A. R. THOMPSON.

SYRUPER.

APPLICATION FILED DEC. 16, 1919.

1,355,015.

Patented Oct. 5, 1920.

5 SHEETS—SHEET 1.

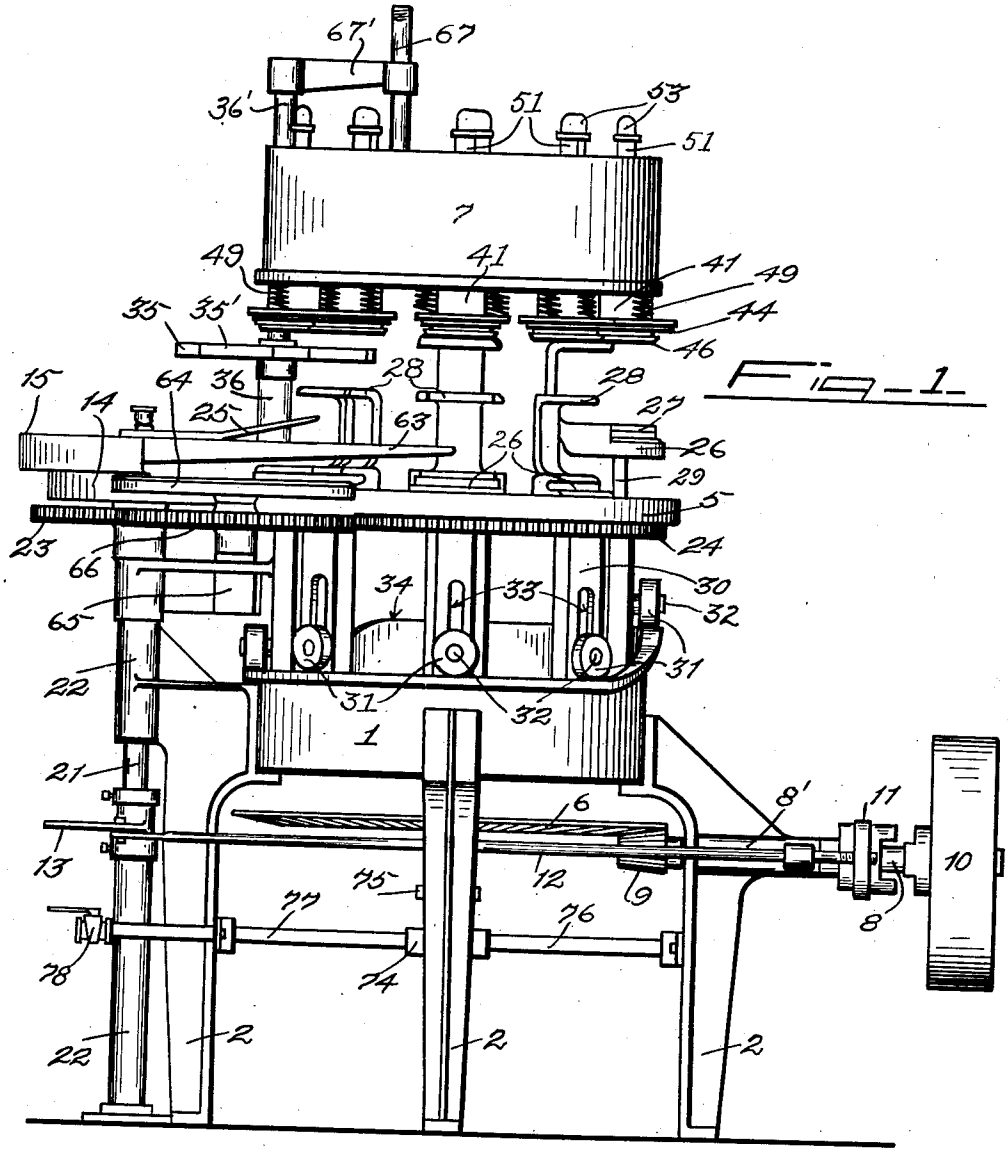


Fig. 1.

