

No. 707,994.

Patented Aug. 26, 1902.

C. J. WARREN.
BOTTLE FILLING MACHINE.

(Application filed Dec. 7, 1901.)

(No Model.)

4 Sheets—Sheet 1.

Fig. 1.

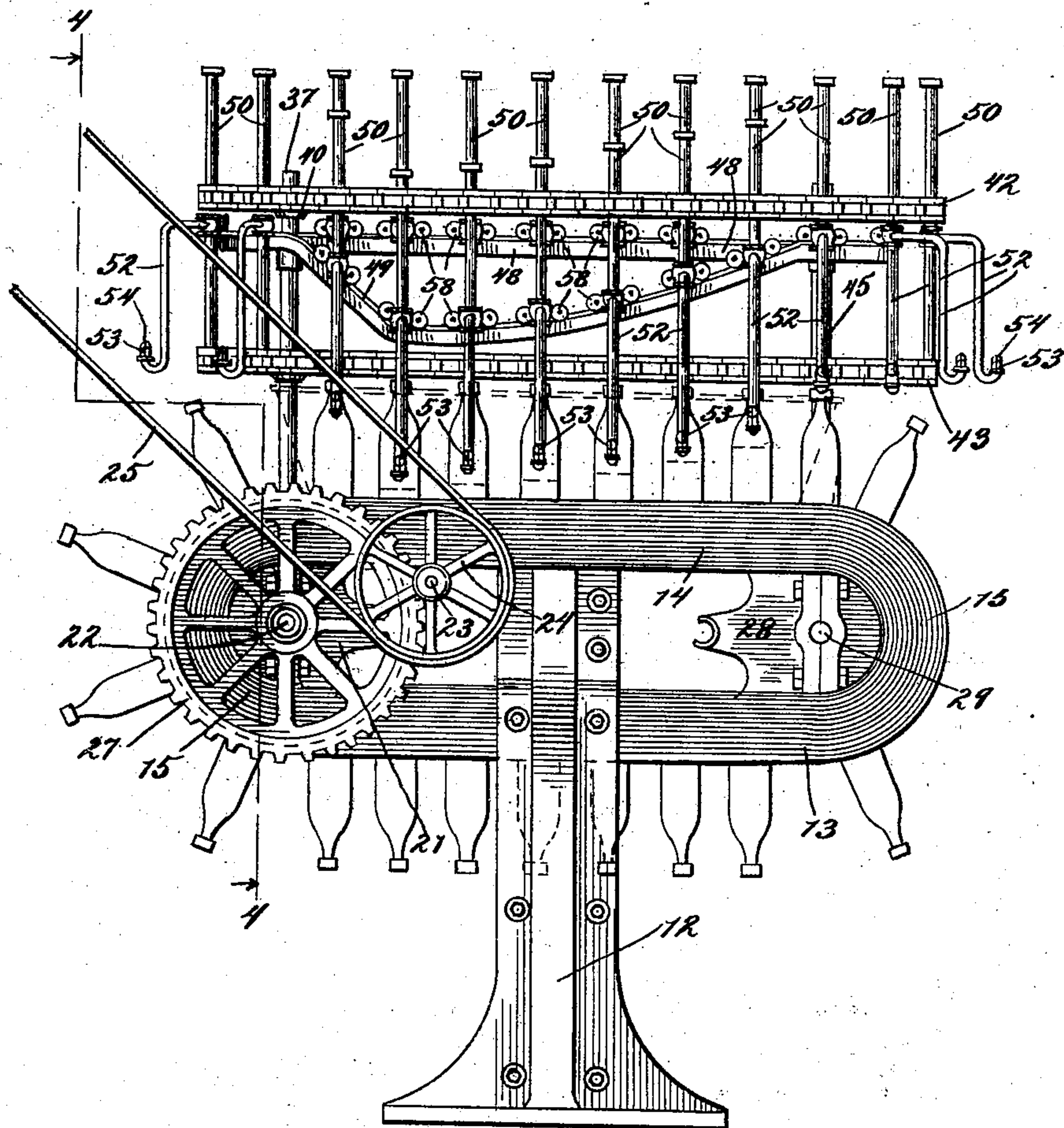
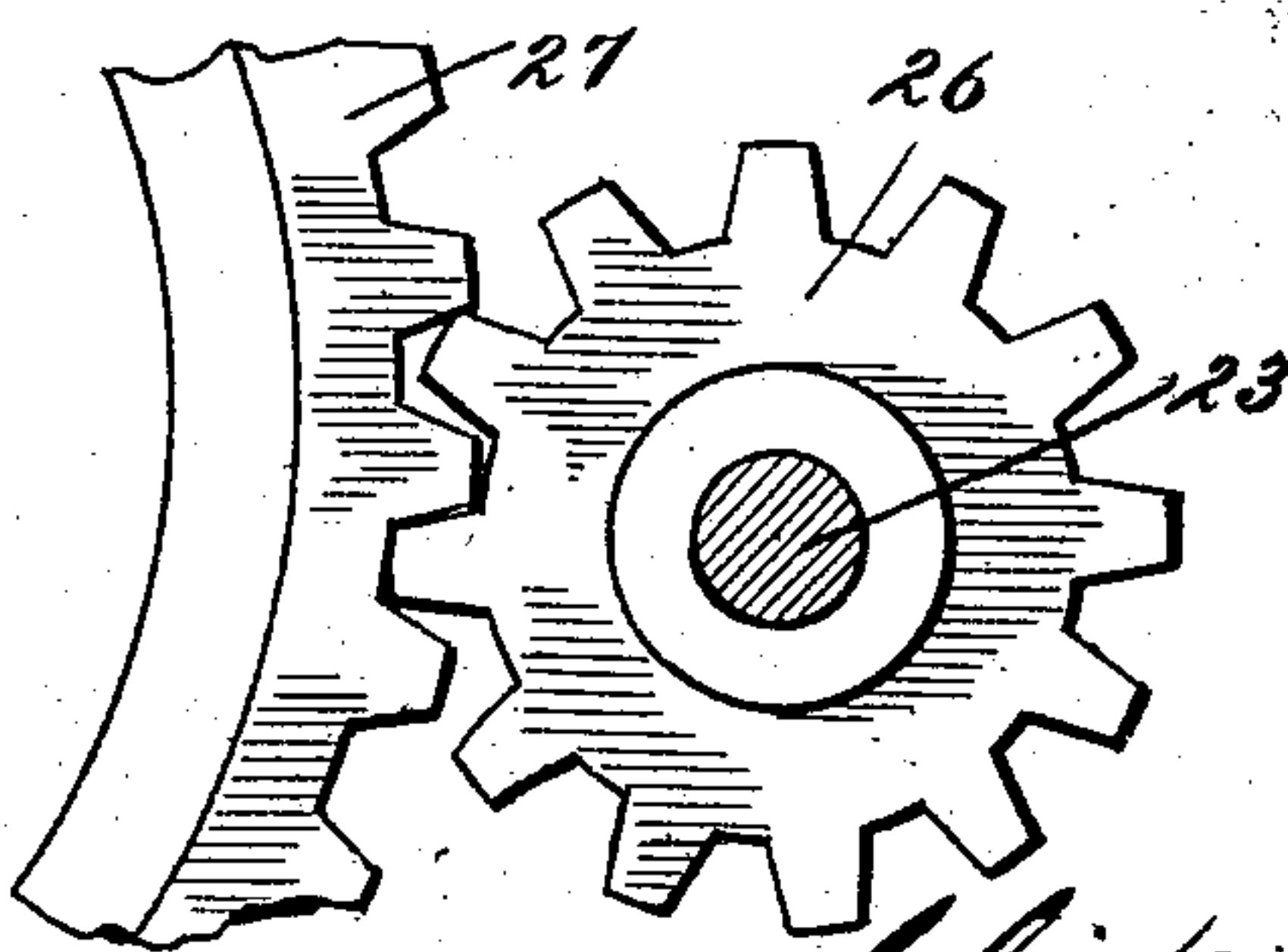


