

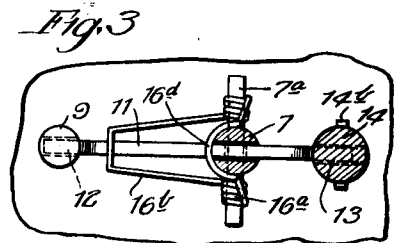
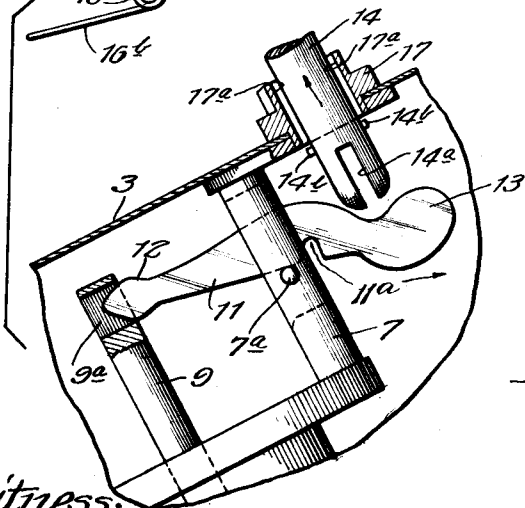
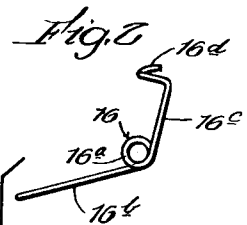
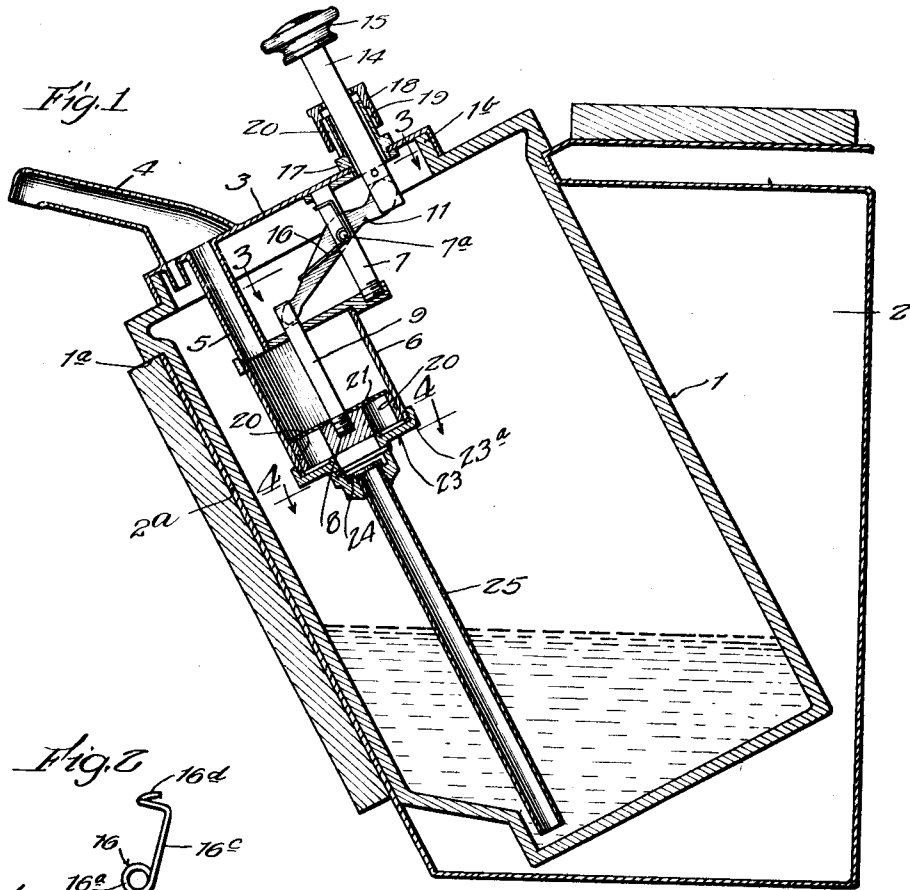
March 17, 1925.

