March 10, 1970 C. L. WOLFE 3,499,177

RETRACTABLE BOAT WHEELS

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Fig. 1.

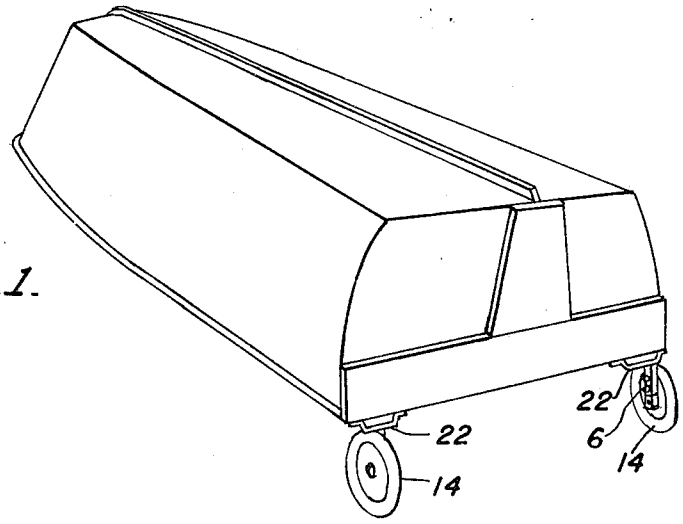


Fig. 2.

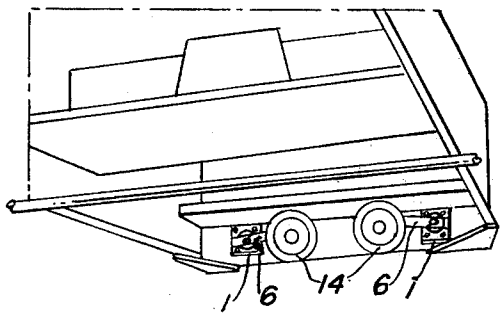


Fig. 3.

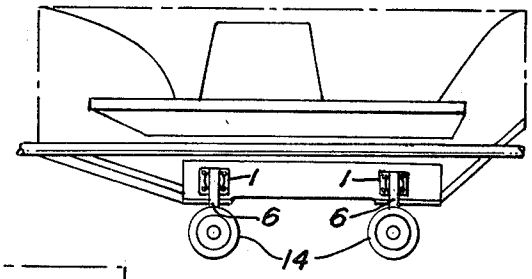
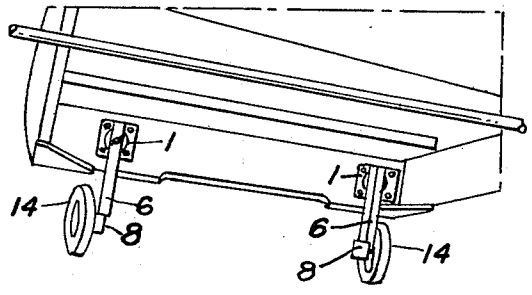


Fig. 4.



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Fig. 5.

