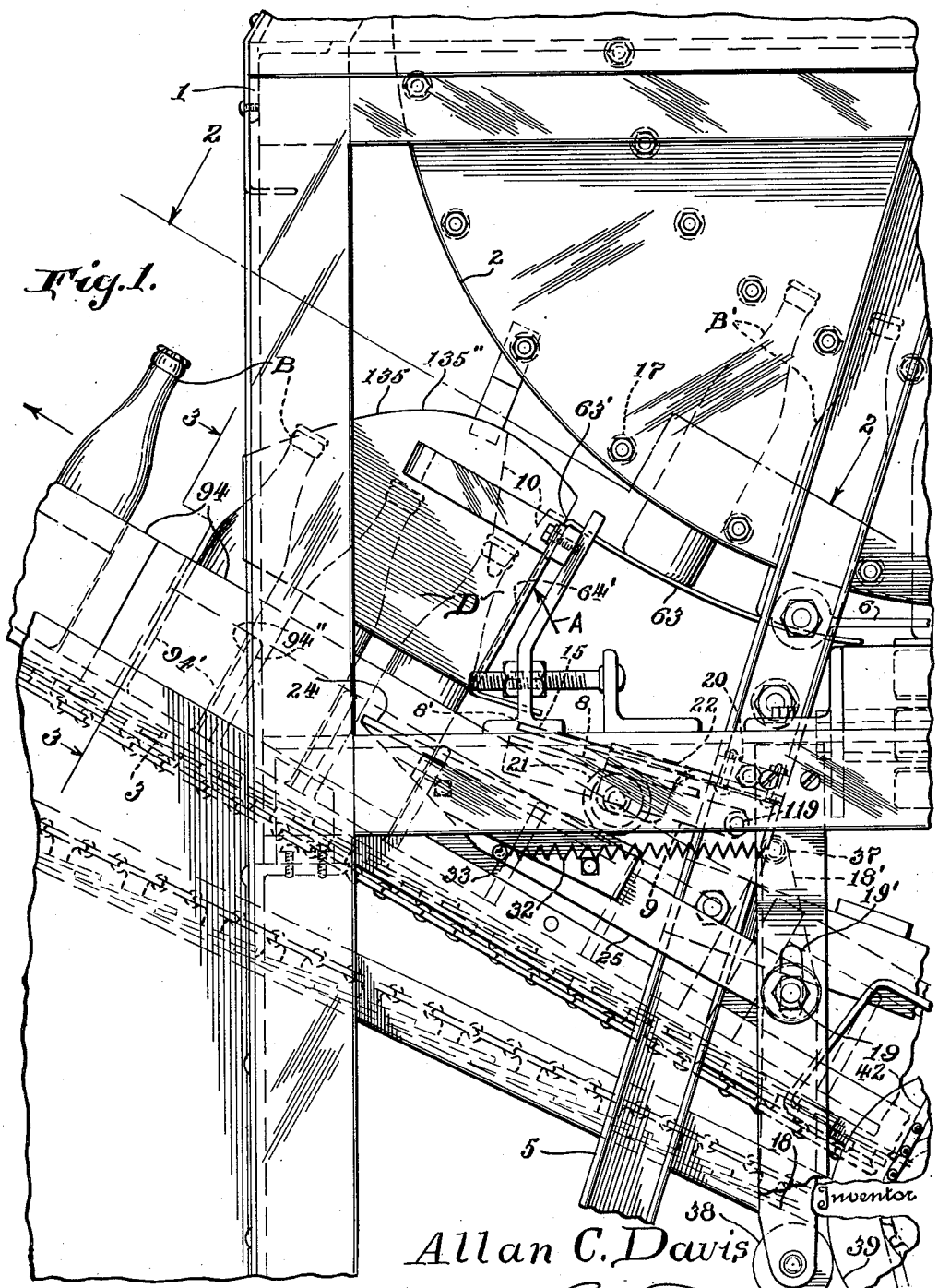
May 11, 1943. A. C. DAVIS 2,318,927

CASE FILLING MACHINE

Filed Nov. 10, 1939 4 Sheets-Sheet 1

Fig. 1.



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May 11, 1943. A. C. DAVIS 2,318,927

