Jan. 17, 1928. 1,656,384

H. A. MESSERVY

COIN CONTROLLED LIQUID DISPENSER

Filed Dec. 8, 1923 5 Sheets-Sheet 1

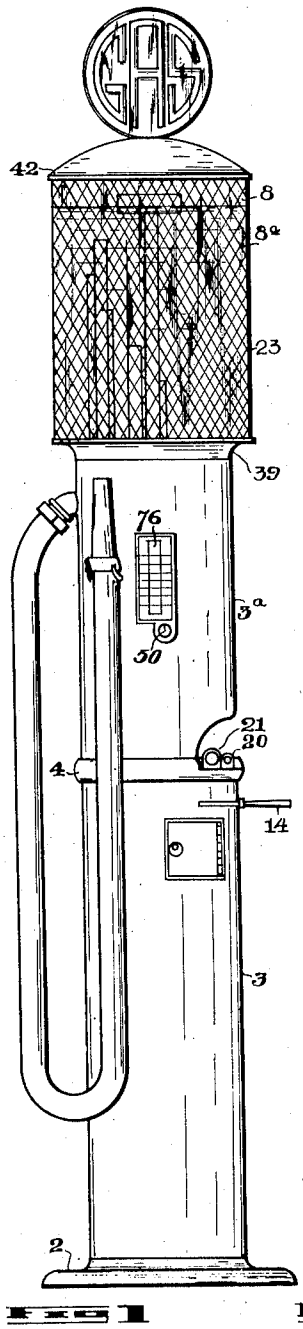


FIG. 1

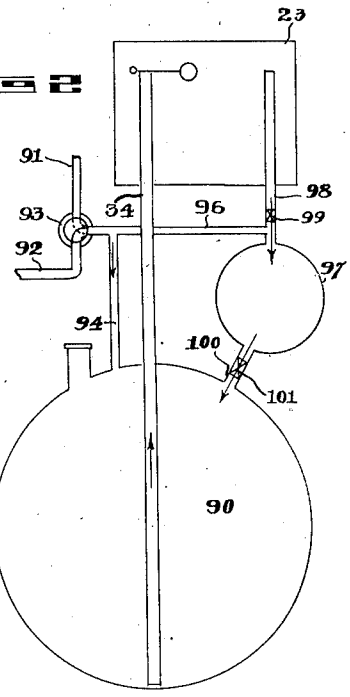


FIG. 2

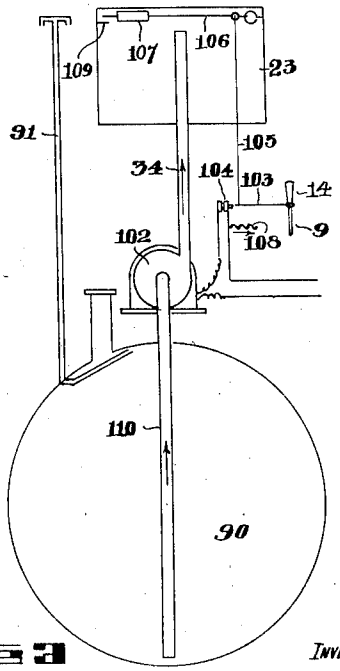


FIG. 3

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Jan. 17, 1928. 1,656,384

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COIN CONTROLLED LIQUID DISPENSER

