Dec. 31, 1929. J. E. HIRES 1,742,074

BOTTLE HANDLING DEVICE

Filed May 8, 1922 9 Sheets-Sheet 1

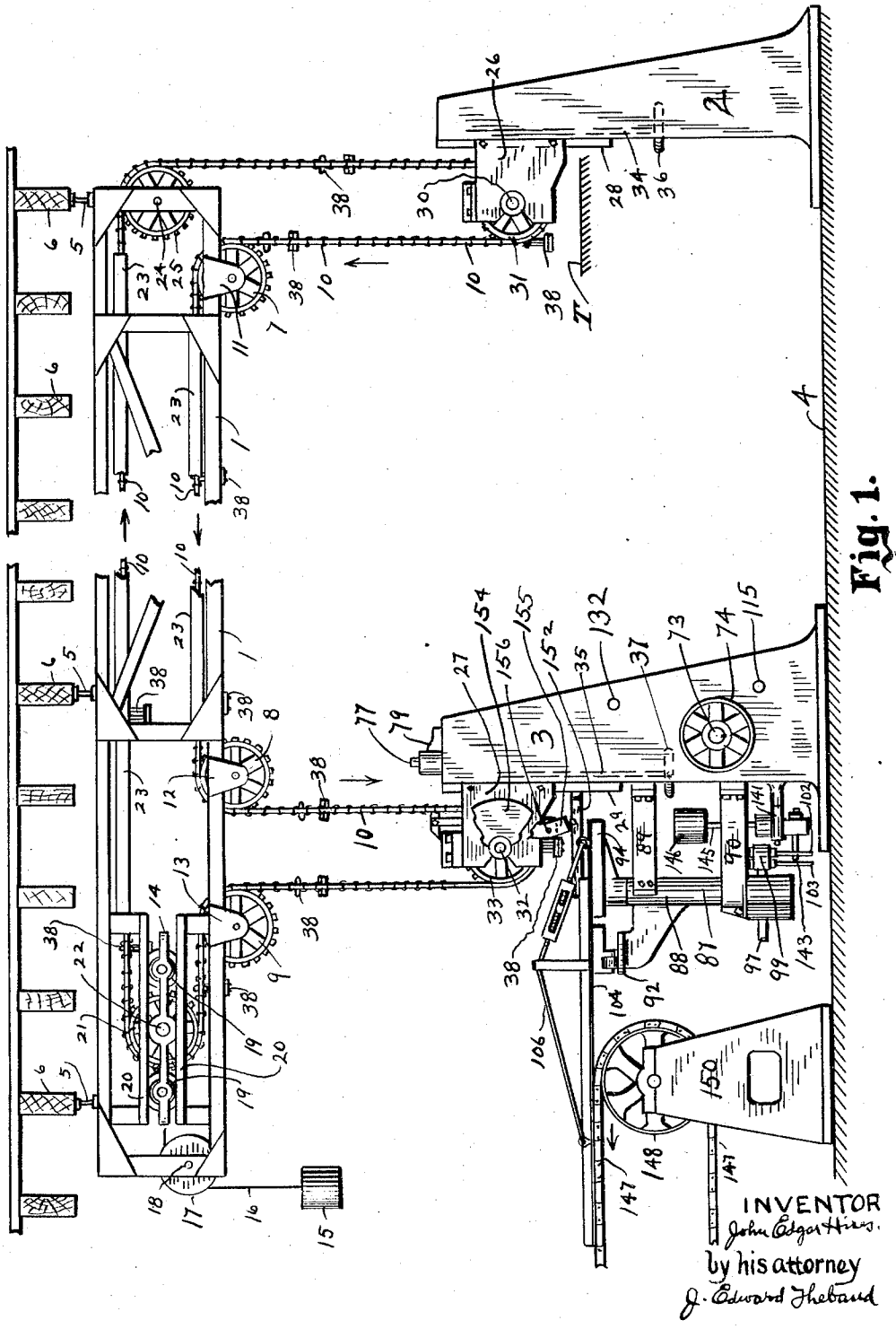


Fig. 1.

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Dec. 31, 1929. J. E. HIRES 1,742,074

BOTTLE HANDLING DEVICE

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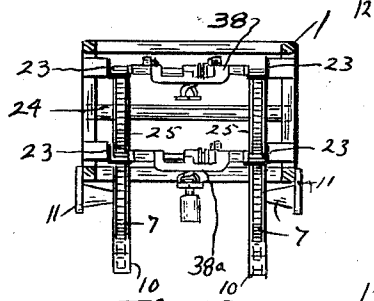


Fig. 3.

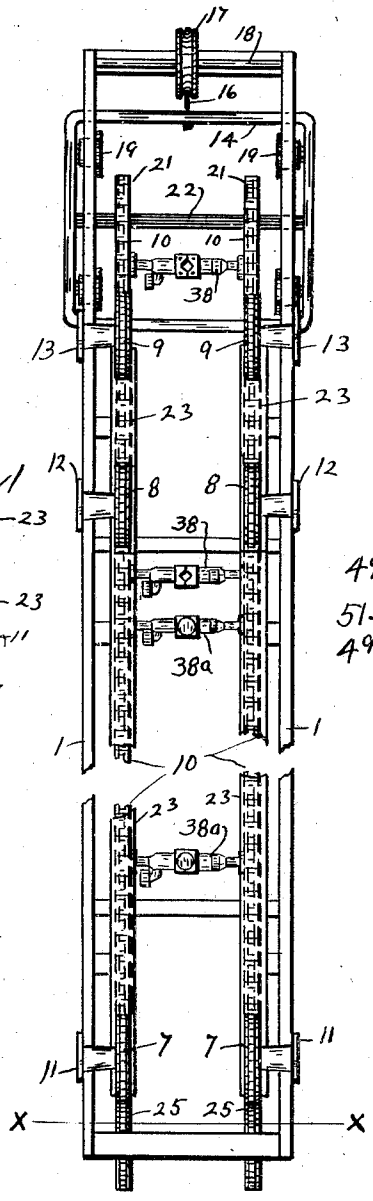


Fig. 2.

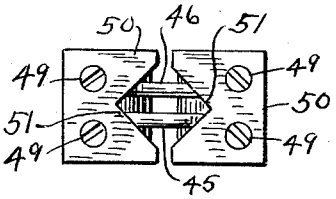


Fig. 9.

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Dec. 31, 1929. J. E. HIRES 1,742,074

BOTTLE HANDLING DEVICE

Filed May 8, 1922 9 Sheets-Sheet 3

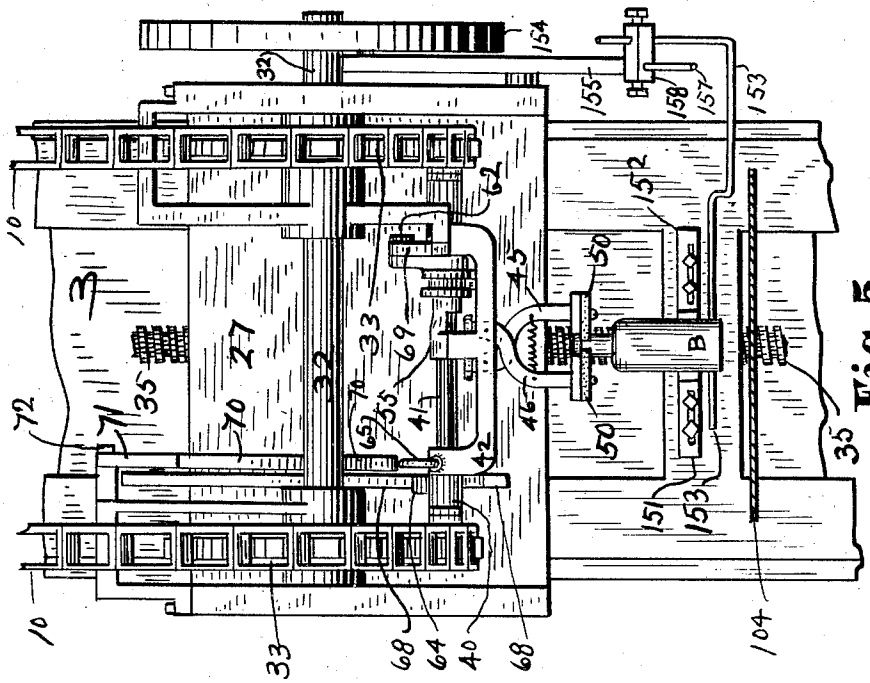


Fig. 5.