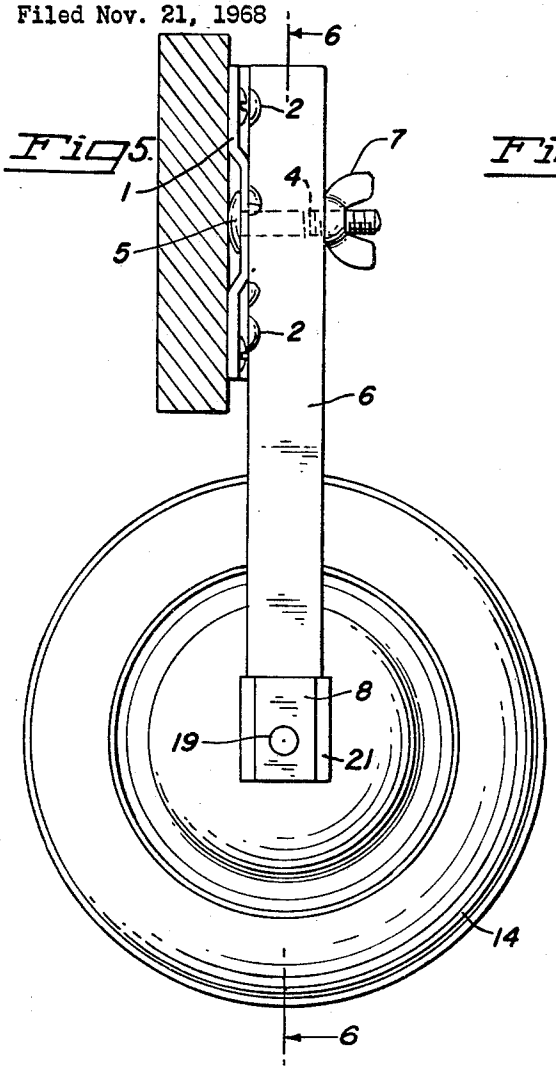


Fig. 6.

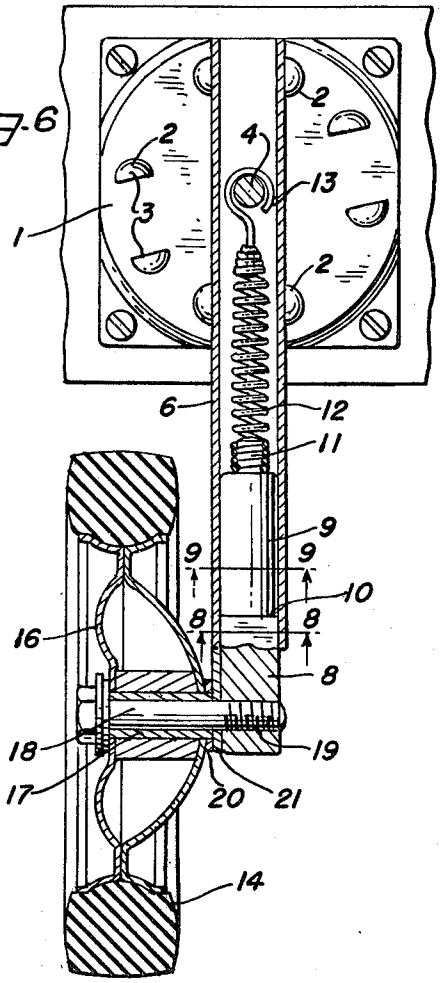


Fig. 7.

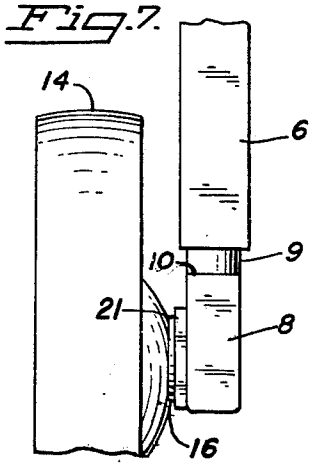


Fig. 8.

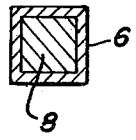
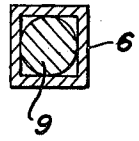


Fig. 9.



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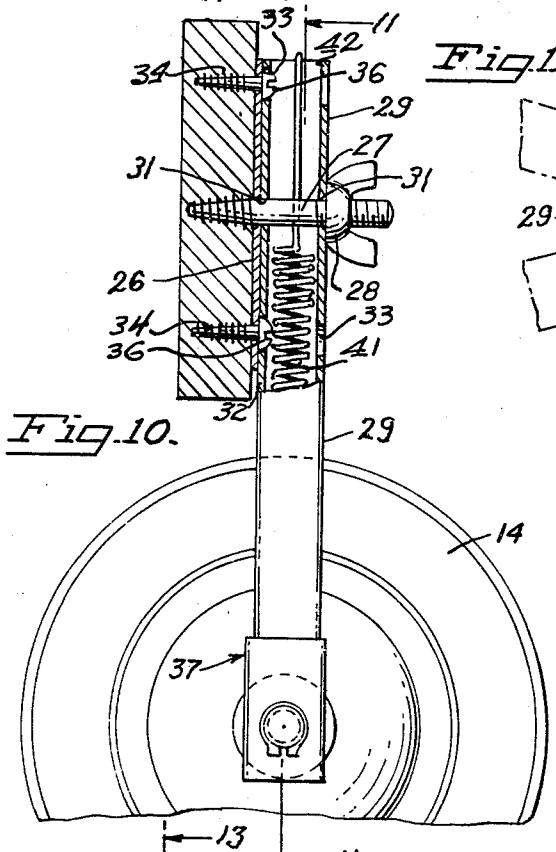


Fig. 10.

