Oct. 1, 1929. B. M. SHIPLEY 1,730,094

CASH REGISTER

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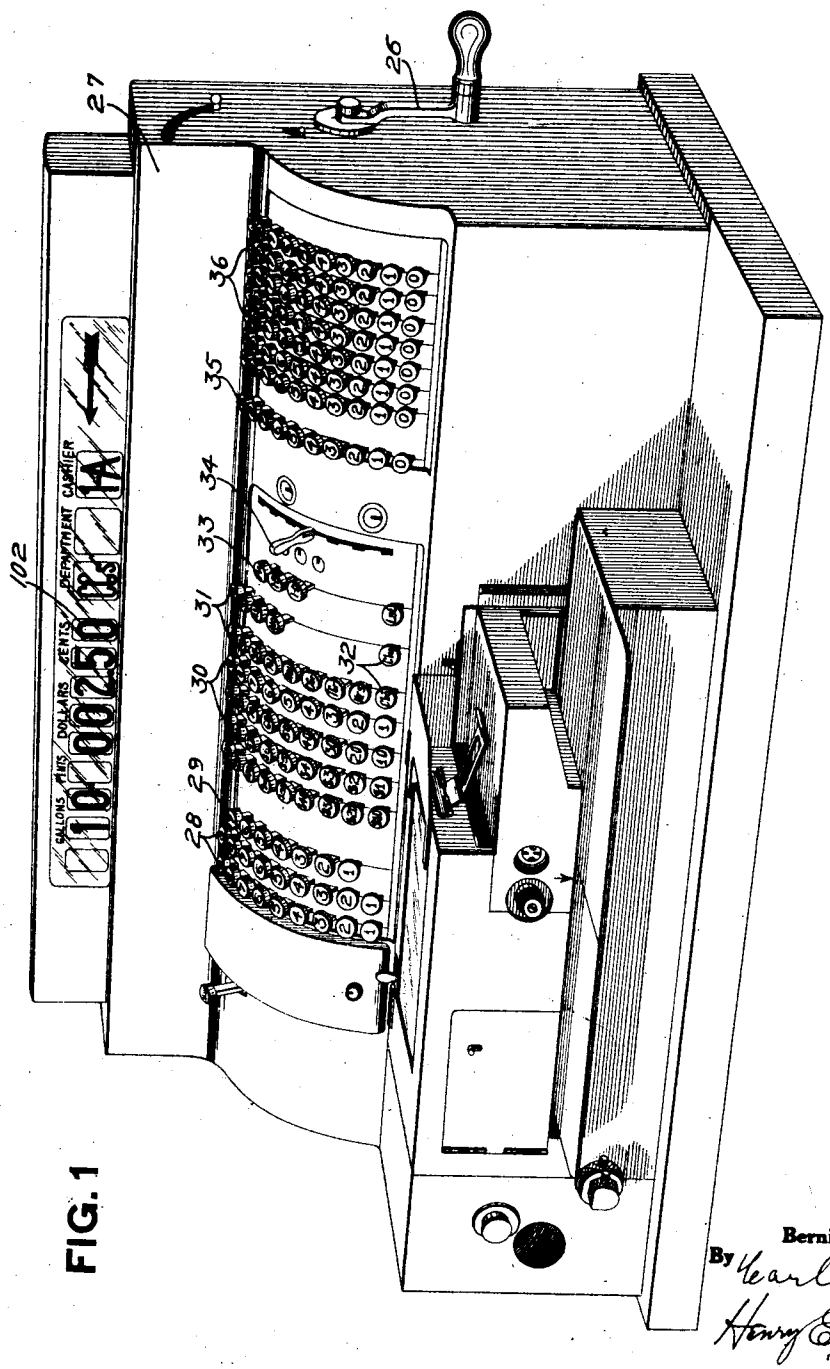


FIG. 1

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FIG. 2

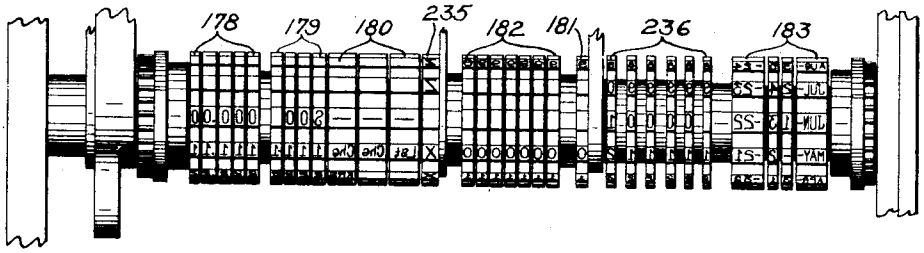
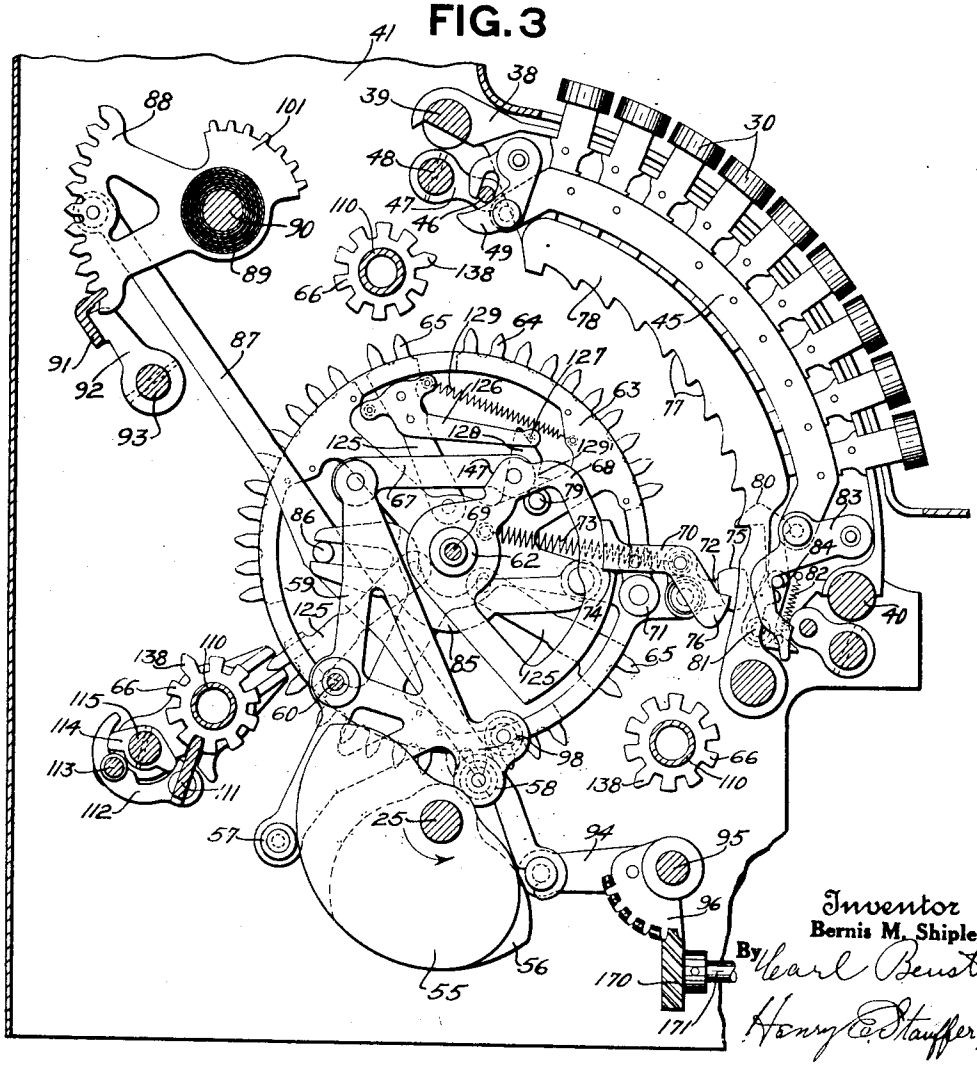


