Oct. 4, 1932. O. DREHER 1,880,243

BOTTLE FEEDING MEANS

Filed June 9, 1930 5 Sheets-Sheet 1

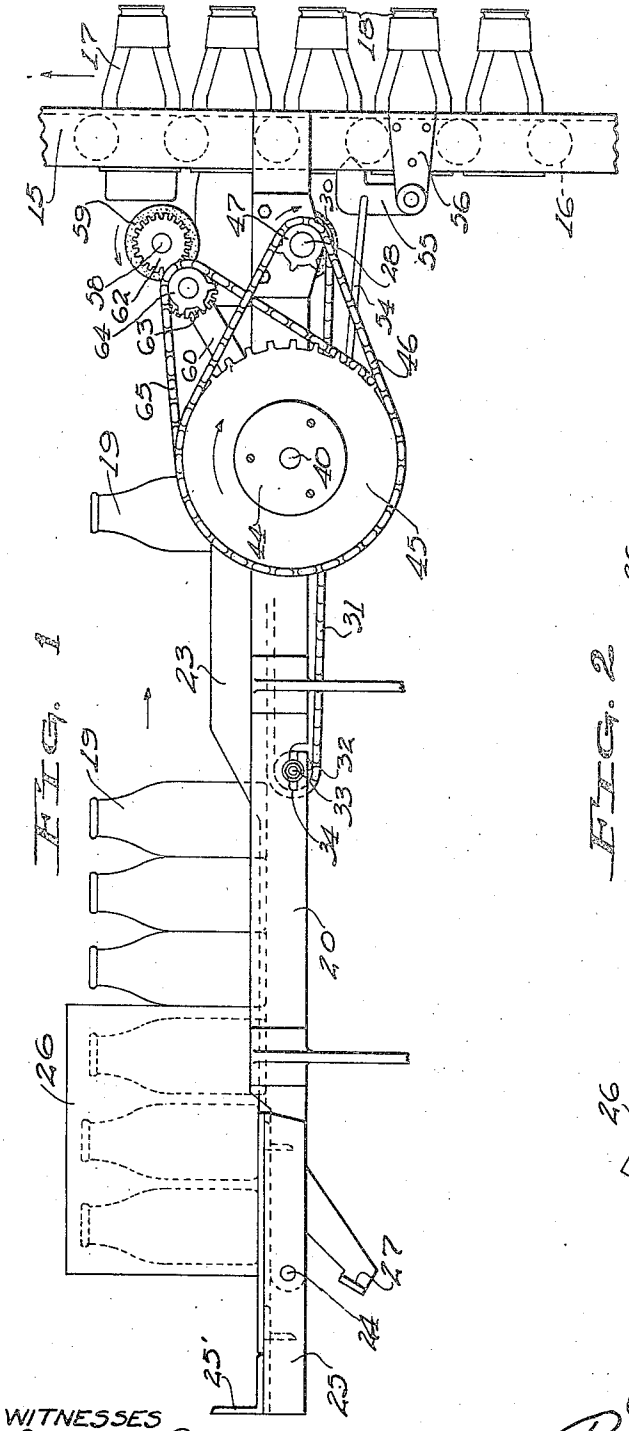


FIG. 1