Fig. 2.



Witnesses:
Chas. Perry
J. B. Wier

Inventor:
Clinton J. Warren
By Bond, Adams, Pickard & Johnson
Attorneys

No. 707,994.

Patented Aug. 26, 1902.

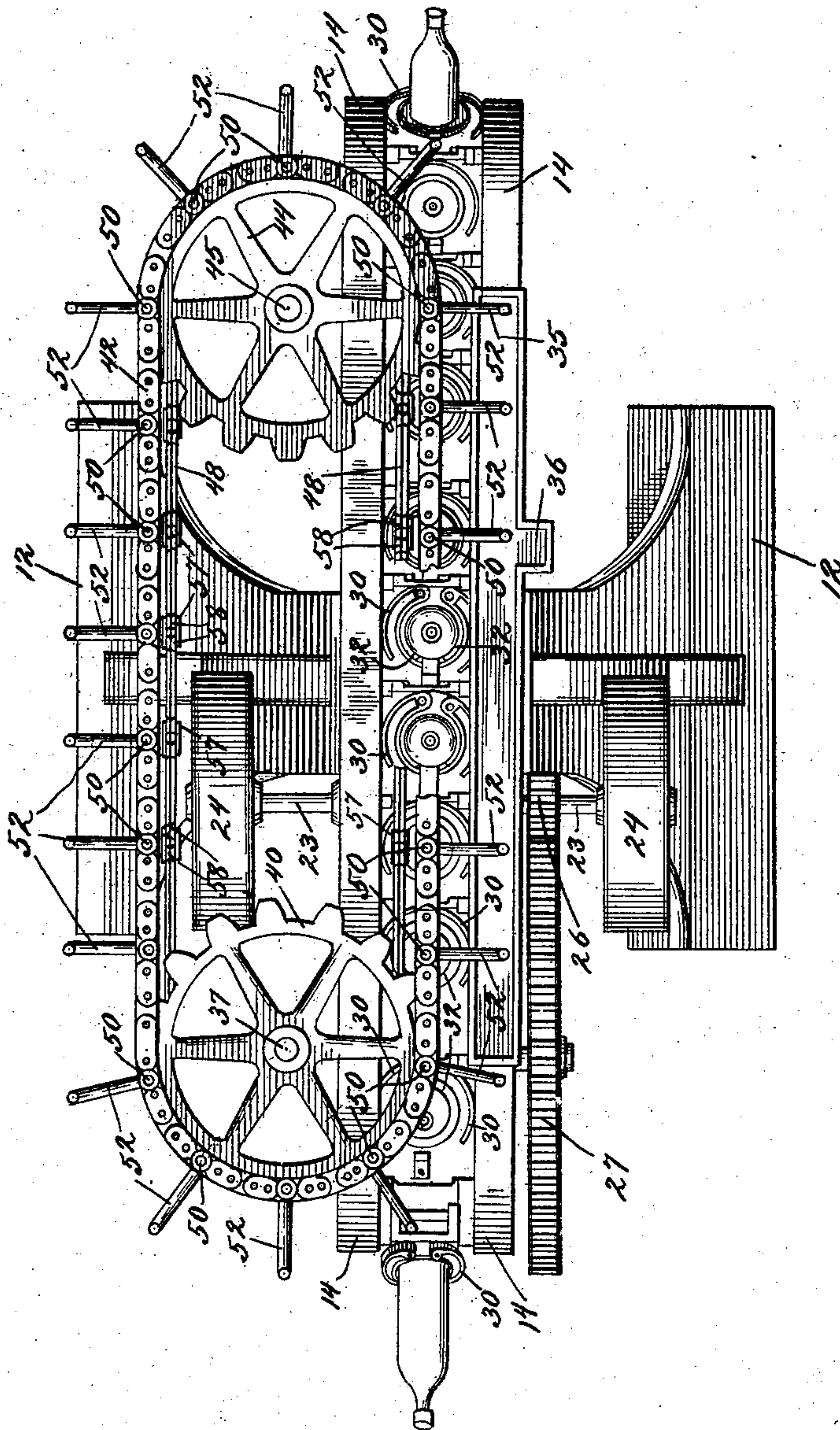
C. J. WARREN.
BOTTLE FILLING MACHINE.

