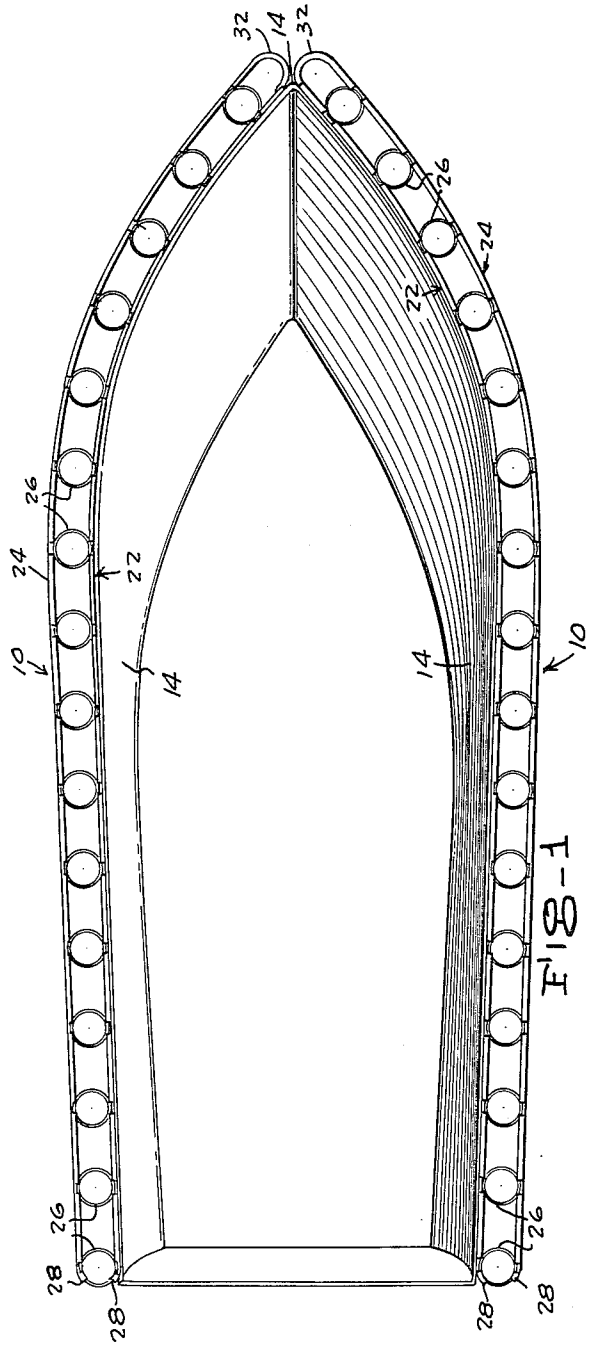
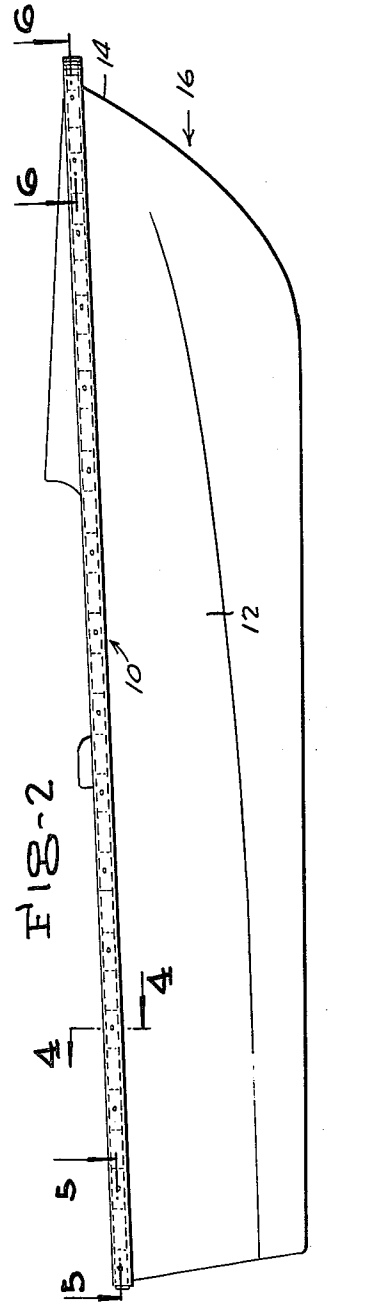
March 5, 1963 N. MILLER 3,079,884

