

[54] MOORING DEVICE

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[58] Field of Search 114/230, 213, 215; 244/115; 242/47.5; 254/189

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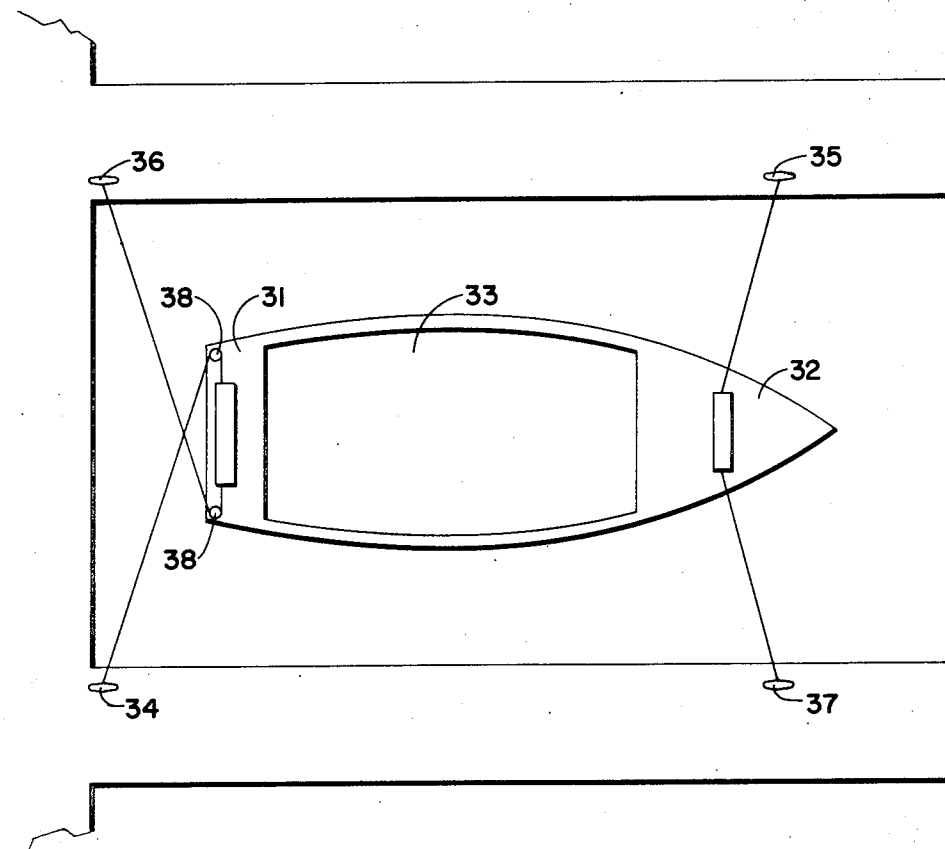
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[57] ABSTRACT

A mooring device comprising a tubular member hav-

ing a rod member coaxially aligned therewith and lying partially therewithin and in slidable engagement therewith, a tension producing means operatively engaged with the tubular member and the rod member such as to force the two members in opposite directions from one another, a first block and tackle system having one pulling point anchored to a first anchor bar extending from the tubular member in substantial perpendicular relation thereto and the other pulling point anchored to a first anchor bar extending from the rod member in substantial perpendicular relation thereto, a second block and tackle system having one pulling point anchored to a second anchor bar extending from the tubular member in substantial perpendicular relation thereto and the other pulling point anchored to a second anchored bar extending from the rod member in substantial perpendicular relation thereto, the two first anchor means of the first block and tackle system being disposed on substantially opposite sides of the tubular and rod members from the two second anchor means of the second block and tackle system, and mooring line extending from each of the block and tackle systems.