(Application filed Dec. 7, 1901.)

(No Model.)

4 Sheets—Sheet 2.

Fig. 3.



Witnesses:

Edw. Perry
J. B. Weir

Inventor.

Clinton J. Warren
by Bond, Adams, Putnam & Jackson
Attorneys

No. 707,994.

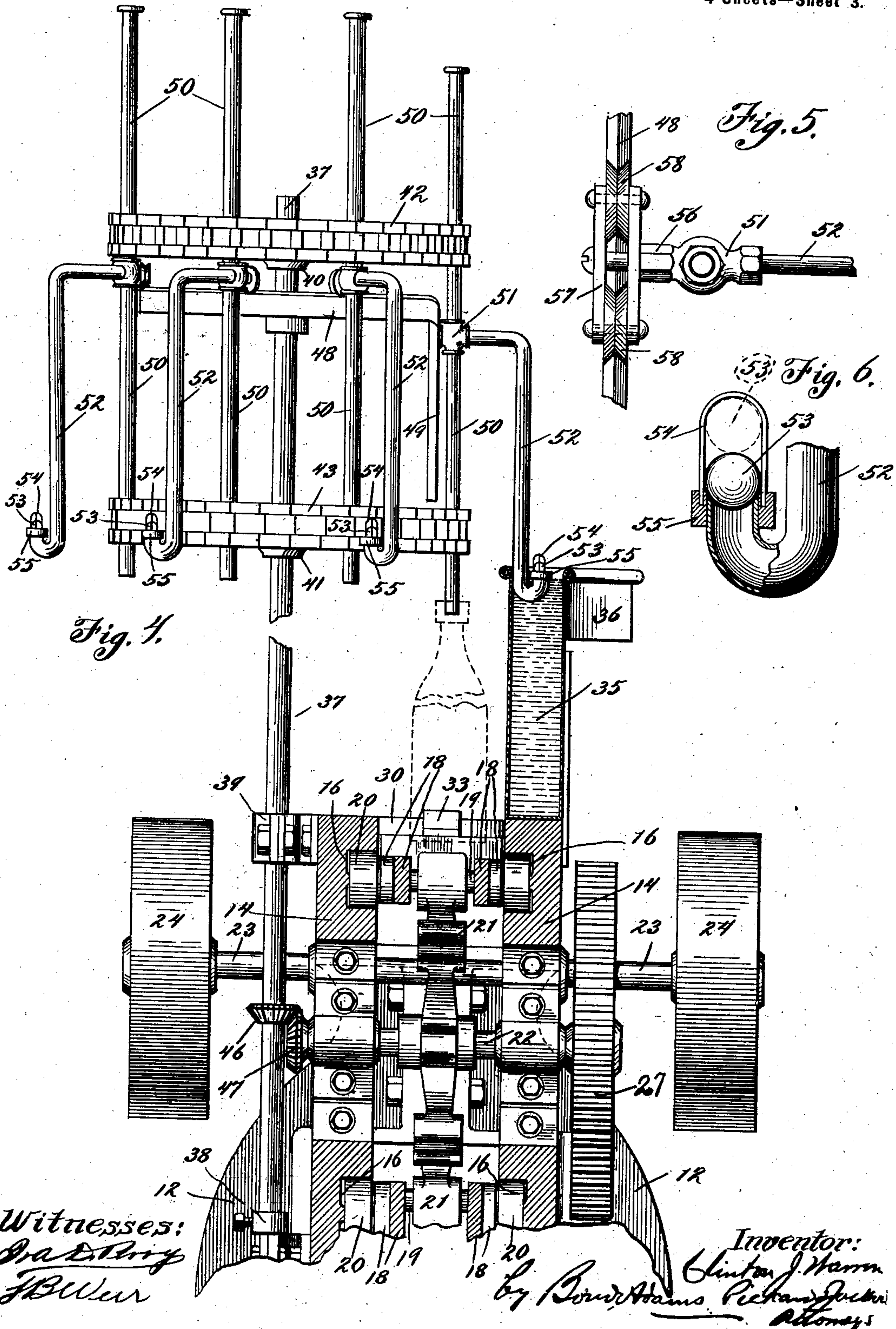
Patented Aug. 26, 1902.