FIG. 3



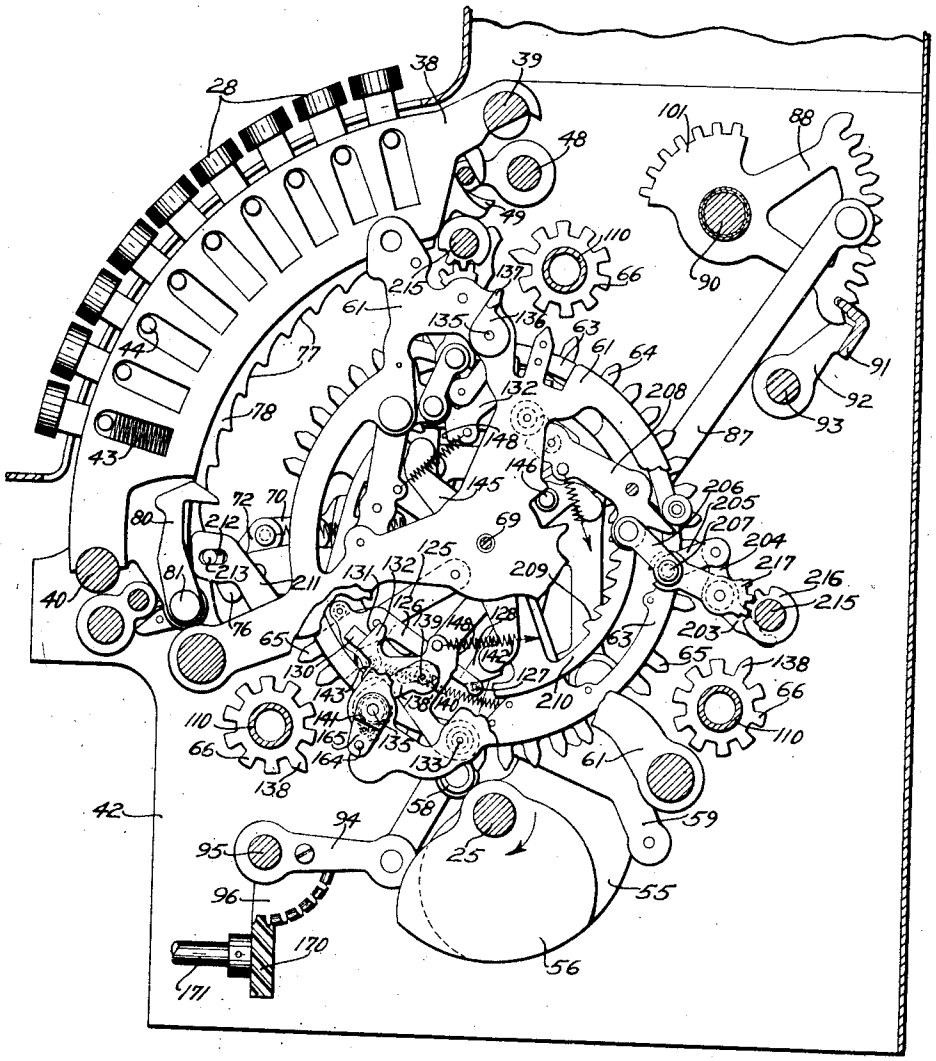
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CASH REGISTER

