Dec. 26, 1967 L. CIESLAK 3,360,294

COLLAPSIBLE CAMPER

Filed Oct. 20, 1965 2 Sheets-Sheet 1

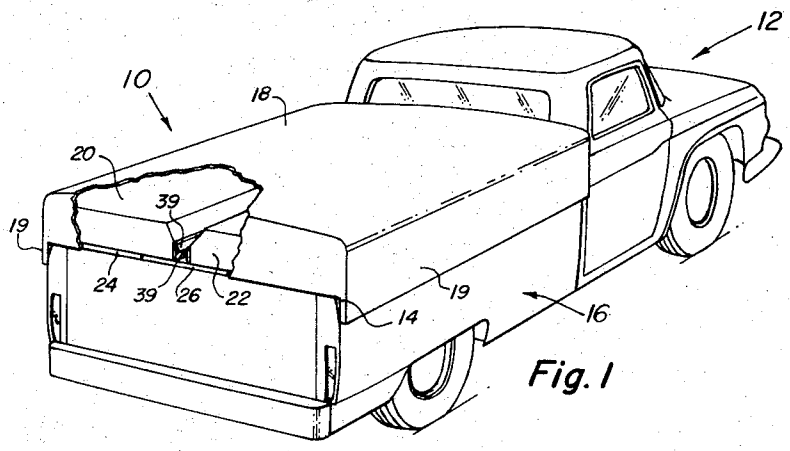


Fig. 1

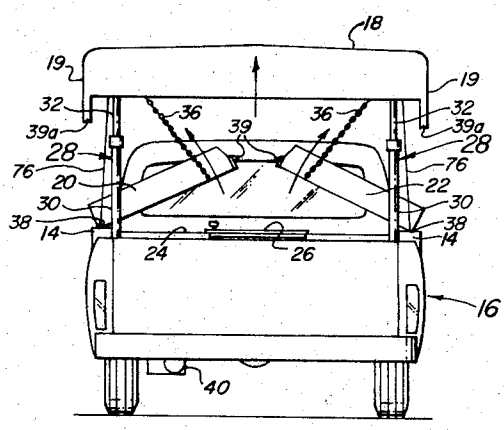


Fig. 2

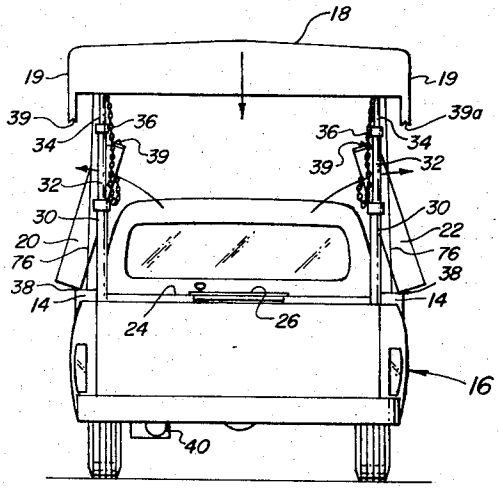


Fig. 3

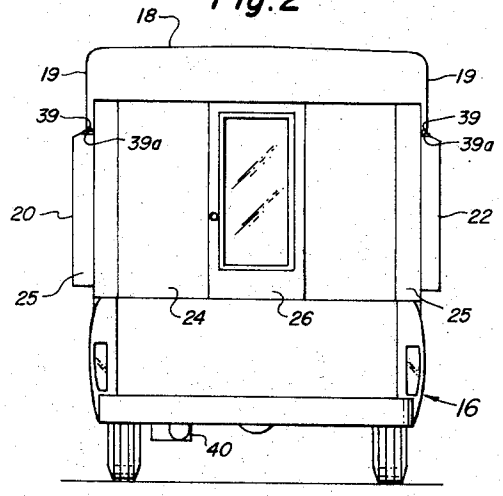


Fig. 4

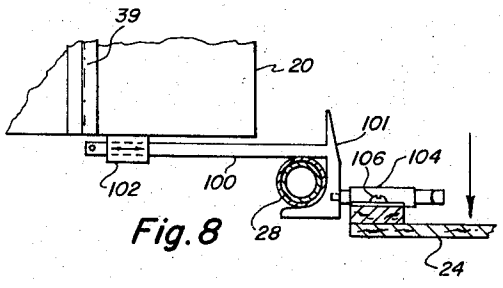


Fig. 8

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Dec. 26, 1967 L. CIESLAK 3,360,294

