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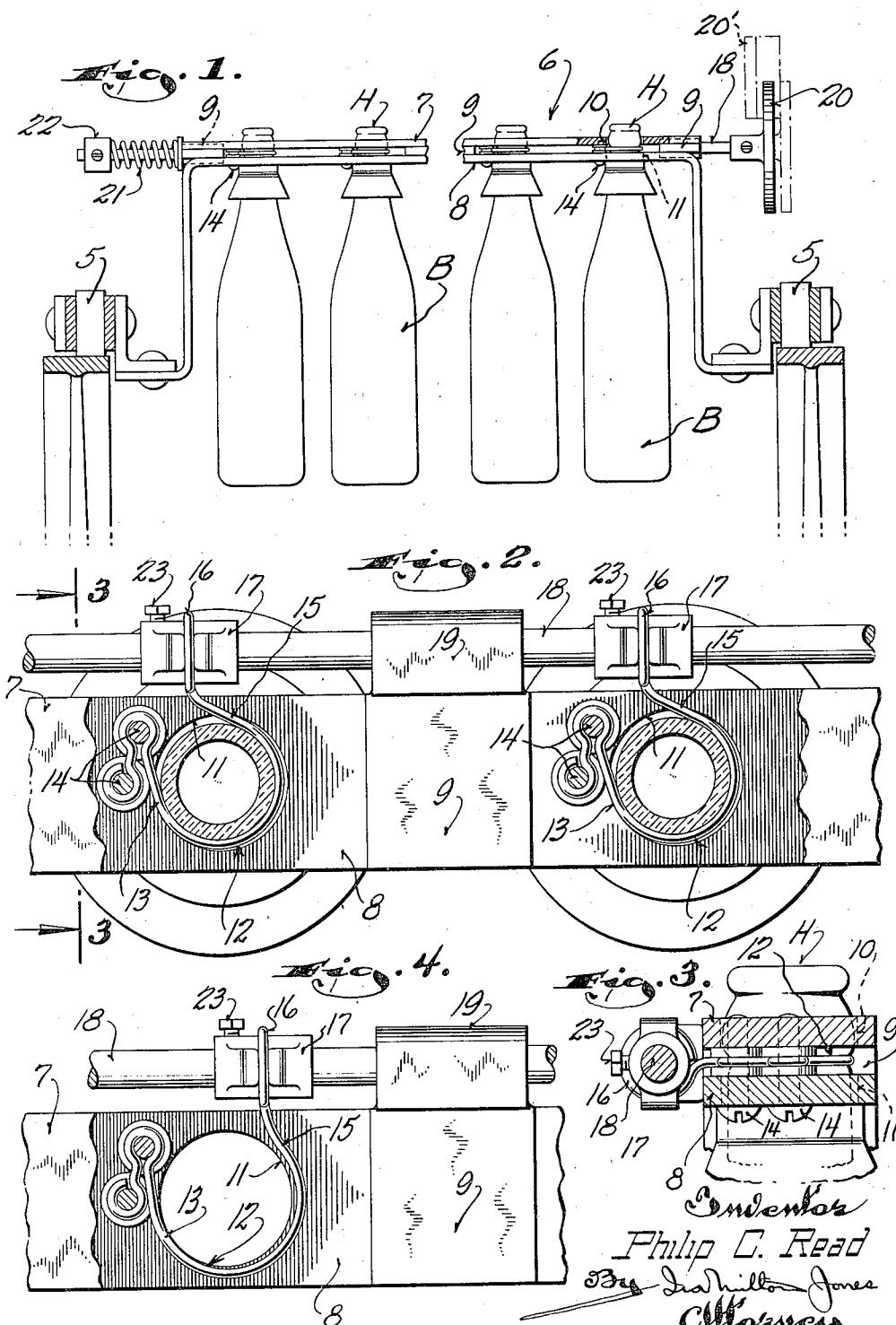
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BOTTLE CARRIER FOR BOTTLE WASHING MACHINES