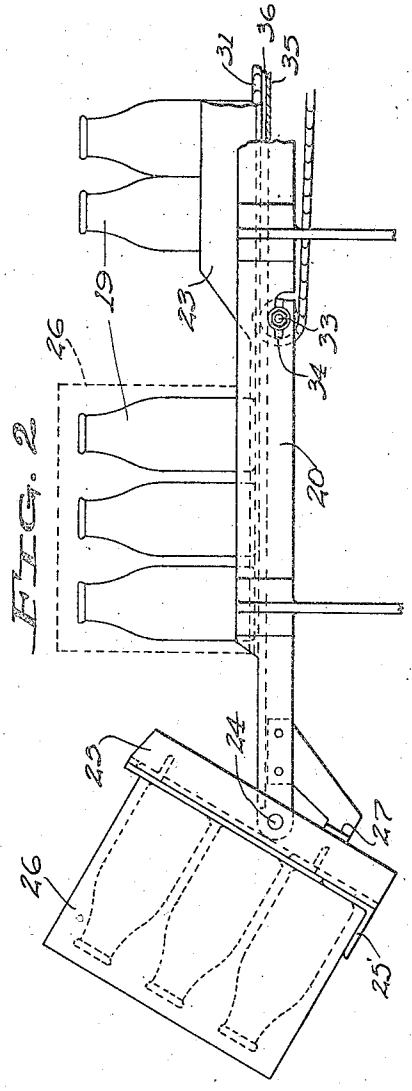


FIG. 2

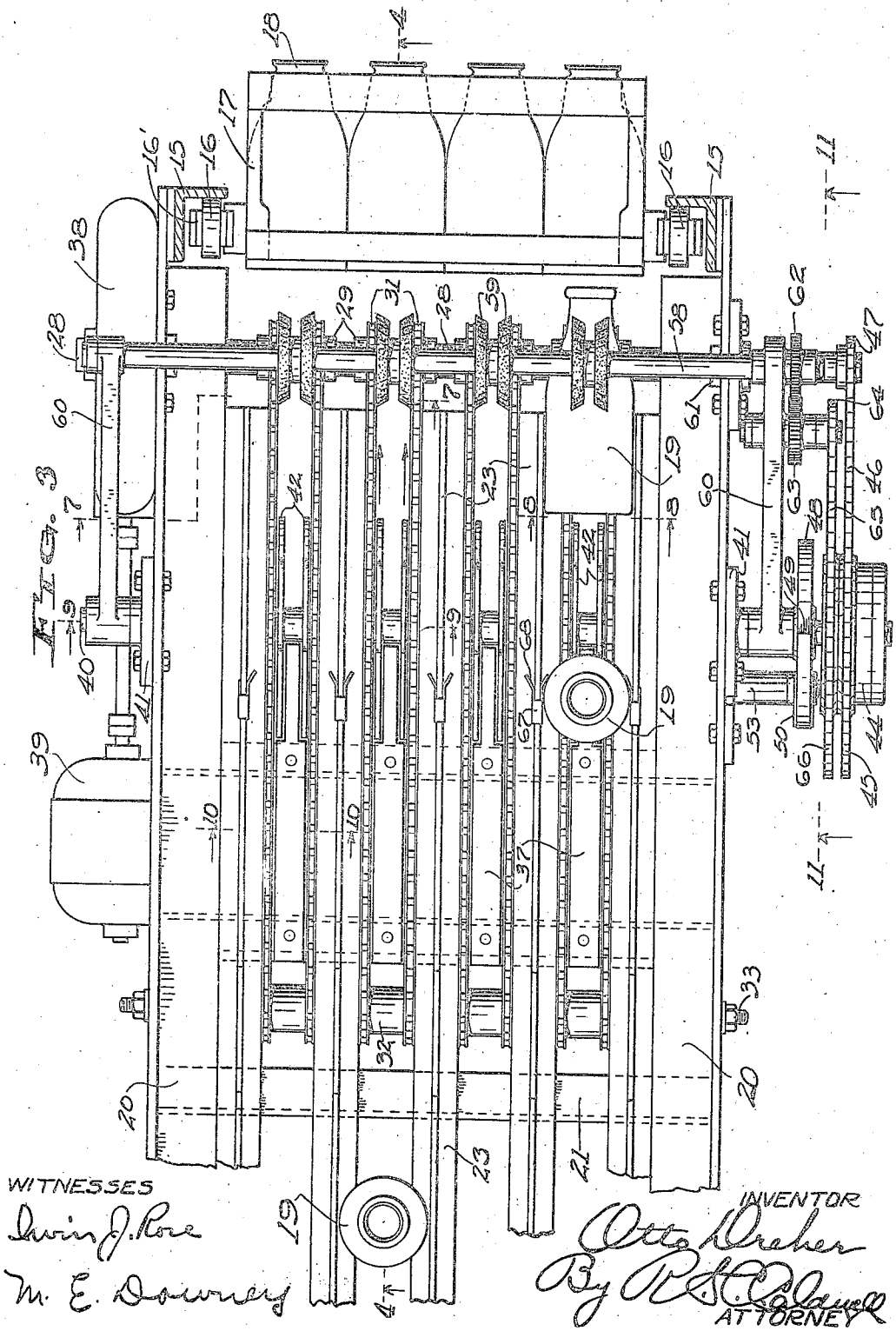
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BOTTLE FEEDING MEANS