CASE FILLING MACHINE

Filed Nov. 10, 1939 4 Sheets-Sheet 2

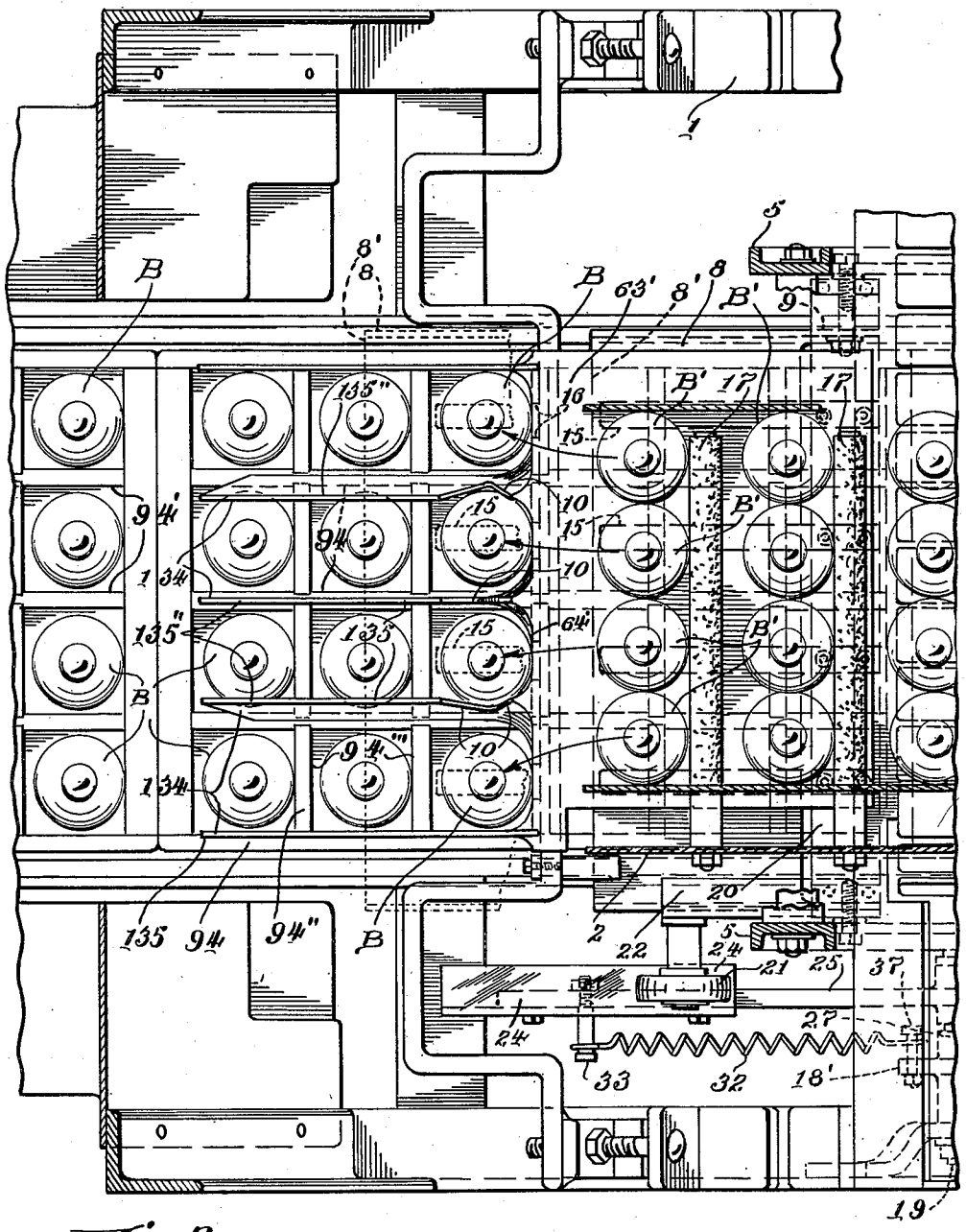


Fig. 2.

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May 11, 1943. A. C. DAVIS 2,318,927

CASE FILLING MACHINE

Filed Nov. 10, 1939 4 Sheets-Sheet 3

Fig. 3.

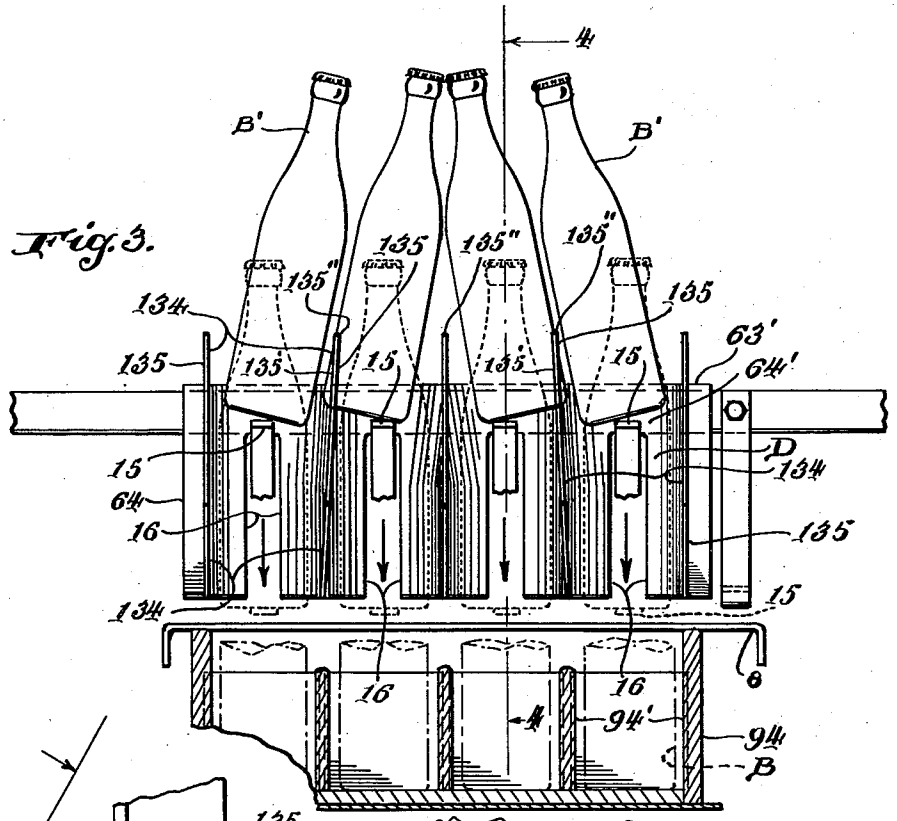
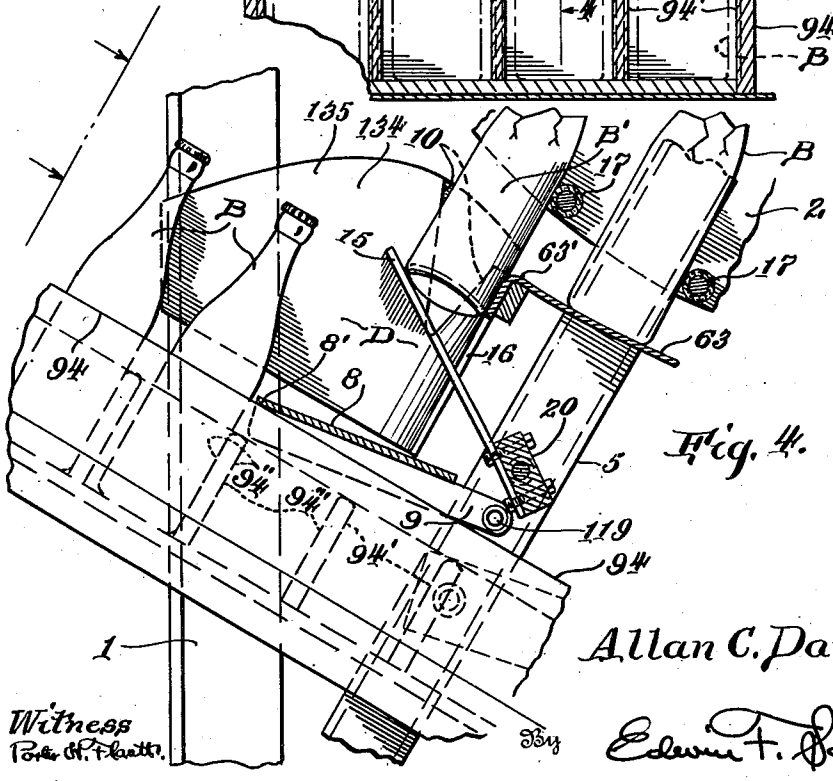


