

May 8, 1923.

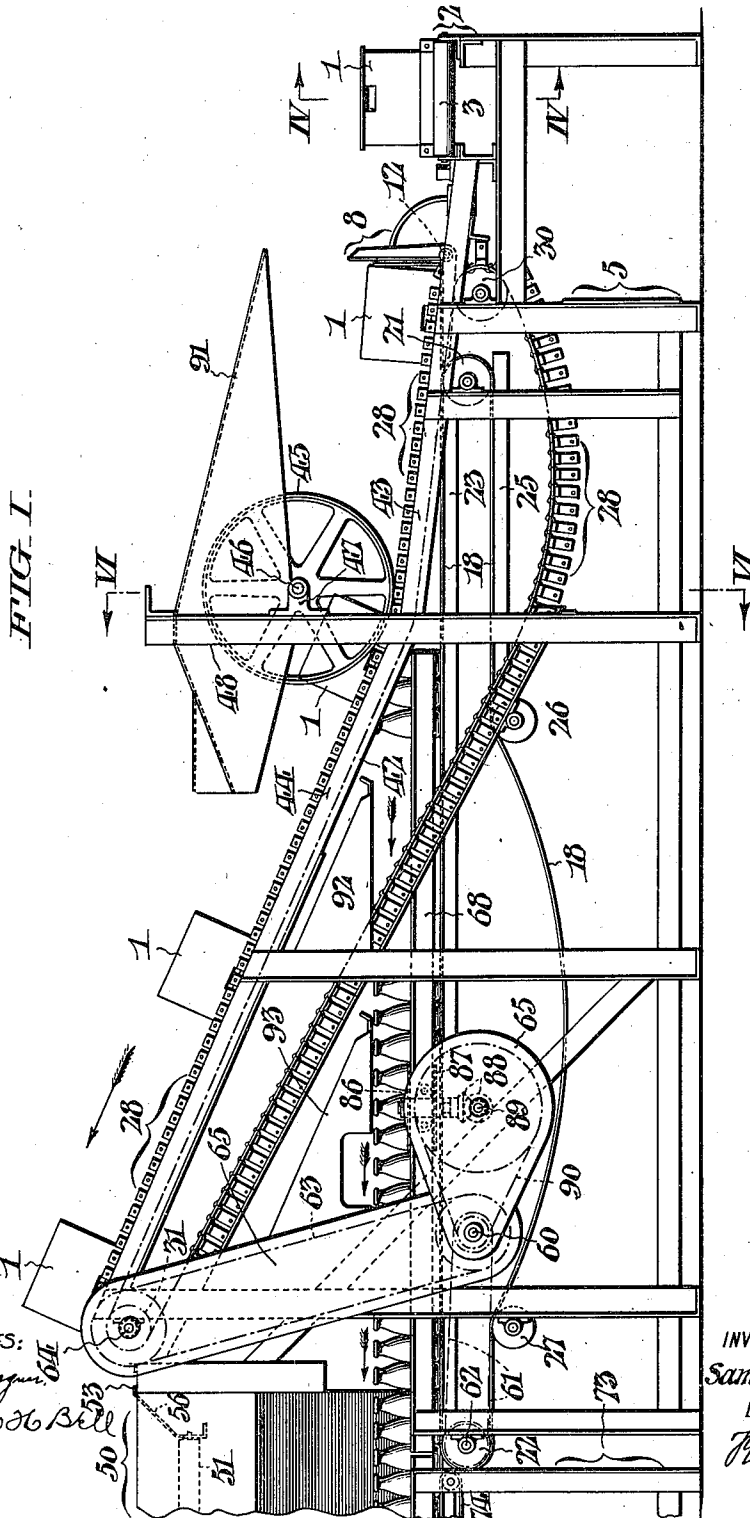
1,454,051

S. M. HEULINGS

CASE EMPTYING MACHINE

Filed March 19, 1920

6 Sheets-Sheet 1



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50

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1,454,051

