

April 5, 1932.

E. J. JUDGE

1,852,308

LIQUID-FILLING MACHINE

Filed April 9, 1929 4 Sheets-Sheet 1

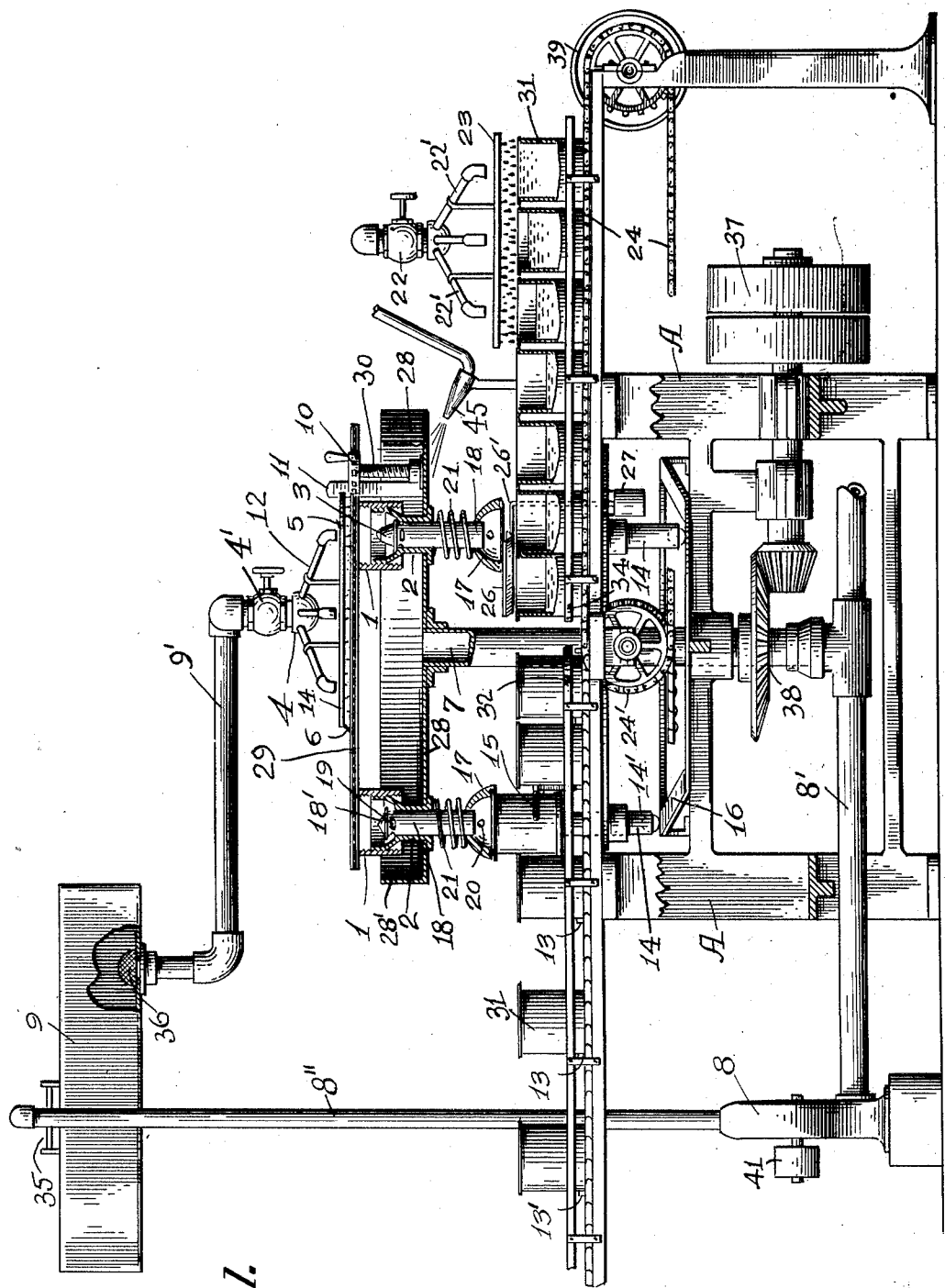


Fig. 1.

