L. E. ARNOLD.

SYRUPING MACHINE.

APPLICATION FILED APR. 2, 1910.

1,046,715.

Patented Dec. 10, 1912.

6 SHEETS—SHEET 1.

Fig. 1.

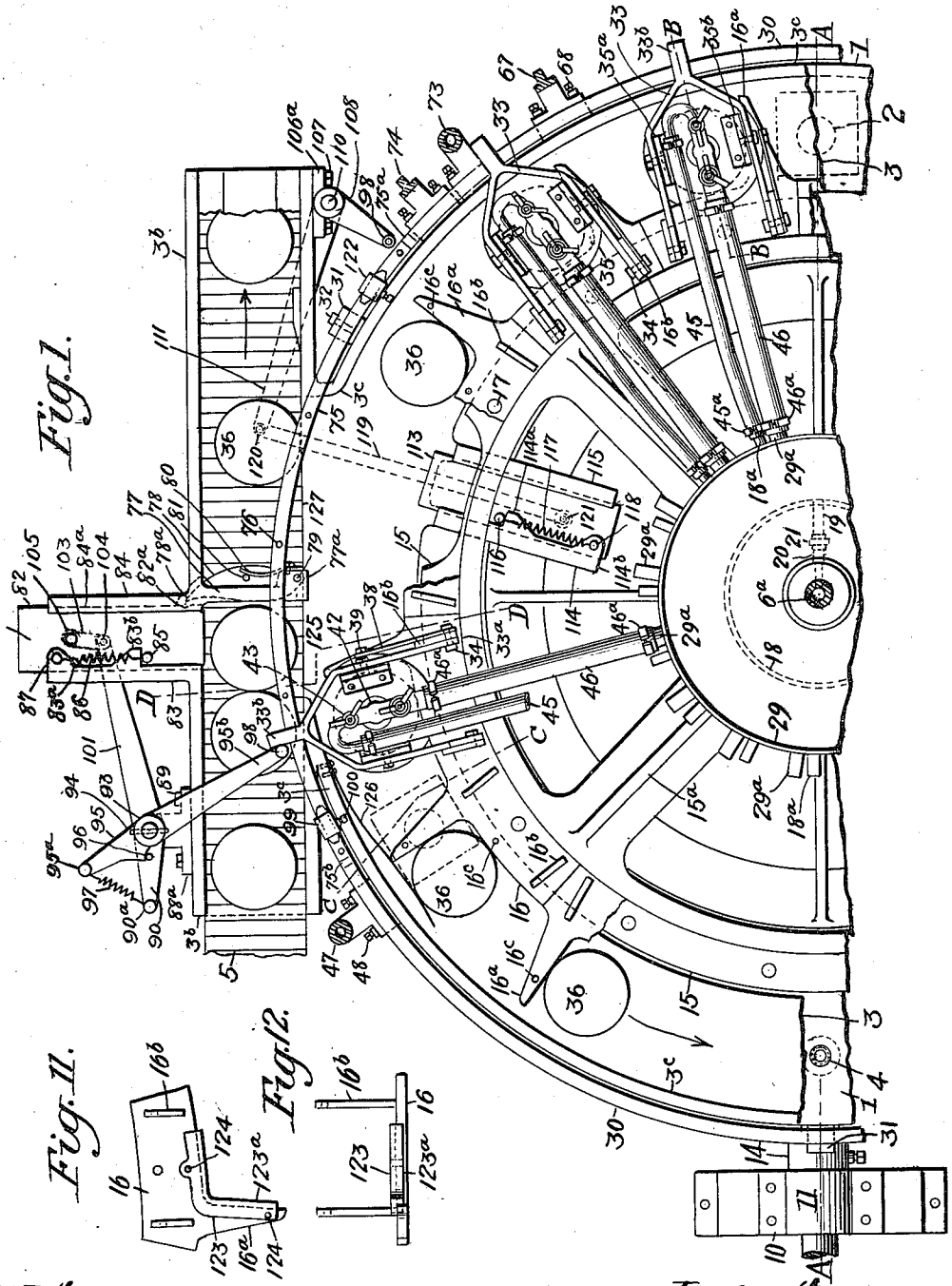

Fig. 11.

Fig. 12.

Witnesses.

D. W. Edelin.

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by Fennie, Fields Brown & Neill

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6 SHEETS—SHEET 2.