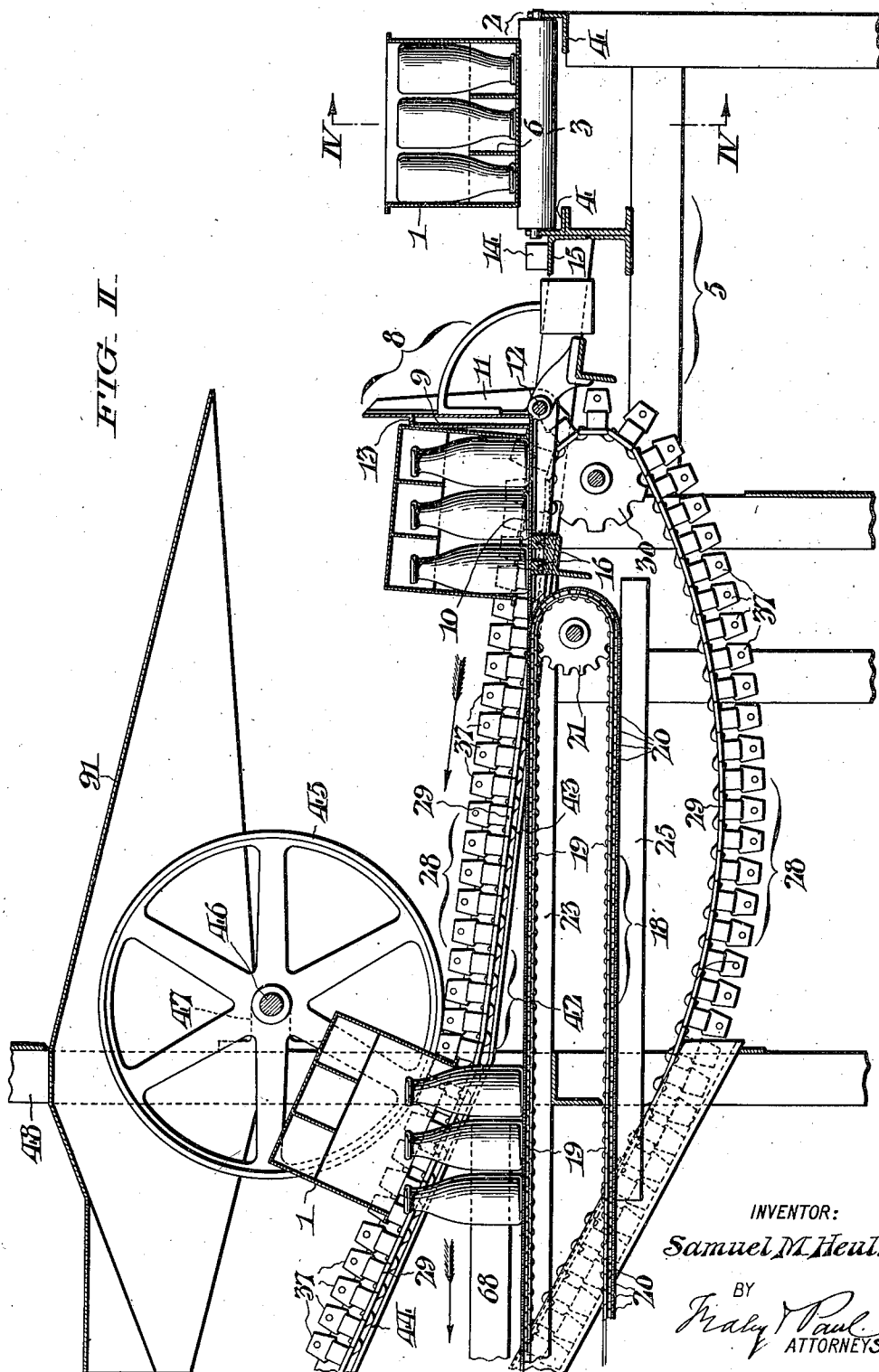
S. M. HEULINGS

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6 Sheets-Sheet 2

FIG. II.



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6 Sheets-Sheet 3

FIG. III.

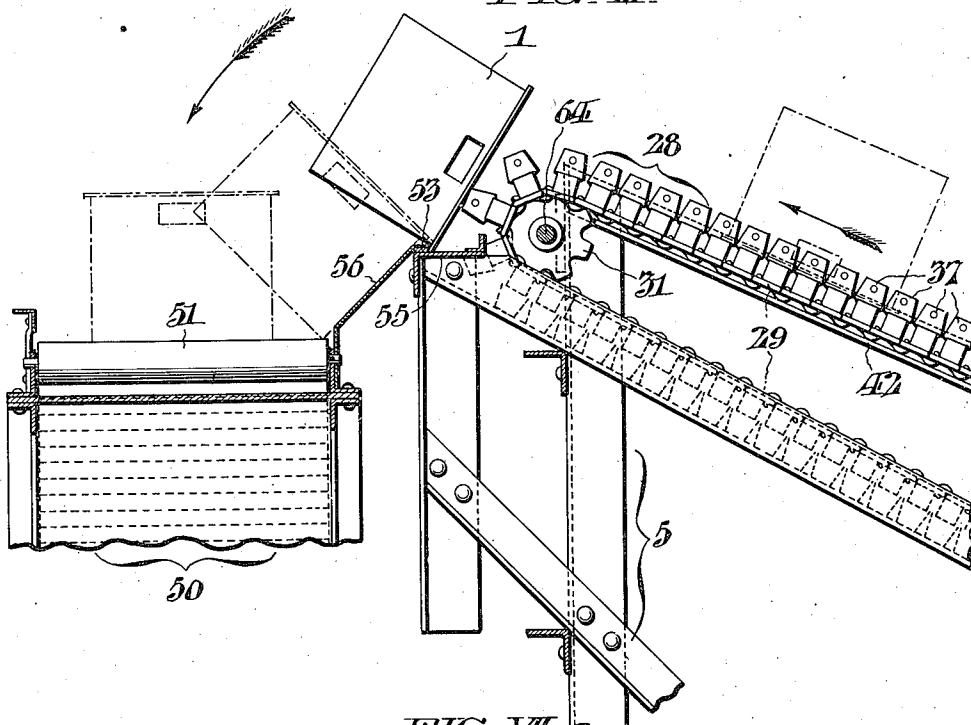


FIG. VII.