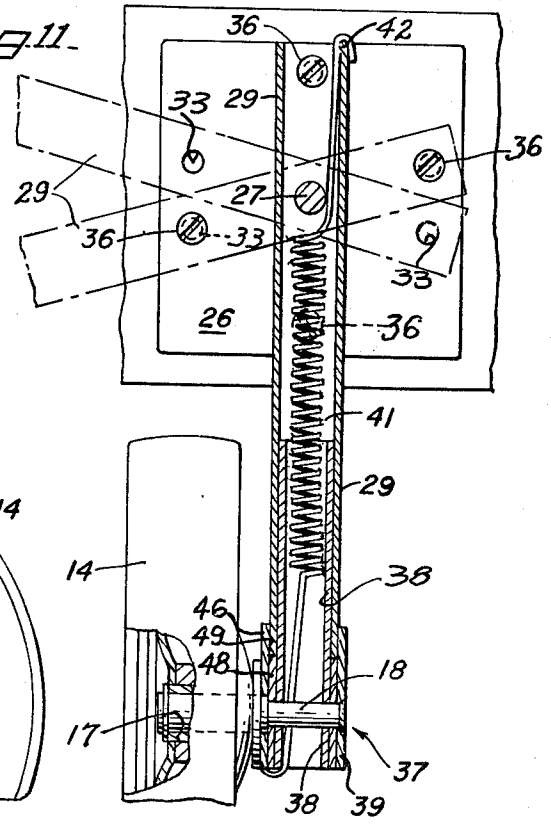


Fig. 11.

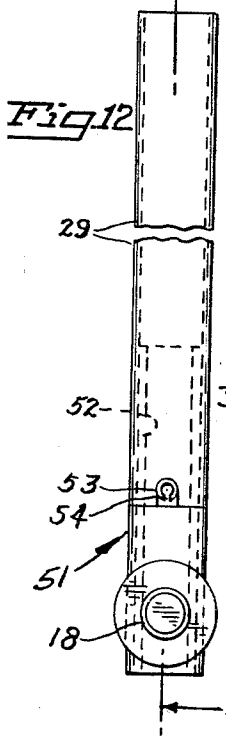


Fig. 12.

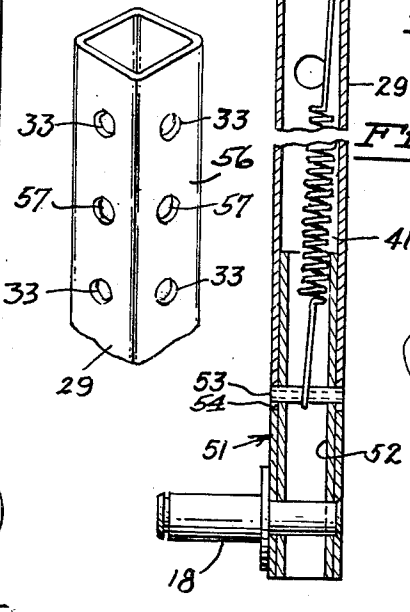


Fig. 15.

Fig. 13.

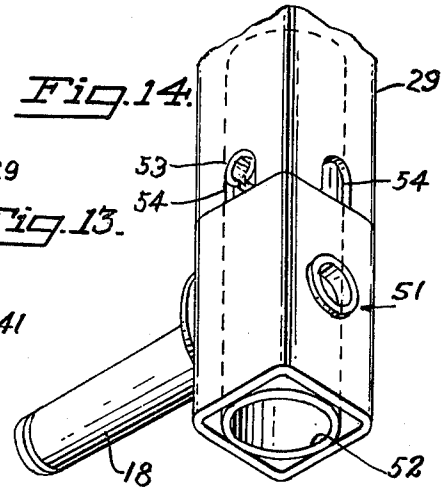


Fig. 14.

