H. F. STOCK.

BOTTLE WASHING AND SOAKING MACHINE.

APPLICATION FILED APR. 18, 1908.

981,712. **Patented Jan. 17, 1911.**

3 SHEETS—SHEET 1.

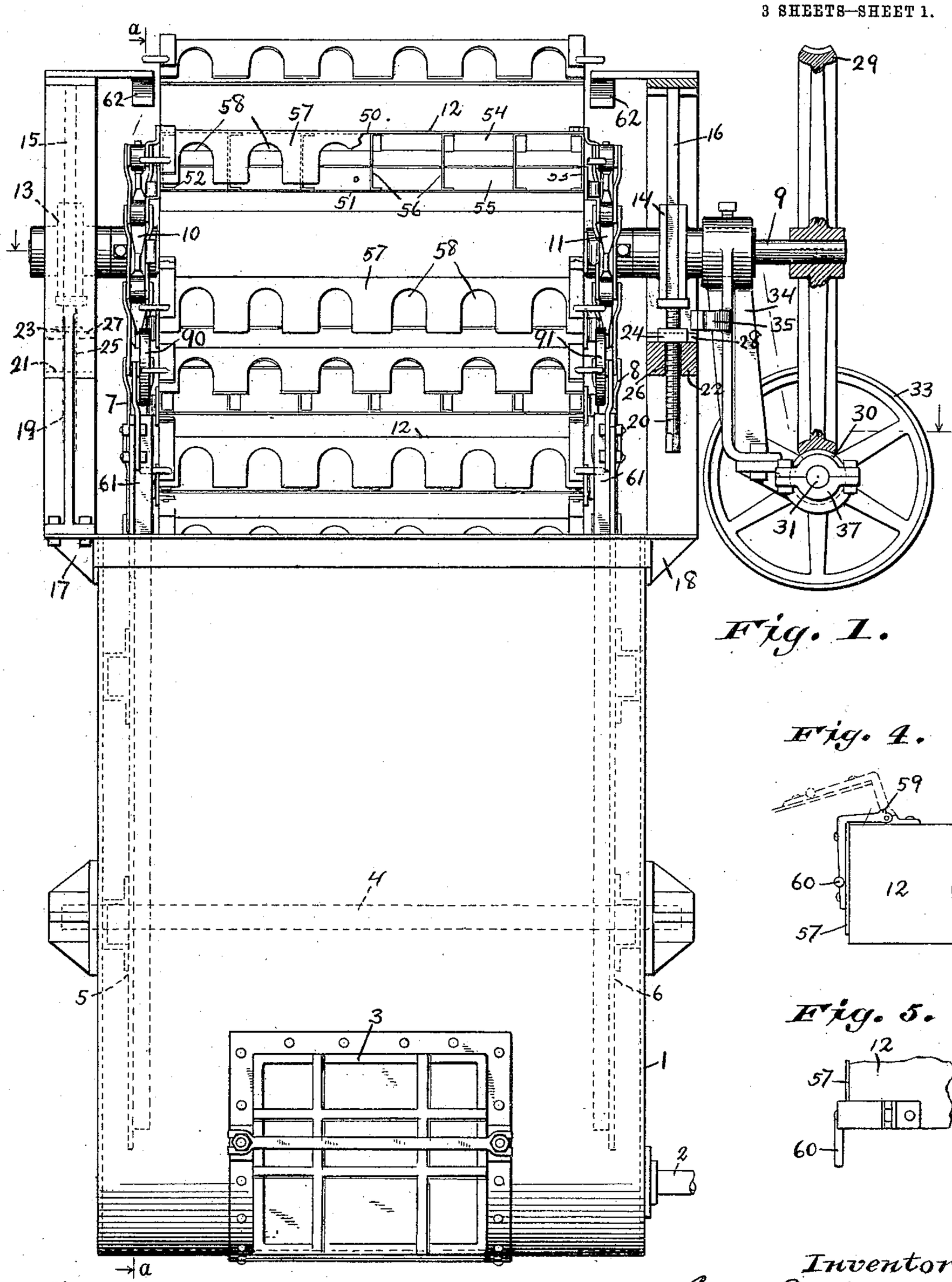

Fig. 1.

