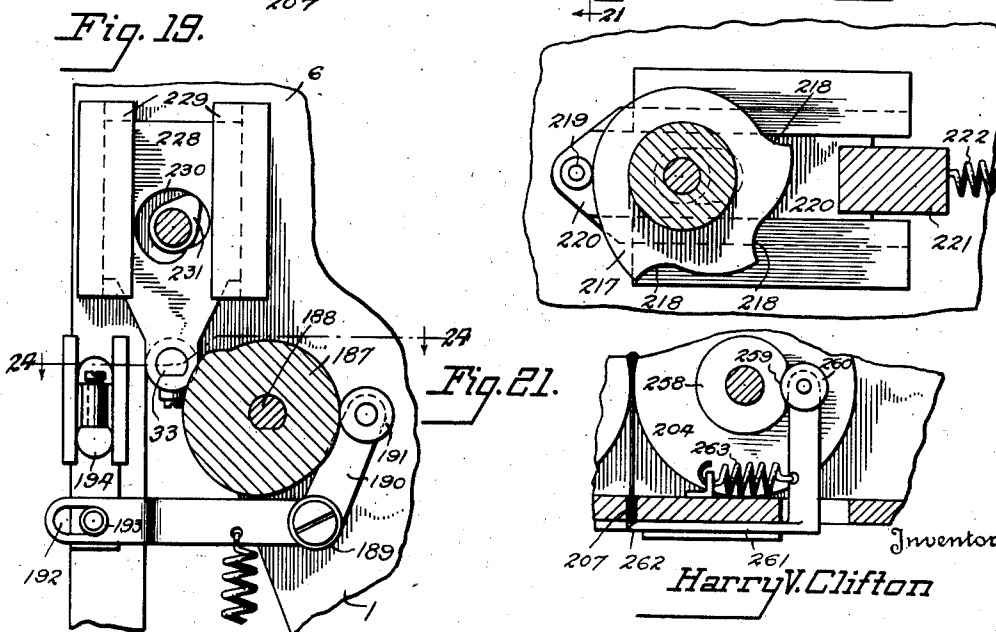


Fig. 21.

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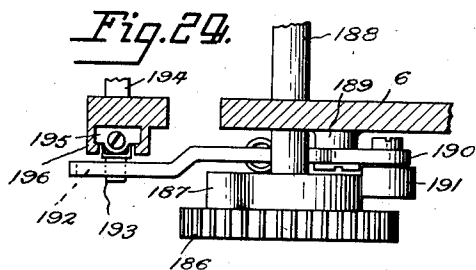
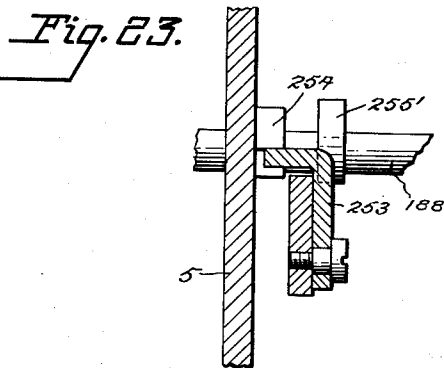
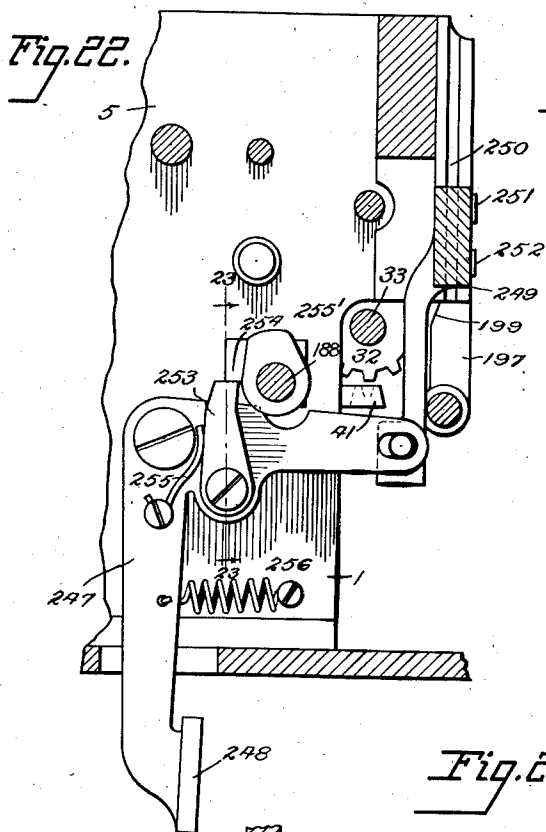


Fig. 28.

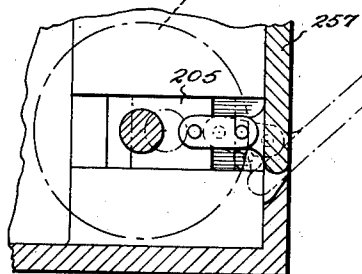
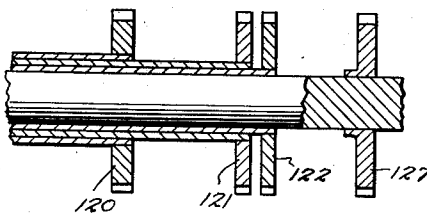
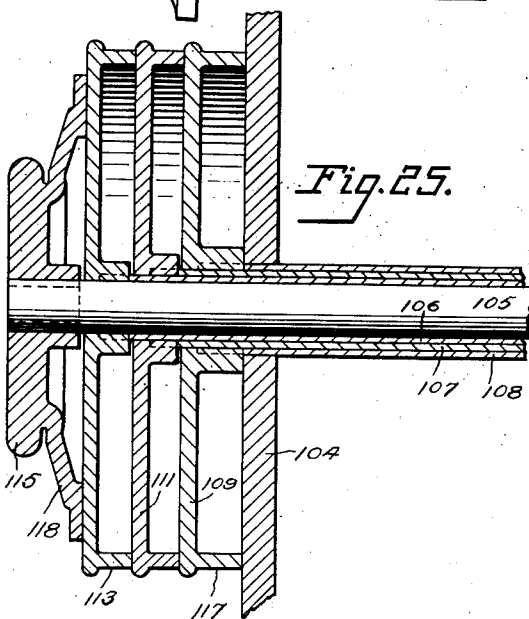


Fig. 25.



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UNITED STATES PATENT OFFICE

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Harry V. Clifton, Erie, Pa.

Application April 19, 1933, Serial No. 666,902

9 Claims. (Cl. 235—61)

This invention is directed to an improvement in recorders for use in connection with gasoline or other fluid delivery pumps or devices, wherein provision is made for recording certain detail knowledge relative to the pump operation both for a selected period and for each pump operation independently, the recorder being constructed as a complete unit wholly independent of the pump or other delivery unit except through a driving connection.

The primary object of the present invention is the provision of a recorder of this type which may be manually set for any given figure as a price per unit measure of the pump delivery, whether such figure involves the fractional part of a cent or not, whereupon after setting the total number of unit measures delivered from the pump in a particular operation, together with the total price of such unit measures, it may be set up on the machine and automatically recorded.

A further object of the invention is the provision of means by which any fractional part of a cent or other unit indicating the cost of a unit measure of the pump is automatically added to the cost of the delivered unit measures of the pump after registering the cost of such unit measures in whole cost units, thereby avoiding undue complication incident to adding the fractional cost to each unit cost as the latter is registered.

A further object of the invention is the provision of means for automatically recording the set up of the machine following a particular pump delivery, with such recording being in the form of bills, preferably in triplicate, which are successively delivered beyond the machine, one of which will serve as the customer's receipt and the others of which may serve for the station record for checking purposes.

A further object of the invention is the provision of means by which the register units will be automatically positioned for proper printing relation, whether they may or may not be in such position following the pump operation, thereby ensuring a clear, positive record under all conditions of operation.

A further object of the invention is the provision of manually controlled means by which the machine may be set for recording as to the particular date and particular unit price per unit measure of the pump, and as to a particular fraction of such unit price, if such is necessary, with mechanism operated in the actuation of the delivery pump or unit for thereafter setting up in

the machine a register denoting the number of unit measures delivered in that pump operation and the total cost of such, either at a unit price or at a price including a unit and a fraction, together with the indication on a totalizer of the total pump delivery for a particular period, the subsequent operation of the recorder in providing for the proper positioning of the register elements for printing purposes of the recording of the bills from such registers, the delivery of the bills beyond the machine, and the restoration of the registering units other than the totalizer to a zero position for the next operation being automatically carried out under selective control of the operator.

