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2,601,353

CLOSURE AND SUPPORT FOR BOTTLES, WITH LOCKING MEANS

Filed Sept. 27, 1947

3 Sheets-Sheet 1

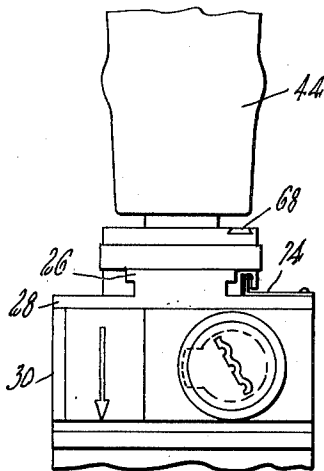


Fig. 1.

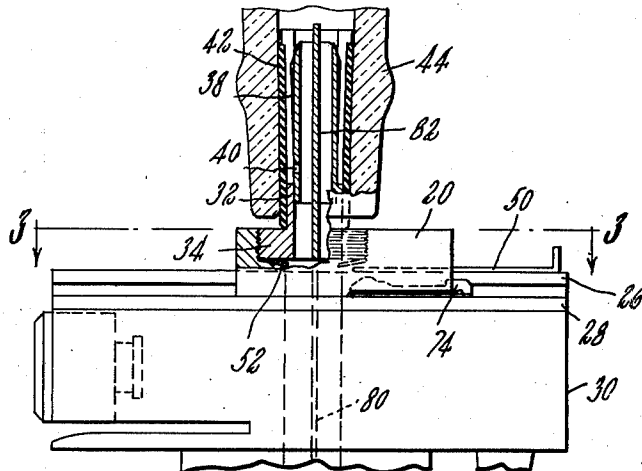


Fig. 2.

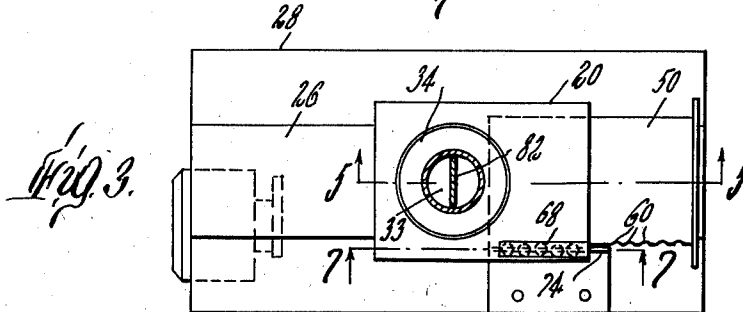


Fig. 3.

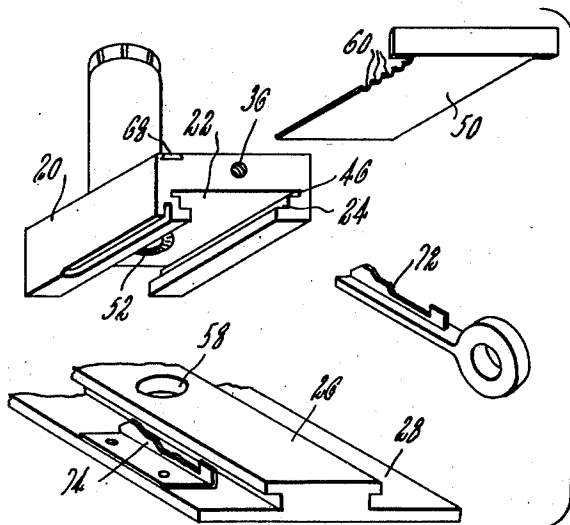


Fig. 4.