Fig. 4.

Fig. 5.

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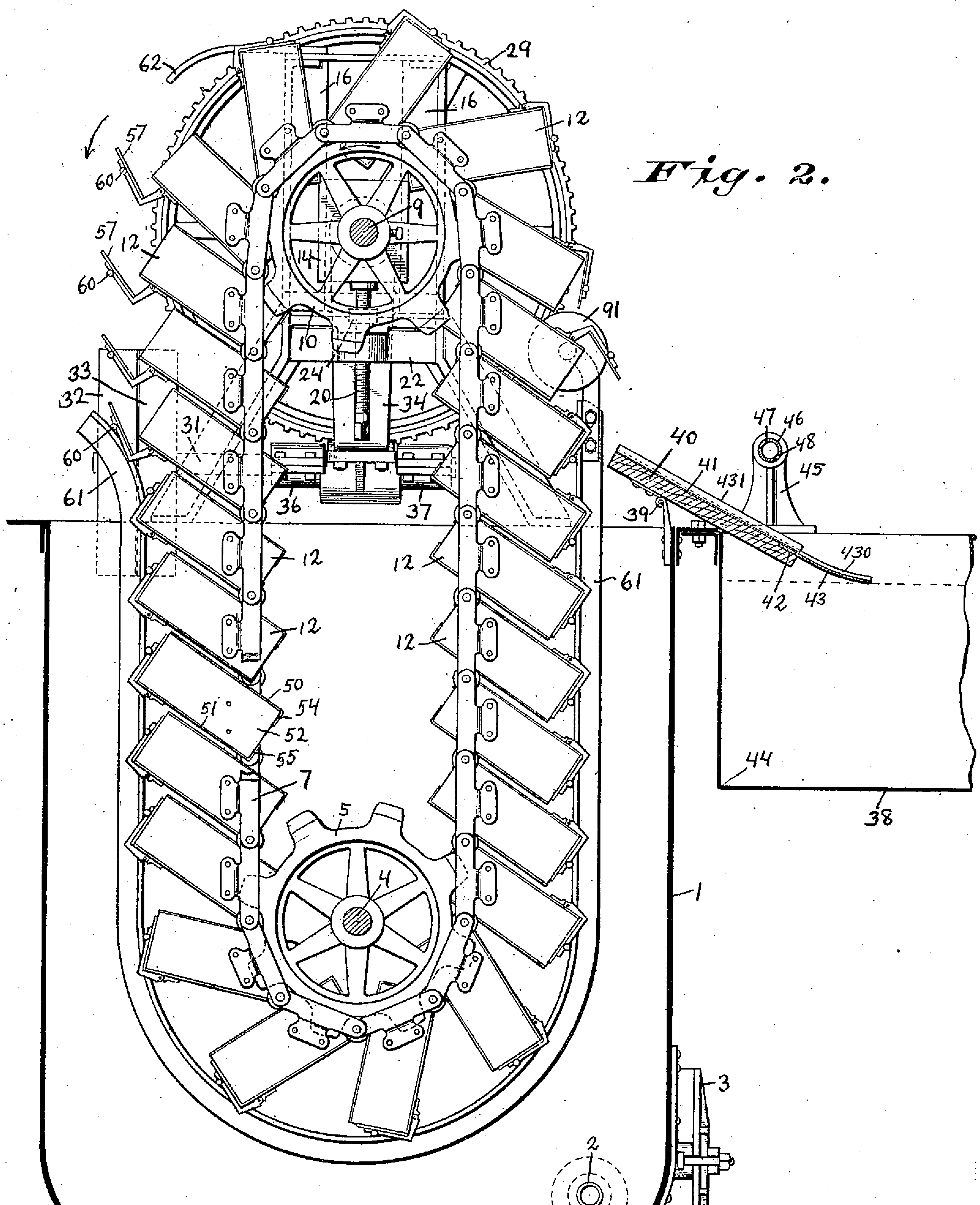
3 SHEETS—SHEET 2.