C. J. WARREN.
BOTTLE FILLING MACHINE.

(Application filed Dec. 7, 1901.)

(No Model.)

4 Sheets—Sheet 3.



Witnesses:
O. A. D. H. H.
J. B. W. H.

Inventor:
Clinton J. Warren
By Louis Adams, Richard J. Adams
Attorneys

No. 707,994.

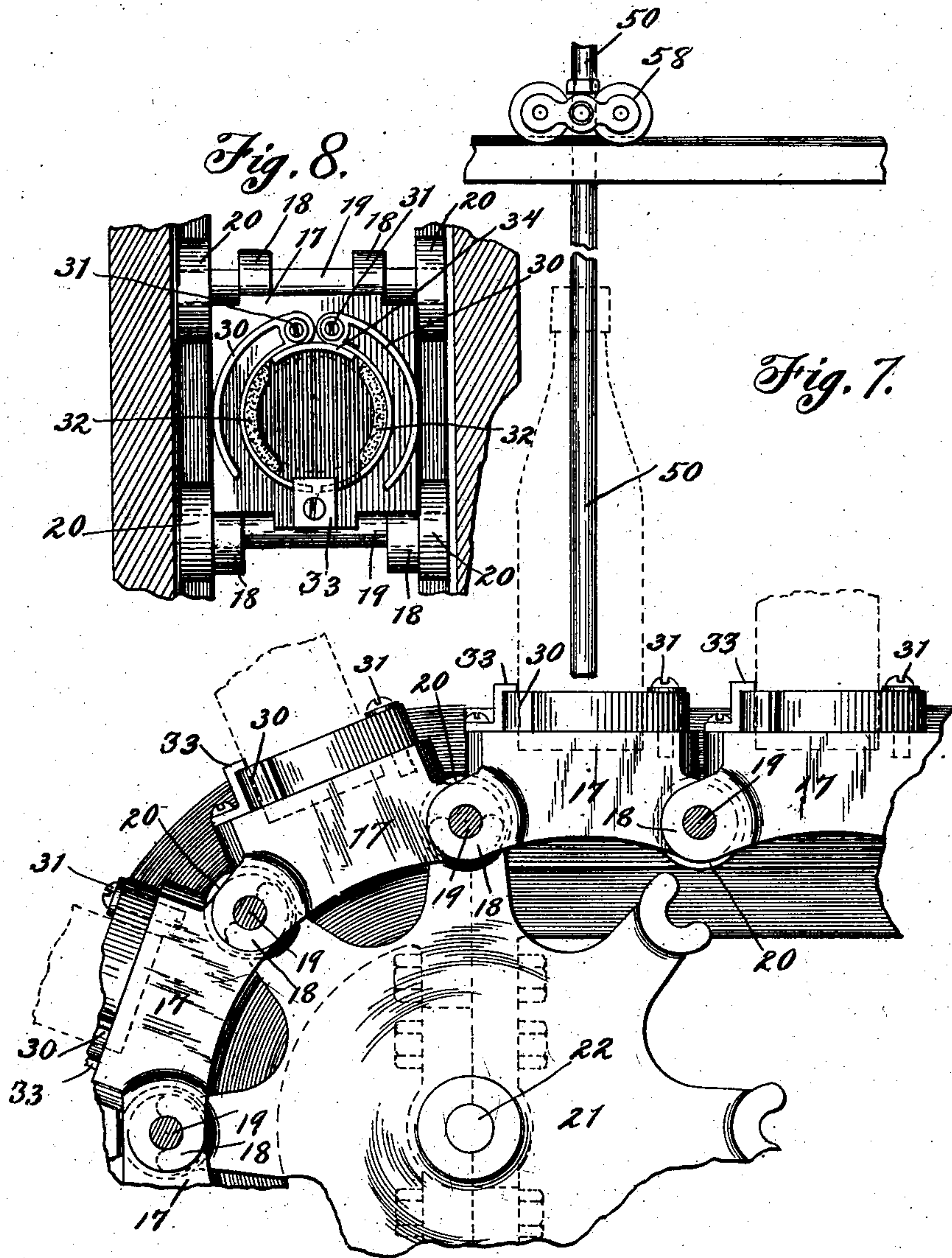
Patented Aug. 26. 1902.

C. J. WARREN.
BOTTLE FILLING MACHINE.

(Application filed Dec. 7, 1901.)

(No Model.)

4 Sheets—Sheet 4.



Witnesses:
Chas. T. Terry
H. B. Weir

Inventor:
Clinton J. Warren
by *Rod, Adams, Pickard & Johnson*
Attorneys

UNITED STATES PATENT OFFICE.

CLINTON J. WARREN, OF CLINTON, ILLINOIS.

BOTTLE-FILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 707,994, dated August 26, 1902.

Original application filed May 16, 1901, Serial No. 60,524. Divided and this application filed December 7, 1901. Serial No. 85,003. (No model.)

