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PATENTED MAR. 14, 1905.

A. S. LINDEMANN & H. F. STOCK.

BOTTLE SOAKING MACHINE.

APPLICATION FILED OCT. 20, 1902.

2 SHEETS—SHEET 1.

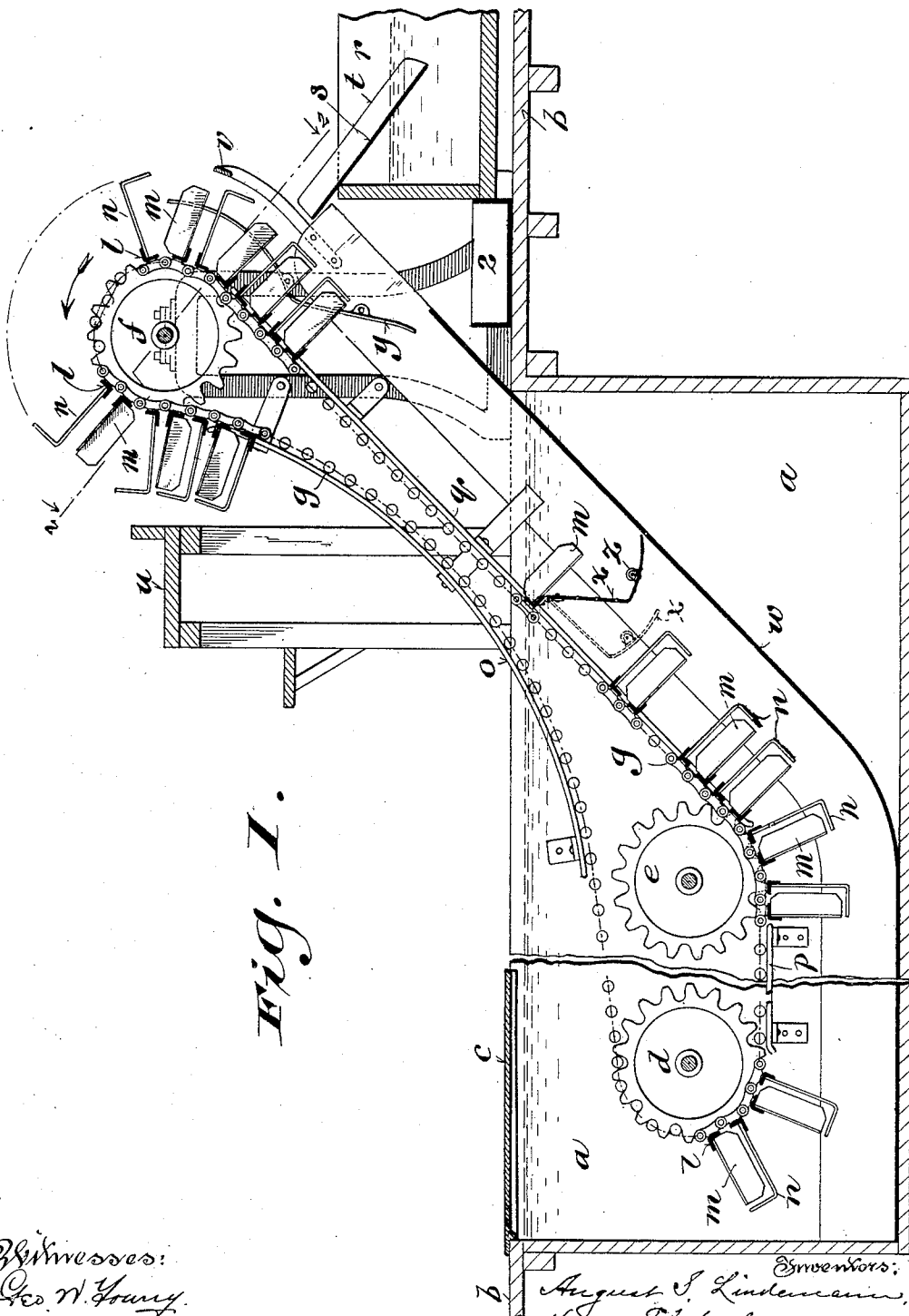


Fig. 1.

