Feb. 12, 1963 J. W. HOLZMAN 3,077,277

BOAT TRAILER

Filed June 20, 1960 3 Sheets-Sheet 1

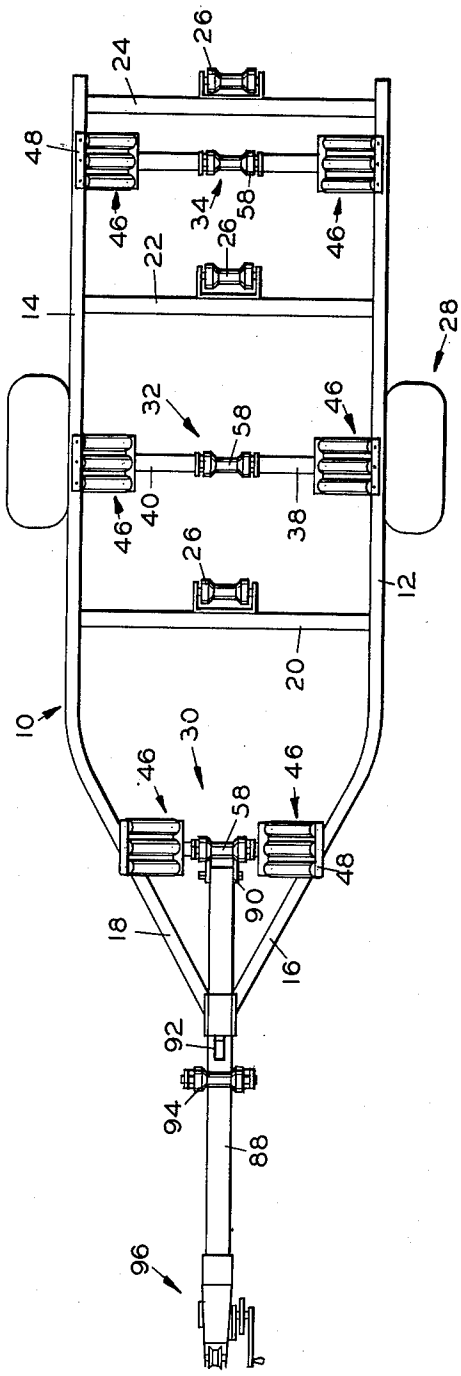


FIG. 1

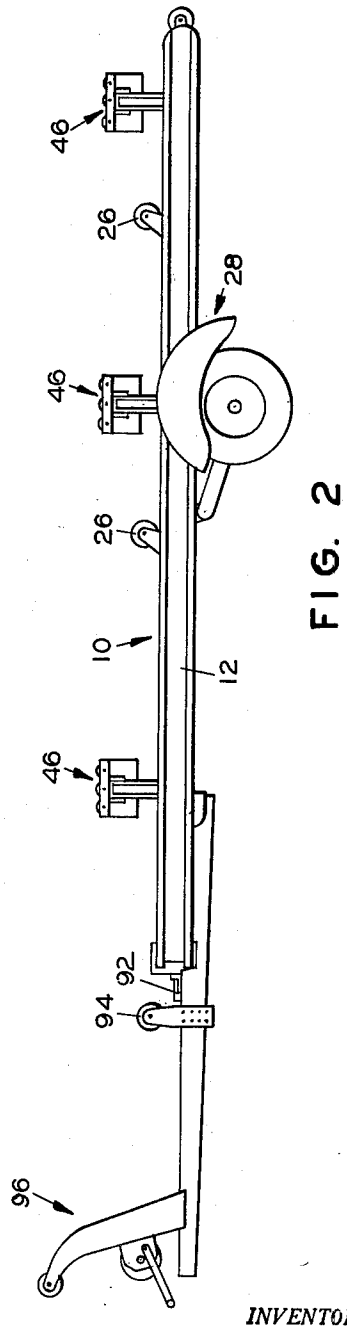


FIG. 2

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BOAT TRAILER

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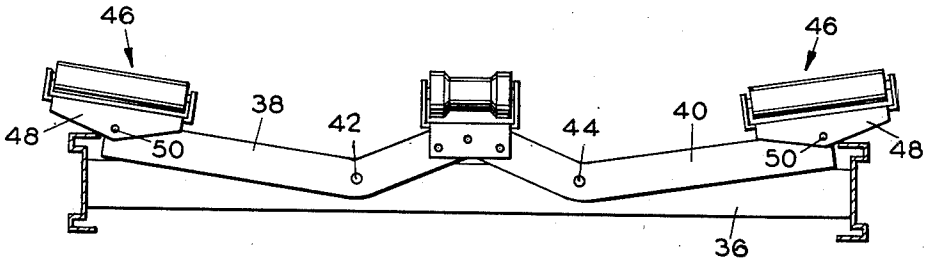