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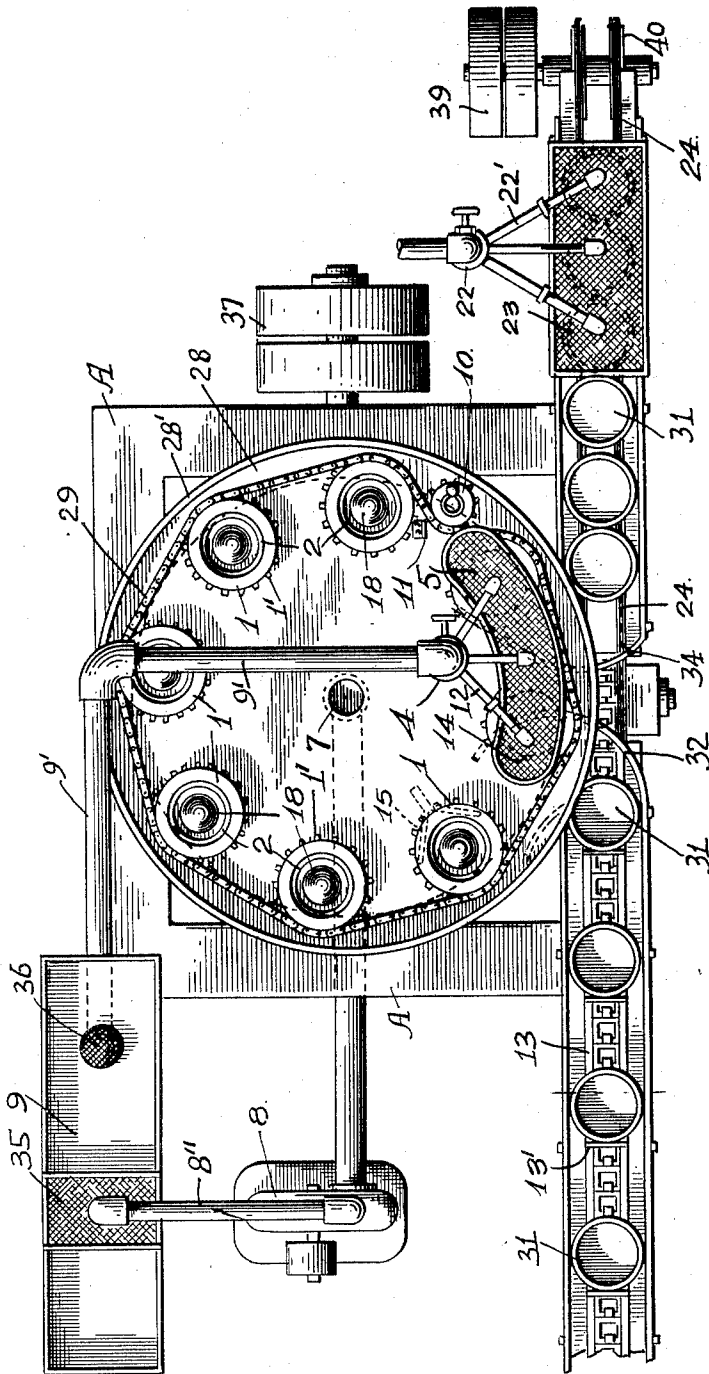
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Fig. 2



