

(No Model.)

J. T. C. KOCH.
FENDER FOR VESSELS.

No. 461,759.

Patented Oct. 20, 1891.

Fig 1.

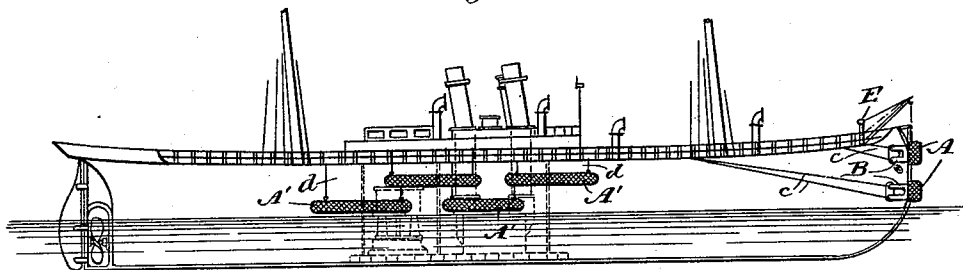


Fig 2.

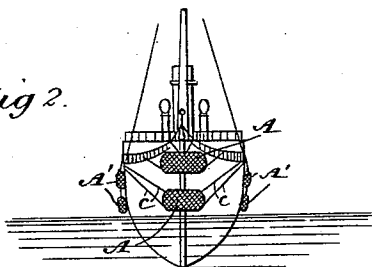


Fig 3.

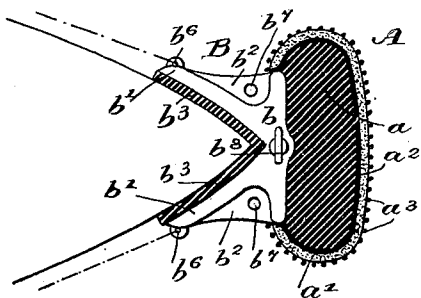


Fig 4.

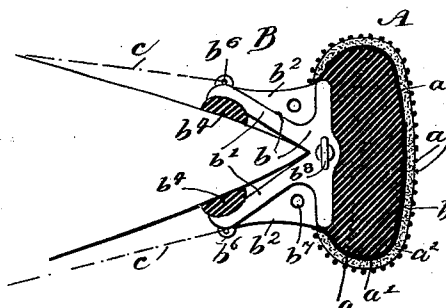
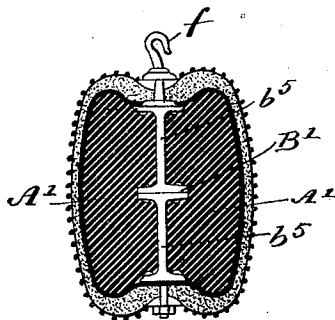


Fig 5.



WITNESSES:

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JACOBUS THEODOOR CHRISTIAAN KOCH, OF AMSTERDAM, HOLLAND.

FENDER FOR VESSELS.

SPECIFICATION forming part of Letters Patent No. 461,759, dated October 20, 1891.

Application filed December 6, 1890. Serial No. 373,751. (No model.)

To all whom it may concern:

Be it known that I, JACOBUS THEODOOR CHRISTIAAN KOCH, residing at 50 Egelantiersgracht, Amsterdam, in the Kingdom of Holland, have invented new and useful Improvements in Fenders or Cuffers for Vessels for Preventing the Disastrous Consequences of Collisions, of which the following is a specification.

10 The object of my invention is to provide effective fenders by means of which the injurious effects of vessels colliding may be materially lessened.

15 The fenders are of elastic material in the main, and are designed to take up much of the effect of the blow in the event of collision and to distribute the effect over a large surface.

20 The invention consists of the novel construction and arrangement, as hereinafter particularly described, and defined in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate 25 corresponding parts in all the figures.

Figure 1 is a side view of a vessel having my improved fenders applied thereto. Fig. 2 is a front view thereof. Fig. 3 is a horizontal section of a fender adapted to the bow of a vessel. Fig. 4 is a similar view of a slightly-modified construction of such fender, and Fig. 5 is a transverse vertical section of a fender adapted to the side of a vessel.

