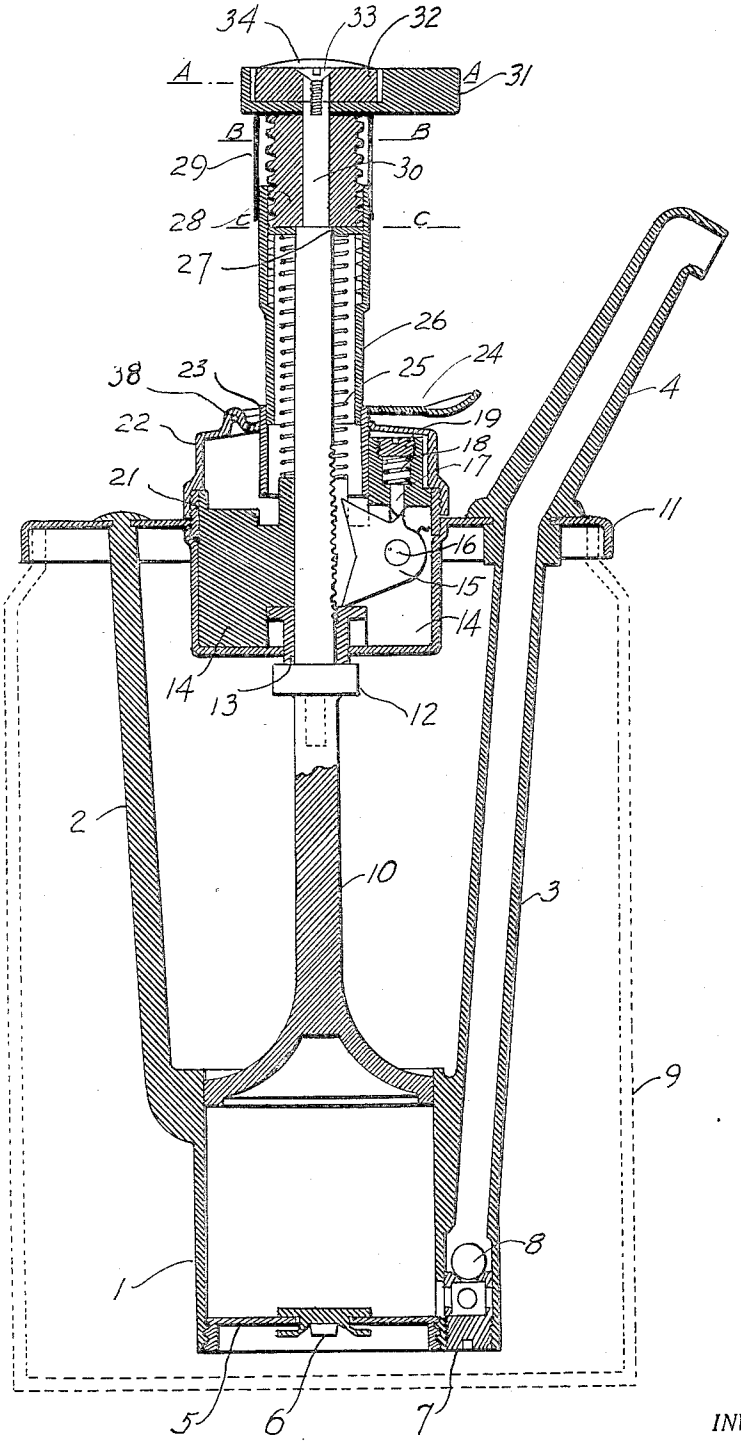
July 11, 1933. H. T. WHEELER 1,917,678

ADJUSTABLE POSITIVE MEASURING PUMP

Filed Feb. 15, 1930 2 Sheets-Sheet 1



INVENTOR.

