May 28, 1963 L. E. LEVINSON 3,090,973

BOATS

Filed Nov. 19, 1959 3 Sheets-Sheet 1

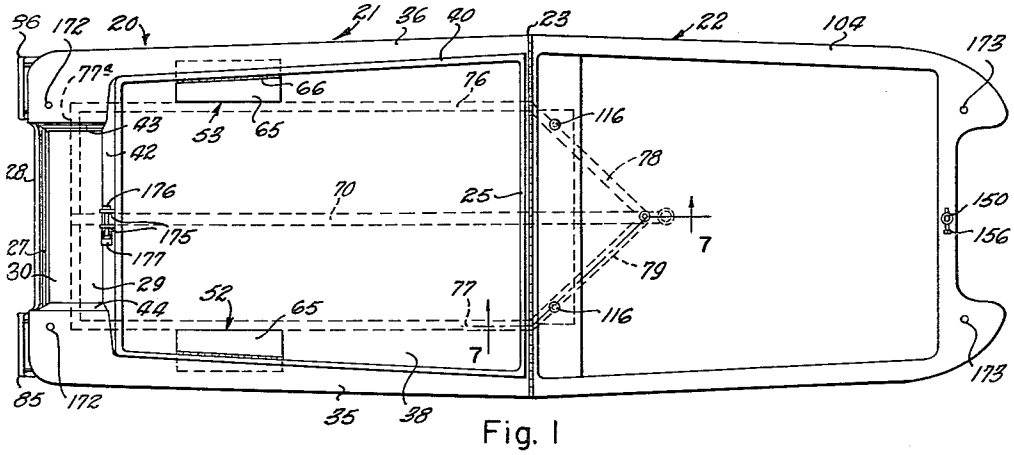


Fig. 1

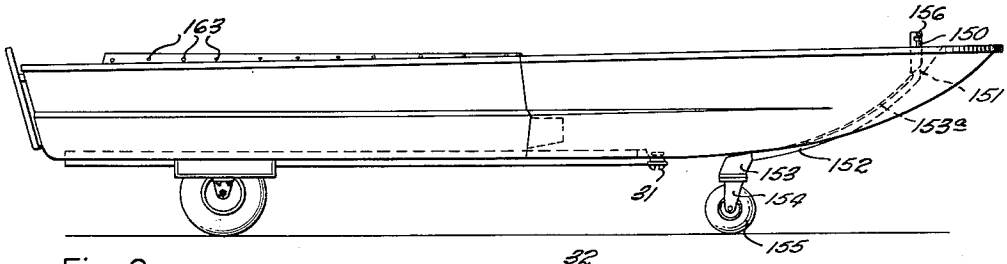


Fig. 2

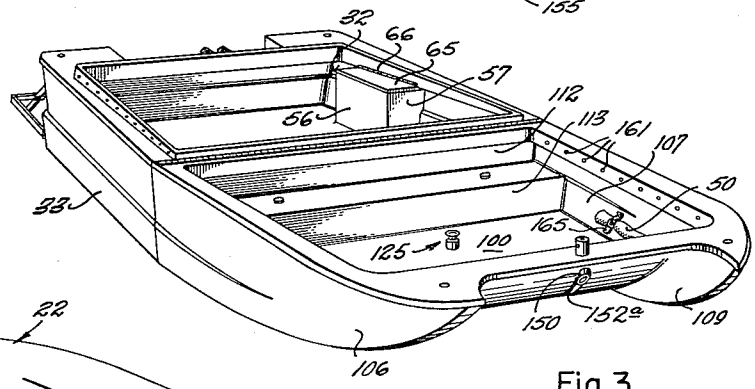


Fig. 3

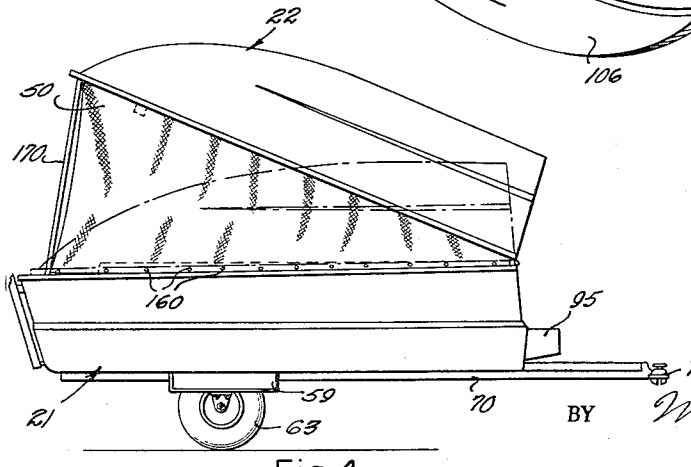


Fig. 4

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BOATS

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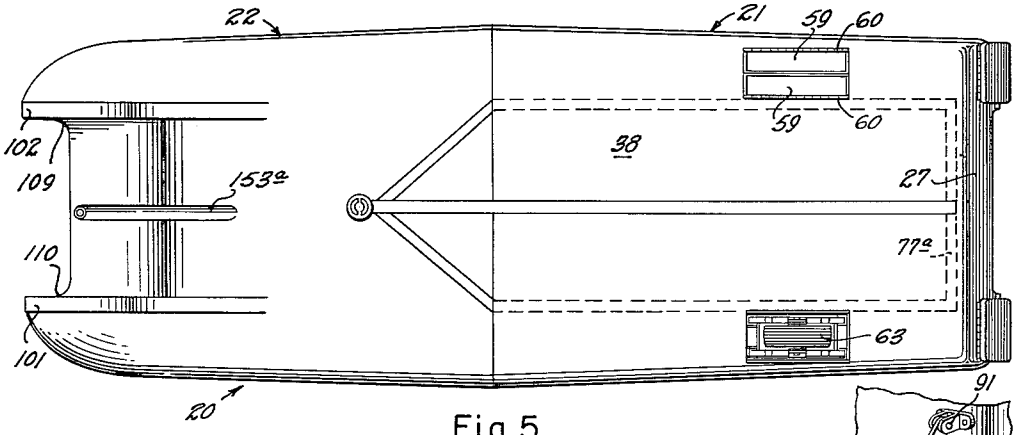