COLLAPSIBLE CAMPER

Filed Oct. 20, 1965 2 Sheets-Sheet 2

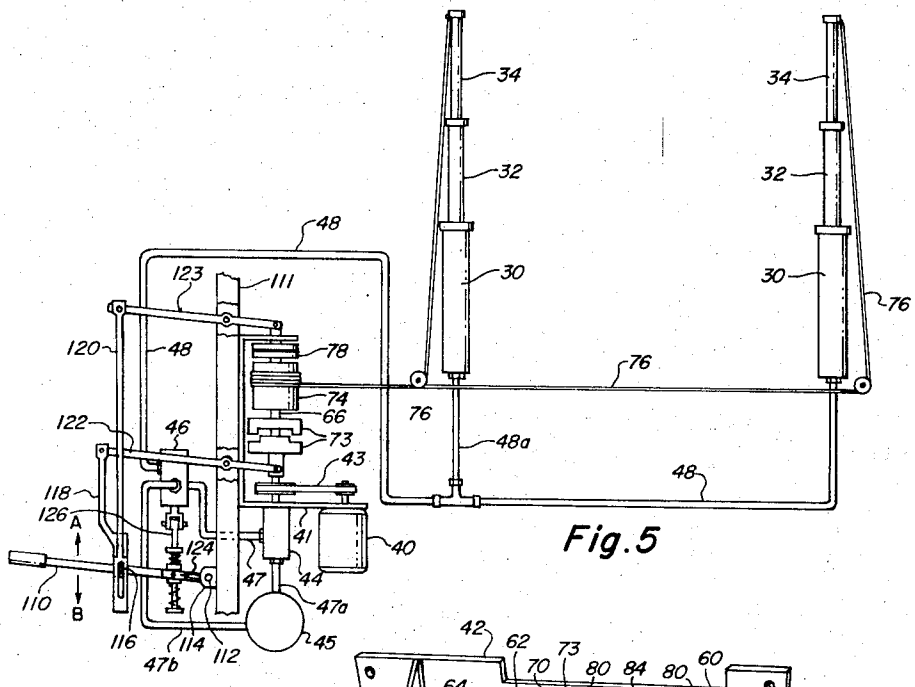


Fig. 5

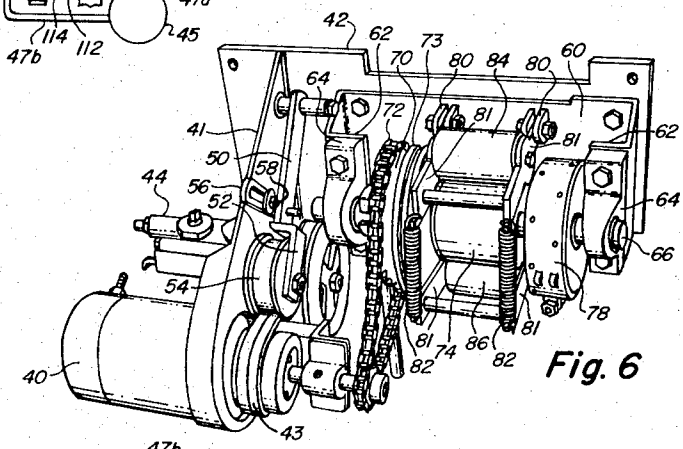


Fig. 6

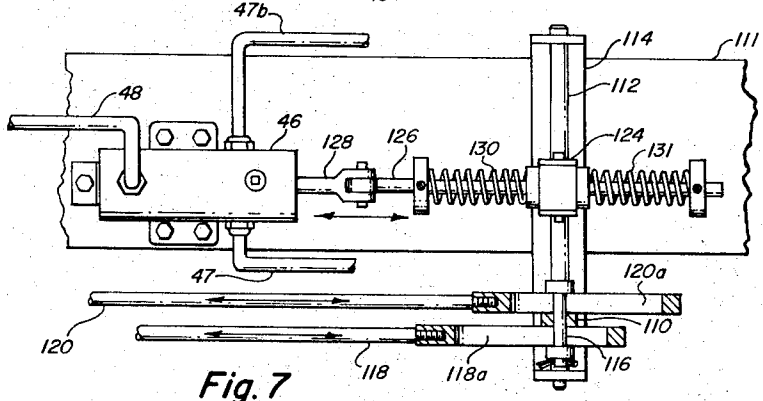


Fig. 7

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3,360,294

COLLAPSIBLE CAMPER

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ABSTRACT OF THE DISCLOSURE

A collapsible camper having an upper section vertically movable over a lower section, movement between the two sections being effected by a piston and cylinder combination located in each corner of the lower section, and having means to insure that the pistons elevate and retract at the same rate, said means including a rotatable drum and a cable associated with each of the pistons, each of the cables being attached at one of its ends to the upper end of its associated piston, the other end being adapted to be wound around the drum, whereby unwinding and winding of the cables causes uniform extension and retraction of the pistons.

This invention relates to an improved collapsible cabin or camper for trucks, one in which the roof is vertically movable or collapsible, so that the height of the cabin may be reduced when the truck is enroute from one place to another.

Collapsible campers have been disclosed wherein the roof is moved vertically by a hydraulic piston and cylinder combination placed in each of the four corners of the truck body. Such an arrangement permits the upper section to be raised to its proper operating height when the cylinders are supplied with hydraulic fluid from a pump. One such collapsible camper is disclosed in Hall U.S. Patent No. 2,879,103. Such an arrangement, however, provides no means for insuring that the four pistons elevate and retract at exactly the same rate. This is important, for if there is unequal movement of the pistons, the upper section of the camper will tilt or cock as it is raised or lowered, thereby to bind and damage the raising and lowering mechanism.