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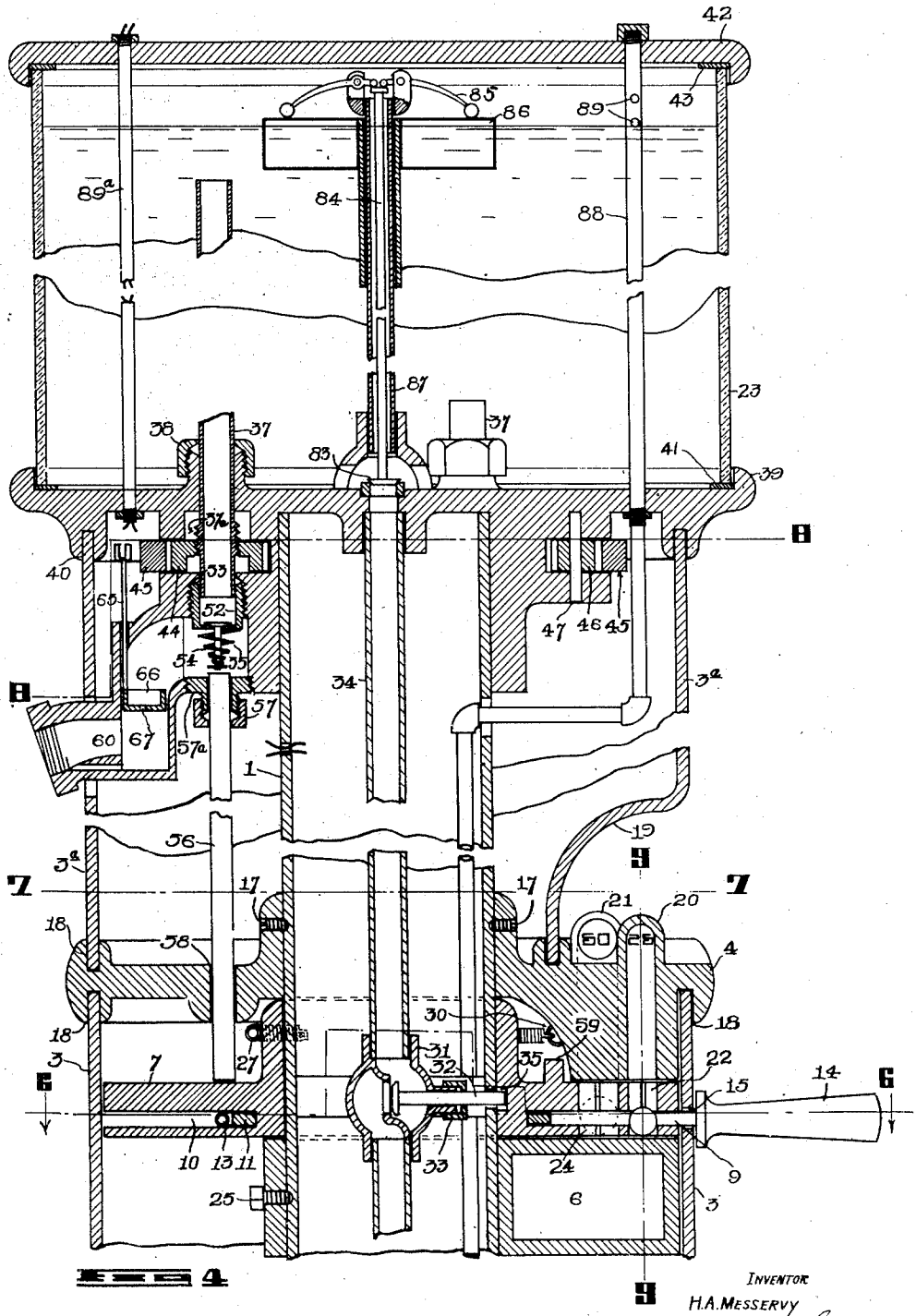


FIG 4

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COIN CONTROLLED LIQUID DISPENSER

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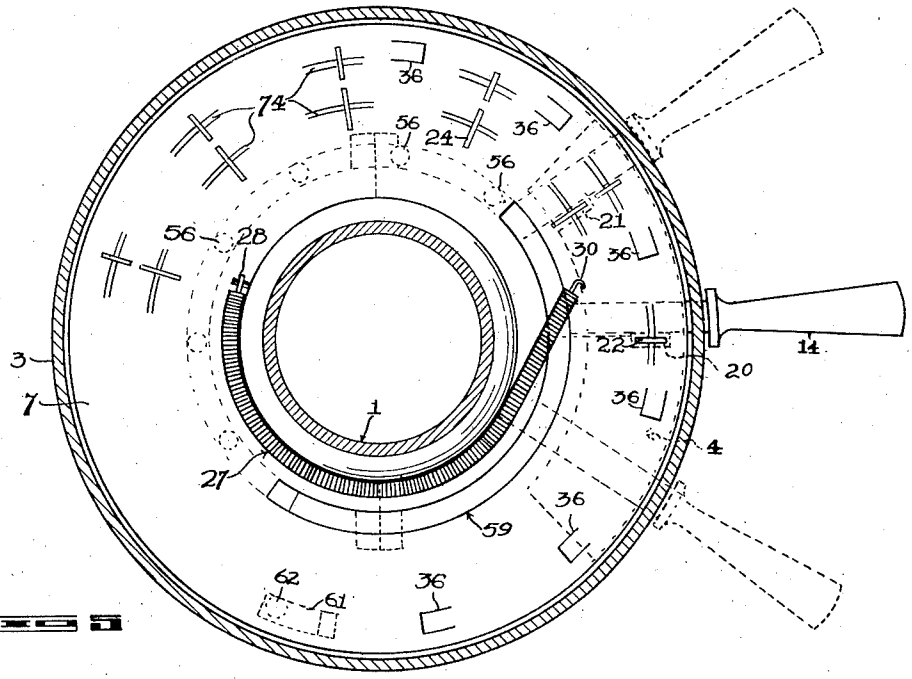