Fig. 5

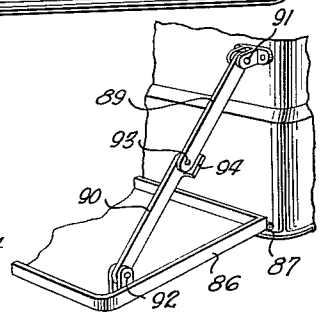


Fig. 9

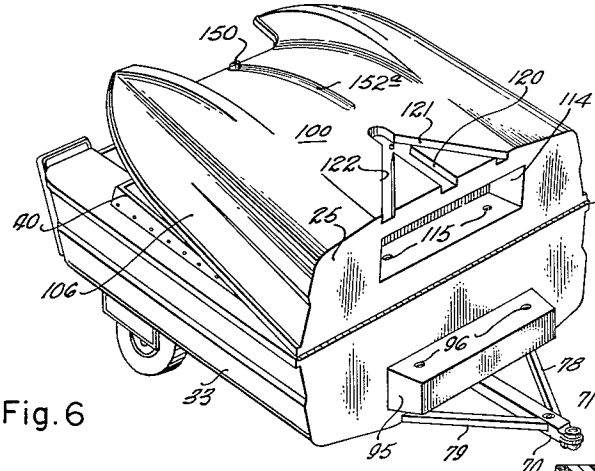


Fig. 6

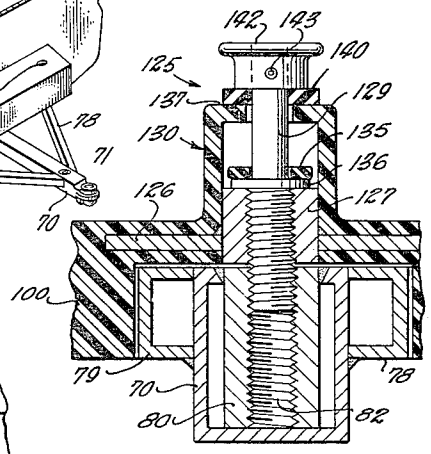


Fig. 8

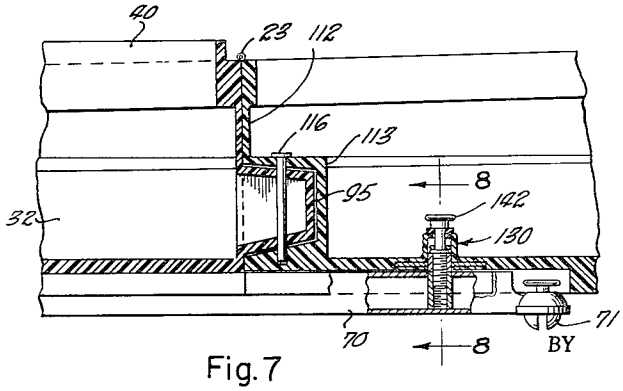


Fig. 7

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BOATS

Filed Nov. 19, 1959 3 Sheets-Sheet 3

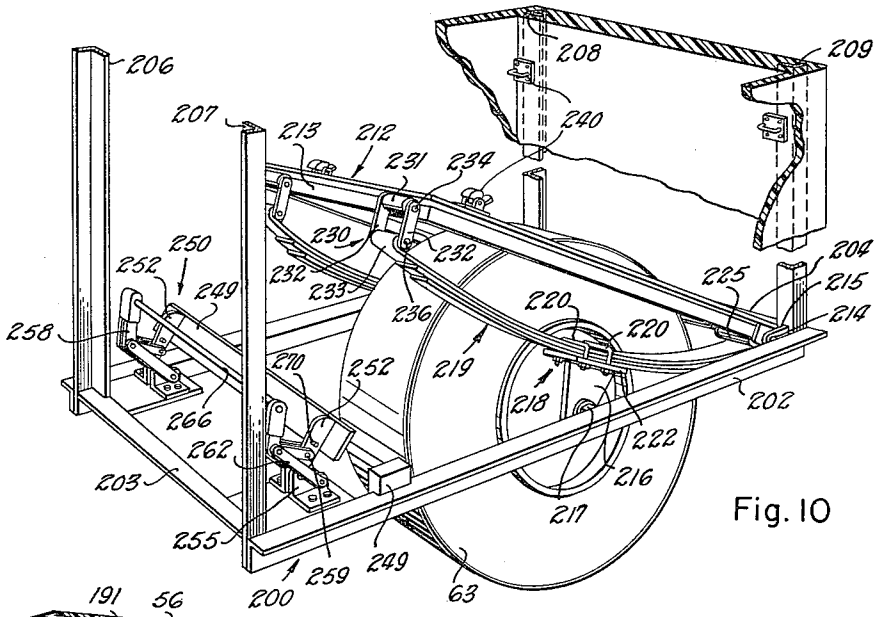


Fig. 10

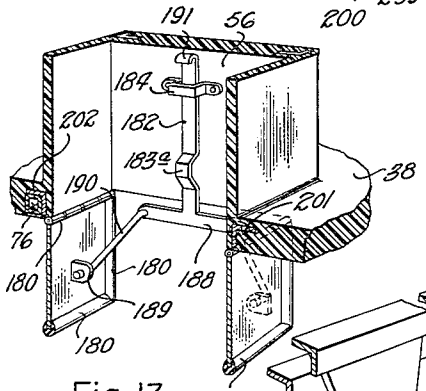


Fig. 13

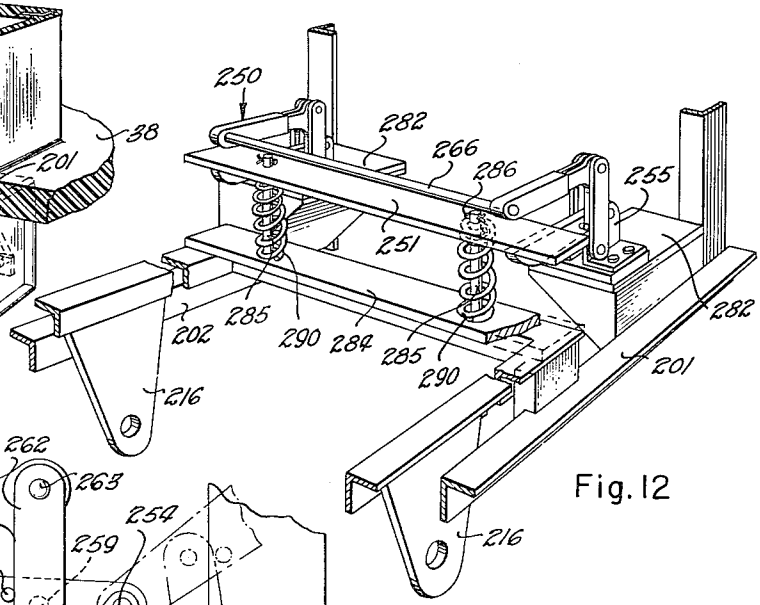


Fig. 12

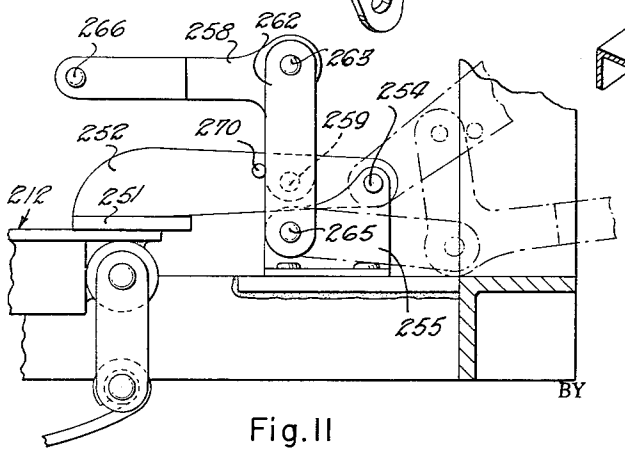


Fig. 11

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United States Patent Office 3,090,973 Patented May 28, 1963

3,090,973
BOATS

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Filed Nov. 19, 1959, Ser. No. 854,034
8 Claims. (Cl. 9—1)

This invention relates to boats and more particularly to sectional boats.

An object of this invention is to provide a new and improved boat having two sections pivotally secured together whereby one section may be pivoted to a position overlying the other.

Another object is to provide a boat having a front section and a rear section wherein the front section may be pivoted to a horizontal position over the rear section to form a storage compartment, the rear section being provided with wheels whereby the boat may be used as a trailer cart when the front section is moved to fully closed position over the rear section.

Still another object is to provide a boat having a rear section and a forward section wherein the forward section may be moved to a position angularly overlying the rear section to form a shelter usable as living or sleeping quarters.

A further object is to provide a boat having a rear section and a forward section wherein the rear section is provided with a draw bar extending forwardly beneath the forward section, when the forward section is in its open or extended position, and is connectable with the forward section to hold it rigidly in the extended position.

A still further object is to provide a boat having a rear section and a front section wherein the draw bar extends longitudinally of the rear section and downwardly thereof to provide a keel and wherein the forward section is provided with a downwardly opening recess in which the forwardly projecting portion of the draw bar is receivable, the draw bar and the forward section having securing means whereby the front section may be rigidly secured to the draw bar and therefore to the rear section.

An object of the invention is to provide a boat having a forward section which is pivotally mounted on the rear section whereby the front section may be pivoted to a position completely overlying the rear section to form a water-tight trailer, the rear section having retractable wheels.

Another object is to provide a boat wherein the rear section is provided with a transom which extends rearwardly of the front end of the front section when the latter is moved to its fully closed position on the rear section whereby an outboard motor secured to the transom may be left in position attached to the transom of the boat when the boat is used as a trailer.

Still another object is to provide a boat wherein the front section is provided with a socket in which is receivable a forwardly extending boss of the rear section whereby the two sections may be rigidly connected by means of connector pins which extend through the boss and socket.

Another object of the invention is to provide a boat having a pair of retractable wheels received in internal side wells of the boat.

Still another object is to provide a retractable wheel mounting for boats and the like wherein the wheel is mounted on a rectangular frame pivoted at one end thereof for movement between operative and retracted positions.

A further object of the invention is to provide a wheel mounting wherein the rectangular frame on which the wheel is pivotally secured to a rectangular wheel support frame rigidly mounted in the boat.