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2 Sheets-Sheet 1



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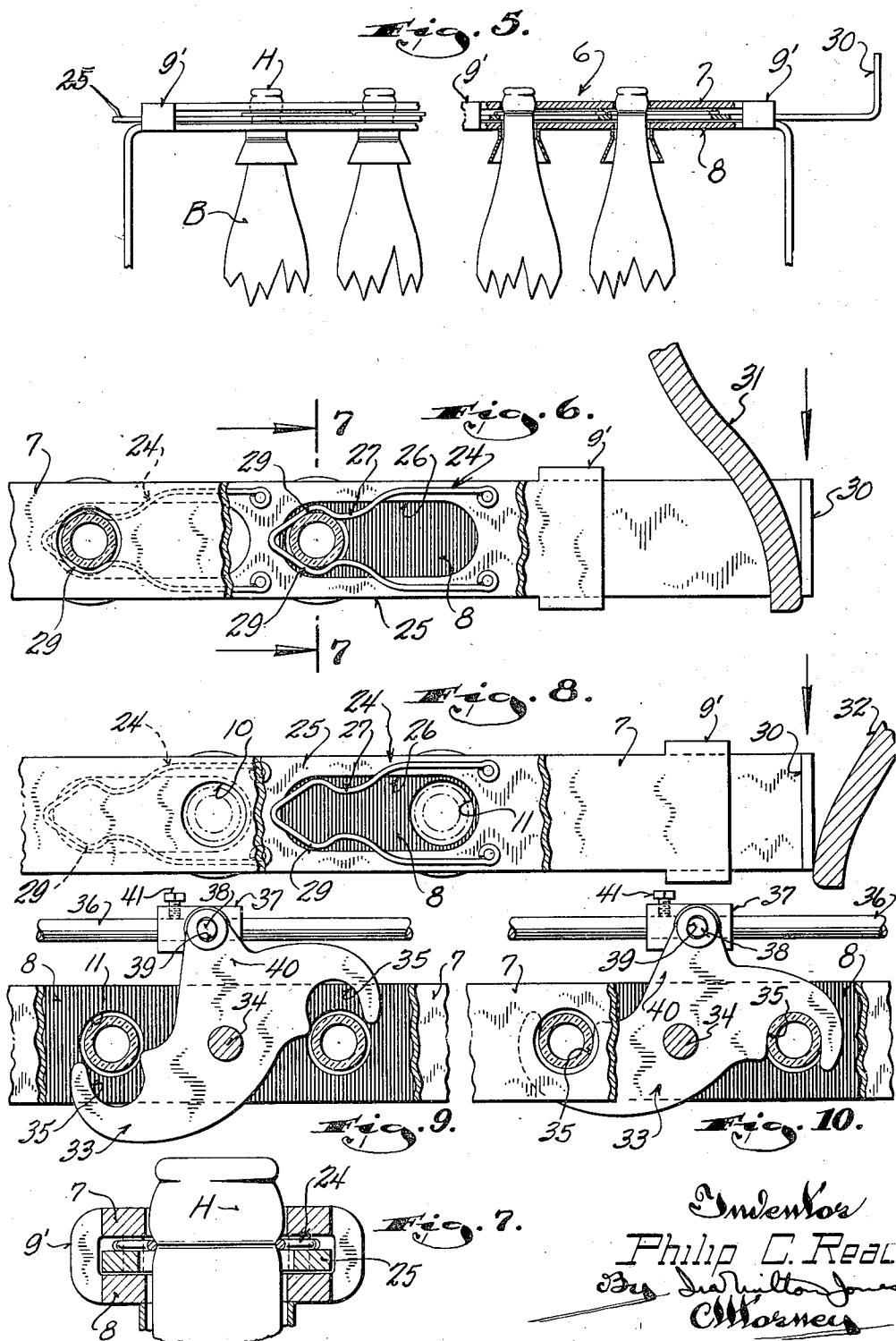
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BOTTLE CARRIER FOR BOTTLE WASHING MACHINES

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2 Sheets-Sheet 2



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BOTTLE CARRIER FOR BOTTLE WASHING MACHINES

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Application August 7, 1939, Serial No. 288,843

12 Claims. (Cl. 198—131)

This invention relates to bottle washing machines of the type described in the pending application of Philip C. Read, Serial No. 257,445, filed February 20, 1939, for Bottle washing machines, and refers particularly to the bottle carriers of such machines which are provided with means for gripping the bottles at their necks.