8 Claims, 4 Drawing Figures



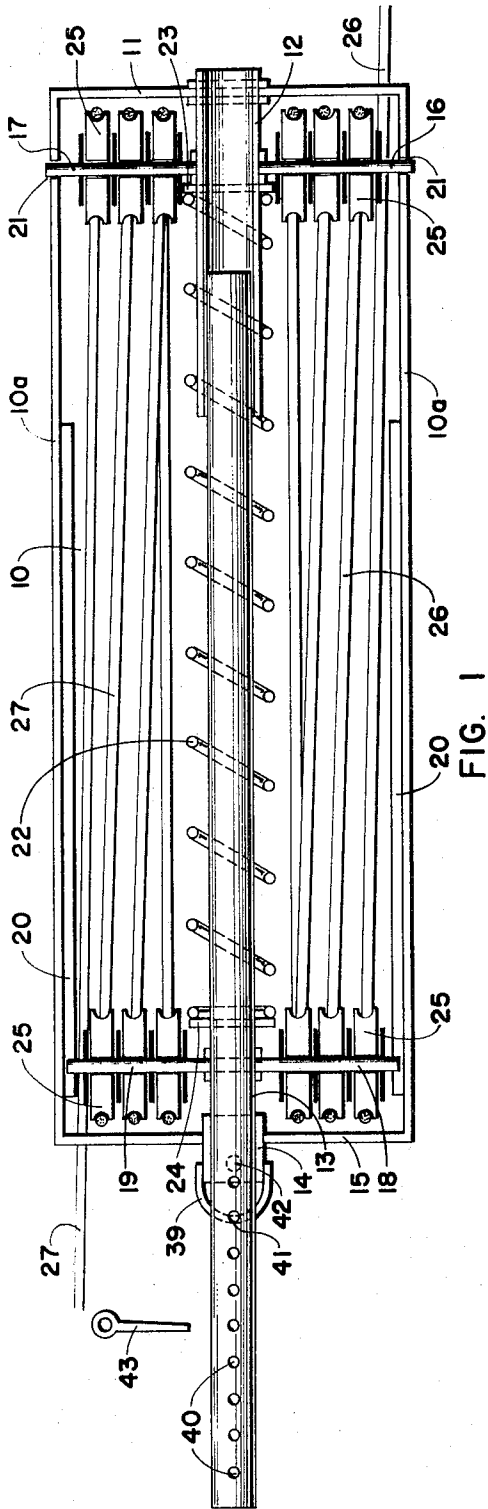


FIG. 1

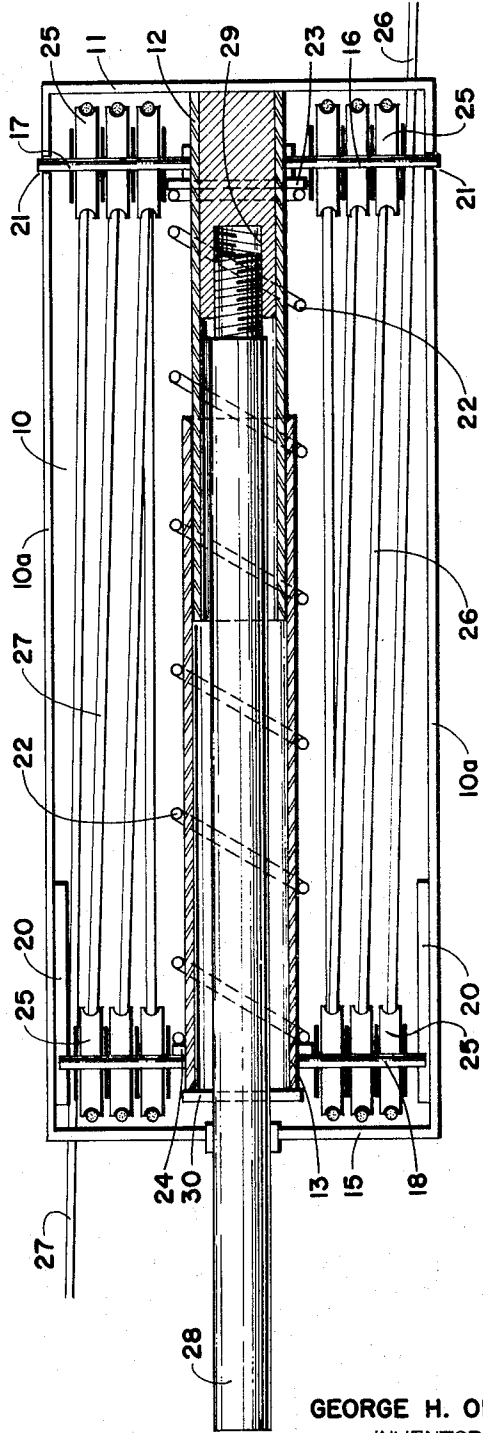


FIG. 2

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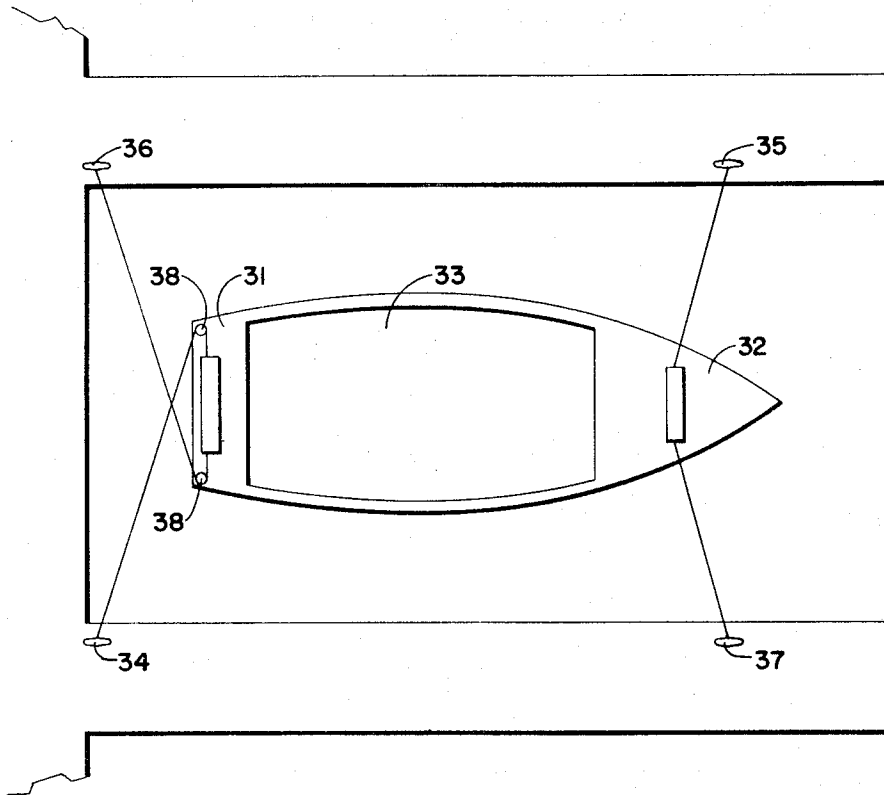


FIG. 3

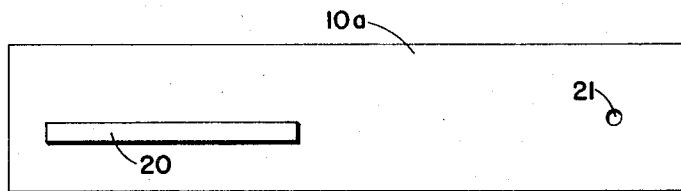


FIG. 4

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MOORING DEVICE**BACKGROUND OF THE INVENTION**

The present invention relates to a mooring system for boats. More particularly, the present invention relates to a mooring system for securing boats and the like within stalls, to docks, piers, etc.

Waves, wind and tide have a very pronounced effect upon the position and attitude of boats when tied within marina stalls, between piers, docks, and the like. Wind and waves, as well as tides, will force the moored boat to gyrate or move within the stall such that it bumps and bangs against the sides of the stall in many instances causing severe damage to the boat.