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Patented Mar. 10, 1970

3,499,177

RETRACTABLE BOAT WHEELS

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Continuation-in-part of application Ser. No. 627,833, Apr. 3, 1967. This application Nov. 21, 1968, Ser. No. 801,887

Int. Cl. B63c 1/00

U.S. Cl. 9—1

14 Claims

ABSTRACT OF THE DISCLOSURE

Folding support for wheels mounted on a boat in such a manner that the wheels can be folded into an out-of-the-way position and permanently kept on the boat, yet can be easily turned into operative position for the moving of the boat on the ground. For each wheel a bracket plate is mounted on the boat, in this illustration on the inside of the transom. A pivot on each bracket plate supports a hollow carrier arm which can be held in selected positions by opposed abutments on the carrier plate. A telescopic wheel carrier on the carrier arm carries a wheel, said wheel carrier being adjustable to hold the wheel in selected attitudes.

This application is a continuation-in-part of the co-pending application of Chesley L. Wolfe for Retractable Boat Wheels filed on Apr. 3, 1967, Ser. No. 627,833, now abandoned.

BACKGROUND OF THE INVENTION

The main feature of the invention is that the boat wheels are permanently mounted on the boat so that they are never lost or misplaced, whereby the storing of wheels away from the boat and its disadvantages are eliminated. The wheels are carried on a wheel carrier telescopically engaged with a tubular carrier arm which wheel carrier is held in position by a spring so that when the tubular arm is turned horizontally and parallel with the surface on which it is mounted, then it can hold the wheel parallel with the mounting surface such as the transom of the boat; the wheel carrier when pulled against the action of a spring to a predetermined distance, can be turned so as to hold the wheel at right angles to its initial position when the carrier arm is extended to right angles of its initial position thereby to support the wheels generally parallel with the longitudinal axis of the boat. Another feature of the invention is to provide co-operation between abutments of each plate and the carrier arm to hold the carrier arm in adjusted attitudes.

DESCRIPTION OF DRAWINGS

FIG. 1 is a perspective view of the boat in inverted position.

FIG. 2 is a fragmental view of the boat showing the wheels folded parallel with the transom and inside of the boat.

FIG. 3 is a perspective view looking into the boat toward the transom and showing the wheels unfolded so as to project beyond the top of the boat.

FIG. 4 is a fragmental perspective view showing the wheels turned into operative position generally parallel with the longitudinal axis of the boat.

FIG. 5 is a view showing the wheel in operative position, and the transom in section.

FIG. 6 is a sectional view, the section being taken on line 6—6 of FIG. 5.

FIG. 7 is a fragmental view showing the wheel carrier pulled out of the tubular carrier arm.

FIG. 8 is a sectional view taken on line 8—8 of FIG. 6.

FIG. 9 is a sectional view of the carrier arm assembly taken on lines 9—9 of FIG. 6.

FIG. 10 is a partly sectional view of a modified form of the wheel carrier.

FIG. 11 is a cross-sectional view of the modified wheel carrier, the section being taken on lines 11—11 of FIG. 10.

FIG. 12 is a side view of another modified form of the wheel carrier and carrier arm.

FIG. 13 is a sectional view of the modified form, the section being taken on lines 13—13 of FIG. 12.

FIG. 14 is a perspective fragmental view showing the wheel carrier head of FIG. 12 on an enlarged scale.

FIG. 15 is a fragmental perspective view of the top end of a carrier arm with engagement sockets on adjacent sides thereof.

DETAILED DESCRIPTION

A pair of bracket plates **1** are mounted spaced from one another at a suitable distance on the same plane, for instance, on the inside surface of a transom or trailing end wall of a boat. Each bracket plate **1** has four pairs of abutment buttons struck out from a dished middle portion. The pairs of buttons have their flat faces **3** in each pair facing one another. The bracket plate **1** is so mounted that at least two opposite pairs of buttons **2** are diametrically opposite aligned generally vertically with respect to the bottom of the boat. The other two pairs of buttons are also aligned but on a diameter at a suitable angle to the vertical diameter of the dished portion of the bracket plate **1**.