FIG. 3

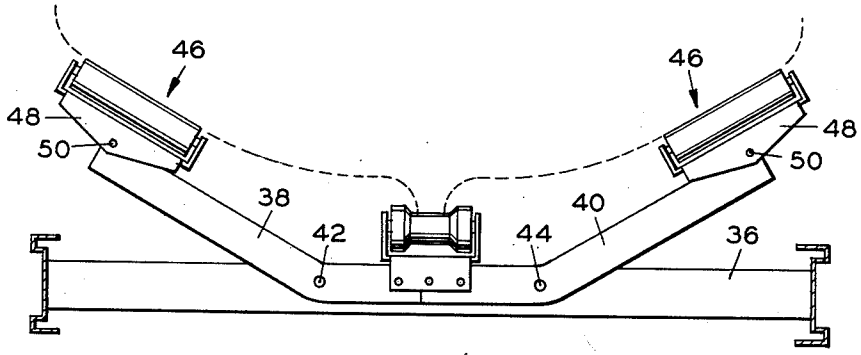


FIG. 4

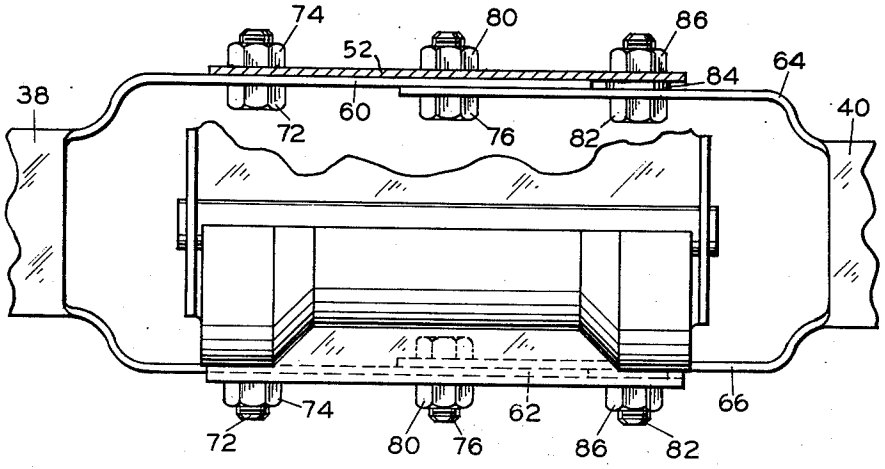


FIG. 5

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BOAT TRAILER

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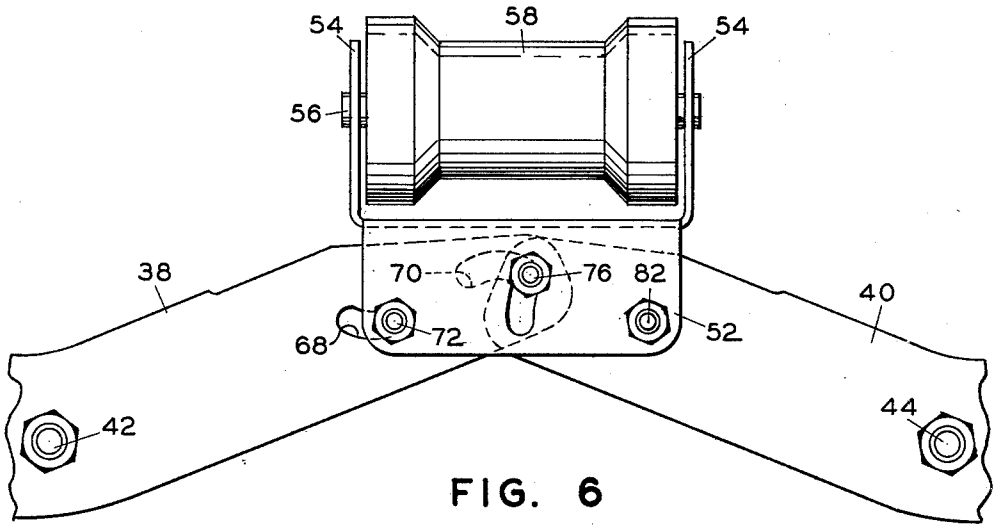