A still further object of the invention is to provide a wheel mounting wherein the rectangular frame on which the wheels are mounted is releasably locked in its operative position by a latch engageable with the free end of the rectangular support frame.

Another object is to provide a retractable wheel mounting wherein the wheels are rigidly secured to the mounting frame and resilient means are interposed between the latch and the free end of the mounting frame to permit limited pivotal movement of the frame to absorb shocks imparted to the wheels during travel.

Still another object is to provide a retractable wheel mounting wherein the wheels are secured to the rectangular mounting frame by a leaf spring assembly and the mounting frame is rigidly secured by the latch to the rectangular support frame.

Still another object of the invention is to provide a boat having wheels mounted in internal wells of the boat wherein the bottom of the wells are closable by doors when the wheels are in retracted positions in the wells.

Still another object of the invention is to provide a boat having a detachable front launching and landing wheel connectable to the front end of the boat.

A further object of the invention is to provide a boat wherein the front section is provided with an attaching means for a launching and landing wheel which is also usable to rigidly secure the front section to the rear section in the fully closed position.

A still further object of the invention is to provide a boat having retractable lift planes extendable rearwardly of the transom of the boat into substantial alignment with the bottom of the boat to exert an upward lift on the stern of the boat to provide greater stability to the boat at high speeds.

A further object of the invention is to provide a boat having ground engaging wheels with retractable lift planes which are extendable rearwardly of the transom of the boat which are usable as steps to permit swimmers to mount into the boat when the boat is afloat and to permit persons using the boat as a shelter, when the forward portion is in its angularly inclined position over the rear section of the boat into the shelter so formed, to climb into the shelter.

Still another object is to provide a boat having a rear section and a front section with a pair of laterally spaced bow planes which improve the stability of the boat during its movement over the water and which are disposable on opposite sides of the motor well at the rear of the boat and forward of the transom when the rear section is folded to its closed position on the rear section to form a closed watertight trailer.

Additional objects and advantages of the invention will be readily apparent from the reading of the following description of a device constructed in accordance with the invention, and reference to the accompanying drawings thereof, wherein:

FIGURE 1 is a top plan view of the boat showing the front and rear sections in extended position;

FIGURE 2 is a side view of the boat showing the wheels of the rear section in operative positions and with a bogey or launching wheel secured to the front part of the forward section;

FIGURE 3 is a perspective view of the boat;

FIGURE 4 is a side view showing the front section of the boat pivoted to its closed position and forming a closed trailer;

FIGURE 5 is a plan view of the bottom of the boat showing the sections of the boat in their extended posi-

tions and showing the doors of one of the wheel wells in open positions;

FIGURE 6 is a perspective view of the boat showing the front section in partly closed shelter forming position;

FIGURE 7 is a vertical sectional view with some parts broken away taken on line 7—7 of FIGURE 1;

FIGURE 8 is a sectional view taken on line 8—8 of FIGURE 7;

FIGURE 9 is a fragmentary perspective view of the lift plane mechanism;

FIGURE 10 is a perspective view of a retractable wheel and of its mounting elements;

FIGURE 11 is a side view of the latch device of the wheel shown in FIGURE 10;

FIGURE 12 is a fragmentary perspective view of a modified form of the wheel mounting; and,

FIGURE 13 is a fragmentary perspective view of the wheel well doors.