A carriage bolt **4** is extended through a central hole in the dished portion of the plate **1** so that the head **5** of the bolt **4** is within the dished portion of the plate **1**. The carriage bolt **4** functions as a pivot and extends through suitable holes of a suitable carrier arm **6**, which latter is tubular and of rectangular cross-section. A wing nut **7** on the outer end of the bolt **4** holds the carrier arm **6** against the plate **1** between opposite aligned pairs of abutment buttons **2**. A wheel carrier **8** is slideable within the free end of the carrier arm **6**. The wheel carrier **8** is of rectangular crosssection slideably fitting into the end of the carrier arm **6** and it has a cylindrical reduced portion or shank **9**, whereby corner shoulders **10** are formed at the base of the rectangular portion of the wheel carrier **8**. The cylindrical shank **9** of the wheel carrier **8** has a threaded reduced end **11** on which is threaded an end of a coil spring **12** within the tubular carrier arm **6**. The other end of the coil spring **12** has a hook **13** thereon which is hooked around the carriage bolt **4** inside the tubular carrier arm **6**. The spring **12** normally pulls the wheel carrier **8** into the tubular carrier arm **6**. When the wheel carrier **8** is pulled out of the carrier arm **6** far enough for the corner shoulders **10** to clear the end of the carrier arm **6**, and when the wheel carrier **8** is indexed or turned so that the shoulders **10** rest on the end of the carrier arm **6**, then the assembling of a wheel **14** can be performed.

The wheel **14** is the usual, preferably rubber tired, wheel with a hub **16** on a limit bushing **17**. A cap screw **18** is threaded into a threaded hole **19** in the outer end of the rectangular portion of the wheel carrier **8**. A flange **20** at an end of the bushing **17** is located between the wheel hub **16** and the adjacent side of the wheel carrier **8** for spacing the face of the wheel **14** from the adjacent face of the wheel carrier **8** and of the carrier arm **6**. On the outer end of the rectangular portion of the wheel carrier **8** is a limit plate **21** between the bushing flange **20** and the adjacent face of the wheel carrier **8** abutting against the end of the carrier arm **6** to limit the extent to which the wheel carrier **8** is pulled by the spring **12** into the carrier arm **6**, thereby to properly space the hub **16**

of the wheel from the end of the carrier arm **6**.

In the modified form shown in FIGS. 10 and 11, each bracket **26** is in the form of a flat plate through the center of which extends a suitable bolt **27** with a wing nut **28** on its free end to bear against the carrier arm **29**. The bolt **27** extends through holes **31** through the carrier arm **29**. On the side **32** of the carrier arm **29** adjacent the plate bracket **26** are a pair of sockets **33** spaced at equal distance on opposite sides of the center holes **31**. In this form the bracket plate **26** is secured by four screws **34**, the heads **36** of which project beyond the surface of the bracket plate **26** and form abutments. The screws **34** are arranged so as to form a vertically aligned pair and a substantially transversely aligned pair of abutments, and are so spaced from the pivot bolt **27** that the screw heads **36** are in registry with and fit into the respective sockets **33** in the respective vertical and transverse positions of the carrier arm **29**, corresponding respectively to the extended and retracted portions of the wheels.

The wheel carrier **37** in this form has a cylindrical shank **38** which slideably fits into the end of the carrier arm **29**, and a head **39** of substantially the same cross-section as that of the carrier arm **29** so as to telescope over the free end of said carrier arm **29**. A coil spring **41** attached at one end to the cylindrical shank **38** and at its other end hooked over the edge of the pivoted end **42** of the carrier arm **29** normally holds the wheel carrier head **39** on the free end of the carrier arm **29**.

The wheel carrier head **39** has a skirt **46** which telescopes over the exterior of the free end of the carrier arm **29** and being of the same angular configuration is prevented from turning thereon. The cylindrical shank **38** of this form has a spacer bushing **48** on its free end to space the wheel carrier skirt **46** from the shank **38** thereby to provide space **49** between the shank **38** and the skirt **46** into which the free end of the carrier arm **29** telescopes.

In the modified form shown in FIGS. 12, 13 and 14, the wheel carrier head **51** is of about the same contour as that of the carrier arm **29** so that it abuts against the free end of the carrier arm **29**. The wheel carrier head **51** is fixed on a shank **52** which projects into the carrier arm **29**. An abutment pin **53** extends transversely through the shank **52** and is engaged within opposite keeper sockets **54** formed in the free end of the carrier arm **29**. There is a keeper socket **54** on each side of the carrier arm **29** so that the projecting ends of the cross pin **53** can engage the respective keeper sockets **54** in two positions at 90° from one another. The spring **41** in this form is hooked over the pin **53** inside of the hollow shank **52**.