Fig 1

Harley T. Wheeler

July 11, 1933. H. T. WHEELER 1,917,678

ADJUSTABLE POSITIVE MEASURING PUMP

Filed Feb. 15, 1930 2 Sheets-Sheet 2

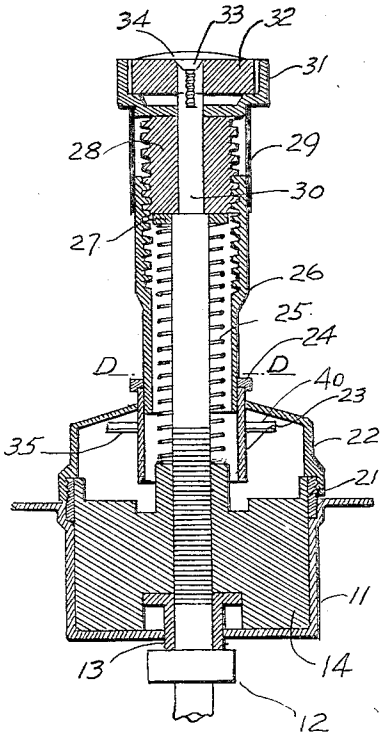


Fig 2

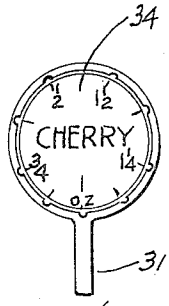


Fig 4

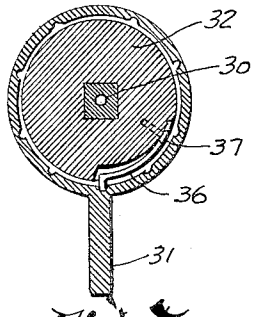


Fig 5

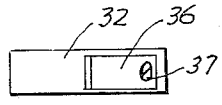


Fig 6

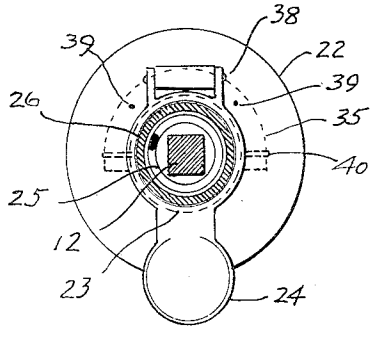


Fig 3

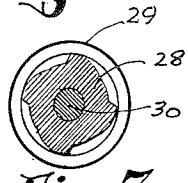


Fig 7

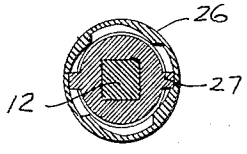


Fig 8

INVENTOR.

Harley J. Wheeler

Patented July 11, 1933

1,917,678

UNITED STATES PATENT OFFICE

HARLEY T. WHEELER, OF DALLAS, TEXAS, ASSIGNOR TO ELIZABETH WHEELER, OF DALLAS, TEXAS

ADJUSTABLE POSITIVE-MEASURING PUMP

Application filed February 15, 1930. Serial No. 428,752.

This invention relates to vacuum pumps, more particularly to certain new and useful improvements in attachments for positive measuring pumps for use in dispensing syrup jars found in standard soda fountains, and its principal object resides in its capability of quickly predetermining different quantities of liquid to be dispensed at each operation, thus effecting a saving by delivering the quantity desired.

Another object of the invention arises from a novelty of structure, particularly the quickly adjustable method of changing the stroke of the reversible mechanism during each stroke if necessary, which in connection with a visible dial makes possible the immediate and accurate discharge of any quantity of syrup within the range of the pump capacity.

Still another and important object is the resetting device by which the reversible rod may be returned to its starting point from any point less than a full stroke, without completing the full stroke and the returning stroke.

With these objects and advantages in view, other objects as well as certain features of construction and arrangement of parts will become apparent as the description proceeds, taken in connection with the accompanying drawings, wherein:

Figure 1 is a side elevation in vertical cross-section of the pump and attachments built according to this invention.

Figure 2 is an end elevation in cross-section of the reversing mechanism and the attachments.

Figure 3 is a plan view and cross-section in part of the resetting device, along lines DD of Figures 2.

Figure 4 is a plan view of the visible dial graduated in fluid ounces.

Figure 5 is a horizontal cross-section of the dial along the lines AA of Figure 1.

Figure 6 is a side elevation of the dial and its spring.

Figure 7 is a horizontal cross-section of the multi-threaded nut and its housing, along lines BB of Figure 1.

Figure 8 is a horizontal cross-section of the adjusting sleeve and guide washer along lines CC of Figure 1.

Continuing more in detail with the drawings, it will be observed in Figure 1 that the pump parts are moulded to the top to form a frame which supports the pump piston and the reversing mechanism. As is apparent, the pump parts are readily removable for repairing and cleaning.