WITNESS

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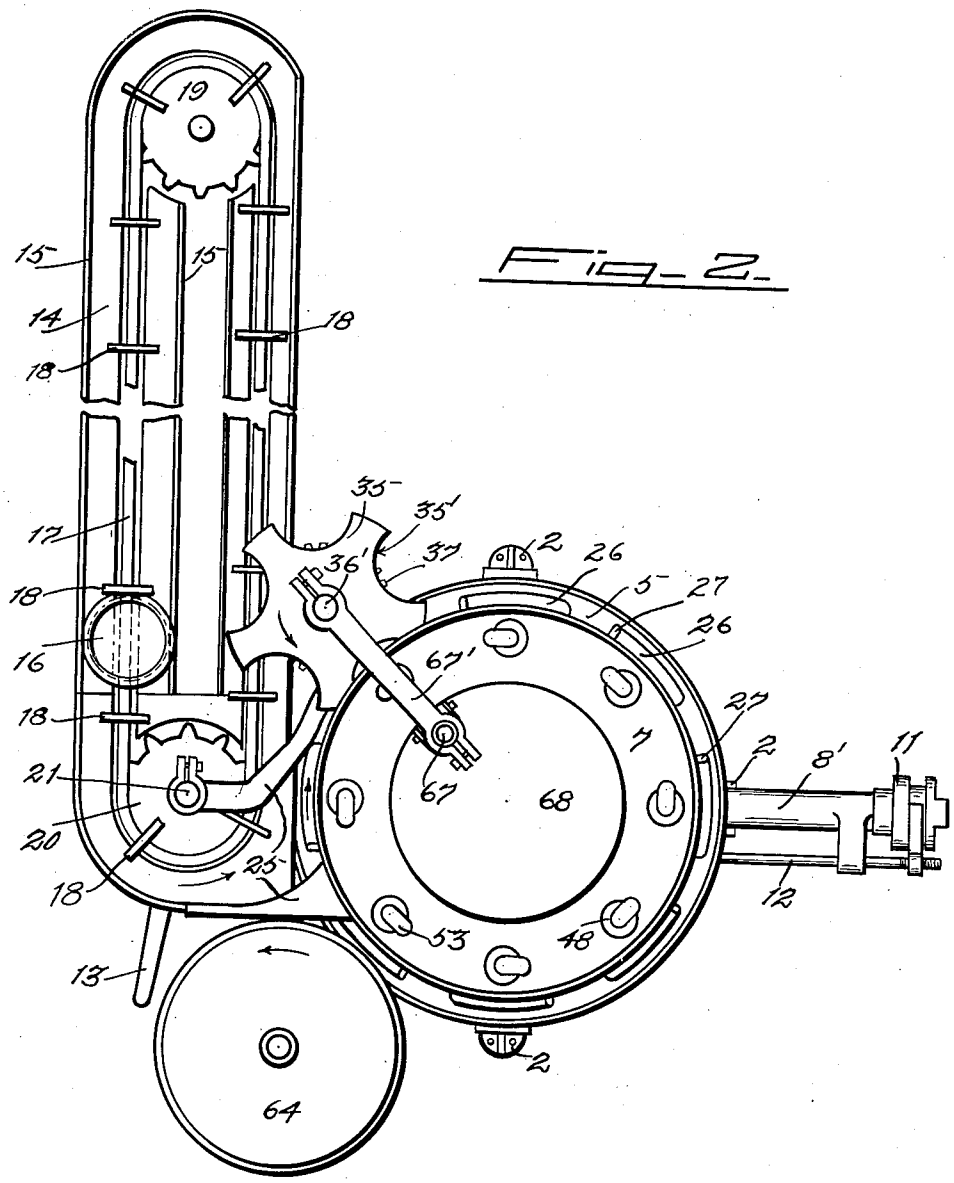
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5 SHEETS—SHEET 2.

Fig. 2.



