Nov. 20, 1956 E. W. GUSTAFSON 2,771,053

BOAT MOORING MEANS

Filed April 1, 1953 2 Sheets-Sheet 1

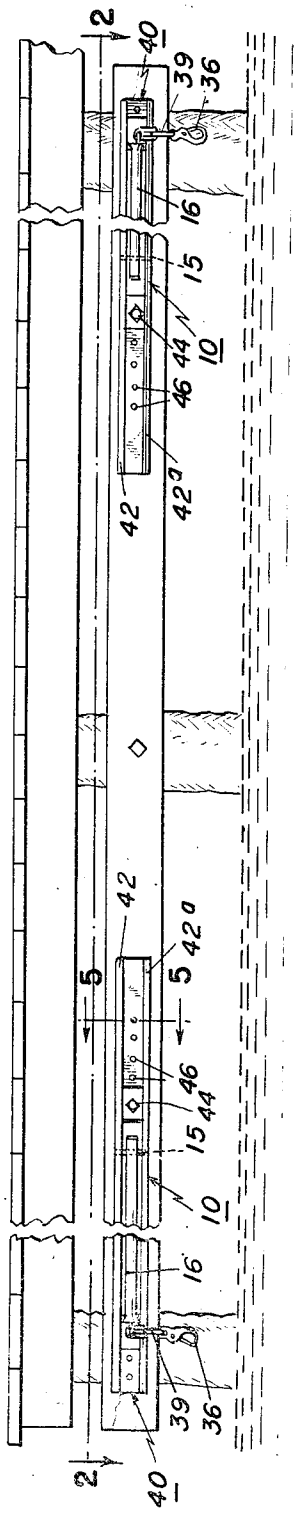


FIG. 1

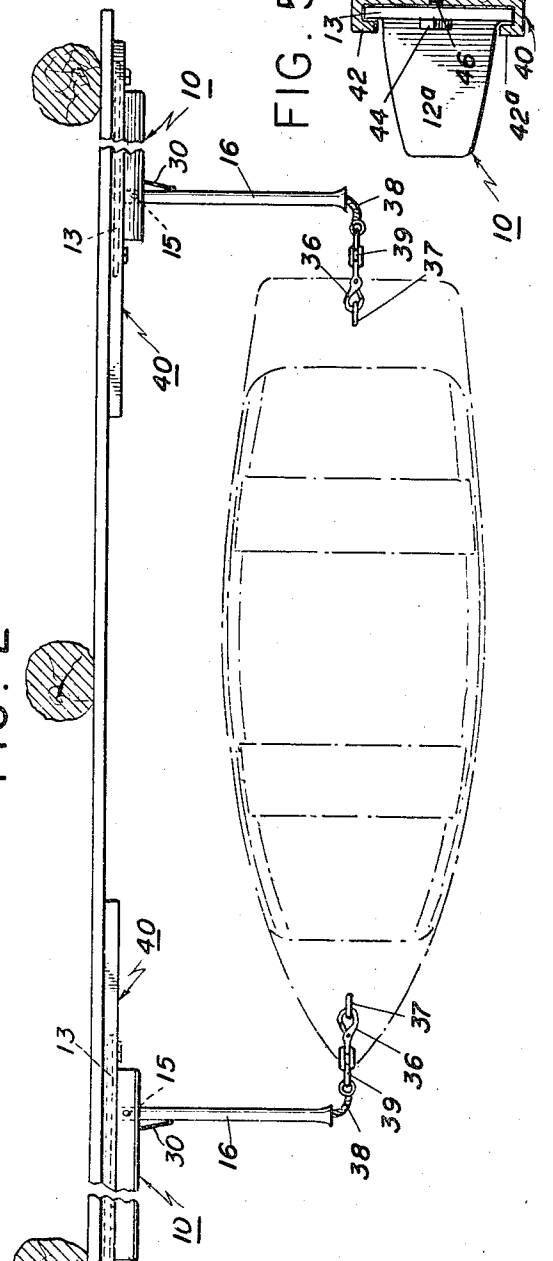