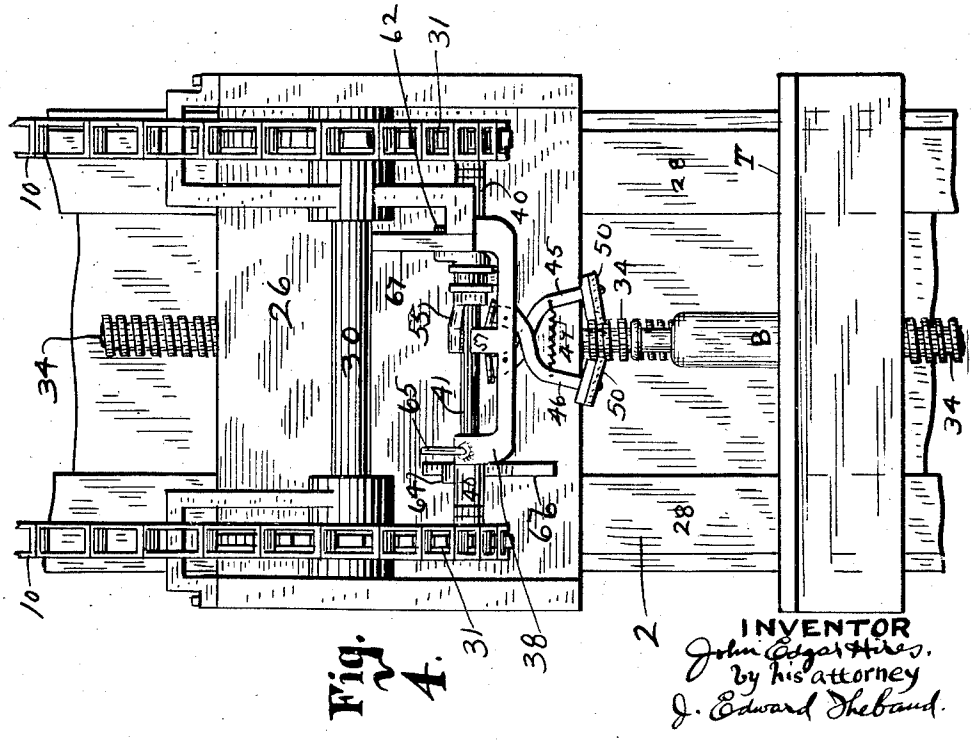


Fig. 4.

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Dec. 31, 1929. J. E. HIRES 1,742,074

BOTTLE HANDLING DEVICE

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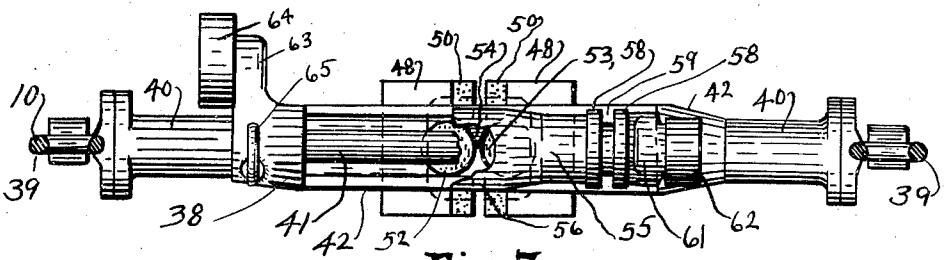


Fig. 7.

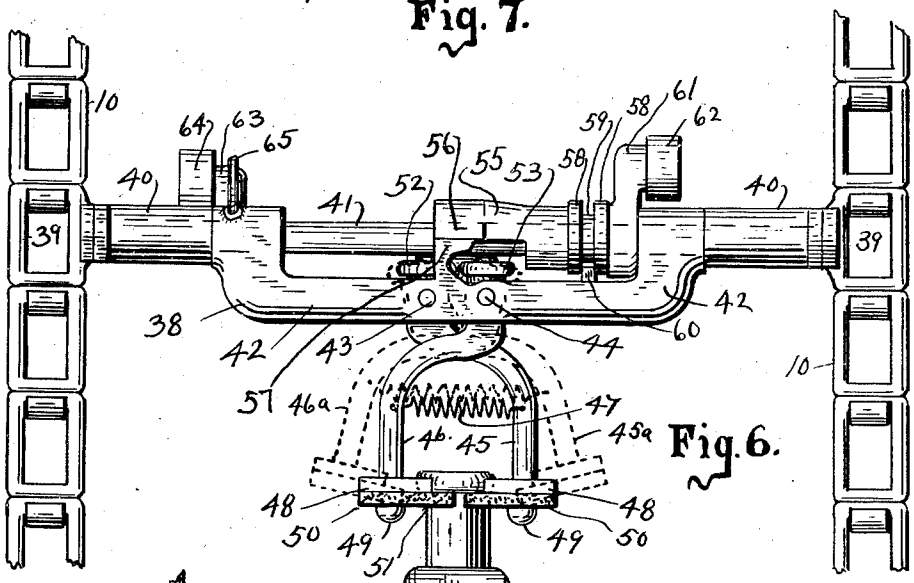


Fig. 6.

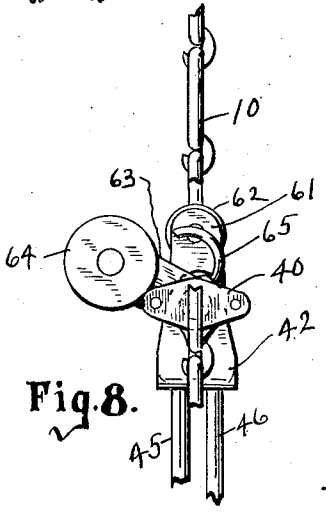


Fig. 8.

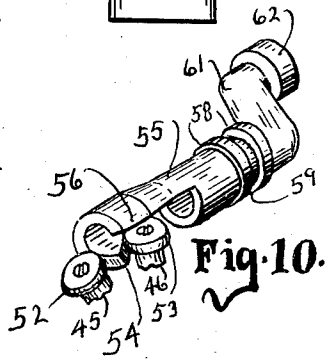


Fig. 10.