A further object of the invention is the provision of a recorder which may be attached as a unit to any fluid delivery mechanism and which, when manually set for the cost price per unit measure of such delivery mechanism, whether said cost price includes a fraction or not, will automatically register, among other details, the number of unit measures delivered in a particular operation of the fluid delivery mechanism and the total cost of such delivered measures calculated at the cost price of each measure for which the machine has been set.

A further object of the invention is the provision in such a unit of electrically operated means selectively controlled for setting the register into accurate printing position, for recording the set-up of the register, and for clearing the machine by restoring the register units to zero positions for the next operation.

The invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a view in front elevation of the machine, the front wall or door of the casing being removed.

Figure 2 is a plan view of the machine, the casing and connected parts being shown in horizontal section.

Figure 3 is an end view of the machine.

Figure 4 is a section on the line 4—4 of Figure 2.

Figure 5 is a section on the line 5—5 of Figure 2.

Figure 6 is a section on the line 6—6 of Figure 5.

Figure 7 is a section on the line 7—7 of Figure 2.

Figure 8 is a section on the line 8—8 of Figure 2.

Figure 9 is a section on the line 9—9 of Figure 5.

Figure 10 is a broken plan view, partly in section, illustrating the means for controlling the position of the rate gears during the manual set-

ting of the machine for a particular cost price.

Figure 11 is a section on the line 11—11 of Figure 4.

Figure 12 is a section on the line 12—12 of Figure 4.

Figure 13 is a section on the line 13—13 of Figure 2.

Figure 14 is a section on the line 14—14 of Figure 13.

Figure 15 is a section on the line 15—15 of Figure 14.

Figure 16 is a section on the line 16—16 of Figure 14.

Figure 17 is a section on the line 17—17 of Figure 14, looking in the direction of the arrow.

Figure 18 is a section on the line 18—18 of Figure 16.

Figure 19 is a section on the line 19—19 of Figure 14, looking in the direction indicated by the arrow.

Figure 20 is a section on the line 20—20 of Figure 14.

Figure 21 is a section on the line 21—21 of Figure 14.

Figure 22 is a detail in elevation, partly in section, illustrating the means for manually and automatically controlling the position of the "cash" and "account" indicators for proper recording of the character of the particular transaction.

Figure 23 is a section on the line 23—23 of Figure 22.

Figure 24 is a section on the line 24—24 of Figure 19.

Figure 25 is a longitudinal section through the manual rate setting and manual date setting elements.

Figure 26 is a broken view in elevation showing the clutches and clutch controls.

Figure 27 is a section on the line 27—27 of Figure 3.

Figure 28 is a view in elevation, partly in section, showing the means for relieving pressure upon the feeding rolls for the paper on which the record is printed in the opening of the door in the front of the casing.

The construction as particularly embodied in the preferred arrangement of details and operation illustrated and to be specifically described is designed to provide a recorder which may be connected as a unit to various delivery mechanisms, and particularly gasoline pumps, with a view to permitting, through proper manual and subsequent automatic control and operation, the delivery from the recorder following any predetermined operation of the liquid delivery unit a series, preferably three, of identical bills. These bills are to present detailed information of the particular liquid delivery mechanism operation as, for example, in the case of a gasoline pump, the number of gallons delivered at the particular operation, the cost per gallon, the total cost of the gallons delivered, the date on which the delivery was made, whether the transaction was a cash transaction or one charged to an account, and additionally for the benefit of the owners of the gasoline pump, the total number of gallons delivered from that pump during a selected period.

The recorder presents means for manual adjustment for setting the recorder at any predetermined cost price per unit measure of the fluid delivery mechanism within the range of cost prices for which the particular recorder may be adapted, this cost price adjustment permitting and providing for provision of fractional parts of

a unit of cost to be included in and computed by the recorder in the total cost at one operation.

The recorder as such is wholly independent from the liquid delivery mechanism and merely requires that it be connected to such mechanism to ensure responsive and synchronous operation of the recorder in the operation of an element of the liquid delivery mechanism during liquid delivery. Of course, under these circumstances the driving part of the liquid delivery mechanism intended to serve as the power means for the recorder will determine the type of connection between the recorder and such means in order that a proper cooperation between the recorder and liquid delivery mechanism may be maintained. This may involve operating the recorder at the same speed at which the selected part of the pump delivery mechanism is operated or at variable speeds relative thereto, and any and all conventional means to secure proper operative relation of the recorder and liquid delivery mechanism is contemplated as within the scope of the present invention.

The construction involves a frame or casing, indicated at 1, within which are arranged partitions of requisite size and in appropriate relation to provide for proper support of the operating parts, such partitions, for the purpose of this description, being indicated at 2, 3, 4, 5 and 6. The walls of the casing proper and the partitions referred to constitute in effect a more or less rigid frame designed primarily for the support of the various operating instrumentalities making up the recorder.

The main or power shaft 7 which constitutes a driving element for the recorder extends through one side wall and is terminally designed to be connected to the appropriate gear or other operating part of the liquid delivery mechanism, for which purposes the shaft 7 beyond the recorder may be flexible or otherwise and may be terminally provided with any appropriate means to ensure that said shaft 7 will be properly operated in the operation of the liquid delivery mechanism. The invention is not concerned with the connection between the power shaft and the liquid delivery mechanism and such will not be shown or described, it being understood, however, that any necessary and conventional coupling arrangement to secure the appropriate operation of the shaft 7 may be provided.

The shaft 7 extends within the recorder casing and may, if desired, be rotatably mounted in a block 8 secured to the partition 4. The inner or recorder end of the shaft 7 is provided with a beveled gear 9. Carried as an integral or fixed part of the beveled gear 9 is a smaller concentric beveled gear 10 which, together with the gear 9, constitute the driving gears of the recorder. The shaft 11 is rotatably supported in the partitions 4 and 6, passing through partition 5. This shaft rotatably supports between partitions 5 and 6 the computing mechanism for indicating the total cost price of the commodity delivered at a particular operation. This mechanism is made up of type wheels, indicated at 12, 13, 14 and 15, and this computing mechanism will be hereinafter referred to as the cost computing unit.

Also rotatably supported on the shaft 11 between the partitions 4 and 5 is a computing mechanism for indicating the quantity delivered during a single delivery operation of the liquid delivery mechanism, this mechanism being made up of type wheels 16, 17, 18 and 19, and will be hereinafter referred to as the quantity computing

unit. Of course, these mechanisms may include any number of type wheels, and while it is understood that the respective wheels, are loose on the shaft 11, it is nevertheless to be also understood that the shaft itself is capable of movement for resetting or machine clearing purposes, as will later appear.

As the type wheels of both the quantity and cost computing units, i. e. the first or initial wheel of each computing mechanism is designed to be driven by a gear, indicated at 20, for the cost unit and at 21 for the quantity unit, and as these gears form parts of gear trains to be later described, and therefore are fixed when the gear train is at rest, provision must be made for permitting a true driving connection between the gear and the first type wheel, while at the same time permitting slight movement of the type wheel relative to its gear in order to compensate for type wheel movement. It will be understood that in the operation of the type wheels, the initial wheel may, when the particular delivery of fluid from the delivery mechanism has ceased, be in a position in which one of the numbers on that wheel is not in accurate printing position. Provision is made herein, as will later appear, for mechanism by which this wheel or these wheels may be moved to accurately position the appropriate number thereon in printing position. This adjusting mechanism advances the printing wheel to printing position or moves it backwardly to printing position, according as to which of the movements necessitates lost movement of the wheel to properly position the numeral, i. e. if the wheel has been moved to a point more than half the distance between the respective numerals, the adjusting mechanism will advance the wheel, whereas if it has moved less than half the distance, the adjusting mechanism will retard or move the wheel backward. Therefore, to permit proper and relative movement of the initial tabulating wheels in either direction while the gear which ordinarily imparts movement to these wheels is fixed, provision must be made for relative play between the driving gear and the initial wheel of the respective computing mechanisms. As the connection is the same in both instances, i. e. for both the cost and quantity computing units, a single description will cover both structures.