FIG. 2

FIG. 5

INVENTOR
ERIC W. GUSTAFSON,

BY J. Harold Kincaid & ATTORNEY

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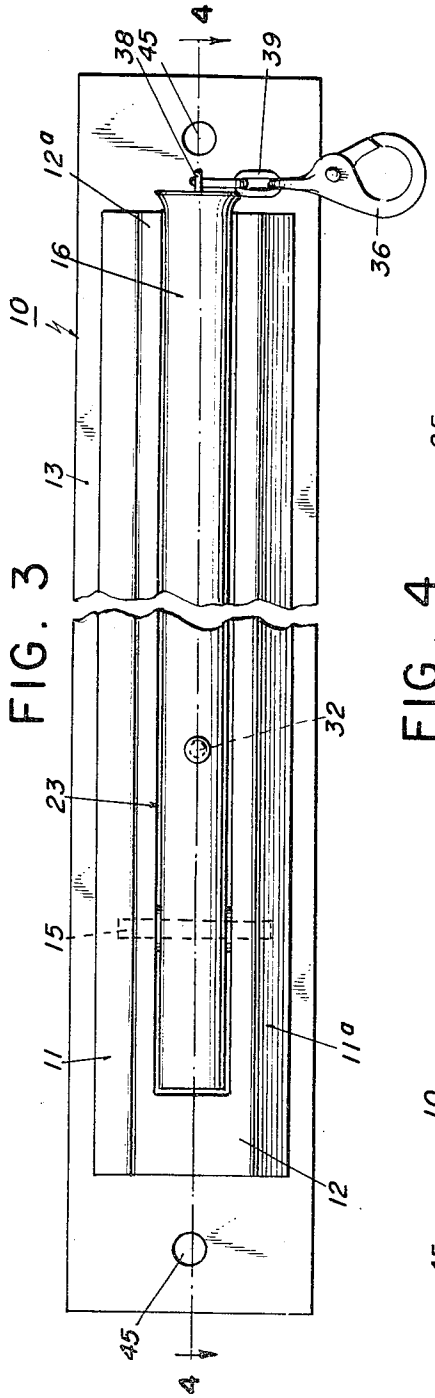