FIG. 5

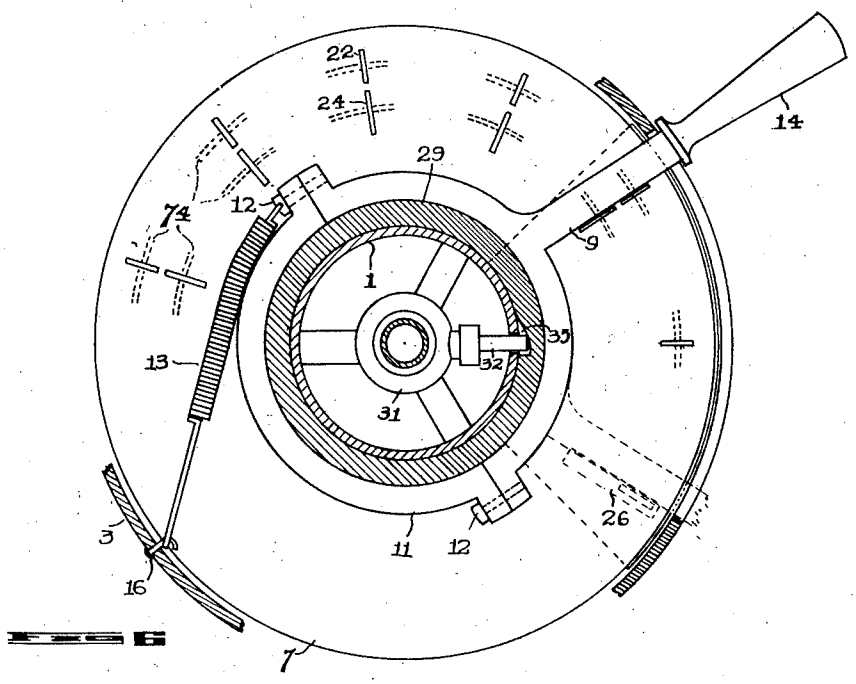


FIG. 6

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COIN CONTROLLED LIQUID DISPENSER

