

Dec. 15, 1931.

M. SELIG ET AL

1,836,879

LIQUID DISPENSING APPARATUS

Filed June 26, 1929

4 Sheets-Sheet 2

FIG. 5.

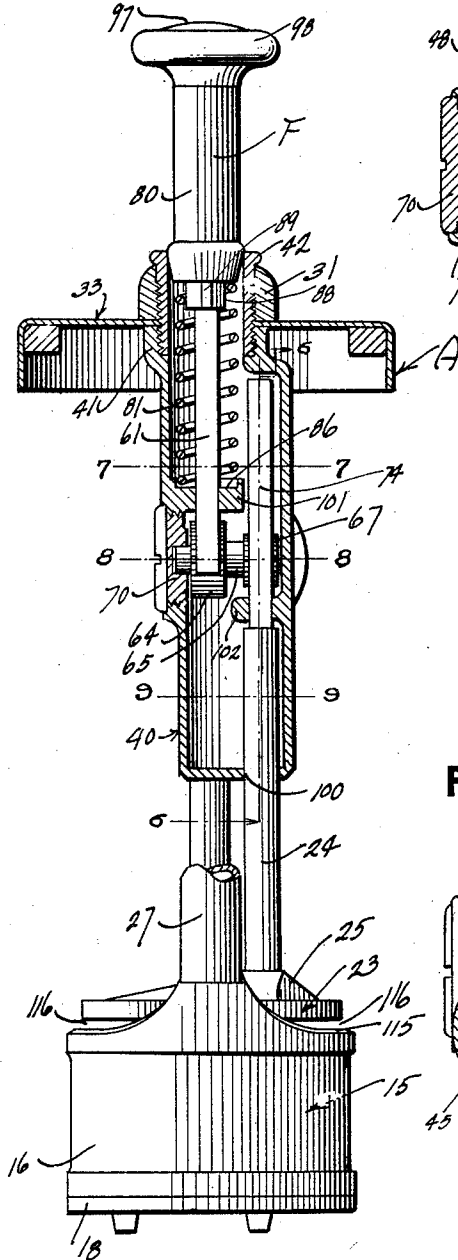


FIG. 8.

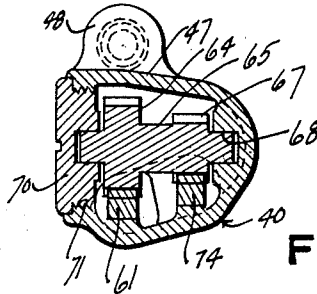


FIG. 6.

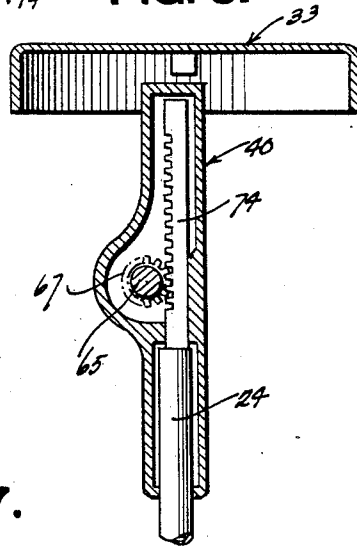


FIG. 7.

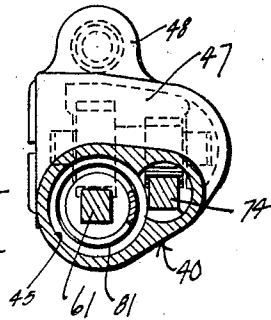
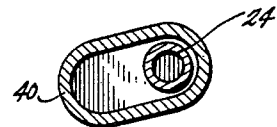


FIG. 9.