BOAT BUMPERS

Filed Nov. 17, 1961 2 Sheets-Sheet 1





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March 5, 1963 N. MILLER 3,079,884

BOAT BUMPERS

Filed Nov. 17, 1961 2 Sheets-Sheet 2

FIG-7

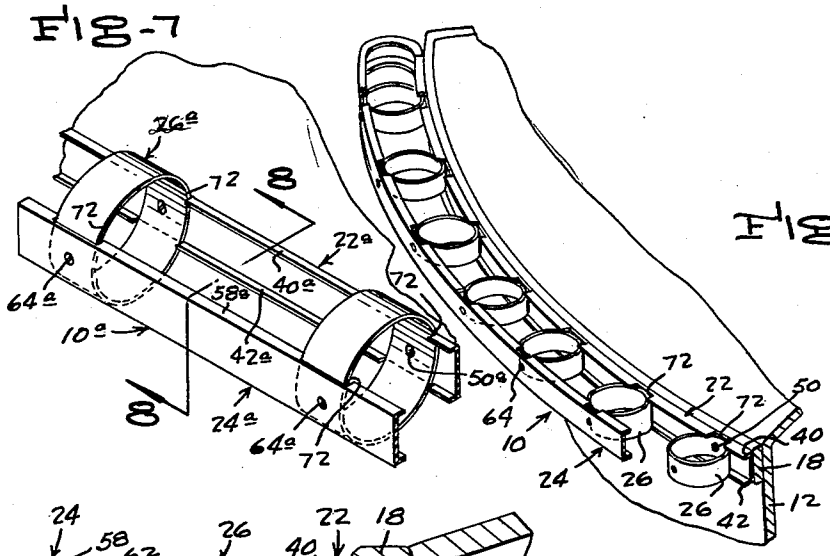


FIG-3

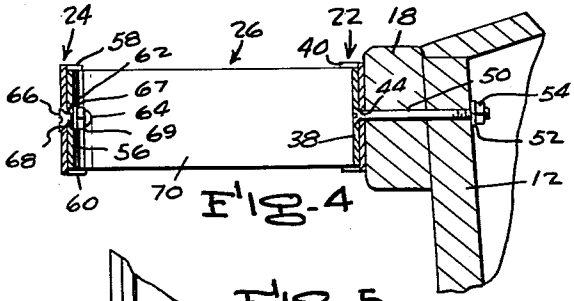
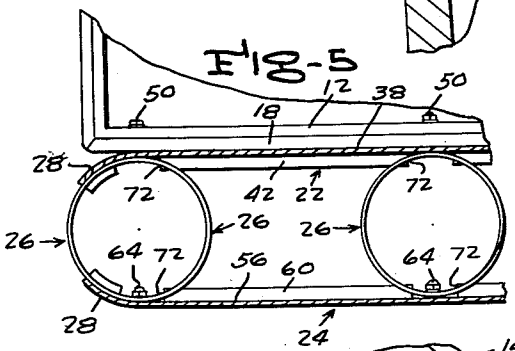


FIG-4

FIG-5



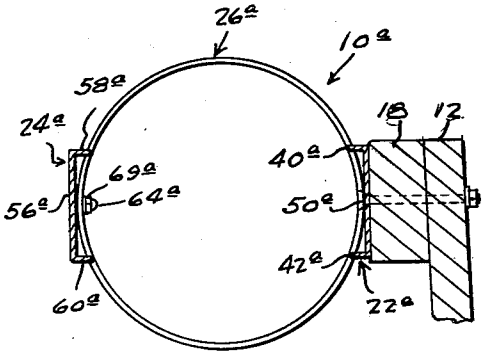


FIG-8

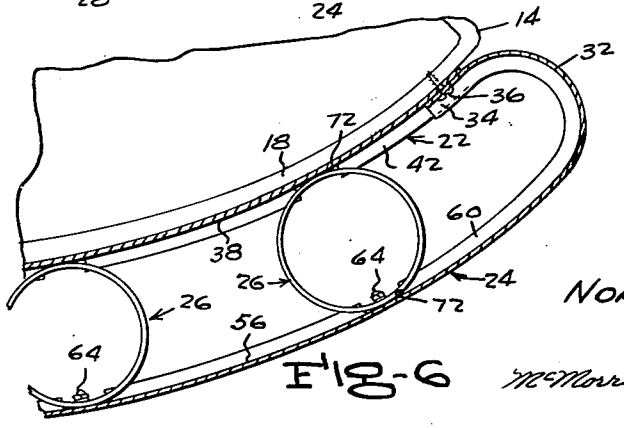


FIG-6

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BOAT BUMPERS

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10 Claims. (Cl. 114—219)

This invention relates to novel bumpers for boats.