Filed Dec. 8, 1923 5 Sheets-Sheet 4

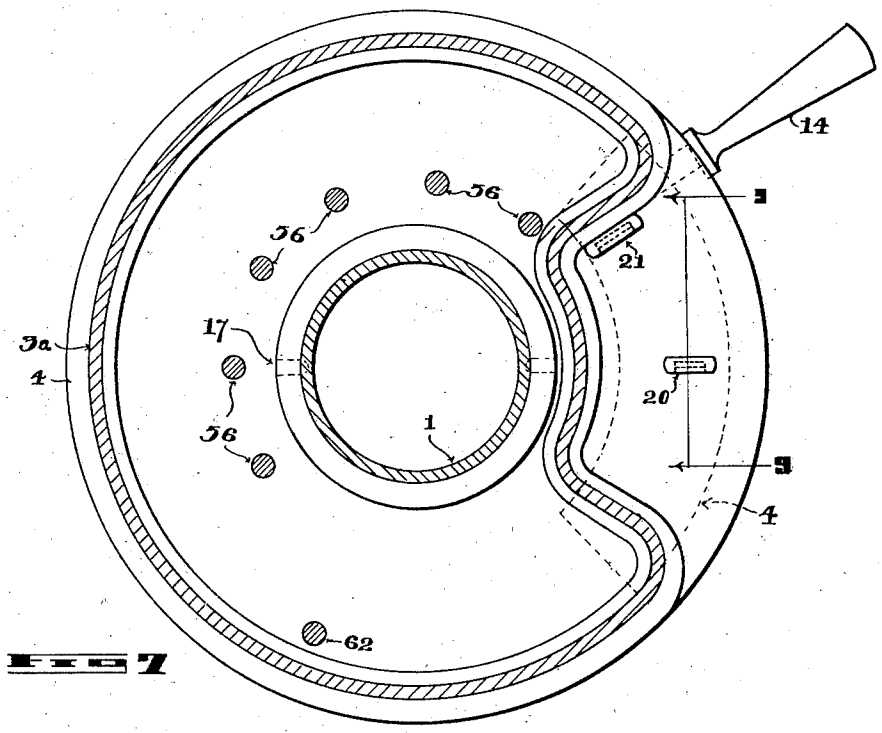


FIG 7

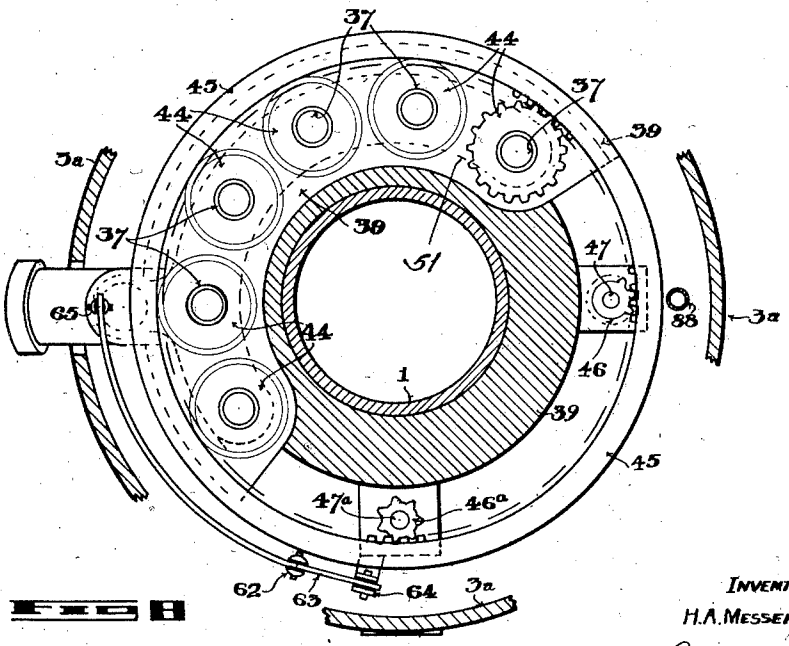


FIG 8

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COIN CONTROLLED LIQUID DISPENSER

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Fig 9

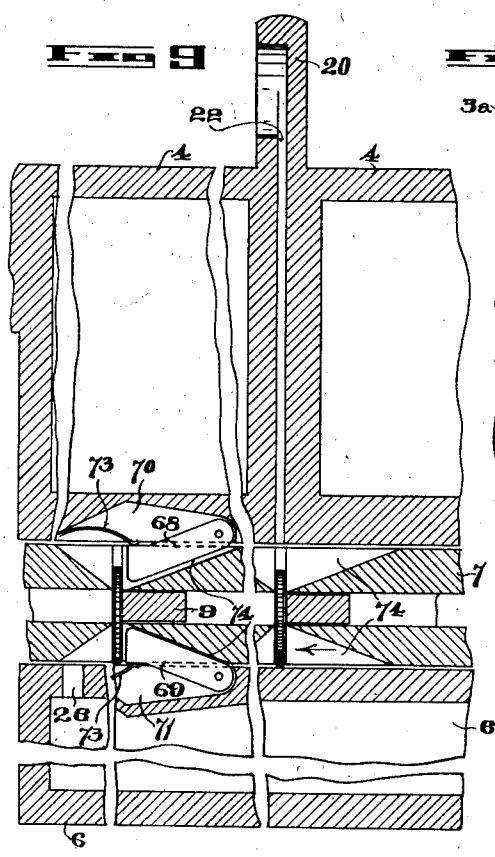
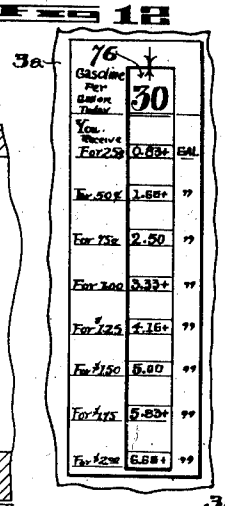


Fig 12



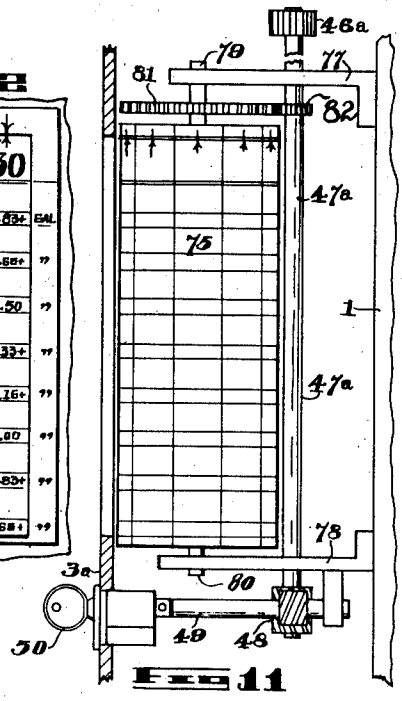


Fig 11

Fig 10

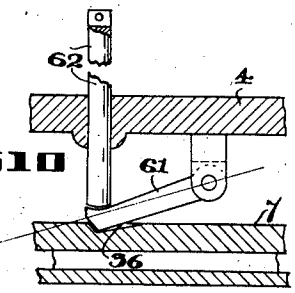


Fig 13

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Patented Jan. 17, 1928. 1,656,384

UNITED STATES PATENT OFFICE.

HAROLD A. MESSERVY, OF TORONTO, ONTARIO, CANADA.

COIN-CONTROLLED LIQUID DISPENSER.

Application filed December 8, 1923. Serial No. 679,292.

My invention relates to a coin-controlled liquid dispenser, more particularly intended to dispense gasoline and oils at service stations, one object being to produce a dispenser capable of supplying definite quantities upon the insertion of a coin.