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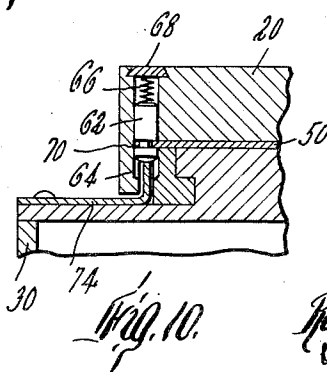
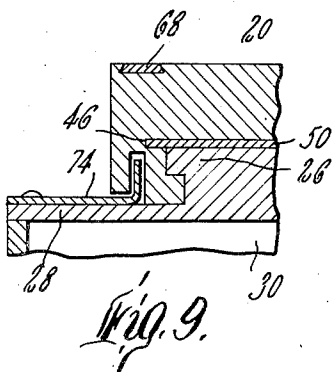
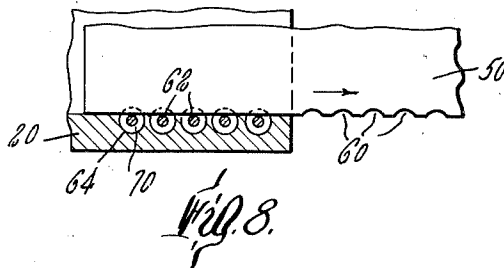
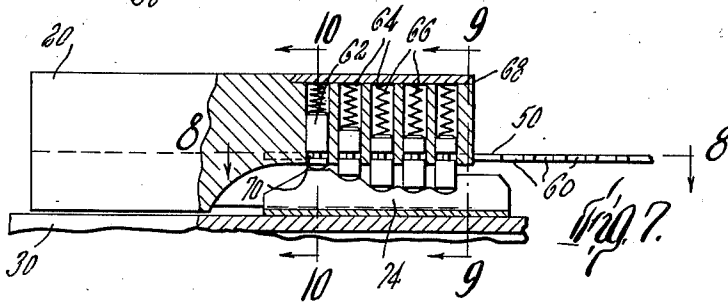
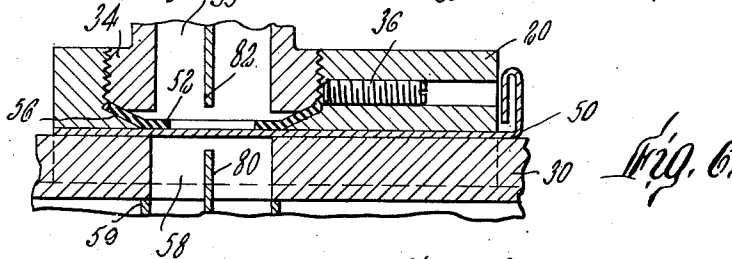
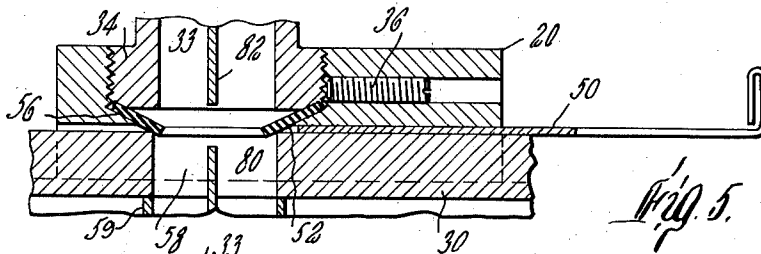
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3 Sheets-Sheet 2



