March 18, 1969 F. M. LE COMPTE 3,433,200

BOAT FENDER

Filed Sept. 22, 1967 Sheet 1 of 6

Fig. 1.

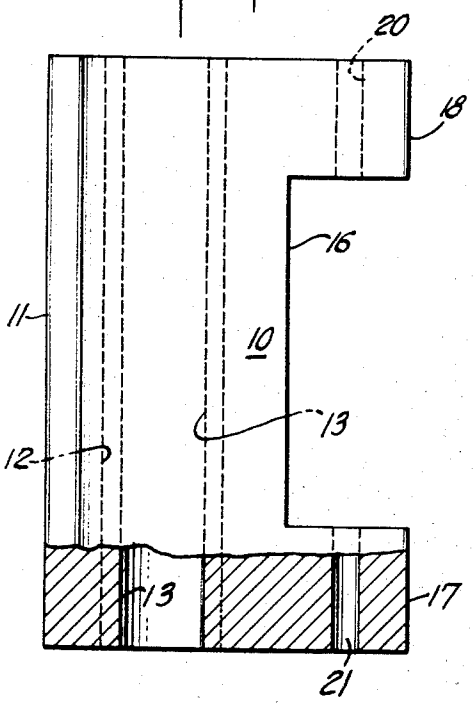


Fig. 3.

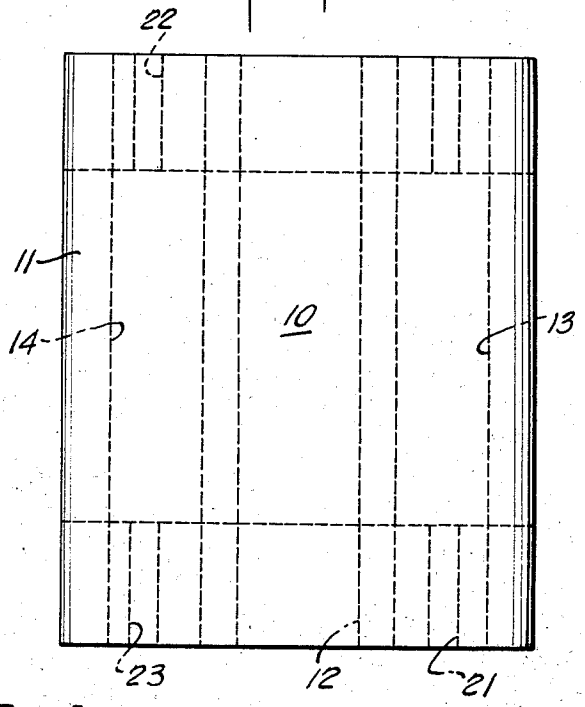
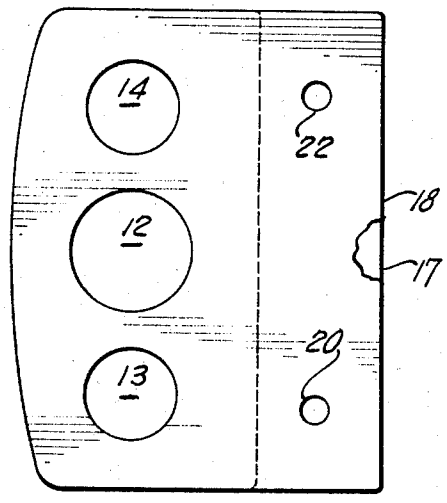


Fig. 2.



INVENTOR.
F. M. LE COMPTE

BY
Morrison, Kennedy & Campbell
ATTORNEYS

March 18, 1969 F. M. LE COMPTE 3,433,200

BOAT FENDER

Filed Sept. 22, 1967 Sheet 2 of 6

Fig. 4.