Fig. 2.



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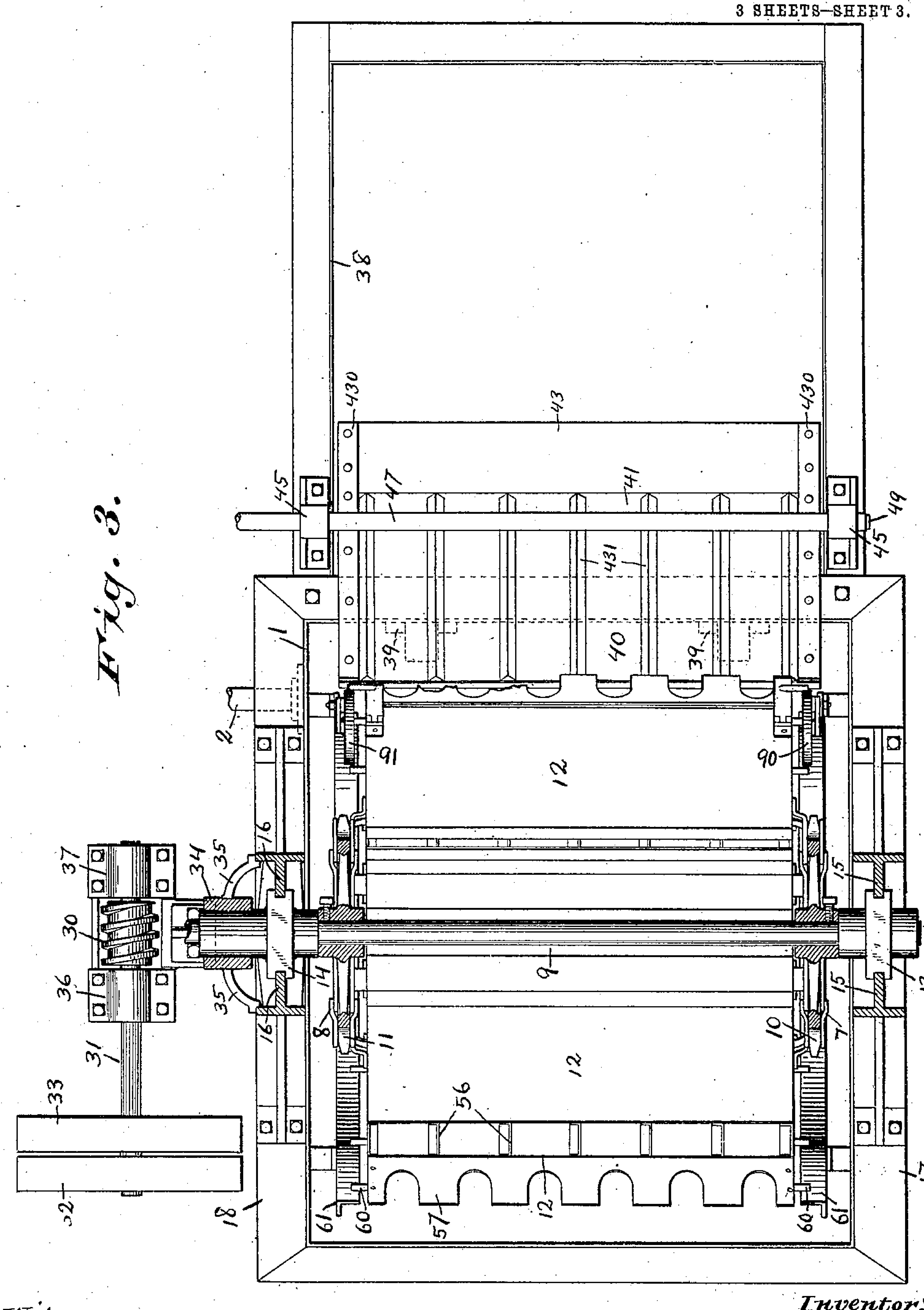
3 SHEETS—SHEET 3.

