Dec. 30, 1969 S. W. AKS 3,486,342

PILE MOORING BUMPER

Filed April 22, 1968

Fig. 1

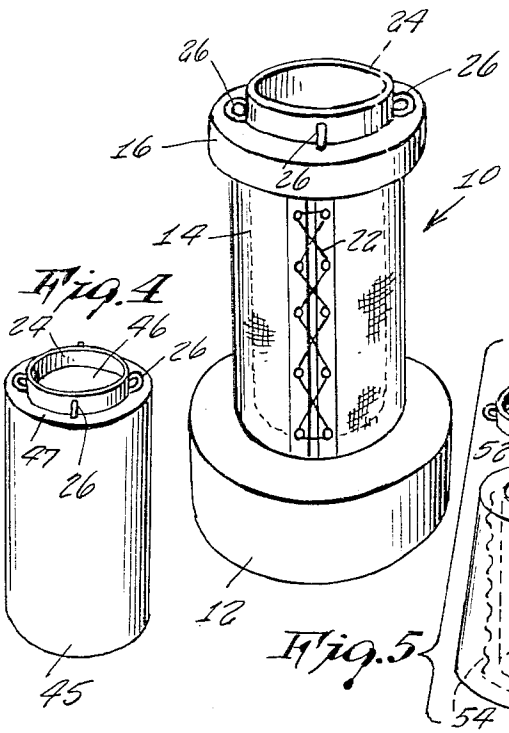


Fig. 2

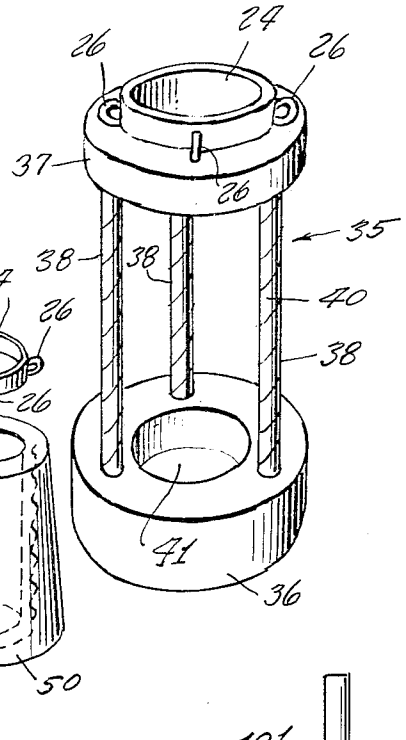


Fig. 4

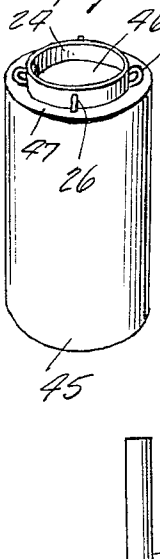


Fig. 5

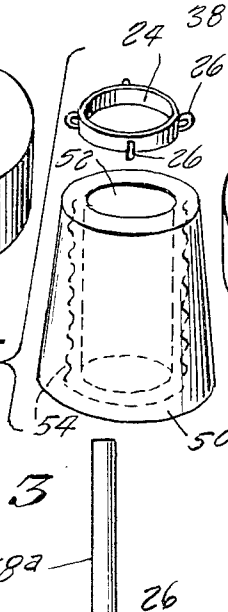
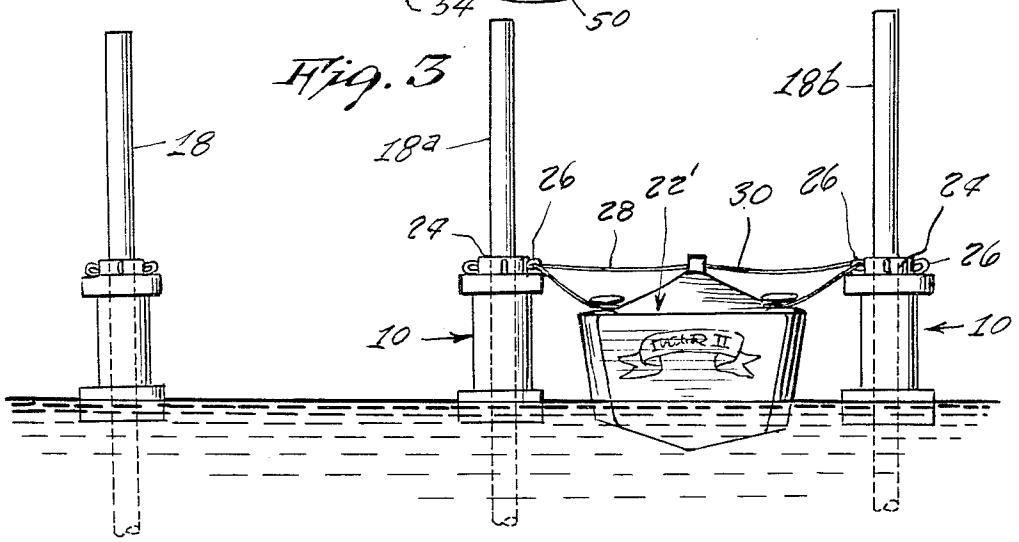