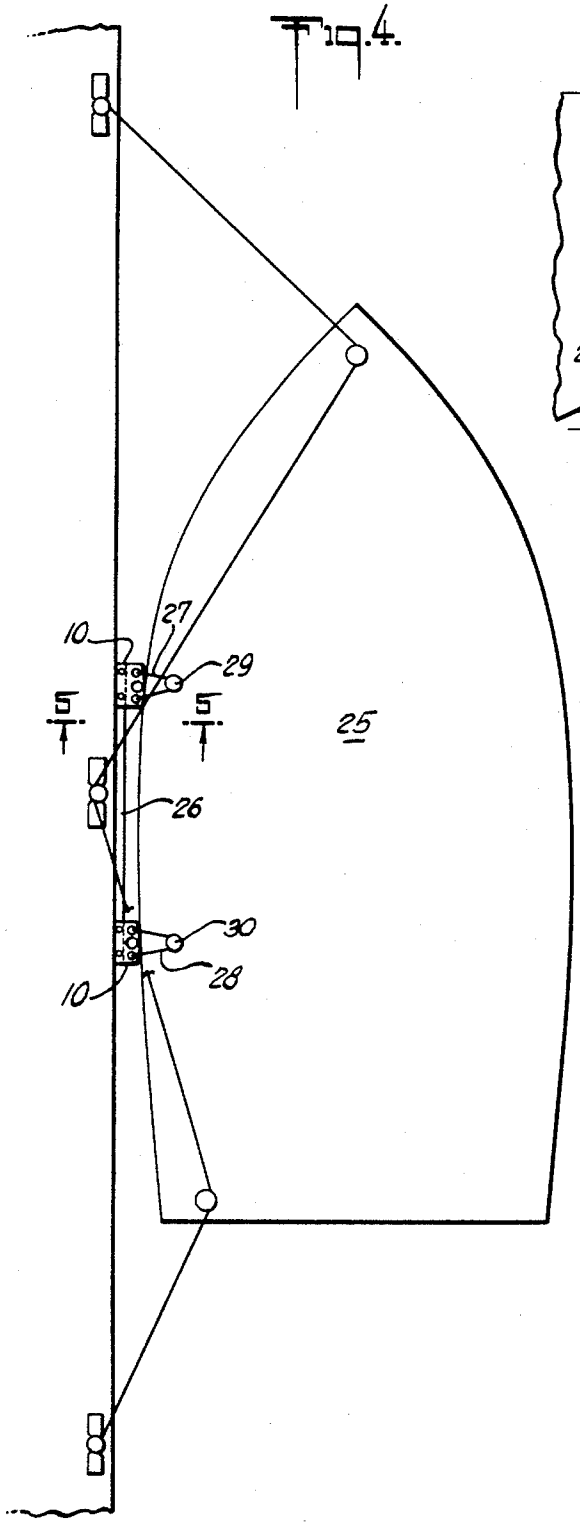


Fig. 5.

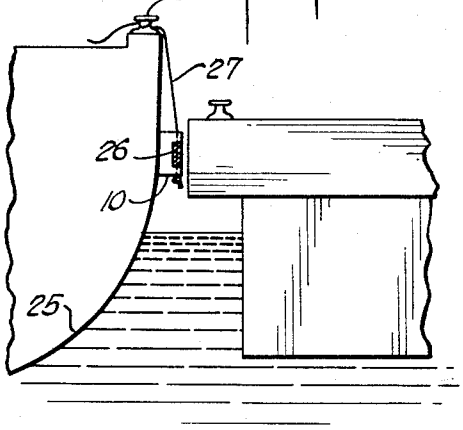


Fig. 6.

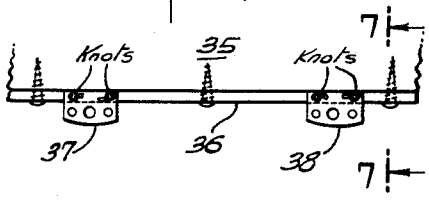
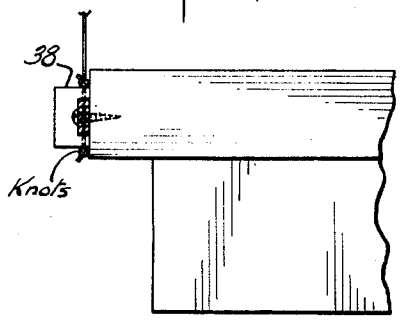


Fig. 7.



INVENTOR:
F. M. LECOMPTE

BY
Morrison, Kennedy & Campbell
ATTORNEYS.

March 18, 1969 F. M. LE COMPTE 3,433,200

BOAT FENDER

Filed Sept. 22, 1967 Sheet 3 of 6

Fig. 8.

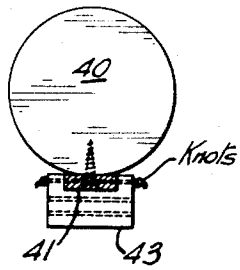


Fig. 9.