Fig. 3.



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BOTTLE WASHING AND SOAKING MACHINE.

981,712. Specification of Letters Patent. Patented Jan. 17, 1911.

Application filed April 18, 1908. Serial No. 427,771.

To all whom it may concern:

Be it known that I, HENRY F. STOCK, a citizen of the United States, residing at Waukesha, in the county of Waukesha and State of Wisconsin, have invented certain new and useful Improvements in Bottle Washing and Soaking Machines, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

This invention relates to bottle washing machines or the like, which are used for washing and soaking bottles, sterilizing bottles and similar purposes, and the object of the invention is to provide a simple machine which will convey bottles through a bath of liquid, the arrangement of the machine being such that the parts can be readily maintained in perfect operating condition and the bottle holders or retainers being constructed so as to avoid all danger of breaking the bottles.

Generally speaking, machines of the general type to which this invention applies, comprise a tank or receptacle for holding a liquid, and mechanism adapted to hold bottles and carry them into and through the liquid contained in said tank or receptacle.

The specific features of novelty presented by this invention will be specifically pointed out in this specification and claimed.

Referring to the drawings which accompany this specification and form a part thereof, and on which the same reference characters designate the same elements in each of the several figures, Figure 1 illustrates in elevation, a bottle washing machine embodying my invention; Fig. 2 illustrates a vertical section on the line *a a* of Fig. 1; Fig. 3 is a plan view of the machine; and Figs. 4 and 5 illustrate details of the hinge mechanism.

Referring specifically to the drawings, the numeral 1 designates a tank or receptacle adapted to contain the liquid in which the bottles are to be immersed, said receptacle being made for convenience from sheet metal and provided with a draw-off pipe 2, and a manhole and cover 3, through which the interior of said receptacle may be cleaned. Within said tank is located a shaft 4, upon which are disposed two sprocket wheels 5 and 6, upon which are adapted to run, sprocket chains 7 and 8.

Above the machine is supported a shaft 9 provided with two sprocket wheels 10 and 11, which are placed the same distance apart as the sprocket wheels 5 and 6 on shaft 4, and around these four sprocket wheels the endless chains 7 and 8 are adapted to pass in the ordinary way. To these endless chains 7 and 8 are attached the bottle receptacles 12, said bottle receptacles preferably inclining downwardly and inwardly on the charging side of the machine, as clearly shown by Fig. 2 of the drawings.

The shaft 9 is supported by boxes 13 and 14, which are slidably retained between guides 15 and 16, which guides are preferably supported upon the top of the tank 1 by being bolted to lugs 17 and 18 thereon, though they may be supported in any other convenient or preferable manner.

The boxes 13 and 14 rest upon screws 19 and 20, which may engage with cross members 21 and 22 secured to said guides, or as is preferred and which construction is illustrated by the drawings, said screws may pass through nuts 23 and 24, which rest upon said cross members 21 and 22 immediately above apertures 25 and 26 therethrough, said nuts being prevented from turning by being seated in the recesses 27 and 28 provided in the tops of the cross members 21 and 22. This construction is adopted because if the members 21 and 22 are ordinary castings, as will usually be the case, the holes or apertures 25 and 26 may be formed by cores during the process of casting, thereby reducing the amount of machine work necessary to complete the apparatus.

By supporting the boxes 13 and 14 so that they are slidable toward or away from shaft 4, the endless chains 7 and 8 may be kept in perfect tension, and if it becomes necessary to dismantle the machine and reassemble it, the links of said chains may be readily removed either from the sprocket wheels of the machine, or the links may be disconnected from each other so as to remove the chains entirely from the machine. Another advantage of this construction arises from the fact that the sprocket chains wear more or less in use, and by the use of the screws shown or equivalent mechanism, the chains 7 and 8 may be kept taut.

Mounted upon one end of the shaft 9 is a worm gear 29, which is keyed to said shaft or otherwise secured thereto so as to rotate the same, and to rotate said worm wheel 29 the worm 30 is provided, this in turn being provided with a shaft 31 to which fast and

loose pulleys 32 and 33 are secured, or said shaft may be provided with a single pulley, or any other means for imparting rotation thereto from some driving mechanism, this specific feature of the machine illustrated not being a part of my invention.