Referring now to the drawings, the boat **20** includes a rear section **21** and a forward section **22** which are pivotally connected by a suitable piano hinge **23**. The rear section is provided with a front side **25** which slopes downwardly and forwardly, a rear wall **27** which slopes downwardly and forwardly and forms a transom **28** above the bottom well **29** of a motor well **30**. The front and end walls of the boat are connected by side decks **35** and **36** extending inwardly from the sides **32** and **33**, respectively, to overlie extreme side and rear portions of the bottom **38** of the boat.

An upwardly extending weather flange **40** extends upwardly from the inner edges of the deck pieces and to the motor well bottom to form the side **42** of the motor well **30**. The side walls of the motor well are formed by walls **43** and **44** which extend between the transom **28** and the wall **42**.

It will thus be apparent that storage areas are provided below the side decks and below the motor well. These storage areas may be used for the disposal of triangularly shaped side curtains or panels **50** which are attachable between the front and rear sections when the front section is pivoted about the hinge **23** to overlie the rear section as shown in FIGURE 4.

Wheel wells **52** and **53** are formed by walls **56** and **57** and the adjacent sides **32** and **33** of the rear section. The rear section together with the wheel well walls is formed of a plastic impregnated fiberglass or other mouldable substance, portions of which may be formed in moulds and then rigidly secured to one another by suitable plastic bonding or adhesive means to form the unitary structure illustrated.

The wheel wells are open at the bottom and are provided with doors **59** pivotally connected, as by hinges **60**, to the bottom **38** of the rear section and are movable between an open position to permit the wheels **63** to be moved to extended ground engaging position and closed positions wherein their edges abut to close the bottoms of the wells when the wheels are in retracted positions. The wells are also open at the top and are provided with covers **65** which may be connected, as at **66**, by hinges to the weather flange **40** of the rear section whereby the doors may be pivoted to open positions to permit the occupant of the boat to retract or extend the wheels and to open and close the bottom doors **59** of the wells.

The bottom of the boat has embedded therein a longitudinal tubular keel and draw bar member, rectangular in cross-section, whose forward portion extends forwardly of the front wall **25** of the rear section and is provided with any suitable hitch member **71**. The keel member **70** has its upper portions embedded and rigidly secured, as by bonding, to the bottom **38** of the rear section and has its lower portions projecting downwardly of the bottom of the boat to act as a keel. A pair of tubular reinforcing members **76** and **77** of smaller cross-sectional dimensions than the longitudinal keel member **70** are wholly embedded in the bottom of the boat and have

rear ends connected to a rear transverse member **77***a* which is of smaller configuration and also embedded in the bottom of the boat at the base of the rear wall **27**. The reinforcing members have forwardly and convergently extending extensions **78** and **79**, respectively, which abut opposite sides of the keel and draw bar member immediately rearwardly of the hitch member **71** and are rigidly secured to the keel or draw bar member by any suitable manner, as by welding. The keel or draw bar member is provided rearwardly of the hitch member and between the forward ends of the extensions of the reinforcing frame members with an upwardly opening aperture in which is disposed a sleeve **80**, rigidly secured to the keel member, as by welding, provided with an internal threaded bore **82** for a purpose to be described below.

The rear section of the boat is also provided with a pair of lift planes **85** and **86** which are pivotally connected at their lower ends, as at **87**, to the rear wall **27** on opposite sides of the motor well **30** and are movable between the extended positions illustrated in FIGURE 3 and the retracted positions illustrated in FIGURES 1 and 2. The lift planes are held in the extended positions by a pair of links **89** and **90** whose opposite ends are pivotally connected to the rear wall **27** of the rear section and to the lift planes, as at **91** and **92**, respectively, and whose adjacent ends are pivotally connected as at **93**. Each link **90** extends upwardly past the pivot point **93** and is provided with an angularly extending tab **94** which is adapted to engage the side of its associated link **89** to limit the counter-clockwise pivotal movement of the lower links about the pins **93** when the links are in the positions illustrated in FIGURE 9 wherein the pivot pin **93** is disposed rearwardly and outwardly of the line running through the pivot pins **91** and **92**. The links of course may pivot inwardly about the pins **93** to permit the lift planes to move to the fully retracted position illustrated in FIGURE 2. It will thus be seen that the links **89** and **90** provide a means for holding the lift planes in their extended positions, it being obvious that any forces acting upwardly on the lift planes, as the force of the water when the boat is moving therethrough, will tend to lock the links **89** and **90** against pivotal movement and thus hold the planes in their extended operative positions.

The front wall **25** of the rear section **21** is provided with a forwardly projecting horizontal boss **95** having vertical apertures **96**.

The front section of the boat has a bottom **100** which curves forwardly and upwardly to the deck **104** between a pair of vertical side bow planes **101** and **102**. The sides **106** and **107** of the front section extend upwardly from the bottom **100** and have forward extensions which conform to the configuration of the bow planes **101** and **102**, the bow planes having inner sides **109** and **110** which extend to the bottom **100**.

The rear side **112** of the forward section is provided with an inwardly extending seat **113** which provides an outwardly opening socket **114** of the same configuration as the boss **95** of the rear section, whereby the boss received in the socket **114** when the front section **22** is in the extended position illustrated in FIGURES 1, 2, 3 and 5. The seat **113** is provided with apertures **115** which are aligned with the apertures **96** of the boss **95** when the boss is in the socket and retaining pins **116** may be inserted therethrough rigidly to hold the two sections in their extended positions.

The bottom surface of the bottom **100** of the front section is provided with grooves **120**, **121** and **122** in which are receivable the keel member **70** and the forward extensions **78** and **79** of the reinforcing members **76** and **77**.