One of the objects of the present invention, therefore, is to provide a collapsible cabin or camper having a vertically movable roof with means for insuring uniform movement of each of the four corners thereof. Other important objects and advantages of the present invention will become apparent from the disclosures in the accompanying drawings and the following specification.

A preferred form of the invention is illustrated in the drawings and hereinafter more fully described.

In the drawings,

FIG. 1 is a perspective view of the collapsible camper of the present invention, with parts broken away, shown in its fully collapsed state;

FIG. 2 is a rear elevational view of the collapsible camper of the present invention showing the roof partially elevated;

FIG. 3 is another rear elevational view showing the hydraulic pistons fully extended;

FIG. 4 is another rear elevational view showing the roof lowered onto the sidewall sections and with the rear and corner panels in place;

FIG. 5 is a schematic view of the control system for raising and lowering the roof, with the cylinders and pistons shown rotated 90° for clarity;

FIG. 6 is a perspective view of the control system;

FIG. 7 is an enlarged elevational view of a portion of the control system; and

FIG. 8 is an enlarged plan view of a corner of the camper.

Referring to the drawings, the collapsible camper **10** of the present invention is adapted to be mounted on a pick-up truck, generally indicated by the reference numeral **12**, although obviously any other type of truck or similar vehicle may be used. The camper includes a lower section **14** supported on the truck bed **16** and an upper section **18**, which is vertically movable over the lower section to form a roof for the camper. When the upper and lower sections are in spaced relation, the intervening space is enclosed by side panels **20** and **22**, which are hingedly connected to the lower section **14**, and by end panels **24**, the rear one of which includes a door **26**.