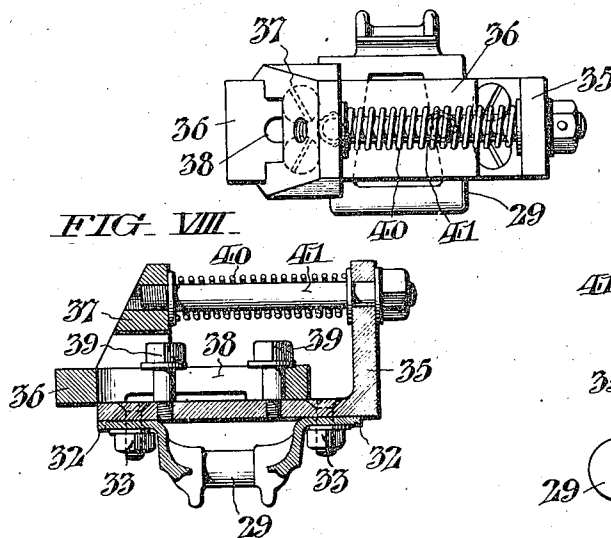
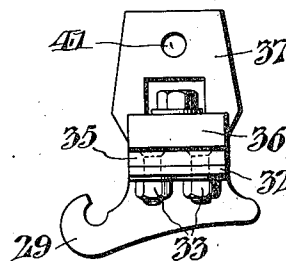


FIG. VIII.

FIG. IX.



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S. M. HEULINGS
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6 Sheets-Sheet 4

FIG. IV

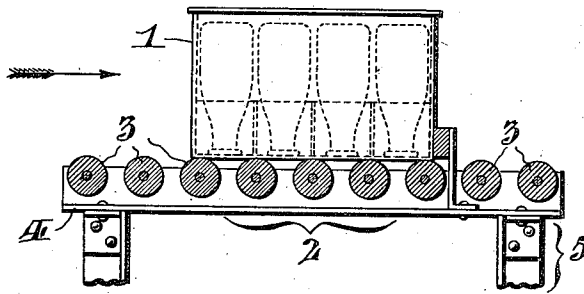
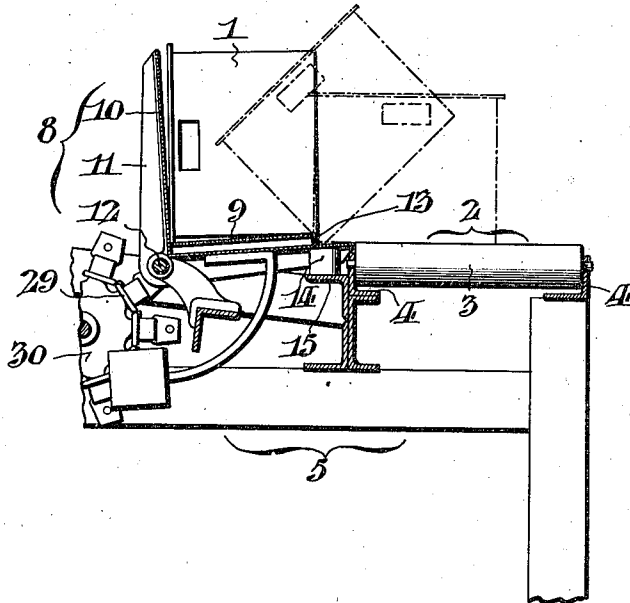


FIG. V



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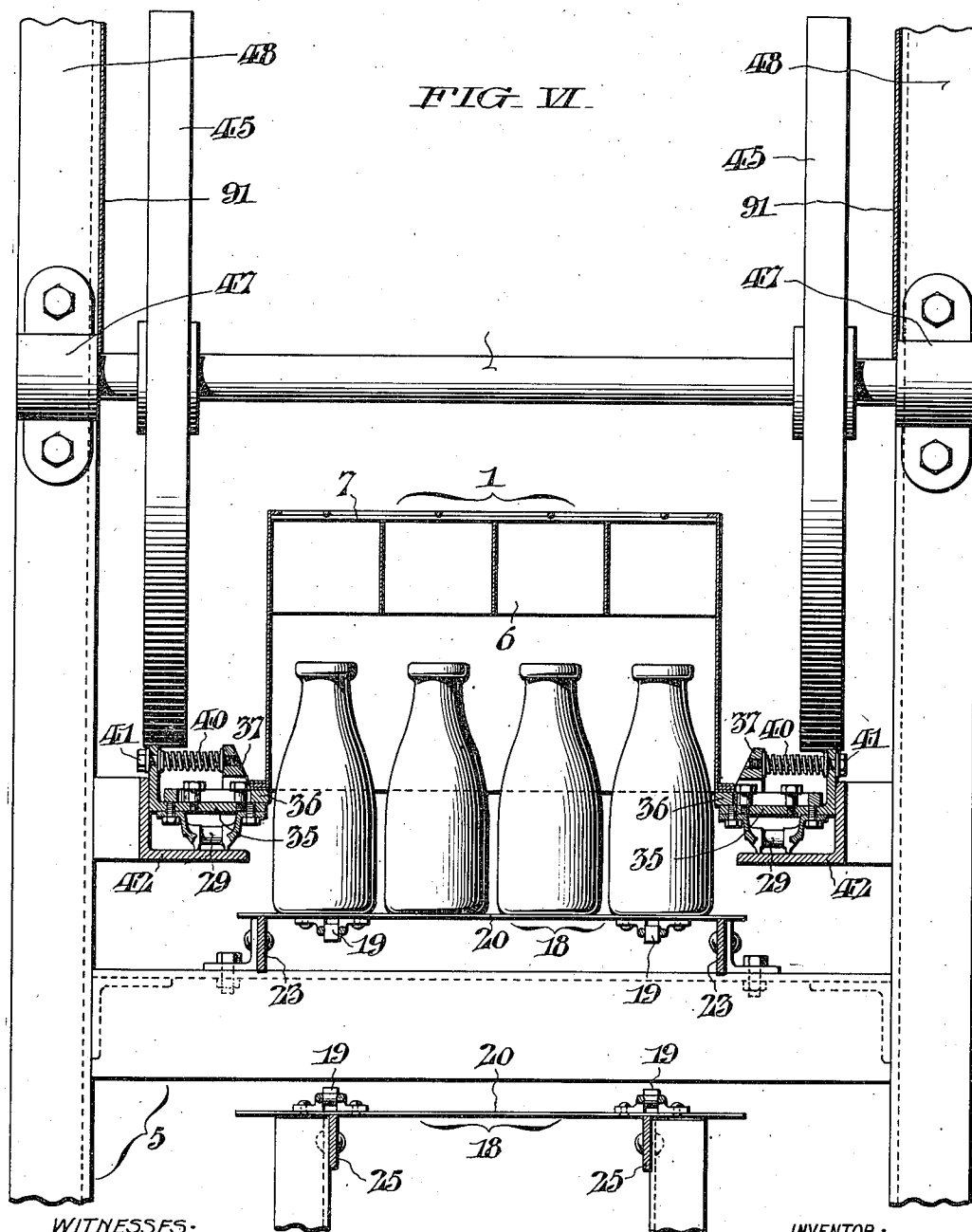
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S. M. HEULINGS
CASE EMPTYING MACHINE