A connector assembly **125** includes a plate **126** embedded in the bottom **100** and a threaded sleeve **127** which extends through a suitable aperture in the plate **126**

and is rigidly connected thereto in any suitable manner, as by welding, and a threaded rod **129** which extends downwardly through an upstanding boss **130** of the bottom of the boss. The connector rod **129** has a lower threaded end which is adapted to be screwed down through the threaded sleeve **127** into the threaded sleeve **80** of the keel and draw bar member, when the front section of the boat is in the extended position illustrated in FIGURE 1, to rigidly secure the two sections to one another. A resilient gasket **135** is disposed about the rod **129** above the external flange **136** thereof and is adapted to engage the underside of the flange **137** of the boss **130** to provide a water-tight seal between the rod and the bottom of the boat when the connector rod **129** is unscrewed so that the forward section when pivoted to an overlying position will be waterproof and will not permit water to flow into the rear section. A second gasket **140** is disposed about the rod **129** below the handle **142**, rigidly secured to the upper end of the connector rod by any suitable means, such as set screw **143**, and is adapted to seal between the rod and the flange **137** of the boss when the connector rod is in its operative position rigidly securing the front section to the keel member.

It will thus be seen that the provision of the recesses **120**, **121** and **122** in the bottom of the front section in which are receivable the keel and draw bar member and the extensions **78** and **79** of the reinforcing members and the use of the connector rod and its associated elements insures that the front section is very rigidly connected relative to the rear section, the engagement of the keel and draw bar member and the extensions of the reinforcing members in the recesses serving to prevent any lateral or transverse movement of the front section relative to the rear section. The engagement of the boss **95** and the socket **114** serves a similar purpose and the pins **116** extending through the boss and through the seat **113** also help prevent any upward or pivotal movement of the front section relative to the rear section.

A tubular socket **150** extends through the forward portion of the deck **104** of the front section and is adapted to receive the angularly upwardly extending portion **151** of the auxiliary wheel bracket **152** having a curvature corresponding to the curvature of the forward portions of the bottom **100** and receivable in a groove **152***a* of the bottom. The bracket has a dependent base **153** to which is rotatably secured the mounting bracket **154** of the auxiliary wheel **155** for rotation about a vertical axis. The upper end of the tubular socket and of the upward extension **151** are provided with aligned apertures whereby a pin **156** may extend therethrough to hold the bracket **152** against movement relative to the forward end of the boat. Since the mounting bracket **154** is rotatably mounted on the base **153** in the usual caster wheel fashion the wheel **155** will rotate as required depending on the direction in which the boat is pushed or pulled.

In use, the top deck **104** of the front section is adapted to telescope over the continuous weather flange **40** of the rear section when the forward section is moved to fully closed position overlying the rear section thus providing a water-tight trailer since any rain water which may flow downwardly over the front section cannot enter into the interior of the rear section due to the weather flange **40**.

Canvas side panels **50** may be provided at their upper and lower edges with snap members **160** by means of which the upper edges of the panels may be secured to the complementary snap members **161** of the top deck **104** of the front section and to similar snap members **163** embedded in the continuous flange **40** of the lower section. It will thus be apparent that since the upper portions of the triangular panels extend into the front section when it is in the angularly overlying position illustrated in FIGURE 4 while the lower edges extend outwardly of the continuous weather flange any water falling thereon will be shed over the decks of the rear section and will not enter into the rear section. The canvas panels may be folded into rolls and secured when not in use below the inwardly projecting portions of the top deck **104**, by any suitable ties, such as the straps **165**.

The brace rods **170** for holding the front section in the angular shelter forming position illustrated in FIGURE 4 are receivable in the socket holes **172** and **173** provided in the side decks of ther ear section and the top deck of the front section, respectively.

In use, when it is desired to transport the boat from one location to another, the canvas panels **50** are folded into rolls and may be placed in the storage compartments or areas beneath the inwardly projecting portions of the top deck **104**. The front section is then moved to the fully closed position illustrated in the dotted lines in FIGURE 4. The brace rods **170** may also be stored in such storage areas. The auxiliary wheel may also be stored in the rear section. The portion of the tubular socket **150** projecting outwardly of the deck **104** is then received between the brackets **175** of the wall **42** and a bolt **176** may be inserted through the aligned apertures in the brackets and the aligned aperture of the tubular socket to hold the front section locked in its closed position. A padlock **177** may be used to prevent unauthorized withdrawal of the bolt **176**. The keel and draw bar member may then be secured to a trailer hitch connected to a towing vehicle by means of the conventional hitch member **71**. The wheels **63** of course are then in their extended ground engaging positions so that the boat which has thus been converted into a trailer may be moved behind a towing vehicle from one location to another. It will of course be apparent that other supplies, bedding and other material may be stored in the trailer so formed by the two sections. The outboard motor may be left secured to the transom **28** in the usual manner since the top deck **104** of the front section extends only partially over the motor well **30** whereby the motor need not be dismounted from the boat when it is converted to a trailer for transport from one location to another.

If the boat is to be used as a shelter, the front section is moved to a position at which it extends at an angle of approximately 45 degrees to the rear section and the brace rods or posts **170** are fitted into the sockets **172** and **173**. The canvas panels **50** may then be secured to the front and rear sections in the manner indicated in FIGURE 4. The lift planes **85** and **86** may then be moved to their extended positions and will serve as steps to facilitate access to the interior of the shelter so formed.

When it is desired to connect the two sections for use as a boat, the front section is pivoted about the hinge to its fully extended position and the connector rod **129** is screwed into the threaded sleeve or socket **80** to rigidly secure the keel member to the front section. The connector pins **116** are then slipped through the aligned registering apertures in the boss **95** and in the seat **113** of the rear and front sections, respectively. The boat may then be moved into the water by means of the wheels **63**. If desired, the auxiliary launching and landing wheel **155** may be secured to the forward portion of the boat, whereby the front section of the boat is protected against undesired contact with the shore of the body of water into which the boat is being launched. When the boat is fully afloat the pin **156** may be withdrawn from the socket and of the extension **151** of the bracket of the auxiliary wheel and the bracket and the auxiliary wheel may be removed and stowed in the boat. The covers **65** of the wheel wells are then opened and the wheels **63** are moved to retracted positions within the wells and the doors are closed shut. The boat may then be easily propelled by means of an outboard

motor or in any other suitable manner upon the body or water.

When it is desired to land the boat, the auxiliary wheel may again be secured to the front sections of the boat, the well doors 59 opened and the wheels 63 moved to and locked in their extended positions. The boat may then be hauled onto the shore where it again may be converted either to a trailer or into a shelter.

When the boat is in the water, the lift planes 86 may be moved to extended positions to prevent undue lowering of the stern of the boat into the water under the force exerted by the propellers of an outboard motor secured to the transom 28. The lift planes of course may also be utilized as steps by swimmers who desire to climb into or out of the boat when the boat is stationary.