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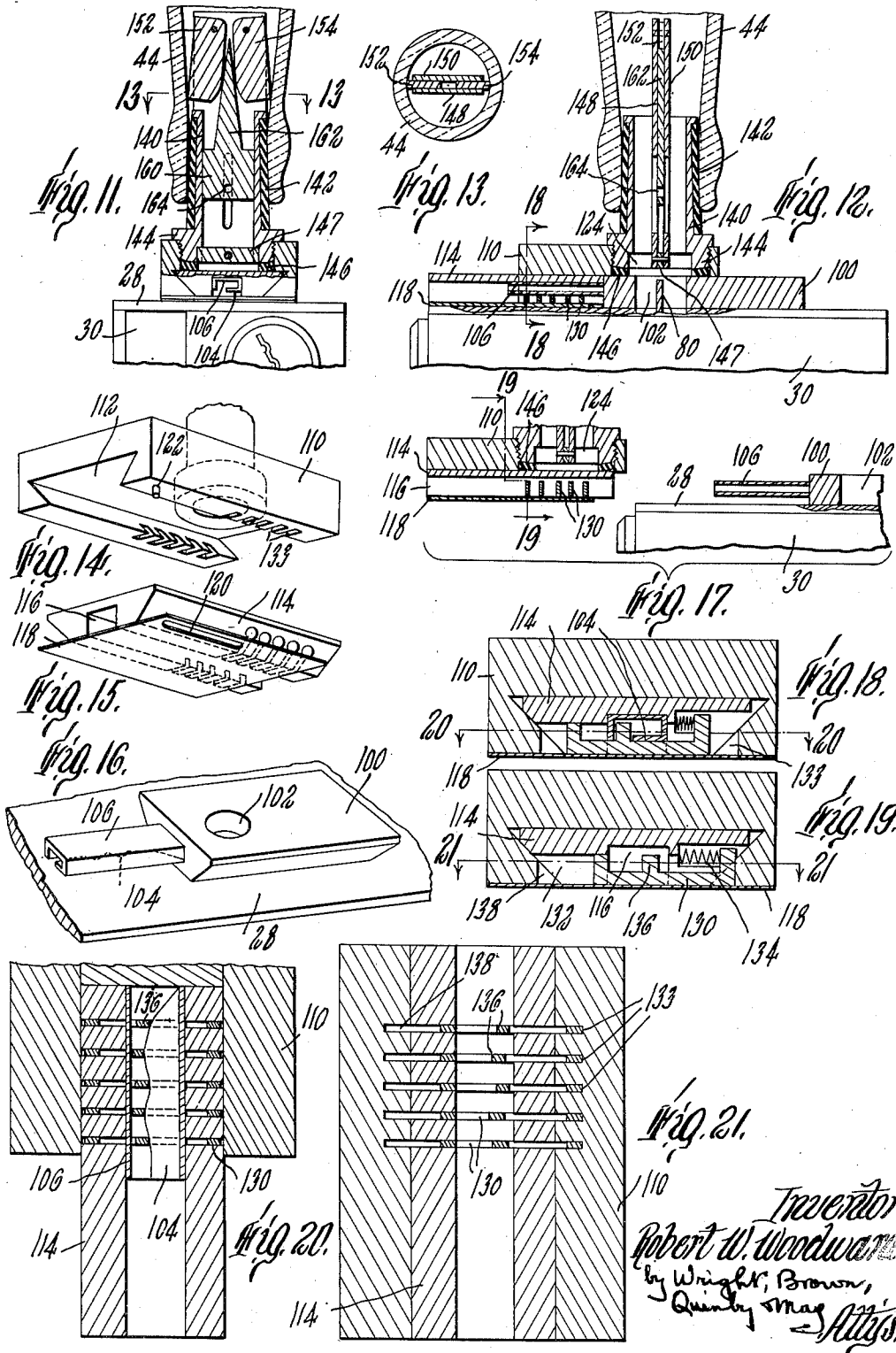
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3 Sheets-Sheet 3



UNITED STATES PATENT OFFICE

2,601,353

CLOSURE AND SUPPORT FOR BOTTLES,
WITH LOCKING MEANS

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Application September 27, 1947, Serial No. 776,577

12 Claims. (Cl. 222—153)

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This invention relates to improvements in devices for dispensing liquid from bottles and measuring and recording the liquid dispensed. More particularly, the invention relates to a closure device which can be locked on a bottle and which is designed for use in connection with dispensing apparatus, such as is shown and described in my pending application, Serial No. 740,353, filed April 9, 1947, for Liquid Dispensing Device. This dispensing device is designed to prevent unauthorized tampering with the contents of a bottle attached thereto and includes a box containing a key-operated lock, a printing mechanism, a register, valves and valve-operating means. A tube projects up into a bottle to support the bottle in an inverted position and to provide a passage for the discharge of liquid from the bottle to a measuring cup secured to the bottom of the box. The dispensing device was designed to be locked as a unit to a bottle, thus making it necessary for a proprietor to have as many such devices as the number of bottles which might be needed during his absence.

It is an object of the present invention to reduce the quantity of apparatus required for any given establishment by providing simple closure devices for individual bottles which interlock and cooperate with dispensing apparatus so that any number of bottles to which such closure devices have been locked can be used in succession on one such apparatus. The closure device includes a key-operated lock which can be unlocked by using a suitable key or by mounting the device on a dispensing apparatus of the kind referred to, having a key element which acts to unlock the closure so that a passage may be opened from the bottle to the measuring cup which is a part of the dispensing apparatus.