Filed June 9, 1930 5 Sheets-Sheet 2



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BOTTLE FEEDING MEANS

Filed June 9, 1930 5 Sheets-Sheet 3

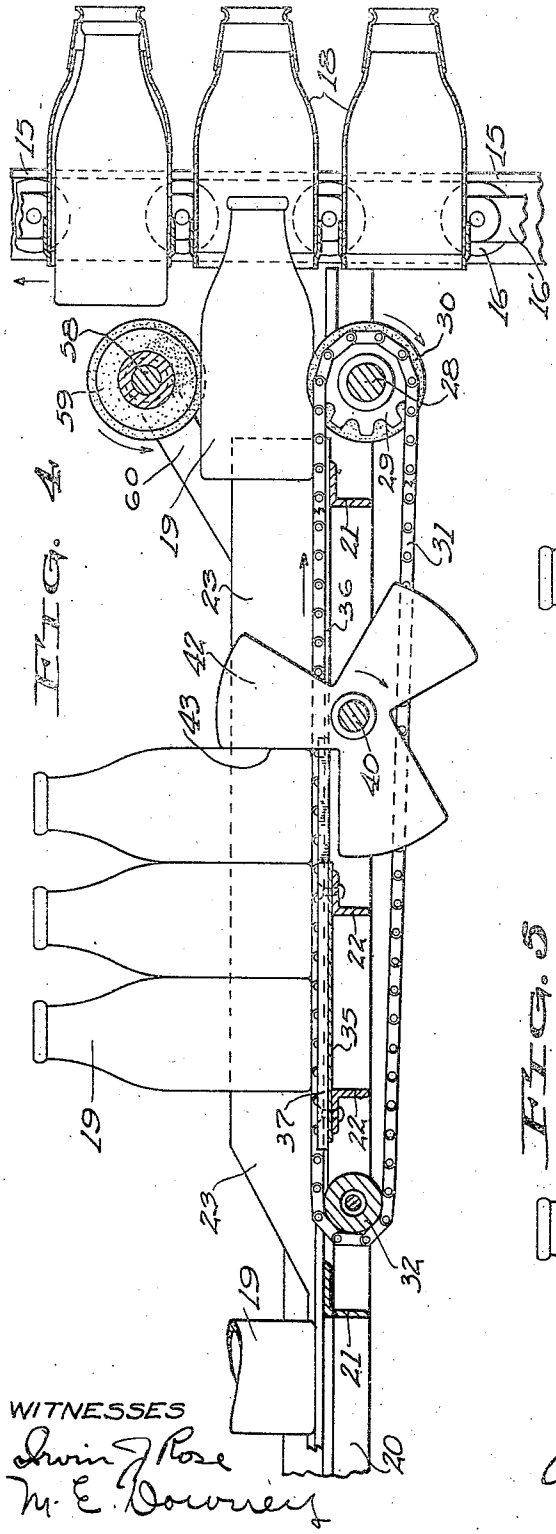


FIG. 4

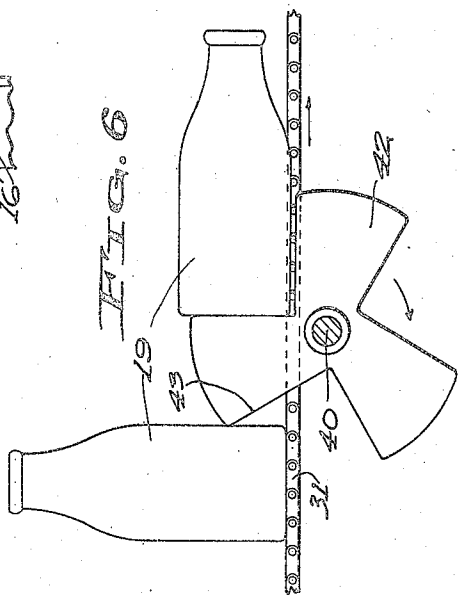


FIG. 6

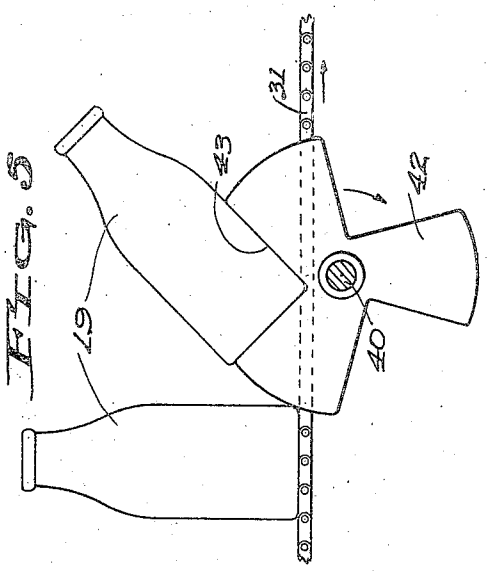


FIG. 5

WITNESSES