When the boat is underway, the curvature of the bottom 100 tends to lift the boat upwardly at its forward end and depress the rear end or stern thereof into the water. The lift planes, since they extend outwardly and rearwardly of the outboard motor secured to the transom, tend to prevent undue sinking or tilting of the rear or stern of the boat into the water thereby increasing the stability of the boat. Moreover, the keel and draw bar member 70 also tends to stabilize the boat especially during turning movement of the boat. The bow planes 101 and 102 also serve to stabilize the boat during its movement through the water and, in conjunction with the downwardly and rearwardly curving bottom 100, tend to form a cushion of air between the forward portion of the bottom and the surface of the water to provide a smooth ride.

It will thus be seen that a new and improved boat has been illustrated and described which is readily convertible into a trailer for use in transportng material from one location to another as well as the transport of the boat itself from one location to another, the pivoting of the front section over the rear section decreasing the effective length of the trailer and thus facilitating its movement over the highways since the longer the trailer, the less maneuverable it is in traffic.

It will further be seen that the boat may be readily converted into a shelter in which persons may sleep by tilting the front section at an angle of approximately 45 degrees to the rear section and if desired attaching the panels 50 thereto, the front section being held in such inclined position by the brace rods 170.

It will further be seen that the provision of the rear section with an upstanding continuous weather flange over which the front section telescopes causes the trailer formed by the two sections to shed water making the interior of the trailer water-tight.

Moreover, it will be apparent that the provision of the weather flange 40 on the rear section permits connection of the panels 50 in such manner that any water falling upon the panels will flow outwardly over the side decks and not into the interior of the rear section when the rear section is being used as a shelter.

It will also be apparent that the lift planes may be used as steps to facilitate entrance and egress of persons into and from the shelter.

It will further be seen that the tubular socket for securing the auxiliary wheel to the front section for use in landing and launching operations may also cooperate with the brackets secured to the wall 42 of the rear section for holding the front section in its fully closed position on the rear section.

It will further be seen that the outboard motor need not be detached from the transom when it is desired to move the boat as a trailer from one location to another, since the front section does not overlie the transom.

The doors 59 may be provided with resilent seal strips 180 along their edges which are adapted to engage the walls of the wells and adjacent edges of the doors themselves to seal the wells against flow of water into the wells.

The doors may be pulled upwardly to closed positions by means of a strap 182 of steel or other resilient substance having a displaced portion 183*a* which serves as a latch to hold the strap in its upper position upon engagement with the bracket 184 connected to the wall 56 of the well when the strap has been pulled to its upper position with the latch portion thereof above the bracket 184, the strap flexing to permit such movement of the latch portion past the bracket. The lower end of the strap is provided with a transverse section 188 whose outer ends are connected to the brackets 189 secured to the doors 59 by links 190 whose oppositely angularly extending end portions are rotatably receivable in suitable apertures in the brackets 189 and in the transverse section 188.

It will be apparent therefore that when the strap is pulled upwardly by means of the hook 191 at its upper end, the doors will be pivoted inwardly and upwardly towards each other to their closed position, the strap flexing to permit passage of the latch portion 183 past the bracket 184 and then being retained in such position by the engagement of the lower portions of the latch portion with the bracket 184.

The wheels 63 are secured to the boat by means of the rectangular support frames 200, each of which includes a pair of side angle members 201 and 202 and end angle members 203 and 204 which are embedded in the bottom 38 of the rear section. One side angle member of a support frame of each wheel well is secured to the adjacent reinforcing member 76 or 77, as the case may be, by welding or any other suitable manner as seen in FIGURE 13. The vertical corner angle members 206, 207, 208 and 209 are embedded in the walls of the wells and may be joined at their upper ends by side and end angle members (not shown) identical to the side and angle members which are embedded in the bottom 38. The various members of the rectangular support frame 200 may be secured to one another at abutting or adjacent surfaces by welding or any other suitable manner. A rectangular mounting frame 212 having a continuous depending rectangular flange 213 is pivotally connected at one end to the support frame 200 by means of shafts 214 which extend outwardly into suitable bearing brackets 215 rigidly connected to the posts 208 and 209. The brackets 216 of the wheels in which the shafts 217 of the wheels are rotatably journalled are secured by the usual clamp assembly 218 to the leaf spring assembly 219. It will be apparent that the clamp assembly includes U-bolts 220 which extend through suitable apertures in the plate 222 of the bracket 216 and are rigidly secured thereto by nuts threaded on their outer ends. One end of each leaf spring assembly is secured to one end of the mounting frame 212 by means of the shaft 214 which extends through the bore formed by the curved end 225 of the upper leaf spring of the leaf spring asembly. The other end of each leaf spring assembly is secured to the other end of the mounting frame by the shackle assembly 230. Each of the shackle assemblies may include a sleeve 231 rigidly secured to the frame 212, as by welding, and a pair of links 232 which are pivotally connected at their opposite ends to the sleeve and to the inturned or curved end portion 233 of the uppermost leaf of the leaf spring assembly by means of pins 234 and 236 which extend through the sleeve and through aligned apertures in the upper ends of the links and through such inturned portion 233, of the uppermost leaf spring and aligned apertures in the lower ends of the links. It will thus be apparent that the leaf springs are pivotally secured at their opposite ends to the opposite ends of the mounting frame 212 with the shackle assembly permitting movement of the spring relative to the mounting frame.

The wheels 63 may be held in their upper retracted positions by means of any suitable hook or latch 240, secured

to a wall of the wheel well, which is engageable with the mounting frame 212 to hold it in its upper position in the well.

Each of the mounting frames 212, and therefore the wheels 63, is held in its lower extended position in the support frame 200, wherein the mounting frame rests on the support blocks 249 rigidly secured to the side angle members 201 and 202 by an suitable means, such as welding, by a latch device 250 which includes a contact bar 251 adapted to engage the upper surface of the mounting flange of the mounting frame over the support blocks 249 to prevent upward movement of the mounting frame about its pivot shafts 214. The contact bar 251 is provided with a pair of arms 252 which extend outwardly of the contact bar and have their remote ends pivotally mounted by means of shafts 254 on the upstanding arms of the brackets 255 rigidly secured, as by welding, to the side members 201 and 202 and the end member 203 of the support frame 200. The lower ends of a pair of bell crank levers 258 are pivotally secured to each arm 252 on opposite sides thereof at points intermediate the shaft 254 and the contact bar 251 by means of shafts 259 which extend through aligned apertures in the bell crank levers and the arms. The bell crank levers are connected to the brackets 255 by links 262 whose upper ends are pivotally secured to the intermediate portions of the bell crank levers by shafts 263 and whose lower ends are secured to the brackets, at points between the shafts 254 and the contact bar 251, by shafts 265 which extend through aligned apertures in the brackets and in the lower ends of the links. The free ends of the bell crank levers of each latch device 250 are connected by a hand bar 266.