Witnesses:

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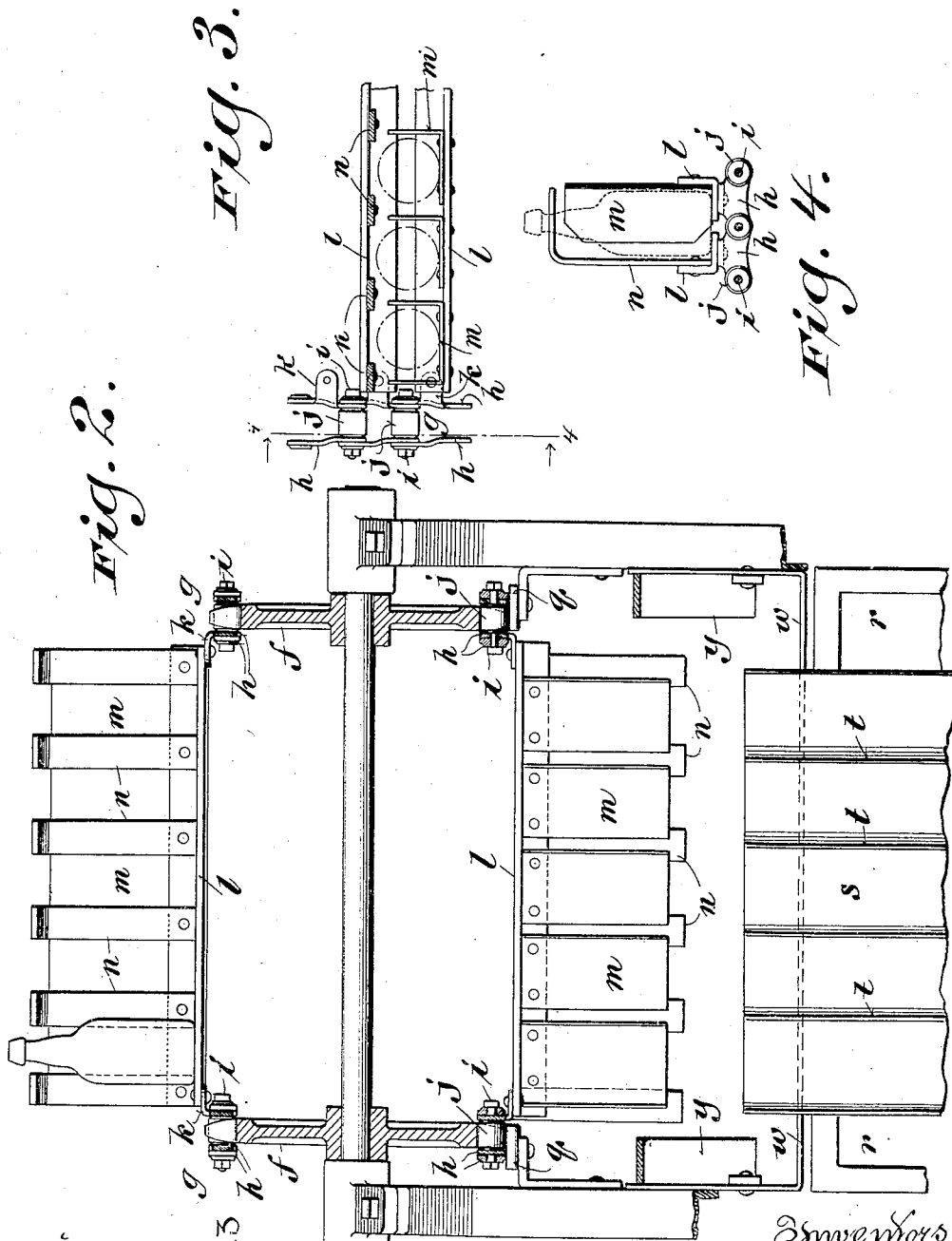
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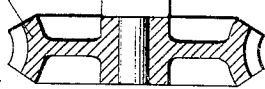
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

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BOTTLE-SOAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 784,622, dated March 14, 1905.

Application filed October 20, 1902. Serial No. 127,952.

To all whom it may concern:

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

The main objects of this invention are to automatically convey bottles through a tank containing a suitable cleansing solution or liquid, wherein they are soaked for a sufficient time to loosen dirt adhering thereto, to automatically empty the bottles and discharge them from the conveyer after they have been soaked, and generally to simplify and improve the construction and operation of machines for this and analogous purposes.

