

May 23, 1967

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3,321,090

SUPPORTING APPARATUS FOR MEDICAL BOTTLES AND THE LIKE

Filed June 1, 1965

2 Sheets-Sheet 1

FIG. 1.

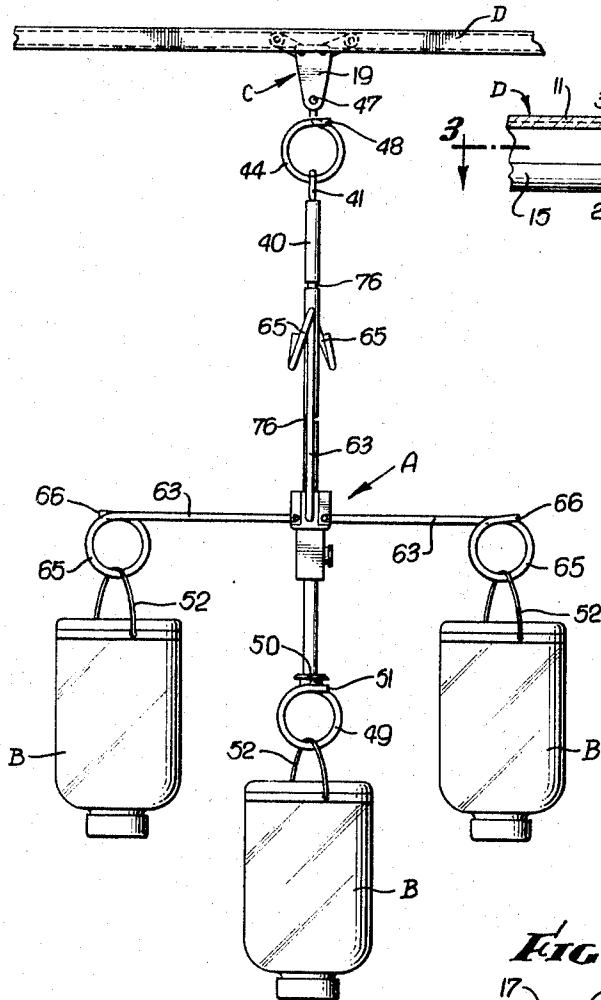


FIG. 2.

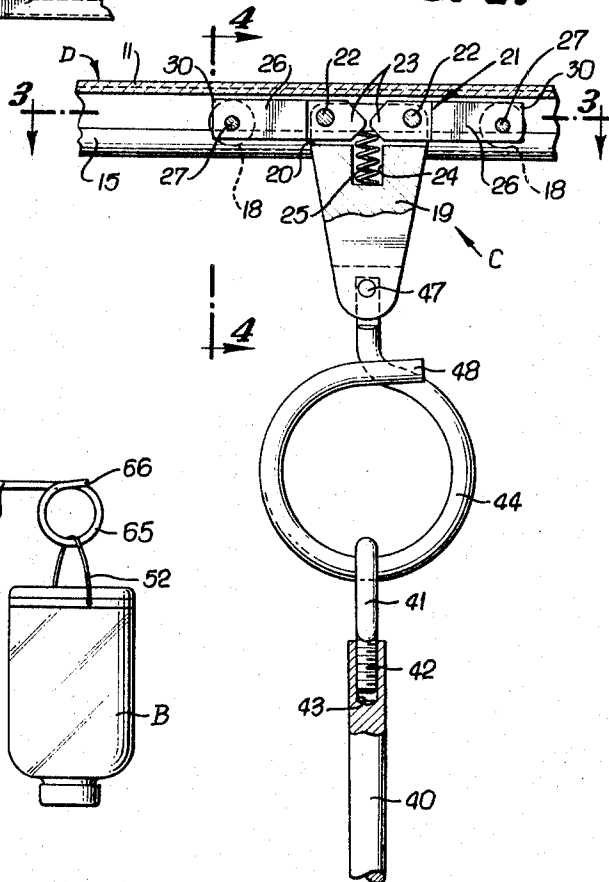


FIG. 4.

