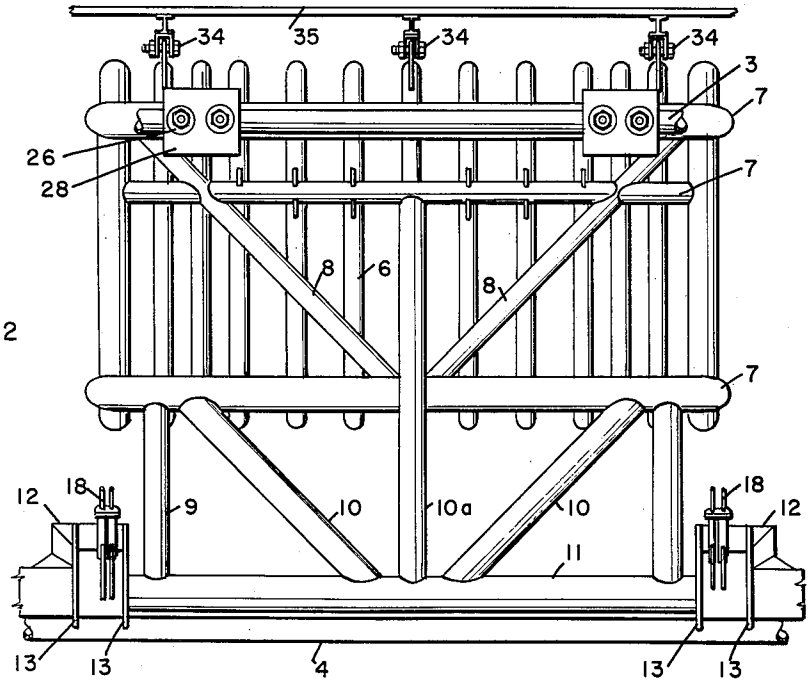
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BOAT LANDING

