United States Patent [19]

Evans

[11] **3,750,812**

[45] **Aug. 7, 1973**

[54] **BOAT LOADER FOR VEHICLE**

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[22] Filed: **June 11, 1971**

[21] Appl. No.: **152,287**

[52] **U.S. Cl.** **214/450,** 214/85.1

[51] **Int. Cl.** **B60r 9/00**

[58] **Field of Search** ..... 214/450, 85.1; 224/29 R, 42.1 G, 42.1 F

[56] **References Cited**

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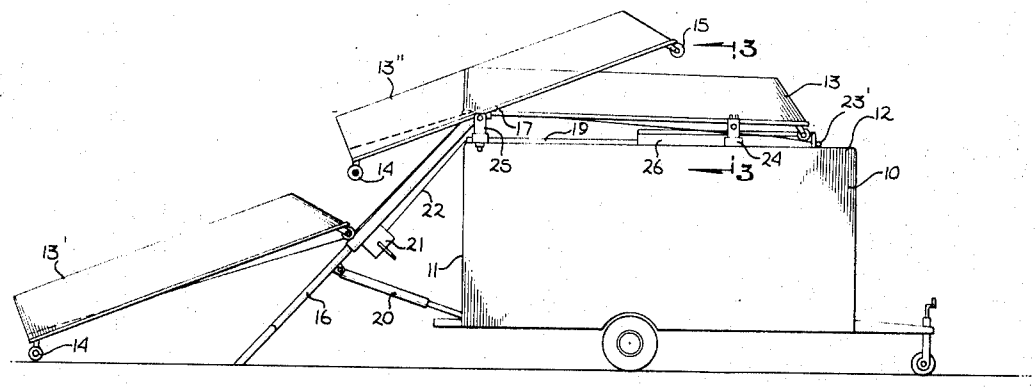
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Primary Examiner—Gerald M. Forlenza
Assistant Examiner—John Mannix
Attorney—Roger A. Marrs

[57] **ABSTRACT**

A mechanism for raising, positioning and securing a boat on the top of a recreational vehicle is disclosed herein having a rail for slidably carrying an inverted boat from the ground surface to the top of the vehicle. A pulley arrangement including a hand winch operably couples the boat to the vehicle for moving the boat on the rail while forward and rearward holding devices selectively engage the bow and stern of the boat as the boat is moved across the vehicle top. Automatic means are provided for registering the selected portions of the boat with the holding devices so that releasable securement therebetween can be maintained.