A hub 22 is loosely mounted upon the shaft 11, and on this hub is rotatably mounted a driving gear, 20 or 21 as the case may be. The initial wheel of each computing mechanism, i. e. 12 or 16 as the case may be, is formed on the side toward the driving gear with an annular extension 23 between which and the particular portion of the type wheel and preferably on the reduced extension of such portion is secured a member having spaced, triangular teeth 24 forming an element of the adjusting mechanism to be later described. The outer surface of the extension 23 is formed with gear teeth 25, and the inner surface of such extension is formed with a series of relatively fine teeth 26. A pawl plate 27 forming part of the hub 22 bears against the end of the extension 23 and is provided on its surface next the type wheel with a pawl 28, the operative end 29 of which is held in yieldable cooperation with the teeth 26 by a spring 30. A spring 31 of sufficient strength has one end secured to the gear 20 or 21, as the case may be, and the opposite end secured to the pawl plate 27, this spring being coiled about the hub intermediate the gear and pawl plate.

The details just described are shown more particularly in Figures 4 and 11, and from this construction it will be apparent that during driving actuation of the particular gear, 20 or 21 as the case may be, the pawl plate driven by the spring 31 will, through the pawl 28, correspondingly operate the particular type wheel, 12 or 16 as the case may be, and yet the particular type wheel may be moved independently in the advance direction as the pawl 28 will readily ride over the teeth 26 and at the same time the particular type wheel will be permitted a slight movement in the opposite direction owing to the yielding of spring 31.

Each succeeding type wheel of both the cost and quantity computing units is advanced one step at each complete revolution of the preceding wheel, as is customary in units of this type. However, for the purposes of the invention, and for reasons which will later appear, it is found desirable to provide a particular type of transfer mechanism between the successive type wheels of each mechanism, and this detail is illustrated more particularly in Figures 6 and 14.

The transfer wheels 32 are mounted loosely on a shaft 33. Each additional type wheel has secured thereto a laterally disposed gear 34 corresponding in all respects to the gear 25 of the initial type wheel but lacking, of course, any internal pawl and ratchet mechanism, as in these instances the gears 34 are merely for stepping up the particular type wheel to which they are attached. The transfer shaft is mounted for movement in a manner which will later appear for bodily moving the transfer wheels from cooperation with the type wheels to a position beyond such cooperation, in order to provide particularly for resetting the type wheels or clearing the machine. The transfer wheels are identical and a description of one will be sufficient.

Each transfer wheel is provided with alternate half teeth 35 and full teeth 36, all of which mesh with the teeth of the wheels 34. Each printing or type wheel on the side opposite its driving gear is formed with a laterally projecting collar 37. On the outer surface of this collar, near the peripheral edge thereof, is a projection 38 having a recess 39 formed between teeth 40. The recess 39 between the teeth is intended to cooperate with one of the long teeth 36 on the transfer wheel (Figure 14). When the collar 37 engages the space or dedendum provided by short teeth 36 between the long teeth 36, the transfer gear is locked, but when the projection 38 engages the alternate long teeth 36, the transfer gear is advanced one tooth. The teeth 40 of the projection 38 never engage a short tooth. This construction is well known in transfer gear construction, and further description is, therefore, unnecessary. However, it will be understood that as each type wheel makes a complete revolution, and during the final step thereof, the next succeeding wheel is moved a single step to advance the same the space of one numeral.

As previously stated, the transfer shaft 33 is bodily movable at right angles to the axis of the tabulating wheels in order that the transfer wheels may be bodily disconnected from the type wheels when necessary to reset such type wheels for clearing the machine. As it is important that the resetting wheels maintain the same relation to their tabulating wheels, means are provided to lock the transfer wheels against movement when moved to free the type wheels to ensure that on

their return into cooperation with the type wheels, proper gearing cooperations will ensue.

For this purpose, there is arranged below the type wheels a strip 41 having a tooth channel 42 to accurately receive a tooth of a transfer wheel. The relation of the strip and the type wheels is such that in the movement of the shaft 33 to disconnect the transfer wheels from the type wheels, a tooth of the transfer wheels will ride into the tooth channel 42 and two such teeth are wholly disconnected from the gear 34 of the type wheels, the depth of the tooth channel, however, permitting continued bodily movement of the transfer wheels to wholly disconnect such wheels and gears 34. Thus the transfer wheels are maintained in their proper relation even when free of the type wheels, and when restored into cooperation with such type wheels will again ensure proper cooperation, as will be evident.

Mounted in longitudinal alignment with the shaft 11 and supported in partitions 3 and 4 is a shaft 43. On this shaft is loosely mounted a number wheel 44, the numbers of which indicate fractional amounts of a unit cost and which wheel 44 is provided with an offset fixed gear 45. On the same shaft and immediately adjacent, though free of the fractional number wheel 44, is a number wheel 46, the numbers on which indicate the unit cost of unit measures of the liquid being dispensed, this number wheel 46, hereinafter termed the unit cost indicating or type wheel, being provided with a gear 47. Also freely rotatable on the shaft 43 are date wheels 48 and 49, the former being peripherally marked to indicate the months and the latter peripherally marked to indicate the days of the month. The wheel 48 has a fixed gear 50, while the wheel 49 has a fixed gear 51. On a shaft 52 in alignment with shaft 43 or forming a continuation thereof are arranged a series of type wheels 53 forming a totalizer.

The transfer mechanism between the wheels may be of any conventional type but is preferably similar to that described, except that it is entirely internal and the transfer gears do not require to be unmeshed. The initial type wheel 55 of the totalizer is provided with a printing adjustment member having triangular teeth 56 corresponding to the member and teeth 24 described in connection with the cost and quantity computing mechanisms. This initial type wheel 55 of the totalizer has a lateral projection 57 adapted to be engaged by a corresponding projection 58 on a driving gear 59, so that in movement of the gear in one direction, the initial wheel of the totalizer is appropriately operated while such initial type wheel is relatively free to be moved in the same direction. The purpose of the totalizer is, of course, to shown on each set of bills rendered the total amount of gasoline or other material dispensed during any selected period.

It will be understood from the above that the computing mechanisms of the recorder involve a quantity computing unit showing the quantity dispensed at any one operation, a cost computing unit showing the cost of such quantity, and a totalizer, all of which units are to be operated in the actuation of the machine. In addition to the registration of these units, however, and for the purpose of printing on the bills to be dispensed, there is included a date indicator and a price indicator showing the price per unit measure charged for the material dispensed, this price indicator including as separate elements a unit

or full digit indicator and a fractional indicator. Quite obviously, the date indicator and the unit measure price indicator are to be manually set and to remain in this set position for printing upon the bills to be delivered so that the customer may know the date of the operation and the cost price per unit measure of the material he has received.

It is, of course, apparent that the operation of the cost computing unit will be varied according to the unit cost per unit measure of the commodity, while the time period remains the same. Thus, if the commodity is ten cents a gallon and ten gallons are dispensed, the cost computing unit must show one dollar, whereas if the cost price is fifteen cents a gallon and ten gallons are dispensed, the cost computing unit must show one dollar and a half. The time period, however, of dispensing ten gallons in each case is the same. Therefore, the variation in the movement of the cost computing unit according to the setting of the unit cost price must be provided for, and this is equally true of the fractional cost price. The mechanism by which these results are gained will now be described.

The means for the variable operation of the cost computing unit is through the use of a stepped gear 60 mounted in partitions 5 and 6 and driven from the main gear 9 operated by a main gear train including one of the gears 61 of a compound gear, the other gear 62 of which is driven by a gear 63 on one side of the partition 5, the shaft of which gear 63 has on the opposite side of the partition a gear 64 meshing with a gear 65 mounted in the partition 5 and provided at one end of a sleeve 66, the opposite end of which carries a beveled pinion 67 meshing directly with the drive gear 9. Motion is thus directly imparted to the stepped gear in the operation of the pump or other delivery mechanism and, of course, if the driving action for the cost computing unit is adjusted relative to the stepped gear, the rate of movement of the cost computing unit will necessarily be varied, this variation being proportioned according to the unit cost of a unit measure. A gear 68 designed for cooperation with any one of the gears of the stepped gear is supported at the upper end of a lever 69 mounted for swinging movement about a shaft 70 supported in partitions 4 and 6, being mounted in a boss projecting laterally from the latter partition. The gearing 68 is in constant mesh with a gear 71 which is keyed for free sliding movement but otherwise fixed relative to the shaft 70.