Fig. 4.



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May 11, 1943. A. C. DAVIS 2,318,927

CASE FILLING MACHINE

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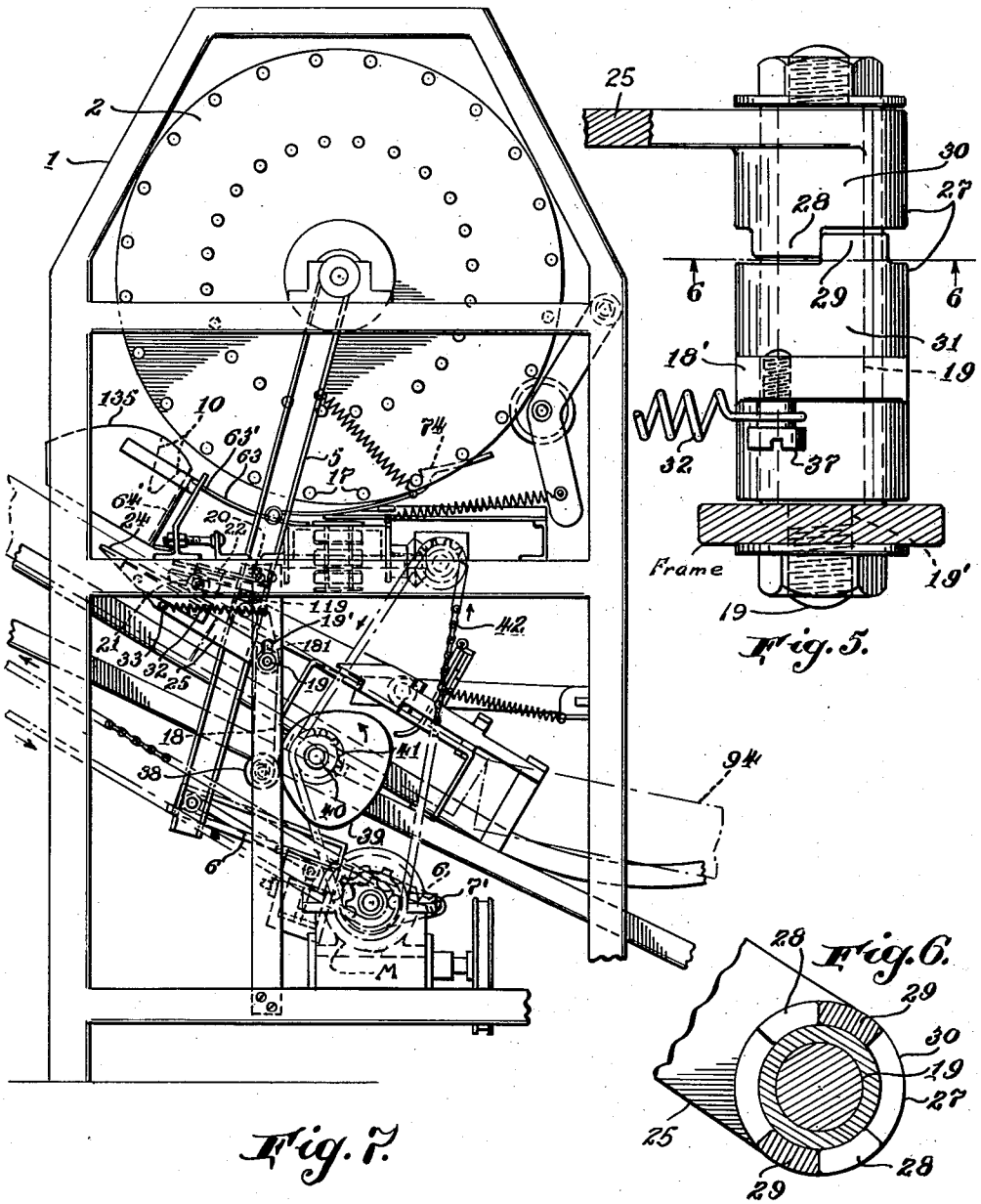


Fig. 7.