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FIG. 4



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FIG. 5

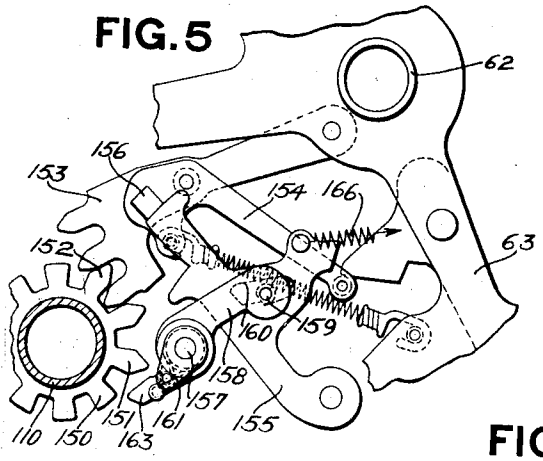


FIG. 6

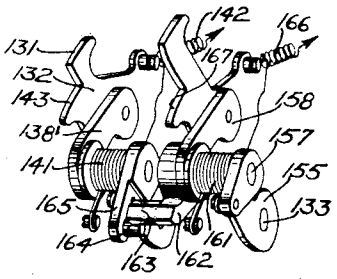
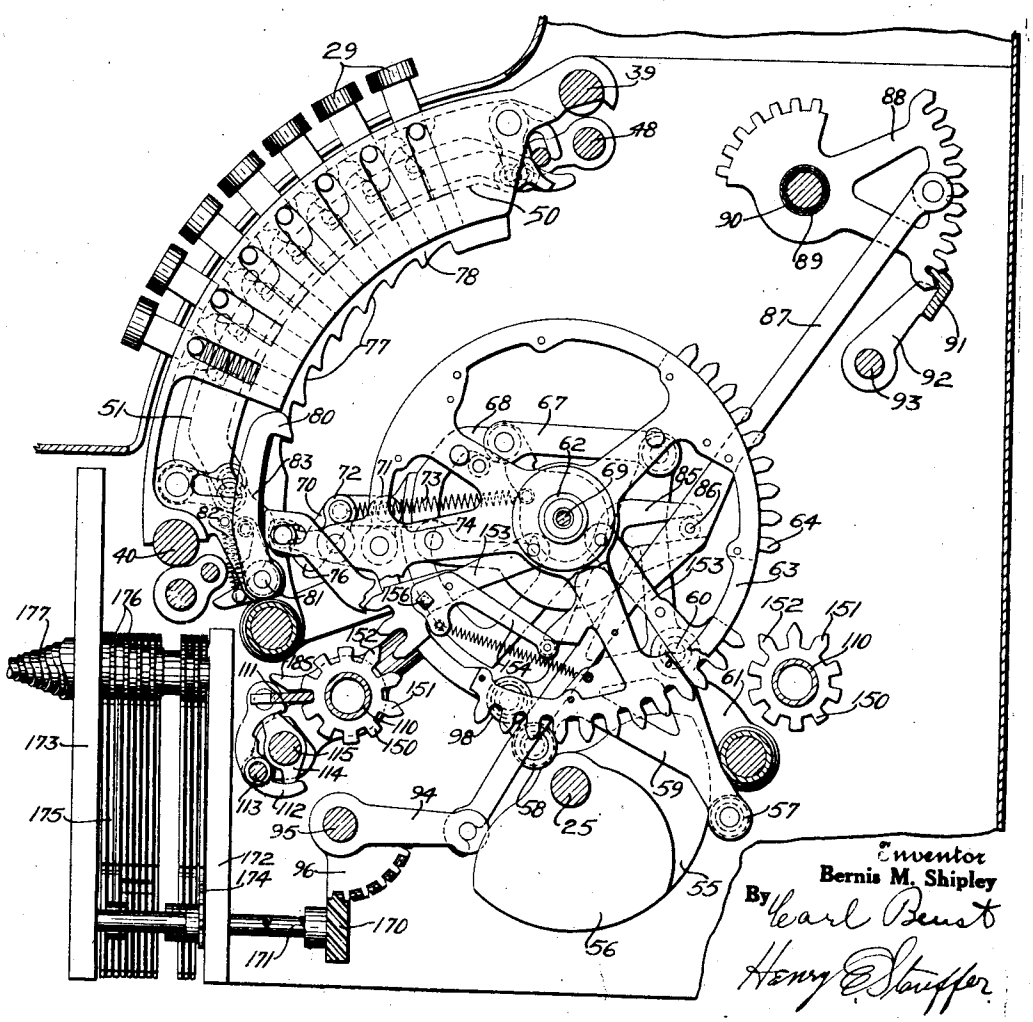


FIG. 7



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CASH REGISTER

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FIG.8

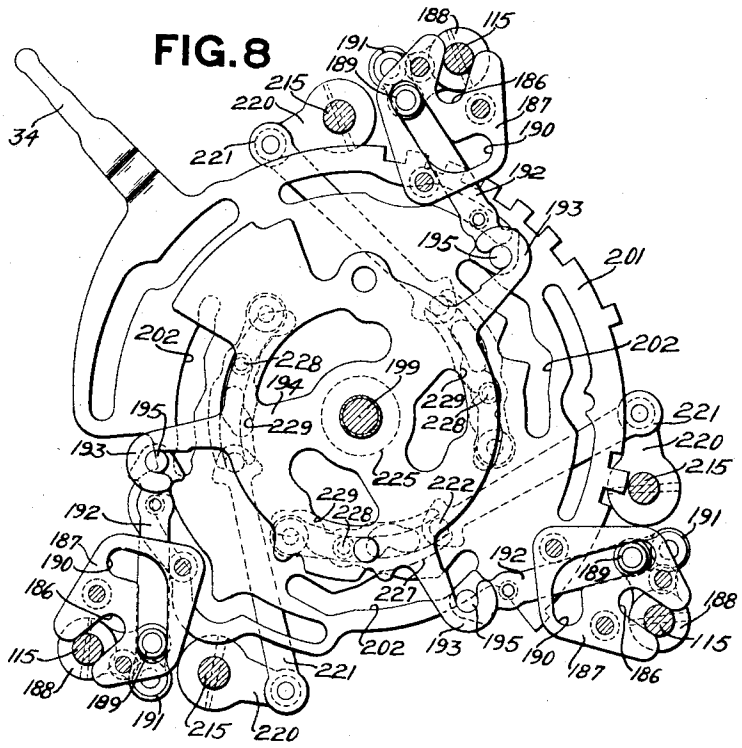
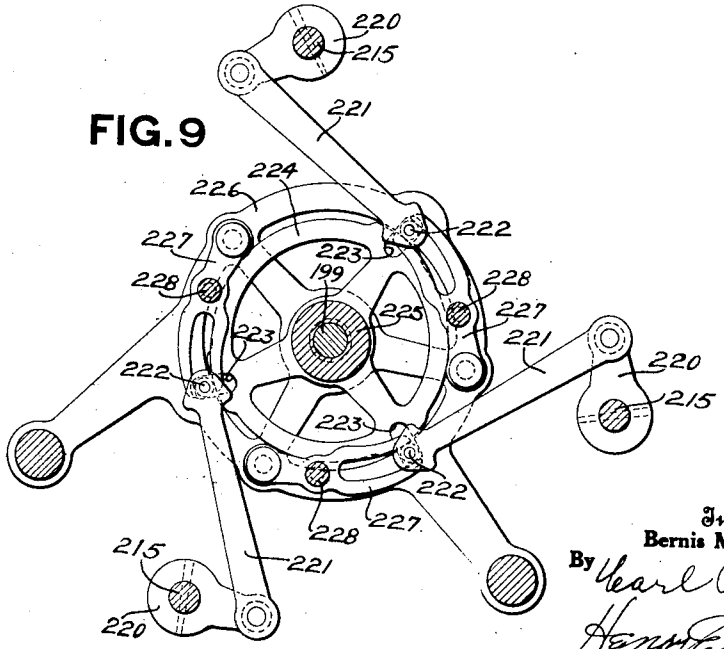


FIG.9



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Patented Oct. 1, 1929 1,730,094

UNITED STATES PATENT OFFICE

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CASH REGISTER

Application filed December 2, 1922. Serial No. 604,518.