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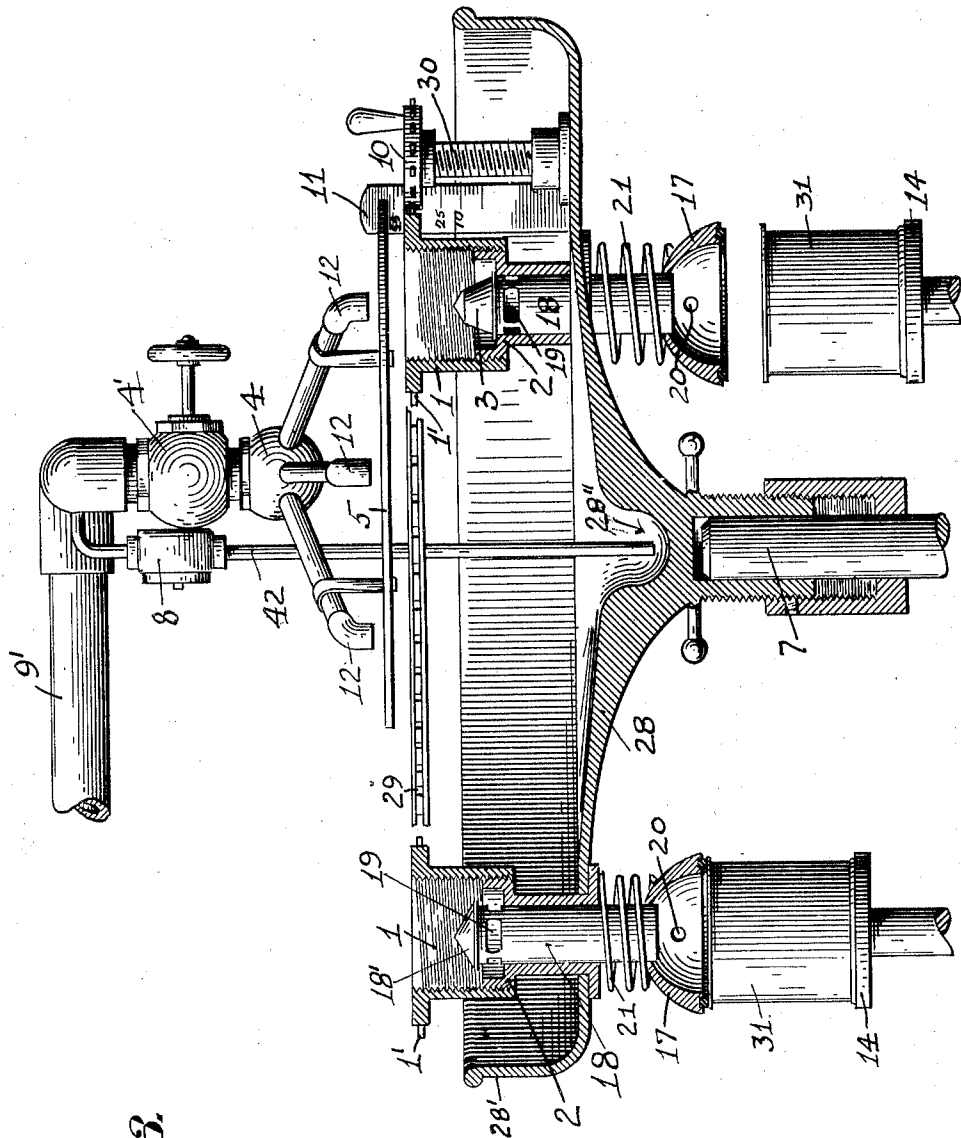
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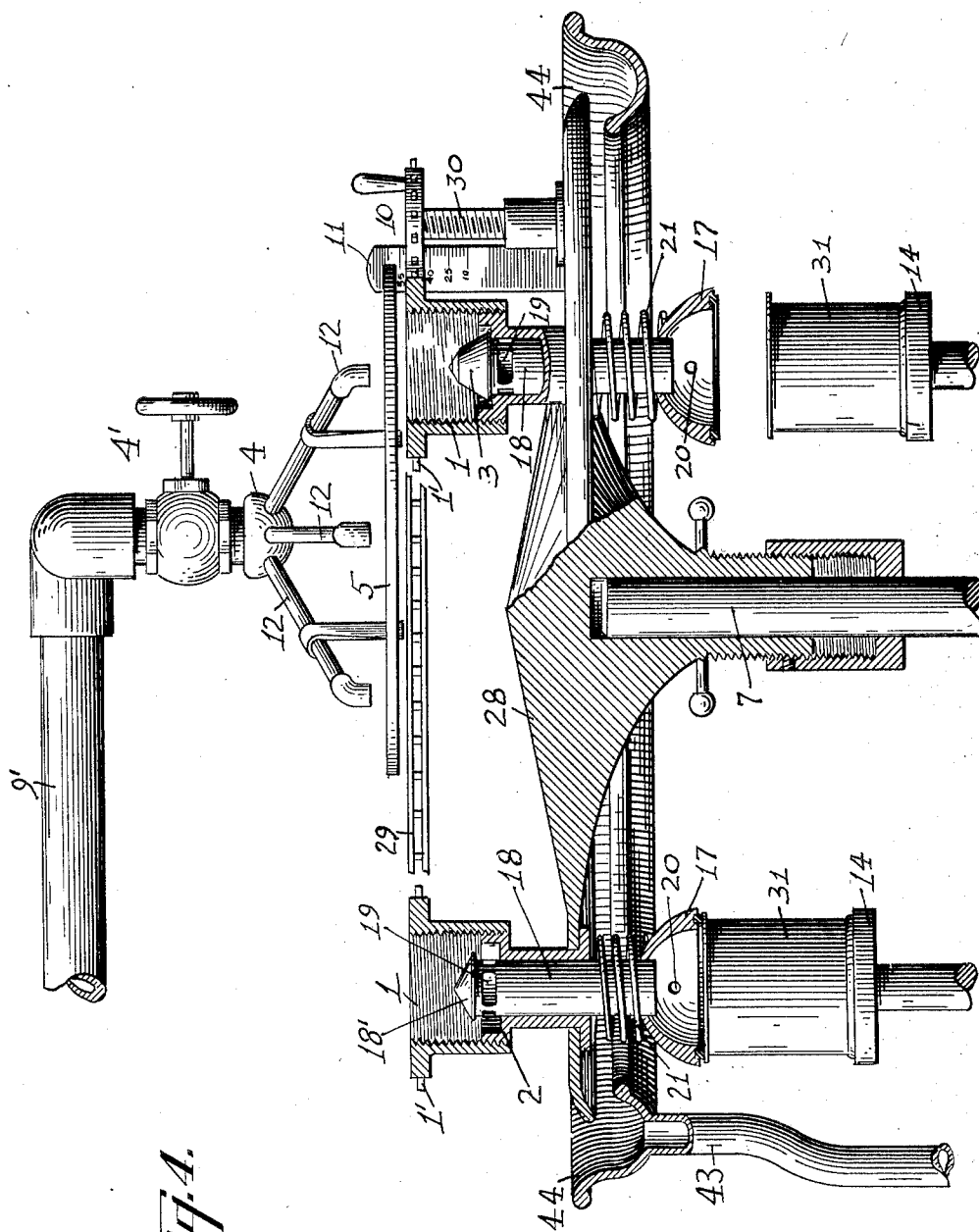