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Dec. 31, 1929. J. E. HIRES 1,742,074

BOTTLE HANDLING DEVICE

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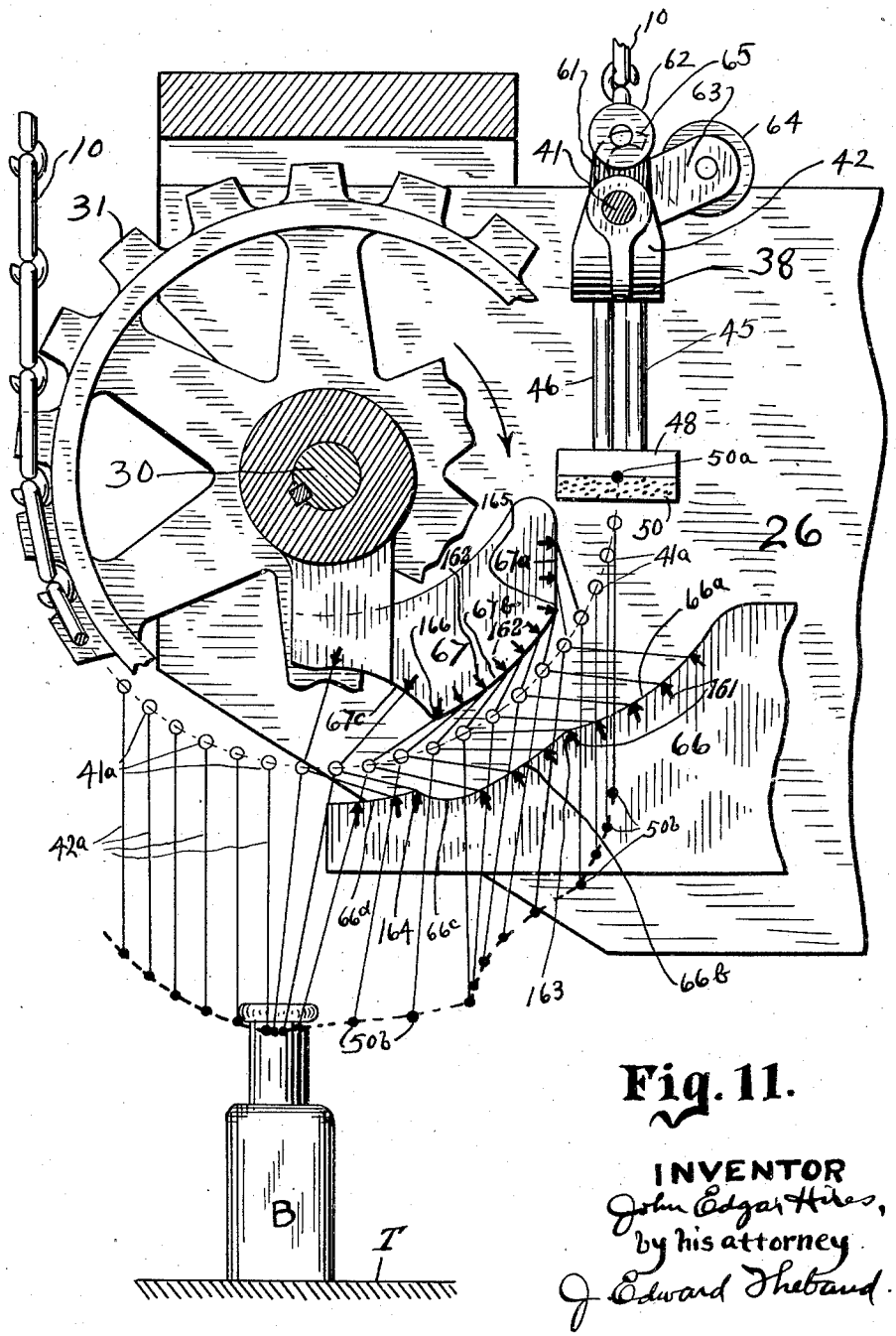


Fig. 11.

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BOTTLE HANDLING DEVICE

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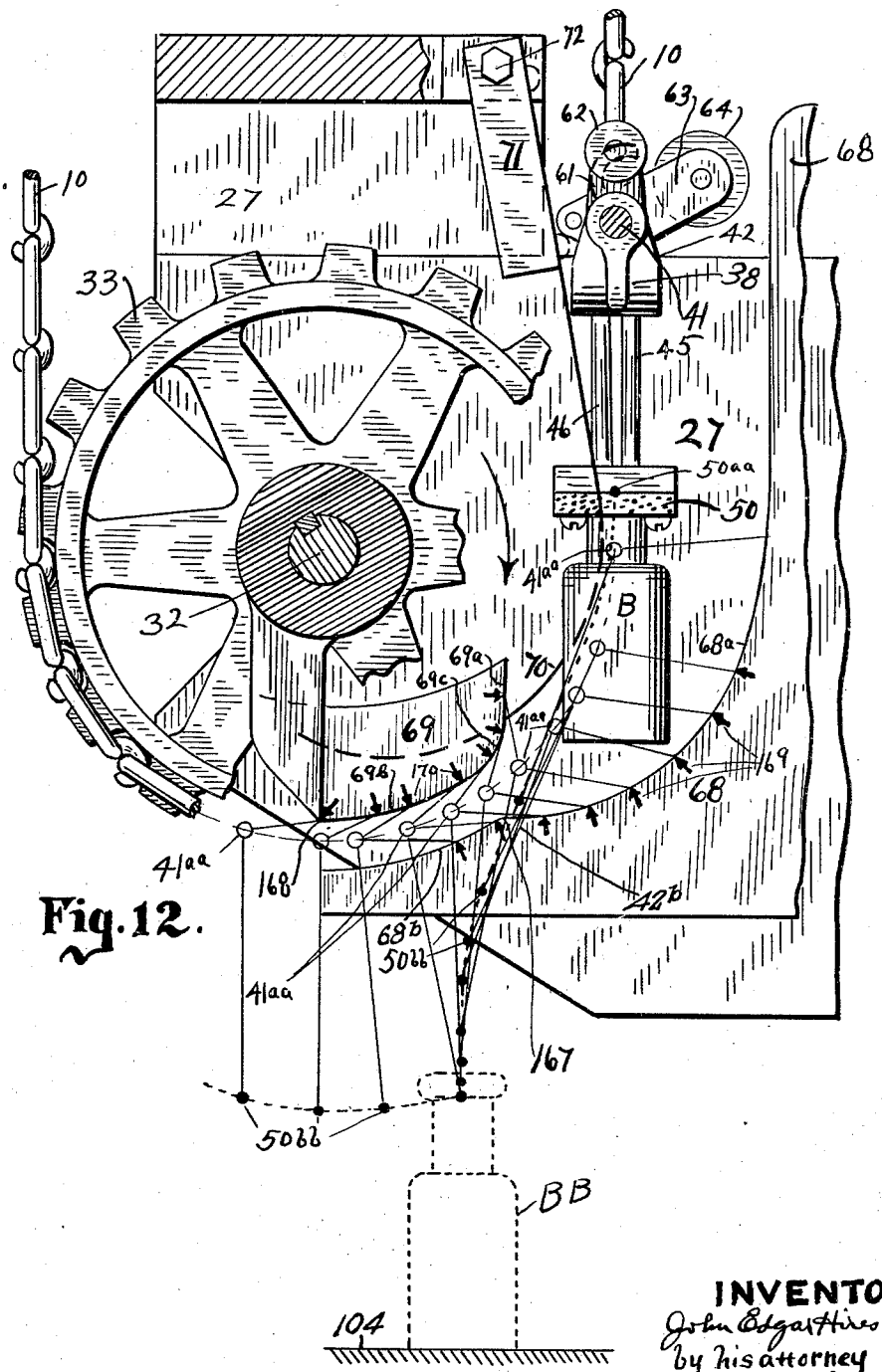


Fig. 12.