In FIG. 15 is shown the top of a carrier arm **56** wherein sockets **33** are provided on at least two adjacent sides of the carrier arm **56**, or to make it more flexible, sockets **33** may be provided on four sides, spaced apart to correspond to the spacing of the screw heads **36** on the bracket plate **26**. This would permit adjustment of the wheel direction by turning the carrier arm **56** around its longitudinal axis and then replacing it on the pivot bolt **27**.

OPERATION

In the form shown in FIGS. 1–9, the plates **1** are mounted spaced apart from one another according to the required spacing of the wheels. The wheels are placed in the initial folded position shown in FIG. 2 by pulling the wheel carrier **8** out of the carrier arm **6** until the shoulders **10** clear the end of the carrier arm **6** and then the wheel carrier **8** is turned to a position where the wheel **14** is parallel with the adjacent plate **1**. This in the present position requires a 90° turn from the position shown in FIG. 6. The turning is in a direction away from the plate **1**. Then the wing nut **7** is loosened and the carrier arm **6** is pulled from between the vertically aligned buttons **2** and is turned around the pivot bolt **4** until it is in registry with the substantially horizontal set of aligned buttons **2**. The carrier arm **6** is pushed between the substantially horizontally aligned buttons **2** and the wing nut **7** is tightened. In this manner the wheels are secured in the boat, but in an out of the way position without interfering with fishing or the mounting of an outboard motor or other use of the boat. There are no loose joints and therefore all rattle or loosening of the wheels is obviated when the boat is subject to vibration, for instance, while trolling with the motor running at a low speed.

The wheels are in such folded position while the boat is being transported. Usually the boat is transported in an inverted position, as shown in FIG. 1. Before the boat is removed from the vehicle, the wing nuts **7** are loosened, each carrier arm **6** is moved from between the substantially horizontal buttons **2** and is turned at right angles outwardly from the position shown in FIG. 2 into the position shown in FIG. 3 and between the perpendicularly aligned buttons **2**, and then secured by the wing nuts **7** between the vertically aligned buttons **2**. Then the wheel carriers **8** are pulled out of the respective carrier arms **6** and turned, in this instance, 90° from the position shown in FIG. 3 into the position shown in FIG. 4, in which latter position the plane of each wheel **14** is generally parallel with the longitudinal axis of the boat. Then the boat is pulled back and lowered from the position shown in FIG. 4 into the position shown in FIG. 1 and then by lifting the free end of the boat is can be rolled on the wheels **14** to or from the water, or from any one location to another location. To facilitate the turning over of the boat, handles **22** are provided at the flat end of the boat adjacent the wheels **14**. After the wheels **14** are turned 90° the spring **12** pulls each wheel carrier **8** into the carrier arm **6** to the extent permitted by the limit plate **21**, but for a sufficient distance to prevent the rectangular portion of the wheel carrier **8** from turning in the carrier arm **6**. For this operation it is important that the connection between the hook **13** and the inner conical end of the spring **12** be swivelable thereby to permit the turning of the spring **12** with the carrier **8**.

When the wheels are in the position shown in FIG. 1 the boat can be pushed and pulled and suitably controlled in its line of travel.

In the form shown in FIGS. 10 and 11 the bracket plates **26** are mounted the same way as in the first form and the wheels are originally folded in the same position and the operation is substantially the same as the first form except that the carrier arm **29** is not placed between projections or buttons, but the carrier arm is turned so that the sockets **33** on its face adjacent to the respective plate **26** engage the respective screw heads **36** to hold the carrier arm **29** in adjusted position. The wheel carrier **37** is pulled out, against the action of the coil spring **41** until the skirt **46** thereof clears the free end of the carrier arm **29** and then the wheel carrier head **39** is turned 90° and reengaged with the free end of the carrier arm **29** for holding the wheel in another adjusted position.

In the form shown in FIGS. 12, 13 and 14, the wheel carrier head **51** is pulled out against the action of the spring **41** until the pin **53** is withdrawn from the sockets **54** and then the wheel carrier head is turned 90° to have the pin **53** engage the other pair of sockets **54** and thereby hold the wheel in the other attitude.

In the form shown in FIG. 15, the position of the wheel can be changed simply by turning the carrier arm **29** 90° so as to engage the other pivot holes **57** with the bolt **27**. In this form either sockets **33** may be provided on at least two adjacent sides of the carrier arm **29**, or the abutments described in the first form may be utilized.