4 Claims, 17 Drawing Figures



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SHEET 1 OF 3

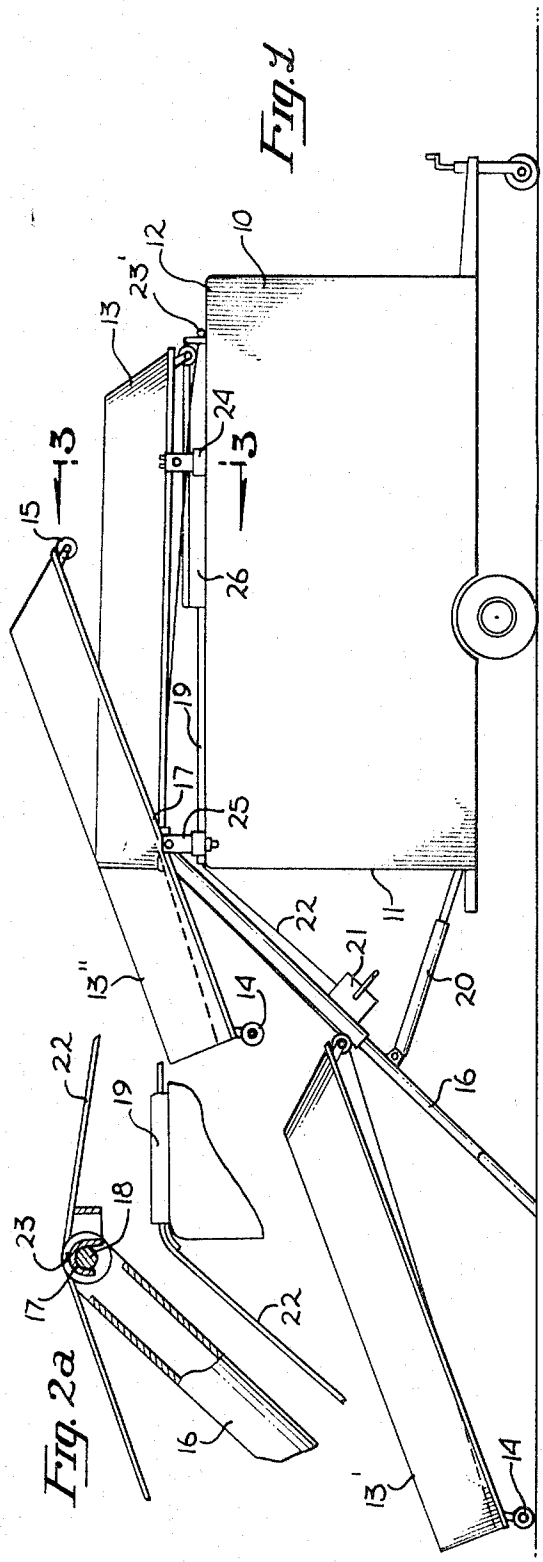


Fig. 1

Fig. 2a

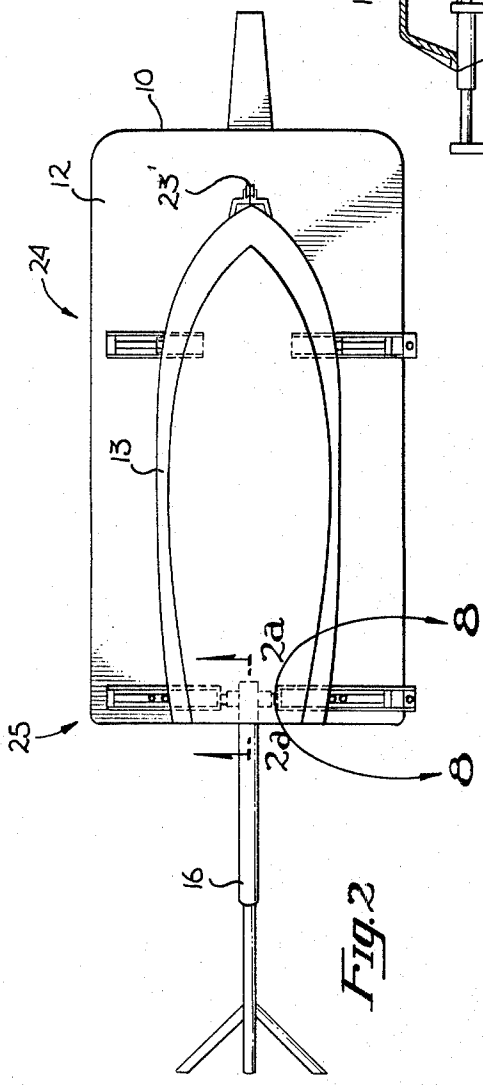


Fig. 2

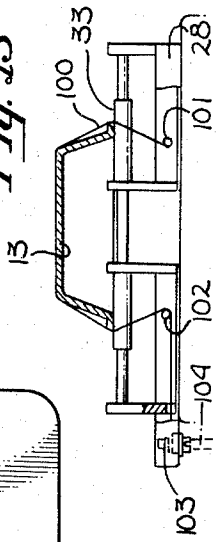
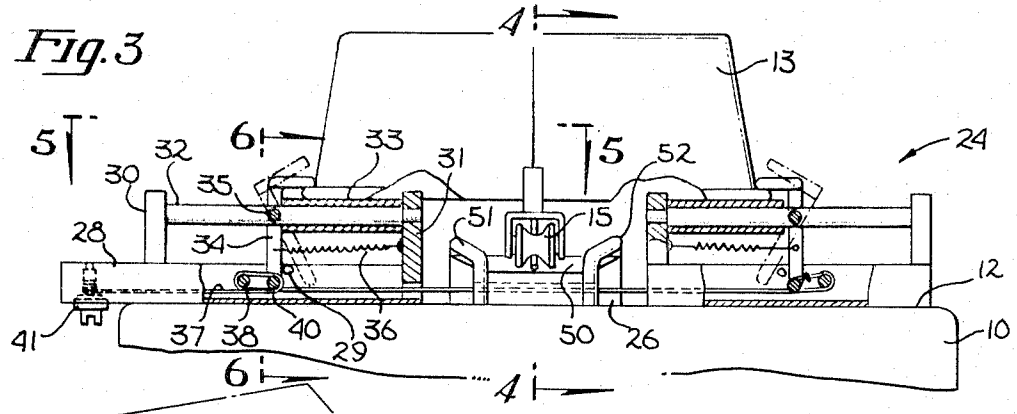