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Dec. 31, 1929. J. E. HIRES 1,742,074

BOTTLE HANDLING DEVICE

Filed May 8, 1922 9 Sheets-Sheet 7

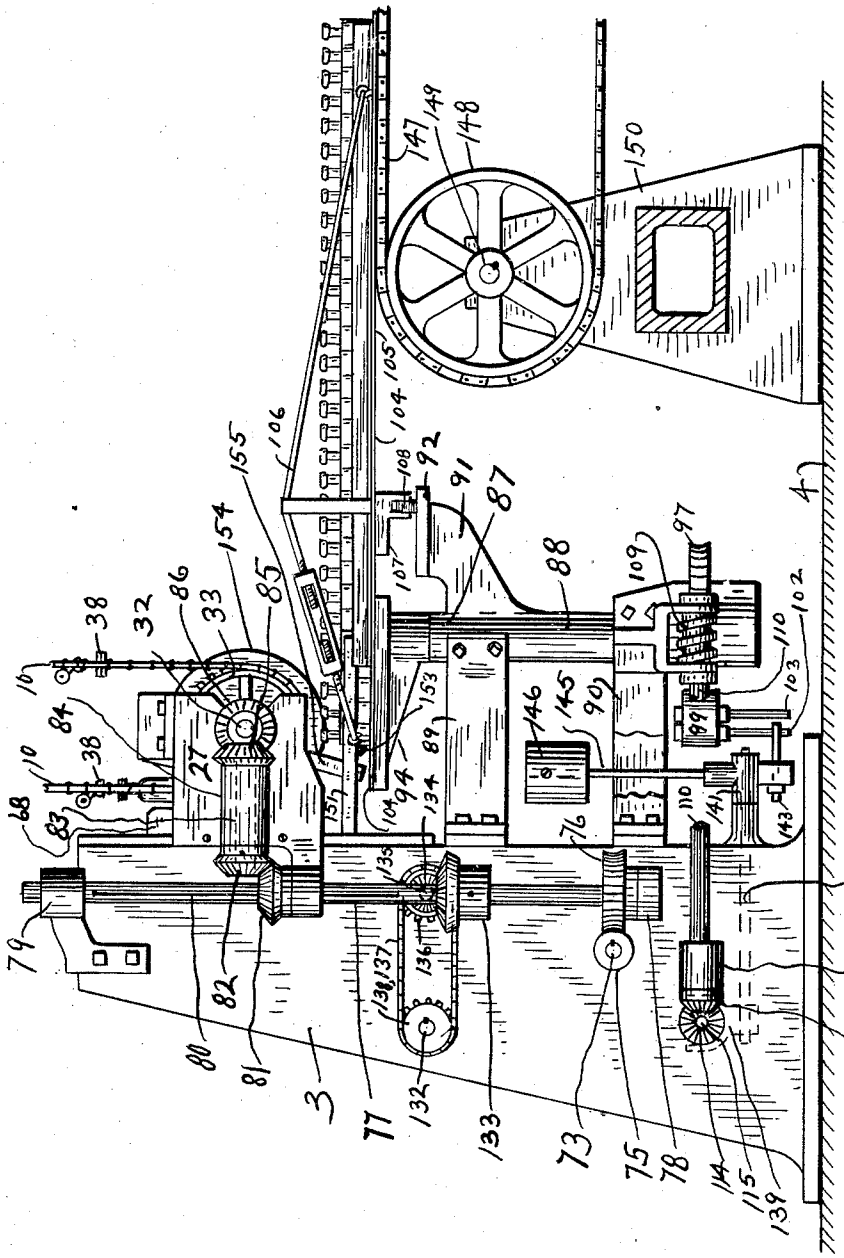


Fig. 13.

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J. Edward Shebard

Dec. 31, 1929. J. E. HIRES 1,742,074

BOTTLE HANDLING DEVICE

Filed May 8, 1922 9 Sheets-Sheet 8

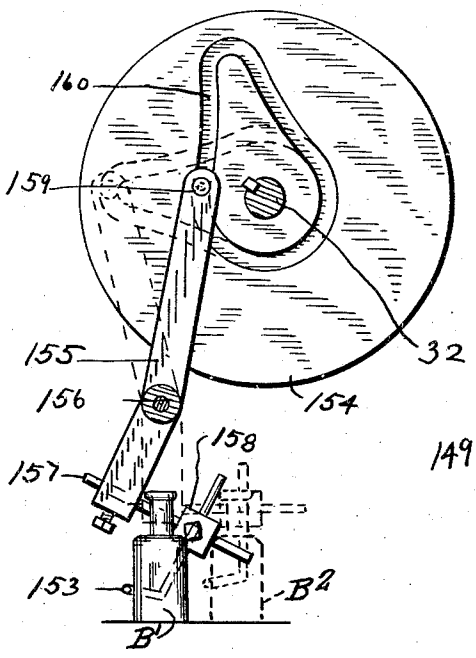


Fig. 15.

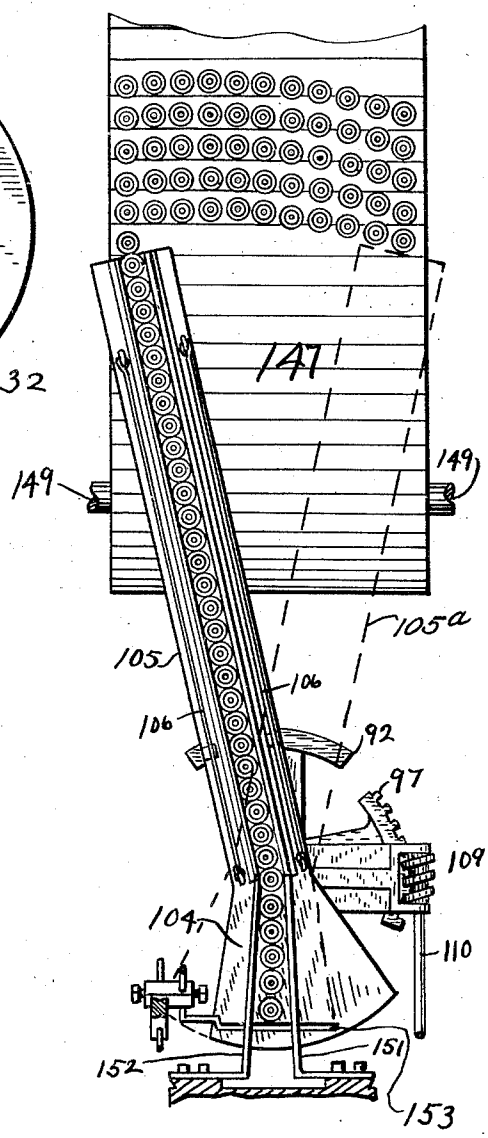


Fig. 14.

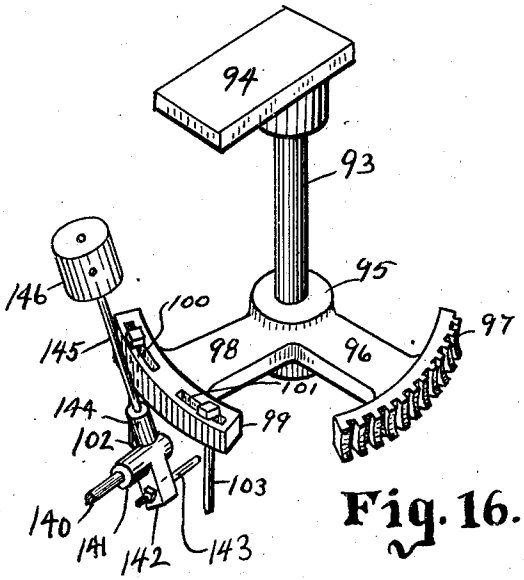


Fig. 16.