FIG. 3

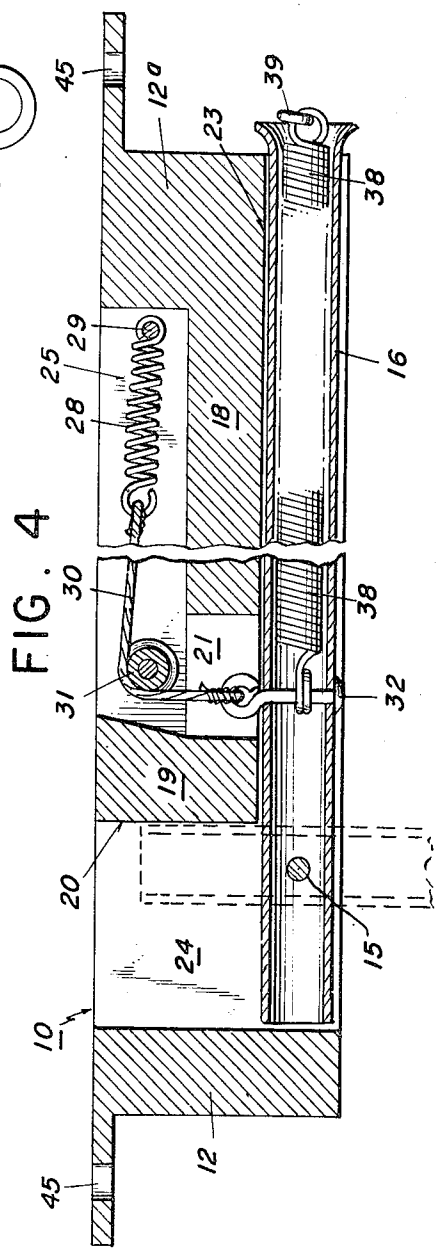


FIG. 4

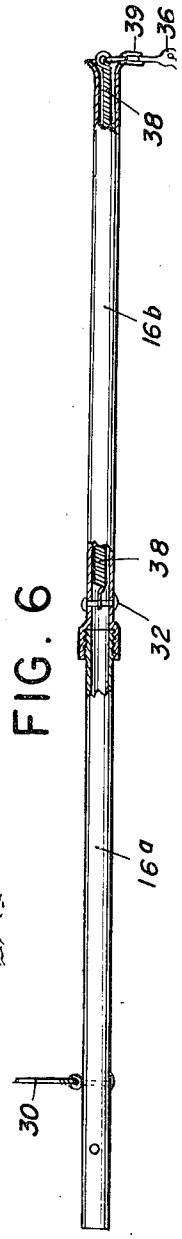


FIG. 6

INVENTOR

ERIC W. GUSTAFSON,

BY J. Harold Kissinger

ATTORNEY

United States Patent Office

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BOAT MOORING MEANS

Eric W. Gustafson, Solon Springs, Wis.

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6 Claims. (Cl. 114—230)

This invention relates to improvements in boat mooring means, and more particularly to an improved mooring means for securing small boats, for example row boats, and motor and sail boats of the pleasure class, to and in conveniently spaced position alongside a dock, pier or similar boat landing.

While boat mooring means functioning in place of the common mooring ropes, buoys and the like are well known, such have never come into extensive use, either because of their expensive and, in most instances, cumbersome construction, or because, when attached to a dock or pier, they interfered with the normal use thereof, if not creating a hazard because of protruding parts. Moreover, while the prior mooring means were capable of permitting raising and lowering movement of boats moored thereby with change of water level and wave action, as far as I am aware they were not concerned with or capable of providing for any fore and aft motion or angular motion surfacewise of the moored boat under the action of waves striking the same, for example, nor were they adapted to moor boats of widely different lengths and widths, being, instead, only adapted to moor boats of fixed size.

Stated generally, a principal object of the present invention is the provision of boat mooring means which overcomes the objections to and/or disadvantages of prior devices intended to serve similar function, through the provision of mooring means which is characterized by compact, simplified design, which incorporates a mooring arm which automatically retracts to a safe, out-of-the-way position when not in use, and which provides for limited motion of the moored boat under changing conditions of water level and of wave action, while at the same time resisting such motion with spring force whereby the motion of the moored boat is effectively controlled.

A more particular object of the invention is the provision of boat mooring means capable of securing a boat in longitudinal tension, while at the same time permitting it to move laterally and vertically in controlled manner.

Another object of the invention is the provision of boat mooring means of a design enabling it to be adapted to the mooring of boats of widely different length and beam dimensions.

Further detailed objects of the invention are the provision of boat mooring means which may be sold and installed as a package, and which, when so installed, is ready for immediate operation; the provision of boat mooring means characterized as in the foregoing, which may be readily operated both in mooring a boat to and freeing it from the dock; and the provision of boat mooring means which is inexpensive yet safe and thoroughly dependable in use.

Other objects and advantages of boat mooring means according to the present invention will appear from the following detailed description thereof, taken with the accompanying drawings illustrating a preferred physical embodiment thereof, in which:

Fig. 1 is a side elevation of a dock, pier or similar boat landing equipped with a pair of mooring devices together constituting the mooring means of the invention;

Fig. 2 is a horizontal section taken on line 2—2 of Fig. 1, which illustrates in plan the action of the pair of mooring devices according to the invention in securing a boat spaced from the dock and in longitudinal tension;

Fig. 3 is an enlarged broken-away side elevation of one of the boat mooring devices illustrated in Figs. 1 and 2, such being the right-side or stern-end mooring device shown in said views;

Fig. 4 is a longitudinal section taken along line 4—4 of Fig. 3;

Fig. 5 is a section taken along line 5—5 of Fig. 1, illustrating one means of attaching the mooring devices to a dock or pier so that it may accommodate boats of different lengths; and

Fig. 6 is a section through a modified form of mooring arm enabling the mooring means to be used in mooring boats of widely different widths.