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BOTTLE FEEDING MEANS

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FIG. 7

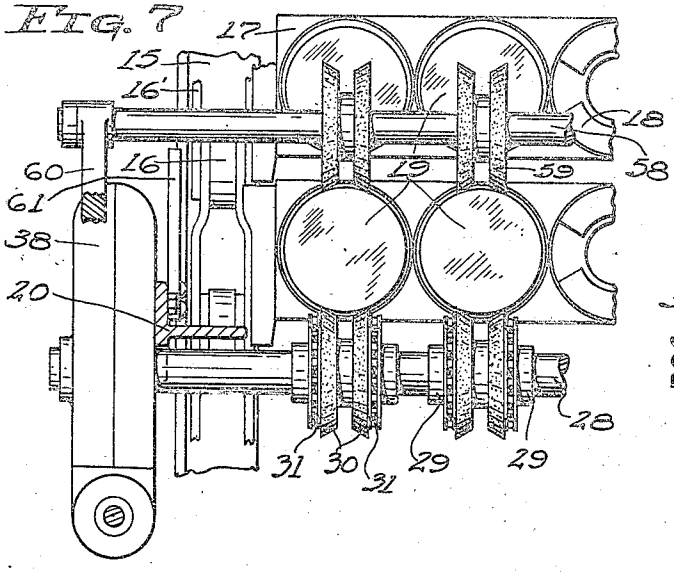


FIG. 8

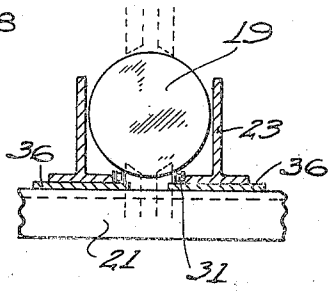


FIG. 9

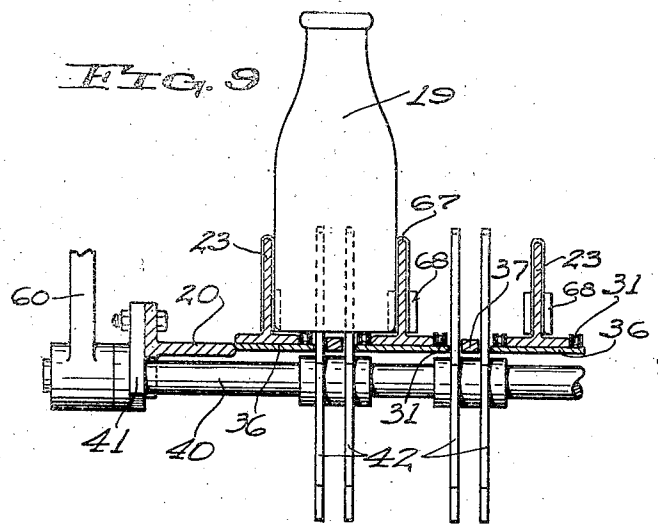
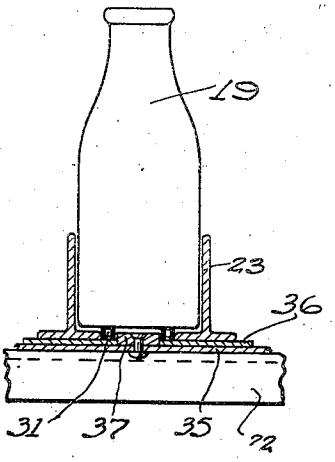