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Dec. 31, 1929. J. E. HIRES 1,742,074

BOTTLE HANDLING DEVICE

Filed May 8, 1922 9 Sheets-Sheet 9

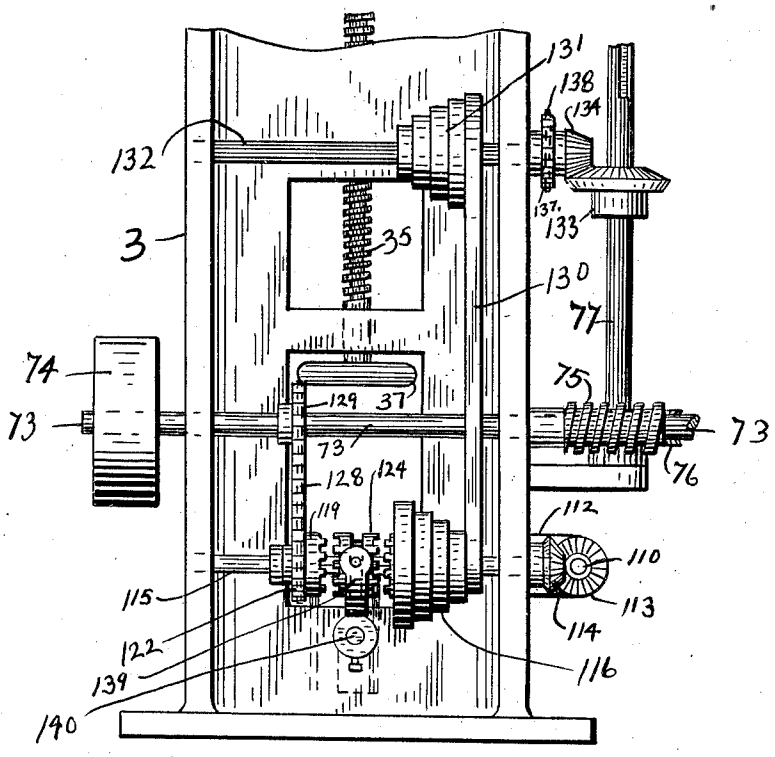


Fig. 17.

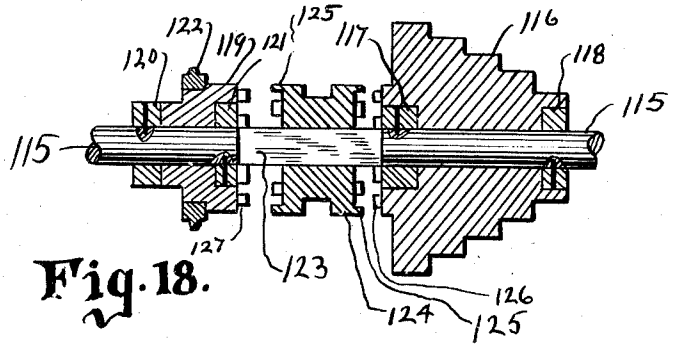


Fig. 18.

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Patented Dec. 31, 1929 1,742,074

UNITED STATES PATENT OFFICE

JOHN EDGAR HIRES, OF LANGHORNE, PENNSYLVANIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO SALEM GLASS WORKS, OF SALEM, NEW JERSEY, A CORPORATION OF NEW JERSEY

BOTTLE-HANDLING DEVICE

Application filed May 8, 1922. Serial No. 559,252.

This invention relates to bottle handling devices, particularly those used in a glass factory in connection with the manufacturing of bottles by machines.

One of the objects of this invention is to provide a device which will automatically do the work now done manually, in taking the bottles from the forming machine and bringing them to the leer.

Another object is to provide a bottle handling device which will pick up the bottles by the neck and carry them to another point, where it deposits them upon a form of conveyor which carries them to the leer.

A further object is to provide, in a bottle handling device, a plurality of gripping means, adapted to pick up the bottles individually, particularly picking them up in succession, by the neck, without knocking them over from their standing position and depositing them in a standing position.

Another object is to provide in a bottle handling device, a conveyor, which shall carry the bottles over head as they leave the bottle forming machine, so as to leave a clear passageway about the machine, affording greater freedom of movement to the operators.

Another object is to provide in a bottle handling device, a conveyor formed to permit the free passage of a hanging bottle gripping device through it, particularly with a bottle depending from the gripping device.

With these and other objects, one embodiment of my invention is shown in the drawings, its operation is explained and what I claim is set forth.

In the drawings,

Figure 1 is a side elevation of a bottle handling device embodying my invention.

Figure 2 is a plan of the underside of the conveyor trestle and parts thereon.

Figure 3 is a vertical upright section taken on the line X—X of Figure 2.

Figure 4 is a front elevation of part of the receiving end of said bottle handling device, showing a table top to adjoin a bottle forming machine. The gripping mechanism is shown in position, about to pick up a bottle by the neck.

Figure 5 is a front elevation of part of the depositing end of my device, showing the top plate of the swinging table, upon which the bottles are deposited. The position of the parts is that of impending discharge of a bottle to a standing position upon the table.

Figure 6 is a front elevation of one of the gripping units, journaled upon a shaft fixed in opposite links of two chains which are spaced by said shaft. A bottle is shown held by the gripping unit.

Figure 7 is a top plan of the unit shown in Figure 6.

Figure 8 is a side elevation of the unit in suspended position on a vertical part of the chain.

Figure 9 is a plan of the underside of the lower ends of the gripping elements of one of said units.

Figure 10 is a perspective view showing the rocking element of the unit shown in Figure 5, which is shown illustrated in a position, out of the normally vertical one, showing the separating effect produced upon the rollers, connected with the gripping tongs, while opening the latter.

Figure 11 is a diagrammatical side elevation of the receiving end of the device, showing the effect of the cams upon the course taken by the parts of one of the gripping units, when picking up a bottle by the neck.

Figure 12 is a diagrammatical side elevation of the depositing end of the device, showing the effect of the cams upon the course taken by the parts of one of the gripping units, when setting down a bottle in an upright position.

Figure 13 is a side elevation of the standard and attached parts of the depositing end of my device adapted to distribute the bottles upon a belt conveyor to be transported further to the leer.

Figure 14 is a top plan of the oscillator and parts shown in Figure 13.

Figure 15 is a side elevation of the cam and attached parts for clearing each bottle away from its deposited position to make room for the next, as well as to intermittently move the bottles along the oscillating distributor.

Figure 16 is a perspective view of the ver-

tical shaft of the oscillating distributor, with attached segmental worm, gear and tripping mechanism parts, which cause the distributor to change its direction of motion.

Figure 17 is a rear view of part of the standard shown in Figure 13, showing other parts of the means used in operating the distributor.

Figure 18 is a sectional elevation of the reversing clutch and rotating members connected therewith, which oscillate the distributor.

In the figures, there are three supporting structures to the operating mechanism—the trestle 1, supported from the ceiling of the operating room; and the two standards 2 and 3 resting upon the floor 4. The trestle 1 is suspended by rods 5 from the ceiling beams 6. Sprocket wheels 7, 8 and 9 engage a continuous double chain 10, and they are journaled on stub shafts fixed in the respective brackets 11, 12 and 13, mounted upon opposite sides of the trestle 1. The chain 10 is held in tension by means of a carriage 14, which is constantly pulled by a weight 15, connected thereto by a cable 16 passing over a pulley 17, journaled upon a shaft 18, fixed in the trestle 1. The carriage 14 is provided with rollers 19 engaging tracks 20 on the trestle 1. The chain 10 passes around sprocket wheels 21, fixed on the shaft 22, journaled upon the frame of the carriage 14. The chain 10 is supported in its length by the guide 23. In the forward end of the trestle 1 is journaled a shaft 24, upon which is fixed a pair of spaced sprocket wheels 25.

Referring now to the standards 2 and 3, there are mounted thereon, the respective brackets 26 and 27 adjustably fixed upon the respective ways 28 and 29, integral with the respective standards 2 and 3. Journaled in the sides of the bracket 26 is the shaft 30, upon which are spaced and fixed a pair of sprocket wheels 31, engaging the double chain 10. Similarly, journaled in the sides of the bracket 27 is the shaft 32, upon which are spaced and fixed a pair of sprocket wheels 33, which also engage the double chain 10. Upon releasing the brackets 26 and 27 from their fixed relation to the respective ways 28 and 29, they may be adjustably positioned vertically by means of the respective threaded shafts 34 and 35, which the brackets 26 and 27 engage. The shafts 34 and 35 are turned by the respective hand wheels 36 and 37 fixed to them. The various sprocket wheels 31, 7, 8, 33, 9, 21 and 25, in succession engage the chain 10, which in motion, passes over these sprocket wheels in the order just mentioned, so that the lower parts of the chains 10, pass forward, as they turn about the lower parts of the respective pairs of spocket wheels 31 and 33.