In the past various methods have been used to grip the bottles by their necks. One of these methods is disclosed in the aforementioned pending application. It employs two spaced superimposed carrier bars provided with aligned holes, through which the headed ends of the bottles project to be secured in place by a locking plate slidable between the carrier bars and provided with longitudinal keyhole slots to engage the necks of the bottles.

Inasmuch as actuation of the sliding bar was cam controlled, these past types of bottle carriers were objectionable due to unavoidable breakage of the bottles when gripped by the bars. Even the most accurately machined carriers of this past type were subject to the same objection, for any inaccuracies were multiplied as a consequence of the large number of bottles carried by each carrier.

With this past objection in mind, the present invention has, as one of its objects, the provision of a yieldable latch or clamp operable to grip the neck of a bottle beneath its enlarged head with spring tension to securely clamp the bottles to the carrier without danger of breakage.

Another object of this invention is to provide a bottle carrier of the type described with individually resilient latching members whose resiliency normally maintains them in operative clamping position about the neck of a bottle, and whereby a single locking bolt connected to each of the latching members is operable to simultaneously release all of the latches on the carrier.

With the above and other objects in view which will appear as the description proceeds, this invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described, and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the herein disclosed invention may be made as come within the scope of the claims.

The accompanying drawings illustrate several complete examples of the physical embodiment of the invention constructed in accordance with the best modes so far devised for the practical application of the principles thereof, and in which:

Figure 1 is a cross sectional view through the conveyor of a bottle washing machine illustrating the application of this invention thereto;

Figure 2 is a top plan view showing a portion of the bottle carrier with bottles gripped thereby;

Figure 3 is a cross sectional view taken through Figure 2 on the plane of the line 3—3;

Figure 4 is a view similar to Figure 2 but illustrating the latching means in released position;

10 Figure 5 is a view similar to Figure 1 illustrating a modified form of gripping means;

Figure 6 is a top plan view of a portion of the bottle carrier shown in Figure 5 illustrating the manner in which the bottles are gripped;

15 Figure 7 is a sectional view taken through Figure 6 on the plane of the line 7—7;

Figure 8 is a view similar to Figure 6 illustrating the gripping means in released position; and

20 Figures 9 and 10 are top plan views of a portion of a bottle carrier illustrating a further modified embodiment of this invention.

Referring now particularly to the accompanying drawings in which like numerals indicate like parts, the numeral 5 designates a pair of endless conveyor chains which are joined at spaced intervals by bottle carriers 6. In the present instance, only one such bottle carrier has been shown.

30 The bottle carriers comprise two superimposed bars 7 and 8 held in spaced apart relationship by spacers 9 at various points along the length of the carrier. At equi-spaced points along the length of the carrier, the bars 7 and 8 are provided with aligned holes 10 and 11, respectively, to permit the heads H on the necks of bottles B to pass therethrough.

To enable the bottles to be gripped at their necks without in anywise endangering the same with regards to breakage, resilient substantially U-shaped wire clamps, indicated generally by the 40 numeral 12, are provided, one adjacent to each set of aligned holes in the carrier bars. The clamping members 12 are positioned between the carrier bars 7 and 8 and have one end portion 13 fixed to the carrier bars as by welding or by screws 14.

The free end portions 15 of the clamps form a loop of a size to snugly and resiliently engage the 50 neck of a bottle beneath its enlarged head to rigidly clamp the same against the edges of the holes 10 and 11 of the carrier.

The free end 15 of each of the clamping members 12 is bent laterally so as to extend from 55 the sides of the carrier bars and have loops 16

formed thereon for engagement with a stop collar 17 secured to a latch bolt 18. The latch bolt 18 is slideable in bearings 19 formed as an integral part of the spacers 9, and extends along the entire length of the carrier bars to project from each end thereof.