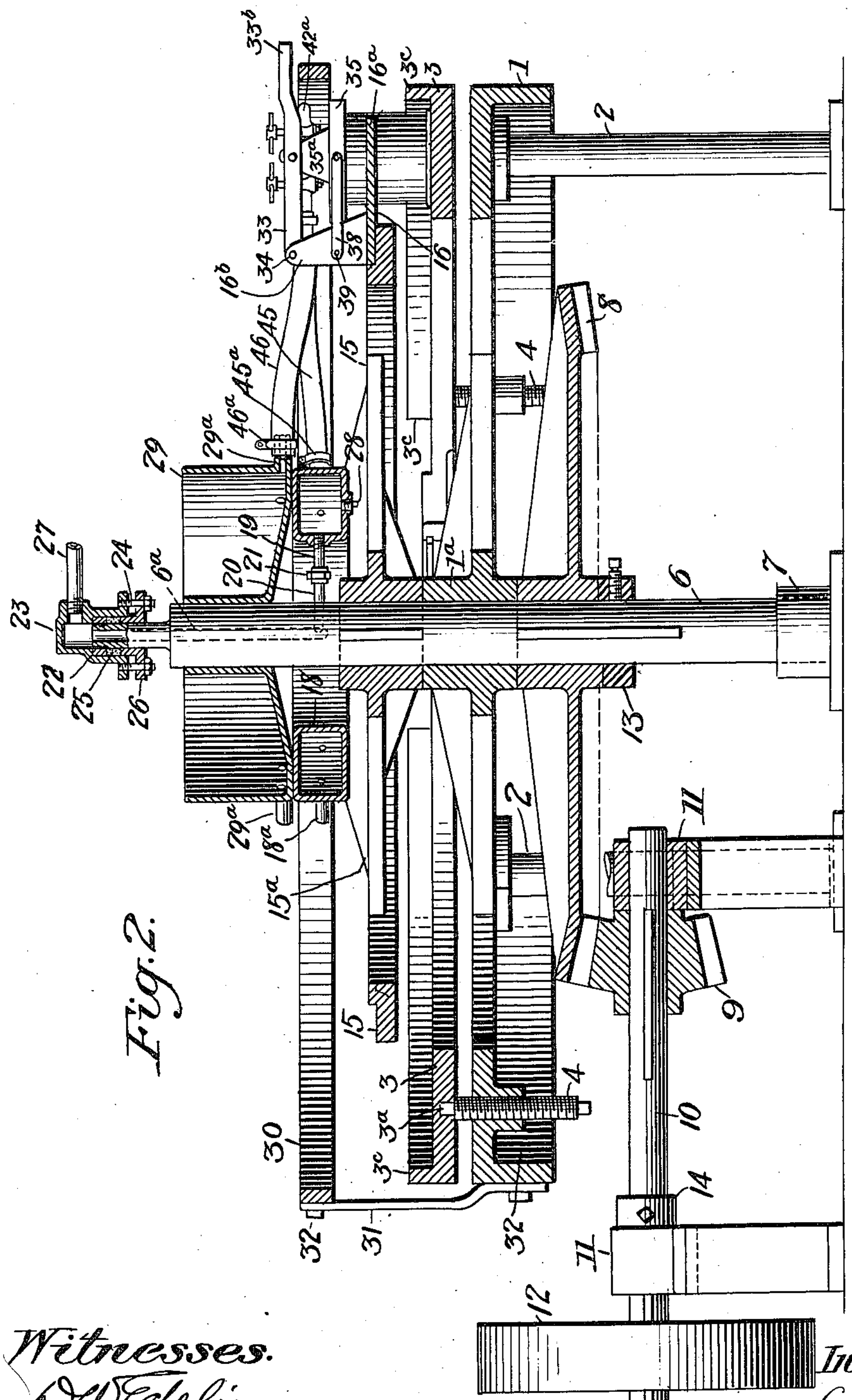

Fig. 2.

Witnesses.
D. W. Edelin.
[illegible]

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6 SHEETS—SHEET 3.

Fig. 4.

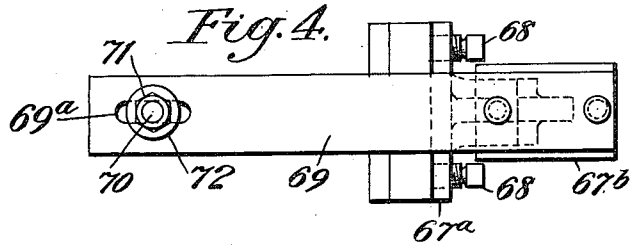
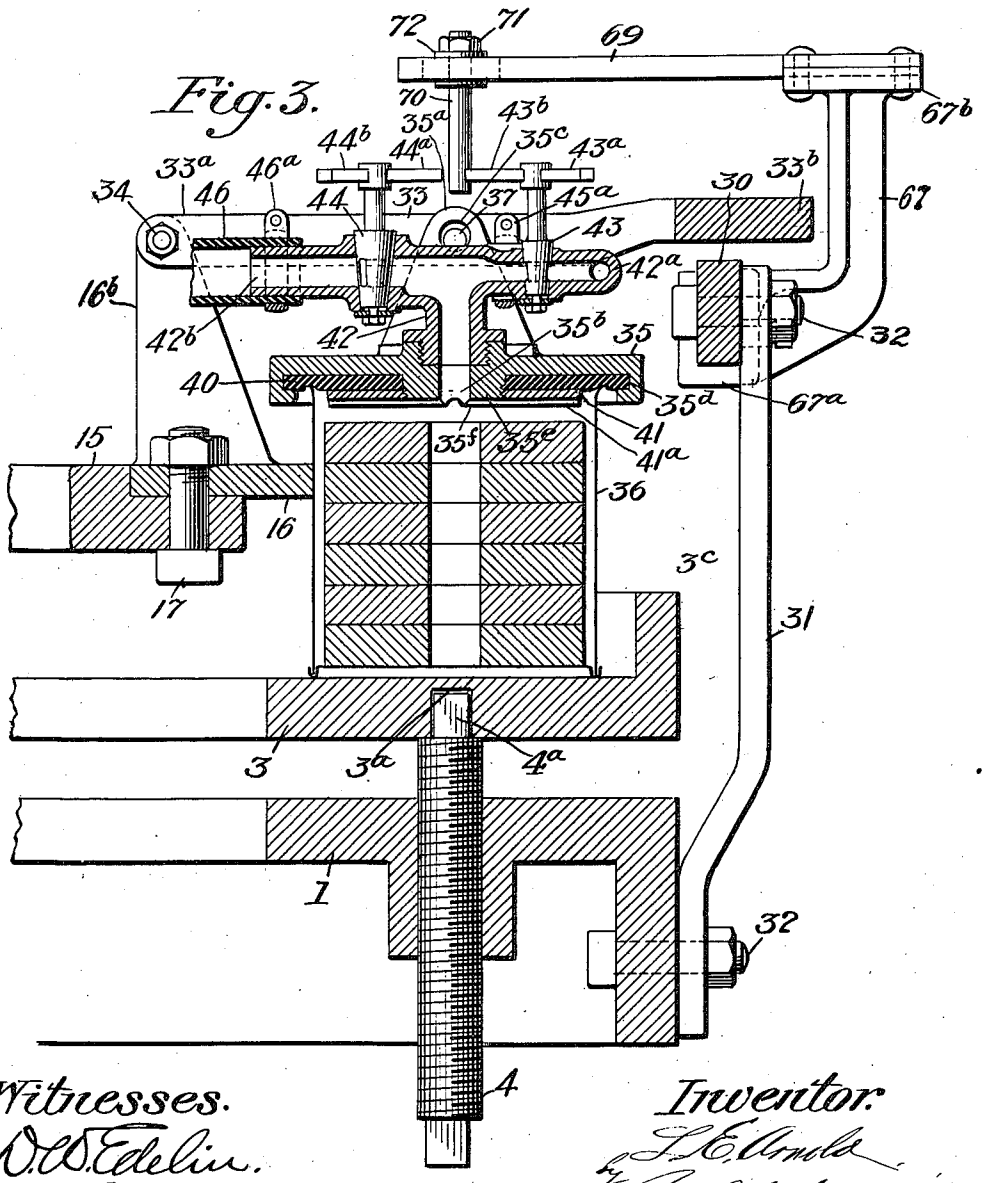


Fig. 3.



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6 SHEETS—SHEET 4.

Fig. 7.