FIG. 8 is an enlarged detail of one of the corners of the camper, showing how the side panels **20–22** and end panels **24** are held in alignment prior to the lowering of the roof **18** thereupon. A catch **100** is received into a sleeve **102**, which is attached to each of the side panels **20–22**. When the side panels are lifted to their vertical position, the catches **100** are in the position shown in FIG. 8. The end panels **24** are each provided with a spring bolt **104**, which is attached to the panel by a screw **106**. When the end panels **24** are placed in position, the spring bolts **104** ride upon the tapered surface **101** of the catches **100**, and are engaged as shown in FIG. 8.

The construction of the camper is such that when the upper section of roof **18** is lowered onto the side panels **20–22**, the depending portions **19** fit over the side panels, thereby to result in a very compact profile. This occurs because the side panels **20–22** are hinged at their inner edges **38**, thereby permitting the depending portions **19** to slide down past the side panels when the roof is lowered. This is clearly shown in FIG. 1.

One of the problems encountered in campers of this type, as previously described, is that of insuring that the four sets of pistons elevate and retract at exactly the same rate to prevent binding. The raising and lowering mechanism of the present invention provides a solution to this problem. Such mechanism is shown in FIGS. 5, 6 and 7.

Referring to FIGS. 5, 6 and 7, there is shown a conventional electric motor **40**, which may be attached to the truck **12** in any convenient place, as to the chassis. (See FIGS. 2–4.) In FIG. 6 the motor **40** is shown mounted on a bracket **41**, which is itself attached to a frame **42**, which is attached to the chassis of the truck. The motor **40** is powered from the vehicle's battery (not shown). The motor **40** drives a double belt **43**, which in turn provides power for a hydraulic pump **44**, which is also mounted on the bracket **41**. The hydraulic pump **44** is connected to a reservoir **45** through a standard two-way hydraulic valve **46** by means of hydraulic lines **47**, **47***a* and **47***b*. The valve **46** communicates with the cylinders **30** by means of hydraulic lines **48** and **48***a*. The cylinders **30** are connected to the pump **44** in parallel, as shown.

Proper tension is maintained on the double belt **43** by means of an idler arm **50**, which is pivotally mounted on the bracket **41**. An idler pulley **54** is rotatably mounted on the end **52** of the arm **50**. The proper adjustment is maintained by an idler adjustment bracket **56**, which is slotted to ride on a knurled screw **58**, received in the bracket **41**.

Attached to one side of the frame **42** is a smaller substantially C-shaped frame **60**, having arms **62** on which are mounted two bearing blocks **64**. The brackets **64** are adapted to receive a rotatable shaft **66**. Mounted on the shaft **66** is a sprocket **70**, which is driven by a chain **72**, which in turn is driven by the motor **40**. Attached to the sprocket **70** is a conventional clutch **73**, which when actuated serves to rotate a winch or drum **74**, which is also

mounted on the shaft **66**. Attached to the drum **74** at one of their ends and wound therearound are four cables **76**, the other ends of which are attached to the tops of the uppermost pistons **34**. (See FIG. 5.) The cables **76** are wound side by side on the drum **74**, so that each may pay out individually at the same rate from the drum, thereby to restrain each of the telescoping pistons **32** and **34** from elevating at a faster rate than the others.

As shown in FIGS. 2 and 3, the upper section or roof **18** is mounted on four extensible corner posts **28**, each of which comprises a cylinder **30** and two telescoping pistons **32** and **34**. The pistons **34**, which are the uppermost ones, telescope into the pistons **32**, which in turn telescope into the cylinders **30**. The roof **18** is raised as the pistons **32** and **34** extend from the cylinder **30**.

The side panels **20** and **22** are attached to the upper portions of the uppermost pistons **34** by means of chains **36**, as shown. One such chain **36** is attached to each of the four pistons **34**. The other end of each chain **36** is attached to the side panels near the upper ends thereof. As the pistons **32** and **34** extend upwardly, the side panels **20** and **22** are also swung upwardly about their hinged edges **38**, the side panels being pulled up by the chains **36**. When the pistons are fully extended, as shown in FIG. 3, the side panels **20** and **22** are not quite in a vertical position, but must be swung thereto by hand and latched into position. The end panels **24** are then placed in position. Corner members **25** are also placed in position to cover the corner posts **28**. Thereafter, the pistons **32** and **34** are permitted to contract slightly, whereupon the roof **18** nests snugly upon the side panels **20–22**, the end panels **24**, and the corner members **25**, as shown in FIG. 4.