The two lengths of the double chain 10 are joined together and equally spaced throughout their length, by means of the plurality of gripping units 38. An individual gripping unit 38 is illustrated in detall in Figures 6, 7, 8, 9 and 10, wherein there are fixed to the opposite links 39, of the chains 10, tubular pieces 40, in which is fixed the shaft 41. Journaled upon the shaft 41, and hanging beneath it, is the yoke 42, in the central part of which, are journaled, at 43 and 44, the respective legs 45 and 46, which are normally drawn together by means of the tension spring 47. At the lower ends of the legs 45 and 46, are feet 48, to each of which is attached, by means of the screws 49, a refractory jaw 50, having notches 51, where they engage the neck of the bottle. To the upper ends of the legs 45 and 46, are journaled the rollers 52 and 53, which engage the wedge 54, of the tubular rocking element 55 which is journaled upon the shaft 41.

The rocking element 55, has a shoulder 56, positioned to engage a lug 57, integral with the yoke 42. There is provided between flanges 58, integral with the rocking element 55, an annular recess 59, concentric with the shaft 41, which recess 59, is engaged by the lug 60, which is integral with the yoke 42, the purpose being to maintain the rocking element 55, in a longitudinal position upon the shaft 41. The rocking element 55, has a crank extension 61, to the outer end of which is journaled a roller 62, whose axis is parallel to that of the shaft 41.

Integral with the yoke 42, is a crank extension 63, positioned at an angle therewith and having journaled at its outer end, a roller 64, the axis of which is parallel to that of the shaft 41. A horn 65 is fixed in the yoke 42.

A set of stationary cams, for operating the gripping units as they pass around the sprocket wheels 31 and 33, is provided in connection with each of the brackets 26 and 27. A detailed description of these cams is given below, in connection with the description of the operation. The cams of the set, in fixed relation to the bracket 26, of the receiving end of the device, are shown in Figure 11, and are numbered 66 and 67. The cam 66 is contacted by the roller 64, and the cam 67 is contacted by the roller 62 of the gripping unit 38, to position the jaws 50 to travel in a certain defined path and to open the jaws 50, and then permit them to close upon the neck of the bottle, as the gripping unit passes the same. The cams of the set, fixed in relation to the bracket 27 and shown in Figure 12, are numbered 68 and 69. The cam 68 being positioned for contact with the roller 64, and the cam 69 being positioned for contact with the roller 62, of the gripping unit 38, so as to define the path of the jaws 50 to let the bottle down practically vertical in the lower end of the path and to hold the jaws open as they pass the bottle just released. In connection with the operation of the roller 64, on the

cam 68, there is provided a leaf spring 70, particularly curved to coordinate in pressed contact with the horn 65, to keep the roller 64 in contact with the cam 68, as the unit travels around the wheel 33. The leaf spring 70 is fixed upon a bar 71, which is adjustably fixed by the screw 72, to the upper part of the bracket 27. Considering now the part connecting the shaft 32, of the sprocket wheels 33, with the driving shaft 73, journaled in the standard 3, (see Figure 13) there is fixed upon the shaft 73, a pulley 74, adapted for belt connection to a motor. Fixed on the opposite end of the shaft 73 is a left hand worm 75, which meshes with a worm gear 76, fixed upon a vertical shaft 77, which is journaled in bearings 78 and 79, against longitudinal displacement. The shaft 77 has a long groove 80, in which slides the key of a beveled gear 81, adapting the same to slide upon the shaft 77 and to be turned therewith. The gear 81 meshes with another gear 82, fixed upon the shaft 83, which is journaled in an extension 84, of the bracket 27. The opposite end of the shaft 83, has fixed thereto a beveled gear 85, which is in mesh with another beveled gear 86, fixed upon the shaft 32, thereby completing the connection between the pulley 74 and the shaft 32, and permitting the vertical adjustment of the bracket 27, while the gears remain in mesh.

Considering now the distributor 87, attached to the standard 3, a post 88 is positioned in fixed relation thereto by means of the pieces 89 and 90. Integral with the post 88 is a bracket 91, having a flat track portion 92 on top thereof. Within the post 88, is journaled a vertical shaft 93, having fixed at its upper end, a shoe 94, which rests on the top of the post 88. Fixed at the lower end of the shaft 93 is a crank 95, having on the arm 96 the gear segment 97, concentric with the shaft 93. Upon the arm 98 is a slotted rim section 99, concentric with the shaft 93 and having slots 100 and 101 adjustably engaged, respectively, by the long pins 102 and 103, these pins being fixed to the section 99, by means of nuts, threaded thereon.

Referring to the upper part of the distributor, there is fixed upon the shoe 94, a plate 104, having the end next the shoe 94, broadened out. This plate 104 extends away from the shoe 94 and is strengthened by longitudinal members 105 and the bridging 106, on each side thereof. Beneath the plate 104, there is fixed a roller bracket 107, having journaled therein a roller 108 which rides upon the curved flat track 92. For swinging the plate 104, there is provided a right hand worm 109, in mesh with the gear segment 97. The worm 109 is fixed upon the shaft 110, which is journaled in an extension 111 of the piece 90. The shaft 110 is also journaled in the bearing 112, fixed upon the standard 3. At this bearing 112, there is fixed upon the shaft 110, a beveled gear 113, which is in mesh with another beveled gear 114, fixed upon the shaft 115 (see Figure 17) the shaft 115 has journaled thereon the cone pulley 116 which is positioned longitudinally by the collars 117 and 118, fixed upon the shaft 115. Spaced from the cone 116 journaled upon the shaft 115, is the clutching element 119, positioned longitudinally, by the collars 120 and 121, fixed upon the shaft 115. Concentrically fixed upon the clutching element 119, concentric with the shaft 115, is the sprocket wheel 122. The shaft 115 has a square portion 123, in sliding engagement with the annularly grooved collars 124 having teeth 125 integral with each end thereof, and adapted for engagement with the teeth 126 of the cone 116 and the teeth 127 of the clutching element 119. The collar 124 has a square hole engaging the square portion 123 of the shaft 115.

The sprocket wheel 122, on the clutching element 119, is connected by the sprocket chain 128, with the sprocket wheel 129, fixed to the shaft 73, so that the clutching element 119 runs at a constant speed due to that of the driving shaft 73, and revolves upon the shaft 115, unless locked thereon by the clutching collar 124. The cone 116 is revolved by means of a belt 130 connected with the cone 131, fixed upon the shaft 132, which is journaled in the standard 3. The shaft 132 runs at a constant speed, being connected with the shaft 73, through the worm 75, the gear 76, the shaft 77, the beveled gear 133, fixed upon the shaft 77, the smaller beveled gear 134, in mesh with it, and journaled upon a stub shaft 135, fixed upon the standard 3, the sprocket wheel 136, fixed concentric with the beveled wheel 134, which is connected by the sprocket chain 137, with the sprocket wheel 138, fixed upon the shaft 132. By changing the position of the belt 130, upon the pulleys 116 and 131, the speed of the cone pulley 116 is changed.