Fig. 5.

Fig. 6.

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UNITED STATES PATENT OFFICE

2,318,927

CASE FILLING MACHINE

Allan C. Davis, Baltimore, Md., assignor to F. A. Davis & Sons, Baltimore, Md., a partnership

Application November 10, 1939, Serial No. 303,727

18 Claims. (Cl. 226—14)

The invention relates to a machine for filling cases with bottles. In the operation of the machine, the filled bottles are advanced and deposited in the cases somewhat as described in my co-pending application No. 256,068, filed February 13, 1939, which includes a bottom supporting plate beneath the magazine from which the bottles are dropped by way of a chute on to a dropping plate which dropping plate 8 is subsequently withdrawn dropping these bottles by a second step into the case.

While the machine illustrated in the previous application was, and is, highly satisfactory in operation, solving and overcoming many difficulties of the prior art, there are instances in which the bottles, generally of partially defective construction, are broken by the shock incident to dropping, necessitating stoppage of the machine to remove the fragments of the broken bottle, or, at times a bottle is cracked, resulting in leakage and, in some instances, the shipment of defective cases which must be replaced. The term, bottles, has been used mainly for convenience and brevity and because bottles are more subject to breakage from impact due to dropping than metal and paper packages.

In the further improved apparatus herein described, the shock incident to dropping has been reduced to the minimum, completely eliminating the tendency to break and crack the bottles. Other improvements have been added whereby the tendency of the bottles to hang on the dividing partitions between the chutes is overcome and misplaced bottles advanced.

In the accompanying drawings, I have illustrated so much of a case filling machine of the type above identified as is necessary to a complete understanding of the construction and operation of the improvements of the present invention, the machine shown being, at present, regarded as the preferred form.

In the drawings:

Fig. 1 is a fragmentary side elevation of the machine illustrating the application of the novel features to which the invention relates.

Fig. 2 is a view in the nature of a plan looking downwardly in the direction of the arrows from the line 2—2 in Fig. 1. Portions of the machine, particularly the frame, are also shown in section on said line.

Fig. 3 is a view looking at the dropping mechanism from the line 3—3 in Fig. 1, and looking in the direction of the arrows, one of the boxes or cases being shown in section on said line.

Fig. 4 is a fragmentary section in a plane parallel to the plane of Fig. 1, and looking in the same direction, the view being a section on the line 4—4 in Fig. 3, looking to the left in said figure.

Figs. 5 and 6 are detail views of the lost motion coupling.

Fig. 7 is a diagrammatic side elevation corresponding to Fig. 1, showing the application of the features to be described.

Referring to the drawings by numerals, each of which is used to indicate the same or similar parts in the different figures, the construction shown comprises a frame 1, and a magazine 2, which, as shown, is of the cylindrical type rotating in clockwise direction, as seen in Figs. 1 and 4, with a step by step motion. The magazine is driven by mechanism, an assembly of which, for the purposes of this application is shown in Fig. 7. The particular type of magazine and the driving mechanism therefor are not essential to the present invention viewed in its broader scope, it being particularly noted that other forms of presenting means adapted to deliver the bottles to the chute and dropping mechanism may be adapted for use to a greater or less degree of satisfaction with the novel features to be described.

The cases designated by reference numeral 94, and having spaced partitions 94' are presented in receiving relation to the dropping mechanism by means of a conveyor 3.

It is also to be noted that the present apparatus in the form illustrated comprises an arm 5 which is oscillated about the center of the magazine, the arm or lever shown being similar to that disclosed in the co-pending application. The drawing also includes a ratchet and pawl or similar means 74 whereby the oscillation of the arm 5 or other reciprocating motion is transmitted to the magazine 2 as a step by step forward clock-wise motion thereof neither the direction nor the details of the mechanism is material. The crank 7', motor M, and connecting rod 6 whereby the arm 5 is oscillated are disclosed diagrammatically in Fig. 7 because the present invention relates mainly to the dropping mechanism.

The bottles B being supported on the supporting plate 63 are, in the form shown, advanced with a step by step motion by the magazine 2, being moved from the plate 63 at the forward end of the same indicated by 63'. At this point, the support 63 is deflected downwardly, or a downwardly disposed plate is introduced, providing a slide plate 64' which forms the rear wall of the chutes 134, which are separated by guide plates 135.

It is of importance to note that in this machine, the guide plates 135 are provided adjacent the slide plate 64' and immediately forwardly of the same with slots 10 which are shown as tapering downwardly from the top edges 135'' of the plates 135.

These slots, as shown, and preferably are of downwardly reducing taper. The slots 10 serve a funnel like function in guiding the bottles, some of which may be laterally displaced, into the adjacent chutes 134, a somewhat exaggerated illustration of this function appearing in Figs. 3 and 4.

It is also of interest that the plates 135' of the series of plates 135, i. e., those on each side of the center plate, are deflected inwardly as to their top portions. This deflection serves to lead outwardly and downwardly the end bottle of the row B' to give the increased spacing of the bottles B in the cases as compared to the contact row B'. This deflection permits the two bottles near the center, as well as those at the ends of each row, to become separated from the position at B' in Fig. 2 to the position B in the cases, Fig. 2.