FIG. 6

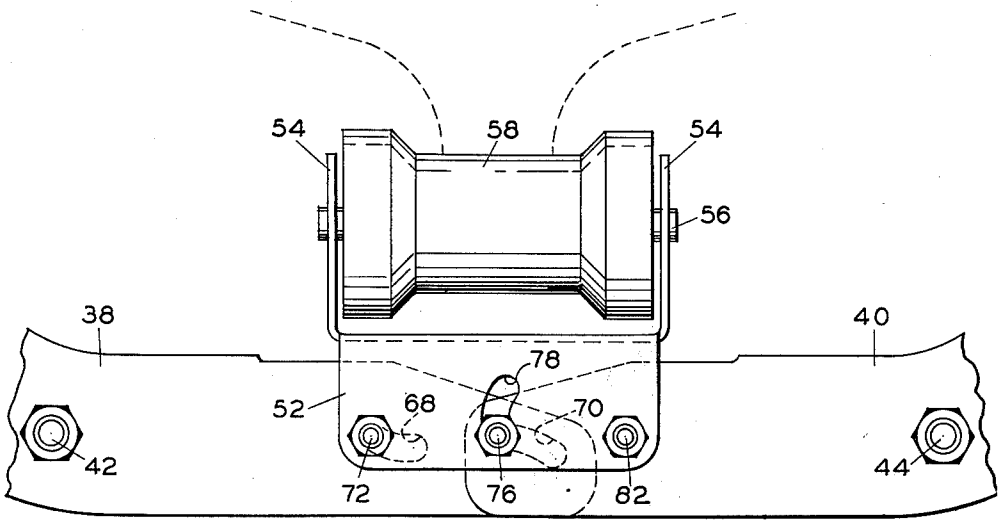


FIG. 7

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BOAT TRAILER

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6 Claims. (Cl. 214—84)

This invention pertains to boat loading and transporting devices, and more particularly to a trailer wherein the weight of a boat is proportioned between keel engaging means and hull engaging means.

Prior constructions, such as the R. Z. Reeder Patent No. 2,827,188, March 18, 1958, have utilized a movable primary support for a boat and secondary supports shiftable into stabilizing engagement with the hull of the boat by movement of the primary support. However, these prior constructions have been complicated in design and expensive to manufacture.

Therefore, a primary object of this invention is to provide a simple and inexpensive boat trailer having means for proportioning the weight of a boat between a keel engaging means and hull engaging means.

Another object of this invention is the provision of means for supporting a boat over extensive areas which are automatically adjustable to minimize strain of the boat structure.

In one preferred embodiment of this invention a boat trailer frame is provided with a transverse member secured to the longitudinal sides of the frame. A pair of angularly-shaped members are pivotally mounted at their apexes about spaced longitudinally extending axes on the transverse member. A plurality of hull rollers are pivotally secured to the outer end of each of the angularly-shaped members and means including a keel roller movably connects the inner ends of the members. Hence, when the boat contacts the keel roller the weight of the boat causes pivotal movement of the pair of angular members to move the hull rollers into weight supporting contact with the boat. As a result, the weight of the boat is proportioned between the hull rollers and the keel roller.