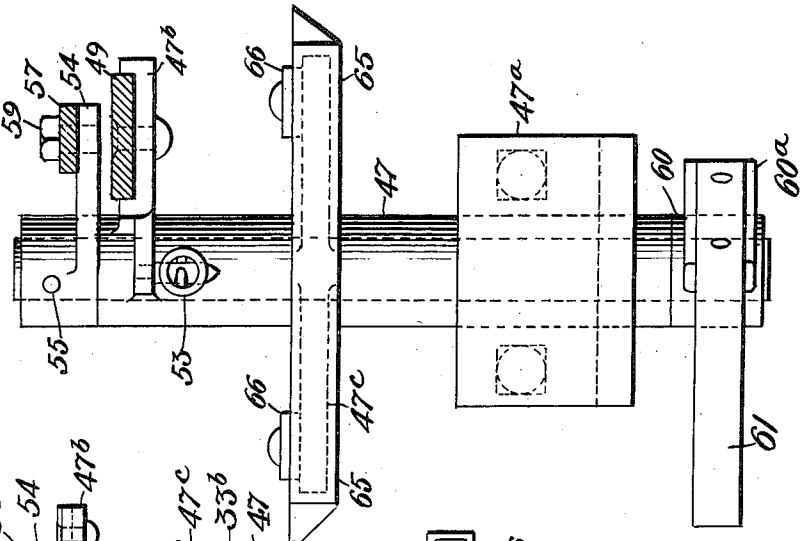
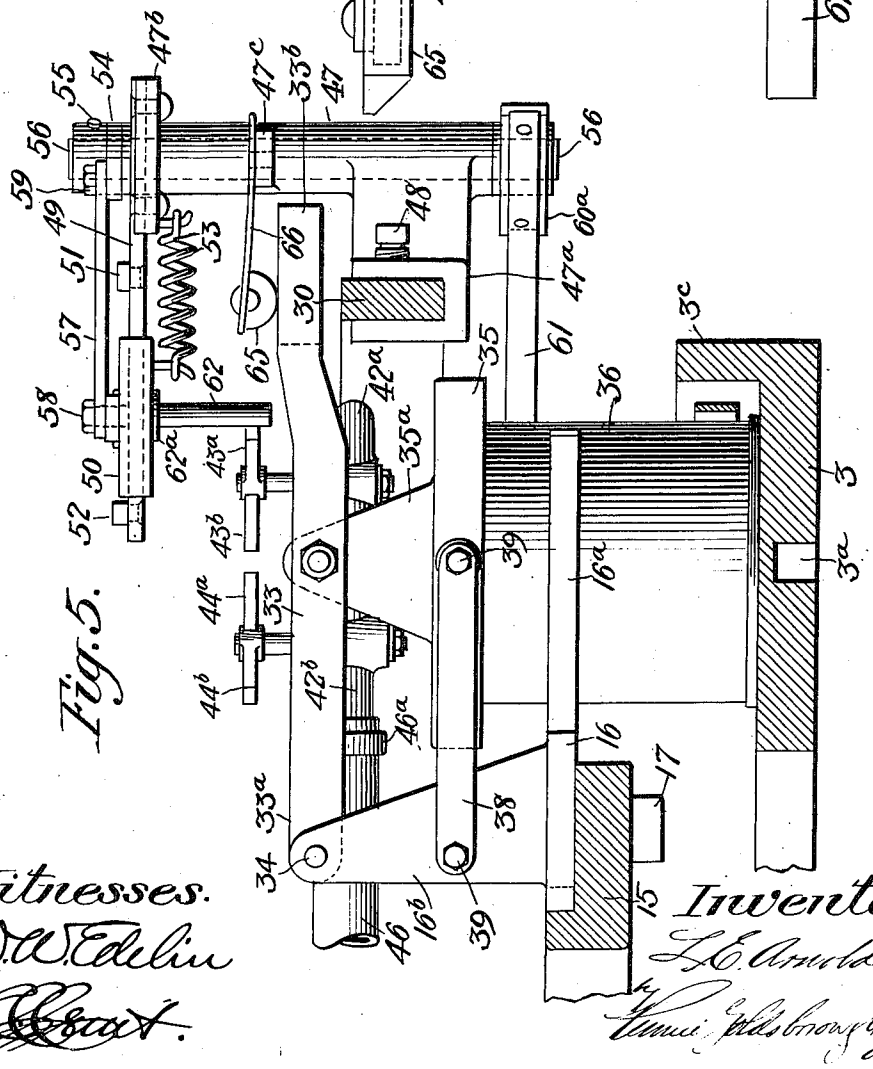


Fig. 5.



Witnesses.

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APPLICATION FILED APR. 2, 1910.

1,046,715. Patented Dec. 10, 1912.

6 SHEETS—SHEET 5.

Fig. 6.

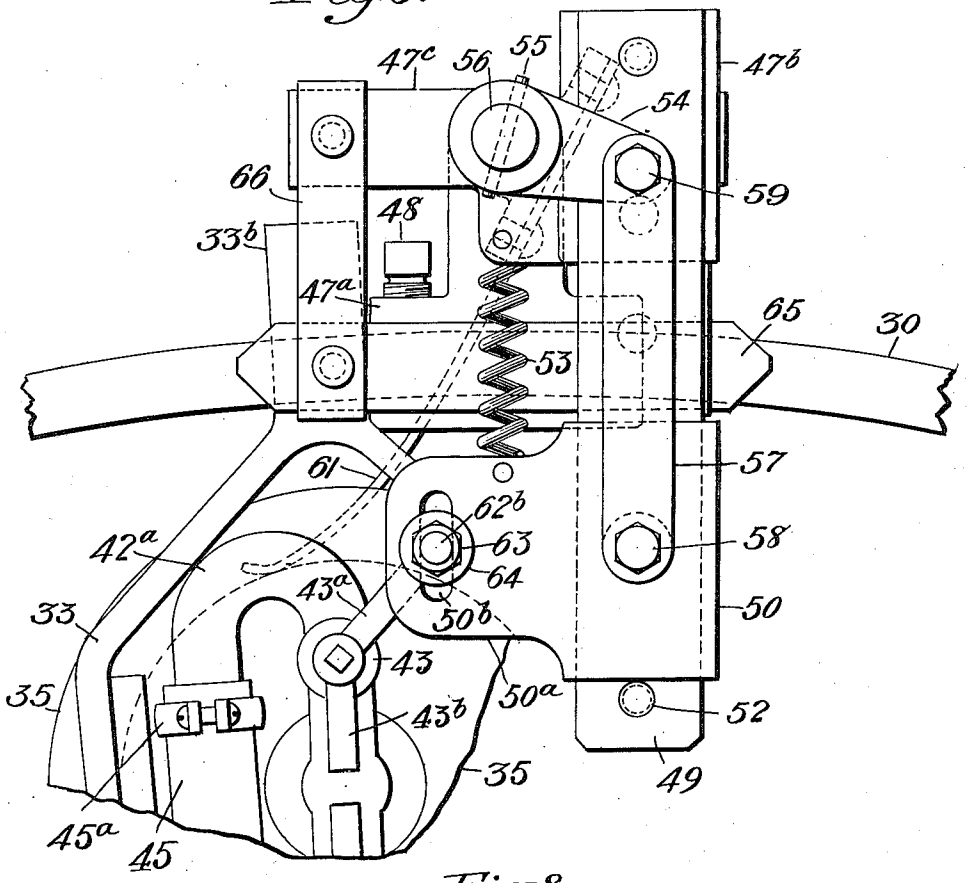
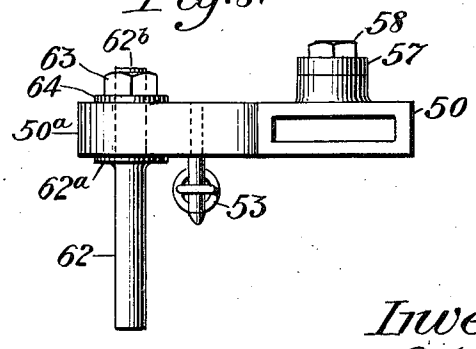


