

Nov. 22, 1927.

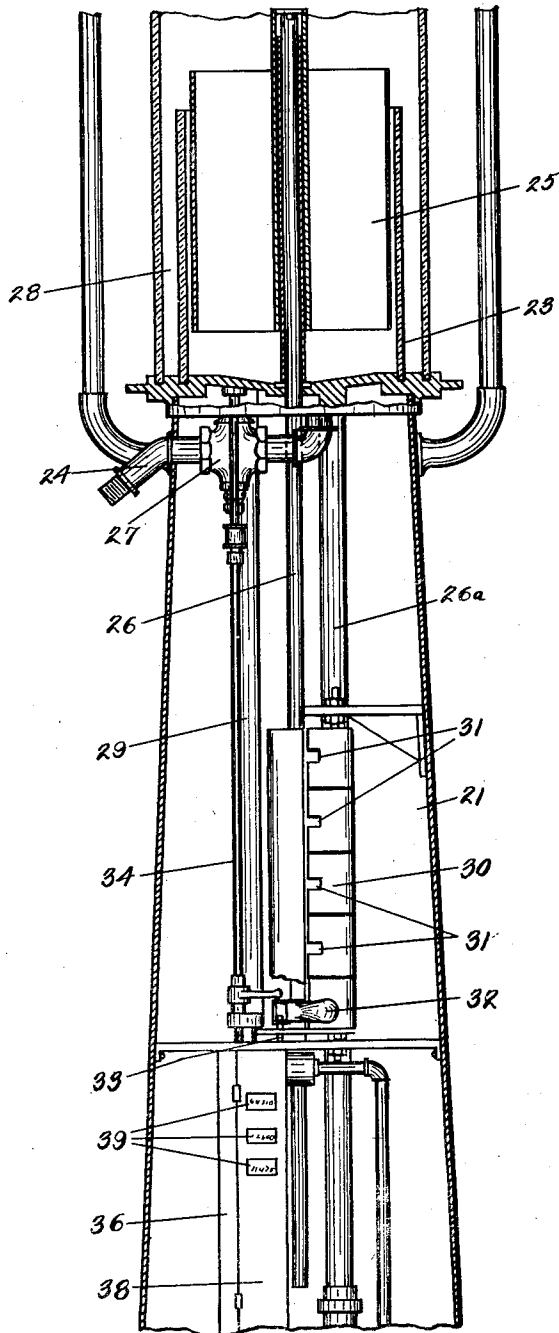
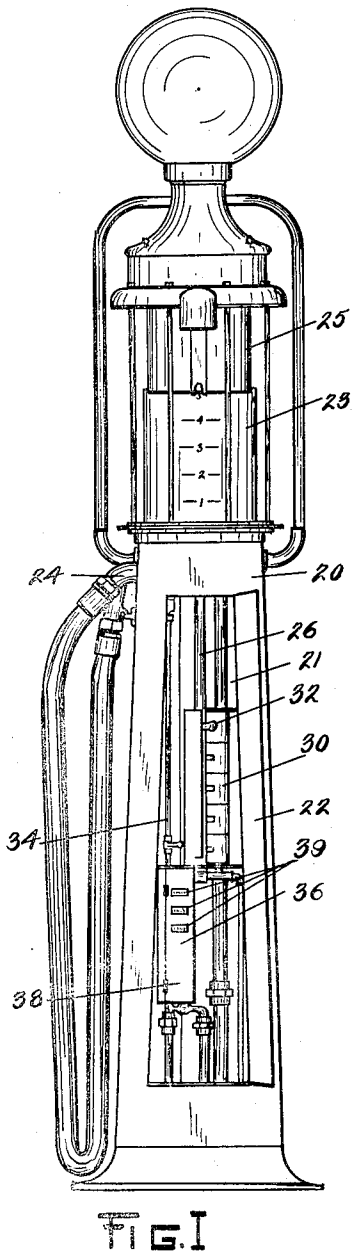
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M. R. JULIAN