The pump is so constructed as to be operative in the usual syrup jar which forms a part of the standard soda fountain equipment, without alteration of the equipment, and may be adjusted as will presently become apparent to dispense any quantity of liquid desired, within the limits for which the pump is designed. The top 11 will fit over the neck of a standard pump jar, holding the pump cylinder 1 just off the bottom of the jar 9, so that the pump valve 6 will admit syrup on the suction stroke. The piston 10 is a close fit to the walls of the cylinder 1; the piece 5 forms the cylinder head and contains a suction valve 6. The support 2 and the delivery tube 3 form the supports to the top 11; the tube 3 is extended to form the nozzle 4, the liquid being discharged thru the latter. To make this a positive measuring pump, a valve body 7 and a valve 8 are used to prevent seepage of the liquid back thru the fits between the surface of the piston 10 and the walls of cylinder 1.

The piston 10 is attached to the rod 12, the latter having formed on its face indentations in which the detent 15 may rest. It is apparent that on the up-stroke the detent 15 in one extreme position will trail and vibrate until the sleeve 13 forces the detent to reverse, so permitting a return stroke. When the up-stroke is completed, the downstroke may be started, the detent 15 trailing and vibrating until forced by the sleeve 26 to reverse. The detent 15 is pivotly attached to the bearing 14 by a pin 16; this same detent resides in a slot cut in the bearing 14 and has a clearance on the top and bottom for movement. The cross-section of the three parts 17, 18 and 19 is a part of the bearing 14, and the section is to one side of the slot in which the detent 15 resides. The cross-piece 17 is sharpened

on the lower edge to alternately maintain the detent 15 in one or the other of its two extreme positions by pressing against the side of the pointed extension of the detent. The spring 18 is held in place by a screw 19 and provides the reaction necessary to operate the cross-piece 17. The bearing 14 forms a housing for the detent 15, being a close fit on the sides of the detent but permitting movement in an up and down direction, and is a guide for the piston rod 12. The piece 21 is threaded on its upper portion to receive the cap 22, and at its lower portion is fixed to the top 11.

Referring now especially to the means for controlling the stroke, attention is particularly directed to the cross-sections of the Figures 1 and 2. The sleeve 26 which reverses the detent mechanism is mounted on a multi-threaded nut 28, so that the length of the stroke may be varied at will and in accordance with a dial shown in Figure 4. All positive stroke pumps as now made have intricate adjustments for stroke length so that the operator cannot change the delivery unless he has been provided with special wrenches, and some time must be taken for the work. There is, however, the necessity of mixing syrups of various quantities to conform with the desires of customers, rarely any two mixtures alike. The proportions desired of two or more syrups are at present dispensed by guesswork only when taken from a plain pump, and cannot be dispensed from a positive measuring pump without wasting the syrup. To enable the operator to deliver into a container fractional amounts of several syrups so that the resulting syrup will be tasty as desired, this invention makes possible by permitting the operator to set the pump at the desired full stroke for each kind of syrup.

A portion of the rod 12 is reduced to a circular cross-section forming a shoulder-fit as at 30; a multi-threaded nut 28 rests on this projection, better shown in the cross-section of Figure 7. The sleeve 26 is correspondingly threaded and is held in a fixed radial position to the rod 12 by the washer 27, whose ears fit into slots of the sleeve 26, as is also shown in Figure 8. Thus when the nut 28 is rotated, the sleeve 26 rises or falls without rotation. The washer 27 is held against the nut 28 by the constant tension of the spring 25. The housing 29 protects and covers the sharp edges of the sleeve 26 and is held in place between the parts 28 and 31 by the adjusting nut 31, the latter being fixed to the squared extension of the rod 12 by the screw 33. As shown in Figure 5, the upper end of the rod 12 is reduced to a rectangular cross-section to prevent the dial body 32 from rotating; the dial body 32 is also held against a shoulder on the rod 12 so formed by the screw 33. It should be apparent that when the nut 31 is rotated, the dial body 32 is stationary, yet the sleeve 26 will rise or fall to change the point of the stroke at which the detent mechanism will be reversed.

Referring now to Figure 4, the dial face 34 is calibrated in terms of liquid measurement, calculated from portions of the piston stroke. The normal position of the nut 31, the wing pointing toward the nozzle, is shown as one liquid ounce. A clockwise movement reduces the stroke, anti-clockwise increasing it. Referring now to Figure 5 again, at each division shown, a spring 36 attached to the dial body 32 by a rivet 37, drops into the recesses made on the inner surface of the nut 31 and opposite to the graduations made on the face of the dial 34. This insures maintenance of the stroke as it is set, until changed to another point. Figure 6 shows a plan view of the spring 36 mounted on the dial body 32 by a rivet 37.