The dropping plate 8 which, in operation, is closely similar to the dropping plate 8 of the co-pending application, normally rests at its forward edge 8' on the top edges of the side walls of the case 94, being filled, or at times on the case immediately following the one just filled. These cases are, in the normal operation of the machine, fed continuously upwardly to the left in Figs. 1 and 4 by means of conveyor 3 assisted by other mechanism, a form of which is shown in the co-pending application.

The plate is mounted on or provided with rearwardly extending arms 9, shown as pivotally connected at 119 to the oscillating arms 5 whereby a continuous oscillation of the supporting plate 8, along the cases 94, is accomplished.

While the plate 8 serves a supporting function in the previous application, its function in the construction here shown is mainly to prevent dislocation of the bottles when and if a case partition 94'' may be displaced or destroyed. It also helps to clear the dropping area and serves an important purpose, in instances where the cases are partially defective, the dividing partitions being missing or displaced. In such instances the case feeding mechanism of the previous application which engages the partitions might fail to sufficiently advance the defective cases or fail to properly position them, or some of them, to receive a corresponding load of bottles. The plate 8, in this instance, engages the rear side of the bottles of the row just ahead of the area about to be loaded thereby serving to hold the case, or the next compartment 94''' therein, in receiving relation to the bottle dropping mechanism, i. e., thus engaging the bottles, the plate 8 advances the cases to receiving position for the next row of bottles, dropping back to the original position on the back stroke of arms 5.

An important function, that of reducing the shock which tends to break some of the packages, most particularly, defective bottles, as they are dropped, is performed by the bottle easing fingers 15, best illustrated in Figures 2, 3, and 4, and particularly, the latter. These fingers when advanced beneath the bottles as in Figure 4, in the cycle of operations to be described project through slots 16 in the slide plate 64', each slot 16 being in the center of the rear (see Figure 3) end wall of one of the chutes 134. The said slots 16 extend upward almost vertically, being a little wider than the easing fingers 15 so that the fingers move freely in the slots (see Figure 3).

The motion of the fingers 15 herein specifically described is believed to be one whereby said fingers contribute to the maximum of efficiency in the easing operation. This motion, which is subject to variation according to conditions presented, consists in advancing the fingers 15 in a manner to be hereafter described, causing them to project forwardly and upwardly through the upper portions of slots 16, the fingers being advanced in this way just prior to the dropping of each transverse row of bottles B. The rows of bottles in the position for advancement and dropping in this way are indicated by reference character B' in Figure 2, and in other positions by B, and the transverse bars of the magazine which advance the bottles are indicated by reference character 17.

As the magazine advances, at each forward swing of arms 5, the front row of bottles of the row B' is advanced beyond the bottom supporting plate 63 and the bottles of the row as they descend are suitably separated in lateral direction by the guide plates 135.

The funnel slots 10 have a guiding function in this connection as the bottles B' come to engage and bear on the easing fingers 15, which have been advanced through slots 16 as previously described. These fingers 15 then move downwardly and backwardly to the bottom position illustrated in dotted lines in Figure 3, when they closely approach plate 8, which slides on the top edge of the cases. The fingers are then withdrawn to the rear, the row of bottles B' being deposited in a corresponding row of compartments of the case 94. The cycle of raising and advancing, lowering and retracting, is repeated for each row of bottles. This cycle may be referred to as an orbital motion.

While this motion of the easing of fingers is highly desirable, and of the maximum of effectiveness, as already pointed out, in easing the bottles downwardly with the minimum shock, it may be varied without abandoning the useful function.

The means for operating easing fingers 15 in the manner described will now be discussed:

In accordance with the construction shown, this mechanism includes a cam follower arm 18 which is shown in substantially upright position near the bottom of Figure 1 at the right. This cam follower arm is pivoted on a stud 19 mounted in a slot 19' shown as extending in a vertical direction in the frame. The slot is for adjustment purposes. The lever 18 extends above the pivot 19 providing an upper arm 18'.

The easing fingers 15 are secured to a rocking bar 20 which is suitably mounted, being, in the form shown, pivotally supported on the oscillating arms 5. This bar extends across the machine from one oscillating arm 5 to the other (see Figure 4). This rocking bar 20 is provided with an actuating roller 21 mounted on a bracket arm 22 secured to the rocking bar 20. The actuating roller 21 rolls on the upwardly disposed flat web of an angle iron 24, see Fig. 2, secured to an arm 25, same figure and Fig. 1, which arm 25 is mounted to swing about the pivot 19, being connected to the arm 18 adjacent pivot 19 in any suitable manner allowing sufficient play, as by a lost motion coupling 27 which is shown as concentric with the pivot or stud 19. The coupling 27, Figs. 5 and 6, is of a well known type, the teeth 28 and 29 of each respective coupling mem-

ber 30 and 31 being separated by spaces wider than the teeth on the opposite coupling member.

The arm 25 is resiliently supported in the uppermost position relative to arm 18 permitted by the lost motion coupling 27. Such resilient support may be afforded by a spring 32, see Fig. 2, which is secured at one end to a pin 33 seated forwardly in the arm 25 and at its other end to a pin 37 seated in the upper end of the upwardly projecting arm 18' of follower arm 18.