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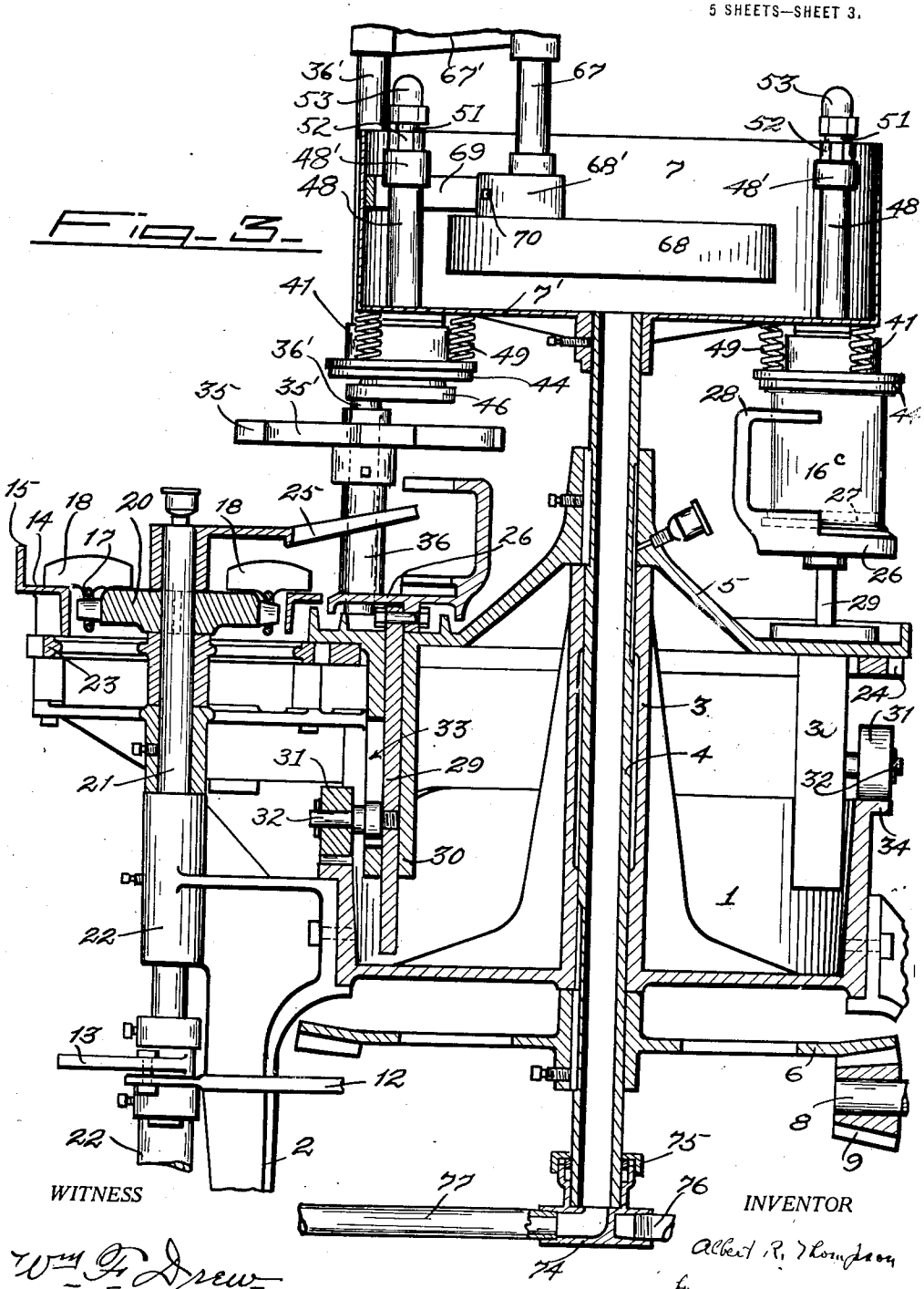
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5 SHEETS—SHEET 3.

Fig. 3.



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5 SHEETS—SHEET 4.

Fig. 5.