For a more complete understanding of the invention, reference may be had to the following description thereof, and to the drawing, of which:

Figure 1 is a front elevational view of an embodiment of the invention mounted on a dispensing apparatus;

Figure 2 is a side elevation of the same, a part being broken away to show in section;

Figure 3 is a section on the line 3—3 of Figure 2;

Figure 4 is an exploded view of the device shown in Figure 1, including the top of the dispensing apparatus;

Figure 5 is a section on the line 5—5 of Figure 3;

Figure 6 is a similar section showing a movable part in a different position;

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Figure 7 is a section on the line 7—7 of Figure 3;

Figure 8 is a section on the line 8—8 of Figure 7;

Figure 9 is a section on the line 9—9 of Figure 7;

Figure 10 is a section on the line 10—10 of Figure 7;

Figure 11 is a front, elevational view, broken away to show certain parts in section, of a modified form of the invention;

Figure 12 is a side view of the same, broken away to show certain parts in section;

Figure 13 is a section on the line 13—13 of Figure 11;

Figure 14 is a perspective view of a block shown in Figures 11 and 12;

Figure 15 is a perspective view of a slide connected to the block shown in Figure 14;

Figure 16 is a perspective view of a portion of the box cover and a dovetail member secured thereon;

Figure 17 is a fragmentary, side view, partly in section, of the box with the dovetail member thereon, and the block and slide shown in Figures 14 and 15;

Figure 18 is a section on the line 18—18 of Figure 12;

Figure 19 is a section on the line 19—19 of Figure 17;

Figure 20 is a section on the line 20—20 of Figure 18; and

Figure 21 is a section on the line 21—21 of Figure 19.

The closure device embodying the invention, as illustrated in Figure 4, includes a member 20 which may be in the form of a rectangular block having a longitudinal groove or channel 22 with undercut side walls, as at 24, to slide on a complementary track 26 on a plate 28, such as the top of a dispensing apparatus 30, described and illustrated in my application, Serial No. 740,353. Projecting up from the block 20 is a split collet 32 having a bore 33 which tapers near its upper end and extends through the block 20. This collet may be integral with a circular base 34 which is screw-threaded in a hole through the block 20. In order to prevent unauthorized removal of the collet from the block 20, a set screw 36 may be employed to lock the base 34 against rotation. Within the bore 33 is a tubular spreader 38. A hole or notch 40 is provided in the wall of the spreader to receive a simple tool by which the spreader can be pushed upward to expand the upper end of the collet or pulled downward to allow the collet to contract.

The collet is surrounded by a suitable sleeve 42 of soft material, such as rubber, neoprene, or the like, so as to make a liquid-tight joint with the neck of a bottle 44 into which the collet is inserted.

The channel 22 in the bottom of the block 20 is widened as at 46 to receive a closure element 50 which may be a thin but sufficiently rigid plate having its edges slidable in the wider portion 46 of the channel. Thus the slide 50 is held against the bottom surface of the block 20 and may be moved to close the hole through the block which provides a passage for the discharge of the liquid from the bottle. In order to make a liquid-tight seal with the slide 50, a suitable washer 52 is mounted at the lower end of the collet base 34, as indicated in Figure 5. The hole in which the collet base 34 is threaded is reduced in diameter where it opens through the bottom of the block, thus forming an inclined inner shoulder 56 against which the washer 52 is pressed by the bottom of the collet base 34 into a frusto-conical shape, so that the inner edge of the washer projects below the bottom of the block 20, as indicated in Figure 5. Thus, when the slide 50 is pushed in to close the bore of the collet, the inner edge of the washer 52 presses tightly against the slide to form a tight seal. Furthermore, when the device is mounted on the top of a dispensing apparatus 30, the washer 52 engages the rim of a hole 58 in the top of the dispensing apparatus which communicates with a duct 59 through the apparatus, thus preventing leakage around the hole when the slide 50 is retracted.