The follower arm 18 has already been described as pivotally mounted on a stud 19 seated in the frame. At its lower end, which extends well downwardly below stud 19, said arm 18 is provided with a cam follower 38 which is actuated by a cam 39 on a shaft or stud 40. The shaft 40 also carries a sprocket 41 which is suitably connected to the cam 39 to operate same, the sprocket 41 being rotated by a chain 42 which as in the co-pending application may be driven by an electric motor and drives a lateral conveyor for the bottles with which sprocket 41 and the other elements of the machine are timed. Chain 42 is driven by a motor M which operates arm 5 and magazine 2 as aforesaid, the details of the drive being of no particular importance.

The fingers 15 and plate 8 are effective in clearing of misplaced bottles from the area just above the case 94, which is in receiving position, and the spring 32 provides for the yielding of the easing fingers 15 in case the dropping area becomes obstructed by a misplaced bottle or in any manner.

In this way, breaking of the driving mechanism for these fingers is avoided, and the spring also may yield very slightly to prevent shock in the transfer of the bottles downwardly to the case, but the fingers do not materially depart from the motion resulting from cam 39, roller 38, roller 21, arm 25 and angle iron 24. The primary purpose of lost motion coupling 27 and spring 32 is to provide for yielding to prevent breaking in case of obstruction above or in front of fingers 15. The spring 32 normally takes up all play at the coupling 27, keeping the teeth 29 and 29 of said coupling in contact as shown in Figure 5.

It is of interest that when the arms or levers 5 are oscillated to impart to the magazine its motion, the easing fingers 15 are advanced upwardly to the left in the direction of the arrow A in Fig. 1, in correspondence with the motion of the bottles B as they pass along the bottom supporting plate 63 so that the fingers 15 are advanced into and across the path of the bottles of each row B' as they are dropped from the support 63. The fingers 15 move downwardly easing each row of bottles down to the case and are then withdrawn completing the cycle described for each row of bottles dropped.

It may be noted at this time that the rows of bottles as they pass along the support 63, the bottles in each row, being close together as indicated by the row B' in Fig. 2, are separated at the entrance to the dropping area D in Fig. 1, separation being accomplished by the guide plates 135, exaggerated illustration of this operation appearing in Fig. 3, and, as already pointed out, the bottles at this time are guided to their positions in the channels 134 by the plates 135, the slots 10 therein having a funneling tendency in combination with the cylindrical surfaces and the round ends of the bottles which are of a greater diameter than the slots. These slots also serve the very important function of preventing the bottles from hanging on the partitions or plates 135 near the slide plate 64', to which locality this tendency is confined.

While the fingers 15 are advanced and retracted in the direction of the motion of the cases by the oscillation of the arm 5, they are held yieldingly in their upper positions relatively to arm 18, by the spring 32. Their position is further controlled by the cam 39 which is so timed in its operation on the follower 38, that the arm 18 is swung forwardly, i. e., to the left in Fig. 1, raising the roller 21 which runs on the plate or angle 24 supported by the arm 25, as the roller 21 in turn rocks the rocking bar 20 moving the fingers to the uppermost position previously described. This uppermost position coincides with the advanced position above described, the fingers being advanced and elevated to the positions in which they are shown in Fig. 4.

Thereafter, the easing fingers 15 are controlled by the cam 39, follower 38, arm 18, arm 25 and roller 21, rolling on said arm 25, whereby said fingers move in accordance with the cycle already described, i. e., descending from the position shown in full lines in Fig. 4, with the bottles resting on the fingers to the position shown in dotted lines in Fig. 3. The motion to this point in the cycle, thus reached, is accomplished during the advance of the arms to their forward position. From the bottom position, the easing fingers 15, shown in Fig. 3, are withdrawn by the back stroke of the arms 5 which, in the application above cited, are connected to the magazine by a ratchet and pawl device so that the magazine is moved forward with a step by step rotary motion as the arms reciprocate.

The construction and operation of the improvements which constitute the invention having been fully and specifically described, I would have it understood that the specific terms herein are used in a descriptive rather than in a limiting sense, the construction shown being capable of wide variation and such variation being contemplated by the invention, the scope of which is more fully pointed out in the claims.

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

1. In a machine for filling compartment cases with bottles, bottle presenting means adapted to receive and advance successive transverse rows of bottles, the bottles corresponding in number to rows of compartments in the cases, means for moving the presenting means to advance the bottles with a step by step motion, means for supporting bottles as they advance, said support terminating intermediately of the path of said bottles whereby the bottles are dropped in rows, means for positioning the cases with a row of bottle compartments beneath the termination of said support, guiding means for leading the respective bottles of each row from said support to the respective compartments, easing fingers for checking the downward motion of the bottles, means timed with the presenting means for raising the fingers and advancing them into the path of the bottles as they are dropped, said latter means providing a downward motion of the fingers to check the downward motion of the bottles into the case.

2. In a machine for filling compartment cases with bottles, a magazine adapted to receive and advance successive transverse rows of bottles, the bottles corresponding in number to rows of compartments in the cases, reciprocating means for moving the magazine to advance the bottles with a step by step motion, means for supporting bot-

tles in said magazine, said support terminating intermediately of the path of said bottles whereby the bottles are dropped in rows, means for positioning the cases with a row of bottle compartments beneath the termination of said support, guiding means for leading the respective bottles of each row to the respective compartments, easing fingers checking the downward motion of the bottles, means for advancing the fingers into the path of the bottles, the fingers being connected to the said reciprocating means whereby the fingers are timed with the magazine and advanced into the paths of the bottles as dropped to the case, yielding means for holding said fingers in elevated position when they are advanced, means providing for the lowering of the fingers and of the bottles thereon for a considerable portion of the downward motion of the bottles whereby they are eased downwardly toward the top of the case, the said reciprocating means serving to withdraw said fingers oppositely to the motion of the bottles in the magazine after each row of bottles is lowered.