It will be apparent that the contact bar may be pivoted in a clockwise direction, as seen in FIGURE 10, to overlie and abut the upper surface of the end of the rectangular mounting frame 212 remote from the pivot shafts 214. The links and the bell crank levers then hold the mounting frame against upward pivotal movement due to the fact that the shafts 263, 259 and 265 are in vertical alignment so that no upwardly acting forces exerted on the contact bar can cause the arms 252 to pivot upwardly in a counterclockwise manner, as seen in FIG. 10, about their shafts 254. Clockwise pivotal movement of the bell crank levers 258 about the shafts 263 is limited by the stop pins 270 which project outwardly from the arms 252. It wil thus be seen that the wheels may be easily locked in their extend positions by means of the latch device 250 merely by swinging the mounting frame downwardly about its pivot shafts 214 until it engages the support blocks 249 and then pivoting the contact bar into engagement with the upper surface of the mounting frame to hold it immovably against the support blocks 249, by grasping the handle bar 266 to pivot the bell crank levers in a clockwise direction, as seen in FIGURE 10, about their shafts 263. The wheels may of course be easily moved to retracted positions within the well by pulling upwardly on the handle bar of the latching device to move the contact bar out of engagement with the mounting frame which is thus freed for upward movement about its pivot shafts 214 to retracted position in the well. The wheels of course may be moved between retracted and extended positions while the boat is afloat.

It will be apparent that due to the provision of the two leaf spring assemblies on each side of each wheel, which are secured to the rigid rectangular mounting frame which in turn is secured to the rectangular support frame 200 embedded in the structure of the boat and therefore is rigid therewith, provides a very strong shock absorbing wheel mounting whereby the trailer may be moved at high speeds over highways, due both to the fact that the trailer is of relatively short length and due to the strength and rigidity of the wheel mounting.

It will further be seen that the provision of the leaf springs provide for a shock absorbing action whereby the shocks imparted to the wheels are absorbed, at least partially, by the leaf springs.

In FIGURE 12 is illustrated a modified form of the wheel mounting for the retractable wheels wherein the brackets 216 of the wheels 63 are rigidly secured directly to the mounting frame 212 by any suitable means, as by welding. The brackets 255 of the latching assembly 250 are mounted on plates 282 spaced above the side and end members 201 and 202 of the support frame 200 whereby the contact bar 251 of the latch device 250 is spaced above the mounting frame when the latch contact bar 251 is in its lowermost locking position. A retainer bar 284 is yieldably secured to the contact bar 251 by means of posts 285, rigid with the retainer bar 284, which extend through suitable apertures in the contact bar and which are held against withdrawal from the apertures by means of cotter keys 26. Shock absorbing coil springs 290 are disposed about the posts and between the bars to permit yielding upward movement of the mounting frame 212 to absorb the shocks imparted to the wheels during their travel over the ground.

If desired, suitable pads of resilient substance may be interposed between the mounting frame 212 and the support blocks 249 and between the retainer bar and the mounting frame and may be bonded to any of these elements to act as further shock absorbers and prevent undue noise.

It will thus be seen that a new and improved means for mounting retractable wheels has been illustrated and described which in each form includes a rectangular frame which is pivoted at one end for movement into and out of a wheel well.

It will further be seen that the wheels are secured to a mounting frame releasably lockable in its lowered positions wherein the wheels extend outwardly of the wheel wells for engagement with the ground.

It will further be seen that the means for retractably mounting the wheels are of simple economical construction, easily maintainable and providing a maximum of strength and rigidity while at the same time permitting limited yieldable movement of the wheels to prevent transmission of shocks from the wheels to the trailer.

It will further be seen that a rectangular rear canvas (not shown) panel may be provided to extend between the rear and front sections of the boat and between the canvas panels 50 when the front section is in the position illustrated in FIGURE 4, to close the open end of the shelter, the rear panel being securable to the weather flange of the rear section and to the front section in the same manner as the panels 50.

The foregoing description of the invention is explanatory only, and changes in the details of the construction illustrated may be made by those skilled in the art, within the scope of the appended claims, without departing from the spirit of the invention.

What is claimed and desired to be secured by Letters Patent is:

1. A boat convertible into a trailer and a shelter including: a rear section having a bottom and side and end walls extending upwardly from the bottom; a pair of wheel wells in said rear section; wheels mounted on the rear section for movement between retracted positions in which the wheels are wholly disposed in the wells and extended positions wherein the wheels project downwardly below the bottom of the boat; means for moving said wheels between said retracted and extended positions; a front section having a bottom and side and end walls extending upwardly from the bottom; means pivotally connecting upper ends of adjacent walls of the two sections whereby the front section may be pivoted upwardly from a fully extended position to a position overlying said rear section; draw bar means rigidly secured to said rear section and projecting forwardly

of the rear section and beneath said front section when the front section is pivoted to fully extended position; and means for rigidly securing said draw bar means to the bottom of said front section when the front section is in fully extended position, said rear section having an end wall of said rear section extending upwardly to provide a transom, said front section being spaced from said transom when in closed position to leave said transom unobstructed by said front section whereby a motor may be secured to said transom when the front section is in closed position on said rear section.

2. A boat convertible into a trailer and a shelter including: a rear section having a bottom and side and end walls extending upwardly from the bottom; a pair of wheel walls in said rear section; wheels mounted on the rear section for movement between retracted positions in which the wheels are wholly disposed in the wells and extended positions wherein the wheels project downwardly below the bottom of the boat; means for moving the wheels between said retracted and extended positions; a front section having a bottom and side and end walls extending upwardly from the bottom; means pivotally connecting upper ends of adjacent walls of the two sections whereby the front section may be pivoted upwardly from a fully extended position to a position overlying said rear section; draw bar means rigidly secured to said rear section and projecting forwardly of the rear section and beneath said front section when the front section is pivoted to fully extended position; and means for rigidly securing said draw bar means to the bottom of said front section when the front section is in fully extended positions, said rear section having a deck and a continuous weather flange extending upwardly and spaced inwardly of the side and end walls of said rear section, said front section when pivoted to a closed position overlying said deck telescoping over said flange, said rear section having an end wall of said rear section extending upwardly to provide a transom, said front section being spaced from said transom when in closed position whereby a motor may be secured to said transsom when the front section is in closed position on said rear section.