The gear 71 is mounted upon a boss 72 on which is rotatably supported and otherwise held against relative movement a U-frame 73, the arms of which are slidable in apertures in partition 5. Strictly speaking, lever 69 is mounted on a boss on U-frame 73. Fixed in the frame and extending longitudinally thereof is a worm rack 74 which extends through an opening in the partition 5 so as to permit free longitudinal movement of the rack to prevent its turning. Supported in partition 5 and in a bearing boss extending from the partition 4 is a shaft 75 on which is secured a worm gear 76 maintained in mesh with the rack 74. The opposite end of the shaft is provided with a pinion 77 through which manual movement is imparted to the worm 76 in a manner to be later described.

The mechanism just described is a manually adjustable means for varying the operation of

the cost computing unit where the cost of a unit measure of the commodity being delivered is expressed in whole numbers. The recorder, however, is designed to provide also for variable fractional costs, and as a variation in fractional cost would also require a variation in cost computing mechanism control, provision must be made for setting the machine for such particular fractional cost. A stepped gear 78 is mounted upon a shaft 79 in bearing bosses on partitions 4 and 5, and this stepped gear is driven by a gear 80 fixed in a shaft 81 mounted in bearings in partitions 3 and 4 and provided at one end with a beveled pinion 82 which meshes directly with a drive pinion 10 of the driving element, and constitutes a part of the secondary gear train for driving the fractional cost computing mechanism.

As in the whole number rate, the variation in the fractional rate is secured by varying the rotation of the elements acting on the cost computing unit, and to this end the stepped gear 78 serves as a variable drive. A gear 83 to be driven by the selected gear of the stepped gear 78 is supported upon a lever 84 mounted for swinging movement about a bushing 85 keyed for sliding movement only on the shaft 86, one end of the bushing being formed or provided with a gear 87 in constant mesh with the gear 83. Guided for sliding movement in partition 4 are the arms 88 of a U-frame, the end of which is mounted for free rotary movement on but held against endwise movement relative to the bushing 85.

Fixed with respect to the frame 88 and freely slidable relative to the shaft 86 is a worm rack 89. That is to say, the bushing 85 is held against endwise movement only with relation to the U-frame. The worm rack and thereby the gears 83 and 87 are moved longitudinally of the stepped gear 78 through the medium of a worm 90 fixed upon the shaft 91 mounted in brackets 3 and 4 having a terminal gear 92 beyond bracket 3 by which the worm is selectively driven, as will later appear. The means by which the driven gears 68 and 83 may be adjusted to cooperate with any selected gear face of the respective stepped gears will now be described. This operation is in two stages, both manually controlled, and including first a means for shifting the respective driven gears out of the path of possible engagement with any gear of the stepped gears, and then adjusting these driven gears longitudinally of the stepped gear to cause cooperation with each driven gear and that particularly selected stepped gear as will insure a proper operation of the cost computing mechanism.

First, as to shifting the driven gears out of the operative plane of the stepped gear, it has been stated that the respective gears 68 and 83 are supported on levers 84 and 84 respectively, and as these levers swing in a plane at right angles to the axis of the stepped gear, it is obvious that if the levers are moved, the driven gears 68 and 83 will be moved out of cooperation with the stepped gear. The means to accomplish this result is shown more particularly in Figures 5 and 10 and includes blocks 93 and 94 slidably mounted on guides 95 and arranged on opposite sides of the partition 5. The lever 84 is pivotally supported at 97 and connected through pin and slot connections 98 with the respective blocks so that movement of one will compel movement of the other. A finger piece 99 projecting through

the casing is connected to one of the blocks, as 93, and the block 93 is spring-pressed in one direction by a spring 100 for resilient positioning of the lever-carried gear in cooperation with the stepped gears. Each block 93 and 94 is formed with a channel 101 and 102 respectively, and in these channels rollers 103 carried on the lower ends of the levers 84 and 69 are respectively mounted.

As in the arrangement disclosed, the driven gears 68 and 83 cooperate with the respective stepped gears on opposite sides. The lever 96 compels opposite movement from the blocks 93 and 94 and the slots 102 are arranged at an angle corresponding to the pitch line of the complete stepped gear in each instance so that after the driven gears 68 and 83 have been moved out of the plane of contact with the stepped gears and the adjustment of said gears 68 and 83 axially of the stepped gears has been carried out, the movement of the lever at the block-connected end will follow a line determined by the pitch plane of the stepped gear as a whole and thereby act in any one correlation of the driven gear and stepped gear to prevent a binding gear cooperation, the gear cooperation being further yielding under the influence of the spring 100.

Having thus positioned the respective driven gears beyond possibility of contact with the stepped gear until the finger piece 99 is released, it is necessary, while holding the driven gears in this relation, to adjust them if both adjustments are necessary longitudinally of their cooperating stepped gears to set the rate. This adjustment is carried out manually in the following manner. Beyond one end of the frame casing, as 104, and supported therein are a series of concentric shafts 105, 106, 107 and 108, the latter being the outermost shaft. Secured to the respective shafts beyond the end 103 of the casing are indicating members to determine the various manual adjustments. For example, there is a hollow, annular element 109 secured to the outermost shaft 108 by a key 110, a similar element 111 secured to the shaft 107 by a key 112, a third similar element 113 secured to the shaft 106 by a key 114, and a handle-like element 115 secured to the innermost shaft 105 by a key 116. The elements 109, 111 and 113 have their peripheral indicating surfaces 117 in alignment longitudinally of the axis, while the indicating surface 118 of the element 115 is inclined with respect to the other surfaces and of reduced diameter. The element 109 is one of the date-indicating elements bearing, for example, on its peripheral surface 117 the names of the months, the indicating surface 117 of the element 111 will bear the numbers corresponding to the days of the month, the indicating surface 117 of the element 113 will bear on its surface the whole numbers corresponding to the rate per unit cost of the commodity being delivered, while the indicating surface 118 of the elements 115 bears successively indicating numerals progressively increasing by tenths. It is preferred, of course, that this indicating mechanism be enclosed, with the enclosure provided with openings 119 serving to indicate the proper adjustment by exposure of the predetermined element through the openings in each instance.

Secured upon the inner end of the shaft 108 is a gear 120 which cooperates directly with gear 50 connected to the type wheel bearing the names of the months. Therefore, by adjustment of the

element 109 until the proper month appears in the opening 119, the type wheel 48 will be correspondingly adjusted to set the proper month type in printing position. The shaft 107 carries within the casing a terminal gear 121 which meshes directly with gear 51 carried by the type wheel bearing the days of the month, and under proper adjustment of the element 111 this type-bearing wheel 49 may be set to arrange in printing position the proper day of the month. Thus the date is set.

The shaft 106 is provided beyond the gear 121 with a gear 122 which meshes with the smaller gear 123 of a compound gear mounted for free rotation in a boss 124 projecting from partition 4, the larger gear 125 of the compound gear meshing with a freely mounted gear 126, which in turn meshes with gear 77 on the end of adjusting shaft 75. Therefore, by turning the element 113, the shaft 75 carrying the worm 76 is rotated, and through the cooperation of the worm 76 with the worm rack 74, the gear 68 which has, by the means previously described, been held out of possible contact with the stepped gear, is moved longitudinally of the stepped gear to a position determined by the adjustment of the element 113. If the rate per unit measure of the commodity being dispensed is a whole number, the release of the finger piece 99 permits the rear gear 68 to move into cooperation with the gear element of the stepped gear with which it has been aligned through the adjustment of the element 113 as described so that the ratio between the selected element of the stepped gear and the driven gear 68 will, in a manner to be later described, operate the units of the cost computing mechanism at proper speed to measure up the cost of the unit measures dispensed at the rate to which the adjusting element 113 has been set.