3. In a machine of the type described, a support for bottles, means for advancing the bottles along the support in transverse rows corresponding to rows of compartments in a case, said support terminating in the path of the bottles whereby the bottles are dropped in rows, guiding means for the bottles beyond the termination of said support, and means for positioning cases with rows of compartments beneath said guiding means, easing fingers for reducing the speed of the bottles as dropped and means for advancing the same into the path of the bottles immediately beyond and beneath the termination of said support, whereby said fingers are moved forwardly in the direction of the bottle motion and upwardly into said path, said means then moving the fingers downwardly substantially to the top of the cases, and thereafter withdrawing them from their lowered position oppositely to the direction of bottle motion.

4. In a machine of the type described, a support for bottles, bottle presenting means and reciprocating means for actuating the presenting means to advance the bottles with a step by step motion along the support in transverse rows corresponding to rows of compartments in a case, said support terminating in the path of the bottles, whereby the bottles are dropped in rows, guiding means for the bottles extending downwardly from the termination of said support, means for positioning cases with rows of compartments beneath said guiding means, easing fingers, means for moving said fingers forwardly in the direction of the bottle motion and upwardly toward the support said means then moving the fingers downwardly in time with the dropping of the bottles substantially to the top of the cases, and thereafter withdrawing them oppositely to the direction of bottle motion in their lowered position, said means for operating the fingers being connected to the means for imparting to the presenting means a step by step motion.

5. In a machine for filling cases with bottles, a presenting member, a reciprocating member, means connecting the reciprocating member to the presenting member to move the bottles with a step by step motion, a support for the bottles in the presenting member terminating intermediately of the path of the bottles moved thereby, means for positioning a case beneath the termination of the presenting member, and guiding means for the bottles from said termination extending downwardly toward the position of the case, means for easing the bottles downwardly from said termination to the case position comprising easing fingers connected to the reciprocating member for advancing the fingers beneath said termination and retracting the fingers in time with the dropping of the bottles, means for raising and lowering said fingers comprising a spring imparting a resilient upward tendency to said fingers, a cam controlled arm having means for limiting the motion of said fingers, means in connection with said spring, and means for raising said fingers in time with the dropping of the bottles comprising a cam follower member connected to said fingers, means moving in time with the reciprocating member for raising said cam follower and releasing it permitting it and the supporting means to descend lowering the bottles and easing them downwardly toward the case.

6. In a machine for filling cases with bottles, a presenting member, a reciprocating member, means connecting the reciprocating member to the presenting member to move the bottles with a step by step motion, a support for the bottles in the presenting member terminating intermediately of the path of the bottles moved thereby, means for positioning a case beneath the termination of the presenting member, and guiding means for the bottles from said termination extending downwardly toward the position of the case, means for easing the bottles downwardly from said termination to the case position comprising easing fingers for the bottles connected to the reciprocating member for advancing the fingers beneath said termination and retracting the fingers in time with the dropping of the bottles, means for raising and lowering said fingers, comprising a spring imparting a resilient upward tendency to said fingers, a cam controlled arm having means for limiting the motion of said fingers, means in connection with said spring, and means for raising said fingers in time with the dropping of the bottles comprising a cam follower member connected to said fingers, means moving in time with the reciprocating member for raising said cam follower and releasing it permitting it and the supporting means to descend, lowering the bottles and easing them downwardly toward the case, the means for raising the cam follower comprising a track therefor and means connected to the source of power for the machine for raising and lowering the track in time with the reciprocating member.

7. In a machine for filling cases with bottles, presenting means, and reciprocating means operating the presenting means to advance the bottles with a step by step motion, a support for the bottles, said support terminating intermediately of the path of said bottles as thus moved by the presenting means, guiding means for the bottles extending downwardly from the termination of the support, in the direction of advance, means for positioning cases for the bottles in alignment with said guiding means, means operated in synchronism with said reciprocating means and advanced beneath the bottles as they leave the support, and moving downwardly with the bottles to check their downward motion into the case.

8. In a machine for filling cases with bottles, presenting means, and reciprocating means operating the presenting means to advance the bottles with a step by step motion, a support for

the bottles, said support terminating intermediately of the path of said bottles as thus moved by the presenting means, guiding means for the bottles extending downwardly from the termination of the support, in the direction of advance, means for positioning cases for the bottles in alignment with said guiding means, means operated in synchronism with said reciprocating means and advanced beneath the bottles as they leave the support, and moving downwardly with the bottles to check their downwaird motion into the case, said means for positioning the cases comprising a member resting substantially on the top of the cases and operated in synchronism with said reciprocating means adapted to engage the bottles last deposited in a case to position the case for the next deposit of bottles.

9. In a machine for filling cases with bottles, presenting means adapted to engage the bottles and to advance them in rows extending transversely to the direction of advance, means reciprocating in the direction of the bottle advance and connected to the presenting means to operate the same with a step by step motion, a support for the bottles in the presenting means terminating intermediately of the path of the bottles as moved thereby, means for positioning cases beneath said termination, means for guiding the bottles downwardly from the said termination of the support to the cases, means for easing the bottles downwardly from the support toward the cases comprising bottle engaging members connected to said reciprocating means to reciprocate therewith, to be advanced into and withdrawn from the path of the bottles as they move downwardly from the support, means for raising said bottle engaging members as they are advanced and for lowering them in supporting relation with the bottles in the forward position of said engaging members and immediately prior to withdrawal from said path.