As already stated, the yieldable clamping members normally maintain clamping engagement about the neck of a bottle with spring tension; and when it is desired to release the bottles from the carriers, it is only necessary to slide the locking bolt 18 to a position illustrated in Figure 4, which enlarges the loops of the clamping members to a diameter equal to or greater than the size of the holes in the carrier bars.

The customary manner of actuating the locking bar in such a manner is to provide a plate or flange 20 which is engageable by a cam 20' to slide the bar against the spring tension of the yieldable clamping means.

While in most instances the resiliency of the clamping means is sufficient to maintain the bottles tightly gripped, an auxiliary spring 21 may be provided, if desired, to further increase the gripping force of the clamping members on the bottle necks.

The spring 21 is located at the end of the locking bar opposite the flange 20 and is engaged between a collar 22 at the extreme end of the locking bar and its adjacent bearing 9.

If desired, the stop collar 17 which secures the free ends 15 of the clamping members to the locking bolt may be adjustable on the locking bolts; and to this end, set screws 23 are provided. It is obvious that by adjusting the position of the stop collar 17, the gripping force of all the gripping members acting on the bottle necks may be equalized.

The carrier illustrated in the modified embodiment in Figure 5 is similar in that it employs superimposed locking bars 7 and 8 held spaced apart by spacers or side walls 9' at various points along its length.

The resilient bottle gripping means 24 of this modification are carried directly by a sliding plate or bar 25 positioned between the carrier bars 7 and 8. Slots 26 in the bar 25 equal in number to the aligned holes in the carrier bars, permit the necks of the bottles to be properly positioned.

The clamping members or grippers 24 in this instance are substantially U-shaped and have their free ends secured to the bar 25 at one end of the slots while the opposite closed end of the clamping members extends to the other end of the slot and has a constriction as at 27 forming a throat to receive and guide the bottle upon sliding of the plate 25.

Such sliding motion of the plate 25 draws the opposite sides of the U-shaped gripping members into engagement with the necks of the bottles in the holes 10 and 11, and the resulting spreading of the sides permits an outwardly kinked locking portion 29 of the grippers to grip the neck of the bottle beneath the head thereof as clearly shown in Figures 6 and 7.

An upstanding flange 30 at one end of the bar which projects from the carrier is engageable by a cam 31 during travel of the conveyor to effect engagement of the bottles by the resilient gripping means while a cam 32 is provided for engagement with the flange 30 to slide the bar inwardly to effect releasing of the bottle gripping means.

Figures 9 and 10 illustrate a further modified

embodiment of this invention wherein the bottles are gripped at their neck portions by pivoted grippers 33. Each gripper, which is formed as a lever, is adapted to effectively grip two bottles; and to this end, the levers are of a length to extend between two adjacent sets of holes 10 and 11 in the carrier bars and are pivoted to the carrier bar by pivot pins 34 passing through the medial portions of the levers.

10 The opposite ends of each lever have jaws consisting in arcuate slots 35 concentric to the axis of the pivot 34 and of a width to receive the neck of the bottles.

15 As in the embodiment of the invention shown in Figures 1 to 4, inclusive, a sliding locking bolt 36 may be provided to actuate the levers to inoperative and operative positions. For this purpose, the locking bolt has a plurality of adjustable collars 37 fixed thereto, each carrying a stud 38 20 which engages in a hole 39 formed in a lug or extension 40 projecting from one side of the adjacent lever.

25 Sliding of the locking bolt 36 in one direction by a cam (not shown) disengages the jaws of the levers from the necks of the bottles beneath their enlarged heads as shown in Figure 9; and sliding of the locking bolt in the opposite direction by a cam (not shown) engages the jaws about the necks of the bottles to securely clamp 30 the same to the carrier, as shown in Figure 10.

35 Inasmuch as the set screws 41 of the collars 37 permit accurate adjustment of the throw of the levers when actuated into gripping engagement with the bottle necks, breakage of the bottles may be held at a minimum.