Another object is to enable the regulation of the quantity supplied in accordance with the fluctuation in prices of the material sold.

A further object is to devise a machine capable of being operated by the purchaser wihout the aid of any attendants.

These and further objects will be pointed out in the following description which, in connection with the accompanying drawings, illustrates one practical form of my invention.

In the drawings, similar reference symbols indicate similar parts throughout the several views.

Figure 1 illustrates the dispenser as it appears complete.

Figure 2 is a diagrammatic view of a refilling system operated by compressed air.

Figure 3 is a diagrammatic view of a refilling system electrically operated.

Figure 4 is a sectional view of the operating parts of the dispenser.

Figure 5 is a top view of the operating disk.

Figure 6 is a view of the operating lever as it appears mounted on the operating disk, taken on line 6—6, Figure 4.

Figure 7 is a cross section on line 7—7, Figure 4.

Figure 8 is a cross section on line 8—8, Figure 4.

Figure 9 is a vertical section on line 9—9, Figures 4 and 7.

Figure 10 is a detail of the disk locking mechanism.

Figure 11 is a side elevation, partly in section, of the price-indicating cylinder, showing the means of operating the same.

Figure 12 is an illustration of the price-indicating scale.

Figure 13 is a diagrammatic illustration of the meter arrangement of the dispensing tubes.

The dispenser is composed of a tube 1, mounted on a base 2, which base has a suitable flange at its top (not shown) to receive the lower end of the first section 3 of an outer casing, the upper end of which casing is engaged in the coin trunk 4, hereinafter described. A second section 3^a mounted on the coin trunk 4 engages in the base 39 of the measuring container 23, which container, in the present instance, is shown with a glass side wall 8 protected by a screen 8^a. The top of the container may be of various configurations and may contain lights or advertising signs.

The base 39 is provided with a groove 40 to receive the upper end of outer casing 3^a. This base is further provided with a gasket 41 to suitably pack the bottom end of the glass 8. The upper end of the glass is closed by means of a cover 42 having a depending flange and a gasket 43 to hermetically close the measuring container.

Referring more particularly to Figure 4, wherein all the parts necessary to control the dispensing of gasoline are illustrated in section, 7 is a disk mounted to rotate freely around the circular tube 1 (see Figure 5). This disk is provided with a deep groove 10 into which is mounted to rotate an operating lever 9, said lever being mounted at the bottom of the groove, preferably by a separable collar 11 united together by means of bolts 12. Lever 9 extends outside casing 3 and travels into a slot 15 in the casing 3. This lever is provided with a hand piece 14, as shown. In order to cause lever 9 to retract independently of disk 7, I provide a spring 13 (see Figure 6), shown connected to the head of one of the bolts 12 and to a hook 16 on the casing 3.

So far, it has been explained that the disk 7 rotates about the tube 1 and that the lever 9 rotates about the disk 7. In order to rotate the disk 7 by means of lever 9, it is necessary to provide a means to temporarily lock the same to affect this rotation. This is done by means of coins of several denominations, two of which are shown in the present instance, of respective values of twenty-five cents and fifty cents. These coins are introduced into a coin trunk 4 which is fastened to tube 1 by means of set screws 17 and forms part of a circular flange extending outside casings 3 and 3^a into which grooves 18 are made, the lower groove receiving the upper end of casing 3 and the upper one the lower end of casing 3^a. The upper casing 3^a is bulged inward at 19 so as to expose the coin slots 20 and 21 (see Figure 7).

While lever 9 is intended to actuate disc 7. it remains free thereon, as already stated,

unless a proper coin is deposited in the device. The device may be made to operate with coins of various denominations. In the present case provisions are made to operate the same with coins of a value of twenty five cents and fifty cents. The coin locks lever 9 to disc 7 by being placed in one of slots 22 or 24 in the disc. The lever when operated will strike the coin and turn the disc. There are two series of slots in disc 7 as shown in Figs. 5 and 6, slots 22 to receive coins of twenty five cents and slots 24, which are larger, to receive coins of fifty cents. In order to prevent the insertion of coins in the slots back of lever 9 when the same is pulled forward and thereby locked against return, a guard, not shown, suitably connected to the lever may be positioned between trunk 4 and disc 7. This guard will advance with the lever and close the bottom of the chutes. The twenty five cent coins are inserted in chute 20 and the fifty cent coins in chute 21. It will be noticed that the chutes 20 and 21 are so placed that each will feed one series of slots in disc 7. Chute 20 feeds slots 22 and chute 21 slots 24. The disc is rotated an equal distance for each twenty five cent coin deposited so that as many coins of that denomination may be employed at one time as there are slots in that series. In the present case there are six slots in the twenty five cent series which means that the machine can dispense to the value of one dollar and fifty cents at a time. The fifty cent coin having twice the value of the twenty five cent one, it is necessary to rotate disc 7 twice as much when a fifty cent coin is used than it is when a twenty five cent coin is used. In order to arrive at this, chute 21 in trunk 4 is placed back of slide 20 a distance equivalent to the distance between each of the twenty five cent slots. This will lock the lever in line with the second twenty five cent slot and therefore, when pulled, will turn disc 7 the same amount as it would with two smaller coins.