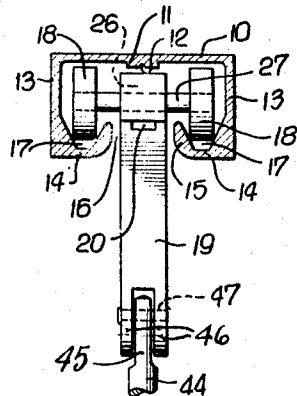
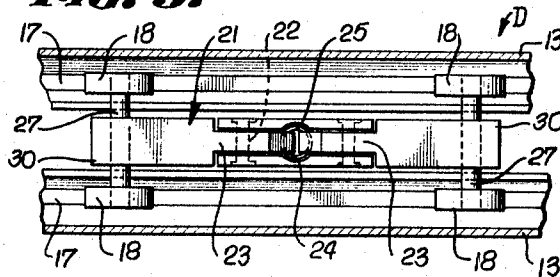


FIG. 3.



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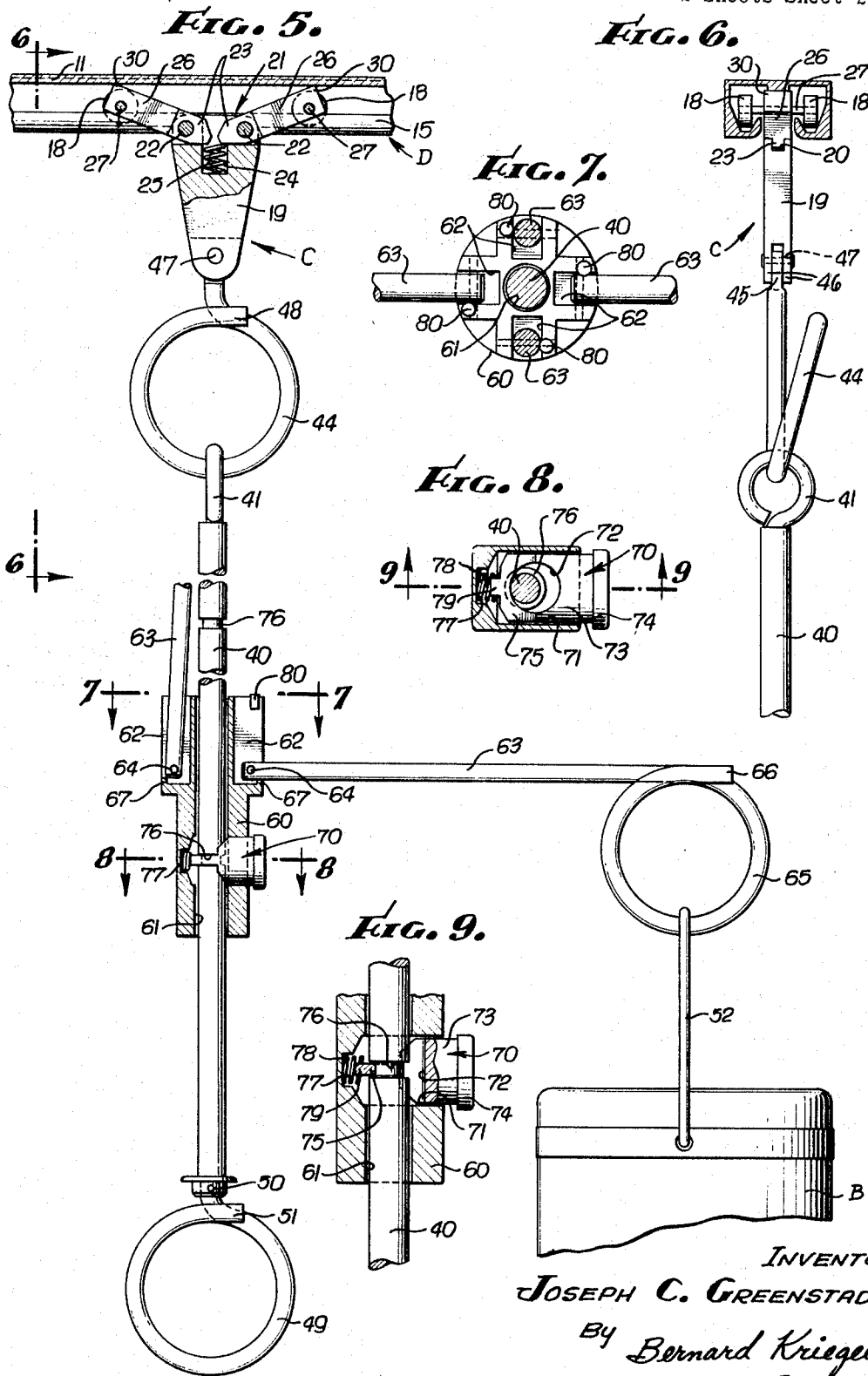
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2 Sheets-Sheet 2