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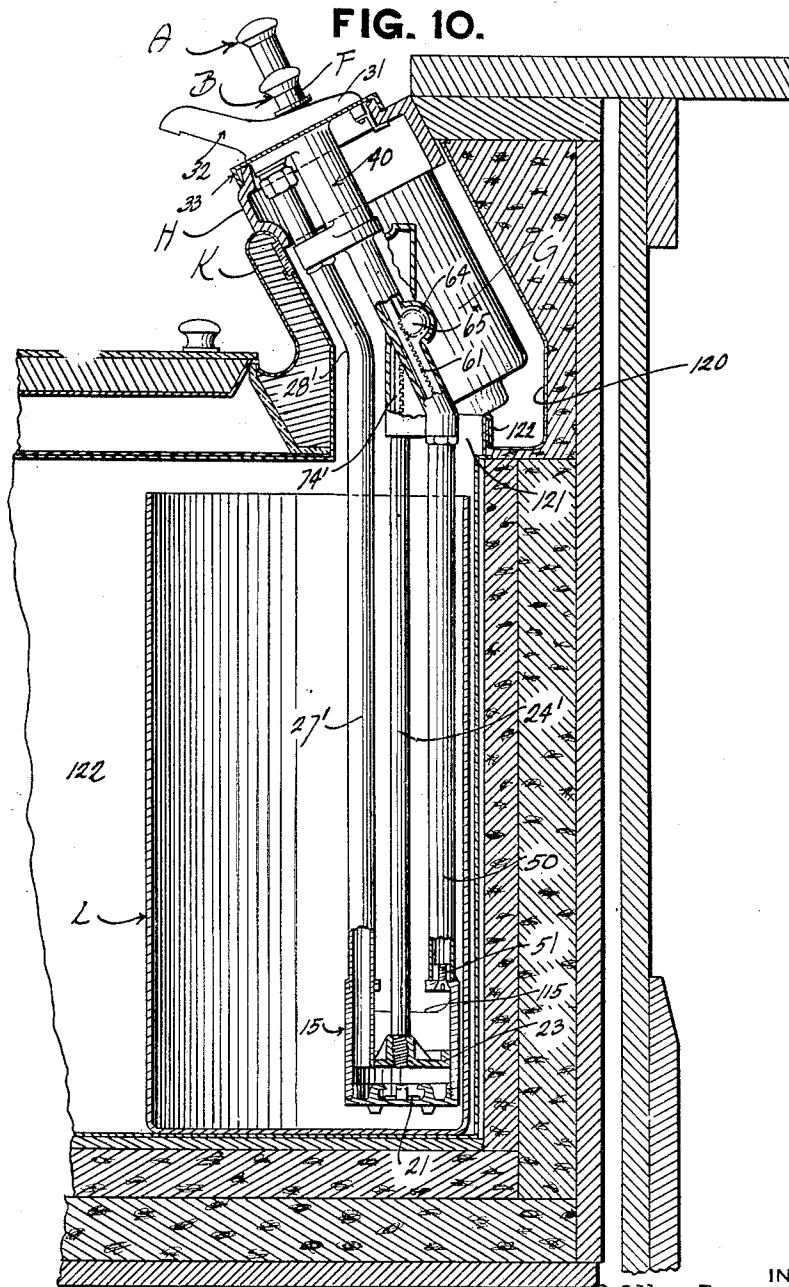
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4 Sheets-Sheet 3



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4 Sheets-Sheet 4

FIG. 11.

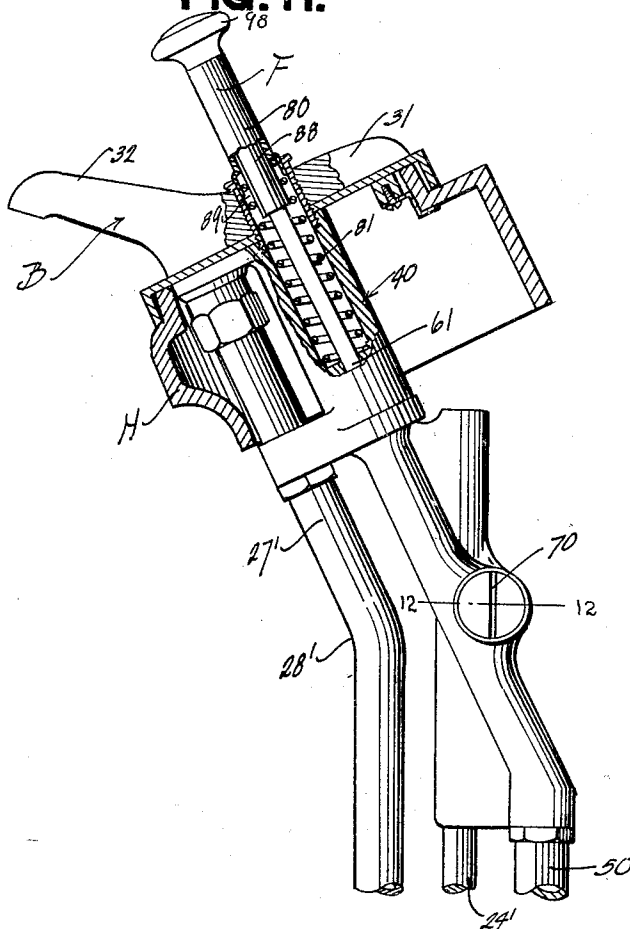


FIG. 12.