The primary object of the invention is the provision of efficient, inexpensive, and rugged spring-metal bumpers for boats which serve to protect the sides and the bows of boats, the bumpers being easily installed and removed, without special skill, and being suitable for mass production, at low cost, for sale by retail outlets.

Another object of the invention is the provision of bumpers of the character indicated above, which have greater collision shock absorbing ability than ordinary bumpers, including rubber or rubber-like bumpers, and which are composed of flexible inboard and outboard strips, and springs interposed between the strips, the bumpers being bendable to conform to the curvatures of the sides and bows of boats of different types, the springs being connected to the strips to assemble the strips and the springs, and the springs and the inboard strips being secured to each other and to the boat sides. The bumpers are adapted to be secured to the outboard surfaces of existing rubrails or to the outboard surfaces of boat sides immediately below the rubrails, and, in the absence of rubrails, to the outer surfaces of boat sides, at the upper edges thereof.

A further object of the invention is the provision of bumpers of the character indicated above whose strips are reinforced, as by means of upper and lower lateral flanges, and the springs are open circular cylinders, the springs being equally spaced along the strips, and disposed either vertically or horizontally, the flanges of the strips being formed with notches for seating the springs in the vertical arrangement, and the springs being engaged between the flanges in the horizontal arrangement.

Other important objects and advantageous features of the invention will be apparent from the following description and the accompanying drawings, wherein, for purposes of illustration only, a specific form of the invention is set forth in detail.

In the drawings:

FIGURE 1 is a bottom plan view of a boat equipped with bumpers of the present invention;

FIGURE 2 is a side elevation of FIGURE 1;

FIGURE 3 is an enlarged fragmentary side perspective view of FIGURE 2, partly broken away and in section;

FIGURE 4 is an enlarged vertical transverse section taken on the line 4—4 of FIGURE 2;

FIGURES 5 and 6 are enlarged fragmentary horizontal sections taken on the lines 5—5 and 6—6 of FIGURE 2;

FIGURE 7 is an enlarged fragmentary section, like FIGURE 3, showing the springs in vertical arrangement;

FIGURE 8 is a further enlarged vertical transverse section taken on the line 8—8 of FIGURE 7.

Referring in detail to the drawings, wherein like and related numerals designate like and related parts throughout the several views, and first to FIGURES 1 through 6, the numerals 10 generally designate similar bumpers of the present invention installed on the sides 12 and the bow 14 of a boat 16. The boat sides 12, in the illustration, have rub strips 18 affixed to the outboard surfaces of the sides 12, at the upper edges thereof, to whose outboard surfaces 20 the bumpers 10 are secured. If desired, the bumpers 10 can be installed on the boat sides 12 immediately below the rub strips 18, or, in the absence of rub strips, directly to the outboard surfaces of the boat sides.

Each bumper 10 comprises an inboard strip 22, and outboard strip 24, and springs 26 secured therebetween at preferably uniformly spaced intervals along the strips. The rear ends of the strips 22 and 24, as shown at 28 in FIGURES 1 and 5, are bent toward each other and bear retainably against the rear side of a rearmost spring 26. The strips 22 and 24 are preferably long enough to extend from the rear end or transom 30 of the boat 16 to points immediately adjacent to opposite sides of the bow or stem 14 of the boat. At their forward ends, the bumpers 10 extend forwardly beyond the bow 14 and are rounded, as by providing the outboard strip 24 with laterally inwardly and rearwardly return bent semicircular bends 32, having straight terminals 34 which are secured to the outboard surfaces of the inboard strips, as by means of screws 36 extended through the terminals 34, the inboard strips 22 and the boat sides or sub strips 18.

The inboard bumper strips 22 comprise horizontally elongated, vertically disposed flat bendable and preferably resilient metal webs 38, along whose upper and lower edges are outwardly extending parallel flanges 40 and 42, respectively. At preferably regularly spaced intervals therealong the webs 38 are formed with holes 44 which receive mounting holts 50, which extend through the sub strips 18 and the boat sides 12, and have washers 52 and nuts 54, on their inboard ends, engaged with the inboard surfaces of the boat sides 12.