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SUPPORTING APPARATUS FOR MEDICAL BOTTLES AND THE LIKE

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20 Claims. (Cl. 211-162)

The present invention relates to apparatus for supporting devices, such as bottles used in intravenous feedings.

An object of the invention is to provide a supporting apparatus embodying an overhead track and a carrier movable along the track, in which the carrier can be locked automatically to the track at various desired locations along its length.

Another object of the invention is to provide an apparatus embodying an overhead track and a carrier movable along the track which is capable of supporting a device or devices therebelow, and in which the weight of the device or devices automatically locks the carrier to the track at various locations along its length.

A further object of the invention is to provide an improved apparatus from which one or more bottles and similar devices can be supported, and in which the apparatus can be adjusted easily as to height, and readily locked in its vertically adjusted position.

An additional object of the invention is to provide a carrier and structure carried thereby for supporting one or more bottles, or the like, used in intravenous feedings in which the bottle supporting structure is readily releasable from the carrier and movable from room to room.

Yet another object of the invention is to provide an apparatus for supporting a plurality of bottles which is easily foldable for ready portability and to permit its storage in a minimum of space.

This invention possesses many other advantages, and has other objects which may be made more clearly apparent from a consideration of a form in which it may be embodied. This form is shown in the drawings accompanying and forming part of the present specification. It will now be described in detail, for the purpose of illustrating the general principles of the invention; but it is to be understood that such detailed description is not to be taken in a limiting sense, since the scope of the invention is best defined by the appended claims.

Referring to the drawings:

FIG. 1 is a side elevational view of an apparatus embodying the invention supporting a plurality of bottles used in intravenous feedings;

FIG. 2 is an enlarged partially side elevational and partially sectional view through the upper portion of the apparatus illustrated in FIG. 1;

FIG. 3 is an enlarged section taken along the line 3—3 on FIG. 2;

FIG. 4 is an enlarged vertical section taken along the line 4—4 on FIG. 2;

FIG. 5 is an enlarged view of the apparatus disclosed in FIG. 1, with its carrier structure in locked relation against its companion supporting track, parts being shown in section;

FIG. 6 is a view taken as indicated along the line 6—6 on FIG. 5;

FIG. 7 is a section taken along the line 7—7 on FIG. 5;

FIG. 8 is a section taken along the line 8—8 on FIG. 5; and

FIG. 9 is a section taken along the line 9—9 on FIG. 8.

In the embodiment of the invention illustrated in the drawings, one or a plurality of bottles B used for intravenous feeding, or the like, are carried by a bottle support-

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ing structure A, which is, in turn, supported from a carrier structure C that is movable to a desired location along an overhead track D which is secured by screws or the like (not shown) to the ceiling (not shown) of a hospital room. When no bottles are carried by the supporting structure A, the carrier structure C can be moved lengthwise along the track. However, when one or more bottles is mounted on the bottle supporting structure, the carrier structure is automatically actuated by the weight of the bottle or bottles, and is gripped or locked to the overhead track.

The overhead track D includes an upper or horizontal web 10 having a central longitudinal rib 11 extending inwardly thereof. This rib may, if desired, have a longitudinal V-shaped groove 12 for the purpose of centering screws and the like (not shown), which can be inserted through the web 10 and into a ceiling or other structure thereabove, whereby the track is fastened to the ceiling. Opposed spaced vertical side flanges or walls 13 are integral with and depend from the sides of the upper web 10, the lower ends of these flanges, in turn, being integral with inwardly directed lower webs 14 integral with inner flanges or lips 15 that project upwardly toward the upper web. The inner flanges or lips 15 are horizontally spaced from one another to provide a slot 16 therebetween through and along which the carrier structure C can move. The lower portion of each vertical side flange 13 and the inner surface of the adjacent inner flange 15 taper with respect to each other in a downward direction to provide a tapered or generally V-shaped groove 17 along which the wheels or rollers 18 of the carrier structure can move.