Fig. 8.



Witnesses.

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APPLICATION FILED APR. 2, 1910.

1,046,715. Patented Dec. 10, 1912.

6 SHEETS—SHEET 6.

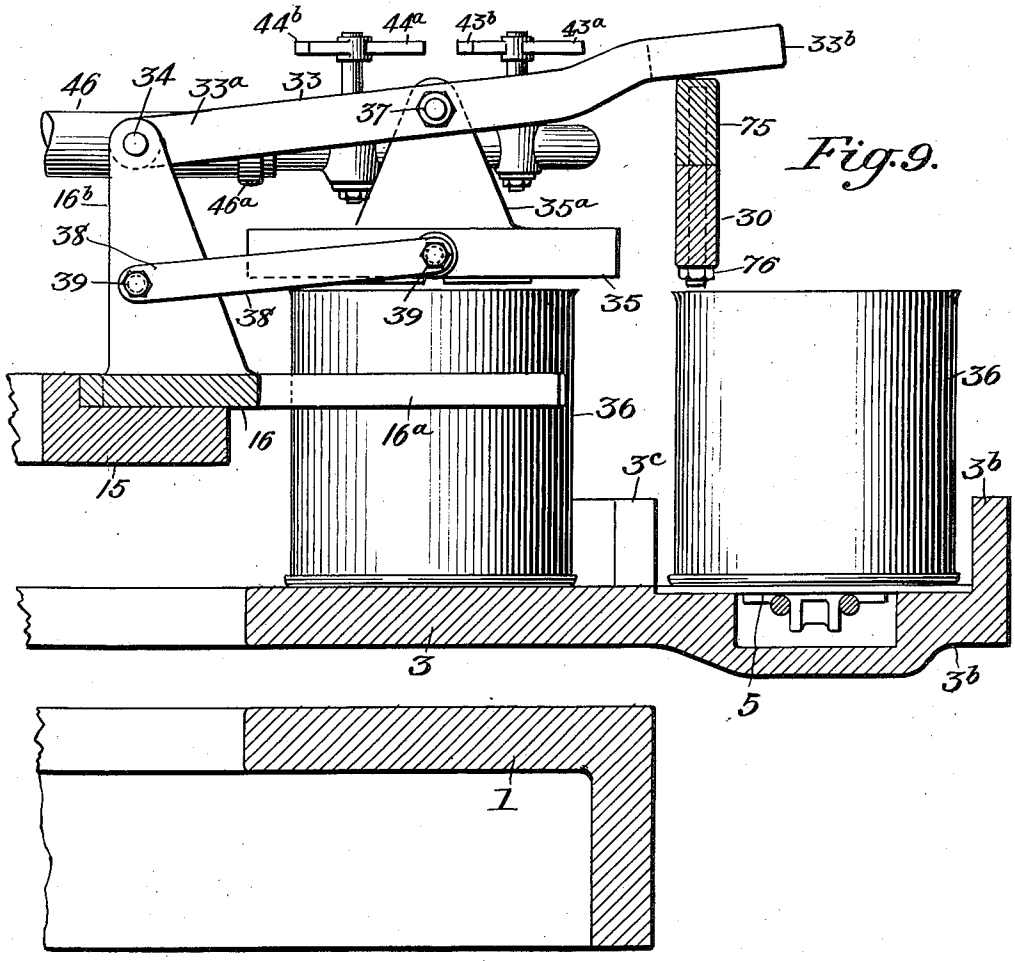
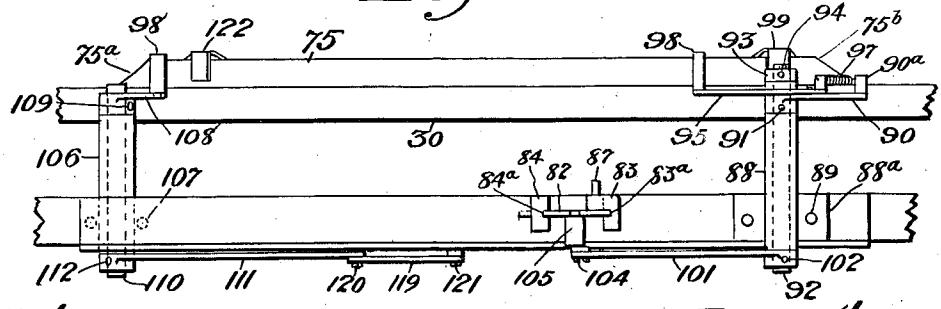


Fig. 9.

Fig. 10.



Witnesses.

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Attys.

UNITED STATES PATENT OFFICE.

LEWIS E. ARNOLD, OF HONOLULU, TERRITORY OF HAWAII.

SYRUPING-MACHINE.

1,046,715. Specification of Letters Patent. Patented Dec. 10, 1912.

Application filed April 2, 1910. Serial No. 553,039.

To all whom it may concern:

Be it known that I, LEWIS E. ARNOLD, a citizen of the United States, residing at Honolulu, in the county of Honolulu, Territory of Hawaii, have invented certain new and useful Improvements in Syruping-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improved apparatus for the syruping of fruit, vegetables, meat or other food products, in order to alter or ameliorate the same.

The primary object of the invention is to provide apparatus for removing air or other gases in the voids of the container in which the food is to be packed, and in the pores, cells or interstices of the material within the container, and to replace such air or gases by a suitable fluid of liquor or gaseous form, such as a syrup, brine or suitable gaseous agent, such fluid serving to preserve or improve the quality of the product or fulfilling both of these functions.