Fig. 4.

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LIQUID-FILLING MACHINE

Application filed April 9, 1929. Serial No. 353,877.

My invention relates to the canning art, and has to do particularly with machines for supplying containers with such liquid content as may be called for.

For the sake of simplicity, I shall herein consistently refer to my invention in terms of syringing, though it is to be understood that it is equally applicable to and includes supplying containers with other preserving, flavoring and condiment liquids.

In the syringing art, the practice is to convey a continuous procession of unsealed comestible-containing cans on the way to the exhaust box or, as it is termed, the first cook, to and through the sphere of action of an apparatus drawing upon a source of syrup and delivering it to each can. According to the nature and requirements of the comestible, the strength or grade of the syrup is varied, and this is usually done by the separate preparation of each grade, storing it separately and supplying it as such grade to the full capacity of the can. The time and labor lost in such procedure and other disadvantages has led to a method of preparing initially a single strength or grade of syrup, concentrated to a degree above any normal requirement; supplying this concentrated syrup to the cans in predetermined relatively small volume; and subsequently supplying the cans with water in order to reduce or dilute the concentrated syrup to the strength or grade required.

The advantages claimed for this method need not herein be set forth in any greater detail than to call attention to the outstanding feature of the initial preparation, storing and handling of a single grade of syrup, instead of several grades. Reference may be had, however, for a complete distinction of this method to Letters Patent No. 1,683,241 granted to me as assignee of Peirce Cutler, September 4th, 1928, for filling containers with preserving, flavoring and condiment liquids.

My invention herein has for its object the provision of a novel means for syringing adapted for said method, in which a concentrated syrup is first supplied to the cans, and is followed by a diluent adapted to reduce within the cans the concentrated syrup to the required grade.

To this end my invention consists in the novel apparatus hereinafter fully described by reference to the accompanying drawings in which:—

Fig. 1 is a side elevation partly in section of the syruer.