1,530,074

A. E. ECKERT

LIQUID DISPENSER

Filed Sept. 24, 1924



Witness:
Florence B. Neino

Fig. 4
Inventor
Adopted E. Eckert
By *[Signature]*

UNITED STATES PATENT OFFICE.

ADOLPH E. ECKERT, OF OAK PARK, ILLINOIS.

LIQUID DISPENSER.

Application filed September 24, 1924. Serial No. 739,450.

To all whom it may concern:

Be it known that I, ADOLPH E. ECKERT, a citizen of the United States of America, and a resident of Oak Park, Cook County, Illinois, have invented a certain new and useful Improvement in Liquid Dispensers, of which the following is a specification.

This invention relates to improvements in liquid dispensing devices, and particularly to apparatus used for dispensing syrups in connection with fountain equipment for serving soda water, ice cream and various mixed beverages, such as disclosed in my prior application, Serial No. 657,663 filed August 16, 1923.

The object of the invention is to provide an improved construction for a dispensing device, characterized especially by the simplicity of mechanical detail, uniformity and regulation of the volume of liquid dispensed, ease of operation and other features tending to promote greater economy and better service.

A further object of the invention is to provide a dispenser in which the mechanical and moving parts are so designed and constructed as to permit the complete and ready dismantling of the apparatus for the purpose of cleansing and sterilizing, if necessary. As can be readily appreciated, sanitation is desirable, if not compulsory, where food products are served, and especially in the handling of syrup flavors and fruit juices. The possibility of fermentation and spoiling makes it imperative that the apparatus be capable of thorough cleaning of every part. As will be seen, the dispenser herein disclosed can be completely taken down and put together by hand and without the use of tools and with the elimination of all small parts, such as nuts, screws, and the like, which can be readily lost.

A preferred embodiment of the invention is illustrated in the accompanying drawings wherein—

Figure 1 is a view in vertical section of the dispensing device.

Figure 2 is an enlarged detail view of the pump operating mechanism showing the parts disconnected for the purpose of removal.

Figure 3 is an enlarged detail view in cross section taken on line 3, 3, of Figure 1, and

Figure 4 is a detail view in cross section taken on line 4, 4, of Figure 1.

The dispensing device is housed within and forms a part of a jar or container 1 from which the liquid is dispensed. The jar 1, is removably mounted within an ice compartment 2, and having oblique front wall 2^a and an oblique portion in its top wall having an opening in which the jar is inserted, the latter assuming an inclined position of say 30° to the vertical, and facing rearwardly from the service counter. The jar 1 is provided with a shoulder 1^a at its upper end which engages around the opening in the compartment 2.

The jar has a relatively large opening in its top wall, preferably of an oval shape and surrounded by a flange or lip 1^b. A flanged plate 3, fits over the openings, and not only forms a closure for the jar, but serves as a supporting plate for the dispensing mechanism, so that all parts can be removed as a unit, in the refilling or cleaning of the jar.

Near the lower edge of the plate 3, is a fixed spout 4, extending rearwardly in horizontal position, and having a downturned end. The spout is provided with an extension, below the plate 3, having the form of a pipe 5, extending parallel to the axis of the jar and connected with a cylinder 6, mounted a short distance below the plate 3, and located generally in the upper portion of the jar. The cylinder is further connected with the plate 3, by means of a slotted stud or post 7, said post and pipe 5 acting to support the cylinder at diametrically opposed points to the plate 3 above.

Within the cylinder is a piston 8, secured to a piston rod 9, extending through the upper end or head of the cylinder.