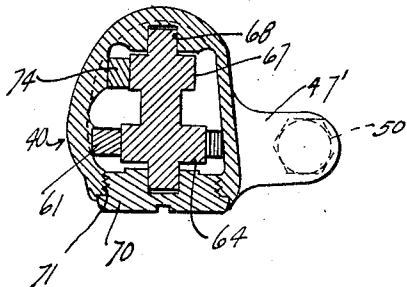
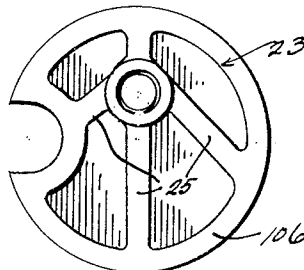


FIG. 13.



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UNITED STATES PATENT OFFICE

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LIQUID DISPENSING APPARATUS

Application filed June 26, 1929. Serial No. 373,829.

This invention relates to improvements in dispensing apparatus.

The primary object of the invention is the provision of a liquid dispensing pump, adaptable for use in connection with soda fountain apparatus, by means of which fruit syrups, milk, heavy flavors, such as chocolate, and other liquids may be dispensed in regulated quantity, with comparative ease, due to an improved force multiplying construction embodied therein.

A further and important object of the invention is the provision of an improved liquid dispensing pump comprising an arrangement of details which enables the pump to be located together with other pumps in the conventional jar rack at the front of the fountain, but which includes a construction which enables the pumping of liquids, such as milk, from a position below the ordinary jar rack from large containers, such as five-gallon milk cans, located in the usual cold storage compartment of the fountain, at a location below the ordinary capping of the fountain.

It is well known in the art, and practically a common feature of conventional soda fountain construction, that substantially uniform sized jars or containers are located in a row upon a jar rack, from which chocolate and other syrups are dispensed. Inasmuch as milk is used in relatively large quantities, much more so than ordinary syrups, it is inconvenient to utilize an ordinary jar in the jar rack of a fountain for containing milk to be dispensed. It is therefore common practice to locate the milk pump at some location in the capping of the fountain, where it is very conspicuous, unsightly; rendering cleaning difficult, and at times is an obstacle to quick dispensing action, since the dispenser's sleeves or clothing very often becomes caught thereon, resulting in broken glasses and the like. In overcoming these difficulties, the present invention contemplates the use of an improved pump construction which enables a milk pump to be placed in the same row as the conventional syrup jars, with a pump that externally conforms to the pump for the syrup jars; the improved construction ex-

tending downwardly through the syrup rack to a location below the ordinary syrup jars, and into a removable milk can or container holding a large quantity of milk, such as five gallons, which container is placed in an ordinary soda fountain cold storage compartment, or cooler box, from whence it may be readily removed.

A further and important object of this invention is the provision of a liquid dispensing pump, adaptable for soda fountain use, including a novel rack and pinion construction for operating the plunger or piston.

A further object of this invention is the provision of an improved liquid dispensing pump, embodying a construction which admits of the linear reciprocatory action of a plunger mechanism, and an operating rod, in relatively inclined or intersecting lines, such, for instance, as will enable a vertical piston or plunger action in connection with a reciprocatory operating rod action in a line inclined to the vertical.

Other objects and advantages of the improved liquid dispensing pump construction will be apparent during the course of the following detailed description.

In the accompanying drawings, forming a part of this specification, and wherein similar reference characters designate corresponding parts throughout the several views,

Figure 1 is a vertical sectional view taken through the improved liquid dispensing pump, of the type which is used in the conventional syrup jars of soda fountains, showing the improved rack and pinion operating details and adjustable features.

Figure 2 is a plan view of the improved pump.

Figures 3 and 4 are transverse sectional views taken substantially on their respective lines in Figure 1 of the drawings.