It would appear from the foregoing that while there are five fifty cent slots in disc 7 a series of three would be sufficient since one slot will pass chute 22 every time the disc is operated with a fifty cent piece but, if the device is first operated on a twenty five cent coin there must then be a slot registering with chute 22 so that a fifty cent coin may be inserted in order to permit a combination of coins.

As the thickness of the groove 10 is less than the diameter of the coins inserted therein, these coins will project on both sides of the lever and rest against the wall of the slot in the disk, thereby locking the lever to the disk until such time as they drop into a coin-box 6, which box may also be fastened around the tube 1 by means of set screws 25. It will be understood, of course, that when the lever has travelled to its full extent, the coin will drop into the coin-box through a slot 26.

It is necessary that when a coin is once inserted in the disk 7, means be provided to prevent the retraction of the disc before it reaches the end of its travel. For that purpose I provide pawls 68 and 69 (see Figure 9), pawl 68 being mounted in a cavity 70 in the coin trunk 4 and pawl 69 in a similar cavity 71 on the coin-box 6. These pawls are provided with springs 73 to keep them against the face of the disk except at every slot where the pawls will enter angular grooves 74 and rest against the coin, thereby preventing the return of the disk until the coin drops in the coin box 6. As soon as the coin falls into the coin-box 6, the disk is disengaged from the lever, and whenever the liquid is fully dispensed, it will return to its original position by means of a spring 27 connected at 28 to collar 29 fixed to disk 7 and to the coin trunk 4 at 30. It will thus be seen that lever 9 can only operate disk 7 when a coin is inserted in either of the slots mentioned.

The function of disk 7 is twofold: First, it will open a valve in a stand pipe 34 feeding the liquid from the reservoir up to the measuring container 23 by operating a valve 31 provided with a stem 32, which extends when in open position outside of the tube 1, being suitably packed by means of a packing box 33. Stem 32 extends into a cavity 35 in the inside of collar 29, as shown in Figure 6, where the lever is shown fully retracted and the valve opened to allow the flow of liquid to the measuring container. The moment disk 7 is operated, stem 32 will be forced out of slot 35 and the valve 31 will be closed during the whole time the disk is out of its original position or, in other words, during the dispensing of gasoline or any other liquid.

Second, disk 7 also controls the opening of the tubes extending inside the measuring container to dispense the quantity of liquid according to the value of coins inserted in the machine. This control is obtained by means of a cam 59, shown in Figure 5, positioned to operate the valve-operating rods 56, about to be described. Rods 56 operate valves mounted in the bottom of measuring container 23. Each tube is provided with a packing gland 38, preferably positioned inside the container.

In order to adjust the height of these tubes so as to dispense a quantity of liquid equal to the value of the coins inserted, it is necessary to provide means to vary this height proportionately to the fluctuation in value of the liquid dispensed, and, as the tube dispensing lesser quantities requires less adjustment than the tube of the next higher quantity, a means must be provided

to regulate them all by one operation. For this purpose, I provide each tube with a threaded portion 37^a, and the thread being of a pitch proportionate to the amount of travel of the tube. Into these threads is engaged a nut 44. The exterior of each nut is circular and has cogs to form gears, which are in mesh with an internal gear 45, operated by means of a pinion 46^a carried by a shaft 47^a, also carrying a worm gear at its other end engaging a worm 48 carried by a shaft 49 rotated by a suitable key 50 (see Figure 11). Nuts 44 are seated in a suitable cavity 51 in the measuring container base 39. The same cavity also supports the internal gear 45 (see Figure 4), which is held in place by gears 44 and pinion 46^a and idle pinion 46 carried by a pin 47. The lower ends of tubes 37 extend into a valve chamber 52 threaded in the base 39 and serving as a packing gland to prevent leakage between the tube and the base.

Valves 54 have on their stem light compressing springs 55 to properly seat the same. These valves are actuated, as before mentioned, by means of valve rods 56 projecting through packing glands 57 of a plug 57^a, also mounted on the bottom 39, said rods also projecting through perforations 58 in coin trunk 4 down to the disk 7 in a position to be actuated by cam 59 on the disk as it is presented to the respective valve rods.

In Figure 4, two measuring tubes 37 are shown but in Figure 8, the six referred to previously are pointed out.