Secured upon the inner end of shaft 105 is a gear 127 meshing with the smaller gear 130 of compound gears 129 supported for free rotation in partition 4, the larger gear 128 of which meshes with the gear 92 mounted on shaft 91 carrying worm 90. Thus element 115 is adjusted to show a fractional cost rate, the worm controlling the position of the gear 83 with relation to the stepped gear 78 being adjusted so that when the finger piece 99 is released, this gear 83 will be set for operating on the cost tabulating wheels to add thereto an amount equaling the number of unit measures dispensed, multiplied by the fractional rate for which the element 115 is set. The whole number rate controlled by the stepped gear 60 will be set up on the cost type wheels in the following manner:—

The shaft 70 is provided with a fixed gear 132 which, as said shaft 70 is driven through the operation of the stepped gear, gear 68 and 71, is also driven. Gear 132 cooperates with a gear 133 idly supported from partition 6, the movement of which through successively meshing and idly supported gears 134 and 135 communicate movement to gear 20 of the cost computing mechanism so that this mechanism is driven directly at a rate controlled by the relative ratio of the selected gear of the stepped gear 60 and gear 68. As the stepped gear 60 is driven at constant speed, the gears for operating such stepped gear are utilized as the driving means for the quantity computing mechanism, in that gear 64 forming part of the train for driving the stepped gear is utilized to drive a gear 136 idly supported on partition 5 and directly meshing with driving gear 21 of the quantity computing

unit. Thus, the cost computing unit and quantity computing unit are driven, the driving of the quantity computing unit being, of course, constant, as it merely indicates the particular number of units dispensed at a particular operation, while the driving of the cost computing unit is variable according to the rate per unit measure of the commodity being dispensed, all of which will be clear from the above description.

If and when a fractional rate is necessary, it is quite apparent that the fractional rate must be considered by itself and cannot be utilized as a means for additionally driving the cost computing mechanism at the same time as such cost computing mechanism is driven by the whole number rate. Provision is made, therefore, for setting up and energizing means for the fractional cost computing mechanism under a tension determined by the fractional rate for which the machine is set, and then after the cost computing mechanism has been set according to the whole number rate, this cost computing mechanism is released to the influence of the stored up energy of the fractional computing mechanism so that this energy is utilized to move the cost computing mechanism to a further extent determined by the fractional rate.

In providing for the storing up of this energy for the automatic setting of the fractional rate on the cost computing mechanism, shaft 86 is extended beyond the partition 5 and provided with a gear 137 meshing with the larger gear 138 of a compound gear idly supported in partition 5. The smaller gear 139 of this compound gear meshes with a gear 140 fixed upon a shaft 141 mounted in partitions 5 and 6. Mounted on shaft 141 are cooperating clutch units 142 and 143. The proximate faces of these units are formed with clutch teeth 144 and the unit 142 is keyed for sliding movement on but otherwise fixed with respect to the shaft 141, as indicated at 145.

The clutch unit 143 includes a drum 146, a gear 147, and a further and smaller gear 148. The drum 146 constitutes the element which, when rotated in order to add the fractional rate to the cost computing mechanism, is operated against the tension of an energizing member to store up a tension with respect to this drum which, when the drum is released, as will later appear, operates under this tension to a predetermined extent to correspondingly actuate the cost computing unit for the purpose of adding thereto the fractional amount. To provide for the tensioned operation of the drum, there is secured to the drum one end of a spring 149, the spring being coiled about the drum and having an end 150 fixed to the frame or casing. As the drum is rotated in one direction, the coils of the spring will be tightened and the drum, when released, will operate under the tension of these spring coils for movement in the opposite direction.

To ensure that the drum will not move past a predetermined or zero point on its return, a fixed stop 151 is provided, with which a movable stop 152 on disk 153 cooperates. The cooperation of these stops indicates the zero position of the drum, and when the drum has been moved to tension the spring, the movable stop moves away from the fixed stop and when the drum is released it will return under the tension of the spring until the stops again cooperate. Thus notwithstanding the tension of the spring, the drum is permitted to move under such tension

only to a zero position. In the example shown in the gear ratio between the gear 142 and the gear 154 is such that drum 143 can rotate approximately $2\frac{1}{2}$ times while the disk 153 is making one revolution. Thus, the drum 143 can move sufficiently to store up energy to take care of the fractional cost for approximately one hundred gallons of gasoline dispensed. By changing the gear ratio above set forth, it will be possible to accommodate additional fractional units to enable the device to operate on a greater quantity dispensed at any one operation. In practice, however, it is entirely feasible to operate the pump on the present basis in successive increments of one hundred gallons. Therefore if more than this quantity is desired in a particular dispensing operation, it would only be necessary to operate the apparatus two or more times.

The stop 151 is carried by the partition 5, while the movable stop 152 is on a disk 153 having gear connection through compound gear 154 with gear 148 on the drum 143. The gearing relation is such that the drum 143 may be tensioned to desired extent in the operative direction, but when released under the tensioning means for setting the fractional rate into the cost tabulator, such drum can only move to the zero position determined by the cooperation of the stops 151 and 152. Of course, the drum is free of the shaft 141, and as the clutch unit 142 is keyed to the shaft, it is quite apparent that when the clutch units are in cooperation, the drum may be rotated in a direction to tension the spring, but that so long as the clutch units remain in cooperation, the drum cannot move in the opposite direction to transmit its stored power to the cost computing unit.

The clutch element 142 is formed in part as a bushing 155 which is directly keyed to the shaft 141 and rotatably supported in an arm 156. The arm then serves as a movable element through mechanism to be later described, by which the clutch unit 142 may be moved into cooperation with the clutch unit 143 or moved from such clutch cooperation. When the clutch units 142 and 143 are in cooperation, the clutch unit 143 is in effect movable with the shaft 141, whereas when the clutch unit 142 has been moved by operation of the arm 156 to disengage it from the clutch element 143, then the latter clutch element 143 is wholly free of connection with the shaft 141 and is capable of independent rotation thereon.

Supported upon the shaft 157 mounted in partitions 5 and 6 and parallel with shaft 141 is a clutch element 158 rotatably supported on the shaft and in an arm 159 by which the clutch element may be moved longitudinally of the shaft for clutching and declutching cooperation. The clutch element 158 carries a gear 160 which meshes with the gear 147 of the clutch element 143. A clutch element 161 mounted for free rotation on shaft 157 and designed for tooth cooperation with clutch element 158 is provided with a gear 162 which meshes at all times with gear 25 of the initial wheel of the cost tabulating mechanism.

It is, of course, to be understood that unless the pinion 83 is in gear cooperation with one of the gears of the stepped gear 78, no movement will be imparted to the shaft 86 and, therefore, the drum 143 will not be tensioned. For normally, i. e. in the absence of any adjustment of the member 115, the gear 83 is free of any of the

gears of the stepped gear 78. Therefore, until it is desired to add a fractional cost, the parts described in connection with this cost are without function, under which circumstances, of course, the cost computing mechanism indicates the cost per unit measure of the commodity in whole numbers controlled by the stepped gear 60 and the pinion 68, as previously described.

If, however, the cost price includes a fraction, and the member 115 has been set to indicate this fraction, the pinion 83 will be positioned in cooperation with the proper gear section of the stepped gear 78 and the drum 143 will be tensioned to the desired extent. After tensioning, however, the gear 143 will be held in this tensioned relation because it forms part of a clutch and is in clutch cooperation with companion clutch member 142 which is not rotatable with respect to the shaft.

It has been stated that clutch 142 is controlled by arm 156 and that clutch element 158 of the other clutch is controlled by arm 159. These arms 156 and 159 are fixed upon a shaft 163 supported for free longitudinal movement in partitions 5 and 6, the arms 156 and 159 being so connected to the shaft that the two sets of clutch elements are always in relatively opposite relation, i. e. when the clutch elements 142 and 143 are in clutching cooperation, the clutch elements 158 and 161 are free, and when clutch elements 158 and 161 are in clutching cooperation, clutch elements 142 and 143 are free. Shaft 163 is influenced in one direction by a spring 164 which tends to normally maintain the shaft and arms 156 and 159 in such position as to maintain the clutch elements 142 and 143 in clutching cooperation and the clutch elements 158 and 161 in declutched relation. The opposite condition is automatically secured by mechanism which will be later described. Referring to Figure 26 which shows the clutch members 142 and 143 engaged and clutch members 158 and 161 disengaged, it may be pointed out that the space between the respective clutch members shown in the drawings is greatly exaggerated for purposes of illustration. In practice, the teeth on the clutch faces are very fine and only a space of from .0007 to .0001 of an inch is provided.