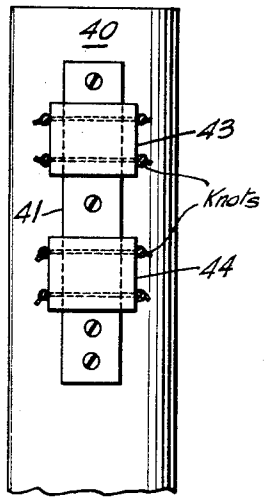


Fig. 10.

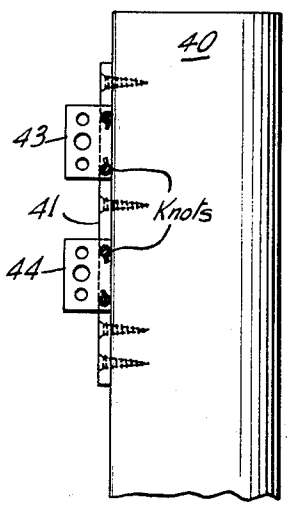


Fig. 11.

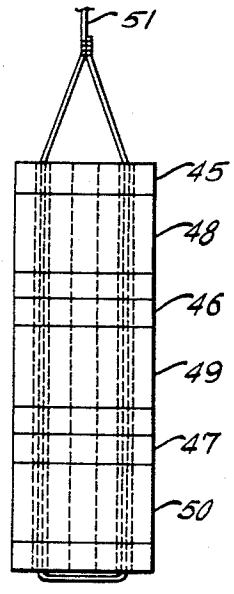
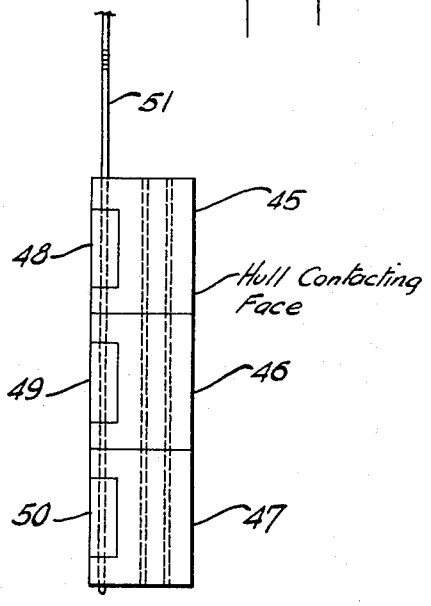


Fig. 12.



INVENTOR:
F. M LECOMPTE

BY

Mossison, Kennedy & Campbell
ATTORNEYS.

March 18, 1969 F. M. LE COMPTE 3,433,200

BOAT FENDER

Filed Sept. 22, 1967 Sheet 4 of 6

Fig. 13.

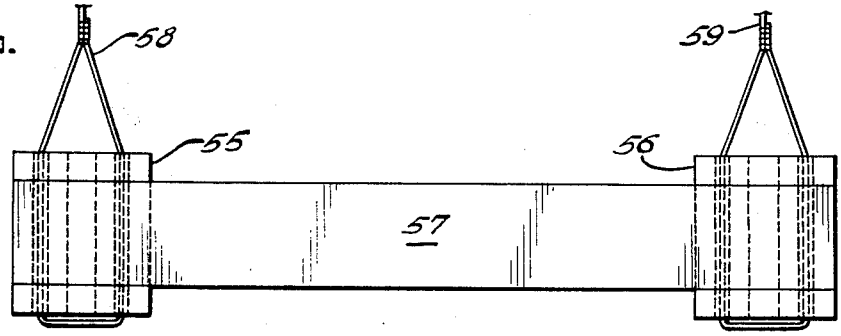


Fig. 14.