Boat mooring means according to the present invention comprise a pair of preferably identical but oppositely disposed mooring devices, one for each end of the boat to be moored, which are designed to be affixed to the side of a dock, pier or similar boat landing (hereinafter referred to as a dock) in longitudinally spaced relation, the spacing of said devices being related to the length of the boat to be moored, as will be hereinafter explained. Each of said devices includes an elongated mooring arm having a normally retracted position in which it is disposed in safe, out-of-the-way position along and close to the side of the dock but which is pivoted adjacent an end thereof so that it may be swung outwardly against the force of spring means tending to retract it, to an operative position in which it extends at right angles to the dock or pier. Each of said mooring arms has length greater than half the width (beam) of the boat to be moored and is provided at its free or outer end with connector means adapted to be coupled to complemental connector means carried at the ends of the boat and preferably on the longitudinal center line thereof. By disposing said devices so that the mooring arms are swingable towards one another in moving to their operative position, and by spacing said devices an amount such that the axes on which the mooring arms turn are spaced slightly in excess of the length of the particular boat to be moored, it will be seen that when the mooring arm connector means are coupled to the complemental connector means provided at the bow and stern ends of the boat, the mooring arms are held in their operative or extended position, wherein they function not only to space the boat from the dock or pier but also to hold the boat in longitudinal tension.

According to a further feature of the invention, the connector means carried by the free ends of the mooring arms, rather than being rigidly affixed thereto, are connected to said free ends by a yieldable or elastic connection enabling the connector means to extend with respect to the arms when pull is applied thereto, and to automatically retract when such pull is relieved. The provision of such a yieldable and extensible connection between the connector means and the free ends of the arms is of particular advantage in that, by spacing the mooring devices from one another a distance in excess of the length of the boat being moored by an amount such that the connector means are only slightly extended in coupling them to the boat, said connector means may be further extended a substantial amount, but only against the elastic force tending to retract them. Since such further extension usually results from lowering motion of the boat in accordance with change of water level and wave action, and/or because of the tendency

of the boat to move laterally or angularly laterally under wave action effective thereon, it will be seen that while the moored boat may partake of the various motions to which a moored boat is subjected, such motion is at all times effectively controlled by the opposing elastic force effective on said connector means and which tends to resist such motion, and to a lesser extent by the spring means tending to return the mooring arms to their retracted position.

Referring to Figs. 3 and 4 illustrating the stern-end mooring device, such comprises a mounting member generally designated **10**, which is preferably cast from aluminum, in which all of the moving parts to be described are effectively mounted and housed. Said mounting member illustratively is of elongated box-like construction providing forwardly extending upper and lower walls **11**, **11***a* and end walls **12**, **12***a* carried on a base **13** in the form of a projecting flange which may extend completely about the mounting member proper.

A pivot pin **15** is shown to extend vertically between the upper and lower walls **11**, **11***a*, said pin being disposed adjacent the forward edges of said walls and spaced a short distance from the end wall **12**, i. e. the end wall nearest the end of the device to which the boat is coupled. Pivotally connected to the mounting member **10** via the pivot pin **15** is an elongated mooring arm **16**, it being observed that said arm is connected a short distance from one end thereof, which distance is slightly less than the aforesaid space between the pivot pin **15** and the end wall **12** of the mounting member, and also somewhat less than the depth of the mounting member. The overall length of the mooring arm **16** is preferably such that its long end projects beyond the other end wall **12***a* of the mounting member, and the front edge of said end wall may be suitably recessed to permit the arm when in its retracted position to seat therein.

As seen in Fig. 4, the interior space within the mounting member **10** is partitioned intermediate its front and rear edges by a wall **18** extending vertically between the upper and lower walls **11**, **11***a* thereof and longitudinally from the end wall **12***a* towards the end wall **12**. However, rather than extending to the end wall **12**, said partition wall terminates short of the pivot pin **15**, and connects with a front-to-rear partition wall **19** having an outer vertical "stop" face **20** disposed parallel to the inner face of the mounting-member end wall **12** and being spaced therefrom a predetermined distance such that the short end of the mooring arm abuts against said stop face (see dotted line position of the mooring arm) when it is swung to its operative position at right angles to the mounting member. As also seen in Fig. 4, the vertical partition wall **18** is provided with a through opening **21** adjacent the front-to-rear partition wall **19**.