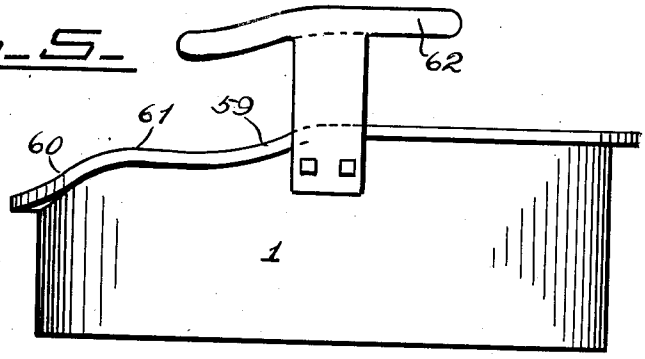
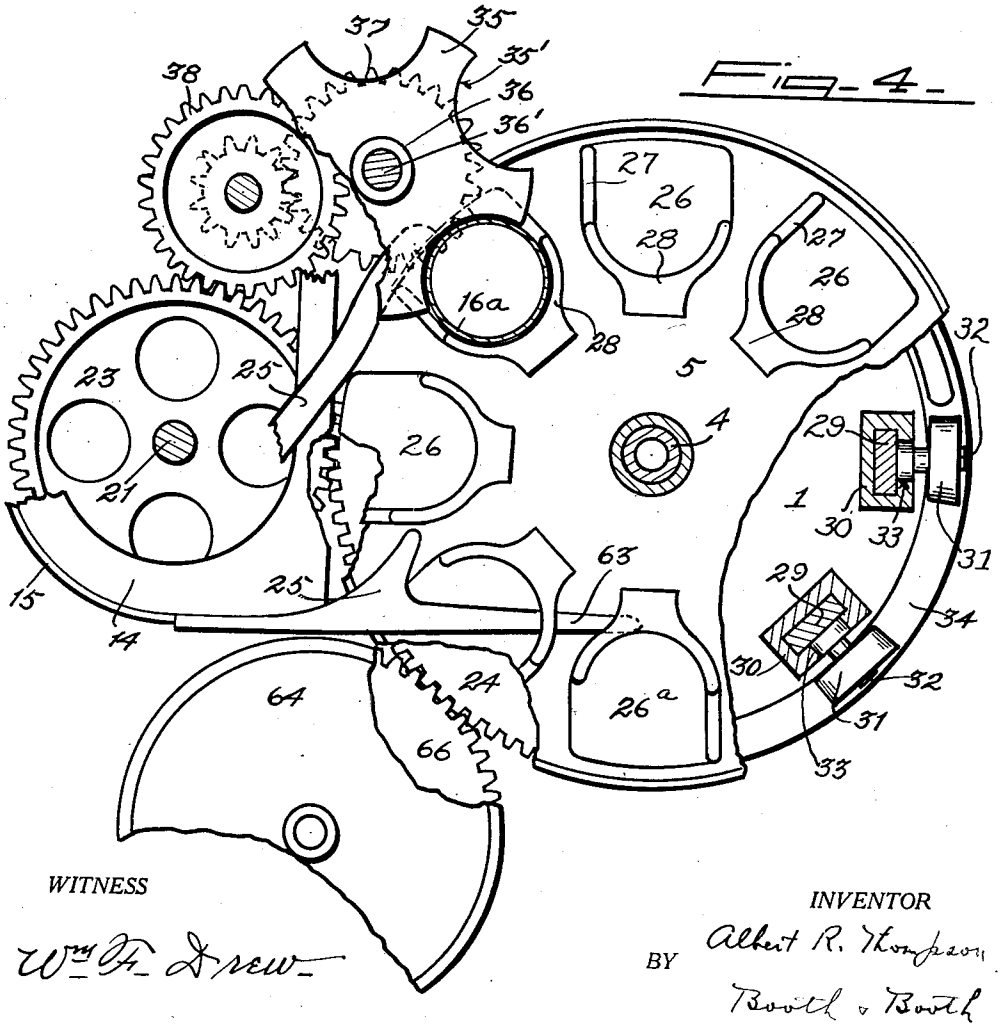


Fig. 4.



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5 SHEETS—SHEET 5.