Other objects and advantages of this invention will become apparent upon consideration of the following detailed description when taken in connection with the accompanying drawings wherein:

FIG. 1 is a plan view of a boat trailer in accordance with the present invention;

FIG. 2 is a side elevation view of the trailer shown in FIG. 1;

FIG. 3 is a rear elevation view of the keel roller and hull roller weight proportioning structure shown in the normal position before a boat is placed thereon;

FIG. 4 is a view of the keel roller and hull roller weight proportioning structure similar to FIG. 3 illustrating the position thereof when a boat is placed thereon;

FIG. 5 is an enlarged plan view of the keel roller construction partly cut away to reveal the supporting structure;

FIG. 6 is an enlarged detail view of the keel roller construction illustrating the position thereof before a boat has contacted the keel roller; and

FIG. 7 is a view similar to FIG. 6 showing the keel roller in depressed position as when a boat is disposed thereon.

Referring more particularly to the drawings wherein like reference numerals indicate like parts throughout, and more particularly to FIG. 1, the present trailer comprises a frame generally indicated at 10. The frame includes horizontal longitudinally extending frame sides 12 and 14 which are spaced apart and parallel for a portion of the length of the frame. The frame sides 12 and 14 terminate forwardly in converging elongated extensions 16 and 18. The frame sides 12 and 14 are rigidly connected by three transverse longitudinally spaced brace members 20, 22 and 24. A keel engaging roller 26 of hard rubber or the like is suitably journaled for rotation on each of the transverse members 20, 22 and 24. The two forward keel rollers extend upwardly and rearwardly at an angle from the transverse members 20 and 22 whereas the rear keel roller extends substantially parallel to the frame 10 to facilitate loading and launching of the boat from the water.

The trailer frame 10 is provided with any preferred type of wheeled undercarriage such as that indicated generally at 28. The structure thus far described is generally conventional in nature and may be subjected to many changes or modifications to suit a particular boat.

Means is provided to proportion the weight of the boat on the trailer between keel engaging means and hull engaging means. More particularly, the trailer frame 10 is provided with three transversely extending longitudinally spaced weight proportioning assemblies indicated generally at 30, 32 and 34. Each weight proportioning assembly 30, 32 and 34 includes a transversely extending mounting brace 36 (FIG. 3 and FIG. 4). The mounting braces 36 are rigidly attached to the frame side members 12 and 14 or as is the case with weight proportioning assembly 30 the mounting brace 36 is attached to side extensions 16 and 18.

A pair of angularly-shaped levers or members 38 and 40 are mounted at their apexes for rotation about pivot pins 42 and 44 fixed on the brace members 36. The pivot pins 42 and 44 are transversely spaced on the medial portion of the brace members 36 and provide substantially parallel longitudinally extending axes for the angular members 38 and 40.

A plurality of hull engaging rollers 46 are suitably journaled for rotation in a bracket member 48 which is in turn mounted for rotation about a pin 50 secured adjacent the outer end of each angularly-shaped member 38 and 40. While the drawings disclose three rollers mounted in each bracket member 48, it is obvious that any number of rollers may be utilized. The only criteria is that the larger the number of rollers the greater the contact area and consequently less strain on the hull.

Means is provided to movably connect the inner ends of the angularly-shaped members 38 and 40. More specifically, a downwardly facing channel-shaped bracket 52 is provided with upwardly extending ears 54 which journal a pintle member 56 of a keel engaging roller 58. As best shown in FIG. 5, the inner ends of the angularly-shaped members 38 and 40 are provided with bifurcations 60, 62 and 64, 66 respectively. The inner ends of bifurcations 64 and 66 are positioned within and overlapped by bifurcations 60 and 62 and both are housed by the downwardly facing channel portion of bracket 52.

The bifurcations 60 and 62 of angularly-shaped member 38 are provided with elongated slots 68 and 70. The elongated slot 68 is slightly concavely curved and the end slot 70 is of a slightly convex configuration. A pair of bolts 72 extend outwardly through the elongated slots 68 and the channel portion of bracket 52 and are firmly held in place by hex-head nuts 74. Another pair of bolts 76 extend outwardly through bifurcations 64 and 66, elongated slots 70 in bifurcations 60 and 62, and subsequently through substantially vertical arcuate elongated slots 78 disposed in the channel portion of bracket 52. Hex-head nuts 80 are threaded on the shank portion of bolts 76 to fixedly secure the same. A third pair of bolts 82 extend outwardly through bifurcations 64 and 66, spacer washers 84, and the channel-shaped portion of bracket 52, and also receive hex-head securing nuts 86.