LIQUID DISPENSING PUMP

Filed Jan. 31, 1924

5 Sheets-Sheet 1



Inventor

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By Clarence Shalken

His Attorney

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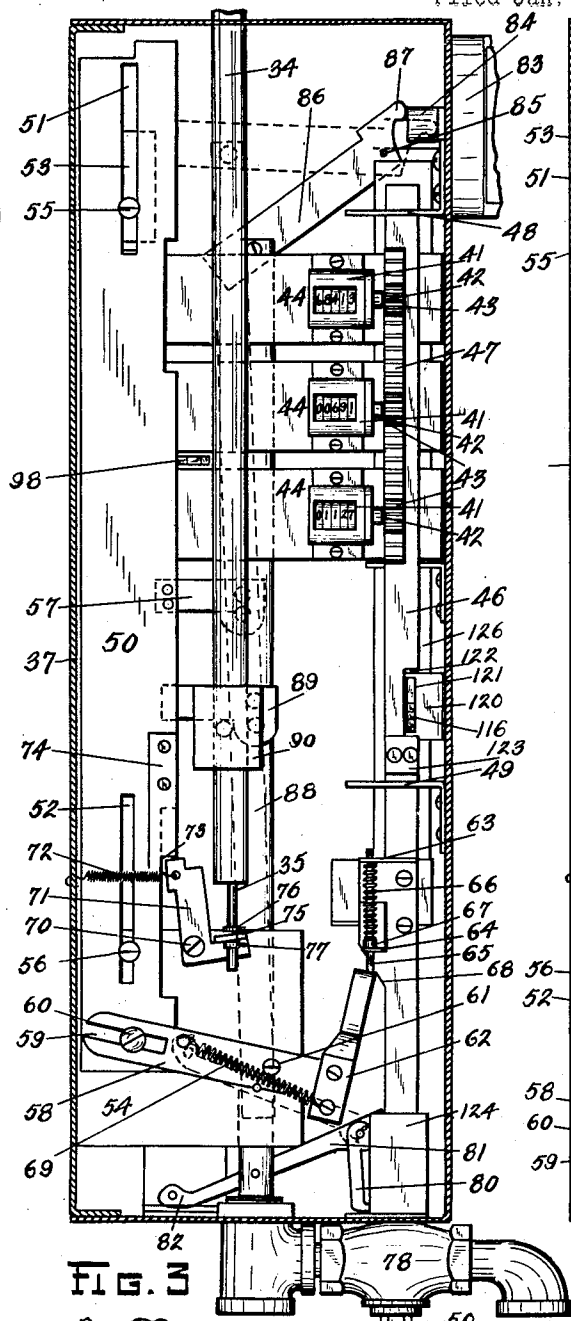


FIG. 3

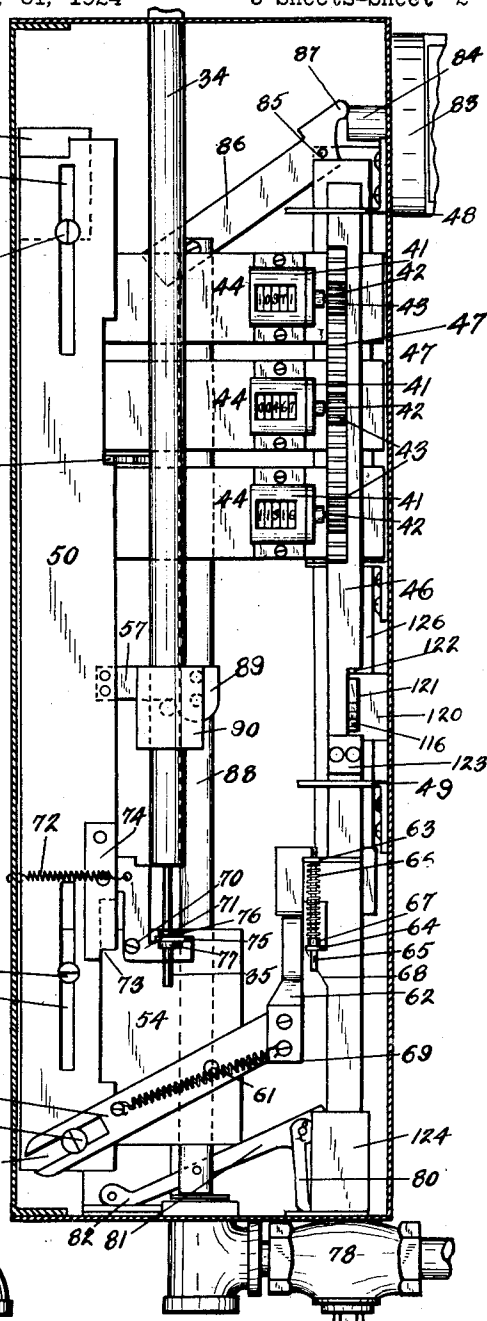


FIG. 4

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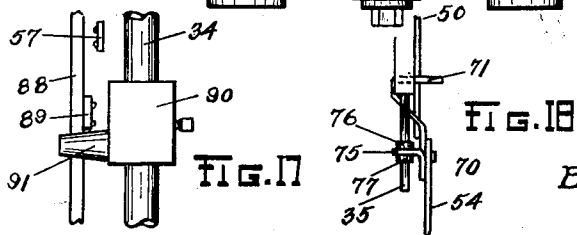


FIG. 7

FIG. 18

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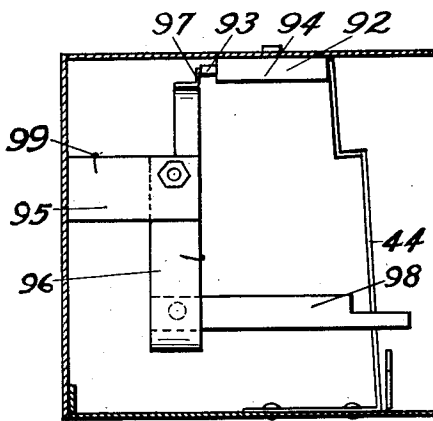