Figure 5 is a vertical sectional view through certain details of the improved pump, with other parts shown broken away, the view being taken in a plane at right angles to the view of Figure 1, and showing cooperating pump operating details.

Figures 6, 7, 8 and 9 are transverse sectional views taken substantially on their re-

spective section lines shown in Figure 5 of the drawings.

Figure 10 is a view showing the improved type of pump as modified for use in the pumping of milk, with the pump operating details located in the vicinity of the jar rack, in uniform and corresponding row relation with the other syrup dispensing pumps of a soda fountain.

Figure 11 is a fragmentary, partly sectional view, of the upper portion of the pump of Figure 10.

Figure 12 is a sectional view taken substantially on the line 12—12 of Figure 11.

Figure 13 is a plan view of the plunger or piston of the pump construction of Figure 10.

In the drawings, wherein for the purpose of illustration are shown different adaptions of the improved pump construction, the letter A may generally designate the improved pump, of the type which is used for dispensing syrups in the relatively short syrup jars located in inclined relation upon the usual jar rack of conventional soda fountains. The pump B includes many generic features of the improved pump A although the pump B is modified for use in pumping larger quantities of liquid, such as milk, and from a location which enables the pump B to be used for pumping milk or other liquid from large containers located in the usual cold storage compartment of a soda fountain, at a location below the elevation of the usual syrup jars or containers. Insofar as applicable, similar reference characters designate corresponding parts in both forms of pumps A and B.

Referring to the details of the pumps, best shown in Figures 1 and 5 of the drawings, there is provided a cup 15, which may be of any approved material, preferably including a hollow cylindrical body 16, internally screw threaded at 17, in the lower end thereof, for detachably receiving a bottom cap or plate 18, provided with a syrup or liquid inlet port 19, through which the liquid may flow to the compartment 20 in the cup. A gravity operated valve 21 is carried inside upon the cap 18, the same being of disc formation and normally closing the port 19. Overhanging fingers 22 are provided rigid or integral upon the inside of the plate or cap 18, to limit and guide the movement of the flap valve 21, so that the same may open to admit liquid to the compartment 20, under suction.

A relatively flat piston or plunger 23 is reciprocable in the compartment 20, the same being preferably flat and having eccentrically connected thereon a piston rod 24 which is in a line at right angles to the plane of the piston head 23, and connected with the latter by means of reinforcing ribs or webs 25, as shown in Figures 1 and 4 of the drawings.

An upstanding delivery tube 27 is connected, integral, or soldered or otherwise

rigidly attached to the cup body 16, having its lower end suitably extended into the compartment 20, and having an inlet 28 at the lower portion of the compartment 20, just above the cap 18. The tube 27, throughout its length, preferably lies within the extended outlines of the cup 15, so as not to obstruct the attachment or detachment thereof with respect to syrup jars and the like. The said tube 27 preferably extends in axial parallel relation to the cup 15, and it may be of any desired length, having the upper end thereof screw threaded for detachable connection in an insert piece 30 which may be cast or otherwise secured in the cap attaching shank 31 of a delivery spout 32.

A top cap 33, preferably of nickeled silver, is provided, including a top wall with depending annular flanges, and upon the outer surface of the top wall, the attaching shank 31 of the spout construction is soldered or otherwise affixed, in the usual relation. The said cap 33 is apertured for receiving the upper end of the delivery tube 27 therethrough, and a lock nut 34 may be detachably connected on the screw threaded portion of the tube 27, adapted to be clamped against the under surface of the top wall of the cap 33, as shown in Figure 1, to insure a proper assemblage of parts.

The means for actuating the piston and piston rod comprise movable details connected in an efficiently supported relation with the cap 33, spout 32, and cup 15. The same includes an irregularly shaped housing or casing 40, which may be of nickeled silver. It has an upper internally screw threaded end 41, into which a sleeve nut 42 detachably threads; the delivery spout shank or base 31 being provided with a screw threaded opening thru which the nut 42 also extends; the head of the nut being exposed on the top of the pump, and being tightly drawn to clamp the shank 31 and housing end 41 at opposite sides of the top wall of the cap 33. The sleeve nut 42 is provided with a passageway therethrough which aligns with a passageway 45 in the upper part of the housing, thru which operating details of the plunger mechanism are reciprocably mounted. The lower end of the housing construction 40 terminates short of the cup 15, and intermediate its ends the housing 40 is provided with a lateral extension 47, having a lug 48 integral therewith, provided with a downwardly facing screw threaded socket 49, adapted to receive a connecting and supporting post or upright 50, which may be of tubular formation, and which extends in substantial parallelism with the line of action of the plunger 24, at the opposite side of the latter from the spout 27. The lower end of the upright 50 is detachably connected at 51, by means of a screw, to a top lug 53 formed rigid with the cup wall 16, at the top of the latter; the screw or bolt 51

being adjustable from within the cup, to detachably connect the tube or upright 50 in place.