The apparatus is peculiarly adapted for the treatment of pineapples prior to the permanent sealing of the containers, in which application the pores or cells of the fruit are filled or impregnated with a suitable syrup or its equivalent which will improve to a large degree the quality of the fruit. It is particularly intended to improve the color and flavor of light colored pineapples which are not fully ripe, and when such pineapples are treated in the improved apparatus they are turned to a yellow or golden color and sweetened in less than a minute, so that they then have the appearance and properties of a fully matured luscious pineapple. However, the apparatus is obviously well adapted for many other uses.

The invention also has as its object the provision of an apparatus which will produce the foregoing results in an automatic and continuous manner, and it is also aimed to adapt the apparatus or machine to the various sizes and shapes of glass jars, tins or other containers which are in general commercial use.

In the accompanying drawings, Figure 1 represents a plan view, with parts broken away, of an apparatus embodying my invention. Fig. 2 represents a sectional elevation on the line A—A of Fig. 1. Fig. 3 represents a sectional elevation of a portion of the apparatus on the line B—B of Fig. 1. Fig. 4 is a plan view of the bracket for carrying the interference pin shown in Fig. 3. Fig. 5 is a sectional elevation of a portion of the apparatus on the line C—C of Fig. 1, showing mechanism for opening the cock to the vacuum suction. Fig. 6 is a plan view of a portion of that shown in Fig. 5. Fig. 7 is an elevation of a portion of the apparatus shown in Fig. 6. Fig. 8 is an elevation of the sleeve and interference pin shown in Fig. 6. Fig. 9 is a sectional elevation on the line D—D of Fig. 1. Fig. 10 is an elevation of a portion of the apparatus at the conveyer side, shown in plan at the top of Fig. 1. Fig. 11 is a plan view of an adapter to suit the size of the containers to be treated. Fig. 12 is an elevation of Fig. 11.

Similar characters of reference indicate similar parts throughout the several views.

Referring to the drawings, the stationary frame 1 is circular and supported by the legs 2. An annular table 3 rests upon three screws 4, which pass vertically through the frame 1. The points 4^a of said screws 4 preferably enter recesses 3^a in the under side of the table 3, (Fig. 3) whereby the table 3 may be maintained concentric with the frame 1, and at the same time it may be either elevated or lowered so as to adjust same to suit the height of the containers which are to be treated. The table 3 is provided on one side with a trough 3^b for an apron or belt conveyer 5 operated in any well known manner. A flange 3^c is also provided around and above the rim of the table 3, except that where the trough 3^b joins the table 3 this flange 3^c is omitted to provide a passage 125 for the admission of containers to be treated from the apron 5 onto the table 3, also for the passage 127 for the discharge of these containers after treatment from the table 3 back onto the apron 5 all as hereinafter described.

A vertical shaft 6 is journaled in the step-

box 7 and in the bearing 1^a located at the center of the frame 1. This shaft 6 may be revolved in any suitable manner; for example, by a bevel gear 8 keyed to said shaft and meshing with a bevel pinion 9 keyed to a countershaft 10 journaled in suitably supported boxes 11, and provided with a driving pulley 12. Set collars 13 14 are provided on the shafts 6 and 10 respectively. The spider 15, keyed to the shaft 6 above the bearing 1^a, is smaller in diameter than the table 3. A plurality of segmental castings 16, bolted on the spider 15 by the bolts 17, are each provided with an outwardly projecting finger 16^a, with two vertical lugs 16^b, and with the holes 16^c for the purpose hereinafter described.

Supported upon the ribs 15^a of the spider 15 is an annular chamber 18, connected to a vacuum pump or any other suitable means for exhausting the air within said chamber; for example, nipples 19 and 20, connected by a union 21, are screwed into the chamber 18 and the shaft 6 respectively, so as to connect the interior of said chamber with the passage 6^a in the shaft 6. On the upper end of the shaft 6 is screwed the collar 22. Over the collar 22 is the bonnet 23 which is stationary and provided with studs 24 for tightening the packing 25 between the gland 26 and collar 22. The bonnet 23 is also provided with the pipe 27 connected to the suction of a pump or other exhauster (not shown). The passage 6^a opens to the bonnet 23. The bottom of the chamber 18 is provided with a cock or plug 28, for the removal of any liquid which may be entrained in said chamber 18. A reservoir 29, for holding syrup, brine or other liquid, is provided above and supported by the chamber 18, and surrounding the shaft 6. A circular track 30 is supported above the frame 1 by the bars 31 bolted to the track and main frame by the bolts 32. A forked lever 33 is provided for each segmental casting 16. The forked ends 33^a of each lever 33 are pivoted on the bolts 34 in the lugs 16^b. The other end 33^b of each lever 33 projects radially outward above the circular track 30. Each cap 35, for covering the top of the jar, tin, or other container 36, which is to be treated, is provided with two lugs 35^a on its top and with a hole 35^b through its center. Each cap 35 is loosely pivoted on the bolts 37 through the levers 33, near the center of the latter, and through the holes 35^c in the lugs 35^a. The ends of a link 38 (Fig. 5) are loosely pivoted on the bolts 39 in one of the lugs 16^b and in the side of the cap 35 respectively, whereby a parallel motion of the cap is obtained and such that said cap is always maintained in a level position. The lower side of the cap 35 is provided with a rubber or other gasket 40, which may be secured in any suitable manner; for example,—the gasket 40 may be forced into a groove 35^d and be further held by a nut 41 screwed onto the threaded portion 35^e of the cap 35, Fig. 3. The nut 41 may be made large enough to provide a fixed amount of displacement within the container, and its lower surface may have radial grooves 41^a to register with grooves 35^f in the bottom of the threaded portion 35^e. The nut 41 is made a little smaller in diameter than the inside of the container 36, and tends to maintain the container in place and prevent same from sliding.

A T casting 42, screwed into the upper threaded portion of the hole 35^b of each cap 35, is provided with two plug cocks 43 and 44. The end 42^a, of the T casting 42 containing the plug cock 43, is preferably curved and is provided with a hose 45 with clips 45^a connecting the said end 42^a with a nipple 18^a in the chamber 18. The end 42^b of the T casting 42 containing the plug cock 44 is provided with a hose 46 with clips 46^a connecting said end 42^b with a nipple 29^a in the reservoir 29. The plug cocks 43 44 are provided with opening contact levers 43^a 44^a and with closing contact levers 43^b 44^b, respectively, which are operated by meeting interference pins in their path as hereinafter described.