FIG. 9

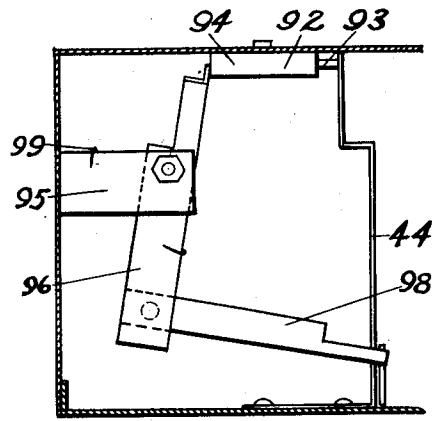


FIG. 10

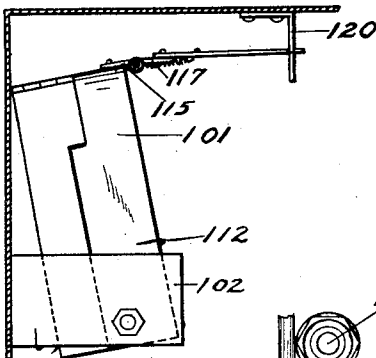


FIG. 11

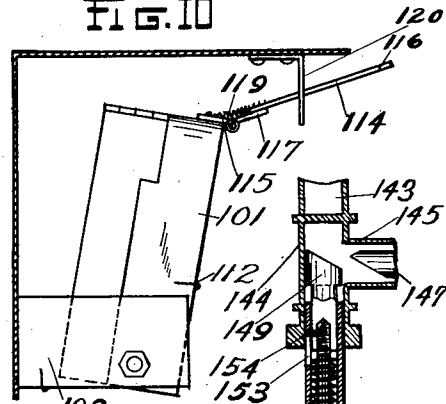


FIG. 12

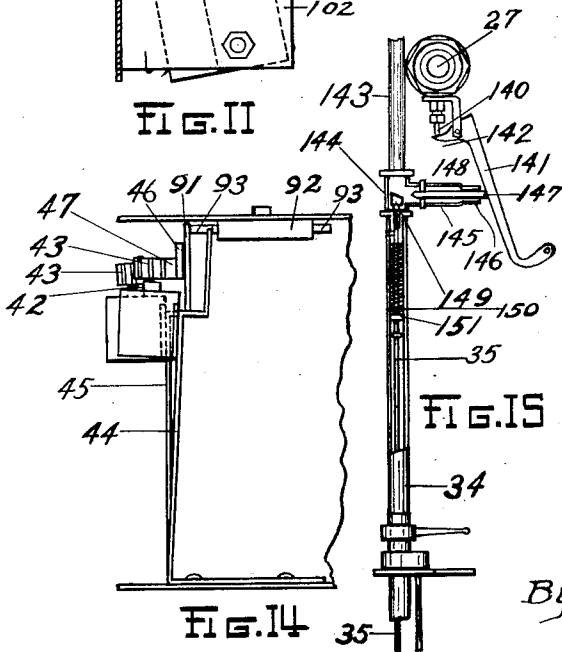


FIG. 13

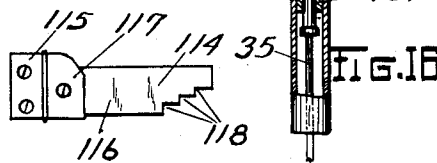


FIG. 14

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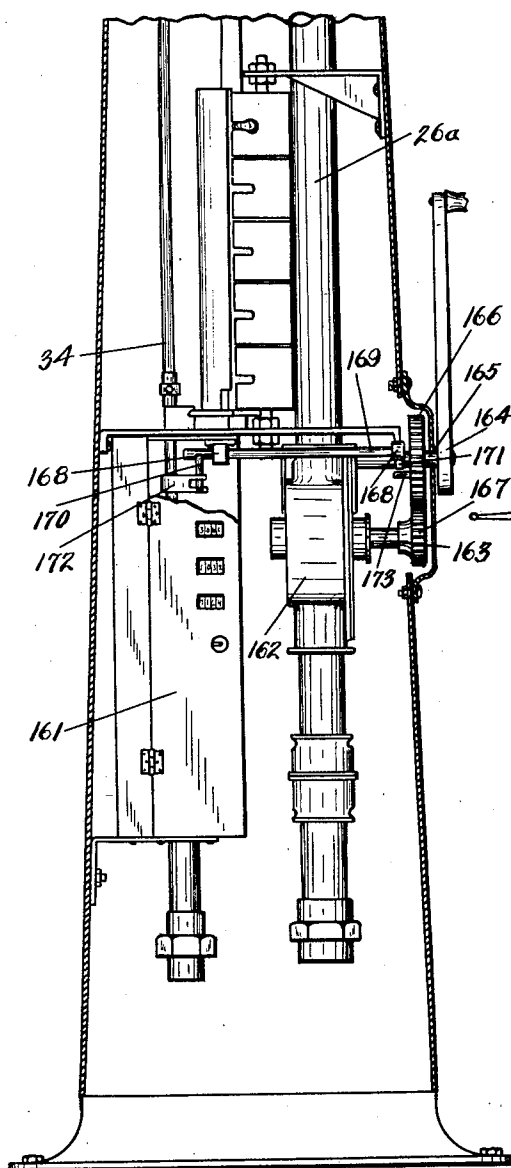