Referring now to the clutching device upon the shaft 115, the clutching element 119 revolves in an opposite direction to that of the cone pulley 116. The collar 124 is thrown to the right or left by means of the yoke 139, which is fixed upon the shaft 140, journaled in the standard 3. The opposite end of the shaft 140, has fixed thereon the piece 141, which has a lower extension 142, upon which is fixed the horizontal pin 143, positioned to be engaged by either of the vertical pins 102 or 103. The piece 141 also has an upward extension 144, in which is fixed a rod 145, to the upper end of which is fixed a weight 146, which serves to quickly and forcibly rock the shaft 140, one way or the other, to throw the clutching collar 124 into engagement with the cone pulley 116 or the clutching element 119, when started in either direction by means of either of the vertical pins 102 and 103, engaging the pin 143.

Positioned below the distributor 87, is a traveling conveyor belt 147, which turns about the wheel 148, fixed upon the shaft 149, journaled in the standard 150. The conveyor being provided to carry the bottles away from the distributor 87, to a leer, or if desired, the bottle handling device may be so designed, as to have the standard 3 in close proximity to the leer, having the bottles pass from the distributor 87, directly to the moving bottom of the leer oven.

Considering now the means provided for moving the bottles along the plate 104, to make room for the successive depositing of the bottles upon the plate 104, and at the same time to discharge the bottles intermittently from the distributor, there are adjustably fixed upon the face of the standard 3, above the plate 104, two guides 151 and 152, the same being adjusted relative to one another to accommodate bottles of different diameter. Positioned between the plate 104 and the guides 151 and 152, and back of the spot where the bottles are deposited, is a rod 153 which has connection with the cam 154, which is fixed upon the shaft 32, oscillating the rod 153 through the cam lever 155, which is pivoted on a stub shaft 156 fixed in the bracket 27. A rod 157 is adjustably fixed in the lower end of the lever 155. Upon the rod 157, is adjustably fixed the block 158, in which is adjustably fixed the rod 153. The cam arm 155 is oscillated by means of the engagement of the roller 159, with the cam groove 160.

In operation, assume that bottles are regularly supplied at the receiving end of the bottle handling device, in a given position, where they are successively picked up, automatically, by the gripping units at the standard 2, and carried to the standard 3. Motion is given to the chain 10 by means of the connection of the sprocket wheels 33 with the driving shaft 73, through the shaft 32, the bevel gears 86 and 85, the shaft 83, the bevel gears 82 and 81, the shaft 77, the gear 76 and the worm 75, fixed upon the shaft 73. Any adjustment of speed of the chain 10 is effected through the size of the pulley 74 and its connection with a motor, or by varying the speed of the motor.

To better explain the functioning of the gripping unit parts with the cams, as the bottle is gripped and released, parts of Figures 11 and 12 are drawn diagrammatically. Considering the action of taking hold of a standing bottle by the neck, assume that a table top, the surface of which is represented by T in Figure 1, is placed directly under the sprocket wheels 31, in proximity thereto, and that the bracket 26 has been so adjusted in position, by means of the screw 34, that a bottle of a given size, will have its neck in the path of the jaws 50, at a point, in this path, where the jaws automatically close. The bracket 26 is then fixed upon the standard 2 for this position, during a run of a given size of bottles, but is again adjusted for a bottle of a different size. Jaws 50, of fireproof material, and of a size, adapted to the bottles to be carried, are attached to the feet 48. These jaws 50 do not have to be changed as often, as the bracket 26 has to be adjusted to the height of bottle, for a set of jaws 50, will accommodate bottles having necks of different diameters within certain limits, which is made possible by the elastic grip, due to the spring 47. Having adjusted the device for a given size of bottle, assume that the chain 10 moves, taking the unit 38 down from its position shown, through successive positions, wherein the small circles 41^a represent the successive positions of the shaft 41 as the unit 38 turns about the sprocket wheels 31 and the large dot 50^a, on the jaws 50 travels through the path taken by the dots 50^b as governed by the action of the cams 66 and 67 upon the parts of the unit 38. The lines 42^a drawn between the circles 41^a and the respective dots 50^b, represent the tilting or vertical positions assumed by the plane of the yoke 42, passing through the shaft 41 and the dot 50^a on the jaws 50, in passing around the wheels 31. Points of contact of the rollers 62 and 64 on the respective cams 66 and 67 corresponding with their positions relative to those occupied by the shaft 41, by the small circle 41^a, are represented by arrows 161, on the cam 66, and by arrows 162 on the cam 67.

The cam 66 has a curved surface 66^a which draws nearer the shaft 30 on the way down, the surface of the cam 66 then changes at a point 163 to a surface 66^b, concentric with the shaft 30 and merges into a curved surface 66^c of short radius which changes at the point 164 to a surface 66^d, concentric with the shaft 30, but of shorter radius than the surface 66^b. There are three surface formations on the cam 67, viz, the vertical surface 67^a, the curved surface 67^b, concentric with the shaft 30, and the curved surface 67^c, most of which is circular, having a center near the path of the shaft 41 and terminating in a small reverse curve. The surfaces 67^a and 67^b connect at the point 165 and the surfaces 67^b and 67^c connect at the point 166. As the roller 62 passes down the surface 67^a, the rocking element 55 is turned out of the vertical and the roller 64 traveling along the surface 66^a assists this turning and tends to hold the unit in a vertical plane. As the rocking element 55 turns, the wedge 54 presses in between the rollers 52 and 53 opening the jaws 50 until they are full open as shown in the broken line position of the parts in Figure 6 marked 45^a and 46^a. The full opening takes place as the roller 64 passes the point 163 of the cam 66 and is held so as the rollers 64 and 62 travel the concentric portions 66^b and 67^b, of the respective cams 66 and 67, the roller 64 enters upon the portion 67^c of the cam 66 and the jaws 50 remaining open approach the

bottle B and momentarily are held opposite the neck thereof, while the roller 62 passes the point 166 on the cam 67 and enters the curve 67^c, rapidly releasing the rocking element 55 from its inclined position, brought about by the co-action of the spring 47, and causing the jaws 50 to snap onto the bottle B at its neck, after which the rollers 62 and 64 leave the cams 67 and 66, and the bottle being spring gripped, is carried up and around the sprocket wheels 7 and across to the sprocket wheels 8, when it descends toward the sprocket wheel 33 at the standard 3.

Previous to starting the device, the bracket 27 is adjusted in position with respect to the plate 104 of the distributor 87, or to any horizontal surface adjoining the standard 3, upon which the bottles are landed. The adjustment of the bracket 27 is effected by means of the screw 35 and is made with respect to the height of the bottle B, being handled by the device.

Referring now to Figure 12, the same system of dots, small circles and arrows is used as those in connection with Figure 11, but the dots and arrows follow different lines. The series of dots 50^{bb} of Figure 12, follow a reverse curve, so designed, that the lower part of this curve is nearly vertical, indicating that the bottle B, in its movements is brought directly over the spot where it is subsequently deposited and let down upon that spot in a vertical position, having been given a chance to be righted to a vertical position during its movement in dwelling in the lower vertical part of the path of the jaws 50. The cams 68 and 69 are designed, as are the cams 66 and 67, to cause the jaws 50 to travel and operate in the path indicated by the large dots 50^{bb} and 50^{aa} respectively. The cam 68 has a surface, the curved portion 68^a, of which, draws nearer the shaft 32 on the way down, and changes to the concentric portion 68^b at the point 167. The cam 69 has a short vertical surface portion at 69^a, for contact with the roller 62. The portion 69^b is concentric with the shaft 32 and is connected by the curved portion 69^c, of short radius, with the portion 69^a. The portion 69^b terminates at the point 168, directly under the shaft 32.