FIG. 10



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BOTTLE FEEDING MEANS

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FIG. 11

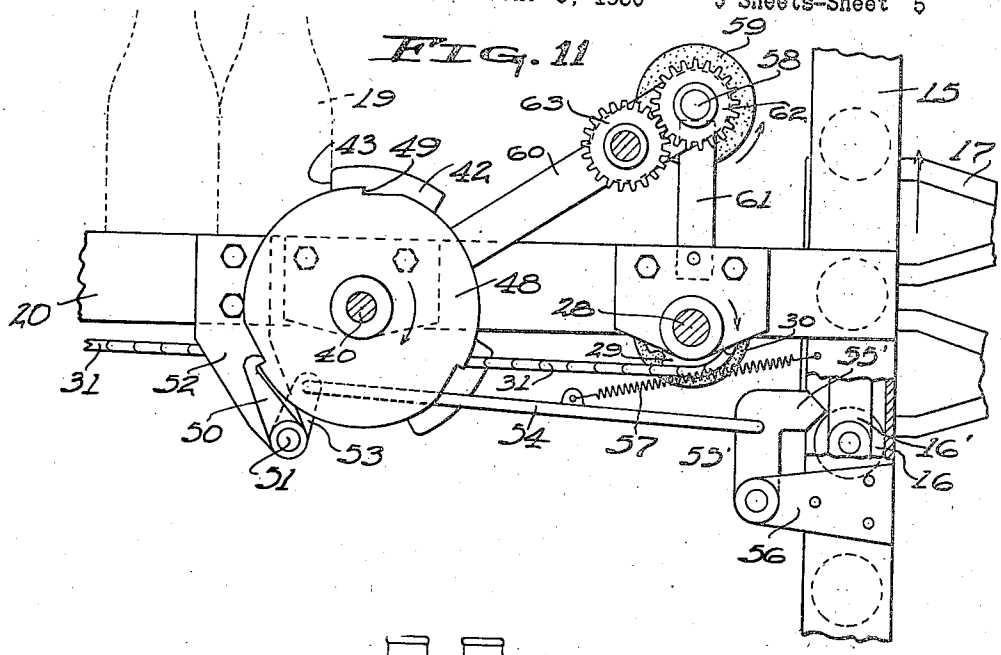


FIG. 12

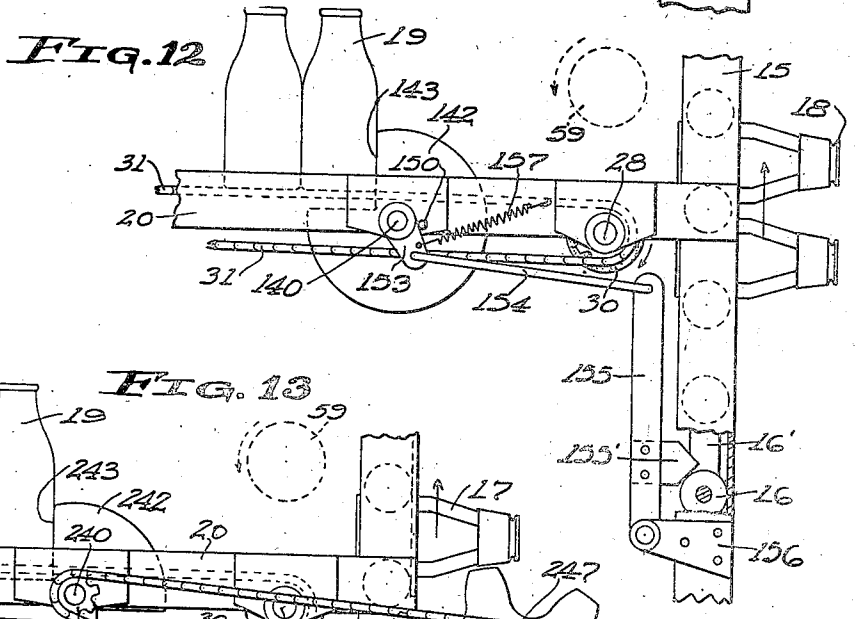
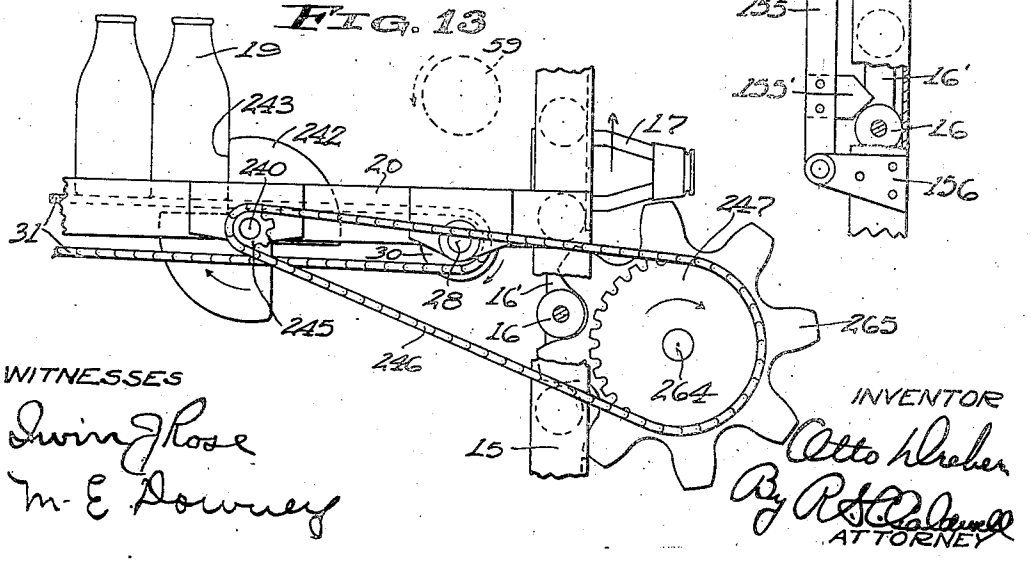


FIG. 13



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UNITED STATES PATENT OFFICE

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BOTTLE FEEDING MEANS

Application filed June 9, 1930. Serial No. 460,045.

The invention relates to bottle feeding means for use with bottle washing machines and the like.

An object of the invention is to provide bottle feeding means including a feeding conveyor on which bottles are accumulated and by which they are impelled to a pivotally mounted member which successively feeds the bottles in spaced relation onto another portion of the same conveyor.