A cylindrical casting 47 is provided with a U shaped lug 47^a to fit the circular track 30 and be clamped to same by means of the set screws 48. The cylindrical casting 47 is held vertically and sufficiently outside of the circular track 30 to permit the end 33^b of the levers 33 to pass same, Fig. 5. A lug 47^b is also provided, near the top of the cylindrical casting 47, to which the guide bar 49 is secured in a position both horizontal and radial toward the center of the machine, Figs. 5 and 6. The sleeve 50 is adapted to slide on the guide bar 49 between the stops 51 and 52. A projection 50^a with a slot 50^b is provided on one side of the sleeve 50, Figs. 6 and 8. A tension spring 53 is connected at one end to the lug 47^b and at the other end to the projection 50^a, such that normally the sleeve is pulled toward the stop 51. A lever 54 is secured by the pin 55 to the upper end of the shaft 56 adapted to turn in the cylindrical casting 47. The link 57 is pivoted at one end by the bolt 58 to the sleeve 50 and at its other end by the bolt 59 to the lever 54. A collar 60 is secured to the lower end of the shaft 56 below the casting 47. The collar 60 is provided with ears 60^a to which a flat spring 61 is attached. When the sleeve 50 is in its normal position against the stop 51, the flat spring 61 projects at right angles across the path of the containers 36 on the table 3.

The interference pin 62 is provided with a

collar 62[a] and a threaded end 62[b]. The pin 62 is adjustably clamped to the projection 50[a] of the sleeve 50, through the slot 50[b], by means of a nut 63 on the threaded end 62[b] and a washer 64 interposed. When the sleeve 50 is against the stop 52, the pin 62 is in position to engage the contact lever 43[a] and open the plug cock 43, Figs. 5 and 6. A shoe 65 for depressing the ends 33[b] of the levers 33 is flexibly supported above the circular track 30 by means of flat springs 66 attached to the lugs 47[c] provided near the center of the cylindrical casting 47.

The bracket 67 is provided with a U shaped lower end 67[a] such that it may be clamped to the circular track 30 by the set screws 68, Fig. 4. This bracket 67 is offset to clear the ends 33[b] of the levers 33, Fig. 3. One end of a flat bar 69 is secured to the upper end 67[b] of this bracket 67, and a slot 69[a] is provided near the other end of said bar 69. An interference pin 70, with nut 71 and washer 72, is clamped to the bar 69, in a manner similar to that described for the pin 62. The pin 70 is adapted to engage the contact lever 43[b] and close the plug cock 43.

A cylindrical casting 73, similar to the one 47 previously described, is provided for engaging the contact lever 44[a] and opening the plug cock 44, Fig. 1. In this case, however, the guide bar 49, spring 53, and link 57, are made longer in order that the pin 62 may be in a position to engage the contact lever 44[a] and open the plug cock 44 when the sleeve 50 is against the stop 52.

A bracket 74, similar to the bracket 67, is provided for closing the plug cock 44, Fig. 1. In this case, however, the flat bar 69 is made longer in order that the pin 70 may engage the contact lever 44[b] and close the plug cock 44. A segment of track 75, superimposed on the circular track 30, is held in place by the bolts 76, Figs. 1 and 9. The end 75[a] of this segmental track 75 is beveled, in order that the end 33[b] of each lever 33 may be forced upward on same and slide upon the segmental track 75, when the said end 33[b] encounters said end 75[a] in its course as it is revolved in the direction shown by the arrow, Fig. 1. The end 75[b] is also beveled to permit the end 33[b] of each lever 33 to drop off same gradually.

An abutment 77 is provided across the path of the apron 5 and above same, and is secured to the trough 3[b]. A pawl or catch 78 is pivoted to the inner end 77[a] of the abutment 77 by the screw 79. A flat spring 80, attached to the end 77[a] of the abutment 77, pushes on a pin 81 on the catch 78, and maintains the catch 78 normally in a position projecting slightly forward of the abutment 77 with the point 78[a] engaging the crotch 82[a] in the edge of the push plate 82. The catch 78 is shown released in Fig. 1. The push plate 82 is adapted to slide in the grooves 83[a] 84[a] of the guides 83 84 projecting from the outer side of the trough 3[b] just forward of the abutment 77. The guide 83 is provided with a projecting lug 83[b] against which the pin 85 in the push plate 82 is normally held by means of a tension spring 86 attached to said pin 85 and to a pin 87 in the outer end of guide 83.

A cylindrical bracket 88 is bolted by the bolts 89 through the ears 88[a] to the outside near the feed end of the trough 3[b], Figs. 1 and 10. A lever 90 is fastened by a pin 91 to the vertical shaft 92 in the cylindrical bracket 88. A collar 93 is secured to the upper end of said shaft 92 by the pin 94. The lever 95 is loose on the shaft 92 between said collar 93 and the lever 90. The lever 95 is normally held against a pin 96 on the lever 90 by means of a tension spring 97 attached to the ends 90[a] and 95[a] of the levers 90 and 95 respectively. A removable contact stud 98 is screwed into the other end 95[b] of the lever 95 and is adapted to be engaged by the end 33[b] of each forked lever 33 when sliding on the segmental track 75. A wedge 99 is secured by the screw 100 upon the segmental track 75 for lifting the end 33[b] of the lever 33 sufficiently to pass over and disengage same from the contact stud 98. The stud 98 is made of various lengths to suit the height of the containers to be treated. A lever 101 is secured by a pin 102 to the lower end of the shaft 92 and just below the bracket 88. A link 103 is connected by the bolt 104 to the end of the lever 101 and by the stud 105 to the under side of the push plate 82.

A bracket 106, similar to the one 88, is bolted by the bolts 107 through the ears 106[a] to the inside near the discharge end of the trough 3[b]. A lever 108 is secured by the pin 109 to the upper end of the vertical shaft 110 in the bracket 106. A contact stud 98 is screwed into the end of this lever 108. A lever 111 is secured by the pin 112 to the lower end of the shaft 110 below the bracket 106. A push plate 113 is adapted to slide radially in the grooved guides 114 115 attached to or a part of the table 3. The guide 114 is provided with a lug 114[a] against which the pin 116 in the push plate 113 is normally held by means of the tension spring 117 attached to said pin 116 and to a pin 118 in the inner end 114[b] of said guide 114. The bar 119 is connected by the bolt 120 to the end of the lever 111, and by the stud 121 to the under side of the push plate 113. A wedge 122, similar to the wedge 99, is similarly clamped upon the segmental track 75 for lifting the end 33[b] of the forked lever 33 and disengaging same from the contact stud 98 in the end of the lever 108. An adapter casting 123, preferably provided with a

flange 123ª, may be provided to be removably secured to each segmental casting 16 by the dowels 124 in the holes 16ᶜ, said flange 123ª fitting against said casting 16 and the finger 16ª, Figs. 11 and 12.