At the upper end of the piston rod is formed a transverse slot, 9^a extending a short distance longitudinally of the rod. Supported by the post 7 is a lever 11 provided midway between its ends and along its lower edge with a notch or recess 11^a, adapted to engage a pin 7^a extending transversely of the slot in the post 7, said notch

and pin forming a fulcrum removably supporting the lever 11. At the end of said lever adjacent the piston rod 9 is formed a cam-like head or enlargement 12, which enters and engages in the slot 9^a at the upper end of the piston rod. At the opposite end of the lever is another and slightly larger head 13, having a rounded cam surface at its upper edge. This end of the lever has a similar form of connection with a plunger consisting of a rod 14, passing through the plate 3, and provided at its upper end with a head 15. At the lower end of the rod is formed a cam slot 14^a opening downwardly and adapted to straddle the cam head 13 of the lever 11.

As clearly shown in Figure 3 the fulcrum pin 7^a extends outwardly at each end, these end portions forming a support for a spring 16, which acts to oppose the pressure on the plunger head, in operating the pump and to restore the parts to their initial position after the pressure has been released. This spring is of a special form consisting of wire bent to form two coils 16^a arranged in axial relation to each other and connected by a U-shaped portion 16^b. The opposite ends of the coils extend in straight free end portions 16^c, 16^c, at right angles to the U-shaped portion 16^b and terminate in semi-circular hooked extremities 16^d, 16^d, bent at right angles and toward each other. This spring is supported on the ends of the pins, each coil 16^a being inserted on one of the pins, with the U-shaped portion 16^b extending lengthwise of the lever 11, toward the piston end, and straddling the top edge thereof, the free end portions 16^c, 16^c extend in the direction of the top plate 3, and along the post 7, the hooked ends passing around the post from opposite sides. The spring wire is sufficiently flexible to permit the spring to be easily removed by springing the hooked ends free of the post, thus allowing the coils to be taken from the pins, thereby releasing the entire spring. To replace the spring the reverse operations are carried out—a matter of a few seconds.

The plunger rod 14, as already explained, passes through the plate 3, and as a bearing therefor a cylindrical bushing or collar 17 is mounted on the plate and projects upwardly therefrom. Extending lengthwise of the initial base of this collar is a slot 17^a adapted to be engaged by a pin 14^b projecting from the plunger rod 14 near its lower end at right angles to the cam slot 14^a adjacent thereto. The slot 17^a in the base of the collar is disposed at an angle of 90° to the normal position of the pin, so that it is necessary to rotate the plunger rod through this angle before the two will register. Obviously, this cannot be done unless the lever 11 is released from the cam slot 14^a, and as a result, the plunger is prevented from

sliding upwardly through the collar by the pin 14^b so long as it is held against axial rotation by the lever 11.

However, by removing the spring 16 in the manner described, the lever 11 can be moved endwise sufficiently to release one end from the slot in the piston rod, and then completely removed. This permits the plunger rod to be turned until the pin 14^b registers with the slot 17^a whereupon the plunger rod can be withdrawn entirely. Thus it will be manifest that all of these parts can be readily disconnected and entirely removed from the apparatus.

Associated with the plunger rod is a regulating sleeve 18 which surrounds the plunger rod and encloses the collar 17. Inside of this sleeve 18 is a plurality of longitudinal slots 19 which vary in length. These slots are adapted to register with and engage a key 20 extending axially along the outside of the collar. By lifting the sleeve to disengage the key from a particular slot 19 engaged thereby, the sleeve can be rotated to bring another slot opposite said key, thereby elevating or lowering the sleeve with respect to collar 17, and likewise decreasing or increasing the stroke of the plunger. In this way the volume of liquid dispensed by a single stroke of the piston can be regulated. This feature of the apparatus has been fully discussed in the prior application, and since it is not an essential part of the present invention, need not be discussed further. However, it is to be observed that with the removal of the plunger rod from the bearing collar 17, this regulating sleeve also becomes readily reached.