To all whom it may concern:

Be it known that I, CLINTON J. WARREN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Bottle-Filling Machines, of which the following is a specification, reference being had to the accompanying drawings.

10 This invention relates to machines for filling bottles, and has for its object to provide means for filling them while the same are being moved forward by an endless carrier, the filling devices being moved for a limited distance parallel with the moving carrier and projecting within the bottles and after traveling in such engagement with the bottles being withdrawn clear of the bottles and returned in position to engage and fill other
20 bottles that are being moved forward by the endless carrier referred to.

Another object of my invention is to provide means whereby the filling devices will be inserted far down into the bottle, so that
25 when such devices are employed for filling the bottles with a frothy or foaming liquid the foaming during the act of filling will be in a large measure prevented, and thereby a full bottle of the liquid be readily obtained.

30 I accomplish these objects by the means shown in the drawings and hereinafter specifically described, and that which I claim as new will be set forth in the claims.

35 The filling devices forming the subject-matter of this application are shown and described in my pending application, Serial No. 60,524, filed May 16, 1901, of which this is a division, in which said application are also shown various other sets of mechanism for operating
40 upon bottles while being continuously moved forward by an endless carrier, to which they are removably attached.

In the accompanying drawings, Figure 1 is a side elevation. Fig. 2 is an enlarged detail
45 of a portion of the driving mechanism. Fig. 3 is a plan view. Fig. 4 is a view taken at line 4-4 of Fig. 1, such view showing the endless bottle-carrier and its frame in cross-section and showing in elevation the large driving-gear and the series of continuously-moving
50 siphon filling-tubes and the supporting-

frame therefor. Fig. 5 is a detail, being a plan view of one of the siphon filling-tubes, the trolley attached thereto, and the track that the trolley runs upon. Fig. 6 is a detail, 55 being a side elevation, partly in section, of the lower curved end of one of the siphon filling-tubes, the end shown being that which enters the tank containing the liquid which is to be transferred to the bottles. Fig. 7 is 60 a detail of a portion of the endless bottle-carrier and its frame and the sprocket-wheel that drives such carrier, showing also one of the bottle-filling siphon-tubes, the trolley attached thereto, and the trolley-track; and 65 Fig. 8 is a plan view of one section of the endless bottle-carrier and one of the bottle-clamps carried thereby, a portion of the frame for said endless carrier being shown in section.

Referring to the drawings, in which corresponding parts are indicated by the same reference-numerals, 12 indicates standards upon which are secured two pairs of longitudinal beams 13 14, each pair having a suitable space between them, as clearly shown in Fig. 4, to
75 adapt the carrier, hereinafter described, to move freely in said space. The two pairs of longitudinal beams are located one above the other and are connected at their ends by curved pieces 15 15. The inner faces of each
80 pair of beams 13 14 and the curved end pieces have formed therein deep grooves 16, in which the supporting-rollers of the carrier are adapted to travel. The carrier referred to is an
85 endless one and is composed of a number of comparatively heavy blocks 17, each block having ears 18 at its ends, through which pass axles 19, and upon the ends of which axles are journaled rollers 20, these rollers traveling, as stated, in the grooves in the inner
90 faces of the beams 13 14 and their curved end pieces 15.

21 indicates a sprocket-wheel keyed to a shaft 22, mounted in suitable bearings secured between the longitudinal beams 13 14
95 near one of the curved ends 15 thereof. 23 indicates another shaft extending across the machine between the longitudinal beams referred to and suitably secured in bearings supported by the framework of the machine. 100 Upon this shaft 23, at each end thereof, is secured a pulley-wheel 24, over one of which

a driving-belt 25 is adapted to pass. The shaft 23 carries a small gear-wheel 26, which is keyed thereto and which meshes with another and larger gear-wheel 27, which latter gear-wheel is secured upon a projecting end of the shaft 22, whereby upon the rotation of such larger gear-wheel the sprocket-wheel 21 is driven and by its engagement with the axles 19 of the carrier-wheels 20 moves such carrier forward. At the opposite end of the machine from that at which the devices just referred to are located is arranged another and similar sprocket-wheel 28, over which the carrier travels, this sprocket-wheel 28 being located on a shaft 29, journaled in suitable supports secured to the framework.

The outer face of each block 17 is provided with a suitable clamp adapted to receive the base of a bottle and hold such bottle firmly in position, so that it will at all times have its neck end projected outward. The form of clamp shown consists of two similar curved metal bands 30, each portion being bent on itself and at the bent portions secured to the blocks 17 by a screw or other pivot 31. The curvature of each portion of the clamp is such as to adapt it to conform to the curvature of the bottle intended to be held, and it is provided on its inner face, as shown, with two oppositely-arranged cushions 32, one of such cushions being provided for each portion of the clamp. The acting portion of the clamp, as shown, forms nearly a complete circle, the two ends approaching closely to each other and working back and forth beneath a bracket 33 when pressure is applied to or released from the sides of the clamp. The outer ends of each portion of the clamp bear against the sides of the beams 14, as shown in Fig. 4, with sufficient force to cause the cushions 32 to grasp the bottle firmly, so as to hold it securely whether the bottle be upright or inverted. Suitable means may be provided for automatically inserting the bottles within the clamps and disengaging them therefrom, so as to be discharged from the machine, and such means are shown and described in my said pending application; but as they form no part of my present invention and so far as my present invention is concerned may be of any suitable character I do not deem it necessary to show or describe them herein. It is also to be understood that other forms of clamping devices for holding bottles securely upon the endless carrier may be employed. In the form of bottle-clamp shown the two portions 30 are adapted to be forced apart at the releasing-point by the action of a curved spring 34, which, as shown in Fig. 8, is secured at one end to one of the parts 30 and bears at its other end against the corresponding part 30.