Fig. 2b

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Fig. 3



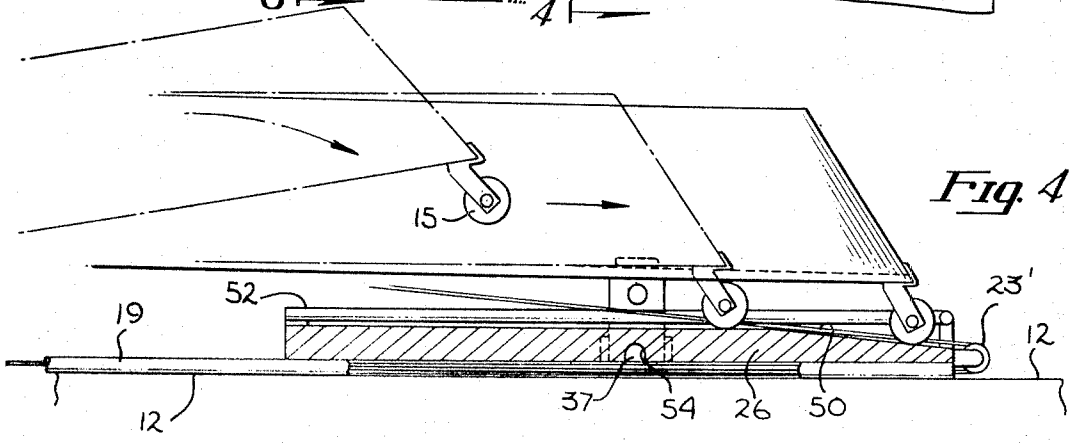


Fig. 4

Fig. 5

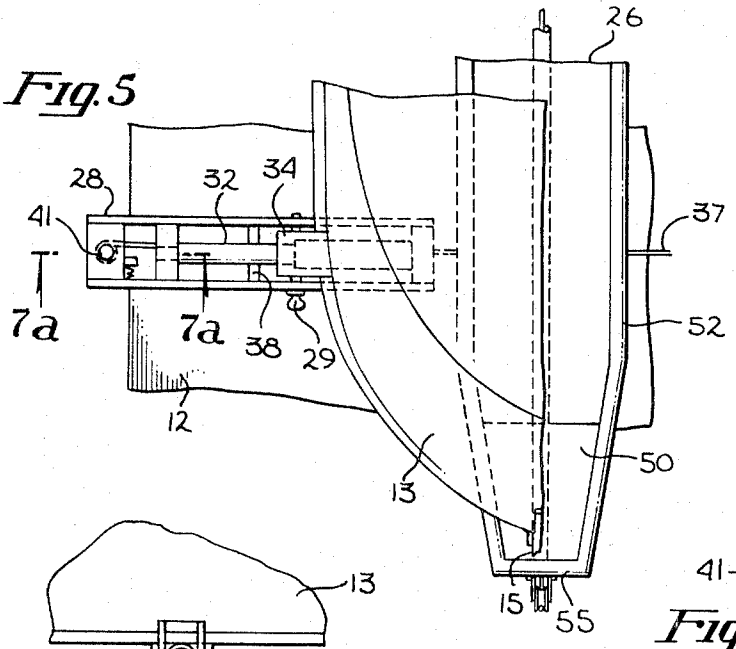
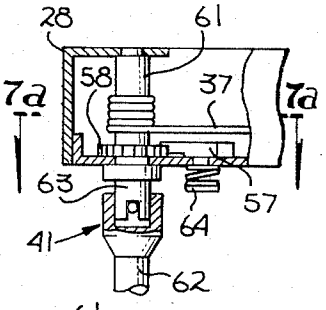


Fig. 7



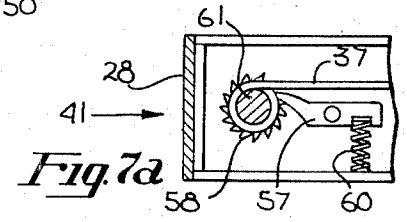


Fig. 7a

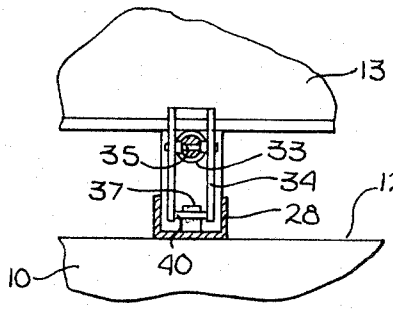


Fig. 6

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Fig. 8

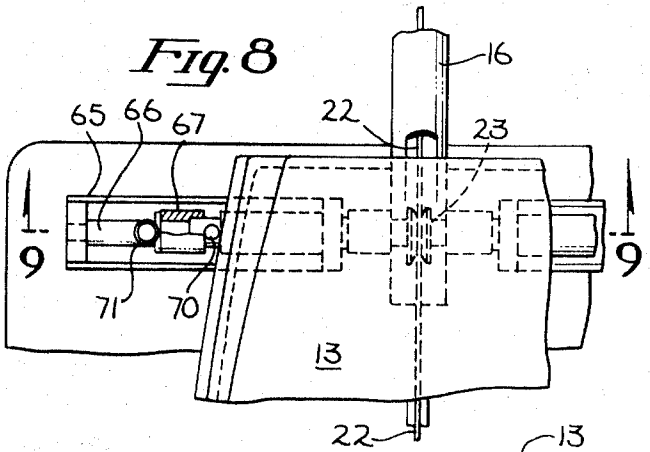
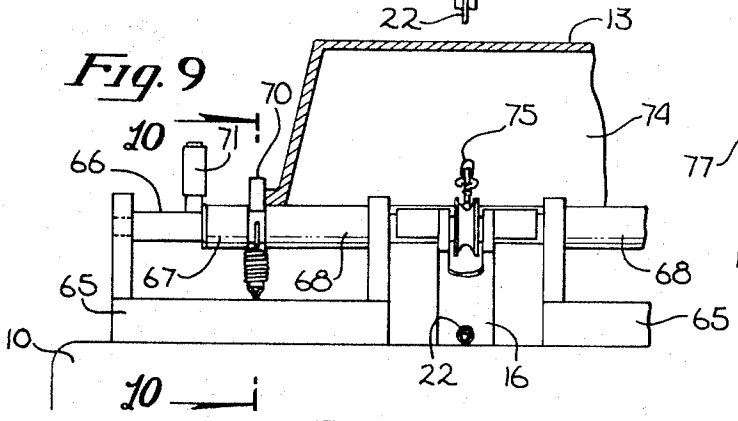