The carrier structure C includes a main body 19 which is narrower than the width of the slot 16 so as to be movable in the latter between the inner flanges 15. The body has an upper horizontal groove 20 therein in which a pair of oppositely directed carrier levers or bars 21 are disposed. Each carrier lever is pivotally mounted on a hinge or pivot pin 22 extending therethrough and suitably mounted in the main body on opposite sides of its slot or groove 20. Each lever has an inner arm portion 23 terminating above a socket 24 in the main body 19 in which a helical compression spring 25 is mounted, the lower end of the spring bearing against the base of the socket and its upper end bearing against the inner ends of the opposed inner arms 23 so as to tend to swing the inner arms upwardly and the outer arms 26 of the carrier levers or bars in a downward direction.

Each outer arm 26 adjacent to its outer end has an axle or shaft 27 passing therethrough and extending on opposite sides thereof, each axle rotatably carrying a pair of the wheels or rollers 18 on their outer portions that are rideable or rollable in the tapered grooves 17 of the track. The wheels extend below the lower surfaces of the outer arms 26, and when riding or rolling in the track grooves 17, they are out of contact with the upper web 10. Assuming the main body 19 of the carrier structure to move downwardly, the carrier levers or bars 21 are shifted downwardly about the axes of the axles 27 and shift the outer upper corners 30 of the outer arms upwardly into engagement with the rib 11, thereby causing such portions to grip or lock against the rib and correspondingly lock the carrier structure C to the track D. Upward movement of the carrier body 19 will swing the levers 21 about the axes of the axles 27 in an upward direction and will move the brake, gripper or locking portions 30 of the outer arms 26 from the rib 11, thereby allowing the carrier to be shifted along the track to a different position.

Normally, when a downward pull or force is not exerted

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upon the main body 19 of the carrier, so as to overcome the compressive force of the helical spring 25, the outer arms 26 and the main body 19 occupy the position illustrated in FIG. 2, in which the gripper portions 30 are out of contact with the rib 11 of the upper web 10, allowing the carrier structure C to be shifted longitudinally along the overhead track D, the spring acting upon the inner arms 23 to shift them in an upward direction and the outer arms 26 relatively in a downward direction about their pivot pins 22. However, when the force of the spring 25 is overcome by the exertion of a sufficient downward pull or force on the main body 19, the pivot pins are also shifted downwardly to cause the inner arms 23 to move downwardly and compress the spring 25 and shift the levers 21 about the axes of the wheel axles 27 and press the outer gripping portions 30 of the arms 26 against the rib 11 of the overhead track.

As disclosed in the drawings, the carrier structure and track have a bottle supporting structure A suspended therefrom. This bottle supporting structure includes a main support rod 40 having an eye 41 attached to its upper end, as by having a threaded or vertical shank 42 of the eye threadedly received in a companion bore 43 in the upper end of the support rod. This eye may be mounted upon a safety hook 44 having an upwardly extending arm 45 received between bifurcated legs 46 of the main carrier body 19 and pivotally carried by such legs through the agency of a hinge pin 47. The safety hook 44 includes a spiral or helical body portion having the circular or loop form disclosed in the drawings, and with the upper end 48 of the spiral body spaced from the other end of the body to permit the eye to be slipped over the free end 48 of the body and suspend it from the safety hook, the latter being adapted to swing around the axis of the hinge pin 47.

The lower end of the main support rod 40 may have a safety hook 49 suitably secured thereto, as by inserting it in the lower end of the rod 40 and fastening it thereto by means of a pin 50, or the like. This lower safety hook may also have a spiral body with a free upper end 51 displaced laterally from the opposed upper end of the spiral body, thereby permitting a bail 52 suitably secured to an inverted bottle B to be slipped thereon and carried by the safety or support hook, as disclosed in FIG. 1. A suitable liquid will feed in a known manner from this bottle to the patient.