With a series of bottles mounted and suitably held upon the endless carrier with their neck ends projected, as explained, and such endless carrier, with the bottles thereon, continuously driven at a comparatively slow rate

of speed the filling of the bottles with the desired liquid is accomplished by the means now to be described.

35 indicates a tank adapted to contain the liquid intended to be transferred to bottles, such tank being supported, as shown, on the upper surface of one of the longitudinal beams 13. This tank, as shown, has a side extension 36 for more conveniently filling the same, and the amount of liquid kept in the tank may be regulated by automatic mechanism of any desired character.

37 indicates a vertical shaft at the side of the machine opposite to that at which the tank 35 is placed, said shaft being suitably stepped in a socket 38, supported by the framework of the machine and passing through a bearing 39, extending out from and secured to one of the longitudinal beams 14. Near its upper end this shaft carries a sprocket-wheel 40, and at some distance below said sprocket-wheel is another and similar sprocket-wheel 41, also secured to the shaft 37. Around these sprocket-wheels and around two other similar sprocket-wheels located in the same horizontal plane pass endless chains 42 and 43. The upper one of the sprocket-wheels last mentioned is clearly shown in Fig. 3 and is indicated by 44, such second pair of sprocket-wheels being suitably mounted on a vertical shaft 45. The shaft 37 is driven through a bevel-gear 46, secured on such shaft, which gear meshes with a corresponding bevel-gear 47 on the end of the shaft 22, that carries the sprocket-wheel 21.

48 indicates a fixed continuous track located between the two endless chains 42 43, the main portion of the track being but a short distance below the upper endless chain 42, but having on the side nearest to the tank 35 an inclined portion 49, which descends sharply and then gradually rises until it approaches about under the upper horizontal sprocket-wheel 44, when it again becomes horizontal, as best shown in Fig. 1.

50 indicates long tubes closed at their upper ends, but open at their lower ends, and of a size to adapt them to enter the necks of the bottles that are to be filled, such tubes being carried by the endless chains 42 43 and being permitted a free vertical movement. Each tube has connected to it by a suitable connection 51 another tube 52, bent so as to have a horizontal portion and a vertical portion, and the vertical portion being over and adapted to enter the filling-tank 35. The lower end of the pipe 52 is bent around, as clearly shown in the enlarged detail, Fig. 6, the bend being such that the open lower end is for a short distance parallel with the main portion of the pipe. On its open lower end rests a float-valve 53, that is prevented from escaping by a cage 54, secured to a ring 55, attached around its open lower end. Opposite the point of junction of the pipes 50 52 is a short projection 56, carrying a suitable frame 57, in which is journaled a pair of trolley-wheels

58, which are adapted to move upon the track 48 49. As the endless bottle-carrier is moved it will be evident that the series of pipes 50, with their connecting-pipes 52, are moved 5 around on the endless track 48 49, and as such track at the side over the bottle-carrier and next to the tank 35 is sharply depressed, as at 49, the pipes will be lowered, the straight pipes 50 passing down into successive bottles, 10 while the branch connecting-pipes 52 will pass into the liquid in the tank 35. Each ball-valve 53 will rise to the limit permitted by its cage 54 as its pipe 52 enters the tank, and the pipes 50 and 52 having, before the machine 15 is first put into use, been converted into siphons by filling them the liquid from the tank will immediately flow into the bottles and fill them, the filling operation being completed as the trolley-wheels 58 ride up the inclined track. When the trolley-wheels have 20 been forced up the incline, the pipe 50 will have been withdrawn from the bottle and the bent end of the pipe 52 will have been withdrawn from the tank, the ball-valve 53 at this 25 time settling down upon its seat, and thus preserving the siphon, so that the filling operation can immediately recommence as soon as the pipe has been carried around the track and been entered in a new bottle. It will be 30 noted that the pipe 50, which enters the bottle, projects somewhat below the bent end of the pipe 52, as of course is necessary for siphoning purposes. As has been stated, the track 48 where it comes over the bottles that 35 are secured in place to the carrier by the clamps 30 is sharply inclined downward, and this permits the pipe 50 very early in the filling operation to be inserted far down in the bottle, which is especially desirable when filling it with liquids having a tendency to froth or foam.

By this invention I am enabled to fill a large series of bottles in a satisfactory manner while such bottles are moving forward 45 through the machine without the stoppage at any time of the movement of such bottles, which manner of filling them is a rapid and economical one and one of especially great value when used in connection with other 50 devices or sets of devices mounted upon the same frame, as shown and described in my said pending application, said other devices or sets of devices also acting to perform their functions while the series of bottles is in motion.

That which I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination with a carrier adapted to receive and hold a bottle with its neck end 60 projected, of means for moving said carrier, a liquid-reservoir, a movable filling device adapted to fill said bottle while said bottle is moving, and means for passing said filling device into and through said reservoir during the operation of filling the bottle, substantially as specified.