It will be evident by an inspection of Fig. 1, that if screws 19 and 20 were manipulated to move shaft 9 up or down, the worm wheel 29 would either crowd against the worm 30 or would be thrown out of mesh therewith, unless the worm 30 were to partake of the upward or downward movement of worm wheel 29 due to the manipulation of screws 19 and 20. This is an important part of my invention, and I provide an arrangement of parts by which worm wheel 29 retains its position with respect to worm 30 regardless of the manipulation of screws 19 and 20. The specific construction which I have adopted for this purpose comprises a bracket 34 supported by box 14 and provided with extensions 35 which are adapted to bear against the guides 16 to prevent rotation of said bracket with respect to said shaft, while permitting said bracket to be raised or lowered with said shaft. This bracket 34 is provided with boxes 36 and 37, within which the shaft 31 is rotatably supported. This part of my invention provides mechanism by which the endless chains 7 and 8 may be tightened or loosened, or the shaft 9 moved toward shaft 4 or away therefrom, without interfering with the rotation of shaft 9 by the driving means, which is preferably a belt engaged with either the pulley 32 or the pulley 33.

Located adjacent the discharge side of the machine is a tank or receptacle 38, adapted to contain water, and hinged preferably to tank 1 by the hinges 39 is a receiving platform or board 40, normally disposed on an incline upon which the bottles are adapted to fall from the bottle receptacles and slide down into the water contained in tank 38. This board 40 is preferably covered with sheet metal 41, and at its lower edge it is recessed slightly at 42 to admit the sheet metal extension 43, which is preferably slightly curved, as clearly shown by Fig. 2 of the drawings, so that the bottles will be delivered on to the surface of the water in tank 38 without undue jar or shock and without causing any particular splashing of the water.

The reference numeral 430 designates straps of iron or other suitable material, which are secured by rivets or other suitable fastenings to the board 40 and to a sheet metal extension 43, in order to provide sufficient stiffness and rigidity for said sheet metal extension, but this stiffness or rigidity could be readily obtained by other equivalent constructions, as for example, by making said extension 43 from metal corrugated longitudinally of the path which the bottles follow. The reference numeral 431 designates strips secured to said board 40 which serve to provide separate runways for the bottles, a separate runway being preferably provided for each one of the compartments of the bottle receptacles. The hinged feature of this receiving board, as it will be termed, is valuable because if this machine is used for washing bottles, more or less paper debris, as labels, etc., will separate from the bottles in tank 38 and collect in the bottom thereof, which can be readily removed by swinging said receiving board up out of the way on its hinges 39, as the bulk of the paper will collect in the corner 44 of the tank 38, for the reasons to be now explained.

The numeral 45 designates a standard provided with an aperture 46 through which a pipe 47 provided with perforations 48 may be inserted, it being understood that there is a standard 45 on each side of the tank 38, as fully disclosed by Fig. 3 of the drawings. This pipe 47 has one end closed by a plug 49, or the equivalent, and its other end is adapted to be attached to a flexible hose or the like. The purpose of this pipe is to spray streams of water at an angle against the surface of the water in tank 38, in order that a current may be established which will tend to move the bottles away from the receiving board to the farther end of the tank, so that as the bottles slide down the receiving board into tank 38, the bottles which have preceded them will have been moved away, so that no collision will occur and consequent breakage.

I have referred to the charging side of the machine and the discharging side, and it is to be understood that by such expressions I mean the side of the machine where the operator stands to insert the bottles into the receptacles 12, and the side of the machine where the bottles are discharged by gravity from said receptacle. Each of these bottle receptacles is similar to each of the others, so that a description of one suffices for a description of all. Each bottle receptacle is formed of two sheet metal walls 50 and 51, which extend transversely of the machine and are united by end plates 52 and 53. Each of the plates 50 and 51 are bent over, as at 54, 55, to form what might be termed the bottom of the bottle receptacle, but these overturned portions 54 and 55 do not quite meet, leaving an opening in the bottom of said receptacle.