3. A boat convertible into a trailer and a shelter including: a rear section having a bottom and side and end walls extending upwardly from the bottom; a pair of wheel wells in said rear section; wheels mounted on the rear section for movement between retracted positions in which the wheels are wholly disposed in the wells and extended positions wherein the wheels project downwardly below the bottom of the boat; means for moving said wheels between said retracted and extended positions; a front section having a bottom and side and end walls pivotally connected; means pivotally connecting upper ends of adjacent walls of the two sections whereby the front section may be pivoted upwardly from a fully extended position to a position overlying said rear section; draw bar means rigidly secured to said rear section and projecting forwardly of the rear section and beneath said front section when the front section is pivoted to fully extended position; and means for rigidly securing said draw bar means to the bottom of said front section when the front section is in fully extended position, said rear section having a deck and a continuous weather flange extending upwardly and spaced inwardly of the side and end walls of said rear sections when pivoted to a closed position overlying said deck telescoping over said flange and cooperable means on said front section and said rear section for securing said front section in said closed position on said rear section, said rear section having an end wall of said rear section extending upwardly to provide a transom, said front section being spaced from said transom when in closed position whereby a motor may be secured to said transom when the front section is in closed position on said rear section.

4. A boat convertible into a trailer and a shelter including: a rear section having a bottom and side and end walls extending upwardly from the bottom; a pair of wheel wells in said rear section; wheels mounted on the rear section for movement between retracted positions in which the wheels are wholly disposed in the wells and extended positions wherein the wheels project downwardly below the bottom of the boat; means for moving said wheels between said retracted and extended positions; a front section having a bottom and side and end walls extending upwardly from said bottom; means pivotally connecting upper ends of adjacent walls of the two sections whereby the front section may be pivoted upwardly from a fully extended position to a position overlying said rear section; draw bar means rigidly secured to said rear section and projecting forwardly of the rear section and beneath said front section when the front section is pivoted to fully extended position, said front section having a downwardly opening recess for receiving upper portions of said draw bar means when the front section is pivoted to fully extended position whereby engagement of the draw bar means with side surfaces of the front section defining said recess prevents lateral movement of the front section relative to said rear section; and means for rigidly securing said draw bar means to the bottom of said front section when the front section is in fully extended position, said draw bar means including a longitudinal member having lower portions extending downwardly below the bottoms of said sections to provide a keel, said rear section having an end wall of said rear section extending upwardly to provide a transom, said front section being spaced from said transom when pivoted to a closed position overlying said rear section whereby a motor may be secured to said transom when the front section is in closed position overlying said rear section.

5. A boat convertible into a trailer and a shelter including: a rear section having a bottom and side and end walls extending upwardly from the bottom; a pair of wheel wells in said rear section; wheels mounted on the rear section for movement between retracted positions in which the wheels are wholly disposed in the wells and extended positions wherein the wheels project downwardly below the bottom of the boat; means for moving said wheels between said retracted and extended positions; a front section having a bottom and side and end walls extending upwardly from the bottom; means pivotally connecting upper ends of adjacent walls of the two sections whereby the front section may be pivoted upwardly from a fully extended position to a position overlying said rear section; draw bar means rigidly secured to said rear section and projecting forwardly of the rear section and beneath said front section when the front section is pivoted to fully extended positions; means for rigidly securing said draw bar means to the bottom of said front section when the front section is in fully extended position, said front section having a top deck extending inwardly of said side walls to form storage areas therebelow, said rear section having a deck and a continuous weather flange extending upwardly and spaced inwardly of the side and end walls of said rear section; shelter panels securable between said sections at opposite sides thereof with upper edges of said panels extending inwardly into said front section and secured thereto and with lower edge portions of said panels disposed outwardly of said continuous flange of said front section and secured thereto when the front section is in angularly overlying position over said rear section; and means for securing said panels in said storage areas, said rear section having an end wall of said rear section extending upwardly to provide a transom, said front section being spaced from said transom when pivoted to a closed position overlying said deck whereby a motor may be secured to said transom when the front section is in closed position.

6. A retractible wheel assembly for a vehicle including: a rectangular frame having a pair of spaced sides

and a pair of spaced ends, said frame being pivotally secured at one end to a vehicle for pivotal movement of substantially ninety degrees about a first horizontal axis between a vertical position and a substantially horizontal lowermost position; a wheel mounted on said frame between said sides and between said ends for rotation about a second horizontal axis, said horizontal axes being disposed parallel to one another and transversely relative to the direction of movement of the vehicle, said wheel projecting downwardly of said vehicle when said frame is in said horizontal position; and latch means on the vehicle engageable with the other end of said rectangular frame for holding said frame in said lowermost position, said latch means having lock means for releasably locking said latch means in position holding said frame in said lowermost position and having resilient means permitting limited upward movement of said frame about said first horizontal axis from said lowermost horizontal position toward said vertical position when said lock means locks said latch means in position holding said frame in said lowermost position, said resilient means yieldably resisting such upward movement of said frame about said first horizontal axis.

7. A retractible wheel assembly for a vehicle including: a rectangular frame having a pair of spaced sides and a pair of spaced ends, said frame being pivotally secured at one end to a vehicle for pivotal movement within the vehicle of substantially ninety degrees about a first horizontal axis between a vertical position and a substantially horizontal lowermost position; a wheel mounted on said frame between said sides and between said ends for rotation about a second horizontal axis, said horizontal axes being disposed parallel to one another and transversely relative to the direction of movement of the vehicle, said wheel projecting downwardly of said vehicle when said frame is in said horizontal position; latch means on the vehicle engageable with the other end of said rectangular frame for releasably holding said frame in said lowermost position wherein said latch means includes a contact bar movable into position over said other end of said rectangular frame; means for rigidly and releasably holding said contact bar over said other end of said rectangular frame, means carried by said contact bar for engaging said other end of said rectangular frame, said engaging means being mounted on said contact bar for limited movement relative to said contact bar; and biasing means urging said engaging means away from said contact bar and toward said other end of said frame when said contact bar is disposed over said other end of said frame.

8. The retractible wheel assembly of claim 7, wherein said engaging means comprises a retainer bar mounted on said contact bar for limited movement toward and away from said contact bar, said biasing means comprising resilient means engaging said contact bar and said retainer bar.

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