The slide 50 is provided with a row of notches 60 along an edge thereof, these notches being arranged to receive tumblers 62 of a key-operated locking mechanism, shown in Figures 3, 7, 8 and 10. The tumblers 62 are vertically slidable in suitable bores 64 in the block 20 and are preferably pressed by springs 66 which are held in place by a cap plate 68. Each tumbler 64 is made with a circumferential groove 70 at a selected level. As indicated in Figures 7 and 8, when the tumblers are in such positions that their grooves are on the same level with the slide 50, the slide can then be withdrawn. If, however, the tumblers or any of them are not on the level indicated, then such tumbler or tumblers engage in one or more of the notches 60 to prevent movement of the slide 50 from the block. In order to release the slide, a suitable key 72 is provided, as illustrated in Figure 4. The blade of the key may be reproduced on the top of the dispensing apparatus, as indicated at 74 in Figure 7, so that when the closure device is slid into place on the top 28 so that the bore 33 of the collet is in line with the hole 58, the key blade 74, which is fixed on the top 28, will engage the plungers 62 so as to move the grooves 70 to the level of the slide 50, thus releasing the slide for movement to open the passage for the discharge of liquid from the bottle. Thus, when the closure device with a bottle mounted thereon is properly mounted on the top 28, the slide may be moved sufficiently to open the passage and permit liquid from the bottle to be dispensed in the manner described in my prior application. When the slide 50 is retracted, as shown in Figures 7 and 8, the margin of the slide engages in the grooves 70 of the tumblers, locking them against axial movement. Since the lower ends of the tumblers are thus held in notches in the edge of the key 74 (Figure 7), the block 20 cannot be moved as long as the slide is retracted. In order to remove the

closure device and bottle from the top 28, it is first necessary to push the slide 50 in to release the tumblers. This closes the discharge passage from the bottle.

When the closure device and bottle are removed from the dispensing apparatus, the tumblers shift axially as they leave the edge of the key 74 and the slide 50 automatically becomes locked in its passage-closing position until released by the use of a suitable key 72 which is to be kept in the possession of the proprietor. Thus, the plungers serve as an interlocking means to lock the slide 50 when the block 20 is slid off the top 28, or to lock the block 20 on the top 28 when the slide is withdrawn from its position across the discharge passage.

In order to facilitate the discharge of the liquid contents of the bottle and to prevent obstruction of outflow by bubbles of air rising through the discharge passage, a central, longitudinal partition 80 is provided in the hole 58, as indicated in Figures 5 and 6, and as described in the prior application. In order to supplement this partition 80, a similar partition 82 is mounted within the collet 32 to register with the partition 80, the partition 82 being secured to the base 34 of the collet and projecting up through the spreader 38. The partitions form two parallel passages extending from the interior of the bottle down through the neck and through the dispensing apparatus. When the discharge valve (not shown) is opened, an unbalance is quickly established in these passages so that liquid from the bottle flows downward in one of them while air flows upward in the other.

A modified form of the closure is shown in Figures 11 to 21. In this embodiment of the invention, the box top 28 is a plate on which is formed or secured a dovetail rail 100. A hole 102 extends downward through the rail and plate, to communicate with a conduit through the interior of the box 30. Extending from one end of the track 100 is a key member 104 which is preferably protected and concealed by a housing member 106 so that the key 104 is made difficult of access for inspection or duplication.

Slidable on the track 100 and removable therefrom is a block 110 having a dovetail groove 112 in the bottom face thereof shaped to fit upon and receive the track 100. Slidable in the groove 112 is a dovetail slide 114 which is similar in shape to the track 100 and is adapted to be brought into abutting end-to-end relation with the track. The slide 114 is provided with a longitudinal recess 116 to receive the housing 106 and the key 104 protected thereby.

A thin bottom plate 118 is secured to the bottom of the slide 114 and is provided with a longitudinal slot 120 near a side edge thereof. A pin 122 projects from the bottom face of the block 110 and rides in the slot 120 to limit the range of movement of the slide 114 with reference to the block 110 and to maintain the slide and block in assembled relation.

The slide 114 is preferably of the same length as the block 110, and when its end faces are flush with the end faces of the block 110, the slide effectively closes a hole 124 through the top of the block 110.