This invention relates to cash registers and the like.

One object of the present invention is to produce a machine capable of registering quantities and the corresponding money value of the same simultaneously.

It is a specific object of the invention to equip a cash register to accumulate amounts not arranged in accordance with the decimal system, such as gallons and pints, as shown herein.

With these and incidental objects in view, the invention consists of certain novel features of construction and combinations of parts, the essential elements of which are set forth in appended claims and a preferred form or embodiment of which is hereinafter described with reference to the drawings which accompany and form part of this specification.

Of said drawings:

Fig. 1 is a perspective view of the machine.

Fig. 2 is a view of one of the type lines.

Fig. 3 is a sectional view taken through the machine beside an amount bank.

Fig. 4 is a section through the machine showing the units of gallons bank.

Fig. 5 is a detail view of the transfer mechanism in the pint bank.

Fig. 6 is a perspective view of a portion of the transfer mechanism in the pint and units of gallons banks.

Fig. 7 is a section through the pint bank.

Fig. 8 is a detail view of the mechanism for engaging the totalizers during totalizing operations.

Fig. 9 shows a part of the mechanism for actuating the totalizer-reset lines.

The invention is shown herein embodied in a machine for use in gasoline filling stations. The invention can be used however in many other kinds of business, and it is not therefore desired to limit it to the form shown herein.

As illustrated, the invention is applied to a machine of the general type shown and described in the patents to W. A. Chryst, No. 1,230,864, issued June 26, 1917, and to F. L. Fuller No. 1,242,170, issued Oct. 9, 1917, and to B. M. Shipley, No. 1,619,796, issued March 1, 1927.

As shown herein the machine is adapted to register, indicate, and print the date, the quantity of any commodity sold at the filling station, the selling price thereof, a symbol to indicate what commodity was sold, a symbol to indicate whether it was a charge or a cash sale, and a character to designate the cashier who made the registration. The machine will also print the consecutive number, the identifying number of the attendant who made the sale, and it is also possible to print a number of seven digits which may be used for recording the license number of the purchaser's car, or for any other desired purpose.

The various totalizers may be reset and the amounts thereon printed automatically, as in all machines of this class. The selection of one of the commodity totalizers for resetting will cause the total quantity of that particular commodity and the total amount of money received therefor to be printed. Thus, the total of the amounts on the commodity totalizers will equal the total of the three cashiers' totalizers, and the total cash on hand will equal the cashiers' totals minus the amounts on the charge totalizers.

Operating mechanism

The present machine is adapted to be operated by an electric motor (not shown) of any suitable design. This motor is located on the left hand side of the machine, and by means of a clutch mechanism and a train of gears, drives the main drive shaft 25 (Fig. 2) of the machine. In case it is desired to operate the machine by hand, a crank 26 is provided projecting through the cabinet 27. This crank is connected to shaft 25 by a train of gears (not shown). The shaft 25 is given one complete rotation during each operation of the machine.

Keyboard

From left to right, in Fig. 1, the keyboard comprises, first, two banks of quantity keys 28 and one fractional bank 29 having only seven keys. As the principal commodities sold at a filling station are liquids, the first

two banks will be referred to herein as gallon banks and the bank 29 as the pints bank. When eight pints have been registered on the pints totalizer wheel, "1" will be transferred to the units of gallons wheel and the pints wheel will be turned to zero, as will be fully described later. However, in case the commodity is measured by some other than liquid measure, the same keys 28 are depressed. For instance, cup grease, which is sold by the pound, is entered by the same keys, the cup grease totalizer showing the number of pounds sold instead of gallons, as with gasoline.

Next proceeding from left to right are four banks of amount keys 30 having a registering capacity of $99.99. In the next bank are eight commodity keys 31 and one "charge" key 32. In the next are four commodity keys 31 and one "charge" key 32. As only one key in a bank can be depressed at a time, it is necessary to have two "charge" keys. In case it is desired to enter a charge item for a commodity appearing in the first commodity bank, the "charge" key in the second bank is depressed, and vice versa. It is thus necessary to add the totals appearing on both charge totalizers together in order to get the total charge business.

The next bank is the release bank, and contains three cashiers' keys 33 and a "list" key. This key is for the purpose of releasing the machine on total-taking operations as the cashiers' keys are not used when taking totals. To the right of the cashiers' keys is the total lever 34, which controls the operation of the machine in total and sub-total operations.

Next comes a bank of keys 35 to control the printing of the number of the attendant making the sale, but these keys do not control indicators or totalizers.

On the extreme right are seven banks of number keys 36 which will print any number from 1 to 9,999,999 on the record material. These keys may be used for any desired purpose, such, for instance, as registering a record of the license number of the purchaser's car.

The amount keys 30 and the gallons keys 28 are identical in construction and operation. The description of one will, therefore, suffice for both. Like parts will be given like reference numerals in Figures 3 and 4.

The keys in each of these two banks are mounted in an individual frame 38 supported by cross rods 39 and 40 carried by the machine side-frames 41 and 42. These keys are retained in their normal outward positions by compression springs 43 abutting against pins 44 in the key shanks.

When a key is depressed it cooperates with a detent 45 and a locking plate (not shown), and is thereby retained in its depressed position, as is well known in the art. The keys are released at the end of an operation by means of a rod 46 carried by a plurality of arms 47 fast on a shaft 48. This shaft is rocked clockwise (Fig. 3) near the end of the operation, and the rod 46 engages a tail 49 of the detent 45 and rocks said detent downwardly, thereby releasing said depressed keys.