The side panels **20–22** and the end panels **24** are each provided with an angle iron **39**, which is adapted to mate with a similar angle iron **39***a* installed in the depending portions **19** of the roof **18**. The angle irons **39** and **39***a* run the full length of the side panels **20–22** and the end panels **24**, thus providing a rigid seal without the necessity of using any clamps or bolts.

A brake **78** is also mounted on the shaft **66** to control the pay-out of the cables **76** from the drum **74**, as will be more fully described hereinafter.

Two sets of brackets **80** are also mounted on the C-shaped frame **60** as shown in FIG. 6. Rotatably attached to each of the brackets **80** are arms **81**, the ends of which are connected by two springs **82**, as shown. Journaled intermediate the ends of the arms **81** are two rubber-coated rollers **84** and **86**, and these are mounted so as to contact the drum **74**. In this manner the rubber-coated rollers **84** and **86** engage the cables **76** as the latter are wound and unwound on the drum **74**, so that the cables remain snugly on the drum and do not tangle.

The controls for the raising and lowering mechanism are illustrated in FIGS. 5 and 7. A control lever **110** is pivotally attached to the frame **111** of the truck by means of a main pin **112**, which is adapted to be received in a fitting **114**. A rod actuating pin **116** keyed to the lever **110** is adapted to ride in elongated slots **118***a* and **120***a* formed in the clutch actuating rod **118** and in the brake actuating rod **120**, respectively. The clutch actuating rod **118** is linked to the clutch **73** by a rod **122**, which is pivotally attached to the frame **111**. The brake actuating rod **120** is linked to the brake **78** by a rod **123**, which is also pivotally attached to the frame **111**.

Rigidly attached to the main pin **114** is a clevis **124** by means of which force may be applied to a valve actuating arm **126**, which is rotatably attached to a valve piston **128**. The piston **128** actuates the two-way hydraulic valve **46**, as will be further described. Two springs **130–131** resist movement of the clevis **124**, as shown.

Operation of the raising and lowering mechanism will now be described. The electric motor **40** is started whenever it is desired to move the roof **18**. This transmits power to the shaft **66**, which in turn actuates the pump **44**. To raise the roof the control lever **110** is moved in the direction of the arrow A in FIG. 5, rotating around the main pin **114**. The rod actuating pin **116** floats freely in the slot **118***a*, exerting no pressure on the clutch actuating rod **118**, but bottoms in slot **120***a*, thereby actuating the brake **78**. The clevis **124** exerts pressure on the valve actuating arm **126**, against the resistance of the spring **130**, thereby to cause the valve **46** to divert hydraulic fluid into the lines **48** and **48***a* and thus into the cylinders **30**, causing the pistons **32** and **34** to elevate. The brake **78** being actuated, applies resistance to the shaft **66**. As the pistons **32** and **34** elevate, the cables **76** are unwound from the drum **74**. Each of the telescoping pistons **32** and **34** thus elevates at the same rate as the others, and the roof **18** is raised in a manner that causes no binding.

To lower the roof **18** the control lever **110** is moved in the direction of the arrow B in FIG. 5. In this case the rod actuating pin **116** contacts the end of the slot **118***a* in the clutch actuating rod **118**, thereby engaging the clutch **73**, but passes freely through the slot **120***a* in the brake actuating rod **120**, leaving the same stationary. The valve actuating arm **126** is also pulled in the direction of the arrow B, diverting the hydraulic fluid from the cylinders **30** into the by-pass through the reservoir **45**, the flow from the pump **44** also circulating through the by-pass into the reservoir **45**. The clutch **73** being engaged, winds up the cables **76** on the drum **74**. The rubber-coated rollers **84** and **86** apply pressure to the cables **76** and cause the cables to be wound snugly around the drum **74**. All four sets of pistons **32** and **34** therefore retract at a uniform rate, the roof **18** is lowered without any tilting or cocking, and consequently there is no binding.

