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HOLDING DEVICE

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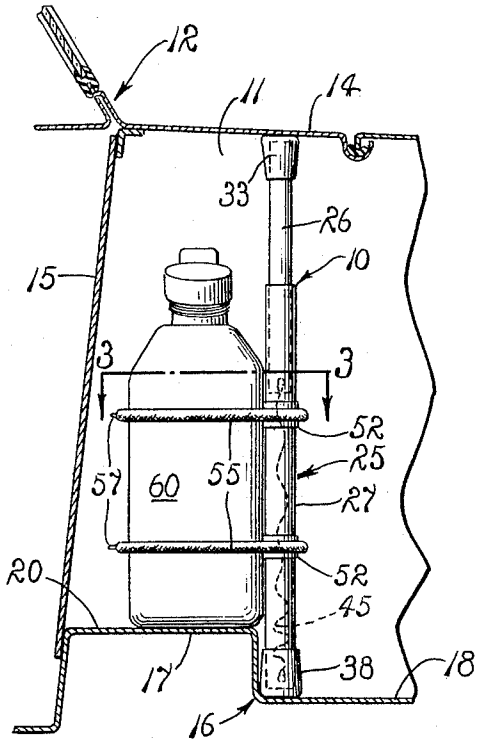


FIG. 1.

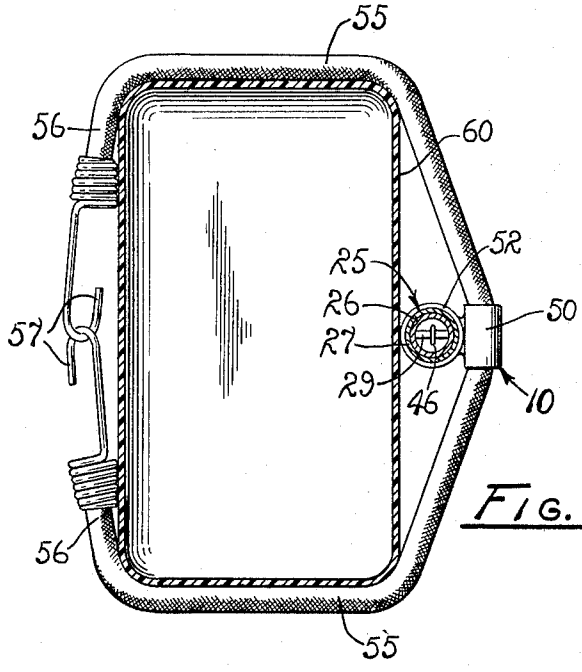


FIG. 3.

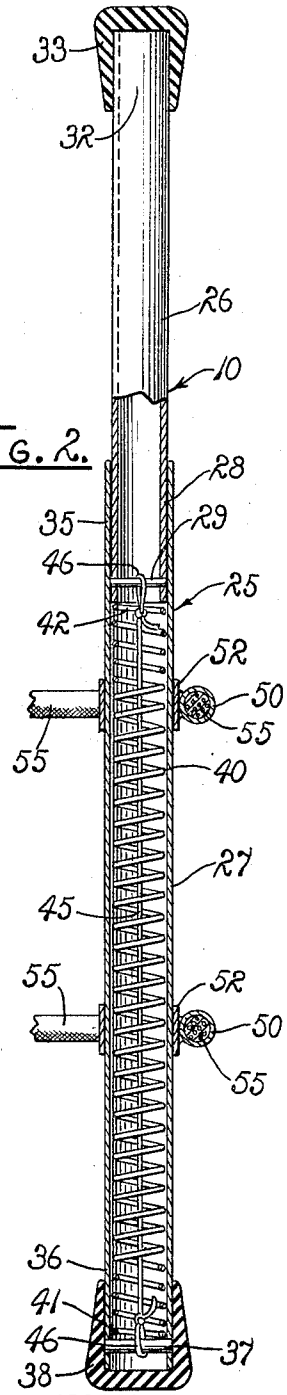


FIG. 2.

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HOLDING DEVICE

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The present invention relates to a holding device for containers of volatile liquids such as fuel cans and the like, and more particularly to such a device for constraining such containers in a predetermined upright position while being transported in a vehicle.

Fuel cans are conventionally carried without any constraint within the trunks of automobiles, under the decks of boats and the like for emergency fueling purposes. Such cans usually provide small breather orifices in their caps or elsewhere for venting the fumes which normally form with the cans and/or permitting air to enter as fluid contents are poured therefrom. Frequently during transport, the can is toppled from its normally upright position, thus permitting fuel to be discharged through the breather orifice and creating a fire hazard.