From the foregoing description taken in connection with the accompanying drawings, it will be readily apparent that this invention provides a simple and inexpensive but highly efficient manner of gripping bottles at their necks which insures against breakage of the bottles during such gripping operation.

What I claim as my invention is:

1. In a bottle carrier of the character described: a carrier bar having a hole adapted to receive the headed end of a bottle; a flexible one-piece clamping member fixed at one end to the carrier bar and formed with a loop intermediate its ends for yielding engagement with the neck 45 of a bottle in said hole; and an actuator connected with the other end of said flexible clamping member and movable with respect to the carrier bar for disengaging the flexible clamping member from the neck of the bottle.

50 2. In a bottle carrier of the character described: a carrier bar having a hole of a size to receive the head on the neck of a bottle; a resilient one-piece gripping member having one end fixed to the carrier bar adjacent to one side of said hole and its other end disposed adjacent to the other side of said hole, said gripping member having a curved portion between its ends engageable about the neck of a bottle in said hole with a spring tension; and a reciprocating bolt connected to said other end of the resilient gripping member, said bolt being normally maintained in one position by the resiliency of said gripping member and being movable against the spring tension of the gripping member to disengage the resilient gripping member from the bottle neck.

55 3. In a bottle carrier of the character described: a carrier bar having a hole of a size to receive the head on the neck of a bottle; a resilient one-piece gripping member having one end

secured to the carrier bar adjacent to said hole and its other end disposed adjacent to the other side of said hole, said gripping member having a curved portion between its ends and cooperable therewith to grip the neck of a bottle in said hole with a spring tension; a reciprocable bolt adjacent to said other end of the resilient gripping member; and an adjustable connection between the reciprocable bolt and said other end of the gripping member whereby movement of the bolt in one direction disengages the gripping member from the neck of the bottle.

4. A bottle carrier of the character described comprising: a carrier bar having a plurality of spaced apart holes through which the headed end of a bottle may pass; a locking bolt; means for supporting the locking bolt from the carrier bar for sliding motion lengthwise of the bar; a plurality of heavy substantially U-shaped spring clamps each having one end secured to the carrier bar adjacent to one of said holes and having their other ends secured to the locking bolt so that their U-shaped portions lie adjacent to the edges of the holes in the carrier bar, the resiliency of said spring clamps normally maintaining the same engaged about the necks of bottles in said holes beneath their enlarged heads to resiliently clamp the same to the carrier; and means for moving the locking bolt against the action of said spring clamps to release the bottles from the grip of the spring clamps.

5. A bottle carrier of the character described comprising: two superimposed spaced apart carrier bars having aligned holes through which the headed ends on the necks of bottles may be passed; a resilient U-shaped clamping member adjacent to each of said holes; means for securing one end of each of said clamping members to the carrier bars adjacent to one edge of one pair of aligned holes therein, and in a position such that their U-shaped portions lie adjacent to and substantially follow along the edges of said holes so that the necks of bottles inserted in said holes are yieldingly gripped between the ends of the clamping members; a locking bolt adjacent to said carrier bars; means on said carrier bars mounting the locking bolt for sliding motion lengthwise of the carrier bars; an adjustable connection between the locking bolt and the other end of each of the U-shaped clamping members whereby the force exerted by the clamping members on the necks of the bottles in said holes may be equalized; and means on the locking bolt engageable with an actuator by which the locking bolt may be moved in a direction against the spring tension of the resilient clamping members to release their grips on the necks of bottles in said holes.

6. A bottle carrier of the character described comprising: two superimposed spaced apart carrier bars having aligned holes through which the headed ends on the necks of bottles may be passed; a resilient U-shaped clamping member adjacent to each of said holes; means for securing one end of each of said clamping members to the carrier bars adjacent to one edge of one pair of aligned holes therein and in a position such that their U-shaped portions lie adjacent to and substantially follow along the edges of said holes so that the necks of bottles inserted in said holes may be yieldingly gripped between the ends of the clamping members; a locking bolt adjacent to said carrier bars; means on said carrier bars mounting the locking bolt for sliding motion parallel to the length of the carrier

bars; an adjustable connection between the locking bolt and the other end of each of the U-shaped clamping members, whereby the force exerted by the clamping members on the necks of the bottles in said holes may be equalized; means on the locking bolt engageable with an actuator by which the locking bolt may be moved in a direction against the spring tension of the resilient clamping members to release their grips on the necks of bottles in said holes; and an additional spring for the locking bolt acting against releasing motion of the locking bolt.