Referring to the operating mechanism for the piston 23 and its rod 24, the same may be generically designated at F in the drawings. It consists of an operating handle 60 reciprocally supported in the sleeve 42 and the upper passageway 45 of the housing 40, having a rack 61 adjustably connected therewith, in a manner to be subsequently described, which is provided with teeth 62 thereon, at one side thereof, adapted to mesh with a pinion 64 which is rotatably supported by a shaft 65, integral or otherwise rigid therewith. The shaft 65 has also connected therewith, in a keyed relation, a smaller pinion 67, and the shaft 65 at one end bears in a step bearing 68, provided within the housing extension 47, as is shown in Figure 8 of the drawings. The shaft 65 is horizontal, and at its end opposite the bearing 68, it rotatably bears in a socket provided in a detachable cap 70, which is screw threaded in a detachable relation at 71 in the housing 40, as shown in Figure 8. The opening in which the cap 70 is screw threaded, is of larger diameter than the diameter of the gears 64 and 67, to permit detachment of the latter together with their shaft 65, merely by endwise sliding of the shaft from the housing upon removal of the cap 70. The teeth of the rack 61 mesh with the teeth of the larger pinion 64. The teeth of the smaller pinion 67 have meshing therewith the side teeth of the upper rack end 74 of the plunger or piston rod 24, as is shown in Figure 6 of the drawings.

The racks 61 and 74 are of course offset with respect to each other, and the lower and upper ends thereof respectively overlap transversely, so that upon depression of the handle 60, the rack riding over the larger pinion 64, through the shaft 65, will cause the smaller pinion to push the rack 74 downwardly, for the stroke of the piston 23 downwardly through the compartment 20 of the cup 15, whereby the liquid trapped in the compartment will be forced upwardly through the tube 27 and through the discharge spout 32 into the receptacle awaiting the liquid dispensed.

The adjusting means which connects the rack 61 to the handle 60 is of improved construction, the handle 60 including a rotatable sleeve 80, slidable in the guide nut 42 and the passageway 45 above mentioned, normally urged upward by means of a compressed spiral spring 81 which is disposed within the compartment 45, and at its lower end seats on a shoulder 86 of the housing 40, and at its upper end rests in a lower socket end of the sleeve 80. A vertical adjustable sleeve 88 is splined at 89 within the sleeve 80; the same being of an external diameter which will permit its movement through the passageway of

the expansion spring 81, without interfering with the latter. The key and groove connection at 89 enables the stroke adjusting sleeve 88 to rotate with the sleeve 80, and slide longitudinally with respect thereto. The said sleeve 88 is furthermore provided with a screw threaded passageway therethrough, adapted to have a screw threaded portion 90 at the upper end of the rack bar 61 adjusted therein, whereby to variably regulate the distance between the lower end of the adjusting sleeve 88 and the shoulder 86, for the purpose of limiting the piston action to a predetermined length of stroke, for the discharge of a desired quantity of the liquid, since in soda fountain use this is desirable, inasmuch as some syrups and liquids need to be dispensed in greater quantities than others. In Figure 1, the sleeve 88 is adjusted for the maximum length of stroke of the piston, and it is seen that the rack bar 61 above the screw threaded portion 90 has a reduced shank 93, provided with an upper screw threaded end which extends through a passageway in the label holding cap 94 which is held by means of a nut 95 immovable upon the upper end of the shank 93. The nut 95 secretes within the top socket 97^a in the label holding cap 94, and on top of this cap 94 a label disc 97 may be detachably connected by means of a ring-shaped nut 98, in a manner which is rather conventional. Thus, it is seen that the label holding cap 94 is non-rotatable, although the sleeves 80 and 88 are rotatable with respect thereto. It is intended that the lower reduced portion of the cap 94 fit within an upper socket of the sleeve 80, which acts as a bearing for the sleeve 80. The lower end of the sleeve 88 striking against the shoulder 86 determines the length of piston stroke.