Locking means are provided to maintain the slide 114 in this hole-closing position until released by means of a suitable key, such as the fixed key 104. As indicated in Figures 18 to 21, the locking means may comprise a series of flat tumblers 130 slidable in transverse slots 132 in

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the slide 114 and corresponding slots 133 in the block 110. These tumblers are spring-pressed by suitable springs 134. Each tumbler 130 has an intermediate upstanding lug 136, the lugs on the several tumblers being variously spaced from the mid-point thereof. The edge of the key 104 is shaped in accordance with the spacing of these lugs so that when the key 104 is inserted in the longitudinal recess 116, its edge engages the lugs 136 of the tumblers and pushes them toward the left, as in Figure 18, against the pressure of the springs 134.

The contour of the key 104 is so shaped that when the key has been fully inserted in the recess 116, the tumblers 130 will then be accurately aligned so as to be clear of the slots 133 in the block 110, thus permitting sliding movement of the slide 114 relative to the block 110.

When the slide 114 and the block 110 are locked together, the hole 124 is effectively closed. In order to open the hole either for the discharge of liquid from the bottle or, as hereinafter described, for the removal of the device from the bottle to which it is secured, it is first necessary to unlock the slide by the insertion of the key 104, or a similarly shaped key, into the recess 116. Since the key 104 is fixed on the box top 28, the block and slide are moved into operative relation thereto. This is done as follows. The bottle being inverted as shown, the slide 114 is brought into alignment with the rail 100 on the top of the box and is then moved horizontally, with the block 110 and bottle, so as to cause the recess 116 to receive the housing 106 and key 104. When the end of the slide abuts the end of the rail, the key 104 is fully within the recess 116 and the tumblers 130 are aligned, thereby unlocking the slide from the block. The block can then be moved along onto the rail 100 until the hole 124 registers with the hole 102. Further movement of the block on the rail is stopped by engagement of the pin 122 with an end of the slot 120. When the block is in this position, the slots 133 do not register with the corresponding slots 132. Hence, the tumblers cannot move in their slots and the lugs 136 thus interlock with the edge of the key 104 to prevent removal of the slide and block from the top of the box until the block has first been moved back on the slide so that the slots 132 register with the corresponding slots 133.

In the top of the block is a tubular member 140 which is screwed into the hole 124. The tube 140 is adapted to enter the mouth of a bottle 44 so as to provide a discharge passage for the escape of liquid from the bottle. In order to avoid leakage around the tube, it is preferably surrounded by a sleeve 142 of soft material, such as rubber or an equivalent. The screw-threaded base 144 of the tube 140 is preferably of a larger diameter than the rest of the tube. At the bottom of the base 144 is a rubber washer 146 which is pinched into frusto-conical shape so that its inner edge projects slightly below the bottom surface of the groove 112 and engages the top of the slide 114 to prevent leakage between the block and the slide.

In order to secure the block to the bottle 44, a locking means is provided, as illustrated in Figures 11, 12 and 13. This consists of a transverse strip 147 which extends diametrically across the bore of the tube 140 at or near the lower end thereof. Secured to the cross-piece 147 are two thin plates 148 and 150. These plates are parallel and extend diametrically across the bore of

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the tubular member 140 and also project upward beyond the upper end of the tube for a substantial distance.

Pivotaly mounted between the upper portions of the plates 148 and 150 are two wings 152 and 154. Also between the plates 148 and 150 is loosely mounted a wedging member 160 having a tapering upper portion 162 between the mutually opposed edges of the wings 152 and 154, as indicated in Figure 11. The wedging member 160 has a hole 164 therethrough near the lower end thereof, this hole being adapted to receive a simple tool (not shown) in the form of a short hook which can be inserted therein after the tool has been thrust up through the bore of the tube 140. A push on the tool moves the wedging member 160 so that its tapered end 162 wedges the wings 152 and 154 outward until they engage tightly against the inner surface of the bottle neck at a point where the interior diameter is greater than the interior diameter at the mouth of the bottle. This wedging member 160 remains frictionally in place until it is retracted by a tool engaging in the hole 164. Since the wedging member 160 is accessible only when the closure device is removed from the box 30 and when the slide 114 is retracted to open the hole 124, the closure device cannot be removed from the bottle to which it has been secured except by a person having a suitable key with which to unlock the slide 114.