The bank of fractional or pint keys 29 (Fig. 7) is similar to the amount and gallons banks just described. The difference lies in the fact that this pint bank has but seven keys, numbered from "1" to "7". Some modification of the detents and other cooperating parts is, therefore, necessary, but these parts operate in exactly the same manner as similar parts operate, in the banks previously described. The keys 29 cooperate with a detent 50 and a locking bar 51, and, when depressed, are thereby retained in their depressed positions. They are released at the end of the operation in exactly the same manner as are the above mentioned gallons keys.

A description of the means, whereby the commodity keys 31 and the cashiers' keys 33 select totalizers for operation, and the manner in which the cashiers' keys and the list key release the machine and start the motor, is not necessary to an understanding of the present invention and, therefore, such means is neither shown nor described herein. If any description of these mechanisms is desired it can be found in the before-mentioned patents.

Differential mechanism

To drive the differential mechanisms of the machine the drive shaft 25 is provided with a plurality of pairs of cams 55 and 56 (Figs. 3, 4 and 7), each pair cooperating with rollers 57 and 58 respectively, carried by Y-shaped levers 59 pivoted at 60 to the differential supporting frames 61 (Figs. 4 and 7). Loosely mounted on hollow studs 62 carried by the frames 61 are differentially movable disks 63 carrying rack segments 64 and transfer teeth 65 for operating totalizer pinions 66. The upper ends of the levers 59 are connected by links 67 to driving segments 68 loose on the studs 62. All differential units are tied together by a rod 69. The segments 68 adjacent the banks of amount keys are connected to the differentially movable disks 63 by latches 70, each of which is supported by an arm 71 and a lever 72 pivoted on the corresponding differential disk. Springs 73 hold the rear ends of the latches 70 in engagement with shoulders 74 on the driving segments 68. When the segments 68 are driven by their cams 55 and 56 the disks 63 are rotated counter-clockwise (Fig. 3) with their latches until noses 75 of the levers 72 engage the depressed keys. Such engagement results in the disengagement of the latches from the driving segments 68 and the engagement of

the ends 76 of the latches with the particular notches 77, formed in arcuate bars 78, opposite the latches at the time. Upon return movement of the driving segments 68 to normal positions said segments engage studs 79 carried by the disks 63 and return said disks to normal positions. If a key has not been depressed in a bank a zero stop pawl 80 in that bank, disconnects the latch 70 from the segments 68 and arrests the disk 63 in the zero position, as is well known in the art. These pawls 80 are fast on short shafts 81 supported by the key frames and are normally held in their obstructing positions by springs 82. When a key in a bank is depressed the corresponding stop pawl 80 is rocked to ineffective position by an arm 83 (Fig. 3) which cooperates with a pin mounted in a short arm 84, also fast on the shaft 81. As the zero position in the pints banks is one step higher than the zero position in the gallons bank, due to the fact that there are only seven keys in said bank, it is necessary to lengthen the zero stop pawl 80, for the pints bank, accordingly.

Pivoted to each of the disks 63 is a beam 85, bifurcated at its rear end to embrace a stud 86 mounted near the center of a link 87. The links 87 are pivoted at their upper ends to segments 88 secured to nested sleeves 89 surrounding a shaft 90 mounted in the side frames 41 and 42. These segments are used for alining purposes and are engaged by aliners 91 carried by arms 92 on a shaft 93. The beams 85 are operated by rollers 98 carried by the levers 59, and as fully described in the before mentioned patents, differentially position the links 87 and consequently the segments 88. The means for rocking the aliner 91 into and out of engagement with the segments 88 is not shown or described herein, as it is fully described in the Shipley patent above referred to.

Pivoted to the lower end of each of the links 87 is an arm 94 loose on a rod 95. Also loose on this rod, and rigidly connected to the arm 94, is a spiral segment 96. The differential positioning of the link 87 differentially positions the arm 94 and segment 96 for setting up the printing elements, as will be later described.

Indicator

The present machine is provided with indicators of the type shown and described in the patents previously referred to. This indicates the amount of the sale, the quantity of any commodity sold, the kind of goods sold, and the cashier. It will be remembered that the segments 88 are set by the differential movement of the beam 85 and link 87 for each bank of keys. Integral with the segments 88 are indicator setting segments 101 which cooperates with mechanism (not shown) to properly position the indicators 102 (Fig. 1) in accordance with the keys depressed. The indicator mechanism is shown in the Fuller Patent No. 1,163,748.

Totalizers

The totalizers used in the present machine are, with the exception of the elements cooperating with the pints differential, identically the same as have been described in the above referred to patents. A brief description of the same will, it is thought, be sufficient herein.

There are three totalizer lines 110 cooperating with the differential mechanism. Each of these lines consists of a plurality of totalizer elements 66 arranged in groups, all the elements of one denomination being located in the same group. Thus, all of the tens of gallons wheels are together, all of the units of gallons wheels are together, and all of the pints wheels are together, with the amount denominational wheels having the same arrangement.

In order to select any totalizer for operation, the whole totalizer line is slid endwise to bring the desired element in each group opposite its differentially movable disk, as is well known in the art. When the three totalizer lines have been so positioned they are engaged with the adding segments carried by the differentially movable disks in order that the wheels may be rotated to the proper extent. A totalizer on either one, two or all three lines can be engaged and actuated simultaneously, depending upon the keys which have been depressed.

Totalizer engaging mechanism

The tubes 110 which carry the totalizer elements are supported by arms 185 (Fig. 7), loosely mounted on shafts 115 (Fig. 8). The ends of these shafts project into slots 186 in plates 187, one at each end, fast to the side frames of the machine. Also fast on each shaft 115, one at each end thereof, is an arm 188 which carries an anti-friction roller 189 projecting into a slot 190 in the plate 187. One of the arms 188 has a projection 191 to which is pivoted a link 192, which at its other end carries a pin 195 adapted to be engaged by a hook 193 on one arm of a three-armed totalizer engaging spider 194 (Fig. 8).

Mechanism (not shown herein) is provided whereby either one, two, or all three of the pins 195 are moved into engagement with the hooks 193, depending on which totalizer line it is desired to rock to move the selected totalizer thereon into engagement with the actuators.