From the foregoing it is apparent that relative pivotal movement may occur between angularly-shaped members 38 and 40 and keel roller supporting bracket 52; whereas, bolts 72 may move in elongated slot 68 and bolts 76 may move in both elongated slots 70 and 78.

Each of the weight proportioning assemblies 30, 32 and 34 is substantially similar in construction with the exception that the position of the pivot points 42 and 44 along the transverse brace 36 may be varied and/or the angularity of angular members 38 and 40 may be varied to conform to the shape of the boat. Accordingly, the angularity of members 38 and 40 of the forward weight proportioning assembly 30 will be substantially greater than that of the weight proportioning assemblies 32 and 34 to conform to the shape of the bow of the boat.

To tilt the trailer bed 10 for facilitating loading and launching of the boat, a centrally disposed longitudinally extending tongue 88 is pivotally mounted at one end in a bracket 90 extending from the weight proportioning assembly 30. A suitable latch 92 is disposed along the medial portion of the tongue 88 to lock the tongue to the trailer frame in substantially horizontal position. A keel roller 94 is suitably mounted on the tongue 88 adjacent latch 92 and is adapted to engage the bow of the boat and the extreme forward end of the tongue 88 is provided with the conventional winch which is operable to pull the boat onto the trailer.

In operation, to load the boat onto the trailer the trailer is backed to the edge of the water. The latch 92 is released and the trailer bed is pivoted about the wheeled undercarriage 28 to an inclined position. The tow line is then attached to the boat and the winch 96 is operated to haul the boat over the rear keel roller 26. Further operation of the winch 96 pulls the boat onto keel roller 58 of the weight proportioning assembly 34. The weight of the boat on the keel roller 58 causes pivotal movement of the angularly-shaped member 38 in a clockwise direction about pivot point 42 and counterclockwise movement of the angularly-shaped member 40 about pivot point 44. This action moves the weight proportioning assembly 34 from the position shown in FIG. 3 to that shown in FIG. 4. As the hull of the boat advances, it comes into contact with the hull rollers 46, gradually depressing them. As a result, the weight of the boat is proportioned between the keel engaging roller 58 and the hull engaging rollers 46.

During movement of the weight proportioning assembly 34 from normal to depressed position, as illustrated in FIGS. 6 and 7 bolt 72 has moved from the extreme right end portion of elongated slot 68 to the extreme left end thereof. At the same time, bolt 76 moves from the extreme upward end of slot 78 and the extreme right end of slot 70 to the extreme downward portion of slot 78 and the extreme left end of slot 70. Thus, elongated slots 68, 70 and 78 compensate for the angular movement of members 38 and 40 and permit substantially vertical movement of the keel roller 58.

Upon further forward movement of the boat the keel rollers 58 of weight proportioning assemblies 32 and 30 will be engaged in sequence. Similarly, the weight of the boat on the keel rollers will lift the hull rollers 46 of weight proportioning assemblies 32 and 30 until the hull rollers assume support of a portion of the weight of the boat. It should be particularly noted that the height of the fixed keel rollers 26 is equal to the height of the keel rollers 58 when these movable keel rollers are in their depressed position. Thus, the fixed keel rollers 26 do not interfere with the weight proportioning function of assemblies 30, 32 and 34. To launch the boat, the reverse of the above procedure is merely followed.

It is now apparent that a simple and inexpensive boat trailer has been provided wherein the weight of the boat is proportioned between a plurality of keel rollers and a plurality of sets of hull rollers. With this arrangement the boat is supported over extensive areas and the support is automatically adjustable to minimize the strain on the boat structure at any point. Furthermore, the hull rollers 46 guide the boat during loading and launching and prevent lateral displacement thereof.

While only a single embodiment of this invention has been shown and described, it is apparent that there may be many changes in structure as well as operation without departing from the scope of this invention as defined by the appended claims.

I claim:

1. In a boat trailer the combination comprising a supporting frame, a pair of members each pivotally mounted relative to said frame at a point intermediate the ends thereof, hull engaging means disposed on the outer end of each of said pair of members, and keel engaging means connecting the inner ends of said pair of members, the keel engaging means being operated by the weight of a boat thereon to pivot said pair of members whereby the weight of the boat is proportioned between said hull engaging means and said keel engaging means, the position of said hull engaging means and said keel engaging means being constantly adjusted in accordance with the varying contour of the boat hull as the boat moves longitudinally onto or from the trailer.