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6 Sheets-Sheet 5



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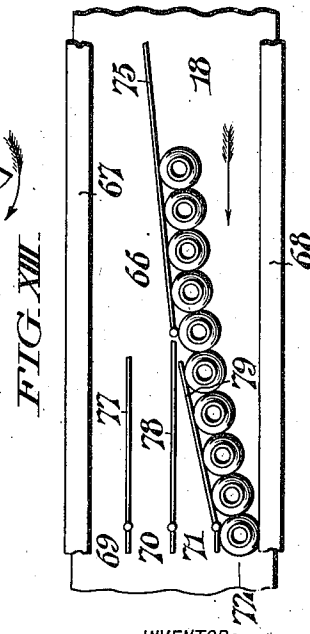
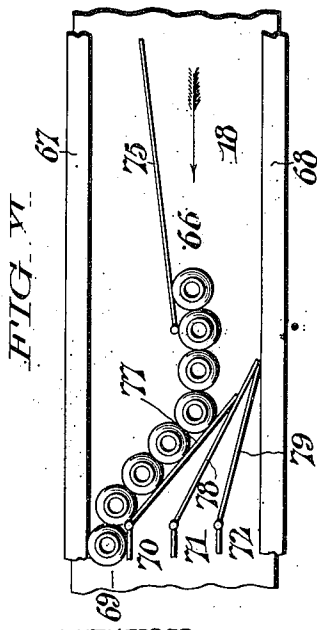
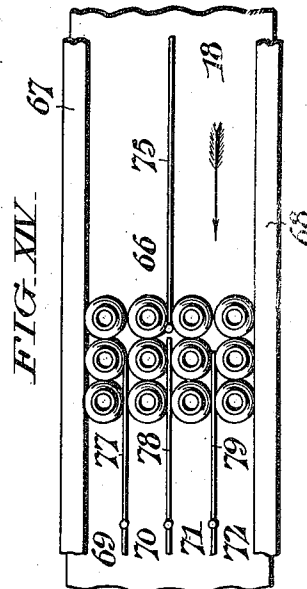
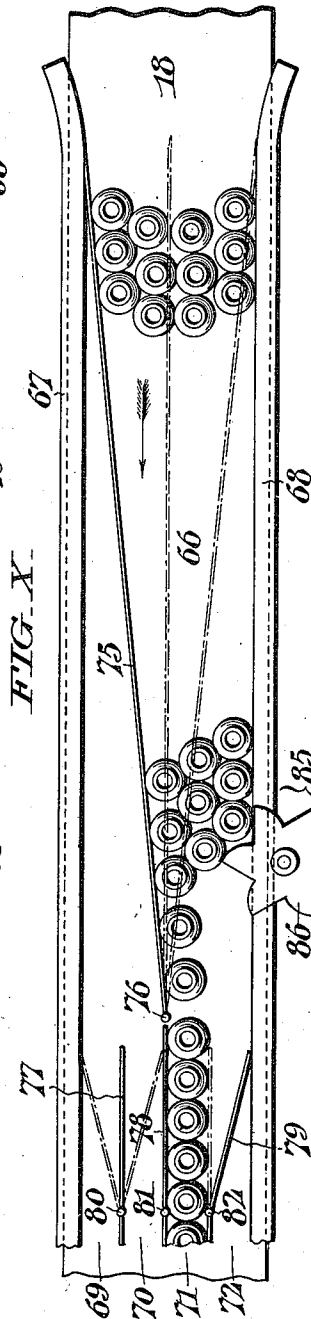
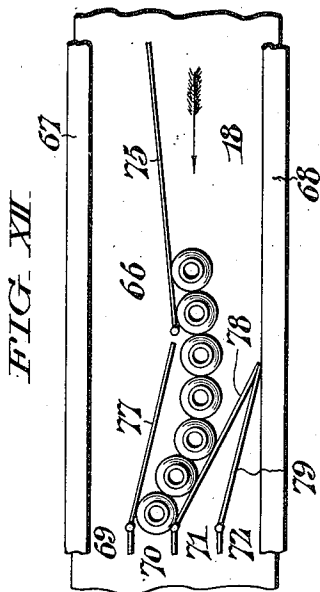
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S. M. HEULINGS

CASE EMPTYING MACHINE

Filed March 19, 1920

6 Sheets-Sheet 6



WITNESSES:

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UNITED STATES PATENT OFFICE.