FIG. 19

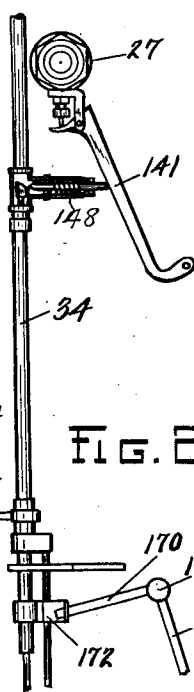


FIG. 20

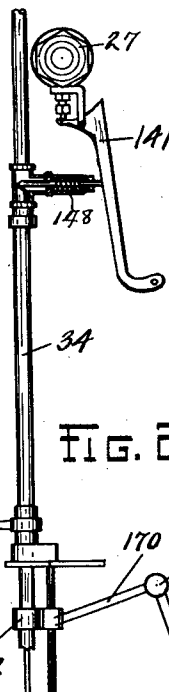


FIG. 21

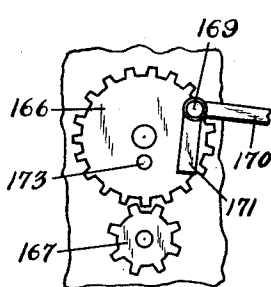


FIG. 22

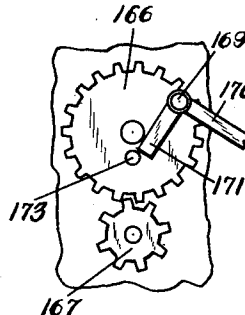


FIG. 23

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UNITED STATES PATENT OFFICE.

MARCENA R. JULIAN, OF JAMESTOWN, NEW YORK, ASSIGNOR TO JULIAN PUMP AND MANUFACTURING CORPORATION, OF JAMESTOWN, NEW YORK, A CORPORATION OF NEW YORK.

LIQUID-DISPENSING PUMP.

Application filed January 31, 1924. Serial No. 689,777.

This invention relates to an improvement in a liquid dispensing pump, and more particularly to the control and registering mechanism therefor, by which the operation of the pump is controlled, and the movement of gallons dispensed is definitely recorded.

The primary object of this invention is to provide in combination with a liquid dispensing apparatus a control mechanism provided with a plurality of locks so constructed that the liquid cannot be supplied until one of these locks has been actuated by a key, and in which the amount of liquid dispensed is recorded automatically upon the opening of the dispensing valves.

A further object of this invention is the provision in a mechanism of this character of elements so arranged that the opening of the valve, by which the liquid is fed to the dispensing receptacle, automatically sets the recording mechanism, so that as soon as the dispensing valve is opened, the quantity of liquid in the receptacle is automatically recorded.

Other objects reside in the various details of construction hereinafter set forth in the following specification, and illustrated in the accompanying drawings, which form a part thereof, and in which

Fig. 1 is a front elevation of a liquid dispensing pump provided with a mechanism of this character;

Fig. 2 is an enlarged section of the liquid receiving receptacle, and the stop control mechanism illustrating the relation of these elements to the recording and registering mechanism;

Fig. 3 is an enlarged view of the recording and registering mechanism with the parts in the position that they would occupy after the receptacle has been filled and before the dispensing operation has taken place;

Fig. 4 is a view similar to Fig. 3 showing the position the parts occupy when locked against operative movement;

Fig. 5 is an enlarged view of the setting and controlling mechanism with the parts unlocked and ready for the registration of one unit;

Fig. 6 is a view similar to Fig. 5 taken from the opposite direction;

Fig. 7 is a detailed view of the registering recording mechanism, showing in full lines

the actuating position and in dotted lines the idle position;

Fig. 8 is a view of certain elements in detail;

Fig. 9 is a view of the stop and one of the recording members in the operative position;

Fig. 10 is a similar view of these parts in the inoperative position;

Fig. 11 is a view of the registering, controlling mechanism, the parts being set for the registration of a single unit;

Fig. 12 is a view similar to Fig. 11 with the parts set for the registration of five units;

Fig. 13 is a detail view of one of the elements of the controlling mechanism;

Fig. 14 is a sectional view showing two of the recording members, one in the operative and the other in the unoperative position;

Fig. 15 is a side elevation partly in section of the dispensing valve and certain of the elements associated therewith;

Fig. 16 is a longitudinal section on an enlarged scale of these elements;

Fig. 17 is a detail view of the portions of the controlling mechanism;

Fig. 18 is a view of the trip mechanism;

Fig. 19 is a front elevation partly in section of the pedestal of a hand operated pump;

Fig. 20 is a detail view of the parts in the unlocked position;

Fig. 21 is a view similar to Fig. 20 of the parts in the locked position;

Fig. 22 is a view of the locking mechanism in the inoperative position; and

Fig. 23 is a view similar to Fig. 22 of the locking mechanism in the operative position.

Referring to the drawings, the reference numeral 20 is employed to designate a pump equipped with one embodiment of this invention. This pump includes a hollow pedestal 21, entrance to which is through an opening having a door 22. Within this pedestal are supported the registering and recording mechanism and the controlling mechanism, as will be pointed out hereinbelow.