Rising tides present a particular problem to moored boats. If the lines are sufficiently short to keep a boat moored in the center of a stall during average water level, rising tides may rather rapidly raise the boat until the lines are completely tight. Should the tides rise higher either the lines must break, pull loose from the boat or mooring or the boat cannot rise and thus may be sunk by the rising tides.

Generally, it is the practice to manually loosen, lengthen or shorten the lines to maintain the moored boat centered in a stall during rising tides and/or wind or wave action. Such practice requires the presence of the owner or a caretaker for the boat. Additionally, in severe weather such as hurricanes, it becomes impossible to attend to the boats in the face of the high winds, waves and tides.

It is an object of the present invention to provide a new and novel means for mooring boats.

Another object of the present invention is to provide a new and novel means for mooring boats within stalls, between piers, etc.

An additional object of the present invention is to provide a new and novel means for mooring boats which provides for maintaining boats moored within stalls, between piers, etc., positioned at a predetermined position within said stall, piers, etc., regardless of wind, wave or tidal action.

Additional objects will become apparent from the following description of the invention herein disclosed.

SUMMARY OF THE INVENTION

The present invention which fulfills these and other objects, is a mooring device comprising

1. a tubular member;
2. a rod member coaxially aligned with said first tubular member, one of said members having a portion thereof lying within said other member, and in slidable engagement therewith;
3. tension producing means operatively engaged with said tubular member and said rod member such as to force said tubular member and said rod member in opposite directions;
4. a first block and tackle system having one pulling point anchored to a first anchor bar extending from said tubular member in substantial perpendicular relation thereto and the other pulling point anchored to a first anchor bar extending from said rod member in substantial perpendicular relation thereto;
5. a second block and tackle system having one pulling point anchored to a second anchor bar extend-

ing from said tubular member in substantial perpendicular relation thereto and the other pulling point anchored to a second anchor bar extending from said rod member in substantial perpendicular relation thereto; said two first anchor means of said first block and tackle system being disposed on substantially opposite sides of said members from said two second anchor means of said second block and tackle system; and

6. mooring line extending from each of said block and tackle systems.

By means of the apparatus of the present invention, boats may be moored between oppositely disposed mooring points and maintained at predetermined spacing from said mooring points without regard to wave or wind action or the rise and fall of the water level by tide or otherwise.

DESCRIPTION OF THE DRAWINGS

FIG. 1 of the drawings presents a cross-sectional view of an embodiment of the apparatus of the present invention as seen from the top of said apparatus.

FIG. 2 of the drawings presents a cross-sectional view of another embodiment of the apparatus of the present invention as seen from the top of said apparatus.

FIG. 3 of the drawings illustrates the use of the apparatus of the present invention.

FIG. 4 of the drawings illustrates a detail of an embodiment of the apparatus of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS**OF THE PRESENT INVENTION**

In order to describe the preferred embodiments of the apparatus of the present invention, reference is made to the accompanying drawings. In the drawings, the same reference characters are used throughout to denote like features of the apparatus.

Referring to the drawings, the apparatus is most often enclosed within a box-like container 10 which generally is rectangular in shape. Container 10 may, of course, be of any other shape or size so long as it does not interfere with the working of the apparatus of the present invention as herein described.

To an end wall 11 of container 10 is affixed a tubular member 12 which is shown in the form of a cylindrical conduit. The tubular member 12 is affixed to end wall 11 at substantially the center of said end wall. Tubular member 12 extends from end wall 11 in substantially perpendicular alignment. While the tubular member 12 is shown and described above as affixed to the inner surface of end wall 11, such is not to be construed as limiting the present invention. Tubular member 12 is affixed in fixed relationship to end wall 11 but may extend therethrough if desired, to the outside of container 10.