SAMUEL M. HEULINGS, OF HADDONFIELD, NEW JERSEY.

CASE-EMPTYING MACHINE.

Application filed March 19, 1920. Serial No. 387,225.

To all whom it may concern:

Be it known that I, SAMUEL M. HEULINGS, a citizen of the United States, residing in Haddonfield, in the county of Camden and State of New Jersey, have invented certain new and useful Improvements in Case-Emptying Machines, whereof the following is a specification, reference being had to the accompanying drawings.

The invention relates to machines for emptying cases of their contents, and its chief object is to provide machines whereby this operation may be quickly accomplished automatically, and the cases and their released charges, transferred separately to convenient points or locations where subsequent operations may be performed upon them. As will become apparent from the detailed description which follows, such machines may be employed to advantage in milk bottling establishments for the purpose of removing the empty bottles, after sterilizing, from the shipping cases in which they are ordinarily handled in dozen lots, so that they may be conveyed to filling machines, and at the same time, of progressing the emptied cases to a point of delivery conveniently accessible for recharging after the bottles have been properly filled and capped.

The invention also comprehends novel means by which the bottles, after being released from the cases as above noted, may be selectively conducted in single file order to any one or multiple of a series of channels leading, for example, to as many different filling machines or other associated apparatus so that the operation of the plants in which the machines are employed may be regulated according to the output required of them.

In the accompanying drawings, Fig. I, is a side elevation of a case emptying machine conveniently embodying my invention.

Fig. II, is a longitudinal sectional view upon an enlarged scale through the receiving end of the machine.

Fig. III, is a similar sectional view of a portion of the delivery end of the machine showing the manner in which the empty cases are delivered to a discharge guideway.

Fig. IV, is a detail cross section viewed in the direction of the arrows IV—IV in Figs. I and II.

Fig. V, is a view similar to Fig. II, somewhat more condensed in scope, showing particularly the tilting table by aid of which

the filled cases are transferred in inverted position to the means for progressing them through the machine.

Fig. VI, is a cross sectional view through the machine indicated by the arrows VI—VI in Fig. I.

Figs. VII, VIII and IX, are detail views on an enlarged scale, of one of the link structures employed in the sprocket chains of the conveyor by which the cases are progressed through the machine, and at the same time lifted from about the dumped contents.

Fig. X, is a view, more or less diagrammatic, showing in plan the guide passage through which the discharged bottles are progressed after being released from their cases.

Figs. XI, XII, XIII and XIV, are illustrations similar to Fig. X showing various arrangements of the switches by which the bottles may be diverted in single file order from the main guide passage to any one or multiple of a series of separate discharge channels.

The filled cases 1, with the bottles up side down or inverted therein are delivered to the machine over a trestle such as indicated at 2, in Figs. I, II and IV. This trestle may lead, for example, from a sterilizing chamber wherein the milk bottles are cleansed in a well known manner preparatory to refilling. Said trestle comprises a series of spaced, freely revolving rollers 3, which are journaled between angles 4, 4, forming parts of the structural frame 5, of the machine. As will be noted more particularly from Fig. VI, the bottle cases 1, are constructed of thin sheet material provided with a cellular insert 6, by which the bottles are maintained in separated relation. The bottoms of these cases are formed of wire mesh 7, so that if desired, sterilizing may be accomplished without necessitating removal of the bottles for this purpose. As here shown, the tops of the cases are open.

In order to permit the ready separation of the cases and their contents in the course of progression through the machine, the filled cases are transferred to the conveying means in inverted position. For this purpose I have provided a tilting table 8, which as best seen in Figs. II and V, comprises two supporting plates 9 and 10, arranged at right angles and sustained by angular brackets 11. These brackets are fulcrumed about a rod 12, extending transversely of the frame struc-

ture. Near its outer edge, the plate 9 is offset to provide a ledge or shoulder 13. When the tilting table is automatically turned under the influence of any appended counterweight to the receiving position shown in Fig. V, the main portion of the plate 9, occupies a level somewhat above the top of the rolls 2. Thus as the cases are shifted forward upon said rollers by the operative in feeding the machine, the shoulder 13, serves as a stop about which the cases are manually swung, as suggested in broken lines in Fig. V, and turned upon their sides in being transferred to the tilting table. When in the position just described, the tilting table is supported upon buffer stops 14, set upon transverse bars 15, of the structural frame 5, of the machine. After this initial positioning of the bottle cases upon the tilting table, the latter is swung about its fulcrum through substantially an angle of 90°, the extent of this motion being determined by a second set of buffer stops 16, upon the opposite side of the rod 12. This inversion of the cases 1 has the effect of righting the bottles therein. When thus turned, the upper surface of the plate 10, of the tilting table serves as a continuation of the top surface of an endless conveyor, represented comprehensively by the numeral 18, by which the bottles are advanced through the machine. This conveyor comprises a pair of spaced sprocket chains 19, 19, (see Fig. VI.) to the respectively coordinated links of which are attached transverse bridging plates 20. These plates serve to form a continuous supporting surface or belt for the bottles during their traverse through the machine. The chains 19, are guided over sprockets 21 and 22, respectively disposed at opposite ends of the machine. The upper or active run of the conveyor 18, is sustained near its edges by longitudinally running rails 23, 23, rigidly attached to the frame of the machine, and which engage the under sides of the plates 20. The lower run of said conveyor is similarly sustained through a proportion of its extent, at the feed end of the machine, by rails 25, 25. The span between the ends of the rails 25, and the sprockets 22, is sustained through the assistance of idler drums 26 and 27.