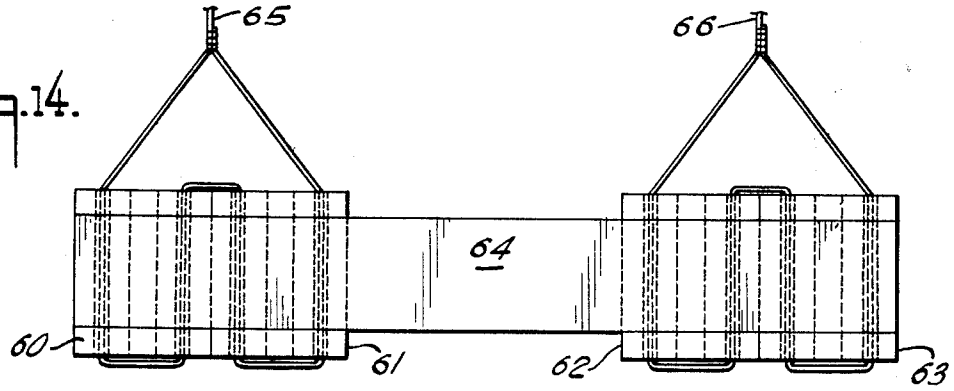
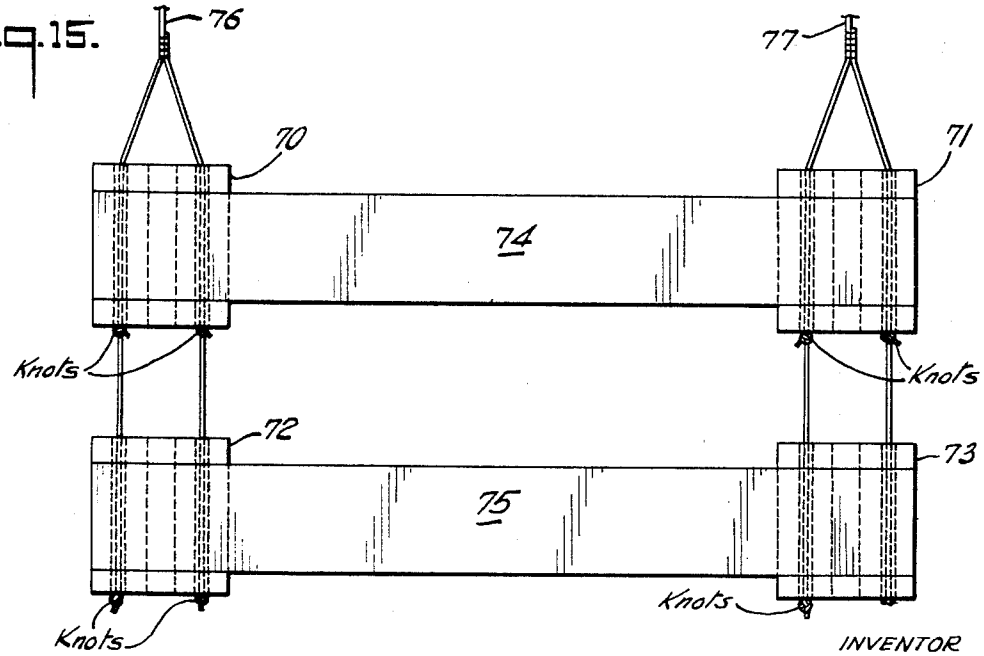


Fig. 15.



INVENTOR
F. M. LECOMPTE

BY

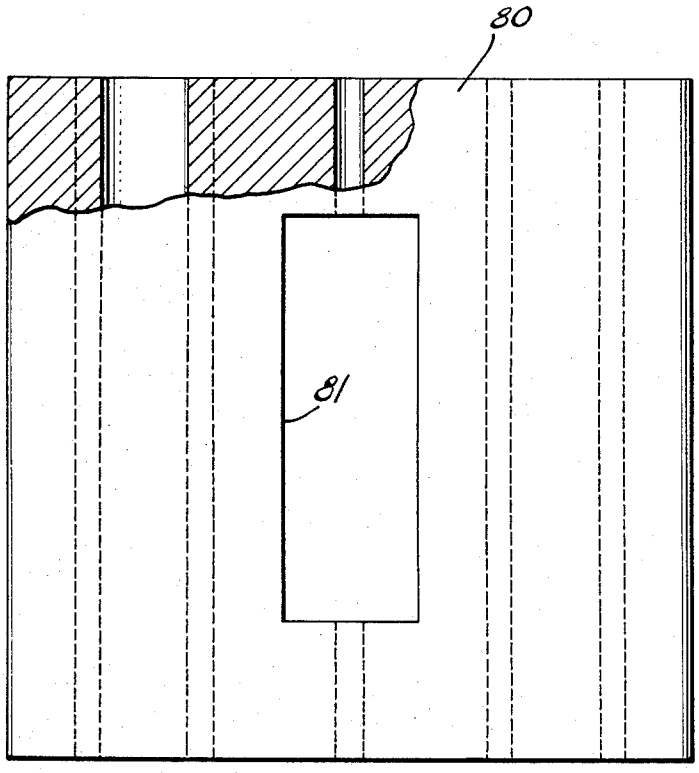
Morrison, Kennedy & Campbell
ATTORNEYS.