Referring again to the cylinder 6, and the piston 8, the latter consists of a metal disk secured to the lower end of the piston rod and having passages 20 therethrough offset on either side of the axis of the piston rod. On top of the piston is a check or flap valve 21, which opens and closes as the piston travels in its downward and upward stroke. Further details of the piston valve may be omitted as it is more fully described elsewhere. At the lower end of the cylinder is a removable head 23, having screw threaded connection with the cylinder through the medium of an internally threaded flange 23^a. At the central portion of the cylinder head is a hollow boss 24 into the bottom of which is screwed an inlet pipe 25, extending axially to a point just clear of the bottom of the container 1. The upper end of the inlet pipe projects a short distance into the interior of the hollow boss 24 and forms a lip on which seats a flat metal disk 26, forming a check valve for controlling the intake of the liquid into the lower end of the cylinder. Just above the valve disk 26 is a pin 27 extending diametrically across the valve cavity above the disk. As shown in Figure 4

this pin 27 is in the form of a screw threaded at one end, and a head at its other end. This pin is permanently fastened in place, the threaded end being lodged in a threaded boss 24 so as to prevent leakage. Owing to the small size of the valve disk 20 and the possibility of its being lost, if removed by the user, it is preferred to permanently secure the same against removal, although it may readily be made removable in any one of a number of ways. However, this check valve can be readily kept clean without this precaution, and hence, for practical reasons, is preferably constructed as shown.

It has already been explained how the spring 10, the lever 11, the plunger rod 12, and regulating lever 13, can be removed and disassembled, this being more clearly shown in Figure 2. Thus assuming that these parts have been removed, it follows that the piston 8 is disconnected. By unscrewing the lower cylinder head from the cylinder, the piston and its rod can be withdrawn from the cylinder, so that the same, as well as the interior of the cylinder, can be cleaned, and similarly, the removal of the cylinder head 23 exposes the check valve therein and interior surfaces, so that they can be subjected to any cleaning process needed.

From the foregoing it is manifest that by the novel arrangements of the moving and operating parts, the pump can be easily disconnected, so that every part can be thoroughly cleaned, without the use of any other agency than the hands. This construction, therefore, promotes cleanliness and compliance with the ordinary rules of sanitation as well as the strict regulations in force in most communities.

Having set forth the construction and advantages of the dispenser embodying the novel features herein disclosed, I claim as my invention:

1. In a liquid dispenser, the combination of a pump, a plate supporting said pump, a plunger rod mounted in said plate, a lever connecting the free end of said plunger rod with the piston rod of said pump through the medium of cam and slot connections, said lever being fulcrumed intermediate its ends, and a detachable member for retaining said lever on its fulcrum.

2. In a liquid dispenser, the combination of a pump comprising a cylinder having a removable head at the end, a piston and piston rod extending through the opposite end, a pump supporting plate, a plunger rod mounted in said plate, a lever connecting the free end of said plunger rod with the piston rod of said pump through the medium of cam and slot connections, said lever being removably fulcrumed intermediate its ends on said pump support, and tension means normally retaining said lever in opened position, and adapted to be re-

moved to permit the complete disassembly of said pump and operating members.

3. In a liquid dispenser, the combination of a pump comprising a cylinder, piston and piston rod, a pump support comprising a plate and a post connecting said plate and said cylinder, a plunger rod mounted in said plate, a lever fulcrumed intermediate its ends and having cam and slot connections at its opposite ends with said piston and plunger rod and a spring mounted adjacent the fulcrum of said lever and detachable to permit the removal of said lever and said plunger from said support.

4. In a liquid dispenser, the combination of a pump comprising a cylinder, a piston and piston rod, a pump support comprising a plate and a post connecting said plate and said cylinder, a plunger rod mounted in said plate, a lever fulcrumed intermediate its ends and having cam and slot connection at its opposite ends with said piston and plunger rod, and a spring mounted adjacent the fulcrum of said lever and acting to retain said lever on its fulcrum, said spring being detachable to permit the withdrawal of said lever, out of operative connection with said piston and plunger rods.