It consists in certain novel features of construction and in the arrangement and combinations of parts hereinafter particularly described and pointed out in the claims.

In the accompanying drawings like characters designate the same parts in the several figures.

Figure 1 is a condensed vertical longitudinal section of a bottle-soaking machine embodying our invention. Fig. 2 is an enlarged cross-section thereof on the line 2 2, Fig. 1. Fig. 3 is a detail view in plan and horizontal section of a portion of one of the conveyer-belts and of one series of bottle-holders, and Fig. 4 is a vertical section on the line 4 4, Fig. 3.

a is a tank for holding the liquid or solution for soaking and, if desired, sterilizing bottles. To economize floor-space, it is preferably located, as shown in Fig. 1, below the floor *b* of the room or apartment in which the bottles are fed to and discharged from the machine and is provided with a removable cover *c*.

d, *e*, and *f* are sprocket-wheels mounted in pairs on cross-shafts in the tank *a* and above one end thereof. Each of these sprocket-

wheels is formed or provided with bearings in a straight line for two or more adjoining links of a conveyer-belt or with teeth the opposite faces of which are constructed on pitch-circles of different diameters, so that alternate spaces between the teeth or sprockets will be deeper than the adjacent spaces and in a straight line therewith, as shown in Fig. 1.

g g are link belts carried and guided by the sprocket-wheels *d* and *e* longitudinally through the tank *a* and upwardly in an inclined direction from the sprocket-wheels *e* over the sprocket-wheels *f* above the tank. Each belt is composed of links of uniform length or pitch, corresponding with the pitch of the sprocket-wheels or with the distance between corresponding faces of adjacent teeth measured alternately from one pitch-circle to the other, so that adjoining links of each belt will be held in a straight line in passing over or around each sprocket-wheel. As shown in the drawings, the sprocket-wheels and belts are constructed to hold two adjoining links of each belt in a straight line as they pass over each sprocket-wheel; but the same result may be attained by so constructing them that three or more links will be held in a straight line, the bend in the belt taking place at every third or fourth joint or other predetermined intervals. The belts may be conveniently constructed, as shown in the drawings, of perforated plates *h*, connected by cross pins or bolts *i*, on which rollers *j* are journaled, the spaces between the teeth of the sprocket-wheels being made to receive and fit these rollers. To ears *k* on the inner sides of adjoining or equidistant links of each belt are attached angular cross-bars *l*, and to one of each pair of these cross-bars are attached the inner ends of angular or flanged plates *m*, which constitute the three sides of transverse series of bottle-holding compartments. These plates and their flanges are arranged perpendicular to the bars *l* and project outwardly from the conveyer. The end plates on one side of the machine are each provided with two side flanges, while the other

plates have but one flange each, as shown in Fig. 3. To the other bars *l* are attached hooked bands or rods *n* opposite the plates *m* and bent at their outer ends toward said plates so as to extend on opposite sides of the necks and over the shoulders of bottles, as shown in Figs. 2 and 4, and to retain them in the bottle-holding compartments of the conveyer while the belt-links to which opposing members of the holders are attached are held in line with each other. The bottoms of the bottles passing along the upper side of the conveyer are supported by the flanges of the angle-bars *l*. Between the sprocket-wheels the conveyer is supported and retained in place by guides *o*, *p*, and *q*, attached to the sides of the tank *a* and the frame of the machine and engaging with the rollers of the link belts *g*. The conveyer-belts are arranged with respect to the bottle-holders on the sprocket-wheels so that in passing over and around the sprocket-wheels *d* and *e* in the tank the belts will bend on the joints between the several bottle-holders, which will thus remain closed; but in passing around the sprocket-wheels *f* above the tank the belts will bend at the joints between opposing members of the bottle-holders, which will thus be opened or spread at their outer ends, so as to discharge the bottles therefrom. Below and adjacent to the upper end of the conveyer a rinsing-tank *r* is located, and an inclined chute *s*, having longitudinal partitions *t*, is provided to receive the bottles as they are discharged from the conveyer and guide them out of contact with each other into said tank. A stand *u* is provided on the opposite side of the conveyer for feeding bottles to the machine.