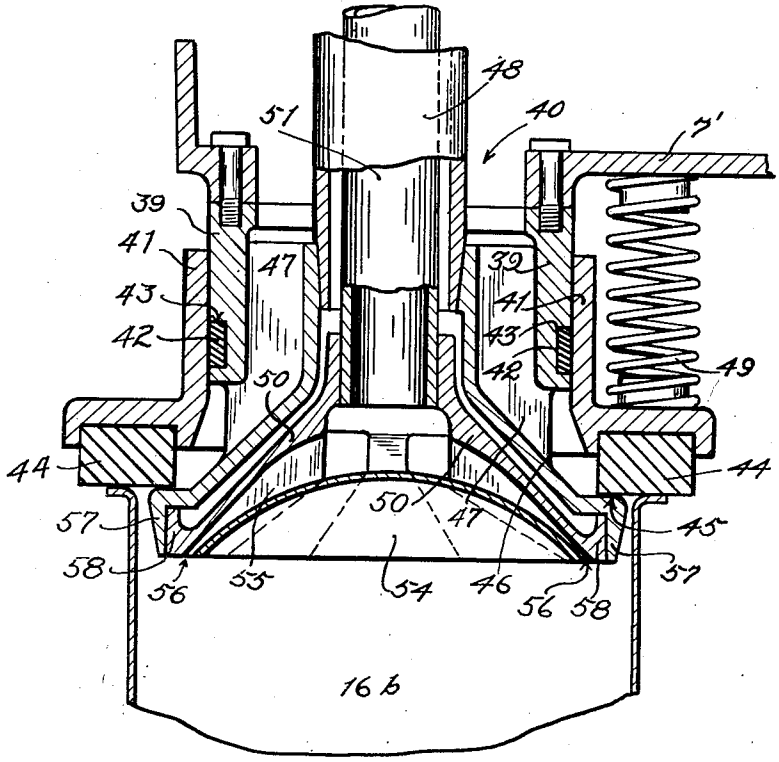


Fig. 6.

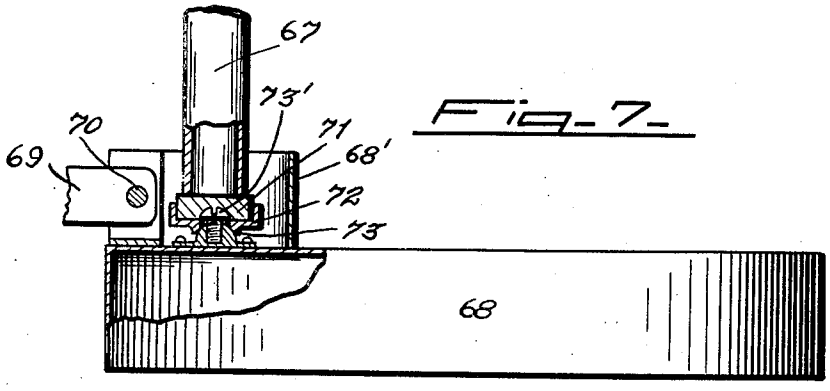


Fig. 7.

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UNITED STATES PATENT OFFICE.

ALBERT R. THOMPSON, OF SAN JOSE, CALIFORNIA, ASSIGNOR TO ANDERSON-BARNGROVER MFG. CO., OF SAN JOSE, CALIFORNIA, A CORPORATION OF CALIFORNIA.

SYRUPER.

1,355,015. Specification of Letters Patent. Patented Oct. 5, 1920.

Application filed December 16, 1919. Serial No. 345,431.

To all whom it may concern:

Be it known that I, ALBERT R. THOMPSON, a citizen of the United States, residing at San Jose, in the county of Santa Clara and State of California, have invented certain new and useful Improvements in Syrupers, of which the following is a specification.

My invention relates to the class of syrupers as used in the canning art, and more particularly to that type known in the art as displacement syrupers, in which a displacement body is inserted into the upper portion of the can during the filling operation, so that the resultant quantity of liquid does not fill the can above a certain predetermined level.

Machines of this class are used in the canning art for filling cans with syrup, the solid portion of the contents, as for example fruit, having been previously placed in the can. To avoid waste it is necessary that the can be not filled to the top, because, due to the expansion of the contents in the cooking operation, and to the jarring and jolting incident to moving the can about, a considerable portion of the syrup would be lost. The solid content of the can, however, extends to or even beyond the top; and when such solid content is fruit, particularly peaches or pears, any attempt to force it down by the entry of a displacing body results in injury which materially lessens the value of the product.

One of the objects of my invention, therefore, is to provide a syruper in which the volumetric quantity of syrup introduced into a can is limited to the proper amount by means of a displacement body positioned within the can during the filling operation, said displacement body being so formed that it will not crush or injure the solid contents of the can. The particular filling valve, with which is incorporated the displacement body, and which I have herewith illustrated, and shall hereinafter describe in detail, in connection with the present invention, is the filling valve for syrupers for which United States Letters Patent No. 1288749, dated December 24, 1918, were granted upon my application, and therefore forms no part of the present invention except in so far as a filling valve of this general type is necessary in the combination to complete an operative machine.

A second object of my invention is to provide, in a machine of the class described, means for insuring the proper coöperation of the can and the filling valve to avoid injury to the can itself. The displacement body, in order to be effective, must have a diameter only slightly less than that of the interior of the can, and in order to insure the proper entry of said displacement body into the can, to avoid mutilating the walls thereof, I provide means for encircling and truing the can body immediately prior to the insertion of the displacement body thereinto.