When the differentially movable disks 63 have been positioned, as above described, the spider 194 is rocked clockwise (Fig. 8). This will exert a pull on whichever ones of the links 192 have their pins 195 in the hooks

193. As these links 192 are pivoted to the arms 188 fast on the shafts 115, these shafts will be rocked, and at the same time pulled toward the center of the spider 194, due to the cooperation of the rollers 189 on arms 188 with the slots 190. When the rollers 189 reach the end of the straigth portions of the slots 190 they are drawn into offset portions thereof in order to hold the parts in the engaged positions while the totalizer wheels are being rotated. It can be readily seen that as the totalizer lines are carried by the shafts 115 they will be moved to bring the selected totalizers into engagement with the actuators if their respective pins 195 are in the hooks of the spider 194.

Alining mechanism

Each totalizer wheel 66 is held in alinement, when disengaged from the actuators, by means of an aliner 111 (Figs. 3 and 7) carried by a plurality of arms 112 pivoted on a rod 113. These aliners are moved out of engagement from the totalizer wheels when the said wheels are engaged with the differential actuators. This is accomplished by arms 114 fast on shafts 115. As the totalizers are engaged, these shafts, and, therefore, the arms 114, are rotated clockwise (Fig. 3) so that the arms cam the aliners 111 out of engagement from the totalizer elements.

Transfer mechanism—normal

When one of the totalizer pinions 66 passes from "9" to "0" a transfer mechanism is operated for causing "1" to be added upon the totalizer pinion of next higher order. Pivotally secured to the differentially movable disks 63 (Fig. 3) are three arms 125 each having two teeth 65 like the teeth of the segments 64. These arms are in the same plane with said segments.

The transfer tripping mechanism associated with these arms 125 for the three totalizer lines is identically the same. Therefore the tripping mechanism for the front line only will be described. Pivoted to the arm 125 (Fig. 4) are levers 126, one on each side of said arm. These levers carry a pin 127 held in contact with a projection 128 integral with the segment 64 by a spring 129 (Fig. 3) stretched between the levers 126 and the disk 63. These springs, during the clockwise movement (Fig. 3) of the differentially movable disks, hold the arms 125 in such a position that the pin 127 is locked in a recess 129′ so that the segment 64 and arm 125 move as a unit. The lever 126 (Fig. 4) has secured thereto a square stud 130 which normally abuts an end 131 of a transfer lever 132 mounted on a stud 133 on the frame 61, when the differential segments arrive at zero positions. These segments 64 are normally given one unit of movement counter-clockwise beyond zero to their normal positions, and consequently the abutment of the studs 130 with the ends 131 causes the levers 125 to be held, whereby the pins 127 become disengaged from the notches 129′, as shown in Fig. 3. Consequently the segments 64 normally move one step farther than the arms 125.

Fast on a short shaft 135 supported by the frame 61 is a trip arm 136 (Fig. 4) having a projection 137 which lies in the path of a long tooth 138 on the totalizer pinion 66 of next lower denomination. Also, fast on the shaft 135 is an arm 138′ carrying a flattened pin 139 held in engagement with a shoulder in an opening 140 in the transfer lever 132 by a torsion spring 141, one end of which is secured to frame 61 and the other end to the trip arm 136.

As a totalizer pinion passes from "9" to "0" the long tooth 138 thereof engages the projection 137 of arm 136 and rocks this arm counter-clockwise (Fig. 4). This movement disengages the pin 139 from the shoulder in opening 140, and a spring 142 rocks the lever 132 clockwise and moves the end 131 away from the square stud 130 and brings a shoulder 143 (Fig. 6) into the path of movement of the stud 130 to regulate the movement of the arm 125. When this occurs, the arm 125 remains locked to the segment 64 during the extra unit of movement past the zero position which said segment receives, thereby causing "1" to be added upon the totalizer pinion 66 of next higher denomination.

All displaced transfer devices are restored to normal positions at the next operation of the machine by a three-armed lever 145 loose on the stud 62. The lever 145 carries a pin 146 engaged by an edge 147 of the segment 68 in the next lower bank near the end of the clockwise movement of said segment. When the pin 146 is thus engaged by segment 68 the three-armed lever 145 strikes the edges 148 of the levers 132 and rocks said levers counter-clockwise until the pins 139 again engage the shoulders in the openings 140 and the transfer trip arms 136 are restored to their normal positions by the springs 141.

Transfer mechanism for pints bank

It will be remembered that the third bank from the left in Fig. 1 is for registering pints. It can be seen therefore that when the pints totalizer wheel passes from its "7" to its "8" position it is necessary to transfer "1" to the units of gallons totalizer wheel. As a ten-tooth pinion is used for the pints totalizer wheels, a mechanism is also required which will not only transfer "1" to the denomination of next higher order, but will move the pints totalizer wheel two steps as well, in order to bring the pints wheel to its zero position. The means for accomplishing this result will now be described.

The totalizer wheels 150 (Figs. 5 and 7) for

pints, are constructed with three long teeth, a tooth 151 in the eighth position, an idle tooth in the ninth position and another long tooth 152 in the tenth position. Tooth 151 in the eighth position actuates the transfer mechanism.

The pints differential has arms 153 (Fig. 7) which are similar to the arms 125 for the other banks except that these arms 153 have three teeth instead of two, so as to give the pints wheels two extra steps of movement to turn them to zero. The arms 153 have fast thereto levers 154 which have the same functions as the levers 126 for the normal transfer mechanisms.

Pivoted to the frame 61 for the pints differential is a transfer lever 155 (Figs. 5 and 6), similar to lever 132 previously described. A flat stud 156 carried by the lever 154 normally contacts the end of lever 155 and stops the arm 153 when the differential segment 64 is moved to zero. Fast on a short shaft 157 is an arm 158 (Figs. 5 and 6), identical with arm 138′ before described, which carries a flattened stud 159 held in engagement with a shoulder in an opening 160 in the transfer lever 155 by a torsion spring 161 surrounding shaft 157.