The weight of the bottle B by itself is sufficient to overcome the force of the helical spring 25 and cause the main body 19 to shift downwardly for the purpose of shifting the carrier levers or bars 21 about the axes of the axles 27 and force the outer gripping portions 30 of the levers into locking engagement with the track rib 11. Removal of the bottle B will allow the helical spring 25 in the main body 19 to reexpand and pivot the carrier levers back to their free position, as shown in FIG. 2, releasing the brake or gripping portions 30 of the levers from the rib 11 and allowing the carrier structure C to be shifted along the overhead track D. If the spring 25 does not release the carrier levers from the track rib, an upward force can be exerted on the main support rod 40 which will be transmitted through the upper safety hook 44 to the main body 19 and shift the carrier levers about the axles 27 to a rib released position. Because of the configuration of the spiral safety hook 44, such upward movement will not inadvertently remove the eye 41 from the safety hook.

The bottle supporting structure A is capable of carrying a plurality of intravenous feeding bottles B, or the like. An adjustable body member 60 is vertically slidable on the main support rod 40 which passes through a vertical bore or passage 61 in the body. This body has a plurality of circumferentially spaced slots 62 which open through its upper end. A bottle carrying arm 63 extends into each of these slots, being pivotally secured to the body near the lower end of the slot by a hinge pin 64

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secured to the body and extending across the slot 62 and the inner end of the arm. The outer end of each arm is formed as a spiral safety or support hook 65, with the free end 66 of the hook being disposed in an uppermost position when the arm extends horizontally outwardly from the main body 60, the inner end of the arm then engaging the body at the lower end 67 of the slot, as disclosed most clearly in FIG. 5. Thus, the arm 63 and its safety hook 65 are disposed in a substantially horizontal position, with the arm 63 being supported against further downward movement relative to the body 60 by its hinge pin 64 and by its engagement with the body at the lower end 67 of its slot 62.

As shown by way of example in the drawings, the body 60 has four circumferentially spaced vertical slots 62 and four body supporting arms or members 63. One or more of these arms can be swung downwardly to its bottle supporting position, or all of them can be swung downwardly to such position. When all of the arms are in their downward position, they can support a total of four bottles B, each of which has a bail 52 for mounting upon a spiral safety hook 65 of an arm, as shown in FIG. 1. A fifth bottle B can, as described above, be supported from the lower spiral safety hook 49 secured to the lower end of the main support rod 40.

The adjustable body 60 and its arms 63 can be locked in different vertical positions along the main support rod 40 to permit high or low gravity feeding of intravenous fluids from one or more bottles B to the patient. The adjustable body carries a lock 70 below its slotted portion, which is slidable transversely in a radial bore 71 formed in the body which intersects the longitudinal body passage 61. The slidable lock has an enlarged opening or passage 72 therethrough through which the main support rod 40 extends, the slidable lock also including a cylindrical portion 73 disposed at one side of the body and terminating in an enlarged flange 74, of larger external diameter than the diameter of the radial passage 71, so as to limit the extent of inward shifting of the locking transversely of the body by virtue of contact of the flange 74 with the periphery of the body 60. The inner portion 75 of the slidable lock member is relatively narrow in a direction longitudinally of the rod and is capable of fitting within a selected lock groove 76 in the rod, a plurality of which are disposed at vertically spaced positions along the rod. The slidable lock member 70 is urged in an outward direction, so as to shift its narrow inner portion 75 into one of the grooves 76, by a helical compression spring 77 having its outer end bearing against a spring seat 78 in the body provided by the base of the radial bore 71, the inner end of this spring bearing against the narrow inner portion 75 of the lock member. This lock member has a projection 79 extending outwardly from its narrow portion and extending into the spring so as to maintain the latter centered with respect to the slidable lock 70.