These and other objects, which will be apparent in the following specification, are achieved in my present invention in a continuously operating machine adapted to receive, fill and discharge an endless succession of cans, and to perform its functions at a high rate of speed and with the least possible spilling and waste.

With these general facts in view, I shall now fully describe my invention with reference to the accompanying drawings, wherein—

Figure 1 is a side elevation of my complete machine.

Fig. 2 is a plan view of the same.

Fig. 3 is a part sectional elevation, enlarged, of the central portion of the machine.

Fig. 4 is a broken horizontal section, enlarged, of the turret and its associated mechanism.

Fig. 5 is a detailed elevation, enlarged, of the bed and cam track.

Fig. 6 is a vertical central section, enlarged, of one of the filling valves.

Fig. 7 is a part sectional side elevation, enlarged, of the float and syrup feed valve.

In the drawings, the reference numeral 1 designates a bed, approximately circular in form, and horizontal in position, which is supported upon legs 2. The bed 1 supports a central vertical column 3, Fig. 3, in which is journaled a vertical hollow shaft 4. This vertical shaft carries, and has secured to it, immediately above the upper end of the column 3, a table or turret 5, Figs. 1, 3 and 4, and, below the lower end of said column, a bevel gear 6, Figs. 1 and 3; and said shaft also carries, at its upper end, a syrup reservoir or tank 7, with the interior of which it communicates to form a drain or draw-off pipe, as will be hereinafter explained.

A drive shaft 8, Fig. 1, is rotatably carried in a suitable bearing 8′, Figs. 1 and 2, supported by one of the legs 2, and has fixed upon its inner end a bevel pinion 9, Figs. 1 and 3, adapted to mesh with the bevel gear 6 of the turret shaft. A driving pulley 10, Fig. 1, is rotatably mounted on the outer end of the drive shaft 8, to which it may be connected in driving relation when desired, by a clutch mechanism 11, operated by a sliding rod 12, Figs. 1, 2 and 3, and a hand lever 13.

Extending from one side of the bed 1 is a horizontal feed table 14, Fig. 2, having parallel spaced guides 15 forming a track for the advancing cans, one of which is shown at 16. An endless feed chain 17, Figs. 2 and 3, operating within a groove in the feed table 14, carries a series of spaced drag flights 18 adapted to engage and advance the cans. Said feed chain runs over sprockets 19 and 20, the latter being the driving sprocket and being rotatably mounted upon a fixed vertical spindle 21, Figs. 1 and 3, suitably carried in supporting brackets 22. Said sprocket 20 is driven by means of a gear 23, Figs. 1, 3 and 4, fixed thereto, which meshes with and is driven by a gear ring 24 secured to the under side of the turret 5.

The cans, as advanced by the feed chain 17, are guided off the feed table 14 by a pair of stationary spaced guide rails 25, Figs. 2, 3 and 4, and onto the turret 5. Said turret carries a series of equally spaced can holders 26, Figs. 1, 2, 3 and 4, disposed about its peripheral region, each adapted to receive and support a can, and each formed with a bottom guide flange 27 on one side and semi-circular rear brackets 28, Figs. 1, 3 and 4, into which the body of the can fits, and which locates said can in its proper position upon the holder.

Each of said can holders is mounted upon the upper end of a vertical rod 29, slidably carried in a guide 30 depending from the turret 5. A cam following roller 31 is mounted on a pin 32 secured to each vertical sliding rod 29 and projecting through a slot 33 in the guide 30 thereof, and said rollers follow a cam track 34 formed upon the periphery of the bed 1, the contour of said track being so formed as to lift the can holder 26, with the can thereon, into operative relation with the filling valve, as hereinafter described.

A peripherally notched or pocketed shaping or truing wheel 35, Figs. 1, 2, 3 and 4, is carried on a sleeve 36 rotatably mounted on a rod 36′ adjacent the turret 5, and is rotated by a gear 37, Fig. 4, fixed to said sleeve 36, said gear being driven by the feed chain driving gear 23 through idler pinions 38. This truing wheel is so positioned and timed, relative to the turret 5, that its semi-circular notches or pockets 35′ coöperate with the successive can holders 26, or more properly with the rear brackets 28 thereof to form a substantially circular clamp for embracing and truing the can body into circular shape as at 16^a in Fig. 4, preparatory to the positioning thereof in operative relation beneath the filling valve.