A second endless conveyor comprehensively indicated by the numeral 28, is adapted to advance the cases through the machine independently of the progression of the dumped contents. This conveyor also comprises a pair of spaced sprocket chains 29, 29, (see Fig. VI.) running over sprocket wheels 30, 31 (Fig. I.). The chains 29, 29, are composed of a series of special links, the details of which are clearly shown in Figs. VII, VIII and IX. Dwelling for a moment at this point to study the structure of said links, it will be seen that each is provided

with integral lug extensions 32, 32, to which is attached, by means of screw bolts 33, a right angled bracket piece 35. Slidably mounted upon the horizontal leg of said angular bracket 35, is a plate 36, formed with an integral beveled projection 37. The plate 36, is slotted as indicated at 38, for cooperation with stud bolts 39, by which guidance is effected. The projection 37, is pressed in a direction away from the vertical legs of the bracket 35, by means of an interposed spring 40, encircling a guide bolt 41, the head of which, by virtue of its engagement with the outer face of the vertical leg of the bracket 35, serves as a stop to maintain the parts normally in the position illustrated in Fig. VIII. From Fig. VI, it will be noted that when the links are assembled to form the conveyor chains 29, upon both sides of the machine, the bevel faces of the projections 37, are disposed relatively in opposition. Thus when the cases are transferred to the conveyor, the spring pressed slide plates will yield under the cam action of the inclined surfaces of the projections so that the (now) lower edges of the inverted open-topped cases will be engaged or grasped and supported between them and consequently carried along by the conveyor 28. Referring now to Figs. I, II and VI, it will be seen that the upper run of the chains 29, 29, are sustained in angle iron guideways 42, 42, rigidly attached to the frame 5, and that these guideways are each formed in two segments represented at 43 and 44. The segment 43, it will be noted, is slightly divergent with respect to the upper surface of the bottle conveyor 18, to permit initially, the gradual ready withdrawal of the cases from about the larger lower portions of the dumped bottles, while the segment 44 is inclined more abruptly so as to elevate the case more rapidly after the point where all further probability of interference with separation or of capsizing of bottles is passed. Thus the cases 1 are progressively withdrawn upward from about the righted bottles,—or the bottles progressively withdrawn downward and released from the cases,—as the cases are progressed above the substantially horizontal conveyor 18, at first gradually and then more abruptly. In order to restrict the conveyor chains 29, 29, to travel positively along the course of the guideways 42, I have provided at the junctures of their composite segments 43, 44, idler wheels 45, adapted to engage the chains to hold them positively to the desired path of travel. These idler wheels 45, are mounted upon a shaft 46, journaled in bearings 47, secured to the up-rights 48, of the machine frame 5.

The empty cases after being elevated by the conveyor, as above noted, are permitted to drop into a discharge chute 50, (Fig. I)

with which is associated a roller trestle 51, similar to the receiving trestle previously described. This roller trestle 51, is inclined downwardly away from the observer, as indicated by the shading in Fig. I, so that the cases may roll by gravity to any convenient point for recharging after the bottles have been filled. It is desirable that the cases be delivered to the discharge channel in upright position, and in order to accomplish this purpose, I propose to break the fall of the cases as they drop from the conveyor 28, by interposing, as shown in Fig. III, a stop ledge 53, which is mounted upon the top of a cross piece 55. During such action, the stop ledge engages one of the edges of the cases, so that they are turned about the same as a pivot, and gradually righted as they fall to the final position upon the discharge trestle 51. The turning of the cases is further facilitated by a deflecting plate 56, in a manner clearly shown in Fig. III.

The bottle conveyor 18, and the case conveyor 28, are operated in practice, at substantially the same speed rate, such actuation being effected through a driving system which includes a main driving shaft 60, journaled in appropriate bearings on the frame 5, of the machine. This shaft may be driven from any convenient source of power, and transmits its motion through a chain connection represented conventionally at 61, in Fig. I, to the shaft 62, upon which the sprockets 22, for the bottle conveyor 18, are mounted. The actuation of the case conveyor is effected from the same source by means of a chain 63, which transmits motion to a shaft 64, upon which the sprockets 31, for said conveyor are mounted. The connections just described are preferably enclosed by a protective guard 65, so as to prevent splashing of oil or grease upon the bottles during their traverse through the machine.