The operation is substantially as follows:—The shaft 6 with the spider 15 and the parts thereto attached are revolved slowly in a left hand direction as shown by arrow, Fig. 1, by means of a belt from any suitable source of power applied to the pulley 12. The height of the table 3 is adjusted by means of the screws 4 to suit the containers 36 to be treated. The apron 5 moving in the direction from left to right, as shown by the arrow in Fig. 1, conveys the containers. A container thus moved first encounters the catch 78 and pushes the latter with it, causing the catch to swing on its pivot 79 against the resistance offered by the spring 80, until the container meets the abutment 77. It is then detained by said abutment, and is in the proper position to be moved onto the table 3, the apron 5 slipping under the container. If containers are fed too rapidly on the apron 5 they will abut one another in the trough 3ᵇ and the apron will slide underneath them. The end 33ᵇ of the lever 33 engages the contact stud 98 on the lever 95 and swings said lever on the shaft 92. The spring 97 pulls on the lever 90 and turns the shaft 92 in the bracket 88 and with it swings the lever 101, which in turn pulls the link 103 and the push plate 82, against the action of the spring 86. The tension of the spring 97 is made greater than that of the spring 86. The catch 78 having been released from the crotch 82ª, the push plate 82 now moves across the apron 5 and pushes a container 36 before it onto the table 3, into a space between two adjacent fingers 16ª, the levers being pinned onto the shaft 92 in positions such as to accomplish this result. It will be noted that this arrangement prevents the possibility of a container 36 being jammed by reason of its not being in the proper position when the push plate operates, for the latter can only occur when the catch 78 has been released by the container to be moved. While the container 36 is thus being moved onto the table 3, the next container on the apron 5 may encounter the push plate 82 and be detained by same and by the sides of the trough 3ᵇ. This push plate is made narrower than the container so as to push only one container at a time and never two. The end 33ᵇ of the lever 33 is now lifted, by encountering the wedge 99, so that the lever 95 is released, and the springs 97 and 86 return the levers and the push plate to the position as shown in Fig. 1. The catch 78 enters the crotch 82ª and remains in this position until again released by a succeeding container on the apron 5, whereupon the operation as described is repeated. If, however, the end 33ᵇ engages the contact stud 98 when the catch 78 has not been released, the lever 95 simply swings on the shaft 92, against the action of the spring 97, until said end is disengaged from the contact stud by encountering the wedge 99. Whenever this occurs, a space between two adjacent fingers 16ª passes by the feed opening 125 without a container being placed therein.

The container which has been placed upon the table 3 as previously described, is under a cap 35, and is slid on the table by the finger 16ª behind it. In being thus advanced the container 36 meets the flat spring 126, attached to the inside of the flange 3ᶜ to the left of the opening 125, Fig. 1. The spring 126 forces the container against the segmental casting 16 as well as its finger 16ª, or against an adapter 123 if used, in which position the container is concentrically under the cap 35. The end 33ᵇ of the lever 33, which supports the cap 35, now leaves the end 75ᵇ of the superimposed track 75, whereupon the lever 33 drops, swinging on its pivots 34, and lowers the cap 35 until its gasket 40 rests upon the rim of the container, the latter then supporting the weight of the lever 33 and cap 35 with T 42, etc. The end 33ᵇ of the lever 33 now passes under the shoe 65 and by means of the springs 66 the gasket 40 of the cap 35 is now forced down onto the container rim insuring a tight fit and overcoming any slight irregularities in said rim. The cap 35 in lowering is maintained in a level position by means of the paralleling link 38. While the lever is depressed by the shoe 65 the container 36 encounters the spring 61 in its path. The shaft 56 is thereby turned in the cylindrical casting 47. The lever 54 turning with the shaft 56 pushes the link 57 and causes the sleeve 50 to slide on the bar 49 to the position against the stop 52, Fig. 6. The interference pin 62 is now in the path of and engages the contact lever 43ª and opens the cock 43, allowing air and gases within the container to be exhausted through the hole 35ᵇ, T 42, cock 43, hose 45, nipple 18ª, chamber 18, nipples 19 20, passage 6ª, bonnet 23 and pipe 27 successively. If, however, no container had been placed under said cap 35, then the end 33ᵇ of the lever 33 slides upon the track 30, the spring 61 is not engaged, the sleeve 50 remains against the stop 51 and the pin 62 is not in position to engage the lever 43ª, consequently the cock 43 would not be opened. A vacuum having been obtained in the container, the cap is firmly holding the container by atmospheric pressure, and the end 33ᵇ leaves the shoe 65. Under this condition of the process the container is now moved

around the table 3, allowing ample time for the complete exhaustion of the air and gases in the material being treated within the container. It is thus moved until it arrives opposite the bracket 67, whereupon the interference pin 70 engages the contact lever 43^b closing cock 43.

In continuing its advance the container soon arrives opposite the cylindrical casting 73, Fig. 1. In a manner similar to that previously described, the contact lever 44^a is engaged and the cock 44 opened. Syrup or other liquid is now admitted to the container through the hole 35^b, T 42, cock 44, hose 46, from the reservoir 29. Just previous to the opening of the cock 44, the end 33^b of the lever 33 is forced downward in a manner as previously described, to prevent the cap from lifting after the voids of the container and the pores of the material therein and the interstices have been filled with the liquid. The container is now under a pressure due to the height of the liquid in the reservoir above the container. For example, the fruit has thus been syruped under a vacuum, *i. e.* the air and gases in the container and in the fruit therein have been replaced by syrup. The container continues advancing and the interference pin 70, supported by the bracket 74, soon engages the contact lever 44^b and closes the cock 44. Continuing, the end 33^b is lifted by the beveled end 75^a onto the superimposed track 75, whereby the cap 35 is lifted off the container. The cap in rising is maintained in a level position by means of the paralleling bar 38. The nut 41 is withdrawn with the cap from the container and the space lately occupied by said nut provides room for the liquid, left in the passage 35^b and T 42 when the cock 44 is closed, to fill the container to the proper height, the nut 41 being made a suitable size to accomplish this result by displacement, and the passage 35^b large enough to prevent the liquid being trapped therein and to allow the liquid to be discharged therefrom. When, however, there is no container under a cap 35, the pin 62 is not in position to engage the contact lever 44^a and the cock 44 is therefore not opened. Continuing, the end 33^b of the lever 33 now engages the stud 98 and moves the lever 108, turning the shaft 110 and lever 111, which in turn pulls the bar 119 and the push plate 113 against the action of the spring 117. If a container is in front of the push plate 113 when it is moved out over the table 3, said container will be pushed through the passage 127 onto the apron 5 and be thereby discharged from the apparatus. The wedge 122 now disengages the end 33^b from the stud 98, whereupon the spring 117 returns the push plate and levers to their normal position, Fig. 1. If, however, a defective container happens to be placed under a cap 35 and the cock 43 above same is opened, in the manner as described, the attendant will close said cock by hand, he being able to identify this defective container by means of the sound caused by the air being drawn in through the defect in said container.