The members 50 and 51 are braced and strengthened by sheet metal braces 56, which also serve to divide the bottle receptacle into separate compartments, each of which is adapted and intended to receive but a single bottle.

The numeral 57 designates a cover or clo-

sure for a bottle receptacle, said cover being provided with notches 58 through which when the covers are closed, the necks of bottles are adapted to extend provided the height of said bottles is greater than the depth of the bottle receptacle. This cover 57 is not hinged at the end of the bottle receptacle, as is the case with an ordinary box cover or the like, but is hinged to said receptacle at a point removed from its front end some considerable distance, as clearly illustrated by Figs. 2 and 4 of the drawings.

Preferably there are two malleable iron hinges to each cover, the hinges being of the kind known as stop hinges, the member secured to the cover being provided with a stop 59, adapted to engage with the other member or element of the hinge to limit the extent to which the cover 57 can open. These hinges, as has been stated, are preferably made from malleable iron, and are secured to the bottle receptacle and the cover by rivets or in any suitable or preferred manner, and each hinge is preferably placed close to the end of its cover, and the part of the hinge secured to the cover is provided with an outstanding pin or projection 60, the purpose of which will be now explained.

Referring to Fig. 2 of the drawings, if the top of the upper sprocket wheel is turning from the right hand to the left, the covers 57 of some of the bottle receptacles will fall down by gravity, thereby giving free access to the interior of said receptacles. This is the charging position of the receptacles, and the left hand side of the machine (see Fig. 2) is the charging side.

The bottles are inserted in the receptacles by the attendant when the covers are in the open position, and as the receptacles descend into the tank 1, the projections 60 on the hinges of the covers engage with guides 61 suitably curved so as to cause said covers to close and to retain said covers closed while said receptacles are passing through tank 1, and until they are above the receiving board 40 on the discharging side of the machine, at which point the guides 61 terminate and the covers open by gravity and because of the weight of the bottles in the receptacles, and the bottles will slide out on to the receiving board 40 and down into tank 38.

As the receptacles pass on and up and around the upper sprocket wheels, the covers will close by gravity, and they would remain closed until they had passed around said sprocket wheel to some considerable distance. In order, however, that said covers may be positively opened, the secondary guides 62 are provided, which engage under the pins or projections 60, thereby raising said covers as the receptacles pass by said guides 62. The covers 57 are hinged to said receptacles at a point somewhat remote from the front ends of said receptacles, for the following reason: If bottles are inserted in said receptacles which are of just such a length that the ends of the necks project out of said receptacles, if the covers were hinged directly at the ends of the receptacles, when the pins 60 engaged with the guides 61 the tendency would be to jam the covers against the necks of the bottles and break the covers or the bottles or both. With the construction adopted however, the covers are swung upwardly as well as toward the receptacle, so that with such bottles as those referred to, the necks of the bottles will be engaged ordinarily by the notches 58 of the covers, and the necks of the bottles will be elevated by the covers into such a position that the covers can properly close.

While I have described in this specification and illustrated by the drawings accompanying the same, certain specific embodiments of my invention, I do not wish to be limited to the precise structural features shown by said drawings, but reserve the right to make alterations therein which fall within the scope of my invention and within the scope of the claims annexed hereto.

In order that the receiving board 40 may be swung up out of the way on its hinges 39, pipe 47 may be withdrawn from standards 45 by simply removing it endwise toward the left hand (see Fig. 3), as said pipe is simply placed loosely within the apertures 46 in standards 45.

I find that it is an advantage to provide means at the discharge side of the machine to cause the covers of the bottle receptacles to be opened positively at the discharging point of the bottles, for the reason that the hinges of the covers may stick, owing to tight joints or slight inaccuracies of workmanship in fitting the parts, and if metals which rust or corrode are employed, such as iron or steel for example, the parts of the hinges become more or less rusted after being used for a considerable period. The positive means for opening the covers may be of any suitable or preferred character, and may be constructed either to cause the covers to be opened suddenly or slowly.