In order to completely empty the quantity of liquid purchased, it is necessary that the valve controlling the tube be kept open until the liquid is fully drawn out. For that purpose, the disk 7 must be temporarily locked and the means employed for that purpose comprises the following arrangement: A number of depressions 36 (see Figures 5 and 10) are made in the face of disk 7, into which a pawl 61, fulcrumed on trunk 4, enters. These depressions are so shaped as to allow the pawl to disengage itself when free from pressure. Therefore, in order to hold the same in pressed engagement, I provide a rod 62 passing through a perforation in the coin trunk 4 and connected to a lever 63 fulcrumed at 64 (see Figure 8), which lever extends over the outlet 60 (see Figure 4), where it is connected to a rod 65 supporting a cup 66 positioned in the path of the liquid flow. This cup is provided with a perforation 67 of a size sufficient to drain the liquid contained therein after the liquid flow ceases. Whenever cup 66 is filled with liquid, its weight will depress the lever and consequently force rod 62 upon pawl 61 to maintain the same in locked position. The moment the cup is emptied, the rod 62 will be released and pawl 61 will be easily disengaged from the depression 36, when through the action of spring 27, the disk 7 is returned to its normal position. If necessary, a small spring or counterweight (not shown) may be attached to pawl 61 in order to counterbalance the weight of lever 63 and cup 66.

As the market price of liquid dispensed fluctuates, it is necessary to provide indicating means to show the existing price. For that purpose, I provide a drum 75 rotatively mounted inside casing 3^a and positioned so that a portion thereof is exposed to view through an opening 76 in said casing (see Figure 12). Drum 75 is supported between brackets 77 and 78 connected to tube 1, the drum being provided with gudgeons 79 and 80, respectively passing through brackets 77 and 78. Gudgeon 79 is provided with a gear 81, which is in mesh with a pinion 82 carried by shaft 47^a. Figures on the drum represent the quantity of gasoline dispensed for the amount of the coins at a given price. It will, therefore, be evident that since the drum is connected to the mechanism operating the measuring tubes 37, the indicating cylinder 75 will have a movement corresponding to the movement of the tubes since it is driven from the same source by means of key 50.

Means must also be provided to maintain the measuring container filled with liquid. For that purpose, I provide a valve 83 seated on the stand pipe 34 inside the container. This valve is maintained closed by means of a float 86 slidingly mounted on stand pipe 87 so as to move freely thereon, said float actuating levers 85, as shown.

In order to provide an overflow for the liquid in the container, I use a tube 88 having perforations 89, said tube leading down to the gasoline tank, about to be described. It may be said here that the measuring container is assembled by means of tube 88 and rods 89^a, as shown in Figure 4.

Several means may be used to force the gasoline into the measuring container from the gasoline tank. In Figures 2 and 3, I have shown two of these means. In each illustration, 90 represents a gasoline tank and 91 a vent pipe, 34 being the stand pipe conducting the liquid into the container.

In Figure 2 is shown a means of forcing the liquid by compressed air. The main pipe leading from the compressor is shown at 92. A suitable three-way valve 93 leads the air into tank 90 through pipe 94 and serves to connect vent pipe 91 with tank 90 and tank 97 through pipe 96, which tank is intended to receive the liquid overflowing from the container through pipe 98. This pipe 98 is provided with a check valve 99. A communication between the draining tank 97 and 90 is obtained through pipe 100 having a check valve 101. It will be apparent by this arrangement that since the liquid in

tank 90 is under compression, it will rise in pipe 34 and fill the container 23 whenever valve 31 is opened. The gasoline contained in the draining tank 97 will evidently be automatically transferred to tank 90 through pipe 100 whenever both tanks are vented.

In the arrangement shown in Figure 3, I provide a pump 102 having a suitable inlet pipe 110 to draw gasoline from tank 90, the outlet of this pump being the stand pipe 34. The pump is actuated by electricity and the switch 104 to actuate the same may operate as follows: Operated by disc 7, which is actuated by operating lever 9 is a rod 103 positioned to close the switch 104 when the disc is in its normal position. This rod is operated by disc 7 and to prevent the same from operating the switch when the tank is filled, I provide a rod 105 extending into the measuring container 23 and there attached to lever 106 operated by a float 107. The spring indicated by 108 is intended to keep the switch contacts separated when the switch is off. It will be understood that lever 106 and float 107 are positioned in the container 23 to permit an overfilling of the same. The overflow tube 88, through its perforation 89, will then cause the excess of gasoline to drain up to the exact measuring point in the container. When the container is overfilled, the float will, through rod 105, deviate rod 103 from the switch 104, thereby opening the same and stopping the motor. The moment the gasoline has reached its proper level, the float will allow rod 103 to again return in line with the switch, when the same may be operated upon the actuation of disc 7.