As is evident in Figure 12, the plates 148 and 150 constitute a diametrical partition extending from the partition 20 within the box up to a point well within the neck of the bottle, thus dividing the bore 124 into two parallel passages, so that air-binding of the liquid is avoided. With such an arrangement, the liquid flows rapidly down one of these parallel passages while the air bubbles ascend the other passage to take the place of the escaping liquid.

The operation of this form of the invention is as follows. The proprietor, who has a suitable key with a contour similar to that of the key 104, unlocks the slide 114 and pushes it back until the hole 124 is open. The tubular member 140 is then pushed down into the mouth of an upright bottle 44 as far as it will go. A tool is hooked into the hole 164 and is pushed until the wings 152 and 154 are wedged away from each other to engage the inner wall of the bottle, as shown in Figure 11. The tool is withdrawn and the slide is pushed back to its hole-closing position, as shown in Figure 17. The key is withdrawn, locking the block and slide. The bottle and the closure member are left in this locked condition for use when wanted.

In order to dispense liquid from the bottle 44, it is inverted to the position shown on the drawing and the block 110 with the slide 114 is pushed on the top of a box 30 toward the track 100. The housing 106 enters the recess 116 and the key 104 aligns the tumblers 130 so that when the slide 114 abuts the end of the track 100, the block 110 is unlocked from the slide and can be pushed along onto the track 100 to a position in which the hole 124 communicates with the hole 102. The bottle is then ready to discharge its contents in measured doses by operation of the dispensing mechanism in the box 30.

The bottle 44 can be removed from the box 30 at any time by sliding the block back on the slide 114 until the ends of these members are flush. The slots 133 in the block 110 are then in registry with the slots 132 in the slide 114 and

the tumblers are free to move when released by the key 104. The block and slide can then be removed as a unit from the top 28 of the box and from the key 104 which is stationary. As the block and slide move clear of the key, the tumblers 130 are moved by the springs 134 from the positions shown in Figure 20 to the positions shown in Figure 21, thus locking the block and slide to each other.

I claim:

1. A device of the class described comprising a member having a hole therethrough to provide a passage for the discharge of liquid from a bottle, means operable by access through said passage to secure said device to a bottle so that said hole communicates with the interior of the bottle, an element slidably mounted on said member to open and close said passage, and key-controlled means in said member and element automatically locking said element in passage-closing position when the key is withdrawn, said means being operable by a key to release said element.

2. A device of the class described comprising a block having a hole therethrough, a tubular projection on said block registering with said hole and adapted to enter the mouth of a bottle to provide a passage for the discharge of liquid therefrom, means arranged diametrically across said tubular projection to divide said passage longitudinally into two parallel passages and operable to grip within the neck of the bottle so as to secure the device to the bottle, an element slidably mounted on said block and movable to open and close said hole, and key-operable means on said block and element for locking said element in hole-closing position.

3. A device of the class described comprising a block having a hole therethrough and a dovetail groove in the bottom surface thereof, a tubular member projecting up from said block in registry with said hole and adapted to enter the mouth of a bottle to provide a passage for the discharge of liquid from said bottle through said hole, means projecting up through said tubular member and expansible by access through said passage to secure said device to said bottle, a slide fitted in said groove and movable therein to close said hole, and key-operated means in said block and slide for automatically locking said slide in hole-closing position when the key is withdrawn.

4. A device of the class described comprising a block having a hole therethrough, a split collet projecting from said block and adapted to enter the mouth of a bottle and to be expanded therein to secure the device to the bottle, a tubular spreader slidably in said collet to expand the same, the bore of said collet and spreader communicating with said hole to provide a passage through said device for the discharge of liquid from a bottle secured thereto, an element slidably mounted on said block to open and close said passage, and locking means on said block to lock said slide in passage-closing position, said means being operable by a key to release said slide.

5. A device of the class described comprising a block having a hole therethrough, a split collet projecting from one face of the block to enter the mouth of a bottle, a tubular spreader within said collet, the bore of said collet and spreader communicating with said hole to provide a passage for the discharge of liquid from said bottle, a partition member extending lon-

gitudinally within said spreader and collet, an element slidably on the opposite face of the block to close said passage, and means for locking said element in passage-closing position, said means being operable by a key to release said element.