March 18, 1969 F. M. LE COMPTE 3,433,200

BOAT FENDER

Filed Sept. 22, 1967 Sheet 5 of 6

Fig. 16.



INVENTOR:
F. M. LE COMPTE

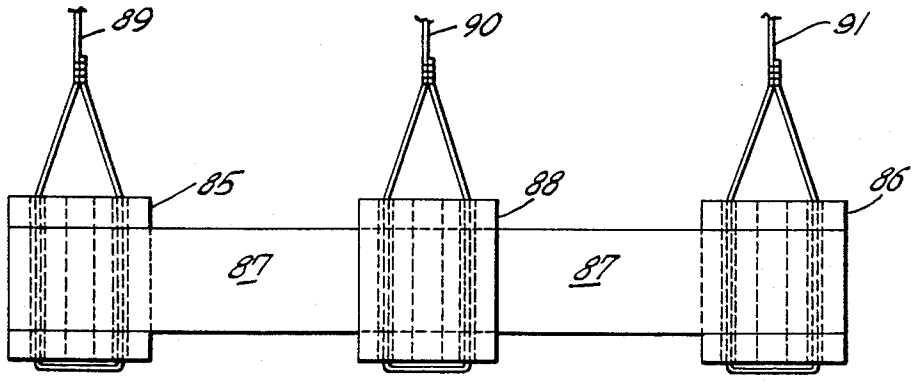
BY
Morrison, Kennedy & Campbell.
ATTORNEYS.

March 18, 1969 F. M. LE COMPTE 3,433,200

BOAT FENDER

Filed Sept. 22, 1967 Sheet 6 of 6

Fig. 17.



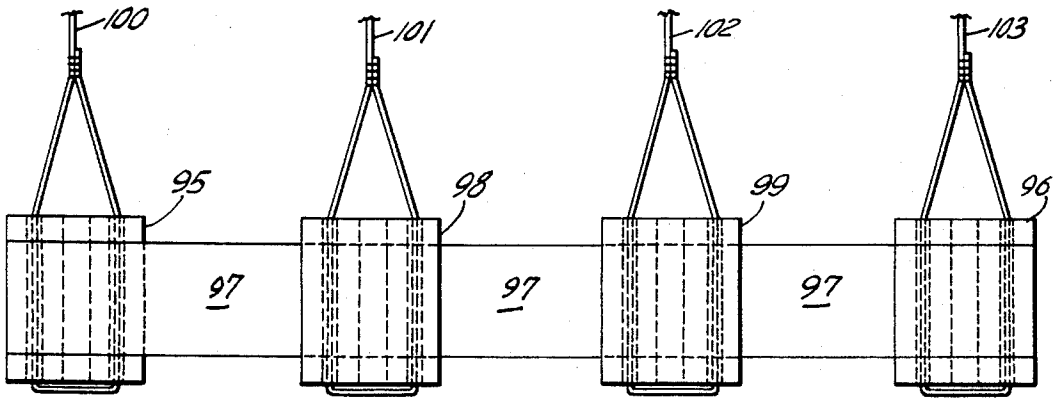


Fig. 18.

INVENTOR:
F. M. LE COMPTE
BY
Morrison, Kennedy & Campbell
ATTORNEYS.

United States Patent Office 3,433,200
Patented Mar. 18, 1969

3,433,200

BOAT FENDER

Frank M. Le Compte, Watchung, N.J., assignor to Tingley Rubber Corporation, a corporation of New Jersey

Filed Sept. 22, 1967, Ser. No. 669,939
U.S. Cl. 114—219 13 Claims
Int. Cl. B63b 21/04

ABSTRACT OF THE DISCLOSURE

Comprises a wooden spar and two transversely notched molded soft rubber bumpers held together in assembled relation by a hemp rope which passes through aligned openings formed in the bumpers and the opposite ends of the spar.