Upon the pedestal 21 is mounted the liquid receptacle 23, into which the liquid is fed, and from which it is dispensed through the pipe 24. Within the receptacle 23 is

mounted a drum 25 carried upon a rod 26 and adapted to be moved into various positions in the receptacle, thus regulating the free capacity of the receptacle. The receptacle here shown is adapted to contain five gallons, and preferably bears upon its outer face numerals indicating the position the lower face of the drum 25 would occupy depending upon the number of gallons to be fed to the receptacle.

This apparatus is fully described in my copending application, Serial No. 663,145, dated September 17th, 1923, and for the purpose of understanding this invention, it is sufficient to state that the liquid is fed into the receptacle through a pipe 26^a, and dispensed therefrom through the pipe 24, the operation of which is controlled by a valve 27. In order to fill the receptacle 23 with the amount of liquid indicated by the position of the lower face of the drum, it is necessary that the receptacle be filled to overflowing, the overflow passing into the annular compartment 28 and returning to the supply tank through the overflow pipe 29.

The position of the drum 25 in the receptacle 23 is determined by the quantity stop mechanism 30, which is provided with a plurality of notches 31, into which a handle 32 fixed upon the rod 26 may be inserted. Fixed to and reciprocating with the handle 32 and the rod 26 is a rod 33. Mounted to reciprocate in the pedestal 21 in front of the valve 27 and at the side of the rod 26 is a tube 34, which tube, as will be pointed out later, must be raised when the receptacle 23 is being filled and will be lowered when the valve 27 is opened, and the liquid from the receptacle 23 is dispensed.

Within the tube 34 is mounted a rod 35 which is normally raised, and which is lowered upon the opening of the dispensing valve. Mounted in the pedestal 21 below the quantity stop mechanism is the controlling, registering and recording unit 36, into which the rod 33, tube 34 and the rod 35 extend for the reasons to be pointed out below.

The controlling, registering and recording unit 36 is enclosed in a casing 37, closed at the front by a door 38 having a plurality of openings 39, preferably closed with isinglass or other transparent material. Mounted in the casing 37 are a plurality of recording members 40, provided with dials 41 which are located behind each of the openings 39, so that the amount recorded can be read therethrough. Each dial is actuated by a shaft 42 carrying a gear 43 at its outer end. Each dial 41 is mounted on one end of a plate 44, which is rigidly secured at the other end to the casing 37 in any suitable manner, and normally occupies the position indicated at 45 in Fig. 14.

Mounted for reciprocation in front of the recording members 40 is a bar 46 having on

its outer face a rack 47 with which the gear 43 of the unlocked recording member engages. The recording members are so formed that only the rotation of the gears 43 by the upward reciprocation of the plate 46 is recorded, the rotation of the gear 43 in the opposite direction caused by the lowering of the plate 46 being idle. The plate 46 is guided by the brackets 48, 49 suitably mounted on the wall of the casing 37.

Mounted to reciprocate in the casing 37 on the opposite side from the plate 46 is a plate 50 having vertical slots 51, 52 at its upper and lower ends. Secured to the casing 37 are brackets 53, 54, which carry screws 55, 56. These screws extend through the slots 51, 52 respectively, and thus guide the movement of the plate 50. Rigidly secured to the plate 50 and projecting toward the plate 46 is an arm 57.

Pivotaly mounted on the bracket 54 is a link 58 having a slot 59 at one end, which surrounds a screw 60 carried by the plate 50. Any movement of the latter plate, therefore, will cause the link 58 to oscillate around its pivotal attachment 61. On the opposite end of the link 58 is pivoted a finger 62. Mounted in brackets 63, 64 on the bar 46 below the bracket 49 is a pin 65 which projects below the bracket 64, and is normally held in that position by a spring 66, which bears against the under face of the bracket 63 and against a collar 67 carried upon the pin 65. The bar 46 at the bracket 64 is cut away to provide an incline 68 in front of which the lower end of the pin 65 normally projects. The finger 62 is held in contact with the plate 46 by means of a spring 69, as will be clear from a consideration of the drawings, Figs. 3 and 4.

Pivotaly mounted at 70 upon the bracket 54 is a right angle trigger 71, which is normally held in the position shown in Fig. 3 by means of a spring 72. In this position, the upper end, which is shaped as shown in Fig. 18, rests in a notch 73 in the adjacent face of the plate 50. As indicated in dotted lines, this notch is usually made longer than absolutely necessary, and its proper extent is determined by the plate 74, which may be riveted upon the plate 50, and which can easily be replaced in case of wear or to vary the affected length of the slot. Formed on the other arm of the trigger 71 is a flange 75 having a hole through which the rod 35 passes. On the rod 35 at either side of the flange 75 are located nuts 76, 77 to insure the simultaneous movement of the trigger 71 and the rod 35.

Referring to Figs. 1, 3 and 4, it will be noted that there is a valve 78 mounted on the underside of the bottom wall of the casing 37. This valve 78 forms a part of the filling mechanism and when opened, causes a flow of liquid into the receptacle

23 through the pipe 26. Mounted on the bottom wall of the casing 37 above the valve 78 is an arm 80, on which is pivoted a lever 81. The outer end 82 of the lever 81 is flattened, and under normal conditions rests against the bottom wall of the casing. Carried by one side wall of the casing adjacent the upper wall is a switch box 83 from which projects into the casing a button 84. The box 83 is connected with a motor not shown, which, when set in motion, provides the pressure necessary to force the liquid to rise in the pipe 26. Pivotally mounted on a bracket 85 is a lever 86, the tip 87 of which rests against the button 84.