30 In the various forms my improved fenders have the common feature of being elastic, and also have a rigid frame, to which the elastic cushion is secured, whereby body is given to the latter.

35 The fenders shown in Figs. 3 and 4 are adapted to the bow of a vessel, two or more of such fenders being employed in practice, as desired. These fenders consist each of an elastic cushion A and a rigid frame B, of metal or wood. The main portion or body a 45 of the cushion A is of highly-elastic india-rubber, over which is secured a covering a', of metal or other suitable material, and over the covering a' a facing a², preferably of cork, is placed, the whole being inclosed in an outer 50 wrapping a³ of rope net-work.

The frame B, of metal or wood, consists of a face-plate b, to which the cushion A is se-

cured, from which plate rearwardly-extending divergent arms b' b' project to conform in a measure to the lines of the bow directly in the rear of the cut-water. Webs b² extend 55 from the plate b to the arms b' for strengthening the fender. On the inside of the arms b' rubber pads are secured for lessening the injury to the vessel's bow. In the form shown 60 in Fig. 3 these pads b³ are of flat form and extend along the length of the arms.

In the form shown in Fig. 4 the pads b⁴ consist of blocks having a rounded outer surface, the arms b' being formed with corresponding 65 recesses for receiving such blocks. In this figure, also, the arms b' are shown as diverging somewhat from the lines of the vessel, the object of which is to further lessen the danger of the arms piercing the vessel in the 70 event of a collision.

The fenders for the sides of the vessel are formed essentially the same as those above described, in that they consist of a rigid frame and an elastic cushion. The cushion A' A' 75 of the side fenders are united to a common frame B' at each side of the latter and are faced with cork, &c., similarly to those above described. The frame B' is by preference formed of two superimposed I-beams b⁵, firmly 80 bolted together.

The fenders are secured in place on the vessel in any suitable manner, preferably by the means shown, which consists in the case of the bow-fenders of guys c, which are suitably secured at one end on deck, and at the 85 other end are fastened to eyes b⁶, formed in the arms b'.

The side fenders are secured to suspension-ropes d, which are fastened to hooks f or other 90 devices on the fenders. Guys may be employed in addition, if desired.

In practice I prefer to locate the side fenders at a point on the vessel's sides opposite the engine and boiler rooms, though it is evident 95 they may be located at any other desired point.

A crane E or similar apparatus serves to hoist and lower the bow-fenders, the suspension-ropes being fastened to eyes b⁷, formed 100 in the webs b², or to the hook b⁸, carried by plate b, or to both, as desired.

By means of the above-described fenders it will be readily understood that the effect of

a collision will be distributed over a large surface, and much of the effect will be taken up by the elastic cushions, the result being that the injury from a collision will be greatly lessened.

5
Having now particularly described and ascertained the nature of the said invention and in what manner the same is to be performed, I declare that what I claim is—

10 1. A fender comprising an elastic cushion, a metallic casing therefor, an outer surrounding netting, and an elastic filling between the netting and casing, substantially as set forth.

15 2. A fender comprising the frame B, formed of a face-plate *b*, rearward-projecting diverging arms provided with suspension-eyes, and the pad secured to the said face-plate, substantially as set forth.

20 3. A fender comprising the frame B, formed of a face-plate *b*, rearward-projecting diverging arms *b'* *b'*, having suspending-eyes *b^e*, and apertured webs *b²*, connecting said plate and arms, and a pad secured to the face-plate, substantially as set forth.

4. As a new article of manufacture, a fender 25 for vessels, consisting of a rigid frame, an elastic cushion secured thereto, and a cork facing on said cushion, substantially as described.

5. The combination, with the bow of a vessel, of a pad, and a frame carrying the pad and 30 having diverging arms embracing the bow and movable vertically thereon and provided with guy-ropes for suspending it, substantially as set forth.

6. The combination, in a fender for vessels, 35 of a rigid frame having rearwardly-extending divergent arms, an elastic cushion secured to said frame, and elastic pads secured to the arms of the said frame, substantially as described.

40
In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JACOBUS THEODOOR CHRISTIAAN KOCH.

Witnesses:

A. S. DOCEN,
A. DOYER, Jr.