The piston rod 24 slidably extends through an opening 100 in the bottom wall of the housing 40, as shown in Figure 5, and the racks 61 and 74 are respectively provided with bearings 101 and 102, thru which they slidably extend, as shown in Figure 5; the bearing extension 101 providing the shoulder 86 above described along which the spring seats. The housing 40 is closed at its lower end to prevent the dripping of moisture, etc., therefrom onto the piston, thus eliminating its liability of admixture with the syrup in the cup. It is also found desirable to provide an upstanding annular wall on top of the piston 23, shown at 106 in Figure 4 of the drawings.

An improved feature of the spout 32 is the fact that the passageway 110 thereof is rearwardly inclined to the passageway of the tube 27, from the extreme entrance end 111. While the entrance end 111 faces, at an angle, downwardly, yet the lower edge of the passageway 110 even at the outlet edge 111 is either horizontal or slopes downwardly towards the tube 27, for the purpose of

preventing drip of syrups onto the fountain capping.

The operation of the improved pump will be apparent from the foregoing. The spring 81 urges the piston 23 upwardly until the same abuts against the top extension 53 of the cup 15. In this location the lower surface of the piston 23 is slightly above the top edge 115 of the cup body 16, permitting liquid from the jar or container in which the cup 15 is submerged to enter the compartment 20 through the space, which is well designated at 116 in Figures 1 and 5 of the drawings. This admits of a quick filling of the pump compartment from the top, not entirely dependent upon the suction filling thereof upon the upstroke of the piston, by the lifting of the valve 21. Of course, the check valve 21 closes by gravity at the top of the upstroke of the piston, to prevent displacement of the contents from the cup 15, except upon downward plunger action.

The type of pump A is used in a jar G, such as shown in Figure 10 of the drawings; the jars G being detachably supported in a row upon a jar rack H; the cap 33 of this type of pump fitting on a suitable collar at the top of the jar G.

Referring to the form of invention B, as above mentioned, the details are quite similar to the form of invention A, and similar reference characters designate corresponding parts in the two forms of invention. It will be noted that the soda fountain construction is altered to accommodate the improved milk dispensing pump B in the arrangement shown. The jar rack compartment 120, wherein the ordinary syrup jars G are disposed, is provided with an opening 121 thru the bottom thereof, to the cold storage compartment 122 of the fountain construction, which ordinarily lies below the syrup jar rack and the capping K of the soda fountain. About this opening 121 is an upwardly extending flange or collar 122, to prevent drip of contents and moisture, from the jar rack compartment into the large container L adapted to contain milk or other liquid in large quantities.

In the form of invention of pump B, the operating means F is arranged the same as for the form of pump A above described, that is, it may be reciprocated in a line at an angle to the vertical, according to the angular inclination of the jars of the jar rack. However, due to the improved rack and pinion operating means, the piston rod 24' is vertically disposed, as is also its rack 74' upon the upper end thereof. The other details of the invention are the same as for the form of pump A, except that the discharge tube 27' has a bend 28' therein at the location where found most convenient, in order to compensate for the angular disposition of the operating means of the pump B and the verti-

cal extension of the same downwardly thru the cooler compartment 122. Of course, the supporting upright 50; piston rod 24' and discharge tube 27' for the form of invention B are longer than the corresponding elements in the form of invention A, inasmuch as the cup of the form of invention B wherein the piston or plunger actuates is disposed in the lower portion of the cold storage compartment 122, at the bottom of the compartment in the container L, for dispensing substantially all of the contents of the container L prior to removing the latter. It is at once apparent that the improved operating means including the rack and pinion connection enables not only a multiplication of power actually used to dispense larger quantities of liquid, such as milk, and to overcome considerable friction due to heavy liquids and syrups, but the same is in large part the solution of placing the operating pump for milk dispensing apparatus in the same row as syrup pumps, and utilizing a large container, such as a five-gallon container, placed in the ordinary cold storage compartment of a fountain, with which the pump cooperates to dispense liquid therefrom.

The assembled details of the pump structure may have soldered connections, and to this end it is contemplated to solder the cap 33 to the spout shank 31, and also to solder the nut 42 in place to the shank 31. The housing 40 at its connection with the cap 33 may also be soldered in place, and various other details, such as the nut 34 soldered to its connections and the upright 50 soldered in place.