2. The combination with a carrier adapted

to receive and hold a bottle with its neck end projected, of means for moving said carrier, a liquid-reservoir, a movable filling device 70 adapted to fill said bottle while said bottle is moving, means for passing said filling device into and through said reservoir during the operation of filling the bottle, and means for shutting off the flow of liquid after the 75 filling operation has been performed, substantially as specified.

3. The combination with a carrier adapted to receive and hold a bottle with its neck end projected, of means for moving said carrier, 80 a liquid-reservoir, a movable filling device adapted to fill said bottle while said bottle is moving, means for passing said filling device into and through said reservoir during the operation of filling the bottle, and means 85 for withdrawing said filling device from the reservoir and shutting off the flow of liquid, substantially as specified.

4. The combination with a carrier adapted to receive and hold a bottle with its neck end 90 projected, of means for moving said carrier, a liquid-containing reservoir, a device for filling said bottle while it is moving, means for forcing said device into said bottle and also into said reservoir, means for moving 95 said filling device through said reservoir while engaged with said bottle, and means for causing a flow of liquid through the filling device into the bottle while said carrier is being moved, substantially as specified. 100

5. The combination with a carrier adapted to receive and hold a bottle with its neck end projected, of means for moving said carrier, a liquid-containing reservoir, a device for filling said bottle while it is moving, means 105 for forcing said device into said bottle and also into said reservoir, means for moving said filling device through said reservoir while engaged with said bottle, means for gradually varying the position of the filling device 110 in the bottle and at the same time maintaining its connection with the reservoir, and means for causing a flow of liquid through the filling device from the reservoir into the bottle, substantially as specified. 115

6. The combination with a carrier adapted to receive and hold a bottle with its neck end projected, of means for moving said carrier, a liquid-containing reservoir, a device for filling said bottle while it is moving, means 120 for forcing the filling device into said moving bottle and into the reservoir, means for moving said filling device through the reservoir parallel with the moving carrier and in engagement with the bottle, means for causing a flow of liquid through the filling device 125 while said carrier and the bottle thereon are moving, and means for withdrawing said filling device from the moving bottle and reservoir and shutting off the flow of liquid through 130 the filling device, substantially as specified.

7. The combination with a carrier mounted on a horizontal axis adapted to receive and hold a series of bottles with their neck

ends projected, of means for moving said carrier, a second carrier mounted on a vertical axis and consisting of an endless chain, means for moving the said chain, a series of filling devices carried by said second carrier, means for causing said filling devices to successively engage successive bottles on said first-named carrier, means for causing a flow of liquid through said filling devices to fill said bottles while the same are being moved, and means for disengaging the filling devices from the bottles and shutting off the flow of liquid without stopping the movement of the bottle-carrier, substantially as described.

8. The combination with a bottle-carrier, and means for moving said carrier, of an endless chain located above said bottle-carrier, means for moving said chain, a series of filling devices carried by said chain and adapted to be successively brought over bottles carried by said bottle-carrier, means for causing said devices to engage such bottles, means for causing a flow of liquid through said filling devices to fill said bottles while the same are being moved, and means for disengaging the filling devices from the bottles and shutting off the flow of liquid without stopping the movement of the bottle-carrier, substantially as specified.

9. The combination with a bottle-carrier adapted to receive and hold a series of bottles, and means for moving said carrier, of a chain located above said bottle-carrier, means for moving said chain, a series of filling devices carried by said chain and adapted to be successively brought over bottles carried by said bottle-carrier, said filling devices having a vertical movement, means for causing said filling devices to successively enter successive bottles on said bottle-carrier, means for causing a flow of liquid through said devices when such devices are within the bottles, and means for withdrawing said devices from the bottles and shutting off the flow of liquid without stopping the movement of said bottle-carrier, substantially as specified.

10. The combination with a bottle-carrier adapted to receive and hold a series of bottles, and means for moving said carrier, of a chain located above said bottle-carrier, means for moving said chain, a series of filling devices carried by said chain and adapted to be successively brought over bottles carried by said bottle-carrier, said filling devices having a separate vertical movement, trolleys attached to said filling devices, a track for said trolleys to run upon, said track being inclined at one portion to cause the filling devices to descend and enter the bottles on the moving carrier, means for causing a flow of liquid through said devices when such devices are within the bottles, and means for withdrawing said devices from the bottles and shutting off the flow of liquid without stopping the movement of said bottle-carrier, substantially as specified.

11. The combination with a bottle-carrier

adapted to receive and hold a series of bottles, and means for moving said carrier, of a chain located above said bottle-carrier, means for moving said chain, a series of filling devices carried by said chain and adapted to be successively brought over bottles carried by said bottle-carrier, said filling devices having a separate vertical movement, trolleys attached to said filling devices, a track for said trolleys to run upon, said track being inclined at one portion to cause the filling devices to descend and enter the bottles on the moving carrier and also inclined to cause a withdrawal of the said devices from such moving bottles, means for causing a flow of liquid through such filling devices when said devices are within the bottles, and means for shutting off the flow of liquid as they are being withdrawn from the moving bottles, substantially as specified.

12. The combination with a carrier adapted to receive and hold a bottle with its neck end projected, of means for moving said carrier, a siphon-tube having its discharge end located above the line of travel of the moving bottle, means for moving said tube parallel and at equal speed with the bottle, means for forcing the said discharge end of the siphon-tube into the bottle, a valve carried by the other or receiving end of the siphon-tube and adapted to open said end when submerged in a body of liquid, a liquid-containing tank into which said receiving end of the siphon-tube is adapted to enter, and means for withdrawing the said ends from the bottle and tank respectively, substantially as described.