A rod member 13 is provided in partial concentric alignment with tubular member 12. Rod member 13 may be in the form of a solid bar or a conduit, but in any event, rod member 13 is partially inserted within tubular member 12, as shown in FIG. 1, and in slidable contact therewith. In another embodiment, however, rod member 13 is in the form of a conduit of diameter sufficient to receive therein in slidable relationship tubular member 12. In the embodiment of the invention illustrated in FIG. 1, rod member 13 is shown extending through a bushing 14 which is fixedly positioned within

end wall 15 of container 10. Rod member 13 is in slidable relation with bushing 14. Tubular members 12 and 13 may have virtually any transverse cross-sectional shape such as round, as shown, square, rectangular, triangular, etc., but preferably are round thereby forming cylindrical members. However, both tubular members must be of transverse cross-sectional configurations compatible for the herein discussed slidable engagement with one another.

Adjacent end wall 11 of container 10, tubular member 12 is provided with a first and second anchor means 16 and 17, respectively, in the form of arms extending substantially perpendicular to the axis of tubular member 12. The two anchor means 16 and 17 generally are fixed to substantially opposite sides of tubular member 12. If desired, and depending on the length and diameter of tubular member 12, the two anchor means 16 and 17 may be a single bar extending through tubular member 12. Alternatively, each of the anchor means 16 and 17 may be a separate bar fixed to the wall of tubular member 12. For added strength, the outer ends of anchor means 16 and 17 preferably extend through or are affixed to side walls 10a of container 10.

Member 13 is provided with a first and second anchor means 18 and 19, respectively. The two anchor means 18 and 19 are fixed to second rod member 13 at a point adjacent to the inner surface of end wall 15 of container 10. The manner of forming anchor means 18 and 19 and their disposition with respect to rod member 13 are otherwise substantially similar to the forming and disposition of anchor means 16 and 17 with respect to tubular member 12, provided, however, the outer ends are not affixed to the side walls 10a of container 10. In order to prevent rotation of rod member 13 when sliding within tubular member 12 when rod member 13 is cylindrical, a guide bar 20 is provided on the inner wall 10a of container 10. Instead of a guide bar, however, a slot or groove within wall 10a may be provided to engage and prevent rotation of anchor means 18 and 19. FIG. 4 shows a side wall 10a having guide bar 20 and a hole 21 through which an anchor means 17 or 18 may extend as mentioned above.

Coaxially aligned with members 12 and 13 respectively, is a tension member 22. Such tension member 22 generally will be in the form of a single spring or a plurality of springs. However, other tension producing means may be employed to serve the purpose of the tension member 22 which is to apply force toward forcing tubular member 12 away from rod member 13.

As a coiled spring, tension member 22 is generally disposed around the outside surface of members 12 and 13. The tension member 22, as a coiled spring, will lie between anchor means 16 and 17 and anchor means 18 and 19. If desired the ends of such coiled spring may rest against anchor means 16, 17, 18 and 19 or alternatively, such ends may otherwise be attached to members 12 and 13, respectively, or rest against special butt plates 23 and 24 affixed to said members 12 and 13, respectively.

The anchor means 16, 17, 18 and 19, generally are aligned with respect to one another such as to lie substantially in a common plane. As noted above, a guide bar 20 is provided to insure that anchor means 18 and 19 remain in the same plane during movement. Attached to each of anchor means 16, 17, 18 and 19 are a plurality of pulleys 25. Passing through and around pulleys 25 are lines 26 and 27, line 26 being employed

with pulleys 25 on one side of members 12 and 13 and line 27 being employed with pulleys 25 on the other side. A free end of each of lines 26 and 27 extends through a wall of container 10, most often through opposite end walls. Lines 26 and 27 may be of any suitable material for mooring purposes but preferably will be a metal wire. The employment of pulleys 25 and lines 26 and 27 are such as to provide a block and tackle assembly disposed on each side of members 12 and 13. By such employment, the pulling upon a free end of either line 26 or line 27 away from container 10 will result in the movement of first anchor means 16 and 17 toward second anchor means 18 and 19 and thereby the compression of tension means 22.

Frequently, it is desirable to provide means for varying the at rest tension produced by tension member 22. This, of course, may be done by either compression or release, as the case may be, of tension member 22 in its at rest position. By "at rest" is meant normal or at that time when there is substantially no pull on either of lines 26 or 27. The at rest tension of tension member 22 may be varied in any number of ways depending upon the specific mode of constructing the apparatus of the present invention.