Fig. 9



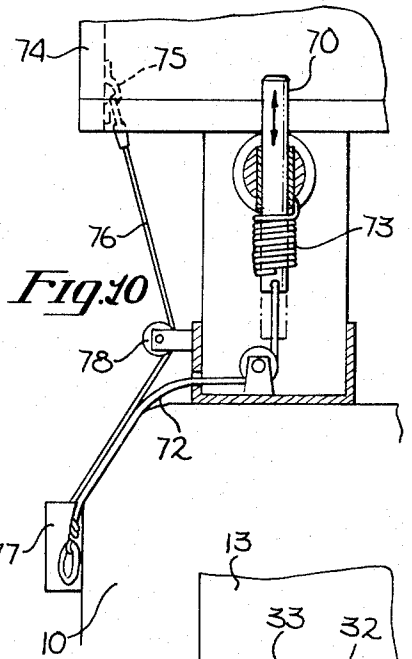


Fig. 10

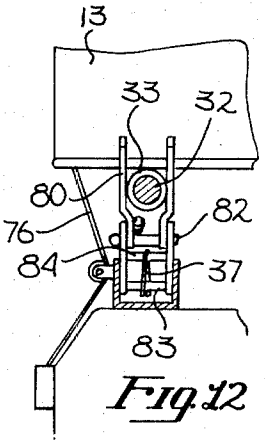
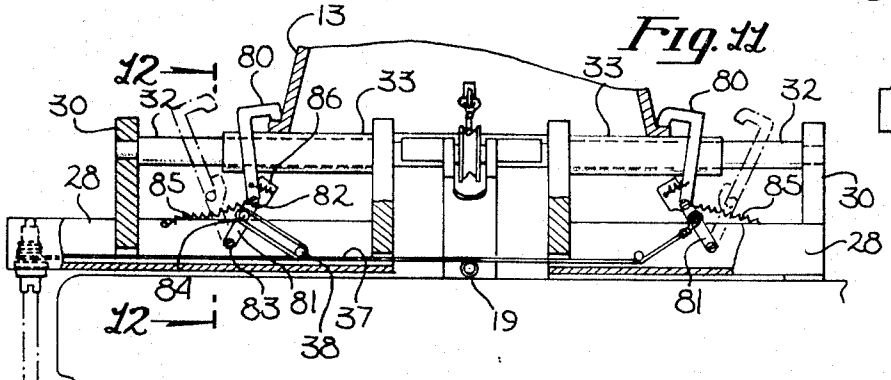


Fig. 12

Fig. 11



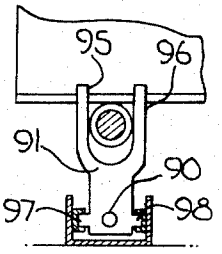


Fig. 14

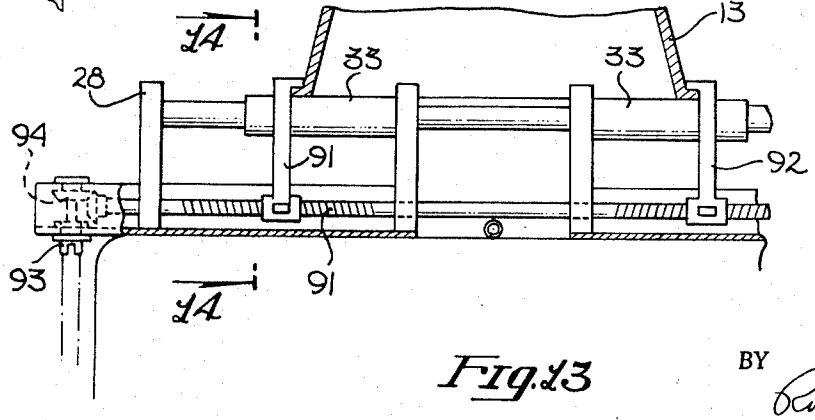


Fig. 13

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BOAT LOADER FOR VEHICLE

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to loading devices for moving a boat from ground location to a storage location atop a recreational or carrier vehicle and, more particularly, to a novel boat loader having automatic indexing means for positioning the boat and automatic means, as well as fail-safe means, for releasably securing the boat in position atop the carrier or vehicle.

2. Brief Description of the Prior Art

For some time, it has been the practice of recreational vehicle owners to carry various camping and recreational accessories on prolonged trips by mounting such equipment or accessories about various external portions of their vehicle. Obviously, it is unwise to use the external sides since this would greatly increase the width of the vehicle and this is undesirable since this provides undesirable road hazards. It is difficult to employ the rear end of the vehicle since this portion of the vehicle normally provides a door for ingress and egress to and from the interior of the vehicle and, therefore, should not be restricted. The preferred location for storage appears to be atop the vehicle; however, this area presents a problem since it is substantially elevated above the surface of the ground and, therefore, requires substantial effort to lift or toss such equipment or accessories onto this area. Furthermore, it then necessitates the climbing atop the vehicle by its owner so that its articles can be properly secured in place for transport on the carrying vehicle.