The means which I at present prefer for causing the covers to be positively opened on the discharge side of the machine is simple, inexpensive and very efficient and positive in action, and comprises one or two wheels which are so located with reference to the pins or projections 60 on the covers that said pins or projections engage with said wheel or wheels and in order to pass by the same, are forced outwardly and away from the bottle receptacles.

I prefer to employ two rotatable wheels 90 and 91, disposed at the sides of the tank

and outside of the line of travel of the bottle receptacles but within the lines of travel of the projections or pins 60. As a matter of convenience in constructing the machine, I support these wheels upon the guides 61, the center of each wheel being located inside the path traversed by the pins 60, with the result (as clearly shown in Fig. 2) that when said pins 60 contact with the periphery of a wheel, they are forced outwardly and away from the bottle receptacles in order to pass by said wheel.

What I claim is:

1. The combination with a receptacle adapted to contain a liquid, of a second receptacle adapted to contain a liquid and located adjacent to the first mentioned receptacle, conveying mechanism adapted to convey bottles through the liquid contained in said first mentioned receptacle and discharge them into the liquid contained in said second mentioned receptacle and a pipe to discharge liquid into said last mentioned receptacle to establish a current to move bottles therein.

2. The combination with a receptacle adapted to contain a liquid, of a second receptacle adapted to contain a liquid and located adjacent to the first mentioned receptacle, conveying mechanism adapted to convey bottles through the liquid contained in said first mentioned receptacle, a receiving board provided with a hinge, adapted to receive the bottles and discharge them into said second named receptacle, and a pipe removably supported adjacent said last mentioned receptacle, said pipe being provided with apertures adapted to discharge liquid against the liquid contained in said receptacle and at an angle to the surface of said liquid.

3. The combination in a machine of the character described, of shafts, sprocket wheels secured thereto, endless chains encircling said shafts and sprocket wheels, bottle receptacles having open ends secured to said chains, each of said bottle receptacles being composed of two sheet metal walls united by end plates and divided by sheet metal braces into separate compartments, each of said receptacles being provided with a cover which is provided with notches, one notch for each of said compartments, said covers being hinged to said bottle receptacles at points close to the bodies of the bottle receptacles but remote from the open ends of said receptacles.

4. The combination with a receptacle adapted to contain a liquid, of a shaft located within said receptacle, a second shaft, endless chains provided with bottle receptacles encircling both of said shafts, said bottle receptacles being provided with covers which in turn are provided with projections, and a rotatable wheel located at the discharge point of said machine and adapted to be engaged by said projections to positively open the covers of said receptacles.

5. The combination with bottle receptacles having open ends and oppositely disposed closed ends to retain bottles in said receptacles, a receptacle adapted to contain a liquid, and conveying mechanism adapted to convey said bottle receptacles through the liquid contained in said receptacle, of notched covers hinged to said bottle receptacles so as to close toward said receptacles and the bottles contained therein, each of said covers being hinged to its bottle receptacle at a point close to the body of said bottle receptacle and between the open and closed ends of said bottle receptacle and at a distance from the open end of said bottle receptacle, and a guide to close said covers.

6. The combination with bottle receptacles having open ends and oppositely disposed closed ends to retain bottles in said receptacles, of conveying mechanism adapted to convey said bottle receptacles, notched covers hinged to said bottle receptacles so as to close toward the same to center and retain bottles which may be therein, and a guide to close said covers.

7. The combination with bottle receptacles having open ends and oppositely disposed closed ends to retain bottles in said receptacles, of conveying mechanism adapted to convey said bottle receptacles, notched covers for said bottle receptacles, a guide to close said covers toward said bottle receptacles, and a hinge connected to a cover and its bottle receptacle and provided with a projection adapted to engage said guide to close said cover.

In witness whereof I hereto affix my signature in presence of two witnesses.

HENRY F. STOCK.

Witnesses:

CHAS. L. GOSS,

ALICE E. GOSS.