Fig. 2 is a plan view of the same.

Fig. 3 is a sectional elevation enlarged showing a modification of the circulating means for the syrup excess.

Fig. 4 is a sectional elevation showing another modification of said excess syrup circulating means.

In these drawings I have illustrated my invention in its preferred forms, but it is to be understood that changes may be made in details of structure, arrangement and combination without departing from the spirit of the invention as defined by the claims hereunto appended.

In a suitable stand A is mounted for rotation a shaft 7 upon the upper end of which is carried a turret comprising a table 28, having an annular series of spaced measuring cups 2 each of which is controlled with respect to its discharge, by means of a vertically movable tubular valve 18 seated in and through the bottom of the cup and projecting below the table 28. The valve 18 has a flanged head 18' coacting with the cup bottom to support it when closed. It has also discharge ports 19 immediately under its head; a foot dome 17 on its lower end; and a spring 21 to hold it normally closed.

The volume capacity of each cup is made variable, according to intention, by means of a vertically movable sleeve 1 fitted to it in such wise as, by its movement, to increase or

diminish its depth. In the present case I have shown this capacity-varying sleeve 1, in its preferred form, as threaded upon the cup, and have also shown, as a means for simultaneously and uniformly adjusting the entire series of sleeves, an encircling sprocket chain 29 engaging a sprocket 1' on each sleeve, and adapted to be moved by a sprocket 10 hand operated or otherwise. The sprocket 10 is screw-threaded upon a post 30, to enable it to participate in the vertical movement of the encircling chain 29 and volume-capacity sleeves 1. It is to be understood, however, that any suitable power transmitting connections may be employed to adjust the sleeves. In convenient proximity to the adjusting sprocket 10 is a gauge standard 11, the scale on which indicates the changes in volume capacity of the measuring cups 2 as defined by the vertical movement of the sleeves 1. The syrup is supplied from a tank 9 through a pipe 9' to a header 4 controlled by a shut-off cock 4'. Radiating from the header 4 are several delivery pipes 12 here shown as three, which lie in an arc above the path of travel of the measuring cups 2, of sufficient length to insure complete delivery to said cups as they pass beneath them. Suspended from the delivery pipes is an arcuate screen 5 having a width about equal to the diameter of the measuring cups 2 and a length greater than the maximum separation of the trio of delivery pipes 12, said screen lying below and receiving the syrup discharge from said pipes 12 and distributing it evenly, gently and without splash to the underlying cups 2 as the latter travel below. The screen is fitted with a wiper 6 at one end (Fig. 1) adapted to wipe off the syrup from the upper edges of the cups.

Below each foot dome 17 of the measuring-cup valves 18, in vertical line therewith, is a can-lifting base 14, which travels with the turret. These bases 14 have a vertical movement, due to their roller-shod stems 14' traveling upon a fixed cam track 16, the contour of which is such as to lift a can resting upon said base 14 into upward-pressing joint-relation with the foot dome 17 at and during a portion of the rotation of said parts, and to cause or permit it to be lowered again to release the can from said joint relation. These movements, it will readily be seen result first in placing the can in tight connection with the foot dome 17 and through the upward pressure thereon, to lift the tubular valve 18 in order to expose its ports 19 to the free passage of the syrup from the measuring cup 2 down into the can; and, second, to allow the valve to close the discharge from the cup when its measured volume has passed out, and to free the can for its subsequent travel. Mounted on the frame A of the apparatus is a conveying

means to advance the procession of cans. In the form here shown there are two conveyers of suitable type, one 13 with spaced cross flight 13' to receive and properly space the cans 31 for timing with the filling devices, and the other a plain chain conveyer 24 to receive the cans from the said devices. The conveyer 13 moving in the direction from left to right approaches the path of and on a level with the lifting bases 14; and at a point immediately preceding its nearest approach to said path it passes under an overlying stripper guide 32 of a shape and in a position to switch the can from the conveyer over upon a timely passing lifting base 14; and said can is thereon received and centered by means of a V-shaped holder 15. The turret table 28 rotates clockwise, so that the can resting upon the lifting base 14 is carried around to a corresponding point on the other side where it encounters an oppositely functioning stripper guide 34 which shifts it to and upon the second conveyer 24.