When the lock member 70 is shifted inwardly by finger or thumb pressure imposed upon the button 74, its narrow inner portion 75 is shifted outwardly of a lock groove 76 in which it may have been retained, which releases the body 60 from the rod 40 and allows the body and all of its arms 63 to be shifted upwardly and downwardly along the support rod. After the narrow portion 75 has been removed from its companion groove 76 and the body 60 shifted to one side of the groove, the finger pressure on the button 74 can be released and the lock member 70 will then merely slide along the periphery of the rod 40 until the next groove 76 is reached, at which time the spring 77 will snap the narrow inner portion 75 of the lock member into the groove and lock the adjustable body 60 to the main support rod. Of course, the finger pressure can be retained on the button 74 to maintain the lock in a released condition until a selected groove 76 has been reached, whereupon release of the finger pressure will allow the spring 77 to snap the inner portion 75

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of the lock member into the companion groove to support the adjustable body 60 and the arms 63 in the desired position along the main support rod 40.

In the event that less than all of the bottle supporting arms 63 are required, the ones not needed can be folded in an upward position adjacent to the main support rod 40 by merely swinging them upwardly, such as designated by the vertically positioned arms in FIG. 1 and the support arm at the left side of FIG. 5. Each arm 63 is retained in this upward position by snapping past a vertical retainer or detent 80 which may be made of a suitable flexible material mounted in the body 60 and projecting into each slot 62 to a slight extent. The retainer or detent 80 may be made of nylon, for example, and will deflect sufficiently to allow the diameter of the round cross-sectional arm 63 to move past it. When the arm is to be swung downwardly, sufficient force can be exerted thereon to compress the retainer member 80 sufficiently and allow the arm to move past it and to the generally horizontal position at which a bottle B is to be supported from its spiral safety hook 65.

When the bottle supporting structure A is not needed in a room that has an overhead track D, the bottles can be removed from the supporting hooks 65, 49, and the lock 70 released so that the body 60 can be shifted to a downward position along the main support rod 40. All of the arms 63 can then be swung upwardly to a position adjacent to the support rod 40 and are held in such adjacent position by the detents 80. The entire supporting structure A can then be moved to a different room or location of use, or it can be stored. Its being folded into a compact shape facilitates its movement from room to room, and also causes it to occupy a minimum of space when stored.

Although disclosed in connection with a carrier structure C movable along an overhead track D, the bottle supporting structure A can, if desired, be suspended from other devices and, for that matter, from a hanger (not shown) that might be permanently fixed to a ceiling.

From the drawings and the foregoing description, it is evident that a supporting apparatus has been provided in which the carrier C is readily movable along the overhead track D and is automatically locked to the track as by exerting a downward pull on the carrier, which downward pull can result from the weight of a single or a plurality of bottles B mounted upon the supporting structure A suspended from the carrier. Removal of the bottle or bottles from the carrier will cause the spring 25 to automatically unlock the carrier from the track, allowing the carrier to be shifted to a different position, if desired. If an unbalanced arrangement of bottles is mounted on the bottle supporting structure, the main rod support 40 will merely tilt to a relatively small extent without releasing or unlocking the carrier C from the track D, since the safety hook 44 can pivot about the axis of the hinge pin 47 relative to the main body 19 of the carrier. The bottle supporting structure A is readily adjustable to position the bottle or bottles at the desired vertical height, and it is easily foldable when not in use, for ease of carrying from place to place, and to permit its storage in a minimum of space.

I claim:

1. In a supporting apparatus: a track; a carrier movable along said track in engagement therewith and depending therefrom, said carrier being adapted to carry a load suspended therefrom; means on said carrier shiftable into engagement with said track upon imposition of the weight of the suspended load on said carrier for locking said carrier to said track; and means only on said carrier for automatically releasing said locking means from said track in response to removal of the suspended load from said carrier.

2. In a supporting apparatus: a track; a carrier movable along said track in engagement therewith and depending therefrom; means on said carrier shiftable into

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engagement with said track upon imposition of a downward force on said carrier for locking said carrier to said track; and means on said carrier for releasing said locking means from said track upon relieving of said downward force from said carrier.

3. In a supporting apparatus: a track; a carrier body; a member mounted on said body and engaging said track and shiftable along said track to support said body from said track for movement therealong; said member being movable with respect to said body into engagement with said track upon imposition of a downward force on said body for locking said body to said track.

4. In a supporting apparatus: a track; a carrier body; a member mounted on said body and engaging said track and shiftable along said track to support said body from said track for movement therealong; said member being movable with respect to said body into engagement with said track upon imposition of a downward force on said body for locking said body to said track; and means engaging said body and member for releasing said member from locking relation to said track upon relieving of said downward force on said body.