From the above description, it will be apparent that the mechanism so far employed responds, after manual adjustment, to the action of the fluid dispensing unit with which the recorder is attached as, for example, a gasoline pump. The manual adjustments reside in operation of the push button 99 to move the gears 68 and 83 beyond the respective stepped gears 60 and 78. The members 113 and 115 are adjusted to establish the rate per unit measure of the commodity dispensed at which the machine will be operated. Of course, if this rate is a whole number, only adjustment of the member 113 is necessary, whereas if there is a fractional part involved in the cost rate, the member 115 will also be adjusted to set this fractional part for subsequent machine operations.

It is, of course, assumed that the members 109 and 111 have been adjusted at the start of the day's business to set the date, and it is further apparent from the description that the adjustment of the members 113 and 115 set up the rate on the respective printing dials 46 and 44. Of course, the setting up of the whole number price and fractional part price, if the latter is required, positions the gears 68 and 83 in proper alignment with the selected gear element of the respective

stepped gears 60 and 78, and upon release of the finger piece 99, the gears 68 and 83 are brought into cooperation with the proper gear section of the respective stepped gears. The gasoline pump or other dispensing unit is then operated to dispense the required number of unit measures. During this operation of the pump or other dispenser, the totalizer tabulating mechanism is operated in a step by step movement to add the number of units dispensed to the previously indicated total in this unit, the quantity computing mechanism is operated to indicate the number of units delivered by the pump in the particular operation being effected, and the cost of this number of units is indicated on the cost computing mechanism through the gearing previously indicated. Simultaneously with this operation, if the cost per unit includes a fraction, the drum 144 has been rotated through the driving of shaft 141 and cooperating clutch element 142 which is at this time in clutching cooperation with the clutch 143, of which drum 144 forms a part. This rotation of drum 144 tensions spring 149 and tensions this spring, of course, in direct proportion to the fractional rate, the higher the fractional rate, the higher the tension of the spring. The fractional rate is thus stored up in the machine because as long as the clutch elements 142 and 143 remain in cooperation, the drum 143 is not free to be rotated under the influence of the spring 149, as is necessary to add the fractional rate to the whole number cost rate.

From this it will be understood that the whole number cost is directly indicated on the cost computing mechanism as the pump or dispensing unit is operated, but that the fractional rate is during this operation stored up as a source of energy which will be independently added to the cost tabulating mechanism after the completion of the whole number rate on that mechanism, i. e. after the dispensing unit or pump has ceased to operate. Following this operation of the machine, there is an automatic operation wholly independent of the pump or other dispensing unit, this automatic operation being inaugurated by a manual movement of a push button and serving to first provide for the automatic operation of the cost tabulating mechanism through the stored up energy mechanism of the fractional rate, if such fractional rate has been employed; then the type wheels of the computing mechanism controlled by the dispensing unit or pump are moved so that the numbers expressed thereon are in proper printing position; then the bills, of which three are employed in the present machine, are successively printed and moved into a position beyond the casing, from which they may be detached; then the means for placing the type wheels in printing position are moved out of cooperative control of such tabulating wheels; then the transfer gears between the type wheels of the respective tabulating mechanisms are moved out of meshing cooperation with such type wheels; the release of the type wheels from cooperation with the mechanism for setting them in printing position and the removal of the transfer wheels from meshing cooperation with the tabulating wheels being accomplished during the movement of the third bill beyond the casing and being completed before the third bill reaches such position; then mechanism is inaugurated to return all type wheels to a zero position for clearing the machine; then the transfer wheels are returned into meshing cooperation with the type wheels; and finally the manually operable key or

button by which this automatic operation has been inaugurated is returned to normal position which, of course, restores the fractional rate mechanism operated by the pump to a position for again storing up fractional rate energy in a succeeding operation of the pump.

This automatic mechanism will now be described. Supported upon one end wall of the casing is a motor 165, the shaft 166 of which operates through a worm drive 167 to drive the shaft 168 supported in appropriate bearings on the end wall of the casing. A worm 169 is mounted in the shaft and cooperates with a worm gear 170 mounted for free rotation on a shaft 171. A disk 172 is fixed to the shaft 171, and a spring 173 is terminally secured to the worm gear 170 and the disk 172. This spring is of sufficient strength to form a driving medium between the worm gear and disk when the spring is in normal relation, i. e. not under tension.

Mounted for swinging movement in the end wall of the casing is a starting arm 174, the upper free end of which has a lateral projection 175 designed to fit in a recess 176 in the edge of the disk 172. The arm 174 is provided with a switch 177 which, when the arm is pressed to release the disk, closes the motor circuit, indicated generally at 178. The arm 174 is provided with a finger enlargement 179, and it is evident that when this arm is operated, the projection 175 is moved from cooperation with the notch 176 and closes the motor circuit at the same time. The motor then operates to effect the mechanism and when the disk has been moved one revolution, the arm extension 175 will move back into the notch 176 and so interrupt disk movement and at the same time stop the automatic operation. This return movement of the arm is under the influence of spring 164 previously referred to and which will be again referred to in this connection.

The projection 175 is preferably provided with a ball 180 which provides an anti-friction bearing between the projection and the inner side of the disk during the rotation of the disk. Of course, as the arm returns to locking cooperation with the disk, the motor circuit is interrupted but the momentum of the motor will tend to a slight continued rotation of the worm gear 170. This independent rotation of the worm gear 170 is permitted by the spring 173, and thus when the motor finally comes to rest, spring 173 is under some tension. Therefore, when the arm 174 has been initially operated to start the mechanism, the movement of the projection 175 out of the recess 176 releases the disk 172 to the tensioned spring 173 so that practically before the motor starts to operate, the disk 173 will be moved by the spring to carry the recess 176 out of alignment with the projection 175 to thus prevent the possibility of the arm, if immediately released, returning to lock the disk against movement.

Underlying the arm 174 is a pin 181 mounted for free sliding movement in the end wall of the casing. The inner end of the pin is connected to a lever 182 pivotally supported on the end wall of the casing at 183, the upper end of the lever being connected to the shaft 163 for moving the clutch arms 156 and 159 controlling the introduction of the energy of the fractional rate cost into the cost tabulating mechanism. Therefore, assuming the fractional rate to be in use and the drum 144 energized for movement by the spring 149, it will be apparent that on initial movement of the arm 174, this drum 144 is released from co-

operation with its companion clutch element 142 by movement of the arm 156 toward the right in Figure 26, while at the same time the clutch element 158 is moved into cooperation with the clutch element 161 by corresponding movement of the arm 159. The drum is thus free to be moved under the influence of the tensioned spring 149, and as the gear 147 of this drum is in driving cooperation with the gear 160 of the clutch element 158, and as this clutch element 161 and the gear 162 of this element 161 are in cooperation with the driving element 25 of the initial type wheel, it is apparent that the spring will operate the drum 144, the clutch elements 158 and 161, and the gear 162 and so move the initial type wheel of the cost computing mechanism and, if necessary, the additional type wheels through the transfer wheels or gears to the extent permitted by the tension of this spring 149 previously set according to the fractional rate selected.

As the drum cannot move under the influence of the spring beyond its normal or set position owing to the cooperation of the stops 151 and 152 previously described, it is apparent that the exact fractional rate energy is transferred to the cost computing mechanism and added to the already set whole rate operation of that cost computing mechanism, thus finally indicating on this cost computing mechanism the total cost of the number of unit measures delivered by the pump at the rate for which the recorder has been previously set, including the whole rate and fractional rate. The drum 144 has been restored to normal position, i. e. to the position limited by the stops 151 and 152, and is ready to add in the fractional rate at the next operation of the drum. The respective clutch elements which have been operated by the movement of the shaft 163 under the pin 181 will be held in this position during the rotation of the disk 172, the arm 174 being under return influence by the spring 164 so that when the disk has completed one revolution, spring 164 restores the various clutch elements of the fractional rate set up to normal position and at the same time moves the projection 175 into the recess 176 to lock the disk 172.