7. A bottle carrier of the character described comprising: a carrier bar having a hole of a size to receive the headed end on the neck of a bottle; a member adjacent to said carrier bar and slideable with respect thereto; and a resilient clamp carried by said slideable member into and out of engagement with the neck of a bottle in said hole, said resilient clamp comprising a substantially U-shaped length of spring stock having diametrically opposite kinked portions adapted to grip the bottle neck upon motion of the slideable member in one direction and lock the bottle to the carrier.

8. A bottle carrier of the character described comprising: a carrier member having a hole to permit the headed end of a bottle to pass therethrough; a resilient one-piece wire gripper having a clamp portion movable with respect to the carrier member and effective in one position to grip the neck of a bottle in said hole with a spring tension; and operating means slidably carried by the carrier member and drivingly connected to said wire gripper for moving the clamp portion thereof with respect to the hole so as to disengage the clamp portion from the neck of a bottle and free the same for removal from the hole.

9. A bottle carrier of the character described comprising: a carrier having a hole of a size to permit the headed end of a bottle to pass therethrough; a releasable resilient one-piece wire clamp having a looped portion adjacent to said hole at one side of the carrier and engageable with a substantial portion of the neck of a bottle in said hole beneath its enlarged head to yieldingly clamp the bottle to the carrier when the looped portion is in an operative position aligned with said hole; and an actuator for the clamp movably mounted on the carrier and drivingly connected with said resilient clamp for controlling the operativeness of the clamp, said actuator being movable in a direction to shift the looped portion of the clamp out of alignment with said hole to effect disengagement thereof from the neck of a bottle in said hole.

10. A bottle carrier of the character described comprising: a carrier bar having a hole through which the head on the neck of a bottle may pass; an actuating member adjacent to the carrier bar; bearings slidably supporting said actuating member from the carrier bar; and a releasable resilient one-piece wire clamp having a looped portion adjacent to said hole at one side of the carrier bar for gripping the neck of a bottle in said hole with a spring tension when the looped portion is in an operative position aligned with said hole, said resilient clamp having a driving connection with said slideable actuating member so that sliding movement of said member in one direction shifts the looped portion of the clamp with respect to said hole for releasing the bottle.

11. A bottle carrier of the character described comprising: a carrier bar having a hole of a size to admit the headed end of a bottle; a one-piece

resilient substantially U-shaped clamping member having its legs arranged at opposite sides of the hole at one face of the carrier bar and so spaced as to grip the neck of a bottle in said hole with a spring tension upon relative lateral movement of the clamping member in one direction with respect to the hole; a shifter movably mounted on the carrier bar; and means mounting the clamping member on said shifter so that movement of the shifter relative to the carrier bar effects relative lateral movement of the clamping member to carry the same into and out of engagement with the neck of a bottle in said hole.

12. A bottle carrier of the character described comprising: a carrier having a hole to permit the headed end of a bottle to pass therethrough; a one-piece resilient substantially U-shaped

clamp having its legs arranged at opposite sides of the hole at one face of the carrier and so spaced at one end of the clamp as to provide a gripping portion operable to grip the neck of a bottle in said hole with a spring tension upon relative lateral movement of the clamp in one direction with respect to the hole; a shifter movably mounted on the carrier; and means for securing the other end of the clamp to said shifter so that the clamp may be moved laterally with respect to said hole by the shifter into and out of operative bottle gripping position, said securing means being remote from the gripping portion of the clamp so as to allow said gripping portion to yield upon engagement thereof with the neck of a bottle in said hole.

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