v is a cross-bar located above the upper end of the chute *s* in position to engage the necks of bottles projecting from the holders and to disengage the bottles in case they should stick to or between the bands *n* when the holders are opened.

w is a way which may be conveniently constructed of sheet metal, extending along the bottom of the tank *a* and upwardly therefrom, on an incline parallel with the guides *q* to a point between the top of said tank and the chute *s*.

x is an angular scoop or scraper which may be conveniently made of sheet metal and is hinged at its upper edge to the belts *g* on opposite sides of the conveyer, so as to drag at its lower edge upon the way *w* in its passage along the bottom of the tank *a* and upwardly therefrom. It is preferably perforated to facilitate the free passage of liquid through it. Inclined guides *y* are arranged on opposite sides of the machine at the upper end of the way *w* and adjacent to the chute *s* and cross-bar *v* for engaging rollers or projections *z* on the ends of the scraper *x* and lifting said scraper so that it will clear the upper end of

the chute *s* and the cross-bar *v* in passing them.

A box or receptacle 2 is provided at the upper end of the way *w* to receive the refuse discharged therefrom by the scraper *x*.

The conveyer may be conveniently driven by means of a worm-gear 3 on the shaft of the upper sprocket-wheels *f* and a worm-gear which is not shown or by any other suitable connection.

The machine hereinbefore described operates as follows: The tank *a* being filled with water or a suitable liquid, such as a solution of caustic soda, for soaking or both soaking and sterilizing bottles and this liquid or solution being heated, if desired, by a steam-coil or other means, (not shown,) the conveyer is set in motion, traveling in the direction indicated by an arrow on Fig. 1. While the bottle-holders are open, as shown, in passing over the upper sprocket-wheels *f* next to the stand *u* they are supplied with bottles. As they leave the sprocket-wheels *f* and pass downwardly into the tank *a* the conveyer-belts are straightened and close the bottle-holders, which remain closed, confining the bottles therein during their entire circuit through the tank *a*, around the sprocket-wheels *d* and *e*, back to the sprocket-wheels *f*. Passing on the upper side of the conveyer with their mouths upward into the tank *a* the bottles are filled with the liquid in said tank and are thus thoroughly soaked inside and outside in their passage through said tank. When they pass out of the tank on the under side of the conveyer, they are held in an inverted position, and the liquid is consequently drained therefrom. When they reach the sprocket-wheels *f*, the conveyer-belts are bent at the joints between opposing members of the bottle-holders and the bottles are discharged therefrom upon the chute *s*, by which they are guided separately into the rinsing-tank *r*. The scraper *x*, traversing the bottom of the tank *a*, gathers labels, broken glass, and other insoluble refuse deposited therein and carrying them up the inclined way *w* discharges them at the upper end thereof into a box 2 or other receptacle.

By the construction of the conveyer herein shown and described the bottles are automatically secured therein and discharged therefrom at the desired points without catches, locks, or trips, whose operation involves striking or rubbing contacts and consequent shock, jar, wear, and noise.

The bottles may be kept in the soaking liquid or solution a longer or shorter period by varying the length of the tank *a* or by varying the speed of the conveyer, or by both.

Various changes in details of construction and arrangement of parts may be made without departing from the principle and intended scope of our invention.

We claim—

1. In a bottle-soaking machine the combination with a tank for holding the soaking liquid, of a conveyer consisting of link belts passing over sprocket-wheels located in and above the tank, and bottle-holders each comprising two members which are attached to different links of each belt, each of the upper sprocket-wheels having bearings in a straight line for a number of links and the belts being so arranged on the sprocket-wheels that as the belts pass over the sprocket-wheels above the tank the bottle-holders will open, substantially as described.

2. In a bottle-soaking machine the combination with a tank for holding the soaking liquid, of a conveyer comprising link belts, sprocket-wheels located in and above said tank and each having bearings in a straight line for a number of links of the belt carried thereon, and bottle-holders each comprising two members attached to different links of each belt which is arranged on its carrying-wheels so that in passing over the wheel at the receiving and discharging point it will bend between the members of the bottle-holders and cause them to open, and in passing over the other wheels the belt will be held straight between the members of the bottle-holders, keeping them closed, substantially as described.