During rotation of the disk 172, however, a number of additional operations are carried out, but it is understood that the addition of the set-up fractional rate energy has been added to the cost rate computing mechanism immediately following initial operation of the arm 174 and as the first step in the automatic operation. The next step in the automatic operation is to advance the type wheels which are directly controlled by the operation of the pump to a printing position. It will, of course, be understood that in order for proper printing, the numbers on the type wheels to be printed must be aligned, and it will be further apparent that in the operation of the pump, particularly where a fractional rate is employed or a part of a unit measure is delivered by the pump, the numbers of the type wheels may be left in a position in which such numbers are out of line with a printing line position. Under these circumstances, the numbers would not be printed on a bill, and hence it is necessary to first align these type wheels so that the proper number will be in printing line. As previously stated, the initial type wheels of the computing mechanism directly controlled by the pump are provided with toothed wheels 24 and the proper aligning of the numbers on the type wheels is secured through the cooperation of the pawls and these toothed wheels 24.

Mounted to rotate between the end of the casing and the partition 6 is what may be termed a drive unit 184. This unit includes a gear 185 meshing with a gear 186 integral with the cam 187 mounted on shaft 188 which is mounted in partitions 2 and 6 and extends through partitions 3, 4 and 5 and supported freely on a boss 189 is an angle arm 190, the free end of which is provided with a roller 191 bearing against the cam 187. At the opposite end of the arm is an elongated opening 192 in which is seated a roller 193 on the end of a block 195 carrying a shaft 194, which shaft extends through partitions 2, 3, 4, 5 and 6 extending through elongated openings in said partitions. The shaft 194 is mounted at its respective ends in slide blocks 195 guided in ways 196 on the respective partitions 2 and 6, it being understood that the cam 187, angle arm 190 and cooperating parts are duplicated on partition 2.

Mounted on the shaft 194 in position to engage the triangular toothed wheels 24 of the initial type wheels of the cost, quantity and totalizer are pawls 197. These pawls, which are more particularly illustrated in Figure 4, have their upper ends formed with an incline 198 extending from the vertical longitudinal median line of the pawl in a forward direction and a sharper and longer incline 199 extending in the opposite direction. These inclines are designed to cooperate with the triangular tooth 24 of the respective initial type wheels of the cost, quantity and totalizer computing mechanisms, and as the shaft 194 is moved upwardly under the operation of the arm 190 and the cam 187, the pawls enter between the immediately overlying triangular teeth and move the teeth and thereby align the initial type wheel to such a position that the nearest numeral thereon will be arranged in printing line. If these type wheels are arranged so that the number next to be positioned has been moved by the pumping mechanism more than half way to such position, the triangular teeth of the elements 24 are such that they will be engaged by the inclines 198 of the pawls, with the result of advancing the type wheels. If, however, the number has not traveled at least half the distance toward proper position, the incline 199 will engage the forward face of the rearward tooth and move the type wheel backwardly. In any circumstances, the pawls will properly position the next appropriate number of the type wheels in printing position and these pawls will further serve to lock the type wheels against further movement during the printing operation to be later described.

If the type wheels are advanced in one direction, there is no interference from the pawl 28 of the feeding gear 20, i. e. the type wheel may be moved in this direction without necessitating movement of the gear 20 which is, of course, locked by its cooperating driving gears. Movement of the type wheel in the opposite direction, however, which would ordinarily be resisted by the pawl 28, is permitted to the limited extent necessary by the spring 31.

In connection with the printing operation, it is to be noted that the bills are printed from a sheet of paper mounted upon a roll, and it is to be understood that this paper is originally printed for all necessary data other than that to be printed thereon by the recorder. The roll of paper 200 has the shaft 201 therefor freely suspended in bearings on partition 6 on the opposite end of the casing. The paper from the roll passes over a guide roller 202 and depends in front of the type wheels. Below the type wheels

the paper passes between two rollers 203 and 204, referred to as the delivery rollers and preferably having rubber or other ribbed surfaces to insure gripping cooperation with the paper. The roller 203 is mounted in slide bearings 205 and roller 204 is suspended on bearings 206. The paper is delivered by the feeding pressure of the rollers 203 and 204 through a slot 207 in the bottom of the casing.

Ribbon-carrying rollers 208 are mounted on adjustable pins 209 and 210 sliding in projections 211 and 212. A ribbon 213 is connected to and wound upon the respective rolls, the ribbon passing over guide rollers 214 located above and below the printing plane, with the ribbon located outwardly beyond the paper relative to the type of the type wheels. It is understood that the shaft 188 is continued through to the opposite end of the machine and provided with a gear 215 forming an integral part of a drive unit 216 similar to unit 184. These drive units include cams 217 having triple identical cam surfaces 218 which cooperate with and actuate rollers 219 serving to move slide members 220 mounted in guideways in the ends of the casing, which slide members carry a printing bar 221 which, through the medium of the cam and a spring 222, is reciprocated in the printing line to force the paper and ribbon against the type on the type wheels which are in that printing line. The springs 222 operate to hold the printing bar away from printing position and such bar is forced to printing position at successive intervals by the cam surfaces 218 of the cams 217.

As the present recorder is designed to print three identical bills, it is obvious that the delivery rollers must rotate at three independent periods in order to deliver three successive bills after the printing operation thereon. To secure this result, the respective drive units are provided with intermittent gears 223. Meshing and locking in correct sequence with the intermittent gears 223 and fixed with relation to the said gears are two gears 224 which mesh with compound gears 225, with the larger gear thereof meshing with a gear 226 on the shaft to feed roller 204. Thus one revolution of the drive units will rotate the delivery rolls to dispense a bill, with an intermediate period between delivery action allowed for printing, determined by the synchronization and relation of the cooperating elements. It is to be noted, however, that all of the printing operations for the three bills and the delivery of the three bills is carried out during one revolution of the drive units.

The transfer wheels 32 are mounted for free movement on the shaft 33, and this shaft is mounted in bosses 227 carried by slide members 228 sliding in guide projections 229 mounted in partitions 2 and 6. The slides 228 have cam openings 230, within which projections 231 carried by the drive units rotate. The cam openings are so shaped and timed that when the drive units revolve, the projections 231 will move the slide members 228 down, thus carrying shafts 33 and with them the transfer gears or wheels 32 out of mesh with the gears of the type wheels and into cooperation with the locking strip 41. This action is timed to take place while the third bill is being printed and the transfer gears are fully out of mesh with the type wheels as soon as the third bill has been printed.

Following the freeing of the tabulating wheels from the transfer wheels, it is necessary to reset the type wheels to zero position, or in other words

clear the machine. In carrying out this operation, the drive unit includes a mutilated gear 232 meshing at the proper time through a gear 233 with a gear 233' fixed in a shaft 234 suspended in bearings in partition 6. On the shaft 234 on the opposite side of partition 6 is a gear 235 meshing with a gear 236 fixed on shaft 11. To prevent gear 233 from moving due to vibration when not in mesh with the mutilated gear 232, a locking disk 237 integral with the drive unit fits a concavity 238 in a disk 239 integral with gear 233. By this means the teeth of gear 233 are held in position for correct operation when the actuating period arrives, and the gear ratio in this detail is such that the gear directly driving shaft 11 causes that shaft to make but a single revolution.

Secured to each of the type wheels is a spring strip 240, and the shaft 11 is cut away to provide an abrupt shoulder 241, the free end of the spring strip 240 riding over this shoulder in the normal operation of the type wheels for computing purposes. As the shaft 11 is not rotated by the type wheels but is only rotated in the proper direction in the resetting of these wheels, it is apparent that if so rotated, the shoulders 241 will engage the ends of the spring strips 240 in each wheel as such spring is reached, and as the shaft makes only one rotation, it is quite apparent that all spring strips 240 will be engaged and carried to a definite position, which is the zero position of the type wheel.

After the tabulating wheels have been set by the actuation of the dispensing unit, the spring strips 240 of the respective wheels will be in different positions, but the shaft 11 when making one revolution will engage all of these springs and will carry all of the springs to the same relative position, and as these springs are arranged with definite regard to the zero type on the type wheels, this definite position of the springs following the complete revolution of the shaft 11 will be such as to arrange the zeros on the respective tabulating wheels in zero position. Thus the machine is cleared. Immediately the shaft 11 ceases to rotate, the transfer pinions are returned to normal position, thus locking all tabulating wheels in the cleared or zero position.