Pivotally joined to the levers 81 and 86 is a bar 88, which insures the simultaneous actuation of both levers. From the bar 88 projects an arm 89, which, when the mechanism is raised, lies directly behind the arm 57, as shown in Fig. 4. Adjustably mounted on the tube 34 is a block 90, from which projects a pin 91 below the arms 57 and 89. The result of raising the tube 34 will, of course, be the raising of the arms 89 and 57 from the position shown in Fig. 4 to the position shown in dotted lines in Fig. 3. When this position is reached, the trigger 71 will spring under the lower edge of the plate 74 and hold the plate 50 in the position of Fig. 3.

When the tube 34 is lowered, the bar 88 and its connected members will return under the force of gravity to the full line position of Fig. 3.

The ends of the plates 44, beyond the recording units 41, are offset, as shown particularly in Fig. 14, so that they project below the bar 35 to a point adjacent the side wall of the casing. In this casing are mounted three locks 92, each of which is provided with a reciprocatory bolt 93, which projects from one end or the other of the lock casing 94. The end 91 of each plate 44 rests against one end of the bolt of its corresponding lock 92. In the locked position the bolt 93 is projected from the casing 94 toward the plate 44 and forces the latter into the position shown indicated in Fig. 14 by 45, the gear 42 being forced out of engagement with the rack 47. When unlocked, however, the bolt 93 is withdrawn from that end of the casing 94 and the plate 44 takes its normal position with the gear in contact with the rack 47.

Pivotally mounted on a bracket 95 on the back wall of the casing a yoke 96, the open ends of which are joined by an angle plate 97, which bears against the rear ends of the casings 94 of the locks 92. Carried on the lower arm of the yoke 96 is a trip 98 which projects between two of the plates 44. Obviously therefore, when the mechanism is completely locked, the yoke under the impulse of the spring 99 will take the position shown in Fig. 10, and the trip 98 will enter a recess

100 formed in the edge of the plate 50. (See Fig. 4.) So long as the parts are in that position it is of course impossible to raise the plate 50, and since, as will be pointed out later, this movement of the plate 50 is the necessary first step in the operation of the mechanism, it is obvious that no operation can take place. When, however, one of the locks is unlocked, the projecting end of the bolt 93 will strike the angle plate 97 and force the yoke into the position shown in Fig. 9, so that the trip 98 will leave the slot 100 and the plate 50 will be free to reciprocate, as is shown in Fig. 3.

The amount of reciprocation of the plate 46 and rack 47 does, of course, determine the amount of rotation of the particular gear 42, which is in mesh with the rack, and this must be regulated according to the quantity of liquid in the receptacle 23. Mounted in the casing below the yoke 96 is a yoke 101, which is supported by a bracket 102, firmly secured to the rear wall of the casing and carrying a rod 103 on which the lower arms of the yoke 101 are pivoted. On one edge of the plate 104 connecting the arms of the yoke 101 are formed a series of steps 105, 106, 107 and 108 connected by the slopes 109. The rod 33 previously referred to as being connected by the handle 32 of the rod 25 enters the casing 37 and projects through an opening adjacent the rear wall. On the side wall is mounted an angle plate 110, which serves as a guide for a slotted block 111 carried by the rod 33.

As the rod 33 is raised and lowered, therefore, the block 111 will reciprocate on the plate 110. The plate and block are so located that one face of the block bears against the stepped edge of the plate 104, which connects the arms with the yoke 100. A suitable spring 112 which engages one edge of the yoke 101, and the bracket 102 has a tendency to hold the yoke 101 in contact with the block 111 at all times regardless of the position of the block in the casing. The lower edge of the block adjacent the plate 101 is rounded as at 113 and this construction, together with the provision of the slopes 109, permits the easy lowering of the block 111.

Rigidly secured to the yoke 101 is a trigger 114, which is shown in elevation in Fig. 13. This trigger 114 comprises a hinge plate 115, one leaf of which is rigidly secured to the yoke and an arm 116 which is pivotally mounted upon the other leaf 117 of the hinge plate 115. The lower face of the arm 116 is provided with a series of steps 118, three being provided in the present instance as will appear from a consideration of Fig. 13.

A spring 119 is secured to the arm 116 and the yoke and projecting from the side wall of the case 37 is a bracket 120 provided with a slot 121 through which the arm 116

projects. The spring 119 acts to hold the arm 116 in contact with the upper edge of the slot under all conditions. As the yoke 101 is oscillated around the rod 103, the trigger 114 will be projected and retracted beyond the bracket 120.

The plate 46 reciprocates directly in front of the bracket 120, and is provided with a recess portion 122 through which the arm 116 of the trigger 114 will project under certain conditions. At the lower edge of the recess 122 is mounted a plate 123, which is adapted to engage with the stepped face of the arm 116. Rigidly mounted on the bottom wall of the casing 37 is a bracket 124, on the upper edge of which rests the lower end of the plate 46 to limit its further depression.