The parts may be made of any suitable material, although it is preferred that all portions having direct contact with the liquids to be dispensed shall have the surfaces thereof tinned to obviate chemical reaction.

It is to be noted that all of the parts are externally rounded to prevent collection of sediment, and to facilitate cleaning. The disposition of the upright 50 opposite the dispensing tube prevents the plunger mechanism and its connection from coming out of alignment.

Any approved ratio between the pinion gears may be used, such as is found most practical to enable an ordinary pressure to multiply itself sufficiently to dispense heavy syrup, or extra large quantities of liquid, such as milk used in making milkshakes. Other conditions than those shown may make it necessary to set the handle at an angle of less than 180° with respect to the vertical center line of the plunger mechanism.

Various changes in the shape, size, and arrangement of parts may be made to the forms of invention herein shown and described, without departing from the spirit of the invention or the scope of the claims.

We claim:

1. In a soda fountain dispensing pump the

combination of a supporting frame including a housing, a plunger mechanism including a rack reciprocally extending into the housing having an external plunger head, an operating device slidably carried by the housing including a handle external thereof and a rack slidable within the housing, a shaft having a pair of pinions keyed therewith, a bearing in the housing for one end of the shaft, and a detachable cap on the housing having a bearing for the other end of the shaft whereby to operatively position the pinions in operative meshing and interconnected engagement with said racks, the opening covered by said cap being of a size to enable withdrawal of the shaft and pinions therewith, and means associated with the plunger head to enable movement of the latter to pump a liquid.

2. In a soda fountain dispensing pump the combination of a supporting frame including a spout provided with an upwardly inclined dispensing passageway therethrough, the extreme exit edge of which is sharp and faces downward, and the extreme lower edge of which passageway adjacent the exit edge slopes directly from the extremity of the sharp exit edge rearwardly without upward inclination into the spout passageway to prevent drip of dispensed liquids.

3. In combination with a soda fountain including the usual jar rack with syrup jars and their respective pumps supported thereby, the soda fountain having the usual cold storage compartment below the syrup jars, and pump means located in a row with the syrup pumps and operatively extending therefrom and thru the jar rack downwardly into the cold storage compartment to adjacent the bottom thereof for dispensing liquids from said cold storage compartment.

4. In combination with a soda fountain including a usual jar rack compartment and a cold storage compartment below the normal capping of the fountain adapted to receive a large container containing a large amount of liquid to be dispensed, and pumping means located in the jar rack row and operatively extending into the lower part of the container in said compartment for pumping liquids from said container.

5. In combination with a soda fountain including the usual jar rack having a jar receiving compartment and a cold storage compartment below the normal fountain capping adapted to receive a large milk container, the jar rack having an opening therethrough from the jar rack compartment to the cold storage compartment, above said container, and a detachable pump supported on the jar rack and extending through the jar rack compartment and opening therein downwardly into the container in the cold storage compartment adjacent the bottom of the con-

tainer and cold storage compartment for pumping liquid from the container.

6. In combination with a soda fountain including the usual jar rack section having a jar rack compartment wherein syrup jars and the like are received, jars in the rack, individual pump means for the jars in said jar rack section, the same being arranged to be inclined slightly to the vertical, the soda fountain having a large cold storage compartment below and to the rear of the jar rack section, a large liquid container in said cold storage compartment, the jar rack section and fountain having an opening from the jar rack compartment to the cold storage compartment above said container, and a pump operatively supported in the jar rack section in the same association therewith as the pumps of said syrup jars and extending through the said opening down into operative pumping relation in the container of said cold storage compartment.

7. In dispensing apparatus a supporting cap, a housing supported by the cap and extending therebelow, a shaft rotatably supported by the housing horizontally below the cap, a pair of pinions keyed with said shaft, an operating plunger slidably mounted in the upper portion of the housing and extending externally above the cap, an adjustable rack connected with said plunger in meshing relation with one of said pinions, spring means supported in the housing and urging said plunger upwardly, means limiting the upward movement of the plunger from said housing so as to maintain said spring under compression, a piston slidably supported by the lower end of the housing including a rack meshing with the other pinion, and means carried by said cap and operatively associated with said piston for the pumping of fluid upon depression of the plunger.

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