5. In a liquid dispenser, the combination of a plate, a cylinder depending from said plate, a post connecting said plate with one end of said cylinder, a piston in said cylinder having a piston rod extending axially from said cylinder adjacent said post, a plunger rod mounted for endwise movement adjacent said post, a lever fulcrumed intermediate its ends in a slot formed in said post, the ends of said lever engaging cam slots in the ends of said piston and plunger rods, a spring detachably mounted on said post and having a portion adapted to engage said lever.

6. In a liquid dispenser, the combination of a cylinder, a support for said cylinder, comprising a plate and a post connecting said plate with one end of said cylinder, a piston in said cylinder having a piston rod extending axially from said cylinder adjacent said post, a plunger rod mounted adjacent said post and parallel therewith, a lever passing through a longitudinal slot in said post, and fulcrumed intermediate its ends therein, the ends of said lever engaging a transverse slot in said piston rod and an endwise opening in said plunger rod, a spring mounted on said post and having a portion adapted to engage said lever, said spring normally holding said lever on its fulcrum whereby the disengagement of said spring permits the disconnecting and removal of said lever, piston and plunger rods.

7. In a liquid dispenser, the combination of a pump comprising a cylinder, piston and piston rod, a pump support comprising a

plate and a post connecting said plate and said cylinder, and provided with a longitudinal slot therethrough, a lever passing through said slot and fulcrumed intermediate its ends, a plunger rod extending through said plate, said piston and plunger rods having cam slots adapted to be engaged by the ends of said lever, and a spring detachably mounted on said post and engaging said

10 lever.
 8. In a liquid dispenser, the combination of a pump comprising a cylinder, piston and piston rod, a pump support comprising a plate and a post connecting said plate and
 15 said cylinder, and provided with a longitudinal slot therethrough, a lever passing through said slot, a pin extending transversely of said post and supporting said lever intermediate its ends, a plunger rod
 20 supported in said plate and provided with an endwise opening slot adapted to be engaged by one end of said lever, the other end being insertable in a slot formed in said piston rod, and a tension member comprising
 25 coils mounted on the ends of said pin, and end portions engaging said lever and said post, said spring being detachable to effect the removal of said lever and said plunger.

30 9. In a liquid dispenser, the combination of a pump and a support therefor, and pump actuating mechanism, comprising a lever removably supported intermediate its ends on
 35 a fixed fulcrum, and provided with cam surfaces at its opposite ends, said pump including a piston and piston rod, the latter being provided at its end with a slot adapted to be engaged by one end of said lever, a plunger mounted in said pump support and pro-

vided at its lower end with an endwise opening cam slot adapted to engage the opposite end of said lever and a removable tension member acting on said lever.

10. In a liquid dispenser, the combination of a cylinder and a support therefor, a
 45 piston in said cylinder and a piston rod extending through the head of said cylinder, a lever removably fulcrumed intermediate its ends adjacent said cylinder, and having a
 50 cam and slot connection with said piston rod, a plunger rod mounted in a bearing in said pump support, and having a cam slot at its free end adapted to engage the adjacent end
 of said lever, and a pin adapted to register with a notch in said bearing whereby said
 55 plunger may be removed when disengaged from said lever.

11. In a liquid dispenser, the combination of a cylinder having a removable head at
 60 one end, a support for said cylinder, a piston in said cylinder having a piston rod extending through the supported end of said cylinder, a lever fulcrumed intermediate its ends
 adjacent said cylinder and having a cam and slot connection with said piston rod, a
 65 plunger rod extending through said cylinder support, and having a cam and slot connection with the opposite end of said lever, and a spring removably supported on said pump
 support and acting on said lever, whereby
 70 on the removal of said spring, said lever and plunger can be detached from said support and upon the removal of said cylinder head the piston and rod can be removed from said
 75 cylinder.

Signed at Chicago, Ill., this 13th day of September, 1924.

ADOLPH E. ECKERT.