One useful and simple means of varying the at rest tension of tension member 22 is shown in FIG. 2. In accordance with such means, adjustment of the tension of tension member 22 is by means of an adjusting bar 28. According to this embodiment, both members 12 and 13 respectively, are tubular with adjusting bar 28 extending therethrough in coaxial alignment. At its interior end, adjusting bar 28 is threaded into a fixed member 29 which is fixed to end wall 11 and/or tubular member 12. From such fixed member 29, adjusting bar 28 extends through end wall 15 of container 10. Adjacent to inner surface of end wall 15, adjusting bar 28 is provided with a fixed circular butt plate 30 which rests against the end of rod member 13 opposite tubular member 12. In such manner, rotation of adjusting bar 28 into or out of fixed member 29 which in turn moves butt plate 30 toward or away from end wall 15. If butt plate 30 is so moved away from end wall 15, then the result is a compression of tension member 22. Conversely, when butt plate 30 is moved toward end wall 15 by rotation of adjusting bar 28, there is a reduction in tension on tension member 22.

The simplest means of increasing the at rest tension is by pulling on lines 26 and 27 to compress the tension member 22 and then tying lines 26 and 27 to the mooring cleats. In like manner, compression may be decreased up to the full expansion of tension member 22 by release of lines 26 and 27.

In operation the apparatus of the present invention is installed on a boat, as shown in FIG. 3, or it may be installed on a dock. As illustrated in FIG. 3, an apparatus as described and claimed herein is attached to both a rear deck 31 and the front deck 32 of a boat 33 which has been moored in the usual stall. A line 26 extends from the apparatus on the rear deck 31 of the boat to a docking cleat 34. Another line 26 extends from the apparatus on the front deck 32 of the boat to docking cleat 35. In like manner, lines 27 extend from the other end of the apparatus on the rear deck 31 and front deck 32 to docking cleats 36 and 37, respectively. Generally, it is preferred that lines 26 and 27 passing from the rear deck 31 pass around pulleys shown as 38 and are reversed as shown to cross each other behind boat 33.

Generally, it is desirable to center the boat in the stall as shown in FIG. 3. However, by shortening or lengthening of lines 26 and 27, the boat may be tied off center within the stall. In either event, using the apparatus of the present invention, the boat will rise or fall with relation to the stall as the water rises or falls. However, in rising or falling, as the case may be, the boat will remain at all times substantially at the pre set distance from the stall piling or walls.

In order to release the tension on lines 26 and 27 to permit the boat 33 to be easily untied from the docking cleatings 34, 35, 36, and 37, use is made of jacking stirrup 39. A lever (not shown) may be inserted through jacking stirrup 39 into one of the holes 40 which extend transversely through the outer segment of rod member 13, such hole being one further from end wall 15 than the apex 41 of the accurate portion of jacking stirrup 39. Pressure is then applied to the outer, non-engaged end of the lever in a direction away from end wall 15. In such manner, apex 41 becomes the fulcrum upon which the lever pivots to force the engaged hole 40 and thus, rod member 13 toward end wall 15. When sufficient pressure on the lever has been exerted to cause a hole 40 to move into alignment with holes 42 of busing 14, a pin 43 may be inserted through the holes 42 and the aligned hole 40. In such manner the increased tension on tension member 22 is maintained thereby causing the lines 26 and 27 to remain slack for easy untying from the docking cleats. To release the tension on tension member 22, the lever is again used as above described to loosen pin 43 in holes 42 and 40 to permit ready removal of pin 43 whereupon lines 26 and 27 are again tightened by tension member 22.