The outboard bumper strips 24 comprise webs 56 and upper and lower flanges 58 and 60, respectively, similar to those of the inboard strips 22, but the flanges 58 and 60 extend laterally inwardly toward and are in the same plane as the flanges 40 and 42 of the inboard strips. The webs 56 of the outboard strips are formed with bolt holes 62, which are aligned with the holes 44 of the inboard strips 22, through which spring anchoring bolts 64 extend, the bolts 64 having flat conical heads 66 seated flush in countersinks 68 at the outboard ends of the holes 62, as shown in FIGURE 4. Washers 69 and nuts 68 on the bolts 64 engage the inboard surfaces of the springs 26.

The springs 26 comprise horizontal open cylinders of resilient metal, having side walls 70 of a height to fit snugly between the upper and lower flanges of the inboard strips 22 and the outboard strips 24. In the illustration, the springs 26 are spaced from each other, and from the bends 32, at intervals greater than their diameters.

The form of bumpers 10*a* shown in FIGURES 7 and 8, the structures of the inboard and outboard strips 22*a* and 24*a*, and the springs 26*a*, are the same as those of the bumpers of FIGURES 1 through 6, and the springs 26*a*, except that the flanges of the strips are formed with longitudinally elongated notches 72, centered relative to the bolts 50 and 64, which snugly receive the springs 26*a*, in vertical instead of horizontal positions, so that the ends of the notches serve to preclude rotation of the springs 26*a* out of their vertical positions, as do the upper and lower flanges of the strips preclude rotation of the springs 26 out of their horizontal positions.

As disclosed in the drawings, where it is desired to have a choice of disposing the springs in either vertical or horizontal positions, the inboard and outboard strip flanges may be provided with the notches 72, which, in the horizontal disposition of the springs, are bridged by the springs, as shown in FIGURE 6.

In operation, and with respect to both disclosed forms of the present invention, forcible contact of the outboard bumper strips, with such as piers, pilings, or other boats, produces compressive flattening of the springs and cushioned approach of the outboard bumper strips toward the inboard strips, either at either side of the boat 16, or at the bow 14 thereof, so that in all cases, except col-

lisions at greater than contemplated forces, the forces of the contacts are harmlessly absorbed without damage to the boat, and without physical shock to the occupants of the boat, to a substantially greater extent than is afforded by present boat bumpers, including those made of rubber or rubber-like materials.

It will be noted that, because of the feasibility of forming the inboard and outboard strips and the springs of relatively thin gauge non-corrosive metal, and because of their ease of formation, boat bumpers in accordance with the present invention can be manufactured and assembled at relatively low cost, and, where desirable, can be shipped to and sold at dealers in easily assembled, knock-down form.

While there have been shown and described preferred forms of the invention, it is to be understood that the invention is not necessarily confined thereto, and that any change or changes in the structure of and in the relative arrangements of components thereof are contemplated as being within the scope of the invention as defined by the claims appended hereto.

What is claimed is:

1. In combination, a boat having sides and a stem to which said sides converge, bumpers extending along the outboard surfaces of the sides, said bumpers comprising inboard strips secured to the boat sides, outboard strips extending along and spaced laterally from the inboard strips, said strips being facing channels having vertical webs and vertically spaced horizontal flanges, and cylindrical springs extending between the strips and interposed between the flanges of the inboard and outboard strips and bearing against the webs, and means securing the springs to the webs of the channels.

2. In combination, a boat having sides and a stem to which said sides converge, bumpers extending along the outboard surfaces of the sides, said bumpers comprising inboard strips secured to the boat sides, outboard strips extending along and spaced laterally from the inboard strips, said strips being facing channels having vertical webs and vertically spaced horizontal flanges, and cylindrical springs extending between the strips and interposed between the flanges of the inboard and outboard strips and bearing against the webs, and means securing the springs to the webs of the channels, the inboard and outboard strips being of flexible metal and said springs of resilient metal.

3. In combination, a boat having sides and a stem to which said sides converge, bumpers extending along the outboard surfaces of the sides, said bumpers comprising inboard strips secured to the boat sides, outboard strips extending along and spaced laterally from the inboard strips, said strips being facing channels having vertical webs and vertically spaced horizontal flanges, and cylindrical springs extending between the strips and interposed between the flanges of the inboard and outboard strips and bearing against the webs, and means securing the springs to the webs of the channels, the inboard and outboard strips being of flexible metal and said springs of resilient metal, said inboard strips being conformed by bending to the contours of the outboard surfaces of the boat sides.