It will be remembered that the clutches controlling the transfer of the fractional rate are restored to normal position before the type wheels are cleared. Under these circumstances, there would be a transfer of movement from the initial type wheel being cleared to the drum 144 and hence a tendency to wind this drum to tension the spring, which might interfere with subsequent proper fractional determination. To overcome this, gear 162 is provided with the unit 242 having on its inside diameter a plurality of fine teeth 243. A disk 244 is mounted upon a boss carried by the clutch element, this disk carrying a latch 245 held in mesh with the teeth 243 by a spring 246. Thus, when the type wheels are returned to zero, the latch 245 rides freely over the teeth 243 and there is no corresponding movement of the clutch elements.

The recorder provides for arranging the machine to indicate whether the particular amount noted on the bills is paid in cash or to be charged to an account. To secure this result, a lever 247 is fulcrumed on partition 5, one end of which projects through an opening in the bottom of the casing provided with a finger piece 248 on which is marked "Account" or an abbreviation of such. The opposite end of the lever is connected to a

slide member 249 sliding in ways 250 on partition 5 and bearing on its face two lines of type 251 and 252. The first of these is marked to print "Account" and the second of these is marked to print "Cash". In the normal position of the lever, the cash type is in the line of printing, the lever being operated to move the account type in the line of printing if the amount indicated on the bill is to be charged to an account.

Swinging on the lever 247 is a latch 253 so formed as to engage with a projection 254 under the influence of a spring 255 when the lever 247 is moved to bring the account type 251 in the printing line. The latch 253 is also, when engaged with the projection 254, in the path of movement of the cam 255' mounted on shaft 188. A spring 256 operates to normally move lever 247 to a position to hold the cash line of type in the printing position when the latch 253 is free of the projection 254.

Thus, when it is desired to print "Account" on a particular set of bills, the lever is pressed and moved to a position to hold the account line of type in the line of printing, under which circumstances the latch 253 will engage in the notch 254. After the bill has been printed and in the final operation of the shaft 171, the cam 255 engages the latch and moves it from beneath the projection 254, permitting the spring 256 to return the lever 247 to normal position, i. e. with the cash line of type in the printing line.

From the construction described, it will be apparent that the recorder may be set for any cost price within its limits, whether this cost price be a whole number or a whole number and a fraction per unit measure of the commodity being dispensed. After the machine is set in accordance with the cost price, the operation of the dispensing unit or gasoline pump will move the type wheels to indicate on the totalizer an added amount to indicate on the quantity tabulator the amount dispensed at the particular operation and to indicate on the cost computing mechanism the cost of the number of units dispensed at the whole number price for which the machine is set. If this cost per unit includes a fraction, the fractional total cost will be set up by tensioning a spring to operate a drum and this sum will immediately, following the inauguration of the automatic mechanism, be added to the cost price on the cost computing mechanism.

After the completion of the pumping operation, the automatic device is set in operation by the pressure of a button, and during this operation the fractional cost price is first added to the cost computing mechanism, the type wheels are adjusted to insure that the proper type on such wheels will be in the printing line, three bills are successively printed and delivered, the transfer gears are moved from cooperation with the type wheels, and the type wheels are reset, i. e. the machine is cleared for the next operation.

In order that the feeding pressure on the bills may be relieved when it is necessary to refill with paper roll or ribbon, the feed roller 203 is connected to a door 257 which also carries the guide projections for the inking ribbon. Therefore, as the door is opened, the roller 203 is moved away from the roller 204, which not only provides access to the drums but permits the easy replacement of the end of the new paper roll of printed bills inserted in the machine. The shaft of roller 204 carries a cam disk 258 having a cam depression 259 which cooperates with a roller 260 on an arm projecting through an opening in the

bottom of the case and having a cut-off 261 having a sharpened edge 262 which aligns with or substantially closes the outlet slot 207 for the paper or printed bill. The relation is such that following the delivery of the bill, and when a particular bill is in fully delivered position, the roller 260 will cooperate with the cam depression 259 and the spring 263 will move the cut-off across the opening 207, thus not only clamping the last bill but providing an edge on which it may be conveniently torn or separated from the succeeding bills.

Of course, it will be understood that any of the internal parts, i. e. the gears and cooperating mechanism, may be independently enclosed in casings or protective coverings in order to protect such mechanism and in order further to protect the paper or other parts against any grease or lubrication for the parts.

I claim:—

1. A computing and registering device comprising a driving element, a units total registering means, means between said driving element and said units total registering means whereby the latter is driven to register total units, means normally disconnected from said units total registering means and normally operatively connected with said driving element to be driven thereby to absorb motion corresponding to unit fractions, said last named means being releasable to expend its absorbed motion, and means for releasing said motion absorbing means and for simultaneously connecting it with the units total registering means for transfer of its absorbed motion to said units total registering means, thus to cause the latter means to register the total of both the units and the unit fractions.

2. A computing and registering device comprising a driving element, a units total registering means driven by said driving element to register part of a total, spring means normally disconnected from said units total registering means and normally connected with said driving element for operation by the latter to releasably absorb motion corresponding to the remaining part of the units total and means for disconnecting said spring means from said driving element and for simultaneously connecting it with said units total registering means for transfer of its absorbed motion to said units total registering means.

3. A computing and registering device comprising a driving element, a units total registering means, selective variable ratio gearing between said driving element and said units total registering means whereby the latter is driven to register total units, a motion absorbing device normally disconnected from said units total registering means, selective variable ratio gearing between said driving element and said motion absorbing device whereby the latter is driven and absorbs motion corresponding to unit fractions, said motion absorbing device being normally releasable to expend its absorbed motion, and means for releasing said motion absorbing device and for simultaneously connecting it with the units total registering means for transfer of its absorbed motion to said units total registering means.

4. A computing and registering device comprising a driving element, a units total registering means, a driving connection between said driving element and said units total registering means, a device normally disconnected from said units total registering means and driven by said driving element simultaneously with said units total

registering means to absorb motion corresponding to unit fractions and means for connecting said motion absorbing means to said units total registering device for transfer of its absorbed motion to the units total registering means.

5 5. A computing and registering device comprising a driving element, a units total registering means, a driving connection between said driving element and said units total registering means, a
10 motion absorbing device normally disconnected from said units total registering means, a unit fractions driving connection between said motion absorbing device and said driving element including a clutch, said motion absorbing device
15 including a drum having a normal position from which it is movable by said driving element when said clutch is engaged, and a spring energized by the movement imparted to said drum by the driving element and tending when so energized to return said drum to its normal position
20 and operable to do so upon disengagement of said clutch, and manually operable means for releasing said clutch and for simultaneously establishing a driving connection between said
25 drum and said units total registering means so that the spring effected return movement of the drum to its normal position is transmitted to the units total registering means.

30 6. The combination as set forth in claim 2 including means for automatically reestablishing the normal disconnected relationship between the motion absorbing device and the units total registering means and the normal connected relationship between the motion absorbing means
35 and the driving element, following actuation of the manual means to establish the opposite relationship of said parts.

7. A computing and registering device comprising a driving element, a units total registering
40 means, selective ratio gearing connecting said driving element with said units total registering means, a motion absorbing device, a selective ratio

gearing connection between said driving element and said motion absorbing device including a normally engaged clutch, a normally disengaged clutch between said motion absorbing device and said units total registering means, and manually operable means for disengaging said first mentioned clutch and for simultaneously engaging said second mentioned clutch for transfer of the absorbed motion of said motion absorbing device to said units total registering means.

8. A computing and registering device including a driving element, a units total registering means, gearing operatively connecting the driving element with said units total registering means for driving the latter to register units, unit fractions computing means normally disconnected from the units total registering means and including a spring drum also geared to and energized by said driving element simultaneously with the operation of the units total registering means, and means for connecting the unit fractions computing means with said units total registering means and for simultaneously releasing the energy stored in said spring drum to additively influence the units total registering means.

9. A computing and registering device including a driving element, units total registering means including character wheels, a gear train for connecting the units total registering means with the driving element, a second gear train connected with the driving element, unit fractions computing means including a drum operatively connected with said second gear train to be driven by said driving element independently of the units total registering means, a spring to be tensioned by movement imparted to said drum, and means including a clutch between the drum and the units total registering means for connecting the drum to the units total registering means for operation of the latter by said spring.

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