What is claimed is:

1. A mooring device comprising
 1. a (first rod) tubular member;
 2. a (second) rod member coaxially aligned with said (first rod) tubular member, (one of) said rod member(s) having a portion thereof lying within said (other rod) tubular member, and in slidable engagement therewith;
 3. tension producing means engaged with said (first rod) tubular member and said (second) rod member such as to force said (first rod) tubular member and said (second) rod member in opposite directions, said tension producing means lying substantially coaxial with said tubular member and said rod member;
 4. a first block and tackle system having one pulling point anchored to a first anchor bar extending from said (first rod) tubular member in substantial perpendicular relation thereto and the other pulling point anchored to a first anchor bar extending from said (second) rod member in substantial perpendicular relation thereto;
 5. a second block and tackle system having one pulling point anchored to a second anchor bar extending from said (first rod) tubular member in substantial perpendicular relation thereto and the other pulling point anchored to a second anchor bar extending from said (second) rod member in substantial perpendicular relation thereto; said two first anchor means of said first block and tackle system being disposed on substantially opposite sides of said (first) tubular member and (second) said rod member(s) from said two second anchor means of said second block and tackle system; and

6. mooring line extending from each of said block and tackle systems.
2. The device of claim 1 wherein said tension producing means is a coiled spring.
3. The device of claim 1 wherein a rectangular container is provided for surrounding and protecting said device.
4. The device of claim 1 wherein said tubular and rod members are cylindrical.
5. The device of claim 3 wherein said tubular member is a conduit fixed to an end wall of said container in perpendicular relation thereto and opening exteriorly thereof and said rod member is in partial slidable engagement within said first tubular member and extends through another end wall of said container in slidable engagement therewith.
6. The device of claim 5 wherein the outer ends of said anchor bars of said tubular member are fixed to the side walls of said container.
7. A mooring device comprising
 1. a first tubular member;
 2. a second tubular member coaxially aligned with said first tubular member, one of said tubular members having a portion thereof lying within said other tubular member, and in slidable engagement therewith;
 3. tension producing means engaged with said first tubular member and said second tubular member such as to force said first tubular member and said second tubular member in opposite directions;
 4. a first block and tackle system having one pulling point anchored to a first anchor bar extending from said first tubular member in substantial perpendicular relation thereto and the other pulling point anchored to a first anchor bar extending from said second tubular member in substantial perpendicular relation thereto;
 5. a second block and tackle system having one pulling point anchored to a second anchor bar extending from said first tubular member in substantial perpendicular relation thereto and the other pulling point anchored to a second anchor bar extending from said second tubular member in substantial perpendicular relation thereto; said two first anchor means of said first block and tackle system being disposed on substantially opposite sides of said first and second tubular members from said two second anchor means of said second block and tackle system;
 6. mooring line extending from each of said block and tackle systems,
 7. said mooring device being provided with means for adjusting tension, said means comprising a threaded adjusting bar coaxially aligned and substantially within said first and second tubular members, a threaded member for threading onto said threaded adjusting bar and fixed to one of said tubular members, means in contact with the other of said tubular members to thereby cause said rod member to be responsive to movement of said adjusting bar.
8. A mooring device comprising
 1. a rectangular container;
 2. a tubular member fixed to an end wall of said container in perpendicular relation thereto and opening exteriorly thereof;

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- 3. a rod member coaxially aligned with said tubular member in at least partial alidable engagement therewithin, said rod member extending through another end wall of said container in slidable engagement therewith;
- 4. tension producing means engaged with said tubular member and said rod member such as to force said tubular member and said rod member in opposite directions, said tension producing means lying substantially coaxial with said tubular member and said rod member;
- 5. a first block and tackle system having one pulling point anchored to a first anchor bar extending from said tubular member in substantial perpendicular relation thereto and the other pulling point anchored to a first anchor bar extending from said rod member in substantial perpendicular relation thereto;

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- 6. a second block and tackle system having one pulling point anchored to a second anchor bar extending from said tubular member in substantial perpendicular relation thereto and the other pulling point anchored to a second anchor bar extending from said rod member in substantial perpendicular relation thereto; said two first anchor means of said first block and tackle system being disposed on substantially opposite sides of said tubular member and said rod member from said two second anchor means of said second block and tackle system, said anchor bars of said rod member being slidably engaged with a guide means affixed to side walls of said container; and
- 7. mooring line extending from each of said block and tackle systems.

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