The boat fender of this invention is of the type which eliminates the necessity for the employment of metal fastening or anchoring means. The fenders may be used singly or in pairs as desired depending on the type of boat and the type of dock to which said boat is to be anchored or tied. The fenders may comprise a spar of suitable area and length affixed to a pair of resilient bumpers and then hung over the rail of the boat to be level with the dock or, in the case of piling, to be centered so that the pile contacts the center of the spar and thus forms the rub rail to protect the hull.

The instant invention was conceived to provide a fender of such shape and size as to allow its use in a multiplicity of ways without the use of metal fastenings or even metal grommets which can under certain conditions cause severe damage to the hull.

In the past one of the problems encountered has been the difficulty of securing the fenders to the dock or vessel in a simple manner and in such a way as to prevent them from being torn away or dislocated under the motion of the vessel or dock with consequent injury to the hull.

In addition, many of the prior art fenders have been too complicated in their designs and have therefore been very difficult and expensive to manufacture as well as assemble and use.

Still another problem encountered with the prior art fenders has been the incorporation of metal parts, such as grommets etc., which can under certain conditions cause damage to the hull instead of protecting it.

A primary object of the invention, therefore, is to provide a resilient fender which has variable shock absorbing characteristics combined with longer wear and the absence of any metal whatsoever in the fender.

Another object of the invention is to provide a resilient fender which is inexpensive to manufacture and which may be combined in many ways to give perfect protection.

Still another object of the invention is the provision of a fender which due to its design and shape resists the effects of vertical movements of either the dock or the vessel to provide constant protection.

A still further object of the invention is to provide a fender which may be used either on the hull or on the docks or piling or even as an intermediate resilient device fastened to suitably aligned timbers or spars.

These and other objects and advantages of the invention will appear from the following specification and the accompanying drawings wherein:

FIG. 1 is a side view of one embodiment of the invention;

FIG. 2 is a top view of the embodiment shown in FIG. 1;

FIG. 3 is a front view of the embodiment shown in FIG. 1;

FIG. 4 is a plan view of a vessel or boat showing the fender unit of the invention suspended from the deck of the vessel on the dock contacting side;

FIG. 5 is a partial section taken along the line 5—5 of FIG. 4 and shows the resilient bumpers and spar with flexible tie elements holding the unit in place at the dock level;

FIG. 6 is a partial plan view of the edge of a floating dock with the resilient fenders in place thereon;

FIG. 7 is a partial section taken along the line 7—7 of FIG. 6 and shows the bumpers in place on a continuous spar on the dock edge;

FIG. 8 is a plan view of a piling with the spar of the instant invention mounted vertically on its face and with the bumpers attached thereto;

FIG. 9 is a front view of the piling with the spar and bumpers attached thereto;

FIG. 10 is a side view of the piling with the spar and bumpers attached thereto;

FIG. 11 is a rear view of a vertical arrangement of the bumpers with the flexible tie elements arranged therein but with the space for the spars filled with short blocks;

FIG. 12 is a side view of the vertical arrangement shown in FIG. 11;

FIG. 13 is a back view of two of the bumpers arranged at the ends of a spar and shows the flexible tie elements used to support the complete unit on the hull;

FIG. 14 is a back view of four of the bumpers arranged in pairs at each end of a spar and shows the flexible tie elements used to support the complete unit on the hull;

FIG. 15 is a back view of four of the bumpers arranged at each end of the two spars and show the flexible tie elements used to support the complete unit on the hull;

FIG. 16 is a side view of a further refinement of a bumper adapted to receive the spar through the center and have the bumper extend on both sides to give still better protection;

FIG. 17 is a back view of two of the bumpers arranged at the ends of a spar with a third bumper arranged midway between the two end bumpers but disposed on the outboard side of the spar, and all the bumpers being secured to the spar by flexible tie elements used to support the complete unit on the hull; and

FIG. 18 is a back view of two of the bumpers arranged at the ends of a spar with a third and fourth bumper arranged inwardly of the pair of end bumpers but disposed on the outboard side of the spar, and all the bumpers being secured to the spar by flexible tie elements used to support the complete unit on the hull.