Also fast on shaft 157 is a transfer trip arm 162 having a nose 163 which extends far enough to the left (Fig. 6) to cooperate with a pin 164 carried by an arm 165 fast on the shaft 135 for the units of gallons bank. It can be seen, therefore, that when the pints totalizer wheel passes from "7" to "8" the long tooth 151 will contact the nose 163 of arm 162 and thereby cause the arm 158 to be rocked counter-clockwise (Figs. 5 and 6) and disengage the stud 159 from the shoulder in opening 160. As the nose 163 contacts the pin 164 this pin, the arm 165, shaft 135 and arm 138′ will also be rocked counter-clockwise. When these arms 138′ and 158 are rocked, as just described, the transfer levers 132 and 155 are rocked clockwise by springs 142 and 166. The lever 155 has a shoulder 167 formed thereon similar to shoulder 143 on the levers 132, but located twice as far from the end of said lever. Therefore, when the differentially movable segment 64 associated with the pints bank is rocked counter-clockwise to zero, the square stud 156 will not come into contact with the end of the transfer lever 155, and the arm 153 will move with the segment 64 and move the pints totalizer wheel two steps to its zero position. As the long tooth 151 simultaneously trips the transfer for the units of gallons bank, "1" will be added to the units of gallons totalizer wheel in the manner above described.

The levers 155 will be returned to their untripped positions by a spider similar to the spider 145, previously described, and operated by the differential unit of the highest amount bank.

Printer

As before described, the spiral segments 96 appropriate to each bank are differentially set by the beams 85 and links 87. Meshing with these segments are spiral gears 170 fast on shafts 171 mounted in transverse printer frames 172 and 173 (Fig. 7). Secured to the forward ends of said shafts 171 are segments 174 meshing with teeth on racks 175, which in turn mesh with gears 176, each fast on one end of one of a set of nested tubes 177. Fast to the opposite ends of said tubes are gears (not shown) which in turn drive amount type wheels 178, (Fig. 2) quantity wheels 179, wheels 180 for printing the name of the commodity sold, a wheel for printing the cashier's number, and a wheel 235 set by the movement of the total lever to print a character indicating whether a total or sub-total has been printed. Other means, not shown herein, but well known in the art, are provided for setting up the wheel 181 for printing the attendant's number, the wheels 182 for printing the purchaser's license number or other desired number, the consecutive number wheels 236, and the date wheels 183. All of these type wheels are shown in Fig. 2. If any further description thereof is desired, reference may be made to the above mentioned patents.

Totalizing operation

In totalizing operations the totalizer line to be moved to engage a totalizer thereon with the actuators is selected under control of a disk 201 (Fig. 8), mounted on a stud 199. This disk 201 is rigid with the total lever 34, and contains three slots 202 so shaped as to control pins which in turn, through other mechanism, not shown herein, but well known in the art, cause any selected one of the pins 195 to move into its respective hook 193 of the totalizer engaging and disengaging spider 194. Only one of these pins can be engaged at a time as, of course, only one totalizer may be cleared at a time in a totalizing operation. When the proper pin 195 has been engaged with its hook, the spider 194 is rocked first clockwise and then counter-clockwise to engage the selected totalizer with the actuators and disengage it therefrom, as above described.

Differential control by totalizer wheel

On total and sub-total taking operations the totalizer wheels are rotated backwardly to zero. It is, therefore, necessary to provide mechanism which will disengage the latch of each differential mechanism when its appropriate totalizer wheel has reached zero. On totalizing operations the totalizer is disengaged at this point so as to leave it at zero, but in sub-totalizing operations the totalizer remains in engagement with the actuators,

and the amount taken therefrom is restored thereto. The means for disengaging the latches on totalizing operations will now be described.

Each totalizer wheel 66 has a long tooth 138 in the zero position, as above described. As the wheel is rotated backwardly on totalizing operations by the segment 64, the long tooth strikes an arm 203 (Fig. 4) pivoted on a stud in the frame 61. Another arm 204 hubbed to arm 203 is pivoted to a short link 205 which is, in turn, connected to another short link 206 by a stud 207. This link 206 is pivotally connected to a stop lever 208 pivoted to plate 61. The lever 208 carries a half-round stud which is adapted to cooperate with notches 209 cut in the inner periphery of a reset spider 210. This spider 210 has an arm 211 integral therewith, which at its end has a slot 212 into which projects a pin 213 mounted in the bell crank 72 which disconnects the latch 70 from the driver 68 on adding operations. It can be seen from Fig. 4 that the small links 205 and 206 form a toggle which is normally broken. When the total lever 34 is moved out of adding position, it selects the line to be rocked towards the actuators, selects the latch-disengaging mechanism appropriate to that line for operation and sets mechanism which in turn straightens the toggle formed by links 205 and 206 and rocks arm 203 into position to be struck by the long tooth 138 of the totalizer wheel.

Fast on a shaft 215 (Fig. 4) is a partial gear 216 whose teeth mesh with teeth formed on the hub of an arm 217, slotted at its opposite end to embrace stud 207. The shaft 215 is given a slight counter-clockwise rotation, which, through the gear 216, rocks arm 217 clockwise and thereby straightens the above mentioned toggle. Then when the long tooth 138 strikes the arm 203 the arm 204 is rocked counter-clockwise (Fig. 4). This movement of arm 204 through the links 205 and 206, which are now in a straight line, rocks the stop lever 208 clockwise. This will cause the half-round stud carried by this lever to engage whichever one of the notches 209 in the spider 210 is opposite it at the time, and, thereby, through arm 211 disconnect the latch from the differential mechanism driver

The means for rocking the shafts 215 on totalizing operations will now be described. Fast to each of the shafts 215 is an arm 220 (Fig. 9), to which is pivoted a link 221. At their opposite ends these links carry pins 222 which are adapted to enter notches 223 in a circular plate 224. This plate is connected to the three-armed totalizer engaging spider 194 by a hub 225 surrounding the stud 199. It will be remembered that the spider 194, and, therefore, the plate 224, is given first a clockwise and then a counter-clockwise movement during a totalizing operation. Pivoted to a stationary hanger 226 which supports the stud 199 are three arms 227 bifurcated to embrace the pins 222 on links 221. Arms 227 also carry pins 228 which project through slots 229 in the total lever disk 201. These slots are so shaped that as the total lever 34 is moved either up or down from its adding position the arms 227 will be rocked clockwise and then counter-clockwise alternately to bring any desired one of the pins 222 into its notch 223 in plate 224. Of course only one of said pins can be moved into a notch at a time, as only one totalizer line can be rocked into engaging position at a time on totalizing operations.