13. The combination with a carrier adapted to receive and hold a bottle with its neck end projected, of means for moving said carrier, a siphon-tube having its discharge end above the line of travel of the moving bottle, a track or guide having a double inclined portion parallel with the line of travel of the moving bottle, means for supporting said siphon-tube on said track, means for moving said siphon-tube down and up said inclined track, whereby the said discharge end of the siphon-tube will be caused to gradually enter and be withdrawn from the moving bottle, a valve carried by the other or receiving end of the siphon-tube and adapted to open said end when submerged in a body of liquid, and a liquid-containing tank into which said receiving end of the siphon-tube is adapted to enter when moving on the inclined portion of the track, substantially as specified.

14. The combination with a carrier adapted to receive and hold a bottle with its neck end projected, of means for moving said carrier, a siphon-tube, a track having a double inclined portion, a trolley adapted to run on said track and connected at one side to such siphon-tube, means for forcing said trolley along said track, whereby when it passes along the double inclined portion the discharge end of said siphon-tube will gradually enter and be withdrawn from the bottle, a

liquid-containing tank adapted to receive the other end of the siphon-tube while said trolley is on the inclined portion of the track, means for admitting liquid to the siphon-tube 5 when said last-named end is in the tank, and means for closing said tube when withdrawn from the tank, substantially as described.

15. The combination with an endless carrier adapted to receive and hold a series of 10 bottles with their neck ends projected, of means for continuously moving said carrier, an endless track located above said continuously-moving endless carrier and having at the side nearest the endless carrier a double 15 inclined portion parallel with the line of travel of said endless carrier, a series of siphon-tubes movably mounted on said track, means for continuously moving said series of siphon-tubes so that as they pass down and 20 up the double inclined portion of the track one end of each will successively enter and be withdrawn from one of the series of continuously-moving bottles, a liquid-containing tank into which the opposite end of each of 25 said siphon-tubes is adapted to enter at the time said tubes travel on the double inclined portion of the track, means for admitting liquid to the bottles from said siphon-tubes while said tubes are in said bottles and in 30 said tank, and means for stopping the flow of liquid through the siphon-tubes as said tubes are withdrawn from the bottles and the tank, substantially as specified.

16. The combination with a bottle-carrier 35 and means for moving said carrier, of an endless chain located above said bottle-carrier, means for moving said chain, a series of siphon filling-tubes carried by said chain and adapted to be brought over bottles carried by 40 said bottle-carrier, means for causing said tubes to engage such bottles, a liquid-containing means into which one end of the siphons is forced and moved therethrough to cause the filling of the bottles while the same 45 are being moved, and means for disengaging the filling-tubes from the bottle and shutting off the flow of liquid without stopping the movement of the bottle-carrier.

17. The combination with a bottle-carrier 50 adapted to receive and hold a series of bottles and means for moving said carrier, of a chain located above the bottle-carrier, means for moving said chain, a series of siphon filling-tubes carried by said chain and adapted 55 to be successively brought over bottles carried by said bottle-carrier, said siphon filling-tubes having a vertical movement, means for causing said filling-tubes to successively en-

ter successive bottles on said bottle-carrier, a liquid-containing means into which one end 60 of the siphons is forced and moved there-through to cause the filling of the bottles while the same are being moved, and means for disengaging the filling-tubes from the bottle and shutting off the flow of liquid without 65 stopping the movement of the bottle-carrier.

18. The combination with a bottle-carrier adapted to receive and hold a series of bottles, and means for moving said carrier, of a chain 70 located above said bottle-carrier, means for moving said chain, a series of siphon filling-tubes carried by said chain and adapted to be successively brought over bottles carried by said bottle-carrier, said filling-tubes hav- 75 ing a vertical movement, trolleys attached to said filling-tubes, a track for said trolleys to run upon, said track being inclined at one portion to cause the filling-tubes to descend and enter the bottles on the moving carrier, a liquid-containing means into which one end 80 of the siphons is forced and moved there-through to cause the filling of the bottles while the same are being moved, and means for disengaging the filling-tubes from the bot- 85 tle and shutting off the flow of liquid without stopping the movement of the bottle-carrier.

19. The combination with a carrier adapted to receive and hold a bottle with its neck end projected, of means for moving said carrier, a stationary liquid-reservoir, a movable fill- 90 ing device independent of said reservoir and adapted to fill said bottle while said bottle is moving, and means for forcing said filling device simultaneously into said bottle and into said liquid-reservoir and for withdraw- 95 ing said filling device simultaneously from said bottle and liquid-reservoir, substantially as specified.

20. The combination with a carrier adapted to receive and hold a bottle with its neck end 100 projected, of means for moving said carrier, a stationary liquid-reservoir, a movable filling device adapted to fill said bottle while said bottle is moving, means for forcing said filling device simultaneously into said bottle 105 and into said liquid-reservoir and for withdrawing said filling device simultaneously from said bottle and liquid-reservoir, and means for gradually varying the position of the filling device in the bottle during the 110 travel of the latter and at the same time maintaining its connection with the reservoir.

CLINTON J. WARREN.

Witnesses:

HELEN M. COLLIN,
ALVY L. ROMME.