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FIG. 2



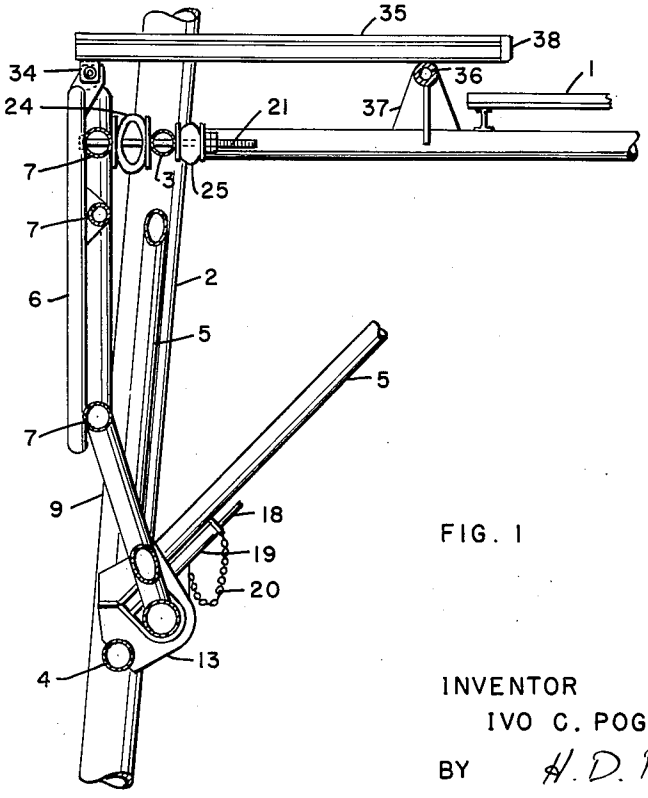


FIG. 1

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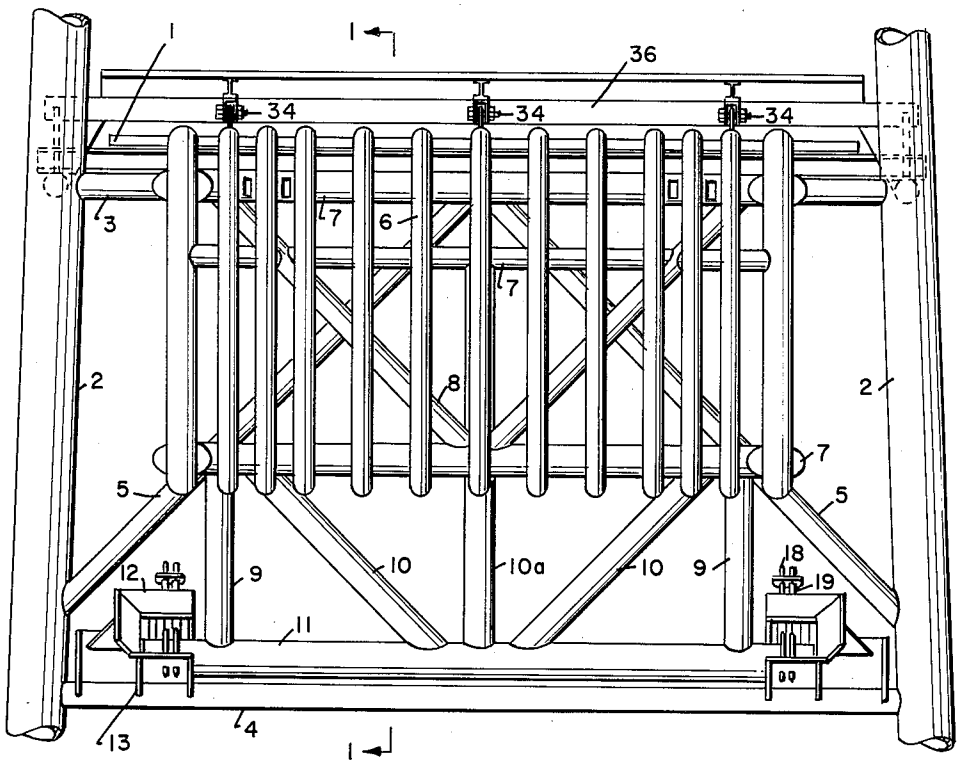


FIG. 3

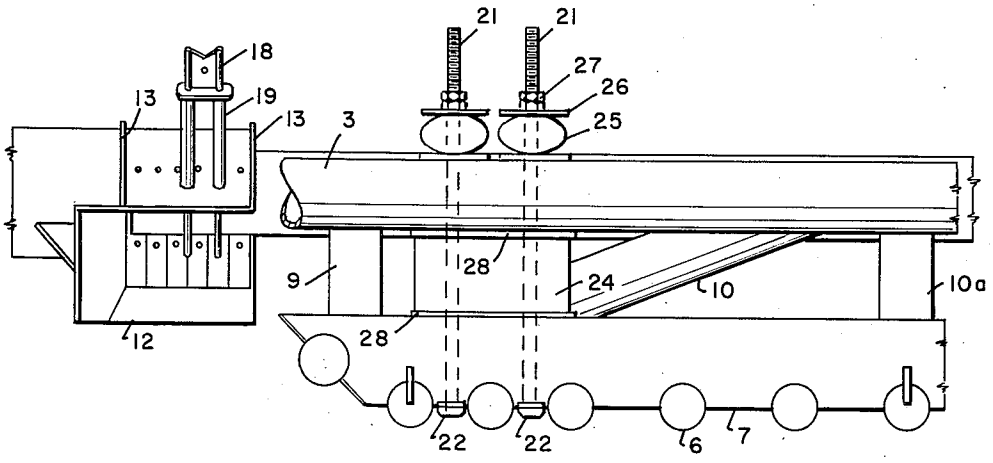


FIG. 4

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BOAT LANDING

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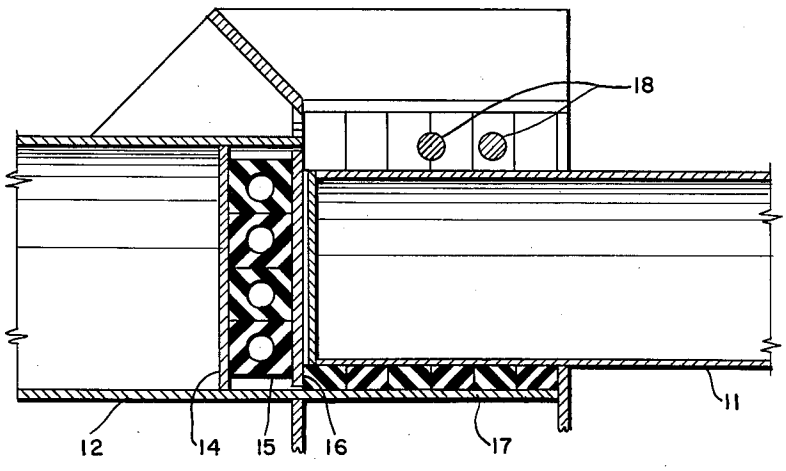