Another object is to provide bottle feeding means of this character in which the bottles on the feeding conveyor are accumulated in upright position before a tilter which successively places the bottles in a recumbent position on the conveyor.

A further object of the invention is to provide bottle feeding means in which the recumbent bottles are moved by friction into the pockets of a bottle conveyer, to thereby avoid the use of bars or fingers for pushing the bottles into these pockets.

A further object is to provide bottle feeding means in which the bottles while in recumbent position are assisted into the pockets of the bottle conveyor by means of rollers engaging the upper portions of the recumbent bottles.

A further object is to control the operation of the bottle tilting means from the pocket-carrying bottle conveyor.

A further object is to provide bottle feeding means including a dumping device by which bottles can be expeditiously transferred from cases or crates to the feeding conveyor on which the bottles are accumulated.

The invention further consists in the several features hereinafter set forth and more particularly defined by the annexed claims.

In the accompanying drawings, Fig. 1 is a side elevation of bottle feeding means embodying the invention;

Fig. 2 is a side elevation of part of the bottle feeding means, parts thereof being shown in a different operative position;

Fig. 3 is a top plan view of the bottle feeding means;

Fig. 4 is a longitudinal sectional elevation of the bottle feeding means taken along the line 4—4 of Fig. 3;

Fig. 5 is a detail view showing one of the bottle tilters in an intermediate position;

Fig. 6 is a similar view showing the bottle tilter in another intermediate position;

Fig. 7 is a detail sectional view taken along the line 7—7 of Fig. 3;

Fig. 8 is a detail sectional view taken along the line 8—8 of Fig. 3;

Fig. 9 is a detail sectional view taken along the line 9—9 of Fig. 3;

Fig. 10 is a detail sectional view taken along the line 10—10 of Fig. 3;

Fig. 11 is a detail sectional view taken along the line 11—11 of Fig. 3;

Fig. 12 is a detail side elevation of a modified form of bottle feeding means, parts being broken away and parts being shown in section, and

Fig. 13 is another modified form of the invention, parts being broken away and parts being shown in section.

In these drawings, the numeral 15 designates each of a pair of spaced upright angles, flanges of which form tracks for the rollers 16 of the spaced side chains 16′ of a bottle conveyor 17. The bottle conveyor includes transversely extending rows of pockets 18 adapted to receive and hold bottles 19, the pitch of the pockets in the present instance being equal to that of the rollers 16. The bottle conveyor is of the endless type and forms part of a bottle handling machine such as a washer, the conveyor being driven either intermittently or continuously by any suitable means (not shown).

In that embodiment of the invention shown in Figs. 1 to 11 inclusive, horizonally extending parallel side-bars 20 of T-shaped cross-section are secured at their ends to the outer faces of the upright track-forming angle bars 15, and are connected at their lower portions by cross bars 21 and 22 of angle cross-section to form a horizontal frame. The cross bars 21 and 22 support thereon a number of spaced parallel T-bars 23 forming a plurality of bottle-receiving tracks thereon separated by the upstanding flanges of the T-bars, the bottle-receiving tracks being in re-

spective alignment with the planes of travel of the bottle-holding pockets 18 of the bottle conveyor. The frame with its track-forming T-bars 23 constitutes a loading table for the bottles.

At their outer ends, the side bars 20 are pivotally connected by pivot pins 24 to the intermediate portions of a swingably-mounted platform 25 which is movable between the horizontal position seen in Fig. 1 and the inclined position seen in Fig. 2. The outer edge of the platform 25 is provided with an upstanding flange 25′ which forms a ledge to support a bottle crate or case 26 placed on the platform, as seen in Fig. 2. The platform is supported in its inclined position by a stop 27. The outer portions of the upstanding flanges of the T-bars 23 are relatively narrow in order that the bottle case or crate may be slid therealong from the platform 25 when it is swung to its horizontal position, as hereinafter described.

A shaft 28 extends transversely of the side bars 20 adjacent the angle bars 15 and is suitably journalled near opposite ends, the axis of the shaft being below the base flanges of the T-bars 23. The shaft has secured thereto a plurality of pairs of spaced sprockets 29, each pair of sprockets carrying at their inner faces a pair of spaced yielding rubber disks 30 having bevelled peripheries. An endless chain 31 passes over each sprocket, and each pair of spaced chains extend rearwardly for some distance between the spaced T-bars 23. At their rear portions, the chains 31 are supported on a transversely-extending roller 32 which is carried by a supporting rod 33 adjustably secured at its ends within slots 34 formed in the side bars 20. A transversely-extending plate 35 is suppored on the cross-bars 22, as seen in Figs. 4 and 10, and in turn forms a support for flat strips 36 extending below, and in parallel relation to, the T-bars 23. The strips 36 are wider than the base flanges of the T-bars and extend laterally therefrom to form tracks for supporting the upper flights of the feeding chains 31. Bars 37 are secured to the plate 35 between each pair of chains 31 to define at their opposite side edges the inner side walls of channels in which the chains are guided.