Mounted in the bracket 48 behind the plate 46 and in a bracket 125 is a locking strip 126 provided at its lower end with right angle plate 127. In the locking strip 126 is provided an opening 128, through which the trigger 114 projects. The face of the opening 128 is so determined that regardless of the position of the locking strip 126, it will not come in contact with the trigger 114. This is illustrated in Fig. 7 in the full and dotted line positions. The locking strip 126 is provided with a plurality of tongues 129, located directly in front of the locks 92. The front end of each bolt 93 is provided with a post 130, which is spaced back somewhat from the front edge of the bolt to provide a recess portion 131, and there is also provided between the post 130 and the main portion of the bolt a space 132. These features are shown particularly in Figs. 5 and 6. When the locking strip 126 is in the raised position as shown in full lines in Fig. 7, the tongues 129 are sufficiently above the bolts 93, so as not to interfere with their actuation. When, however, the locking strip 126 is in the dotted line position of Fig. 7, the tongues 129 would be behind the posts 130 of the locked bolts and in front of the post 130 of the unlocked bolt, and so long as the locking strip occupies this position, it is obviously impossible to make any change in the condition of the bolts 93. The dotted line or locking position is the one which the strip 126 tends to occupy under the influence of the force of gravity. When, however, the parts are shifted into the integral position shown in Fig. 4, with the plate 50 depressed, the finger 62 of the ring 58 will bear against the flanged plate 127 and raise the locking strip 126 into the full line position of Fig. 7, so that the condition of the locks 92 can be changed as desired, but as soon as the cycle of operations is started, the strip 126 will drop and no change in the locks can be made.

The relation of the tube 34 and rod 35 to the valve 27 is shown in Figs. 15 and 16,

The valve 27 is of the type opened by the depression of a pin which projects from the side of the valve casing. Referring to Figs. 15 and 16, it will be noted that the valve pin 140 projects from the bottom of the valve casing on which is pivotally mounted a handle 141 having a finger 142 normally below and out of contact with the pin 140. Supported by a rod 143 depending from the bottom plate of the receptacle 23 is a housing 144 having an arm 145 projecting at right angles to the rod 143. In the outer end of the arm 145 is formed a vertical slot 146 within which the handle 141 reciprocates. Mounted in the arm 145 is a pin 147 which under the action of a spring 148 normally bears against the portion of the handle 141 in the slot 146.

The tube 34 projects into the housing 144 as shown particularly in Fig. 16 and is freely reciprocable therein. Mounted in the mouth of the tube 34 and projecting into the housing 144 is a pin 149 from which projects a rod 150. The lower end of the rod 150 is guided by a sleeve 151 on the tube 34 and the parts normally occupy the position shown under the influence of a spring 152 which bears against the sleeve 151 and the pin 149. In order to prevent any rotation of the pin 149 relative to the tube 34, a slot 153 is provided in the tube into which projects a nub 154 carried by the pin 149. The lower end of the rod 150 is enlarged below the sleeve 151 and against it the upper end of the rod 35 is held by the spring 72. The adjacent faces of the pins 147 and 149 are suitably sloped so that when they are brought into contact by the oscillation of the handle 141, the pin 147 forces the pin 149 to descend until the nub 154 strikes the lower end of the slot 153. At the same time the rod 35 is depressed against the tension of the spring 72 until the trigger 71 leaves the slot 73 permitting the plate 50 to fall by the force of gravity. When the valve 27 is closed and the pins 147 and 149 are in the position shown, the tube 34 may be raised by the handle 155.

The relative movement of the various elements of this apparatus will be described briefly: The operator when coming on duty first inserts his key in the particular key hole and retracts a bolt 93, permitting the plate 44 carrying his individual dial 41 to swing into operating position with its gear 42 into engagement with the rack 47. At the same time the trip 98 is shifted out of the recess 100 (see Fig. 9) releasing the plate 50 to permit the raising of the tube 34 and filling of the receptacle 23. The drum 25 is placed in the desired position so that the predetermined amount of liquid may be fed into the receptacle 23. This movement of the drum 25 raises or lowers the rod 33 and through the engagement of the block 111

with the yoke 101 advances or retracts the trigger 114, thus determining the length of reciprocation of the plate 46 and the rack 47 as described hereinbelow.

5 The tube 34 is now lifted by its handle 155 and the pin 91 engaging the arms 57 and 89 raises the plate 50 and bar 88 from the position shown in Fig. 4 into the position of the plate 50 indicated in Fig. 3 by full lines and the position of the bar 88 indicated in Fig. 3 by dotted lines. When this position is reached, the trigger 71 enters the notch 73 and holds the plate 50 in the upper position. The elevation of the bar 88 causes the lever 86 to depress the button 84, setting the air pressure motor in operation, and simultaneously causes the lever 81 to open the valve 78. The motor and the valve permit the filling of the receptacle 23 which continues until the tube 34 is released and the bar 88 falls under the force of gravity, the plate 50, however, remaining in its upper position. When the plate 50 is raised the link 58 turns on its pivot 61 and the finger 62 is withdrawn from the plate 127 permitting the strip 126 to descend and lock the bolts 93 in position the finger 62 being swung under the pin 65.