Referring now to the drawings and in particular to FIGS. 1, 2 and 3, the resilient bumper **10** has a rounded face **11** on the hull contacting side and is formed with vertically oriented cavities **12**, **13** and **14** of suitable size to control resilience and absorb the shocks that are thrust upon the bumper in normal use. In its rear face, the bumper is formed with a transverse rectangular notch **16** arranged to accept a suitably sized wooden spar therein when the bumpers are used in multiples. The outwardly extending portions **17** and **18** of the bumper **10** are formed with two sets of aligned holes **20**, **21**, **22** and **23** arranged to receive vertical tie elements to thus form a means of maintaining the bumpers in place on the spars and allow the bumpers to be arranged one above another in vertical tiers for a distance to be determined by the type of vessel and the tide rise. By varying the sizes of the vertically oriented cavities, it is possible to control the resilience of the bumper and the combination of one large hole with two small holes results in a very satisfactory curve with the ability to withstand severe service. The bumpers are made to accommodate various sizes of wooden spars, such as any nominal 2" x 4", 2" x 6" and

2" x 8", etc., and for lighter boats the spars may be such as any nominal 1" x 4" or 1" x 6", etc., in other words any standard dressed boards or timbers with the receiving notch on the rear face of the bumper being sized accordingly. The bumpers are to be molded of a suitable nonstaining rubber or plastic material properly compounded to develop the necessary toughness, resilience and weathering properties.

In FIG. 4 is shown a plan view of a vessel **25** protected with two bumpers of the instant invention arranged on a spar **26** and supported at dock level by means of tie elements **27** and **28** suitably tied to cleats **29** and **30** on the deck of the vessel. The normal spring lines are used to keep the vessel in place alongside the dock. FIG. 5, which is a partial section taken along the line **5—5** on FIG. 4, more clearly shows the relation of the bumpers **10** and the spar **26** with the dock.

FIGS. 6 and 7 show a floating dock **35** with a spar **36** nailed or screwed thereto and having bumpers **37** and **38** arranged thereon at suitable intervals to form a system of resilient bumper units which will protect the hulls of the vessels that will be moored alongside. The bumpers **37** and **38** may be fastened to the spar **36** by means of wooden dowels or by lengths of rope knotted top and bottom.

FIGS. 8, 9 and 10 show a piling **40** with a vertically arranged spar **41** attached thereto by means of nails or screws and having bumpers **43** and **44** arranged thereon and held in place by means of lengths of rope knotted at both ends.

FIGS. 11 and 12 illustrate a vertical arrangement of three bumpers **45**, **46** and **47** having their transverse notches filled with three short lengths of spars **48**, **49** and **50** and all held in place by means of tie element **51** which is threaded through the entire assembly to thus form a vertical bumper with no slots which would tend to catch on the dock. In use, the hull contacting side would be the side having the vertically oriented cavities.

FIG. 13 is a back view of two bumpers **55** and **56** arranged at opposite ends of a spar **57** and held in place by means of tie elements **58** and **59** which also form the mounting means for suspending the unit on the side of a boat.

FIG. 14 shows four bumpers **60**, **61**, **62** and **63** arranged in pairs at each end of a spar **64** and held in place by means of the elements **65** and **66** which, as in all cases, forms the mounting means.

FIG. 15 is a back view of four bumpers **70**, **71**, **72** and **73** arranged on the ends of two spars **74** and **75** and held in place by means of tie elements **76** and **77** which, here again, form the mounting means.

In FIG. 16 is shown a side view of a further refinement of the bumper shown in FIGS. 1, 2 and 3 and in the interest of brevity it may be simply stated that two of the notched bumpers are placed back to back to form a single unit **80** and a horizontal slot **81** through which a suitably sized spar may be inserted. In this instance two sides of the bumper unit have resilient portions rather than one side only. These dual bumper units may be stacked, using the tie elements to keep them in place and eliminating the necessity of placing short sections of spars therein.

FIG. 17 is a back view of two bumpers **85** and **86** arranged at opposite ends of the spar **87** with a third bumper **88** arranged midway between the two end bumpers **85** and **86** but disposed on the outboard side of the spar and held in place by means of the tie elements **89**, **90** and **91** which also form the mounting means for suspending the unit on the side of the boat.

FIG. 18 is a back view of two bumpers **95** and **96** arranged at opposite ends of the spar **97** within a third and fourth bumper **98** and **99** arranged inwardly of the pair of end bumpers **95** and **96** but disposed on the outboard side of the spar, and all the bumpers being secured to the spar by flexible tie elements **100**, **101**, **102** and **103** which also form the mounting means for suspending the unit on the side of the boat.