6. In combination with a plate having a hole therethrough, a closure device slidably on said plate, said device including a member having a hole therethrough adapted to register with the hole through the plate, tubular means projecting from said member to enter the mouth of a bottle and adapted to be secured therein, said tubular means having a bore communicating with the hole through said member to provide a passage for the discharge of liquid from a bottle in which said tubular means is inserted, an element slidably mounted on said member and movable to close said passage, locking means for locking said element in passage-closing position, said locking means being operable by a key to release said element, and means on said plate operating to unlock said locking means so as to release said element when said closure device is moved on said plate to a position in which said holes register with each other.

7. In a liquid-dispensing device including a box with a top cover thereon, a dovetail rail secured on said top, said rail and top having a hole therethrough for the passage of liquid to be dispensed, a key element projecting from an end of said rail, and lockable bottle closure means comprising a block with a dovetail groove in the under face thereof adapted to receive said rail with a sliding fit, said block having a hole therethrough adapted to register with the hole through the rail and box top, a tubular member on said block extending up from the hole in the block and adapted to enter the mouth of a bottle, means carried by said block and expansible within the neck of a bottle to secure said block thereto, a slide fitted in said groove and movable therein to close the hole through said block, key-operable means in said block and slide for locking the slide in hole-closing position, said slide having a longitudinal recess to receive said key element when the locked block and slide are moved to a position on said box in which the slide abuts and is aligned with said rail.

8. A device of the class described comprising a block member with a hole therethrough to provide a passage for the discharge of liquid from a bottle, means for securing said device to a bottle so that the hole communicates with the interior of the bottle, a slide member slidably mounted on said block member to open and close said passage, and means for locking said slide member in passage-closing position, said means comprising shoulders on one of said members, lock tumblers slidably mounted in the other said member, and spring means yieldingly holding said tumblers in positions wherein they are engageable by said shoulders to block the movement of said slide member.

9. A device of the class described comprising a block with a hole therethrough and a tubular extension registering with the hole and adapted to project into the neck of a bottle for the discharge of liquid from the bottle through said hole, an element slidably in said block to open or close the passage through said hole, key-operable locking means normally locking said element to said block in passage-closing position, a base having a hole therethrough, means on said block and base for securing the block on the base

with their holes registering, and key-means on said base arranged to engage said locking means to release said element when the block is mounted on the base, said block and slide being relatively movable when the locking means is unlocked to open the discharge passage through said holes.

10. A device of the class described comprising a block member with a hole therethrough and a tubular extension communicating with said hole and adapted to project into the neck of a bottle to provide a passage for the discharge of liquid from the bottle, a slide member slidable in said block member to and from a passage-closing position, and locking means in said members normally locking the slide member in passage-closing position, said locking means comprising shoulders on one of said members and lock tumblers mounted on the other said member and movable therein in a direction transverse to the direction of movement of said slide member relative to the block member, said tumblers normally engaging said shoulders when the slide member is in passage-closing position to prevent movement of said slide from said position but being key-operable to clear said shoulders.

11. A device of the class described comprising a block with a hole therethrough, a tubular extension on said block registering with said hole and adapted to project into the neck of a bottle for the discharge through said hole of liquid from the bottle, an element slidable in said block to open or close the passage through said hole, key-operable locking means in said block and element normally locking said element when said element

is in passage-closing position, a base having a hole therethrough, means on said base and block for releasably securing said block on said base with the holes thereof registering, and key means carried by said base and arranged so that said locking means is unlocked when the block is in secured position on the base.

12. A device of the class described comprising a block with a hole therethrough, a tubular extension on said block registering with said hole and adapted to project into the neck of a bottle for the discharge through said hole of liquid from the bottle, an element slidable in said block to open or close the passage through said hole, key-operable locking means in said block and element normally locking said element when said element is in passage-closing position, a base having a hole therethrough, means on said base and block for releasably securing said block on said base with the holes thereof registering, key means on said base arranged to release said slidable element when the block is moved into secured position on said base, and means operable by movement of said slidable element to passage-opening position to lock said block in position on the base.

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The following references are of record in the file of this patent:

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Number	Name	Date
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