Considering now the functioning of the parts, as the shaft 41 passes around the wheels 33, after the unit 38 leaves the full line position shown in Figure 12, the horn 61 comes in contact with the leaf spring 70, which causes a tilting of the unit 38 from a vertical plane, as shown by the lines 42^b, as the jaws 50, pass down through the successive positions of the dots 50^{bb}, and the shaft 41 passes through the successive positions of the small circles 41^{aa}. The rollers 64 and 62, at the same time contact the cams 68 and 69 at the respective points indicated by arrows 169 on the cam 68, and arrows 170, on the cam 69. In both Figures 11 and 12 the three thin lines radiating from each of the small circles, in the path of the shaft 41, connect with the points of contact of the rollers 62 and 64 with the arrows 169 and 170, on the respective cams 68 and 69 and with the dots 50^{bb}, the arrows and dot, so connected with a given circle, represent the roller contact points with the cams and the position of the jaws 50 for the instant which the shaft 41 occupies the given circle 41^{aa}.

The release of the bottle B, begins to take place shortly before the roller reaches the point of connection 167 between the curved portion 68^a and 68^b, at which position the jaws are wide open, leaving the bottle B to rest in the broken line position BB, upon the surface of the plate 104, or any other horizontol flat surface desired. The jaws 50 remain open as the rollers 62 and 64 traverse the concentric portion 68^b and 69^b, of the respective cams 68 and 69, so that the jaws 50 pass clear of the bottle. In both cases of picking up a bottle and of depositing it, the chain 10 runs constantly uniform, consequently, the shaft 41 of each unit 38 travels at a uniform speed while the cams modify the movement of the jaws confining them to the paths indicated by the dots, besides opening and closing the jaws 50 as explained above. In the design of the device, there preferably passes a unit 38 for each revolution of the sprockets 31 and 33.

The chain 10 is maintained in tension by the carriage 14 which adjusts itself in position for the adjustments made in the positions of the brackets 26 and 27.

Considering now the distributor 87, the extension 105 of the swinging plate 104, which is close to the belt 147, the movements of the same are derived from the driving shaft 73. Referring to Figures 13 to 18 inclusive, the oscillating movement of the top plate 104, is caused by oscillations of the shaft 93 through the connection of the gear segment 97 with the worm 109, which turns first in one direction then reverses, according as the collar 124, slidingly keyed on the shaft 115, engages the pulley 116 or the clutching element 119. If the clutching element 119 is engaged, then the plate portion 105 swings rapidly from the dotted position 105^a to the full line position, while if the teeth 126 on the pulley 116 are engaged, then there is a slow movement from the full line position to the dotted position 105^a, the rate of the latter movement being fixed by the position of the belt 130 upon the cone pulleys 116 and 131. In Figure 17 the belt 130 is shown connected with the pulleys 116 and 131 for the fastest speed, during the distribution of the bottles on the conveyor belt 147. The movement of the swing top 105, is regulated for the diameter of bottle carried, and for the rate at which they are deposited from the units 38, of the conveyor. The changing of en-

gagement of the clutch collar 124, from the clutching element 119 to the cone pulley 116 and vice versa, is effected by the pins 102 and 103, which alternately and slowly push the pin 143, to one side or the other, so that the weight 146 passes through a vertical position from which it falls, rapidly changing the position of the clutch collar 124 from its partial engagement with the cone 116 to full engagement with the clutching element 119 or vice versa. Adjustment of the position of the pins 102 and 103 on the slotted segment 99 is made to regulate the amount of angle through which the extension 105, of the plate 104, swings.

The bottles are deposited upon the plate 104 between the guides 151 and 152, in front of the rod 153, and as each bottle is deposited, the cam 154 causes the cam lever 155 to move, giving a forward movement to the rod 153 to push the bottle from the position B^1 to the broken line position B^2 of Figure 15, as the bottle moves forward between the guides 151 and 152, pushing previously deposited bottles ahead of it along the extension 105 and out of the end upon the conveyor belt 147, to be carried further, as to a leer.

Changes in construction can be made from the one embodiment of my invention, herein shown and described, without departing from the spirit and scope thereof.

I therefore do not wish to be confined to this one embodiment, hence I claim:

1. A bottle handling device comprising a linked conveyor, a supporting member on which said linked conveyor is adapted to run longitudinally, means swiveled on said conveyor for holding a bottle in suspended position by the neck, and other means for actuating the first mentioned means, at places where the bottle is taken hold of and where it is released from said first mentioned means.

2. A bottle handling device comprising a conveyor, means swiveled on said conveyor for holding a bottle in suspended position by the neck, other means for actuating the first mentioned means, at places where the bottle is taken hold of and where it is released from the first mentioned means, a self adjusting tension device, for maintaining a fixed tension upon said conveyor.

3. In a bottle handling device, a conveyor, a trestle frame for said conveyor, said frame comprising an upper closed portion and spaced side portions, open opposite said upper closed portion, whereby a load carried by said conveyor on said frame may hang free while being transported by said conveyor, and a series of bottle handling members, swiveled on said conveyor and spaced thereon, adapted to hold bottles in suspension by the neck.

4. In a bottle handling device, a conveyor, a trestle frame for said conveyor, said frame comprising an upper closed portion and spaced side portions, open opposite said upper closed portion, said conveyor including a double chain and pairs of sprocket wheels for supporting said chain, some of said pairs of sprocket wheels being individually supported by said side portions to have a clear space between the wheels of a pair, permitting an object hanging from said conveyor to pass between the wheels in each pair adjoining said side portions, and a series of bottle handling members, swiveled on said conveyor and spaced thereon, adapted to hold bottles in suspension by the neck.

5. In a bottle handling device, a conveyor, including a double sprocket chain having the strands thereof spaced, gripping units between the strands of said chain, longitudinally spaced thereon, each of said gripping units comprising a shaft extending between the strands of said chain and supported thereon, a yoke journaled on said shaft, gripping tongs pivoted on said yoke, a rocking element journaled upon said shaft next to said yoke, a wedging member integral with said rocking element and positioned to spread the upper ends of the legs of said tongs, a tension spring normally holding the said tongs together, means for turning said rocking element to operate said tongs, and other means for operating said chain.

6. In a bottle handling device, supporting structures including a conveyor trestle, and two standards, said trestle being supported above and between said standards, a bracket mounted for vertical adjustment on each of said standards, a shaft journaled horizontally in each of said brackets, a pair of spaced sprocket wheels fixed upon each of said shafts, sprocket wheels journaled upon said trestle, a double chain engaging said sprocket wheels, the strands of said chain being spaced, and a plurality of bottle gripping units journaled in said strands, and longitudinally spaced on said chain.

7. In a bottle handling device, a conveyor, gripping units spaced and swiveled on said conveyor, adapted to hold bottles by the neck, cam devices co-operating with said gripping units, adapted to open said units as they approach individual standing bottles, and adapted to close said units to grip said bottles as they pass, during the continuous movement of said conveyor, and other cam devices co-operating with said gripping units, adapted to move said bottles individually in a path which terminates in a nearly vertical direction, as said bottles are lowered, and to release said gripping units from said bottles at the instant of coming to a standing position, and passing clear from said standing bottles, during a continuous movement of said conveyor.

8. A bottle handling device comprising a conveyor, gripping and carrying members spaced on said conveyor, and adapted to pick

up and let go of objects to be carried in connection with said conveyor, cam devices at the pick-up and at the let-go places in the travel of said conveyor, the cam devices at the pick-up end of the path of said conveyor being formed and adapted to cause said members to approach said objects while the latter are standing, approaching the same while open and coming to a stop at the object, subsequently gripping the said object suddenly, all during the continuous movement of said conveyor, the cam device at the let-go end of said conveyor being formed and adapted to cause said members to bring said object in a path terminating in a practically vertical part, letting said object down in a standing position on a platform and releasing said member from said object at the instant said object reaches said standing position, then passing clear of said object the instant after the same stands on said platform, the said cam devices and said members, being formed and relatively positioned substantially as shown and described for the purpose stated.

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