5. In a supporting apparatus: a track; a carrier body; a member pivotally mounted on said body and engaging said track and shiftable along said track to support said body from said track for movement therealong; said member having a portion shiftable upwardly into engagement with said track upon downward movement of said body for locking said body to said track.

6. In a supporting apparatus: a track; a carrier body; a member pivotally mounted on said body and engaging said track and shiftable along said track to support said body from said track for movement therealong; said member having a portion shiftable upwardly into engagement with said track upon downward movement of said body for locking said body to said track; and spring means engaging said body and member for pivoting said member on said body to remove said portion from locking engagement with said track upon upward movement of said body.

7. In a supporting apparatus: a track; a carrier body; oppositely directed members pivoted on said body; means on said members and movable along said track for shiftablely supporting said members and body from said track; said members having portions shiftable upwardly into engagement with said track upon downward movement of said body for locking said body to said track; and spring means engaging said body and members for normally yieldably retaining said body in an upper position relative to said track and said member portions from locking engagement with said track.

8. In a supporting apparatus: a track; a carrier body; oppositely directed levers pivoted on said body, each lever having an inner arm and an outer arm; means on said outer arms engaging and movable along said track for movably supporting said levers and body from said track; said body being movable downwardly of said track to shift the outer portions of said outer arms upwardly into engagement with said track and lock said body to said track; and spring means engaging said body and inner arms for yieldably retaining said body upwardly and said outer portions of said outer arms downwardly from locking engagement with said track.

9. In a supporting apparatus: a track adapted to be secured to a ceiling and the like and including an upper web, opposed side flanges depending from said web, and lower webs extending inwardly from said side flanges in spaced relation to provide a slot between said lower webs; a carrier body extending upwardly through said slot; oppositely directed levers pivoted on the upper portion of said body within said track, each lever having an inner arm and an outer arm; wheels on said outer arms engaging said lower webs for movably supporting said levers and body from said track; said body being shiftable downwardly of said track to shift the outer portions of said

outer arms upwardly into engagement with said upper web and lock said body to said track; and spring means engaging said body and inner arms for yieldably retaining said body upwardly and said outer portions of said outer arms downwardly from locking engagement with said upper web.

10. A carrier structure adapted to be carried by and shiftable along an overhead track, comprising a carrier body, oppositely directed levers pivoted on said body, each lever having an inner arm and an outer arm, means on said outer arms adapted to engage the track to support said levers and body for movement along the track, said outer arms having outer portions shiftable upwardly into locking engagement with the track upon downward movement of said body, and spring means engaging said body and inner arms for yieldably retaining said body upwardly and said outer arm portions downwardly from locking engagement with the track.

11. In a supporting apparatus: a track; a carrier movable along said track and depending therefrom; means on said carrier and engageable with said track for locking said carrier to said track; a bottle supporting structure suspended from said carrier and imposing a downward force on said carrier in response to the weight of one or more bottles supported by said structure to engage said locking means with said track; and means on said carrier for releasing said locking means from said track in response to removal of all bottles from said structure whereby no bottles are supported by said structure.

12. In a supporting apparatus: a track; a carrier movable along said track and depending therefrom; means on said carrier engageable with said track for locking said carrier to said track; a spiral hook pivotally mounted on said carrier and depending therefrom; a bottle supporting structure suspended from said hook and imposing a downward force on said carrier in response to the weight of one or more bottles supported by said structure to engage said locking means with said track; and means on said carrier for releasing said locking means from said track in response to removal of all bottles from said structure whereby no bottles are supported by said structure.

13. In a supporting apparatus: a track; a carrier movable along said track and depending therefrom; means on said carrier and engageable with said track for locking said carrier to said track; a bottle supporting structure suspended from said carrier and imposing a downward force on said carrier in response to the weight of one or more bottles supported by said structure to engage said locking means with said track; means on said carrier for releasing said locking means from said track in response to removal of all bottles from said structure whereby no bottles are supported by said structure; said bottle supporting structure including a rod; a body on said rod; and a plurality of circumferentially spaced bottle supporting arms carried by said body.