The syrup tank or reservoir 7 carries a series of filling valves depending from its bottom, one positioned in vertical alinement with each can holder 26. One of said filling valves, which is typical of all, is illustrated in detail in Fig. 6 of the drawings. A tubular supporting member 39 is secured to the bottom 7′ of the syrup reservoir, and registers with an aperture 40 therein. Surrounding said tubular support is a sliding sleeve 41, and the joint between said support and said sleeve is made tight by a gasket ring 42, of resilient material, positioned in a seat 43.

The sleeve 41 is flanged at its bottom and carries an annular valve gasket 44, preferably formed of some suitable resilient material. Said valve gasket normally rests upon a valve seat 45 which comprises the peripheral region of a conical member 46 supported by webs 47 within the tubular member 39, and said conical member carries a vertically disposed tube 48, Figs. 3 and 6, extending upwardly through the syrup reservoir 7 and terminating at a point above the level of the liquid therein. The flow of syrup, which passes down through the aperture 40, Fig. 6, and the space between the conical member 46 and the tubular support 39, is cut off by the contact of the valve gasket 44 with the seat 45, and the valve sleeve 41 is normally retained in this position by springs 49 disposed about said sleeve, as shown in Figs. 1, 3 and 6.

The valve gasket 44 is also adapted to seat upon the top flange of the body of a can 16^b, Fig. 6, and to be pressed upwardly, off its seat 45, by the upward movement of the can, thereby permitting syrup to flow through the valve and into the can. The conical member 46 extends for a slight distance into the top of the can, and carries within it an adjustable second conical member 50, fixed upon the lower end of a vertical tube 51 positioned within the tube 48, and vertically adjustable within said tube 48 by means of a nut 52, Fig. 3, which screws upon the inner tube 51 and rests upon a suitable collar 48′ secured to the upper end of the outer tube 48. The inner tube 51 is also provided at its upper end with a return bend fitting 53, to protect its mouth against the entry of dust and foreign matter.

The inner adjustable conical member 50, Fig. 6, carries an inverted cup-shaped member 54 secured to radially disposed webs 55 and separated at its edge from its conical

supporting member 50 by an annular space 56, which communicates with the inner tube 51 and forms a vent for the escape of air from the can 16b during the inflow of syrup. This inverted cup-shaped member 54 forms a pocket for entrapped air, when the level of the syrup in the can rises to its edge, into which the solid contents of the can may project, and by this means a displacement body is provided, in the upper portion of the can, without crowding down and injuring the solid contents thereof.

When the can body 16b is again lowered, the valve gasket 44 is allowed to return to its seat, cutting off the flow of syrup. Further downward movement of the can then draws it away from the displacement portion of the valve mechanism, so that said can leaves the sphere of action of the valve mechanism with a liquid content whose level is the desired distance below the can-rim. By adjusting the inner conical member 50 downwardly from the position shown in Fig. 6, the volume of the displacement body is increased, and the resultant final syrup-level is lowered, the limit of such adjustment being the width of the inter-engaging flanges 57 and 58 of the outer and inner cones 46 and 50 respectively.

The cam track 34 is so formed as to elevate each successive can holder 26 at that point in the travel of the turret 5 when the can body is partially encircled by the coacting truing wheel pocket 35′ and the semi-circular rear holder bracket 28, as shown at 16a in Fig. 4. This truing of the upper end portion of the can body insures that it will pass over the displacement portion of the filling valve structure, as described above, without damaging the edge or flange of the can, and that said flange will make a tight seat, to prevent wasteful leakage of syrup, with the valve gasket 44, Fig. 6.

The upward movement of the can holder with the can thereon continues until the syrup valve is opened, as described above, and the can is held in this filling position for a sufficient length of time to enable it to be filled to the bottom of the displacement body. When the syrup rises to this point, its flow is almost stopped by the restricted area of the air vent 56, into which any excess syrup must pass, so that the exact moment of closing of the valve is not a matter of great importance.