It is readily evidence from the foregoing disclosure that the bumper disclosed herein is quite novel and can be used in a variety of ways to protect ship hulls and docks. The vertical cavities of the bumpers which control their resilience are quite important and by varying their size and placement with respect to the hull contacting face, the resilience can be built up when the unit is in use, the resilience being low at the beginning but building rapidly as the face is forced in to flatten the cavities, at which point the resilience approaches a maximum point and thereafter the cushioning effect of the material itself can be relied upon. The nonstaining rubber or plastic materials from which the bumper is molded may also be used to add to the resilience by varying the compounding thereof. Of course, one main attraction of the instant invention is the ability to form boat bumpers without the use of metal parts and simply use rope to form the tie elements. As any one knows, rope is soft and pliable, so even though it contacts the hull it will not scratch or mar.

While certain representative embodiments and details have been shown for the purpose of illustrating the invention, it will be apparent to those skilled in this art that various changes and modifications may be made therein without departing from the spirit or scope of the invention.

What is claimed is:

1. A boat fender unit comprising an elongated spar, a pair of resilient bumpers, one arranged at each end of the spar and on the hull side thereof, and a pair of flexible tie elements passing through aligned openings formed in the spar and the resilient bumpers respectively and holding them together in assembled relation.

2. A boat fender according to claim **1**, wherein the flexible tie elements have extensions for fastening to cleats on the deck to thus suspend the fender therefrom at a suitable elevation to contact dockside elements.

3. A boat fender according to claim **1**, wherein each resilient bumper and each end of the spar are formed with two openings extending vertically therethrough, and wherein the pair of flexible tie elements has a rope of suitable diameter passing through each of said openings.

4. A boat fender according to claim **1**, wherein each resilient bumper is formed on its hull contacting side with cavities which control its resilience.

5. A boat fender according to claim **1**, wherein the resilient bumpers are formed in their outboard sides with transverse notches in which the spar is fitted.

6. A boat fender according to claim **1**, wherein the resilient bumpers are composed of a suitable nonstaining rubber or plastic material properly compounded to develop the necessary toughness, resilience and weathering properties.

7. A boat fender according to claim **1**, wherein the spar is in the form of a wooden plank.

8. A boat fender according to claim **1**, wherein the tie element is in the form of a suitable diameter rope.

9. A boat fender according to claim **1**, including a third resilient bumper arranged midway between the two end bumpers and secured to the spar by a flexible tie element in a manner similar to the two end bumpers, said third bumper being disposed on the outboard side of the spar.

10. A boat fender according to claim **1**, including a third and fourth resilient bumper arranged inwardly of the pair of end resilient bumpers and secured to the spar by a flexible tie element in a manner similar to the two end bumpers, said third and fourth bumpers being disposed on the outboard side of the spar.

11. A boat fender unit comprising a pair of elongated spars, a pair of resilient bumpers arranged at each end of each spar on the hull contacting side thereof, and a pair of flexible tie elements passing through aligned openings formed in the spars and the resilient bumpers respectively

to hold the bumpers on the spars and hold the spars in parallel spaced relation.

12. A resilient boat fender bumper formed of rubber and comprising a substantially rectangular box shaped unit formed with a plurality of vertically oriented cavities for resilience control, the hull contacting side of the unit being suitably contoured to allow the hull to slide over it, said unit being formed on the opposite face with a transverse rectangular notch arranged at right angles to the vertically oriented cavities and open at the dockside to receive a longitudinal spar or filler.

13. A resilient bumper according to claim **12**, wherein the box shaped unit is formed with a vertically oriented tie element opening passing through the upper and lower walls of the transverse spar receiving notch.

References Cited

UNITED STATES PATENTS

1,744,408	1/1930	Millard	293—71
2,578,291	12/1951	Dickson	114—219
2,874,669	2/1959	Norman.	
3,183,875	5/1965	Russell	114—219
3,286,680	5/1966	Caretta	114—219

FERGUS S. MIDDLETON, *Primary Examiner.*

JAMES E. PITTENGER, *Assistant Examiner.*

U.S. Cl. X.R.

267—1; 293—62, 65, 71