It is apparent from the above that when the totalizer engaging spider 194 is rocked to move the totalizer line selected for operation by the plate 201, the plate 224 will be rocked and will rock whichever one of the shafts 215 is connected therewith. As above described, the rocking of the selected shaft 215 places the associated arms 203 and cooperating mechanism in positions to be operated by the long teeth of the totalizer wheels to disconnect the latches 70 from the drivers to control the positioning of the differentials in accordance with the amounts taken from the totalizer wheels.

In the pints bank it is the long tooth 152 in the zero position which actuates the above described mechanism to disconnect the latch.

While the form of mechanism herein shown and described is admirably adapted to fulfill the objects primarily stated, it is to be understood that it is not intended to confine the invention to the one form or embodiment herein disclosed, for it is susceptible of embodiment in various forms, all coming within the scope of the claims which follow.

What is claimed is:

1. In a machine of the class described, the combination of a totalizer wheel having a plurality of teeth, an actuator meshing with said totalizer wheel, and means operated by certain of said teeth for controlling said actuator in adding movements.

2. In a machine of the class described, the combination of a totalizer wheel having a plurality of teeth, certain of which are longer than the remainder, an actuator for said totalizer wheel, and means controlled by certain of said teeth for controlling said actuator in adding movements.

3. In a machine of the class described, the combination of a totalizer wheel, operating means therefor, and means carried by said totalizer wheel for causing said operating means to give it an additional movement.

4. In a machine of the class described, the combination of a plurality of totalizer elements, actuators for adding units on said elements, means for causing one actuator to add additional units in one element and for causing the other actuator to add an additional unit in the other element, and means

carried by one of said totalizer elements for controlling the first means.

5. In a machine of the class described, the combination of a totalizer element, a main actuator and an auxiliary actuator therefor, and means for positively connecting the main and auxiliary actuators, said connecting means being controlled as to its effectivity by said totalizer element.

6. In a machine of the class described, the combination of a totalizer element, a main actuator and an auxiliary actuator therefor, means for normally preventing said auxiliary actuator from actuating said totalizer element, and means carried by said totalizer element for making said auxiliary actuator effective.

7. In a machine of the class described, the combination of a totalizer wheel having teeth, a main actuator and an auxiliary actuator adapted to mesh therewith, means for normally preventing said auxiliary actuator from actuating said totalizer wheel, and a long tooth carried by said totalizer wheel for making said auxiliary actuator effective.

8. In a machine of the class described, the combination of a totalizer wheel having teeth, a main actuator and an auxiliary actuator therefor located in the same plane, driving means common to said actuators, means for normally stopping said auxiliary actuator before it has reached its limit of movement, and means carried by said totalizer wheel for removing said stop.

9. In a machine of the class described, the combination of a totalizer wheel having teeth, a main actuator and an auxiliary actuator therefor located in the same plane, a driving segment common to said actuators, a lug on said auxiliary actuator, an arm normally in the path of said lug, and means under control of said totalizer wheel for removing said arm from the path of said lug.

10. In a machine of the class described, the combination of a totalizer wheel having teeth, a main actuator and an auxiliary actuator therefor located in the same plane, a driving segment common to said actuators, a lug on said auxiliary actuator, an arm normally in the path of said lug, a latch for holding said arm in the path of said lug, and a pawl operated by one of the teeth on said totalizer wheel for disconnecting said latch from the arm.

11. In a machine of the class described, the combination of a totalizer wheel having teeth, a main actuator and an auxiliary actuator therefor located in the same plane, a driving segment common to said actuators, a lug on said auxiliary actuator, an arm normally in the path of said lug, a latch for holding said arm in the path of said lug, a pawl operated by one of the teeth on said totalizer wheel for disconnecting said latch from the arm, and a spring for removing said arm from the path of said lug.

12. In a machine of the class described, the combination of an accounting device comprising two totalizer wheels having an equal number of divisions, normally latched means for transferring from the lower order wheel to the higher order wheel, a device to control the release of the transferring means when said lower order wheel has received only a part of its movement, and normally latched means for rotating said lower order wheel sufficiently to complete its movement, said last-mentioned means being released by said device simultaneously with the releasing of the transferring means.

13. In a machine of the class described, the combination of an accounting device comprising two totalizer wheels having an equal number of divisions, means for transferring from the lower order wheel to the higher order wheel when said lower order wheel has received only a part of its rotation, and means under control of said lower order wheel for rotating said wheel sufficiently to complete its rotation.

14. In a machine of the class described, the combination of an accounting device comprising a units pinion and a pinion of next higher order, main actuators and auxiliary actuators cooperating with each of said pinions, means cooperating with each of said actuators for stopping said auxiliary actuators before they reach their limit of movement, and means carried by said units pinion for simultaneously causing the removal of the stopping means from the auxiliary actuators for both the units pinion and that of next higher order.

15. In a machine of the class described, the combination of an accounting device comprising a plurality of pinions of different denominational orders, mechanism for adding one unit on a pinion of higher order and a plurality of units on a pinion of lower order, and means on said pinion of lower order for controlling said mechanism.

16. In a machine of the class described, the combination of an accounting device comprising a plurality of pinions, including a units pinion having a plurality of controlling teeth, and means actuated by one of said controlling teeth for adding one unit on the pinion of next higher order simultaneously with the addition of a plurality of units on the said units pinion.

17. In a machine of the class described, an accounting device comprising a plurality of pinions, mechanism for simultaneously adding one unit on one of said pinions and a plurality of units on another of said pinions, and means operated by said last mentioned pinion for actuating said mechanism.

18. In a machine of the class described, a totalizer element, an actuator therefor, and

means carried by said totalizer element and effective during item entering operations for controlling said actuator to actuate said totalizer element.

19. A totalizer actuator comprising a member controlled by manipulative amount determining means for entering amounts on a totalizer element, and another member adapted to be controlled by said element for advancing the element a plurality of steps.

20. In a machine of the class described, the combination of an accounting device comprising two totalizer wheels of the decimal system, normally latched means for transferring from the lower order wheel to the higher order wheel, a device to control the release of the transferring means when said lower order wheel has moved eight divisions, and normally latched means to turn said lower order wheel two more divisions, said last-mentioned means being released by said device simultaneously with the releasing of the transferring means.

In testimony whereof I affix my signature.

BERNIS M. SHIPLEY.