After being delivered upon the conveyor 18, the bottle groups are progressed through a guide passage 66, bounded upon the sides by guard rails 67, 68, which run longitudinally of the frame structure at a level somewhat above the top of the conveyor, see Figs. II, X, XI, XII, XIII and XIV. The passage 66, thus formed leads to a series of discharge channels 69, 70, 71 and 72, adapted to receive the bottles in single file, and through which the bottles may be conducted to as many different filling machines or to any other associated apparatus, over an interposed connecting table, a portion of which is shown at 73, in Fig. I. This table merely serves as a continuation of said channels and is provided with a series of conveyor belts, such as indicated at 74, in said figure. The cases, ordinarily employed in milk bottling establishments, are adapted to contain a dozen bottles arranged in four rows of

three each, and the bottles are deposited in this order upon the conveyor 18, when the cases are dumped as previously described. For the purpose of gradually breaking up these bottle groups, and permitting selective diversion to any one or multiple of the outlet channels 69, 70, 71 and 72, I have provided a series of switches including a main switch 75, which is pivoted at 76, centrally of the guide passage, and a series of secondary switches 77, 78 and 79, which are pivoted respectively at 80, 81 and 82, in line with the partitions between the discharge channels. When these switches are arranged in parallelism according to the diagram of Fig. XIV, it will be seen that the bottle groups are left undisturbed and that they travel along the guide passage in the same order in which they are deposited upon the conveyor, and readily find their way in equal distribution to the several discharge channels. If it be desired for example, to divert the bottles only to the channels 71 and 72, this may be effected by swinging the main switch 75, to the full line position illustrated in Fig. X, and leaving the secondary switch 79, in the normal position indicated in broken lines. By virtue of the attenuation effected in the guide passage by positioning the main switch as above suggested, the bottle groups will automatically resolve themselves into two rows in the course of their approach to the channels 71 and 72.

By swinging the main switch to the opposite side of the guide passage, it will be seen that the bottles may be as readily diverted to the channels 69 and 70. As other alternatives, if it be desired to employ any one of the channels 69, 70, 71 or 72 separately, this may be accomplished by arranging the various switches to the different full line positions shown in Figs. X, XI, XII and XIII, the resultant effects thus obtained being so obvious from the illustrations that further detailed description is thought unnecessary.

In practice, it is sometimes a difficult matter to cause milk bottle groups to be broken up for delivery in a single file order, because of the interference of raised letters, which are ordinarily molded upon the outer surfaces of the bottles for advertising or ornamental purposes. For this reason, such bottles will not roll about each other freely when caused to move through an attenuated passage, the projecting lettering or ornamentation invariably causing interlocking with attendant breakage. In order to overcome this difficulty, I have provided a rotating element in the form of a turning device 85, comprising two spaced star disks 86 and 87, the one projecting into the bottle passage above, and the other below the guide 68. This element rotates, as shown by the arrow in Fig. X, in a counterdirec-

tion to the movement of bottles, and is driven through a bevel gear connection 88 (Fig. 1) from a shaft 89, actuated directly from the main shaft 60, through a sprocket chain 90.

5 The action of this turning device induces a counterrolling of the outer lines of the bottles, and thus tends to prevent clogging of the passage, when congested as shown in Fig. X. Except when feeding the channels
10 69, 70, 71 and 72, separately, the turning device may be removed entirely.

At the region of the mounting of the idler wheels 45, the structure is provided with a protective canopy 91, which overhangs substantially the whole of the receiving end of
15 the machine.

The guide passage for the bottles is similarly overhung by protective canopies 92, 93. These canopies serve to prevent infection from over head drippings either from
20 the cases or the conveyor 28.

Having thus described my invention, I claim:

1. A bottle case emptying machine, comprising, in combination, a conveyor with means for grasping and supporting the lower edges of inverted cases; and a conveyor travelling beneath the cases so progressed serving to support and progress the bottles
30 along a course divergent from that of the cases, so that the cases are progressively withdrawn from about the bottles.

2. A bottle case emptying machine comprising, in combination, a substantially horizontal conveyor for supporting and progressing bottles; and means for supporting inverted cases initially containing said bottles and progressing them above said conveyor along a course diverging upward therefrom at first gradually and then more abruptly, so as at first to withdraw the cases from about the lower portions of the bottles without interference or capsizing of bottles, and then effect more rapid separation of
45 cases and bottles.

3. A case emptying machine comprising means for progressing a filled case in inverted position and for at the same time causing the case and the dumped contents to travel respectively along vertically divergent paths, the relative deviation being maintained at an easy angle initially to prevent interference with withdrawal, and thereafter being more abrupt to effect complete separation more rapidly.
55

4. A case emptying machine comprising means for progressing a filled case in inverted position, said means including a conveyor for supporting and advancing the dumped contents of the case and a second conveyor for independently supporting and advancing the case, the course of the latter conveyor being divergent from that of the first conveyor, and the relative deviation
65 being comparatively slight initially to pre-

vent interference to withdrawal of the case, and thereafter being more abrupt to effect complete separation more rapidly.

5. A case emptying machine comprising means for progressing a filled case in inverted position, said means including a conveyor for supporting and advancing the dumped contents of the case and a second conveyor for independently supporting and advancing the case, the course of the latter conveyor being divergent from that of the first mentioned conveyor and the relative deviation being comparatively slight initially to prevent interference to withdrawal of the case, and thereafter being more abrupt to effect complete separation more rapidly; in combination with guideways for sustaining the case conveyor; and co-operative means for positively holding the conveyor to said guide ways at the region of the change of inclination in the course of its travel.
75 80 85

6. A case emptying machine comprising means for progressing a filled case in inverted position, said means including a conveyor for supporting and advancing the dumped contents of the case and a second conveyor for independently supporting and advancing the case, the course of the latter conveyor being divergent from that of the first conveyor and the relative deviation being comparatively slight initially to prevent interference to withdrawal of the case, and thereafter being more abrupt to effect complete separation more rapidly; in combination with guideways for sustaining the case conveyor; and co-operative idler wheels for positively holding said conveyor to said guide ways at the region of the change of inclination in the course of its travel.
90 95 100 105