Accordingly, it is an object of the present invention to provide a holding device to constrain containers and the like in a predetermined upright position within a vehicle compartment.

Another object is to provide such a holding device which may be readily adapted to constrain a wide range of objects of various shapes and sizes.

Another object is to provide a holding device of the character described which is readily adapted for placement in compartments having a wide range of dimensions.

Another object is to provide a holding device having a telescopic support member which may be easily retracted for installation in a small compartment and which is automatically extensible to a substantially rigid holding position therein.

Other objects and advantages of the present invention will be more fully apparent upon reference to the following description in the specification.

In the drawing:

FIG. 1 is a side elevation of a holding device embodying the principles of the present invention having a telescopic support member disposed in a position to constrain a container within the trunk of an automobile, shown fragmentarily in vertical section.

FIG. 2 is a somewhat enlarged central vertical section through the telescopic support member of the present invention.

FIG. 3 is a somewhat enlarged transverse horizontal section through the support rod and container showing one of the tie members circumscribing the container taken on line 3—3 of FIG. 1.

Referring more particularly to the drawings, a holding device embodying the principles of the present invention is generally indicated by the reference numeral 10. As best shown in FIG. 1 the holding device is adapted as a matter of illustrative convenience for installation within a trunk compartment 11 of an automobile fragmentarily indicated by the reference numeral 12. The trunk compartment is defined by a top wall 14, a forward wall 15 and a bottom wall 16. In the described environment, the walls 14 and 16 serve as reaction surfaces. The bottom wall has upper and lower sections 17 and 18, respectively, which define a shelf 20.

The holding device 10 of the present invention provides an elongated tubular support rod 25 having opposite inner and outer telescopic sections 26 and 27, respectively. The inner section includes a telescopically received inner end 28, having a rigid pin 29 diametrically extended therethrough, and an opposite outer end 32.

The outer end mounts a closure cap 33 of a resiliently flexible material such as rubber or the like, so as frictionally to engage a wall surface with a minimum of slippage. The outer section 27 of the support rod 25 has a telescopic receiver end 35 adapted to receive the inner end 28 of section 26 for relative sliding axial movement. The outer section has an opposite end 36 having a diametrically disposed pin 37 extended therethrough. A closure cap 38 similar to the cap 33 of the inner section is disposed in closing relation to the outer end of the outer section of the rod.

An elongated compression spring 40 is disposed within the support rod 25 and provides an end 41 abutting the pin 37 of the outer end 36 of section 27. The spring has an opposite end 42 which engages the telescopically received end 28 of the inner section 26 of the rod. The sections of the support rod are retained in the assembled telescopic relation of FIG. 2 by an elongated flexible cable 45. The cable has opposite looped ends 46, each secured to a respective one of the pins 29 and 37 of the sections, and an intermediate portion of the cable is extended axially through the spring 40.

A pair of elongated sleeves 50 individually provide ring portions 52 which are slidably mounted on the outer periphery of section 27 of support rod 25. The sleeves and their respective ring portions are right-angularly related so that in their assembled positions of FIG. 2 the longitudinal axes of the sleeves are disposed in a plane normal to the longitudinal axis of the support rod. Each of the sleeves slidably supports therein an elongated resiliently flexible tie member 55 having opposite ends 56. The opposite ends individually mount elongated return-bent fastener hooks 57. As best shown in FIG. 3, the hooks are connected for dependable constraining support of an object such as a fuel can 60.

Operation

The operation of the described embodiment of the subject invention is believed to be clearly apparent and is briefly summarized at this point. Before use the support rod 25 of the holding device 10 is normally extended to its maximum extensible position, as shown in FIG. 2, under the urging of the compression spring 40 therein tending to separate the sections 26 and 27. Further axial movement of the sections toward separation is limited by the cable 45, which is of a length proportioned to sections 26 and 27 so as to maintain the sections in assembled condition. The sleeves 50 are axially slid along the outer periphery of section 27 of the rod to approximately spaced positions most adaptable to the particular size and configuration of object to be supported. With a container such as the fuel can 60 to be supported on the shelf 20 within the trunk, the sleeves are substantially equally spaced from the ends of the outer section 27 of the rod in corresponding relation to the length of the can.

As best shown in FIG. 3, the opposite ends 56 of the tie members 55 are positioned about the can and the hooks 57 engaged dependably to hold the can against the support rod 25. The support rod 25 is then compressed by applying an opposite equal force against caps 33 and 38 to telescope the inner and outer sections 26 and 27 against the compression spring 40. The rod is telescoped to a length to permit its introduction into the trunk compartment 11. After positioning within the trunk, the rod is released permitting it to extend to a rigid holding position, as shown in FIG. 1, with the ends frictionally engaging the top and bottom walls 14 and 16, respectively, of the trunk compartment. With the device in a rigid holding position, the sleeves 50 may be further manipulated on the support rod to position the fuel can 60 relative to the rod which in FIG. 1 is pref-

erably rested upon the shelf **20** of the trunk compartment. When so held by the device, the fuel can is dependably constrained in an upright position, even though subjected to upsetting forces during transport.