It will be seen, by reference to Fig. 1, that the table 28 is of a nature to receive and to provide for the disposal of the excess of syrup discharged from the delivery pipes 12, meaning by "excess" the surplus over and above the volume which is delivered to the measuring cups. I shall refer to this more at length hereinafter. The table 28 has a rim 28' constituting it a pan. The shaft 7 upon which it is mounted and by which it is rotated is a tubular or hollow one opening from the table bottom and having a communication at its foot with a pipe 8' leading to a pump 8, the discharge pipe 8'' of which leads back into the syrup tank 9, a screen 35, Fig. 2, being preferably located in the delivery of said pipe. A screen 36 is also placed in the communication between the tank 9 and the supply pipe 9'.

Under the foot dome 17 of the valve 18, at a point beyond where the can is released, is placed a drip trough 26, from which a pipe 26' leads to a drip can 27, Fig. 1.

In the foot dome 17 is made an air vent 20.

In the path of the syrup-filled cans after leaving the syruer and above said cans is located the means for supplying them with the necessary diluent, say water. This is indicated by the cock controlled pipe 22 which leads from a source of water (not shown) and discharges through the pipes 22' upon a screen 23 above the underlying traveling cans.

The adjacent ends of the two conveyers 13 and 24 are carried by a sprocket 24'.

I have not deemed it necessary to describe in detail the power transmitting means, the illustrations herein of the power inleading pulleys 37 and gearing 38 to the main shaft 7; the pulleys 39 and sprockets 40 of the con-

veyers and the pulley 41 of the pump 8 being sufficient to indicate such means.

In Fig. 1, the numeral 3 indicates a displacement body removably seated upon top of the valve 18. This may be used or not as desired, according to whether it be found necessary to further decrease by displacement the capacity of the cup 2.

The operation of the machine is as follows:—The cans 31, previously supplied with the comestible being run, are carried by the conveyer 13 in a continuous procession, to the syruer. The travel of the conveyer 13 and the rotation of the turret-table 28 are properly timed, so that each can switched from the conveyer by the stripper guide 32 finds its corresponding lifting base 14 and steadying holder 15 ready to receive it.

The lifting base 14' now elevates the can to upward-pressing joint-contact with the foot dome 17 of the valve 18 so that said valve rising, opens communication with the previously filled measuring cup 2, and the syrup therefrom passes down into the can. The can then proceeds around to the opposite side of its rotary path, near which point the lifting base 14 and the can having descended by gravity assisted by the spring 21, the valve 18 moves down and closes the cup 2.

Concentrated syrup from the supply tank 9 flows continuously through the supply pipe 9', header 4 and delivery pipes 12 to and upon the screen 5, through which it passes in a fall, uniformly, gently and without splash, throughout a relatively long arc. The measuring cups 2 with closed valves pass through this arc of falling syrup, and receive their complement while the excess or surplus of the syrup, falling upon the pan-like table 28, flows through the tubular shaft 7, pipe 8', pump 8 and pipe 8'' to the supply tank 9. Thus the cups 2 are filled to repletion, and the excess of syrup is taken care of cleanly and without waste.

The cans with their charge or modicum of syrup now meet with the stripper guide 34 and are shifted from the bases 14 outwardly to and upon the conveyer 24, and thence proceed to and pass through the zone of falling water from the screen 23. With this water, which primarily and until the later cooking operations, rests on top of the concentrated syrup without mixing, the cans are filled with their necessary liquid content, and any surplus, which will thus be water only, can be disposed of in the usual ways, say, for instance, by tipping. Thus there will be no waste. The added water eventually dilutes the syrup to the required grade, a result flowing from the predetermined volume and strength of the syrup concentration. This is the method contemplated and disclosed by and in my patent hereinabove referred to.