FIG. 5

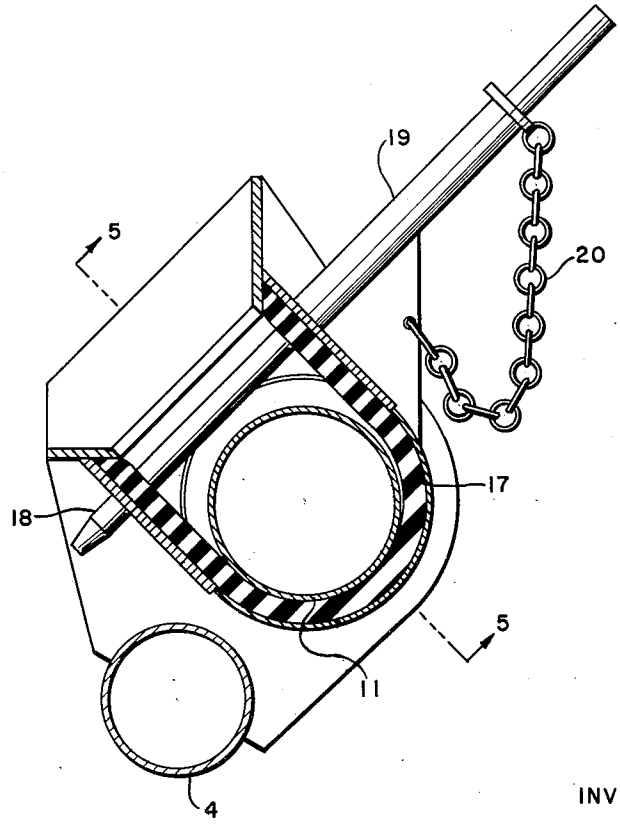


FIG. 6

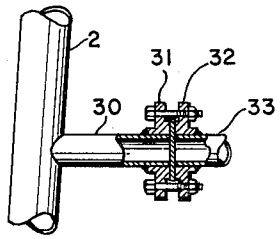


FIG. 7

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United States Patent Office 3,036,437 Patented May 29, 1962

3,036,437

BOAT LANDING

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Filed Jan. 25, 1960, Ser. No. 4,264
5 Claims. (Cl. 61—48)

This invention relates to piers, docks, wharves and other pile structures, such as offshore well drilling platforms and offshore radar stations, and is particularly concerned with a boat landing to protect the land-anchored structure from the impact of ships, boats and barges against the structures.

In the past, various fenders and bumpers have been used between floating objects and the land-anchored structures, however, in many cases, severe damage has resulted due to either wave action or mishandling of the vessels concerned. Where the boat landing has formed an integral part of the structure, accidental damage to the landing has been in many cases difficult to repair.

Accordingly, a principal object of this invention is to provide a boat-landing which is effective in preventing damage to either the land-anchored structure or the floating vessel.

A further object of the invention is to provide a boat-landing structure which can readily be installed and readily replaced.

Another object of the invention is to provide a boat-landing employing a hinged shock-absorbing construction.

The above and other objects and advantages of the invention will be fully understood by the following detailed description of a preferred form of the invention, throughout which reference is made to the accompanying drawing of which:

FIG. 1 is a side elevational view of the boat fender attached to the side of a land-anchored or rigid structure.

FIG. 2 is a back elevation of the boat fender of FIG. 1.

FIG. 3 is a front elevation of the boat fender.

FIG. 4 is a plan view of part of the boat fender on an enlarged scale with landing stage removed.

FIG. 5 is a sectional elevation of the hinge cradle on an enlarged scale, taken along the line 5—5 of FIG. 6.

FIG. 6 is a sectional elevation of the hinge cradle on enlarged scale taken along the line 6—6 of the FIG. 5.

FIG. 7 is an elevation partially in section of an alternate form of hinge cradle.

Referring to the figures: 1 designates a platform supported by piles 2 driven into the sea bed below the water line. Horizontal cross-beams 3 and 4 connect the main piles 2 one to the other and with diagonal braces 5 unite the beams and piles into a fixed structure. The face of the boat landing comprises a grid of vertical bumper pipes 6 held together by cross-beams 7 and diagonal braces 8. The face is attached by vertical members 9 and diagonal braces 10 and back brace 10*a* to a horizontal pivot pipe 11. The pivot pipe 11 is journaled in cradles 12 attached to the rigid structure. The cradles are mounted on the horizontal beam or support pipe 4 of the rigid structure extending across the area where the landing is located. The cradles are fabricated of pipe of larger diameter than the pivot pipe 11. Gusset plates 13 are located along the length of the cradle and are suitably shaped to partially encompass the fixed horizontal support pipe 4. Referring to the FIG. 5 it will be seen that the cradles 12 are each provided with an interior diaphragm 14 located across the tubular cradle to act as an end stop to any lateral movement of the pivot pipe or hinge pin 11 in the cradle. Towards the pivot pipe from these diaphragms 14, shock absorber elements 15 of rubber strips having center holes are located. A suitable slidable piston 16 is located in the cradle in opposition to the end of the