4. In combination, a boat having sides and a stem to which said sides converge, bumpers extending along the outboard surfaces of the sides, said bumpers comprising inboard strips secured to the boat sides, outboard strips extending along and spaced laterally from the inboard strips, said strips being facing channels having vertical webs and vertically spaced horizontal flanges, and cylindrical springs extending between the strips and interposed between the flanges of the inboard and outboard strips and bearing against the webs, and means securing the springs to the webs of the channels, the inboard and outboard strips being of flexible metal and said springs of resilient metal, said inboard strips being conformed by bending to the contours of the outboard surfaces of the boat sides, said outboard strips being parallel to the inboard strips and being adapted to conform by bending to the contours of the inboard strips as the inboard strips are conformed to the boat sides.

5. In combination, a boat having sides and a stem to which said sides converge, bumpers extending along the outboard surfaces of the sides, said bumpers comprising inboard strips secured to the boat sides, outboard strips extending along and spaced laterally from the inboard strips, said strips being facing channels having vertical webs and vertically spaced horizontal flanges, and cylindrical springs extending between the strips and interposed between the flanges of the inboard and outboard strips and bearing against the webs, and means securing the springs to the webs of the channels, the inboard and outboard strips being of flexible metal and said springs of resilient metal, said inboard strips being conformed by bending to the contours of the outboard surfaces of the boat sides, said outboard strips being parallel to the inboard strips and being adapted to conform by bending to the contours of the inboard strips as the inboard strips are conformed to the boat sides, said outboard strips having return bends on the forward ends terminating at points spaced forwardly from the boat stem and secured to the inboard strips.

6. A boat side bumper comprising a bendable inboard strip securable conformably to the outboard surface of a boat side, a bendable outboard strip extending spacedly along the inboard strip and adapted to conform to the bending of the inboard strip, said strips comprising facing channels having vertically disposed webs having spaced upper and lower flanges extending therealong, and springs interposed between and spaced from each other along and securably engaged with the webs and engaged between and with the flanges, said springs comprising horizontally disposed open-ended cylinders having side walls engaged with the strip webs and the upper and lower flanges of the webs.

7. A boat side bumper comprising a bendable inboard strip securable conformably to the outboard surface of a boat side, a bendable outboard strip extending spacedly along the inboard strip and adapted to conform to the bending of the inboard strip, said strips comprising facing channels having vertically disposed webs having spaced upper and lower flanges extending therealong, and springs interposed between and spaced from each other along and securably engaged with the webs and with and between the flanges, said upper and lower flanges having notches in their outer edges, said spring cylinders being vertically disposed and having side walls securably engaged with the webs of the strips and disposed in the notches.

8. A boat side bumper comprising an inner strip adapted to be secured to and extend along a boat side, an outer strip coextensive with the inner strip and spaced laterally therefrom, one of the strips having laterally inwardly extending arcuate end portions secured to the ends of the other strip and springs spaced along and between the strips and secured thereto, said strips being facing channels having webs terminating at their upper and lower edges in lateral flanges, said springs comprising resilient open-ended cylinders having sidewalls bearing against the channel webs between the flanges and with the flanges, and means securing the sidewalls of the cylinders to the channel webs.

9. A boat side bumper comprising an inner strip adapted to be secured to and extend along a boat side, an outer strip coextensive with the inner strip and spaced laterally therefrom, one of the strips having laterally inwardly extending arcuate end portions secured to the ends of the other strip, and springs spaced along and between the strips and secured thereto, said strips being facing channels having webs terminating at their upper and lower edges in lateral flanges, said springs comprising resilient open-ended cylinders having sidewalls bearing against

the channel webs between the flanges and with the flanges, and means securing the sidewalls of the cylinders to the channel webs, said cylinders being disposed with their axes in horizontal position.

10. A boat side bumper comprising an inner strip adapted to be secured to and extend along a boat side, an outer strip coextensive with the inner strip and spaced laterally therefrom, one of the strips having laterally inwardly extending arcuate end portions secured to the ends of the other strip, and springs spaced along and between the strips and secured thereto, said strips being facing channels having webs terminating at their upper and lower edges in lateral flanges, said springs comprising resilient open-ended cylinders having sidewalls bearing against the channel webs between the flanges and with the flanges, and means securing the sidewalls of the cylinders to the

channel webs, said flanges having free edges formed with longitudinal spaced notches, said cylinders being disposed with their axes in vertical positions, the sidewalls of the cylinders being engaged in the notches of the flanges.

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