By the time, however, that the can has been filled to the required point, the travel of the turret 5 has carried said can to a position shown approximately at 16c in Fig. 3. At this point the cam roller 31 enters upon the depressed portion of the cam track 34, which, as shown in Fig. 5, is arrived at in two successive stages 59 and 60, separated by a horizontal portion 61. The first stage 59 of said depression causes the can to be lowered sufficiently to close the valve but still maintaining a tight joint between the flange of said can and the valve gasket. The horizontal stage 61 enables said can to remain in such position long enought to permit the syrup to drain out of the air vent 56, Fig. 6, of the valve, and off the displacement body and valve gasket, so that this relatively small amount of syrup is caught by the can and is not wasted. The final stage 60, Fig. 5, lowers the can holder 26, Fig. 3, to its seat on the turret 5, in which position the can is entirely free of the valve mechanism. A guide 62, Fig. 5, is spaced above the initial stage 59 of the cam track depression, to make sure that the cam roller shall follow said depression promptly.

When the can holder 26 reaches the position indicated by 26a, Fig. 4, the can, not shown, is removed by a stationary guide finger 63, and caused to slide off the turret 5 and onto a rotating discharge wheel 64, Figs. 1, 2 and 5, from which it may be removed by any means, not shown. Said discharge wheel 64 is suitably mounted in a bracket 65, Fig. 1, and is driven by a gear 66, Figs. 1 and 4 which meshes with the turret gear 24.

Syrup is introduced into the reservoir 7 through a pipe 67, supported by a bracket 67′, fitted on top of the rod 36′, Figs. 1, 2 and 3, and the level of the syrup in said reservoir is maintained constant by means of a float 68, Figs. 2, 3 and 7, and a float valve, shown in detail in Fig. 7. The float 68 which is preferably formed of hollow metal, is pivotally secured to a fixed bracket 69 by a fulcrum pin 70. A flat valve gasket 71 is carried in a flanged valve member 72, which in turn is secured to the upper side of the float 68 by a ball and socket connection 73, by means of which said valve member is permitted to have slight universal movement upon said float, the retaining screw 73′ being loosely fitted through said valve member 72 to permit such movement. Said valve member is positioned beneath the open end of the feed pipe 67, and the valve gasket 71 is pressed against said open end of the feed pipe by the rising of the float 68, thereby cutting off the supply of syrup. The open end of the feed pipe is faced to form a smooth valve seat. This construction, by providing a free opening for the feed pipe and a flat valve gasket, does not readily become inoperative through clogging of the valve opening with particles of crystallized sugar, and by mounting the valve directly on a large float, provides sufficient power to close the valve tightly under all ordinary conditions. A guard 68′, carried by the float 68, is provided around the valve opening to prevent splashing.

The hollow turret shaft 4, Fig. 3, provides a drain or draw-off for the syrup reservoir

7, as before stated. The lower end of said shaft 4 extends into an elbow fitting 74 through a packed joint 75 which permits said shaft to rotate within said fitting. The fitting 74 is braced to one of the legs 2 by a rod or dead end pipe 76, Figs. 1 and 3, to provide stiffness, and a pipe 77, having a valve 78, Fig. 1, at its end, is connected with said fitting and led to a conveniently reached position.

I claim:—

1. In a syruper, the combination of a rotatable turret having an annular series of open sided rigid holders to receive and closely fit a circumferential section of the exterior of cans to be filled; a syrup-supply tank rotating with said turret and having an annular series of filling valves adapted to engage the cans, each valve being provided with a displacement member to enter and nearly fill the cross sectional area of the upper part of the can; a rigid circumferentially notched rotatable wheel, the notches of which are adapted to closely fit about a circumferential section of the cans opposite to the section embraced by the turret holders and to true the cans therein; and means for successively moving the holders to cause their trued cans to operatively engage their respective filling valves, and accurately receive the displacement members of said valves.

2. In a syruper, the combination of a rotatable turret having an annular series of vertically movable holders to receive cans to be filled; an overlying syrup-supply tank associated and rotating with said turret; a series of filling valves carried by the tank, corresponding to the can holders of the turret; means operatable by the elevation of the cans to open the filling valves and make a tight joint therewith; and a cam-track for raising the holders and cans to operate the valves, said track having a two-stage drop with an intervening horizontal portion adapted to hold the cans in relation to the valves, after the filling operation is complete and during the drip, and then to lower said cans away from the valves.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALBERT R. THOMPSON

Witnesses:

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D. B. RICHARDS