The transversely extending shaft 28 for impelling the feeding chains 31 is driven by any suitable source of power in a direction to cause the upper flights of the chains to travel toward the bottle-holding pockets 19. In the present instance, one end of the shaft 28 is connected to a speed reducer 38 and is driven therethrough by an electric motor 39.

At a point between the shaft 28 and the rollers 32, a shaft 40 extends transversely of the side bars 20 and is journalled near its ends in brackets 41 secured to the side bars, the shaft 40 being arranged in parallel relation to the shaft 28 and below the upper flights of the chains 31. The shaft 40 carries thereon a plurality of tilters 42 which, in the present instance, are in the form of disks having a plurality of bottle-receiving notches 43 formed therein. Each tilter comprises a pair of these disks arranged in spaced relation closely adjacent the inner sides of each pair of bottle feeding chains 31. The tilter shaft 40 is driven in the direction indicated by arrows, the tilters stopping momentarily at the position seen in Fig. 4. The shaft 40 at one end carries a slipping clutch 44 including a sprocket wheel 45 which is continuously driven by a chain 46 connected to a sprocket 47 on the shaft 28. As best seen in Fig. 11, a disk 48 is fixedly secured to the shaft 40 and is provided with a plurality of equally spaced notches 49 equal in number to the bottle-receiving notches 43 of the tilters. A pawl 50 engageable with the notches 49 is secured to a shaft 51 journalled in a bracket 52 mounted an the adjacent side bar 20. An arm 53 carried on the shaft 51 is connected by a rod 54 with a cam lever 55 pivotally mounted on a bracket 56 secured to one of the angle tracks 15. The cam lever is provided with a cam projection 55′ engageable with the rollers 16 of the bottle conveyor for intermittently releasing the pawl 50 from the notched disk 48. A spring 57 acts on the rod 54 to normally hold the pawl 50 in engagement with the notched disk 48 to prevent rotation of the tilter shaft 40.

As hereinafter more fully described, the bottles carried along the feeding chains 23 are successively tilted from an upright position to a recumbent position in which they are urged by the chains into the pockets 19 of the bottle conveyor 18. In order to increase the driving friction on the bottles, a horizontal shaft 58 extends in parallel relation to the shaft 28 and in spaced relation thereabove and carries a plurality of pairs of spaced resilient rubber disks 59 which are provided with bevelled peripheries to engage the recumbent bottles. At its opposite ends, the shaft 58 is journalled in arms 60 loosely mounted on the tilter shaft 40 for permitting the shaft 58 to rise and to allow the bottles to pass beneath rubber disks 59. The downward movement of the shaft 58 is limited by upstanding stop bars 61 secured to the side bars 20. A gear 62 carried at one end of the shaft 58 meshes with another gear 63 which is secured to a sprocket 64 connected by a chain 65 with a driving sprocket 66 continuously rotatable with the sprocket 45, the gearing ratio being so selected that the rubber feeding disks 30 and 59 will have substantially the same peripheral velocity.

The upright bottles on the feeding chains 31 are impelled by these chains to the tilters 42, and the foremost bottle in each file is centered with respect to the tilter by clips 67 saddled over the upstanding flanges of

the T-bars 23 and having bottle-centering wings 68, as seen in Figs. 3 and 9.

In operation, cases of bottles are carried to the loading platform 25, each case being placed on the platform by an attendant while the platform is in the inclined position seen in Fig. 2. The bottles have been previously placed in the cases necks foremost so that when the cases are inverted the bottles will be upright. The platform 25 is then swung to the horizontal position seen in Fig. 1, whereupon the case is slid off the platform and onto the upper edges of the narrow flanges of the T-bars 23. When this is done, the platform swings back to the inclined position of Fig. 2, and the upright bottles drop slightly into the trackways formed by the T-bars 23. The case is then lifted off the bottles and a second case of bottles is placed on the platform 25. The succeeding cases are manipulated in the manner above described, and while each case is being pushed off the loading platform, it urges the previously deposited bottles onto the upper flights of the feeding chains 31, which carry the bottles toward the tilters 42. The bottles in each file on the feeding chains are in lateral contact, and the foremost bottle in the file is in engagement with the spaced pair of tilting disks, as seen in Fig. 4. The upright bottles are confined against lateral movement by the upstanding flanges of the T-bars 23. The tilters 42 are intermittently operated in a manner heretofore described and deposit the bottles from an upright position on the feeding chains to a recumbent position on these chains, as illustrated in Figs. 4, 5, and 6, which indicate successive positions of the tilters. During their tilting movement, the bottles are held against lateral displacement by their abutment with the edges of the spaced pairs of tilting disks. The recumbent position of one of the bottles on the spaced feeding chains is shown in Fig. 8. The succeeding upright bottles are urged into the next notches of the tilters by the feeding chains 31. The recumbent bottles on the feeding chains, when approaching the shaft 28, ride up slightly on the bevelled peripheries of the resilient rubber disks 30, and the rotation of these disks acts to urge the bottles into the then stationary pockets of the bottle conveyor. When a continuously traveling bottle conveyor is used, the operation of the parts is so timed that the bottles will properly enter the pockets. The bottles are assisted into the pockets by the action of the rotary resilient rubber disks 59 engageable with the upper portions of the bottles.