10. In a machine for filling cases with bottles, the machine having presenting means for the bottles and reciprocating means operating the presenting means to impart a step by step motion to the bottles, a support along which the bottles are advanced with said step by step motion, the support terminating intermediately of the path of the bottles as engaged by the presenting means, guiding means extending downwardly from the support, means for positioning a case in alignment with the guiding means to receive the bottles, means for easing the bottles downwardly from said support toward the cases, comprising means connected to the reciprocating means whereby the easing means are advanced into the path of the bottles as they leave the termination of the support and means for retracting the easing means, a follower operatively connected to said easing means, means for raising and lowering said follower and hence said easing means in time with the operation of the reciprocating means and presenting means.

11. In a casing machine, means to support bottles, means beneath said first-named means to support cases, an element rotatable on a horizontal axis adjacent said bottle support to move bottles from the support to drop into the cases, an oscillating lever pivoted on said rotary element axis and operatively connected to said rotary element to drive the latter step by step, means to oscillate said lever, fingers pivotally carried by said lever to ease the dropping movement of bottles, and rotary cam means to swing said fingers vertically relative to said lever.

12. In a bottle casing machine, a support for upright bottles, a case support beneath said bottle support, means to move a bottle from said bottle support to drop into a case on said case support, a guideway extending substantially vertically downwardly from the bottle support toward a case on the case support to define a path of dropping movement for a bottle, and mechanism to retard the dropping movement of a bottle comprising a member oscillatable on a horizontal pivot to operate said bottle moving means, and mechanism to retard the dropping movement of a bottle comprising a movable retarding element first movable forwardly and upwardly into said path of dropping movement to be contacted by the bottom of a dropping bottle, then movable downwardly along said path while still beneath the bottle bottom, and finally movable out of said path, said retarding element being carried by said oscillatable member so that the forward and rearward movement of said retarding element will be controlled by said oscillatable member, and a rotary cam to control the upward and downward movement of said retarding element.

13. In a machine for filling cases with bottles, bottle presenting means, reciprocating means operating the presenting means to advance the bottles with a step-by-step motion, means to move said reciprocating means in the direction along which the bottles are advanced and to then withdraw the reciprocating means in the opposite direction, a support for the bottles which are engaged by the presenting means, said support terminating intermediately of the path of the bottles as thus moved by the presenting means, guiding means extending downwardly and forwardly in the direction of bottle advance from the termination of said support, means for positioning cases in alignment with said guiding means, easing fingers movably connected to said reciprocating means whereby said fingers are advanced in the direction of the advance of the bottles and then withdrawn in the opposite direction, and means for raising the fingers as they are advanced and lowering them with the bottles prior to their withdrawal from said path.

14. In a casing machine, means to support bottles, means to support cases beneath said first-named means, movable means to move bottles from said bottle supporting means to drop into the cases, an oscillating element to actuate said movable means, easing fingers movably carried by said oscillating element, means to move said oscillating element and easing fingers transversely of the path of dropping movement of the bottles, and means to move said easing fingers in a direction along the line of dropping movement of the bottles.

15. In a casing machine, means to support bottles, means to support cases beneath said first-named means, movable means to move bottles from said bottle supporting means to drop into the cases, an oscillating element to actuate said movable means with a step-by-step motion, easing fingers pivoted at one end thereof on said oscillating element, means to move said oscillating element and easing fingers transversely of the path of dropping movement of the bottles, and means to move said easing fingers relative to said oscillating element to impart an orbital movement to the free ends of the fingers.

16. In a machine for filling transversely divided cases with bottles of such height that they will project above the cases, a bottle support, a

case support beneath the bottle support, means to push bottles from said bottle support to drop into a case on said case support, bottle engaging means extending horizontally and transversely of said case support in a plane spaced above the case support by a distance at least equal to the height of the cases and located below the bottle support, and means for reciprocating said bottle engaging means along the case support to engage the bottles last deposited in a case at a point on the bottles above the case to thereby cause the case to be advanced on said case support.

17. In a machine for filling cases, a bottle support, a case support, a lever pivoted on a horizontal axis vertically spaced and substantially vertically aligned with respect to said bottle support, means to oscillate said lever forwardly and rearwardly, means to push bottles from said bottle support to drop into a case on said case support, said bottle pushing means being operatively connected to said lever to be actuated for bottle pushing movement on the forward stroke of said lever, and means extending horizontally from said lever and transversely of said case support in a plane between the bottle support and the case support to engage the transverse row of bottles last deposited in a case and thereby cause the case to be advanced on said case support.

18. A machine for filling cases with bottles having a member upon which the bottles may stand, means for advancing the bottles on said member in rows, and for causing the rows to drop at intervals from said member, the rows of bottles corresponding in length to the width of the cases, means for presenting the cases beneath said member and positioning each case to receive in turn the successive rows of bottles as dropped, until the case is filled, bottle supporting means beneath said member for easing the rows of bottles into the cases, and means operated in time with said bottle advancing means to advance said supporting means into supporting relation with the bottoms of the bottles in each row as the row is dropped, and to then move said supporting means downwardly toward the case in supporting relation with the bottles, and to then withdraw said supporting means to release the bottles to permit them to enter the case.

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