7. A case emptying machine comprising, in combination, means for progressing a case and its contents along divergent paths to effect complete separation; and means for receiving the filled cases and transferring them to said progressing means in inverted position.
110

8. A bottle case emptying machine comprising, in combination, means for receiving open-topped cases with inverted bottles therein and transferring said cases in inverted position with the bottles therein righted; means for supporting and progressing the inverted cases receiving them from said first mentioned means; and a conveyor travelling beneath the cases so progressed serving to support and progress the bottles along a course divergent from that of the cases, so that the righted bottles are progressively withdrawn from the cases.
115 120 125

9. A bottle case emptying machine comprising, in combination, a substantially horizontal conveyor for supporting and progressing bottles; means for supporting cases
130

initially containing said bottles and progressing them above said conveyor along a course divergent upward therefrom, to progressively withdraw the cases from about the bottles; and means for breaking up the group formation of the bottles and delivering them in single file order as they are carried along by said conveyor after their release from the cases.

10. A bottle case emptying machine comprising, in combination, a substantially horizontal conveyor for supporting and progressing bottles; means for supporting cases initially containing said bottles and progressing them above said conveyor along a course divergent upward therefrom, to progressively withdraw the cases from about the bottles; means forming a guide passage for bottles terminating in a plurality of separate channels each adapted to receive bottles in single file order; and means for breaking up the group formation of the bottles, as they are carried along the guide passage by said conveyor after their release from the cases, and selectively diverting them to one or more of said channels.

11. A bottle case emptying machine comprising, in combination, means for receiving open-topped cases with inverted bottles therein and transferring said cases in inverted position with the bottles therein righted; means for supporting and progressing the inverted cases receiving them from said first mentioned means; a substantially horizontally conveyor travelling beneath the cases so progressed serving to support and progress the bottles along a course divergent from that of the cases, so that the righted bottles are progressively withdrawn from the cases; and means for breaking up the group formation of the bottles and delivering them in single file order as they are carried along by said conveyor after their release from the cases.

12. A case emptying machine including, in combination, means for progressing filled cases; means for delivering the filled cases successively to a point adjacent the receiving end of the said progressing means; and means for receiving the cases from the delivering means and transferring them to said progressing means in inverted position, the latter means comprising a tilting table having two supporting surfaces arranged in quadrant relation and adapted to be swung substantially through a right angle about a fixed fulcrum, one of said surfaces having a stop ledge in the path of the cases as they are advanced from the delivering means about which the said cases may be turned upon their sides in being mounted upon said table, so that upon subsequent swinging of the latter the cases shall be delivered to the progressing means in inverted position.

13. A bottle case emptying machine comprising means for progressing bottles in group formation, as released from cases, to a guide passage, said passage terminating in a series of separate channels each adapted to receive the bottles in single file order; and means for breaking up said group formation and selectively diverting the bottles to enter any one or any multiple of said channels.

14. A bottle case emptying machine comprising means for progressing bottles in group formation, as released from cases, through a guide passage, said guide passage terminating in a series of separate channels each adapted to receive bottles in single file order; and a group of switches for breaking up said group formation and diverting the bottles to enter one or any multiple of said channels.

15. A bottle case emptying machine comprising means for progressing bottles in group formation, as released from cases, through a guide passage, said guide passage terminating in a series of separate channels each adapted to receive the bottles in single file order; and a main switch centrally pivoted in said guideway and capable of being swung to one side or the other of a central neutral position to break up the aforesaid group formation and divert the bottles to enter the corresponding ones of said channels.

16. A bottle case emptying machine comprising means for progressing bottles, as released in group formation from cases, through a guide passage, said passage terminating in a series of separate channels adapted to receive the bottles in single file order; selective means by which the bottles may be diverted to enter any one of said channels; and a rotary element turning in a direction opposite to that of the travel of the bottles for inducing counter rotation between bottles of adjacent rows to prevent jamming in the course of the breaking up of the groups to single file order.

17. A bottle case emptying machine comprising an inclined endless conveyor for gradually lifting an inverted case from its dumped contents during simultaneous progression through the machine, said conveyor comprising a pair of spaced endless sprocket chains having links with sliding members capable of yielding relatively in such manner as to receive and hold the cases between them to effect their progression through the machine.

18. A bottle case emptying machine comprising an inclined endless conveyor for gradually lifting an inverted case from its dumped contents during simultaneous progression through the machine, said conveyor comprising a pair of spaced endless sprocket chains, the links of said chains being provided with spring pressed sliding members

having beveled surfaces disposed in opposed relation upon the respective chains so as to be capable of receding under tension automatically to receive the cases between them
5 and thereafter of holding the cases to effect their progression through the machine.

19. A bottle case emptying machine comprising, in combination, means for progressing a case and its contents along divergent
10 paths to effect complete separation; a guide passage for progression of the bottles in group formation as released, said guide passage terminating in a plurality of separate

channels each adapted to receive bottles in single file order; and means for breaking up 15 the aforesaid group formation and selectively diverting the bottles to any one or more of said channels.

In testimony whereof, I have hereunto signed my name at Philadelphia, Pennsylvania, this seventeenth day of March 1920. 20

SAMUEL M. HEULINGS.

Witnesses:

JAMES H. BELL,
E. L. FULLERTON.