In the embodiment of the invention shown in Fig. 12, the tilter shaft 140 is arranged for oscillation, instead of rotation in one direction, and carries pairs of tilting disks 142 each of which is provided with a single bottle-receiving notch 143. The tilter shaft 140 has secured thereto an arm 153 which is connected by a rod 154 with a lever 155 pivotally mounted in a bracket 156 secured to one of the upright angle tracks 15. The lever 155 is provided with a cam 155′ which is engageable with the rollers 16 of the bottle conveyor, to thereby periodically swing the lever as the conveyor advances in its travel, the conveyor in the present instance being of the continuously moving type.

The swinging movement of the lever 155 is communicated to the tilter shaft 140 through the rod 154 and acts to periodically swing the tilters through an arc of about 90° to tilt successive bottles and place them in recumbent position on the feeding chains 31 in readiness to be urged into the bottle pockets 18. The tilter shaft 140 is returned to its initial position by a spring 157, or equivalent weight, the arm 153 being limited in its movement by a stop pin 150.

In the embodiment of the invention shown in Fig. 13, the tilter shaft 240 is driven in the same direction either intermittently or continuously, but preferably continuously, and carries pairs of tilter disks 242 each of which is provided with one or more notches 243, two notches being shown in the present instance. The speed of rotation of the tilter shaft will vary in accordance with the number of bottle-receiving notches in the tilting disks. The tilter shaft carries a sprocket 245 which is driven by a chain 246 from a sprocket 247 carried on a suitably supported shaft 264. The shaft 264 carries a sprocket 265 which meshes with, and is driven by, one of the side chains 16′ of a bottle conveyor which travels either intermittently or continuously, but preferably continuously. In this type of bottle feeding means, the rotatable tilters 242 tilt the bottles one by one and deposit them in recumbent position on the feeding chains. The recumbent bottles are then urged into the pockets in a manner heretofore described.

By the use of the bottle feeding means of this invention, the bottles are accumulated before the tilters while the attendant unloads the cases, so that any short interruption in his work will not result in lack of bottles to be fed. The bottles are urged into the pockets of the bottle conveyor by friction, which dispenses with the use of bars or fingers for this purpose. The bottles are tilted smoothly and accurately and there is no danger of jostling the succeeding bottles.

While the feeding means of this invention is more particularly adapted for the feeding of bottles, it is also suitable for the feeding of other containers where similar conditions are encountered.

What I claim as new and desire to secure by Letters Patent is:

1. The combination of a feeding conveyor on which bottles are impelled in upright position, a pivotally mounted tilter disposed in

the path of the upright bottles on said feeding conveyor to stop their movement therealong, said tilter having bottle-supporting surfaces on which a bottle is tilted from an upright position to a recumbent position on said feeding conveyor during the angular movement of said tilter, a bottle conveyor having pockets into which the recumbent bottles are urged from said feeding conveyor, and means controlled by said bottle conveyor for operating said tilter.

2. The combination of means for supporting and advancing bottles in upright position, tilting means for tilting successive bottles from an upright position to a recumbent position, means for impelling the recumbent bottles away from said tilting means, a traveling bottle conveyor having bottle-holding means receiving the recumbent bottles, and means actuated by said bottle conveyor for operating said tilting means.

3. The combination of means for supporting and advancing bottles in upright position, rotary tilting means for tilting successive bottles from an upright position to a recumbent position, means for impelling the recumbent bottles away from said tilting means, a traveling bottle conveyor having bottle-holding means receiving the recumbent bottles, a rotary member driven by said bottle conveyor, and means actuated by said rotary member for operating said tilting means.

4. The combination of means for supporting and advancing bottles in upright position, oscillatory tilting means for tilting successive bottles from an upright position to a recumbent position, means for impelling the recumbent bottles away from said tilting means, and means for operating said oscillatory tilting means.

In testimony whereof, I affix my signature.

OTTO DREHER.