While the particular mounting of the wheels and the structural combinations herein shown are practical illustrative embodiments of the invention, it is to be understood that variations in the location of the wheels and in the showing made by the herein drawings and descrip-

tion may be adopted within the scope of the invention.

I claim:

1. Retractable mounting for wheels for a boat comprising,
a pair of mounting brackets adapted to be fixedly secured flat against a wall of the boat,
a pair of spaced pivots held on said brackets, the pivot axis of each pivot being at right angles to its bracket and to said wall,
a carrier arm on each pivot, being movable independently of the other carrier arm from a folded position along said wall of said boat to a position extending from the boat in boat supporting position,
holding means on said brackets coacting with the respective arms to hold the arms respectively in said positions,
releasable means to hold each carrier arm in engagement with the respective arm holding means,
a wheel on each carrier arm,
and wheel carrier means on each carrier arm rotatably to support each wheel on its carrier arm to permit the wheel to move from a position at right angles to said wall to a position parallel to said wall.

2. Retractable mounting for wheels for boats as defined in claim 1 and
said carrier arm being tubular and of rectangular cross-section,
said wheel carrier means on each carrier arm including a wheel carrier element of at least partly rectangular cross-section telescopingly engaging the free end of said carrier arm for holding the wheel at respective adjusted positions.

3. The invention defined in claim 2 and
a spring anchored on said carrier arm and connected to said wheel carrier element for normally urging said wheel carrier element into engagement with said carrier arm thereby preventing accidental turning of said wheel carrier element relatively to said carrier arm.

4. Retractable mounting for wheels for boats defined in claim 1, and
said carrier arm being tubular and being of rectangular cross-section at least interiorly at its end adjacent said wheel carrier,
said wheel carrier having a portion of rectangular cross-section telescopingly engaging the adjacent end of said carrier arm and having a reduced cross-section portion rotatable in the adjacent end of said carrier arm,
and an abutment member on said wheel carrier engaging said carrier arm thereby to limit the telescoping of said portion of rectangular cross-section.

5. The invention defined in claim 4, and
a coil spring in said tubular carrier arm having one end thereof anchored in said carrier arm and the other end thereof connected to said reduced portion of said wheel carrier thereby to urge said wheel carrier into telescoped position relatively to the end of said carrier arm.

6. The invention defined in claim 1, and
said arm holding means being spaced abutments on each bracket arranged in spaced pairs aligned respectively to correspond to folded and extended positions of said carrier arm,
each carrier arm being tubular and of substantially rectangular cross-section fitting between the respective abutments.

7. The invention defined in claim 1, and
each carrier arm having pivot holes therethrough for slideably and rotatably engaging its pivot.

8. The invention defined in claim 1, and
each carrier arm having a plurality of pivot holes therethrough aligned at predetermined angles to one another for selective engagement with the respective pivot to hold said arm in selected attitude.

9. The invention defined in claim 1, and
said holding means including
a plurality of pairs of spaced abutments on the exposed face of each plate,
said carrier arm being of a cross-sectional shape fitting between the abutments of the respective pairs,
at least two paris of abutments being aligned on a line intersecting said pivot generally vertically with respect to the bottom of the boat thereby to hold said carrier arm in extended position,
another two pairs of abutments being alinged on a line intersecting said pivot at an angle to said vertical position thereby to hold said carrier arm in retracted position along said wall of said boat.

10. The invention defined in claim 1, and
said holding means including a plurality of projections on each bracket plate spaced from said pivot, and said carrier arm having sockets at least on one face thereof related to said pivot so as to engage said projections respectively in selected attitudes of said carrier arm,
said projections being arranged on each bracket for engagement with said sockets respectively in extended and in retracted attitudes of said carrier arm.

11. The invention defined in claim 10, and
each carrier arm having projection engaging sockets on at least two adjacent faces thereof.

12. The invention defined in claim 5, and
said rectangular portion of each wheel carrier telescoping into the end of said carrier arm.

13. The invention defined in claim 5, and
said rectangular portion of each wheel carrier abutting the end of said carrier arm, and said abutment member projecting from said reduced cross-section portion, and said carrier arm having keeper sockets in its end to receive said abutment member.

14. The invention defined in claim 5, and
said rectangular portion of each wheel carrier telescoping over the outside of the end of said carrier arm.

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U.S. Cl. X.R.

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