When it is desired to use the fuel can **60**, the entire assembly is easily removed by merely retracting the telescopic support rod **25** to its previously described telescoped inserting position. It is to be noted that after removal of the support rod from the trunk compartment **11**, complete separation of the inner and outer sections **26** and **27** of the rod is precluded by the cable **45**. The hooks **57** permit ready separation of the device from the can **60**.

If, however, it is desired to remove the fuel can for a short time and thereafter to return the can to its transport position of FIG. 1, removal can be easily accomplished without removing the support rod **25**. In this instance, the fuel can and tie members **55** are unitarily rotated by grasping the can and exerting a torque force thereon acting about the longitudinal axis of the rod **25**. This causes relative rotation between the ring portion **52** of the sleeves **50** and the support rod. Rotation continues until the hooks **57** are positioned for easily separating the opposite ends **56** of the tie members, thereby releasing the can from the rod. After use the can is positioned against the rod and the hooks **57** refastened to hold the tie members about the can. The can is then repositioned upon the shelf **20** by rotational or axial movement of the sleeves **50** relative to the rod to the degree required.

In view of the foregoing, it is readily apparent that the structure of the present invention provides an improved holding device for containers in confined areas such as the trunk of an automobile as shown and described herein. The device is readily adapted to hold a wide variety of objects of virtually any configuration. The telescopic rod permits ease of insertion and removal from any confined area sufficiently large to receive the device in a telescoped condition. Furthermore, the fuel can or other constrained objects may either be removed along with the holding device or independently thereof and returned to its constrained position without disturbing the rigid mounting of the holding device.

Although the invention has been herein shown and described in what is conceived to be the most practical and preferred embodiment, it is recognized that departures may be made therefrom within the scope of the invention, which is not to be limited to the details disclosed herein but is to be accorded the full scope of the claims so as to embrace any and all equivalent devices and apparatus.

Having described our invention, what we claim as new and desired to secure by Letters Patent is:

1. A holding device adapted to constrain a container and the like in a predetermined upright position while being transported in a vehicle compartment having oppositely spaced walls comprising an elongated tubular support rod having opposite ends and telescopic sections movable between a retracted installing position and an extended restraining position placed within the compartment with the ends in contact with the walls; an elongated compression member disposed within the rod between the sections urging the sections toward said restraining position; a flexible cable within the rod interconnecting said sections to preclude complete separation of the sections; a pair of elongated resiliently flexible tie members circumscribing the rod and the container in relatively closely spaced relation intermediate said ends of the rod to hold the container against the rod; and means slidably mounting said tie members on the rod for adjusting the spacing between the tie members and between the tie members and said opposite ends of the rod.

2. A holding device adapted to constrain a container and the like in a predetermined upright position while being transported in a vehicle compartment having oppositely spaced walls comprising an elongated tubular support rod having opposite ends and telescopic sections movable between a retracted installing position and an extended restraining position placed within the compartment with the ends in contact with the walls; an elongated compression member disposed within the rod between the sections urging the sections toward said restraining position; a flexible cable within the rod interconnecting said sections to preclude complete separation of the sections; and a pair of elongated resiliently flexible tie members; and means axially slidably mounting the tie members on the rod in circumscribing relation to the rod for placement about the container to hold the container against the rod.

3. A holding device adapted to constrain a container in a predetermined upright position while being transported in a vehicle compartment having oppositely spaced walls as reaction surfaces comprising an elongated tubular support rod having opposite telescopic received and receiver sections individually providing respective inner ends and closed outer ends and the sections being movable between a retracted installing position and extended restraining position within the compartment with the ends in frictional engagement with said walls; an elongated compression spring disposed within the rod in contact with the outer end of one section and the inner end of the opposite section to urge the sections toward said restraining position; a flexible cable disposed within the compression spring and providing opposite ends; pin means individually connecting the ends of the cable respectively to the outer end of said receiver section and to the inner end of said received section to preclude complete separation of the sections; a pair of elongated resiliently flexible tie members, each providing opposite ends, a pair of sleeves journaled on said receiver section of the rod slidably individually to receive the tie members therethrough and being axially slidable on the rod for placement of the tie members about the container to hold the same in said predetermined upright position against the rod; and hooking fasteners secured to the ends of the tie members for detachably holding the container in said position.

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