Fig. 3



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PILE MOORING BUMPER

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ABSTRACT OF THE DISCLOSURE

A mooring bumper device having a floatable base floating on the water surface and loosely surrounding a mooring pile for up and down movement thereon under the action of tide and wind. The bumper device has an axial opening through which the mooring pile extends and the upper terminal end of the bumper device is flat and horizontal. A metal hitch ring provided with a plurality of eyes to one or more of which a boat mooring line is attached is freely seated on the flat upper end of the bumper device in surrounding relation to the mooring pile providing relative rotation between the bumper device and the hitch ring. The eyes on the hitch ring lie inwardly of the peripheral edge of the flat upper end of the bumper device.

This invention relates to a mooring bumper device and has for its primary object the provision of a bumper element mounted on a boat mooring pile for up and down movement thereon and floating on the surface of the water.

Another object of this invention is to provide a hitch ring equipped with a plurality of eyes for free seating on the upper end of the bumper element and between which there is relative rotation, one or more of the eyes securing a mooring line of a boat.

Yet another object of this invention is to provide a mooring bumper defining as a single unit a floatable base, an upstanding column and a collar at the top of the column on which is freely seated the hitch ring, and a padded sheath surrounding the column.

A further object of this invention is to form the mooring bumper as a cylindrical member.

A still further object of this invention is to form the mooring bumper as a tapered member with its larger diameter end lowermost, and including reinforcing means embedded therein.

Another object of this invention is to provide a mooring bumper having a base, a collar and a plurality of spaced rods interconnecting the base and collar.

Further objects of the invention will appear as the description proceeds.

To the accomplishment of the above and related objects, my invention may be embodied in the form illustrated in the accompanying drawings, attention being called to the fact, however, that the drawings are illustrative only, and that change may be made in the specific construction illustrated and described within the scope of the appended claims.

FIGURE 1 is a perspective view of one form of mooring bumper device with coacting hitch ring.

FIGURE 2 is a perspective view of a modified form of mooring bumper device with coacting hitch ring.

FIGURE 3 is an elevational view of three spaced mooring piles with the mooring bumper devices mounted thereon and showing mooring lines securing a boat docked between two mooring piles with the mooring lines attached to opposed hitch rings.

FIGURE 4 is a perspective view of another type of mooring bumper device.

FIGURE 5 is an exploded view showing a still further modified form of mooring bumper device with coacting hitch ring.

Referring in detail to the drawings, FIG. 1 illustrates one form of pile mooring bumper **10** having a cylindrical base **12**, a supporting column **14** and a bumper collar **16** integrally or otherwise secured together and with at least the base **12** formed of a floatable material such as wood, foam plastic or other suitable material. The pile mooring bumper **10** is provided with a substantially cylindrical axial opening (not shown) from end to end of a diameter such as to loosely fit over a pile **18** for up and down movement thereon with the base **12** floating on the surface of the water and rising and falling therewith due to tides, etc., as seen in FIG. 3. The supporting column **14** is of a less outside diameter than base **12** and bumper collar **16**, and is surrounded by a padded canvas bumper sheath **20**, the opposed ends of which are secured by a cord **22** as seen in FIG. 1. The canvas sheath **20** may be replaced by a rubber backed fabric or other type of high impact absorbing material.

With the mooring bumpers **10** positioned on piles **18***a*–**18***b*, see FIG. 3, which piles are spaced apart to provide a slip between which a boat **22'** is to be moored, there is provided on top of each bumper collar **16**, a metal hitch ring **24** having at least four diametrically opposed eyes **26** at 90° intervals. The hitch rings **24** loosely surround the piles associated therewith so as to freely turn on the top surface of the bumper collar **16**. It is to be noted that the eyes **26** on the hitch ring **24** lie inwardly of the outside diameter of the bumper collar **16** as clearly seen in FIG. 1.

The boat **22'** is moored in its slip by the ropes **28**, **30** each respectively secured on passing through an eye **26** of an adjacent hitch ring. Since the mooring bumpers **10** float on the water, the effects of tide on the adjustment of the mooring lines **28**, **30** is eliminated. Boat **22'**, tide and mooring bumpers **10** rise and fall together. The hitch rings **24** are free to rotate for the reason that should a boat in docking between piles **18** and **18***a* first strike mooring bumper **10** on pile **18***a*, the mooring bumper would be free to rotate permitting the entering boat to roll damage free into its berth. At the same time the relative rotation between the mooring bumper **10** (on pile **18***a*) and its supporting hitch ring **24** would not disturb the connection of the mooring line **28** thereto. Once docked the mooring bumpers **10** will prevent damage to the hull and finish of the boat due to wave or wind-action causing the hull to repeatedly come in contact with said mooring bumpers on the mooring piles.