In the past, it has been extremely difficult to elevate or raise a large recreational item such as a boat onto the top of the vehicle because of the awkward shape and weight thereof. In some instances, frames or other load bearing members have been employed for accommodating sliding movement of the boat from the ground up to the top of the vehicle. In some instances, these frames have been used as in a side loading procedure whereby the boat is manually pushed up the rails and then manhandled onto the storage location atop the vehicle. In other instances, such as disclosed in U. S. Pat. No. 3,382,993, a single rail is provided that extends from ground surface to the top of the vehicle wherein it is similarly manhandled into its storage position for securement. Disadvantages are found in such prior art devices since there is no means for positioning or indexing the boat with hold-down mechanisms that operate automatically upon engagement. The prior art devices require that once the boat has been raised to the roof of the carrying vehicle, that the operator must then climb atop the vehicle himself and physically pull and wrench the boat into proper position for securement. Securement generally comprises the tying of ropes or cords about the vehicle and does not envision a positive, releasable clamp or hold-down mechanism.

Therefore, a need has long existed to provide a boat loader for a recreational vehicle wherein the vehicle storage location for the boat includes adequate positioning and hold-down means whereby the operator is not required to climb the vehicle and to manhandle the boat into position and securement.

SUMMARY OF THE INVENTION

Accordingly, the boat loader of the present invention obviates the difficulties and problems encountered with

prior art loaders in that a rail is provided for slidably moving the boat from ground level to the roof level of the carrying vehicle and which provides a pulling and winch system for sliding the boat to its storage location. The invention further provides hold-down means for selectively engaging portions of the boat after the boat has been automatically positioned to its storage location. The hold-down means includes a releasable mechanism for engaging several selected portions or points about the boat so as to prevent its sliding or slipping regardless of load generated or applied thereto during travel of the primary carrier or vehicle.

Therefore, it is among the primary objects of the present invention to provide an automatic boat loading system for elevating the boat, positioning the boat respective to its hold-down means and for providing automatically operated hold-down mechanism for releasably securing the boat in its storage position.

Another object of the present invention is to provide a novel one-man boat loading device for loading the boat from the ground onto the roof of a recreational vehicle such as a station wagon, camper or the like, which includes automatic means for positioning and securing the boat atop the vehicle.

Still another object of the present invention is to provide a novel boat loader having automatic positioning and hold-down means carried atop the carrier or vehicle so that complete "hands off" positioning and securement may be effected.

Yet another object of the present invention is to provide a novel boat loader that may be readily operated by one man without the necessity of climbing the vehicle and wherein the vehicle operation of the mechanism is simple, uncomplicated and relatively inexpensive.

A further object of the present invention is to provide a novel one-man boat loader for elevating a boat from the ground to a storage position atop a vehicle wherein the vehicle includes fixtures for automatically positioning and securing the boat in position atop the vehicle and wherein the mechanism may be employed for releasably holding the boat in a secured position.

BRIEF DESCRIPTION OF THE DRAWINGS

The features of the present invention which are believed to be novel are set forth with particularity in the appended claims. The present invention, both as to its organization and manner of operation, together with further objects and advantages thereof, may best be understood by reference to the following description, taken in connection with the accompanying drawings, in which:

FIG. 1 is a side-elevational view of a recreational vehicle embodying the present invention and illustrating a boat in two positions preparatory to storage atop the carrier or vehicle;

FIG. 2 is a top plan view of the boat loader shown in FIG. 1 and illustrating the boat in its stored position secured by the hold-down means;

FIG. 3 is an enlarged transverse cross-sectional view of the forward hold-down mechanism employed in the boat loader of the present invention as taken in the direction of arrows 3—3 of FIG. 1;

FIG. 4 is a fragmentary cross-sectional view of an indexing means employed in the boat loading apparatus for automatically locating and positioning the boat with respect to the hold-down means;

FIG. 5 is a fragmentary view, in elevation, of a portion of the forward hold-down means as taken in the direction of arrows 5—5 of FIG. 3;

FIG. 6 is a cross-sectional view of the hold-down means shown in FIG. 3 as taken in the direction of arrows 6—6 thereof;

FIG. 7 and FIG. 7*a* are views, in section, of a ratchet mechanism for operating the forward hold-down means shown in FIGS. 3 and 5;

FIG. 8 is an elevational view, partly in section, of the rear hold-down means as shown in FIG. 2;

FIG. 9 is an elevational view taken in the direction of arrows 9—9 of FIG. 8 showing the rear hold-down means;

FIG. 10 is an elevational view, partly in section, showing a stop mechanism for holding the stern of the boat on the rear holding mechanism as taken in the direction of arrows 10—10 of FIG. 9;

FIG. 11 is another embodiment of a rear hold-down means;