14. In a supporting apparatus: a track; a carrier movable along said track and depending therefrom; means on said carrier and engageable with said track for locking said carrier to said track; a bottle supporting structure suspended from said carrier and imposing a downward force on said carrier when one or more bottles are supported by said structure to engage said locking means with said track; means on said carrier for releasing said locking means from said track when no bottles are supported by said structure; said bottle supporting structure including a rod; a body on said rod; and a plurality of circumferentially spaced bottle supporting arms pivotally mounted on said body, each arm being swingable from an upper position folded against said rod to an extended position adapted for supporting a bottle.

15. In a supporting apparatus: a track; a carrier movable along said track and depending therefrom; means on said carrier and engageable with said track for locking said carrier to said track; a bottle supporting structure suspended from said carrier and imposing a downward

force on said carrier when one or more bottles are supported by said structure to engage said locking means with said track; means on said carrier for releasing said locking means from said track when no bottles are supported by said structure; said bottle supporting structure including a rod; a body on said rod; a plurality of circumferentially spaced bottle supporting arms pivotally mounted on said body, each arm being swingable from an upper position folded against said rod to an extended position adapted for supporting a bottle; and detent means on said body engageable with said arms for releasably retaining said arms folded against said rod.

16. In a supporting apparatus: a track; a carrier movable along said track and depending therefrom; means on said carrier and engageable with said track for locking said carrier to said track; a bottle supporting structure suspended from said carrier and imposing a downward force on said carrier in response to the weight of one or more bottles supported by said structure to engage said locking means with said track; means on said carrier for releasing said locking means from said track in response to removal of all bottles from said structure whereby no bottles are supported by said structure; said bottle supporting structure including a rod; a body slidable along said rod; means for releasably securing said body to said rod at selected positions therealong; and a plurality of circumferentially spaced bottle supporting arms carried by said body.

17. In a supporting apparatus: a track; a carrier movable along said track and depending therefrom; means on said carrier and engageable with said track for locking said carrier to said track; a bottle supporting structure suspended from said carrier and imposing a downward force on said carrier when one or more bottles are supported by said structure to engage said locking means with said track; means on said carrier for releasing said locking means from said track when no bottles are supported by said structure; said bottle supporting structure including a rod; a body slidable along said rod; means for releasably securing said body to said rod at selected positions therealong; and a plurality of circumferentially spaced bottle supporting arms pivotally mounted on said body, each arm being swingable from an upper position folded against said rod to an extended position adapted for supporting a bottle.

18. In a supporting apparatus for bottles and the like: a rod having a plurality of longitudinally spaced lock grooves; a body slidable along said rod; a lock slidably supported in said body and shiftable radially of said rod into and from a selected groove for releasably securing said body to said rod at selected positions therealong; spring means bearing against said lock to shift said lock into a selected groove; and a plurality of circumferentially spaced bottle supporting arms pivotally mounted on said body, each arm being swingable from an upper position folded against said rod to an extended position adapted for supporting a bottle.

19. In a supporting apparatus for bottles and the like: a rod having a plurality of longitudinally spaced lock grooves; a body slidable along said rod and having a plurality of circumferentially spaced slots; a lock slidably supported in said body and shiftable radially of said rod for releasably securing said body to said rod at selected positions therealong, said lock having a passage through which said rod extends; spring means bearing against said lock to shift said lock into a selected groove; a bottle supporting arm pivotally connected to said body in each slot and swingable from an upper position folded against said rod to an extended position bearing against said body at the lower end of a slot, in which position said arm is adapted to support a bottle.

20. In a supporting apparatus for bottles and the like: a rod having a plurality of longitudinally spaced lock grooves; a body slidable along said rod having a plurality of circumferentially spaced slots; a lock slidably sup-

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ported in said body and shiftable radially of said rod for releasably securing said body to said rod at selected positions therealong; said lock having a passage through which said rod extends; spring means bearing against said lock to shift said lock into a selected groove; a bottle supporting arm pivotally connected to said body in each slot and swingable from an upper position folded against said rod to an extended position bearing against said body at the lower end of a slot, in which position said arm is adapted to support a bottle; and detent means on said body extending into each of said slots and engageable with an arm in said slot for releasably retaining said arm folded against said rod.

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