10 The handle 141 is now actuated to open the valve 27 and the rod 35 is depressed by the connections described above. The depression of the rod 35 swings the trigger 71 on its pivot 70 until it leaves the notch 73 and the plate 50 drops. The dropping of the plate 50 turns the link 58 on its pivot 61 and the finger 62 raises the plate 46 and rack 47 to the limit permitted by the trigger 114. When the limit is reached the finger 62 guided by the incline 68 leaves the plate 46 and strikes the plate 127 raising the locking strip 126 into the position shown in full lines in Fig. 7, and releasing the bolts 93, so that they can be reset if desired. The cycle of operations is now completed and the apparatus is ready for resetting and re-actuating.

15 Conditions sometimes arise under which a hand operated pump is desired instead of a power operated pump. There the pump shown in Fig. 19 may be used. The controlling and registering and recording mechanism indicated generally in Fig. 19 by the numeral 161 are the same as those in the power operated type and will not be described in detail. The valve 27 actuated by the handle 141 functions in the manner previously described but the mechanism for feeding the liquid differs in many respects as will be pointed out below.

20 The feed pipe 26* leads from a pump 162 which may be of any well known type operated by the actuation of a shaft 163 by a handle 164 on a counter shaft 165, the shaft being connected by the intermeshing gears 166, 167. In order to prevent the operation

of the pump 162 when the valve 27 is open a locking mechanism is employed, by which the gear 166 is positively held against rotation. Depending from a cross plate are brackets 168 in which a cross shaft 169 is freely rotatable. Projecting from one end of the shaft 169 is an arm 170 and from the other end is an arm 171. Carried by the tube 34 below a cross plate is a forked strap 172 between the forks of which extends the arm 170, whereby any reciprocatory movement of the tube 34 is transmitted to and causes the rotation of the shaft 169. Projecting from the inner face of the gear 166 is a pin 173 with relation to which the arm 171 is so located that when the tube 34 is in the lowest position (see Fig. 21), the arm is swung into the path of the pin 173 and prevents the rotation of the gear 166, (see Figs. 21 and 23), while when the tube 34 is raised, which is only possible when the valve 27 is closed, the arm 171 is swung out of the path of the pin 173 and the pump 162 may be operated (see Figs. 20 and 22).

25 While certain embodiments only have been shown and described, I am not to be limited thereto, since it is obvious that others may be made without departing from the spirit and scope of the invention as set forth in the following claims.

30 Having thus set forth my invention what I claim as new, and for which I desire protection by Letters Patent is:

1. In a liquid dispensing pump having a measuring and dispensing receptacle, means for predetermining the amount of liquid said receptacle will contain, means for filling said receptacle, means for dispensing liquid from said receptacle, mechanism for recording said predetermined amount of liquid and connections between said mechanism and said filling and dispensing means whereby said mechanism is set upon the operation of said filling means and actuated upon the operation of said dispensing means.

2. In a liquid dispensing pump having a measuring and dispensing receptacle, means for predetermining the amount of liquid said receptacle will contain, means for filling said receptacle, means for dispensing liquid from said receptacle, mechanism for recording said predetermined amount of liquid and connections between said mechanism and said dispensing means whereby said mechanism is actuated upon the operation of said dispensing means.

3. In a liquid dispensing pump having a measuring and dispensing receptacle, means for predetermining the amount of liquid said receptacle will contain, means for filling said receptacle, means for dispensing liquid from said receptacle, mechanism for recording said predetermined amount of liquid and connections between said mechanism

and said dispensing means whereby said mechanism is set upon the operation of said filling means.

4. In a liquid dispensing pump having a
5 measuring and dispensing receptacle, means for filling said receptacle, means for dispensing liquid from said receptacle, means for predetermining the amount of liquid said receptacle will contain, mechanism for re-
10 cording said predetermined amount, a reciprocatory plate for actuating said mechanism and a trigger set by said predetermined means for fixing the length of reciprocation of said plate.

15 5. In a liquid dispensing pump having a liquid receptacle, means for determining the capacity of said receptacle, means for filling said receptacle and means for dispensing liquid from said receptacle, mechanism for
20 recording the liquid capacity of said receptacle, movable means for actuating said mechanism, means controlled by said capacity determining means for limiting the movement of said mechanism actuating

means, means controlled by said dispensing 25 means for operating said mechanism actuating means and means controlled by said filling means for setting said operating means in position.

6. In a liquid dispensing pump having a 30 liquid receptacle, means for determining the capacity of said receptacle, means for filling said receptacle and means for dispensing liquid from said receptacle, mechanism for recording the liquid capacity of said recep- 35 tacle, a reciprocatory plate for actuating said recording mechanism, means controlled by said capacity determining means for limiting the reciprocation of said plate, a second plate controlled by said dispensing 40 means for operating said first plate, and means controlled by said filling means for setting said second plate in operating position.

In testimony whereof I have affixed my 45 signature.

MARCENA R. JULIAN.