FIG. 12 is a cross-sectional view of a portion of the rear hold-down means as taken in the direction of arrows 12—12 of FIG. 11;

FIG. 13 is still another embodiment of the rear hold-down mechanism incorporated into the present invention;

FIG. 14 is a transverse cross-sectional view taken in the direction of arrows 14—14 of FIG. 13; and

FIG. 15 is still another embodiment of a hold-down means for the boat loader embodying the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIG. 1, a recreational vehicle is indicated by numeral 10 and may take the form of a camper, trailer, station wagon or the like. The rear end of the trailer or camper 10 is indicated by numeral 11 while the top of the unit is indicated by numeral 12. The top or roof 12 is the preferred location for storage of a boat 13. The boat is illustrated as being in three positions of disposition during the loading process. The first position is indicated by numeral 13' wherein the boat is initially supported at one end by a roller 14 on the surface of the ground while the opposite end or bow of the boat supports a rotatable sheave 15 which is rollably disposed on a telescoping rail 16. The second position shown is when the boat 13'' has been elevated to the roof 12 of the carrier 10 and teeters over the rear corner of the carrier or vehicle to ultimately rest in the position shown by boat 13. The telescoping rail 16 is supported at one end on the surface of the ground while its opposite end is formed with a hook 17, as shown in FIG. 2*a*, that engages with a shaft 18 carried on the vehicle. The rail 16 is further supported by a brace 20 that extends between the rear of the vehicle end and the rail 16. Also included on the rail is a conventional winch mechanism 21 that operates a cable 22 connected at its opposite end to the stern or transom of the boat 13. Between the winch 21 and the stern of the boat, the cable 22 is trained through a tube 19 and wheels 23 and 23', shown in FIG. 2*a*, and then through sheave 15 into fixed securement with the stern of the boat.

It can be seen in FIG. 1 that the loader apparatus of the present invention further includes a forward hold-down means indicated by numeral 24 and a wire hold-down means indicated by numeral 25. The forward and rear hold-down means are carried on the roof 12 of the vehicle 10 in fixed spaced apart relationship and are adapted to insertably receive the opposite edges of the boat 13 for securement purposes. The invention further provides a registering or indexing means 26 adapted to position the bow of the boat with respect to the forward hold-down means during the positioning of the boat 13 on the roof 12 by cable 22.

Referring now to FIG. 2, it can be seen that the forward hold-down means 24 includes a left and a right portion and that the rear hold-down means 25 similarly includes a right and left portion. Each of the hold-down portions includes a freely operating roller mounted on a fixed shaft so that as the edge of the boat encounters the rollers, friction is reduced as the boat is moved over the rollers into its storage location. As can be seen, when properly loaded, boat 13 resides substantially in the center of the vehicle roof 12 along its longitudinal axis and the stern of the boat terminates substantially in alignment with the back side 11 of the vehicle 10. Also, it is to be noted that the hold-down portions of the forward and rear hold-down means are arranged so that the forward hold-down means is separated so as to support the bow substantially behind the stem of the boat while the rear hold-down means is of sufficient width to support the stern of the boat.

Referring now in detail to FIG. 3, it can be seen that each side portion of the forward holding means 24 includes a mount 28 having spaced apart upright portions 30 and 31 between which a shaft 32 is fixedly supported. Shaft 32 carries a roller 33 thereon for rollably supporting the boat 13. Also carried on the shaft 32, there is provided a hook means for securing the boat to the mount. The hook means comprises a hook member 34 pivotally supported on shaft 32 by means of a pivot 35. When pivoted out of the way during rolling of the boat 13 for positioning purposes, the hook member 34 is shown in broken lines so that it will not interfere with the positioning on the roller 33. However, once the boat has been drawn into its storage position and location, the hook member 34 associated with each side section of the rear hold-down means 24 is pivoted clockwise to the position shown in solid lines so that the foot of the hook engages with the edge of the boat 13 in securing relationship. It is to be noted that the hook members 34 are normally biased out of engagement with the edge of the boat by means of a compression spring 36 that operates as an overcenter toggle mechanism. The bias of the spring is overcome by the operator through a cable system identified by numeral 37 which is trained about a fixed rod 38 and a pin 40 carried on the lower end of the hook member 34. One end of the cable 37 is secured about the spindle of a ratchet mechanism identified by numeral 41 while the opposite end of the cable crosses through the indexing means 26 to an identical rod and pin relationship with respect to the other side portion of the hold-down means. Therefore, it can be seen that as the spindle of the ratchet mechanism 41 is rotated, the cable 37 is taken up thereon and a force is exerted on the bottom of each hook member 34 to cause it to pivot on pivot 35 so that the hook portion of the member will engage with the edge of the boat.

As the boat rolls forward, the gunwale rolls under the front clamps. A stop pin 29 will let the clamp move away from the boat gunwale only sufficiently to permit

the boat to slide under them with the boat in tie-down position. A rear safety cable **76**, in FIG. **10**, connected at the stern of the boat is held forward under the clamps. This prevents the boat coming off if the clamps become loose.