In the drawing I have shown the container, which is illustrated as an ordinary tin can, as being filled with washer-shaped slices of pineapple. When this fruit is of a light color and not fully ripe, it is greatly improved by treatment, in the above described apparatus, with a syrup which may consist of refined cane sugar and water. The peeled fruit from the field, sliced or otherwise, without any preliminary treatment, is placed within the container, temporarily sealed by a cap, air is exhausted from the container to a vacuum of about 28 inches of mercury and the container then remains in this condition for about 45 seconds, after which communication with the vacuum source is cut off and the syrup cock opened. The container is then almost instantly filled with the syrup, which thoroughly penetrates the fruit and enters all of the pores or cells of the same; the syrup cock is then closed and the container unsealed. The fruit will then be found to have a full yellow or golden color, and it will also be sweetened to the desired extent. If a glass container is used bubbles may be seen coming out of the cells of the fruit during the vacuum treatment. It is not known whether or not the change in the fruit (particularly in color) is due to a chemical change in the fruit itself. The change in color is almost instantaneous after the syrup is admitted but it can hardly be due to the sugar solution, which is preferably colorless. If the fruit is already yellow before treatment, it undergoes no change in color.

I claim:

1. The combination of a fixed table, means to feed the containers onto the same, a rotary spider above the table and carrying a plurality of sealing devices, said spider moving the containers over the table, common air exhausting means, a source of fluid medium, connections between said air exhausting means and the respective sealing devices, and connections between said source of fluid medium and the respective sealing devices.

2. The combination of a fixed table to support a container, means to slide the container over the table in a temporarily sealed condition, means carried by said first-named means to seal the container, means to depress and raise said sealing means, and

means associated with said sealing means to exhaust the sealed container and admit fluid thereto.

3. The combination of a table on which the containers are supported, means to move the containers over the table, comprising a rotary carrier, sealing devices carried by said carrier, means to operate said devices to seal and unseal the containers, and means to exhaust the sealed containers and then fill them with a suitable fluid agent.

4. The combination of a table on which the containers are supported, a rotary carrier to move the containers over the table, a plurality of sealing devices mounted on said carrier, means to operate said sealing devices to seal the containers during a portion of their travel over the table, means to exhaust the containers while sealed, and means to admit fluid into the containers before they are unsealed.

5. The combination of a fixed table, means to slide a container over the same, sealing devices carried by said first-named means, stationary means to operate said sealing devices to temporarily seal said container in its movement over said table, means to act at one point in the travel of the container to subject the same to the action of a vacuum, and means automatically acting at another point in the travel of the container to admit a fluid medium into the same.

6. The combination of a fixed table, means to slide a container over the same, sealing devices carried by said first-named means, stationary means to operate said sealing devices to temporarily seal said container in its movement over said table, means acting at one point in the travel of the container to place the same in communication with a vacuum, means acting at another point to cut off the vacuum, means acting at a farther point in the travel of the container to admit a fluid to the container, and means acting at a still farther point in the travel of the container to cut off the supply of fluid to the latter.

7. The combination of a fixed table on which the containers are supported, a carrier to slide the containers over the same, sealing devices mounted on the carrier, vacuum and fluid connections associated with the respective sealing devices, stationary means to depress said sealing devices on and raise them from the containers and fixed devices located at different points in the travel of the carrier to open and close said connections automatically.

8. The combination of a fixed table, a carrier movable over the same, sealing devices mounted on the carrier, stationary means to raise and lower said sealing devices, vacuum and fluid connections associated with each sealing device, each of said connections including a valve, and fixed devices acting at different points in the travel of the carrier to operate said valves automatically.

9. The combination of a fixed table, a rotary carrier or spider above the same, a plurality of sealing devices mounted on the carrier, a vacuum connection associated with each sealing device and comprising a valve, a fluid connection associated with each sealing device and likewise including a valve, said carrier moving the containers successively over the table in an endless path, means for opening the vacuum valve when each container is sealed and begins its movement over the table, means to close said valve after a predetermined interval, means to then open the fluid valve, and further means for closing the fluid valve.

10. In apparatus such as described, the combination of a fixed table, a movable spider above the same and acting to move the containers over the upper surface of the table, sealing devices carried by said spider, means operated during the movement of said spider to raise and lower the sealing means, and means to adjust the height of the table relatively to the spider to adapt the apparatus to containers of different heights, as described.

11. The combination of a fixed frame, an upright shaft journaled therein, means to rotate said shaft, a fixed table above and concentric with said shaft, means to adjust said table vertically relatively to the frame, and a spider above the table connected to said shaft for rotation thereby, to slide containers directly on said table, sealing devices carried by said spider and means on said fixed frame for raising and lowering the sealing devices.

12. In a machine such as described, the combination with a table, the carrier and the sealing devices carried by the latter, of a track coacting with said sealing devices to operate them automatically.

13. The combination of a rotary spider or carrier, pivoted sealing devices carried thereby and comprising caps, and relatively fixed means to depress and raise the caps.

14. The combination of a rotary spider having a plurality of radial arms between which the containers are engaged, and pivoted sealing devices carried by said spider in the spaces between said arms, fixed means to depress and raise the sealing devices as described.

15. The combination of a rotary spider having a plurality of radially directed arms, forked levers pivoted to the spider in the spaces between said arms and movable vertically, caps carried by said levers, and means for raising and lowering said levers automatically.

16. In a syruping machine, the combination of a rotatable central source of fluid supply, a central rotatable air exhausting chamber, a spider mounted to rotate with said source of fluid supply and said air exhausting chamber, sealing caps carried by said spider, flexible connections between the caps and the source of fluid supply and air exhausting chamber respectively, and means acting during the rotation of said spider to raise and lower said caps.

In testimony whereof I affix my signature, in presence of two witnesses.

LEWIS E. ARNOLD.

Witnesses:
ROBT. J. PRATT,
H. G. GINACA.