It should be noted that the slots **118***a* and **120***a* in the clutch rod **118** and brake rod **120**, respectively, are opposite to each other with relationship to the rod activating pin **116**, thereby to enable the one control lever **110** to control both the raising and lowering operations. It should also be noted that the motor **40** is switched on by rotation of the main pin **112**, but other means could be used alternatively.

It is believed that from the foregoing description the structure and manner of operation of the collapsible camper will be apparent to those skilled in the art. It is to be understood, of course, that changes in the details of construction, arrangement and combination of parts may occur, provided they fall within the spirit and scope of the following appended claims.

I claim:

1. A collapsible cabin for mounting on a truck bed, comprising:

a lower section supported on the truck bed;

an upper section vertically movable over said lower section to form a roof for said cabin;

hydraulic means for raising and lowering said upper section, said hydraulic means comprising,

a pump,

a motor to actuate said pump, and

a piston and cylinder combination in each corner of said lower section, said cylinders being attached to said lower section, said pistons being attached to said upper section, extension and retraction of said pistons raising and lowering said upper section over said lower section, respectively; and

means for insuring uniform vertical movement of each of said pistons during raising and lowering of said upper section, said insuring means being connected to said hydraulic means and comprising:

a rotatable drum, and

a cable associated with each of said pistons, each of said cables being attached at one of its ends to the upper end of its associated piston and at its other end to said drum, each of said cables being wound around said drum,

whereby unwinding and winding of said cables causes uniform extension and retraction of said pistons, respectively.

2. In the collapsible cabin of claim 1, brake means connectable to said rotatable drum for restraining said unwinding of said cables.

3. In the collapsible cabin of claim 1, clutch means connectable to said rotatable drum, said clutch means upon actuation being adapted to rotate said drum to wind said cables therearound and retract said pistons uniformly.

4. In the collapsible cabin of claim 1, a roller mounted adjacent to said rotatable drum, and spring means biasing said roller toward said drum, said roller being adapted to maintain pressure on said cables as they are wound and unwound.

5. The collapsible cabin of claim 4 in which said roller is a rubber-coated roller.

6. A collapsible cabin for mounting on a truck bed, comprising:

a lower section supported on the truck bed;

an upper section vertically movable over said lower section to form a roof for said cabin;

side-wall sections, one hingedly mounted on each side of said lower section,

said side-wall sections being hinged at their inner edges so as to fold from a generally horizontal position to a generally vertical position,

said side-wall sections when in their generally horizontal position being supported on said lower section,

said side-wall sections supporting said upper section when in their generally vertical position,

said upper section fitting over said side-wall sections when the latter are in their generally horizontal position;

hydraulic means for raising and lowering said upper section, said hydraulic means comprising,

a pump,

a motor to actuate said pump, and

a piston and cylinder combination in each corner of said lower section, said cylinders being attached to said lower section, said pistons being attached to said upper section, extension and retraction of said pistons raising and lowering said upper section over said lower section, respectively;

second means connected to said hydraulic means for raising and lowering said side-wall sections simultaneously with said upper section, said second means comprising,

a chain attached at one end to the top of each of said pistons,

the other end of each of said chains being attached to said side-wall sections near the upper ends thereof; and

means for insuring uniform vertical movement of each of said pistons during raising and lowering of said upper section.

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PHILIP GOODMAN, LEO FRIAGLIA, *Examiners.*

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

December 26, 1967

Patent No. 3,360,294

Leo Cieslak

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 3, line 9, beginning with "As shown in" strike out all to and including "clamps or bolts." in line 39, same column 3, and insert the same after "door 26." in line 15, column 2.

Signed and sealed this 21st day of January 1969.

(SEAL)
Attest:

Edward M. Fletcher, Jr.
Attesting Officer

EDWARD J. BRENNER
Commissioner of Patents