FIG. **3** also shows the indexing means for properly aligning or positioning boat **13** with respect to the forward holding or retaining means **24**. The index means **26** comprises an inclined ramp **50** decreasing in height to the forward end of the ramp so that wheel **15** will engage with the ramp and roll down the inclined surface. This relationship is shown more clearly in FIG. **4** wherein wheel **15** is shown in connection with the boat in solid lines in its final resting or storage position. In broken lines, wheel **15** is initially elevated and then lowered onto the rear side of the ramp **50**. As the winch and cable are further activated to draw the boat onto the roof of the vehicle, wheel **15** will progress along the ramp until it reaches the inclined portion thereof and the bow of the boat will be lowered onto the rollers **33** of each side portion of the forward hold-down means **24**. The ramp **50** is further provided with tubular guides **51** and **52** so that the wheel **15** will not inadvertently fall off the edge of the ramp. Another alignment means or indexing means may be employed which utilizes the ramp principle but employs a bump **53**, as shown in broken lines, in place of the inclined portion of the ramp. In this latter instance, wheel **15** will engage with the bump and raise so that the edges of the boat bow will pass forward of the forward hold-down means. When the bow has passed far enough, the wheel will go down the opposite side of the bump **53** so that the bow edges of the boat are lowered to the rollers **33**. It is also to be noted that the ramp **50** includes a transverse opening or aperture **54** through which the cable **37** passes from one side thereof to its opposite side so as to operatively interconnect the two side portions of the forward hold-down means **24**.

Referring now in detail to FIG. **5**, it can be seen that the hook device **34** has engaged with the edge bow of the boat **13** so that the boat is held in place in its forward position. It is further noted that the wheel **15** carried on the bow of boat **13** abuts against a forward guide **55** interconnecting the side guide members **51** and **52** so that the forward movement of the boat is arrested thereby. The guides **51** and **52** diverge toward one another and are connected by the forward guide **55**.

In FIG. **6**, it can be seen that the hook member **34** fixedly secures the edge of boat **13** to the roof **12** of the vehicle and that the cable **37** is wound around pin **40** for actuation of the hook about its pivot **35**. It can also be seen that the edge of the boat **13** rests on the roller **33**.

In FIG. **7**, the ratchet mechanism **41** is illustrated whereby a pawl **57** is biased into engagement with teeth on gear **58**. This bias is indicated by means of spring **60** shown in FIG. **7***a*. The spindle, as shown by numeral **61**, is rotatably mounted on the mount **28** and gear **58** is secured thereto so as to rotate therewith. The spindle is rotated by means of a wrench-type torque bar **62** that is detachably engaged with a fitting **63** wherein the spindle may be manually and therefore selectively rotated to increase or decrease the tension applied to cable **37** for pivoting the hook devices. The pawl **57** will ensure that the system will remain taut unless released by pressing spring-loaded button **64** so as to disengage the pawl with the teeth of gear **58**. Therefore, it can be seen that the hold-down arrangement for the forward portion of the holding system is automatic in that the boat may roll on rollers **33** into position and that by pulling cable **37** taut, the hook members will pivot into holding or securement relationship with the bow portion of the boat.

Referring now in detail to FIGS. **8** and **9**, the rear hold-down means **25** is illustrated. Inasmuch as this means also includes opposite side portions, only the one side or side portion of the rear hold-down means will be described since the opposite side is intended to be substantially identical. A mount **65** is secured to the roof of the carrier or vehicle and a shaft **66** is incorporated between opposing uprights carried on the mount **65** so that a roller **67** may be carried thereon. The roller includes an inner roller portion **68** which rotates on the shaft **66** between the uprights of the mount so that the rear or stern of the boat may be rollably supported thereon. However, a slight space is provided between the roller portions **67** and **68** so as to accommodate the projection of a pin **70** therein.

Pin **70** is intended to spring up against the outside edge of the boat stern so as to hold the stern of the boat between pins **70** carried on the opposite side portions of the rear holding means. The pin **70** is illustrated as projecting above the surface of the roller so as to prevent any transverse or sideway movement of the boat stern. However, during the initial roll-on of the boat over the rollers, the waist or mid-section of the boat is substantially wider than either the bow or the stern and a pair of side guide rollers **71** are employed for preventing the boat from any lateral movement which would cause the edges of the boat to roll from the supporting rollers. The pin **70** may be manually moved down out of the way as shown in FIG. **10** by manually pulling on a cable **72**. This action will move the pin **70** against its biasing spring **73** to the position shown in broken lines. When the pin has been retracted, it will not operate as an obstruction to the rolling of the boat on rollers **67** and **68**. However, once the boat has been positioned on the holding means, the pin **70** may be released so that spring **73** will cause the pin to project above the periphery of the rollers **77** and **78** to restrict lateral movement of the stern of the boat.

FIGS. **9** and **10** also illustrate that a transom **74** comprising the stern of the boat contains a fixture **75** to which the end of a cable **22** is attached for lifting purposes. However, as illustrated in FIG. **10**, the cable **22** has been removed and a tie-down cable **76** is attached so that one end is secured to fixture **75** while its opposite end is secured to a holding box **77**. The cable **76** is trained about a tension pulley **78** so that the stern of the boat is fixedly secured to the vehicle.