There are other operations in soda dispensing beside accurate measurement of quantities of syrup by control of the pump stroke, notably dispensing a quantity into a container to a certain level, an unknown quantity being in the container to begin with. To effect this, and yet be able to return the pump piston to its normal starting point, a resetting device is applied as shown in Figures 1, 2 and 3. The sleeve 23 is concentric with the sleeve 26 and is caused by the body 22. The sleeve 23 is held tensioned in an upper position by the spring 35 attached to the body 22 by rivets 39, 39, pressing against ears 40 which are attached to the sleeve 23. The sleeve 23 is forced into contact with the reversing detent 15 by a lever 24, fitting the exposed top of the sleeve 23 and being hinged to the cap 22 by a rivet 38. It should be apparent that the resetting device operates independently of the sleeve 26 or of the setting of the dial 34.

In operation of the dial, the normal position of the wing of the nut 31 is toward the nozzle, giving the average dispensation of syrups, one liquid ounce for example. In mixing drinks or dispensing an extra large portion, the dial is rotated to the desired position, being there held by the spring 36 pressing into a depression of the nut 31. The position of the sleeve 26 so set, predetermines the stroke by reversing the detent mechanism at the point corresponding to the liquid measurement shown on the dial 34. For those operations before mentioned, after which the pump piston is left at a partial position of the stroke as set, the reversing detent mechanism may be reset by the lever 24 operating the sleeve 25, thus permitting the spring 25 to return the piston to its uppermost position.

It should be apparent that while the mechanism covered by this invention has been shown applied to a reversing detent, the principle may be applied to other types of

positive measuring pumps. On pumps having no reversible motions, the effect of applying the invention is a method of quickly changing the length of the stroke. And it should also be apparent that by the application of a special and a positive lock between the nut 31 and the dial body 32, the pump becomes a positive measuring pump of fixed stroke.

Manifestly, the construction illustrated and described is capable of considerable variation and such variation as is within the scope of the appended claims is considered within the spirit of the invention.

I claim:

1. In a pump, a cylinder having a piston and a piston rod therein, a series of teeth formed on said piston rod, a double-pointed detent pivotally situated at a fixed point with relation to the pump frame, either point of said detent engageable with the series of teeth on said rod, a pointed projection on the detent contacting with a sliding spring-actuated pawl to hold the detent in either of its extreme positions, a spring-tensioned threaded spool rotatively positioned on the upper end of said rod, a washer in a fixed position on said piston rod with extensions into axial grooves of a sleeve, said sleeve threaded to fit said threaded spool; a dial fixed to the upper end of the piston rod and its circumference visibly graduated in terms of piston stroke, the periphery of said dial residing within an annular groove of a winged nut, said winged nut attached to said threaded spool, rotation of the winged nut and threaded spool assembly varying the distance of the end of said threaded sleeve with respect to the position of said detent; said threaded sleeve in motion contacting with one face of said detent to reverse it at a point predetermined according to the graduation of the visible dial in terms of piston stroke, a shoulder integral with said piston rod in opposite motion contacting with a movable sleeve, the latter in turn contacting with a face of the detent to reverse it in the opposite direction.

2. In a pump, a cylinder having a piston and a piston rod therein, a series of teeth formed on said rod, a double-pointed detent pivotably situated at a fixed point with relation to the pump frame, either point of said detent engageable with the series of teeth on said rod, means to hold the detent in either of its extreme positions; a spring-tensioned threaded spool rotatively positioned on the upper end of said rod, a sleeve threaded to fit said threaded spool and means to position said sleeve radially with respect to said rod; a dial fixed to the upper end of said rod and its circumference visibly graduated in terms of piston stroke, a winged nut housing the periphery of said dial and attached to said threaded nut, rotation of the winged nut and threaded spool assembly varying the distance of the end of said threaded sleeve with respect to the position of said detent; said threaded sleeve in motion contacting with one face of said detent to reverse it at a point predetermined according to the graduation of the visible dial in terms of piston stroke; a secondary sleeve concentric with said threaded sleeve operatable by a lever from an exterior point of the pump frame, to contact with one face of said detent to reverse it and permit a return stroke of said rod from any point less than the predetermined stroke.

In testimony whereof I have signed my name to this specification.

HARLEY T. WHEELER.