The aforesaid partitioning of the mounting member **10** results in the formation of an outwardly facing channel **23** in which the long end of the mooring arm **16** seats and is partially enclosed so as to be contained within the outer edge line of the mounting member when in its retracted position, and with a front-to-rear recess **24** into which the short end of said arm may freely move when the arm is swung to its extended position, the vertical "stop" face **20** of the partition **19** which defines one side wall of said recess also functioning as a stop for the short end of the mooring arm, thereby preventing same from being swung outwardly in excess of an angle of approximately 90°. In addition, the partition **18** results in the formation of an elongated chamber **25** opening through the rear face of the mounting member **10**, and which communicates with the outwardly facing channel **23** through the aforesaid opening **21**.

As also seen in Fig. 4, the mooring arm **16** is normally maintained in its retracted or nested position by spring means illustratively comprising a coiled tension spring **28** contained within the aforesaid rearwardly opening chamber **25** provided in the mounting member. One end of said spring may be affixed to the mounting member as by means of a pin **29** shown to be vertically disposed, and the other end is connected to the mooring arm **16** via a flexible cable **30**. Illustratively, said cable is bent around a roller **31** also contained within the chamber **25**, so that it may extend forwardly through the opening **21** in the partition wall **18**, its so extending end being connected to said mooring arm by means of a cross pin **32** extending therethrough.

With the construction so far described, it will be seen that the spring means **28**—**32**, which is substantially completely housed within the mounting member **10**, normally holds the mooring arm **16** in safe, out-of-the-way position in which it seats in the outwardly facing channel **23**. It also imposes a spring force resisting swinging movement of the mooring arm **16** to its extended or operative position. It follows that, when the arm is held in its extended position, as by the drag of a boat secured to the outer end thereof, it places said boat under longitudinal tension.

To enable a boat to be moored to be connected to the outer or free end of the mooring arm **16**, the latter carries a connector means, illustratively a hook **36** but which may be a hasp or the like, which is adapted to be engaged with complemental connector means such as an eye or ring **37** (Fig. 2) carried at the ends of said boat preferably at its longitudinal center line. According to the invention, the connector means **36** is non-rigidly, i. e. yieldably, connected to the mooring arm as by means of an extensible coil spring **38** which is preferably housed within the arm which for this purpose may be formed tubular. The coil spring may be connected at its inner end to the mooring arm by means of the aforesaid cross pin **32**, and it is preferably connected at its outer end to the hook **36** via a short length of chain **39**, or equivalent. Thus, the connector means (hook) **36** may be extended a substantial distance beyond the free end of the mooring arm **16**, due to the stretchability of the spring **38** by which said hook is connected to the mooring arm as aforesaid.

Two such mooring devices as described above are secured in horizontal alignment to the side of a dock, in relative position that the mooring arms **16** thereof swing towards one another in their movement to extended position and, conversely, swing away from one another in their movement to retracted position. Illustratively, the pair of mooring devices are secured to a horizontal plank disposed on edge and which is bolted to the piles which support the dock. However, other forms of securement may be employed, including that of bolting the mooring devices to the existing dock siding. In positioning the mooring devices, they are preferably spaced horizontally from one another a distance such that the spacing between the pivot pins **15** substantially exceeds the overall length of the boat to be moored, or at least the distance between the mooring eyes or rings **37** provided stern and bow thereon. As to vertical positioning, the mooring devices are spaced from water level the approximate distance that the boat to be moored rides out of water.

In mooring the boat, it is necessary only to bring same alongside the dock, swing the mooring arms **16** to their extended position and finally engage the connector means **36** with the complemental mooring eyes **37** with which the boat is provided, as aforesaid. Due to the spacing of the mooring devices, such results in the mooring arm **16** being maintained in fully extended position, and also in the spring **38** being substantially but not fully extended. Accordingly, the boat is held in tension and it additionally may raise and lower with change of water level and may also partake of limited surface motion such as that imparted by wave action, but only under the resisting force of springs **38** and **28** of the mooring devices. That is to say, mooring devices of the invention permit limited motion of the moored boat but always in controlled manner.