3. In a bottle-soaking machine the combination with a tank for holding the soaking liquid, of a conveyer comprising belts composed of links of uniform length or pitch, bottle-holders each composed of two members attached to different links of the same belt, and sprocket-wheels carrying said belts in and above said tank and each having two pitch-circles of larger and smaller diameter, the pitch of the teeth measured alternately from one pitch-circle to the other being the same as that of the belts, and the belts being arranged on said sprocket-wheels so that they will bend between members of the same bottle-holders and open them in passing around the sprocket-wheels above the tank, and will not bend at those points in passing around the sprocket-wheels in the tank, substantially as described.

4. In a bottle-soaking machine the combination with a tank for holding a soaking liquid, of sprocket-wheels located in and above said tank and having teeth the opposite faces of which are formed to pitch-circles of larger and smaller diameters, link belts mounted on said sprocket-wheels, cross-bars attached at their ends to different links of each belt, angular plates attached at their inner ends to one of each pair of cross-bars, and hooked bands or rods attached to the other cross-bars and forming with the opposing angular plates transverse series of bottle-holding compartments, the belts being arranged on the sprocket-wheels so that the bottle-holding compartments will open at their outer ends in

passing over the upper sprocket-wheels and will remain closed in passing over the sprocket-wheels in the tank, substantially as described.

5. In a bottle-soaking machine the combination with a tank for holding a soaking liquid, of sprocket-wheels located in and above said tank and each having bearings in a straight line for a number of links in the belt carried thereon, link belts mounted on said sprocket-wheels, transverse angle-bars attached at their ends to different links of each belt, angular plates attached at their inner ends to one of each pair of bars, and bands or rods attached to the other bars and bent at their outer ends toward said plates, with which they form transverse series of bottle-holding compartments, the belts being arranged on the sprocket-wheels so that they will bend between opposing members of the same compartments when they pass over the upper sprocket-wheels, and will not bend at those points when they pass over the other sprocket-wheels, substantially as described.

6. In a bottle-soaking machine the combination with a tank for holding liquid, of sprocket-wheels located in and above said tank, link belts mounted on said sprocket-wheels, cross-bars attached at their ends to different ends of each belt, bottle-holders composed of members attached at their inner ends to adjacent cross-bars, said sprocket-wheels and belts being constructed and arranged so that the belts will bend on joints between opposing members of the same bottle-holders and thereby open said bottle-holders as they pass over the upper sprocket-wheels, and a cross-bar located adjacent to the upper sprocket-wheels in position to engage the necks of bottles protruding from the bottle-holders as the latter are opened to discharge the bottles therefrom, substantially as described.

7. In a bottle-soaking machine the combination with a tank for holding liquid, of sprocket-wheels located in and above said tank, link belts mounted on said sprocket-wheels and provided with bottle-holders, an inclined way extending from the bottom of said tank to a point above the top thereof parallel with the lower ascending side of said belts, and a scraper hinged to said belts and adapted to traverse said inclined way for removing refuse deposited in said tank, substantially as described.

8. In a bottle-soaking machine the combination with a tank for holding liquid, of an endless conveyer comprising sprocket-wheels located in and above said tank, link belts mounted on said sprocket-wheels, bottle-holders each consisting of opposing members attached to different links of each belt, said sprocket-wheels and belts being constructed and arranged so that the belts will bend between the members of the bottle-holders and open the same as they pass over the upper

sprocket-wheels, an inclined way extending from the bottom of the tank to a point above the top thereof parallel with the lower ascending side of the conveyer, an inclined chute
5 arranged to receive the bottles discharged from the conveyer as it passes around the upper sprocket-wheels, a scraper hinged to said conveyer and adapted to traverse said inclined way for removing refuse from the tank, and
10 a guide arranged to lift said scraper as it passes said chute, substantially as described.

9. In a machine of the class described, a multiple bottle-holder comprising a plurality of jaws arranged in succession along an end-
15 less flexible carrier, each jaw serving, with

the jaw next to it, to form a bottle-pocket, in combination with means for moving the jaws apart and together and moving the carrier, said means consisting of sprocket-wheels suitably placed along the line of travel of the carrier
20 and each having two pitch-circles of larger and smaller diameter, substantially as described.

In witness whereof we hereto affix our signatures in presence of two witnesses.

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HENRY F. STOCK.

Witnesses:

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LYDA E. SAECKER.