This essential volume proportion of the concentrated syrup is, in my present machine,

rendered determinable for each comestible being run, by the variable capacity of the measuring cups 2, a change which can be readily made by raising or lowering the sleeves 1, the proper movement being read upon the gauge 11. Thus only a single syrup grade of a concentration suitable for subsequent dilution to reduce it in the cans to the required grade can be initially prepared and fed through the machine without regard to the comestible being run, the different requirements of which being provided for by the variation in capacity of the measuring cups. This variation does not interfere with the full measure to the cups, since they are, in all changes, supplied by passing through the fall of syrup in volume exceeding their maximum capacity. Herein lies the essential step of the herein applicable novel method; and, further, by circulating the syrup excess, I not only avoid its loss, but also, especially when using the concentrate hot, keep the pipes clear of incrustation or deposits, since there is no stoppage of operation such as is the case from the use of different grades of syrup according to the comestible being run. In the method herein there is but one grade, continuously flowing, and the pipes may be emptied once for all at the close of the runs of all comestibles.

Referring to Fig. 3 there is a modification, in that the turret table 28 has a central sump 28'' from which the excess syrup is removed by an upwardly extending pipe 42. In Fig. 4 is shown another modification in that the table 28 slopes to a launder 44 around its periphery, said launder having an outlet 43, which it is to be understood, is included in the circulating system.

In practice I have found that the launder 44, as a means for collecting the excess of syrup from the turret table 28 and placing it in circulation, is the most practical and for that reason I prefer and use it.

In operation I find it of great advantage to keep the circulating concentrate hot. This condition not only, as I have stated hereinbefore, keeps the pipes clear of incrustation or deposits, but also, for like reason, keeps the cup valves 18 from gumming or sticking. In order to provide for this heated condition of the syrup, I find it practicable to heat the table 28. In Fig. 1, I have shown for this purpose a steam jet 45 playing upon the bottom of the table.

I claim:—

1. A liquid-filling machine comprising a rotatable turret; a plurality of measuring cups carried by said turret; a sleeve threaded upon each of said cups adapted by its adjustment to vary the cup's capacity; means for adjusting all of said sleeves in unison; means for supplying filling liquid to said cups; and means for placing successive con-

tainers in communication with successive cups.

2. In a liquid-filling machine, the combination of a conveyer for containers; a rotating table; a series of measuring cups carried by the table; a source of liquid having a controllable outlet pipe; a plurality of radiating discharge terminals of said pipe, their delivery ends lying above and throughout an arc of the path of said cups; a screen member suspended from and lying beneath said radiating discharge terminals adapted to distribute and to break the force of the liquid falling into the cups; a wiper carried by the end of the screen member and engaging the top edges of the cups to level them off as they pass beyond the filling region; means for catching the overflow from said cups and returning it to its source; and means for placing the containers in communication with the cups.

3. In a liquid-filling machine, the combination of a conveyer for containers; a rotating table; a series of measuring cups carried by the table; a source of liquid supply in communication with said cups; means for catching upon the table an overflow of liquid from said cups; means for returning said overflow to the liquid source of supply; a steam-jet nozzle arranged to play upon the table to heat it; and means for placing the containers in communication with the cups.

4. In a liquid-filling machine, the combination of a conveyer for containers; a rotating table; a series of measuring cups carried by the table; cup-controlling valves slidable through said table; a source of liquid supply in communication with said cups; means for catching upon the table an overflow of liquid from said cups; means for returning said overflow to the liquid source of supply; a steam-jet nozzle arranged to play upon the table to heat it; and means for placing the containers in communication with the cups.

5. In a liquid-filling machine, the combination of a series of measuring cups; an adjustable capacity-regulating sleeve threaded upon each cup; means for uniformly adjusting all of said sleeves in unison; means for supplying filling liquid to said cups; and means for placing successive containers in communication with successive cups.

6. In a liquid-filling machine, the combination of a series of measuring cups; an adjustable capacity-regulating sleeve threaded upon each cup; power transmitting connections for uniformly adjusting all of said sleeves in unison; means for mounting said transmitting connections to conform with the adjustments of the sleeves; means for supplying filling liquid to said cups; and means for placing successive containers in communication with successive cups.

7. In a liquid-filling machine, the combination of a series of measuring cups; an ad-

justable capacity-regulating sleeve threaded upon each cup; power transmitting connections for uniformly adjusting all of said sleeves in unison; means for mounting said transmitting connections to conform with the adjustments of the sleeves; means for gauging the adjustments of the sleeves by the adjustment of the transmitting connections; means for supplying filling liquid to said cups; and means for placing successive containers in communication with successive cups.

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

EDWARD J. JUDGE.