To adapt boat mooring means as described both to boats of different size, at least one of the mooring de-

vices, instead of being secured directly to the side of the dock, may be carried in a track or rail **40** which is secured directly to the dock siding or a side plank thereof. As seen in Fig. 5, said track **40** is provided with retaining flanges **42**, **42***a* which engage over the upper and lower base flanges **13** formed on the mounting member as aforesaid. Such arrangement permits the spacing between the mooring devices to be varied at will by the simple procedure of shifting the track-mounted mooring device or devices with respect to one another. The shiftable mooring device may be secured in adjusted position by means of bolts **44** extending through holes **45** provided in the end base flanges **13** of the mounting member and which thread into holes **46** provided in the track **40**, as best seen in Fig. 1. In the event it is desirable to vary the spacing of the moored boat from the dock, or to moor boats of greater width than the conventional row boat or motor and sail boats of the pleasure class, the length of the mooring arms may be extended as illustrated in Fig. 6. Thus, the mooring arms, rather than being made of a single length of tubing, may be made in two (or more) sections **16***a*, **16***b* which are adapted to detachably couple to one another, thereby to extend or shorten the arm length in accordance with the beam of the boat to be moored. When of sectional construction, it is necessary that only the outer or free end section of said arms carry the extensible spring **38** for the connector means **36**.

Without further analysis, it will be appreciated that boat mooring means comprising identical but oppositely arranged mooring devices as described and illustrated achieves the objectives therefor as set forth herein. For example, each mooring device may be purchased and installed as a complete operating unit or package. The operation of such boat mooring devices, following their proper installation, is exceedingly simple, requiring only extension of the mooring arms and coupling of the hooks or equivalent connector means **36** with the eyes **37** or equivalent carried by the boat to be moored. Following such engagement, the moored boat is held in longitudinal tension by the conjoint action of the springs **28** and **38**. The characteristics of said springs are of course such that the moored boat may move vertically with change of water level, and may also move laterally or angularly surfacewise with wave action due to the extensibility of the springs. Upon a mooring arm being disengaged from an end of the boat to free the latter, said arm automatically retracts to a safe, out-of-the-way position in which it creates no hazards due to projecting parts to occupants of other boats or of persons using the dock. It will also be apparent that boat mooring means according to the invention is also sufficiently flexible that it may be adapted to the mooring of boats of varying length and width.

As many changes could be made in carrying out the above constructions without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. Boat mooring apparatus comprising, in combination, a pair of oppositely disposed mooring devices, one for each end of a boat to be moored, adapted to be affixed to the side of a dock or the like in horizontally spaced relation, each said mooring device including a housing-link mounting member, an elongated, horizontally disposed mooring arm normally housed in said member, and vertical pivot means operatively connecting said arm near one end thereof to said mounting member and for swinging movement in a fixed horizontal plane outwardly from and thence inwardly toward the side of the dock, said pivot means connecting the adjacent ends of the mooring arms to their respective mounting members whereby said arms are swingable outwardly towards one another and being horizontally spaced a distance at least as great as the length of said boat to be moored, means for limiting the outward swinging movement of the mooring arms to approximately 90° whereby said arms may be swung outwardly from the dock only to a position in which they extend substantially normal thereto, and extensible connector means carried by and extending from the free ends of the mooring arms adapted upon the arms being swung outwardly as aforesaid to be separably connected to the ends of said boat to be moved, thereby to secure same to said arms and so that it extends longitudinally between said arms.

2. Boat mooring means substantially as set forth in claim 1, wherein at least one of said mooring devices incorporates spring means interconnecting its mooring arm and its associated mounting member and normally biasing said arm to its housed position in which it lies close against the side of the dock.

3. Boat mooring means substantially as set forth in claim 2, wherein said spring means is substantially completely enclosed within said mounting member.

4. Boat mooring means substantially as set forth in claim 1, wherein the connector means of at least one of said mooring devices is resiliently extensible.

5. Boat mooring means substantially as set forth in claim 1, wherein said mooring devices each incorporates spring means operative between its mooring arm and mounting member for biasing said arm to its normally housed position in which it lies close against the side of the dock, and wherein said connector means are resiliently extensible.

6. Boat mooring means substantially as set forth in claim 1, wherein at least one of said mooring devices is mounted for sliding movement in a horizontally disposed track affixed to the dock side and means are provided for securing said one mooring device in a desired position of adjustment along the track thereby to vary the spacing between said pivot means.

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