In operation, assuming that the measuring container is full of gasoline and that, for example, it is desired to obtain gasoline to the value of one dollar and fifty cents by means of six twenty-five cent pieces, the coins will be deposited in the twenty-five-cent chute one after the other, pulling lever handle 14 after each coin is inserted. As there are six slots for coins of twenty-five cents in the disk, it will be possible to deposit the whole amount before refilling the reservoir. At the first pull the disk will close the valve 31. After each coin has been deposited and the lever pulled, the disk will have lifted, by means of its cam 59, a rod 56 and opened a valve in one of the outlet tubes, thereby causing a flow of liquid and lowering cup 66, thereby holding the disk, as already explained, while the following coin is inserted, and so on until the six tubes are opened. The flow will continue until the level of the liquid reaches the top of the lowest tube when it will stop. The cup 66 will then drain and by means of its associate parts, as already explained, release the disk 7 which will return to its original position and open valve 31, whereby the measuring container will refill.

If, as a second example, two twenty-five-cent coins and two fifty-cent coins are to be employed, the two twenty-five-cent coins can be first inserted and the device operated as in the first example, opening two tubes, and then inserting the fifty-cent pieces in the fifty-cent chute. As already stated, a fifty-cent piece will cause the disk to rotate twice as much as will the smaller coin, therefore these last two coins will each open two tubes, making a total of six tubes in all, dispensing the same quantity of liquid for the same value as in the first example.

Now, assuming that the price of gasoline prevailing in the first instance to be thirty cents, as shown in Figure 12, by glancing at the cylinder in line with $1.50, corresponding to the amount deposited, 5.00 will be seen which means that five gallons will or have been dispensed. If, for the second example, the price has been lowered to twenty-two cents, it becomes necessary to alter the proportions supplied by each coin and also the proportions supplied for different amounts on the cylinder. This will automatically be done by means of key 50 when inserted in its lock as shown and turned until 22 appears instead of 30. The amount supplied appearing next to $1.50 on the cylinder will now be 6.81+ and the lowest tube will be automatically lowered to dispense 1.81+ gallons more than in the first instance; the second lowest tube five-sixths of 1.81+ or 1.51 more; the third tube four-sixths or 1.21; the next tube three-sixths or 0.905; and so on. By removing the key the device becomes fool proof and guarded against unauthorized tampering.

While I have illustrated a practical embodiment of my invention, I do not wish the invention to be understood as restricted to the precise details of structure or arrangements hereinbefore set forth, as various changes in the shape, size, location and construction of same or all the parts making up my invention, may be made without departing from the spirit or nature of my invention as covered by the appending claims.

What I claim is:—

1. In a dispenser of the class described, a dispensing container, a plurality of tubes of graduated height mounted to move vertically in said container, means to adjust said tubes to dispense a quantity of liquid equal to a predetermined quotation comprising threads at the lower end of each tube, gears having threads engaging the threads of said tubes, and means to simultaneously rotate said gears.

2. In a dispenser of the class described, a dispensing container, a plurality of tubes of graduated height mounted to move vertically in said container, means to adjust said tubes to dispense a quantity of liquid equal to a predetermined quotation comprising

threads at the lower end of each tube, gears having threads engaging the threads of said tubes, means to simultaneously rotate said gears, comprising an internal gear engaging the gears of each tube, a shaft provided with a pinion positioned to rotate said internal gear, a second shaft mounted at right angles to the first mentioned shaft and geared thereto, and a key to turn said second shaft.

3. In a dispenser of the class described, a dispensing container, means to fill the same with liquid, means to discharge said liquid from said container in measured quantity corresponding to a predetermined quotation, comprising a plurality of tubes mounted to move vertically in said container, said tubes varying in height corresponding to a predetermined quotation, means to move each tube proportionately to the value and quantity of liquid purchased so that the tubes delivering lesser quantities may travel proportionately with those delivering greater quantities, comprising threads on each tube, of a pitch to simultaneously give the proportionate required movement to each tube, nuts forming gears threaded on each tube, and means to rotate all the nuts simultaneously, comprising an internal gear engaging the same, means to revolve said internal gear, comprising a key inserted in the machine to unlock the revolving mechanism.

4. In a dispenser of the class described, a dispensing container, a series of dispensing tubes mounted therein, valves closing said tubes, valve rods to actuate said valves, a disk rotatively mounted below said valve rods, a cam on said disk to operate said valve rods, means to lock the disk during the dispensing of liquid, comprising depressions in the face of the disk, a pawl mounted over said disk engaging said depressions, said depressions being shaped to allow said pawl to free itself upon rotation of said disk, means to prevent the freeing of said pawl comprising a liquid container movably positioned in the dispensing outlet so as to be filled by the liquid during dispensing, and actuating means between said liquid container and said pawl.

In testimony whereof, I have this 13th day of November, 1923, affixed my signature, at Toronto, in the Province of Ontario, Canada.

HAROLD A. MESSERVY.