In FIGS. **11** and **12**, another rear hold-down means is illustrated incorporating the present invention which comprises a two-piece hook device rather than the substantially unitary or single hook device **34** shown in the previous figures. The hook device shown in FIG. **11** includes a hook portion **80** having a pivot connection to a link **81** wherein the pivot connection is identified by numeral **82**. The opposite end of the connection **81** is pivotally secured at numeral **83** to the mount **28**. The connection **81** includes a pin **84**. The cable **37** is trained about fixed pin **38** and then about pin **84** where it then passes around pin **38** again and through the mounting to the opposite side section which is of sub-

stantially similar construction. The extreme end of cable **37** is attached to pin **84** associated with the opposite side. It is also to be understood that although the modification in FIG. **11** is being described with respect to the rear hold-down means, it may also be applied to the forward hold-down means and for this reason, identical numerals may be employed where like parts are representative between FIGS. **3** and **11**.

The hook members **80** are normally biased out of the way of boat **13** by means of a spring **85** that couples the pin **82** to the mount **28**. Therefore, it can be seen that by tensioning cable **37**, such as by ratchet mechanism **41**, the connection **81** is pulled toward the fixed pin **38** so that the pivot **82** is drawn over center and the hook member **80** brought into contact with the edge of the boat **13**. A secondary spring **86** is connected between the hook portion **80** and an extension of the connection **81** so that a biasing moment is placed on the hook **80** to releasably engage the hook with the edge of the boat. The pins of the mechanism, as well as the springs, serve in a broad sense as an overcenter toggle mechanism.

Referring now to FIG. **13**, still another modification of the present invention is shown whereby the hold-down means includes a lead screw **90** extending across the top of the roof of the carrier. The lead screw includes threads on its opposite ends for movably and threadably supporting a pair of hook members **91** and **92**, respectively. As the lead screw is rotated in one direction, the hook members **91** and **92** are drawn together against the edges of the boat **13**. When the lead screw is rotated in an opposite direction, the hook members **91** and **92** disengage with the opposite sides of the boat and separate so that the boat may be passed therebetween. In this embodiment, rollers **33** are employed as well as mount **28** in the same manner as previously described. The lead screw **90** may be rotated by means of a hand crank mechanism engageable with a fixture **93** that operates a bevelled ring gear **94**.

In FIG. **14**, it can be seen that lead screw **91** includes a yoke terminating in hook portions **95** and **96**. The lead screw **90** passes through the major portion of the yoke and a pair of side guides **97** and **98** are provided for supporting the hook members ss they move along the lead screw **90**.

In FIG. **15**, still another embodiment of the present invention is shown for holding the boat **13** which comprises a strap **100** that has one of its ends secured to a rod **101** carried on mount **28** and wherein a portion of the strap is trained about a fixed rod **102**. The opposite end of strap **100** from its end secured to rod **101** is secured to a spindle **103** that may be readily rotated by means of a hand crank **104**. Therefore, it can be seen by placing the strap **100** over the sides and bottom of the boat **13**, the strap may be tightened and secured so that the boat will not be dislodged from its storage position.

With respect to final securement, it is to be understood that the cable **76**, as shown in FIGS. **10** and **12**, may also be employed in the apparatus shown in FIGS. **11**, **13** and **15**. The securement may take the form of a latch or pushbutton release so that the hold-down is automatic or selectively releasable.

While particular embodiments of the present invention have been shown and described, it will be obvious to those skilled in the art that changes and modifications may be made without departing from this invention in its broader aspects and, therefore, the aim in the appended claims is to cover all such changes and modifications as fall within the true spirit and scope of this invention.

What is claimed is:

1. A boat loader for raising a boat from ground level to a storage position atop the roof of a carrier vehicle comprising the combination of:

an extendable rail disposed between the ground level and said roof;

a rear holding means carried on said roof adjacent the terminating end of said rail at said roof;

a front holding means carried on said roof forward of and in fixed spaced relationship to said rear holding means;

mean carried on said vehicle and detachably engageable with said boat for drawing said boat along said rail and into said storage position on said rear and front holding means;

said rear and front holding means including pivotally mounted hook members for releasably engaging with the gunwale of said boat at its stern and bow respectively;

rollers adjacent for each of said hook members rollably receiving said boat as it is drawn thereover;

resilient means normally biasing said hook members into their boat engaging positions;

a cord attached to said hook members for manually pivoting said hook member to override said normal bias of said resilient means; and

a centering means secured to said roof midway between its opposite edges for positioning said boat on said holding means.

2. The invention as defined in claim **1** wherein

said centering means includes a wheel carried on the bow of said boat and rollably engageable with a platform having tapered side guides.

3. The invention as defined in claim **2** including

lock means for securing said boat to said vehicle in its storage position which includes an anchor line extending between the stern of said boat and said vehicle.

4. The invention as defined in claim **3** including

a pulley carried at the rear of said roof and a second pulley carried at the front of said roof and said drawing means trained about said pulleys.

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