pivot pipe and between the shock absorber elements 15 and the pivot pipe. As will be seen from FIGS. 5 and 6, the inward ends of the generally tubular-shaped cradles are U-shaped with an opening located outwardly and upwardly from the face of the boat-landing structure. Each of these U-shaped sections is lined with rubber sheeting or strips 17 attached to the metal by suitable fastening means. The pivot pipe is kept in place in the U-shaped bearing thus formed by suitable retaining pins 18 which traverse the ends of the U and are partially encased by sheaths 19 attached to the upper arm of the U-shaped section of the cradle and at right angles to the longitudinal axis of the pivot pipe. Each retaining pin when in place passes through an opening in the lower arm of the U. A chain 20 attached to the pins and to the cradle prevents loss of the pins upon their removal. The upper part of the boat landing is held against the rigid structure, pier or offshore platform by horizontal bolts 21 having heads 22 shaped to fit the curvature of the top horizontal cross-beam 7 through which the bolts are passed. Interposed between the top beam 7 and the beam 3 of the rigid structure are two rubber shock absorbing elements 24 which are normally of cylindrical shape. The bolts 21 are passed at right angles to the longitudinal axis of the shock-absorbing elements 24. The bolts 21 pass through slots in the cross-beam 3 of the rigid structure. Suitable rubber sleeves 25 are placed on the bolts after they have passed through the beam 3. Metallic washers 26 are interposed between the sleeve 25 and nuts 27. The nuts 27 on the bolts 21 are tightened so that the rubber elements of the shock absorber are loaded as shown in FIGS. 1 and 4. To provide vertical bearing surfaces for the rubber elements 24 and 25, vertical plates 28 are located between the rubber elements and the beams 7 and 3. These plates are indicated by numeral 28.

Hinges (34) on the vertical bumper pipes 6 connect the vertical face to a horizontal land stage 35. The landing stage 35 is supported at its inner end on rollers (36) under the landing stage. The rollers being journaled in supports 37 mounted on the main structure. If desired the rollers could be replaced by a rub plate. The edges of the landing stage are preferably protected with a rubber fender 38. The landing stage or floor, it will be seen from FIG. 1, overlaps and is slightly elevated above the platform 1 forming part of the pile supported structure.

FIG. 7 illustrates an alternate support means for the cradles 12 on the fixed structure which includes stub pipe members 30 extending horizontally from the piles 2 of the rigid structure provided with a flange 31 mating with a similar flange 32 on an extension 33 of the cradle 12.

It will be seen by those skilled in the art that a boat landing results which which has the advantage of being readily located in a desired position and readily removed. Installation only necessitating the insertion of the pins 18 at the lower end of the landing and the insertion of the bolts 21 at the upper end. Removal entails the reverse operation.

The hinge construction and upper shock-absorbing construction serve to dampen the shocks to both the rigid structure and the boats on transferring personnel or equipment from boats to the rigid structure and vice versa.

Various other modifications, of course, can be made in the construction shown. For example, in some cases it has been found desirable, when the face plate of the boat landing is made of metallic pipes, to fill the pipes with concrete.

While the hinge sockets are shown as being welded to the piles at their outer ends, it will be appreciated that the hinge sockets in some cases can be attached by flanges and bolting to the rigid structure.

While the boat landing has been shown as attached to

a metal pile structure, it will be realized that the landing can be attached to a wooden pile structure or to a concrete or stone structure.

I claim as my invention:

1. A shock absorbing marine structure comprising: a fixed support structure, a vertically disposed fender, means mounting said fender on said support structure, said means comprising a horizontal pivot pipe attached to the bottom of said fender, horizontal axially disposed sockets attached to the fixed support structure and receiving the ends of said pivot pipe, a plurality of fender mounting devices attached to the top of said fender, said fender mounting devices being spaced horizontally along the length of the fender and comprising bolts joining said fender to the fixed structure and resilient elements interposed between the fender and the fixed structure and a horizontal loading platform hinged to and movable with the vertically disposed fender at its upper end.

2. A shock-absorbing marine structure as defined in claim 1 in which the horizontal sockets are U-shaped.

3. A shock-absorbing marine structure as defined in claim 2 in which pins spanning the legs of the U-shaped horizontal sockets are provided to hold the pivot pipe therein.

4. A shock-absorbing marine structure as defined in claim 1 in which the horizontal sockets are lined with resilient material.

5. A shock-absorbing marine structure as defined in claim 1 in which the horizontal sockets are provided with shock-absorbing pistons to resist end thrust of the pivot pipe.

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