FIG. 2 illustrates a modified form of mooring bumper **35** for applications on a mooring pile where carrying the hitch ring **24** is mainly required and protecting the hull from contacting the mooring pile is not important. In this constructional form the floating base **36** and bumper collar **37** are interconnected by at least three circumferentially spaced rods **38** that are preferably provided with a suitable plastic covering **40**. Both the collar **37** and base **36** are provided with axial openings such as **41** in base **36** to loosely receive therein a mooring pile. The metal hitch ring **24** with eyes freely sits on the top of the collar **37** so as to provide for relative rotation therebetween. As with the construction in FIG. 1, the eyes **26** of hitch ring **24** lie inwardly of the outside diameter of collar **37**.

FIG. 4 illustrates a further modified form where the mooring bumper is a thick walled cylinder **45** formed of rubber, plastic or other suitable material that floats on water provided with an axial opening **46** through which the moving pile is to extend the bumper **45** loosely surrounding the pile so as to freely move up or down thereon. Freely seated on the top surface **47** of the bumper **45** is a metal hitch ring **24** provided with eyes **26**, the

ends of which lie inwardly of the outside cylindrical surface of the bumper **45**.

FIG. 5 is yet another modification of mooring bumper similar to that of FIG. 4 wherein the mooring bumper **50** is shown to be upwardly tapered, the wider diameter lower end providing a larger surface area to provide more flotation at the bottom where it is needed. The bumper **50** is provided with an axial opening **52** of a diameter such that the bumper **50** will loosely surround a mooring pile to insure unrestricted up and down movement. The mooring bumper **50** is formed of a suitable floatable material such as rubber, foam plastic, etc., and may be reinforced by an internal wire mesh reinforcement **54**.

In each of the forms of mooring bumpers described above the inside diameter of the metal hitch ring **24** (which may be of steel, bronze or other type of alloy all preferably non-corrosive) corresponds to the diameter of the axial opening in the bumper so that there is never any likelihood of the hitch ring slipping or falling into the axial opening.

It is also to be understood that the mooring bumpers may be made of any desired height and size to accommodate different sizes of mooring piles but also different shapes and sizes of boats.

While certain novel features of my invention have been shown and described and are pointed out in the annexed claims, it will be understood that various omissions, substitutions and changes in the forms and details of the device illustrated and in its operation can be made by those skilled in the art without departing from the spirit of the invention.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A mooring bumper device for use with spaced mooring piles between which boats are to be docked and moored there being one such mooring bumper device for each mooring pile comprising:

(a) an upstanding bumper element,

(b) a floatable base portion on said bumper element,

(c) the upper terminal end of said bumper element being circuilar with its surface flat and horizontal,

(d) there being an axial opening in the bumper element of a diameter to loosely receive therethrough a mooring pile,

(e) a cylindrical hitch ring of substantially greater height than thickness freely seated on its lower edge on said top flat surface of said bumper element when in surrounding engagement with said mooring pile,

(f) the outside diameter of said hitch ring exceeding the diameter of said axial opening and being less than the outside diameter of the upper circular terminal end of said bumper element whereby to preclude the hitch ring from slipping down into said axial opening,

(g) a circumferential row of spaced eyes on said hitch ring each lying inwardly of the outer peripheral edge of the circular top flat surface of the bumper element for the attachment to at least one of said eyes a mooring line of a boat docked adjacent the mooring pile mounting said bumper element and superposed hitch ring,

(h) said hitch ring and associated circular top flat surface of said bumper element being freely rotatable relative to each other, and

(i) both said hitch ring and associated bumper element being freely movable up and down on the associated mooring pile under tide and wind action with the base portion of the bumper element floating on the surface of the water.

2. The mooring bumper device of claim **1**, wherein said bumper element comprises:

(a) a lower cylindrical floatable base,

(b) a column upstanding from said cylindrical base and of less diameter than said cylindrical base,

(c) a cylindrical collar constituting the upper end of said bumper element located at the upper end of said column and having an outside diameter greater than the diameter of said column, and

(d) said floatable base, column and collar consitituting a unitary structure with the upper terminal face of said collar providing said top flat and horizontal surface of said bumper element.

3. The mooring bumper device of claim **2**, including:

(a) a yieldable bumper sheath surrounding said column.

4. The mooring bumper device of claim **1**, wherein:

(a) said bumper element is a cylindrical member.

5. The mooring bumper device of claim **1**, wherein:

(a) said bumper element is tapered with its larger diameter end at its bottom, and

(b) reinforcing means embedded in said bumper element between the axial opening therein and the outer surface thereof.

6. The mooring bumper device of claim **1**, wherein said bumper element comprises:

(a) a lower floatable annular base,

(b) an upper collar, and

(c) a plurality of circumferentially spaced vertical rod elements connecting said base and collar.

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U.S. Cl. X.R.

61—48; 114—220, 230