2. In a boat trailer the combination comprising a supporting frame having substantially parallel sides, a transverse member secured to said sides, a pair of transversely extending angularly-shaped members pivotally mounted on said transverse member about transversely spaced longitudinally extending axes, the outer end of each of said pair of members having hull rollers pivotally mounted thereon, and means including a keel roller movably connecting the inner ends of said pair of members and operable by the weight of a boat on the keel roller to pivot one of said pair of members in a clockwise direction and the other of said pair of members in a counterclockwise direction whereby the weight of the boat is proportioned between said hull rollers and said keel roller.

3. In a boat trailer the combination comprising a supporting frame having substantially parallel sides, a mounting member secured to said sides, a pair of transversely extending members, means mounting each of said transversely extending members for movement relative to said mounting member, the outer end of each of said transversely extending members having hull rollers pivotally mounted thereon, and means including at least a keel roller connecting the inner ends of said transversely extending members and operable by the weight of a boat on said keel roller as the boat moves longitudinally onto or from the trailer to pivot one of said transversely extending members in a clockwise direction and the other of said transversely extending members in a counterclockwise direction whereby the weight of the boat is proportioned between said hull rollers and said keel roller.

4. A boat trailer comprising in combination a substantially longitudinaly extending trailer frame with suitable wheel and axle means for the mobility thereof, means on said frame for attachment to a drawing vehicle, a mounting member located transversely to the longitudinal axis of said frame and being carried by said frame, a pair of transverse members, means pivotally mounting said transverse members for movement relative to said mounting member, boat contacting means carried by each of said transverse members, and means including another boat contacting means connecting said transverse members and operated by the weight of a boat thereon to pivot one of said transverse members in a clockwise direction and the other of said transverse members in a counterclockwise direction whereby the weight of the boat is proportioned among said boat contacting means, the position of said boat contacting means being constantly adjusted upon movement of the boat longitudinally onto or from the trailer so that boat contacting means will accommodate boat hulls of various sizes and constantly varying contours.

5. A boat trailer comprising the combination of a substantially longitudinally extending trailer frame with suitable wheel and axle means for the mobility thereof, means on said frame for attachment to a drawing vehicle, a mounting member located transversely to the longitudinal axis of said frame and being carried by the frame, a pair of transverse members each having hull roller means on the outer end thereof, and means intermediate the ends of each of said transverse members operatively connected to said transverse members and said mounting member for mounting said transverse members for movement relative to the mounting member, and means including at least a keel roller connecting the inner ends of said transverse members and operable by the weight of a boat on said keel roller to pivot one of said transverse members in a clockwise direction and the other of said transverse members in a counterclockwise direction whereby said hull roller means engage the hull of the boat, the weight of the boat being proportioned between said hull roller means and said keel roller, the position of said hull roller means and said keel roller being automatically adjusted upon movement of the boat longitudinally onto or from the trailer so that said hull roller means remain in contact with the hull of the boat as the contour thereof varies.

6. A boat trailer comprising the combination of a substantially longitudinally extending trailer frame having a pair of parallel side members, wheel and axle means for supporting said trailer frame, means on said frame for attachment to a drawing vehicle, a pair of mounting members located transversely to the longitudinal axis of said frame and being connected at the ends thereof to said frame, an automatically adjustable mechanism associated with each of said mounting members comprising a pair of transverse members each having hull roller means on the outer end thereof, means intermediate the ends of each of said transverse members operatively connected to said transverse members and its respective mounting member for mounting said transverse members for movement relative to the mounting member, and means including keel roller means connecting the inner ends of said transverse members and operable by the weight of a boat on said keel roller means to pivot one of said transverse members in a clockwise direction and the other of said transverse members in a counterclockwise direction whereby said hull roller means engage the hull of the boat, the weight of the boat being proportioned between said hull roller means and said keel roller means, the position of said hull roller means and said keel roller means being constantly adjusted by the varying contour of the boat as the boat moves longitudinally onto or from the trailer so that said hull roller means and said keel roller means constantly support the boat hull.

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