No. 821,770. PATENTED MAY 29, 1906.

J. TRUAX.

FENDER.

APPLICATION FILED OCT. 23, 1905.

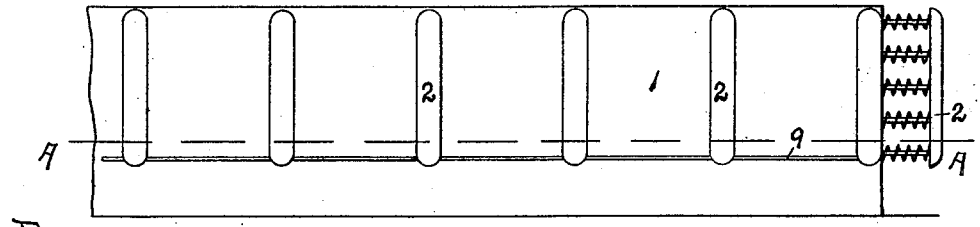


Fig. 1.

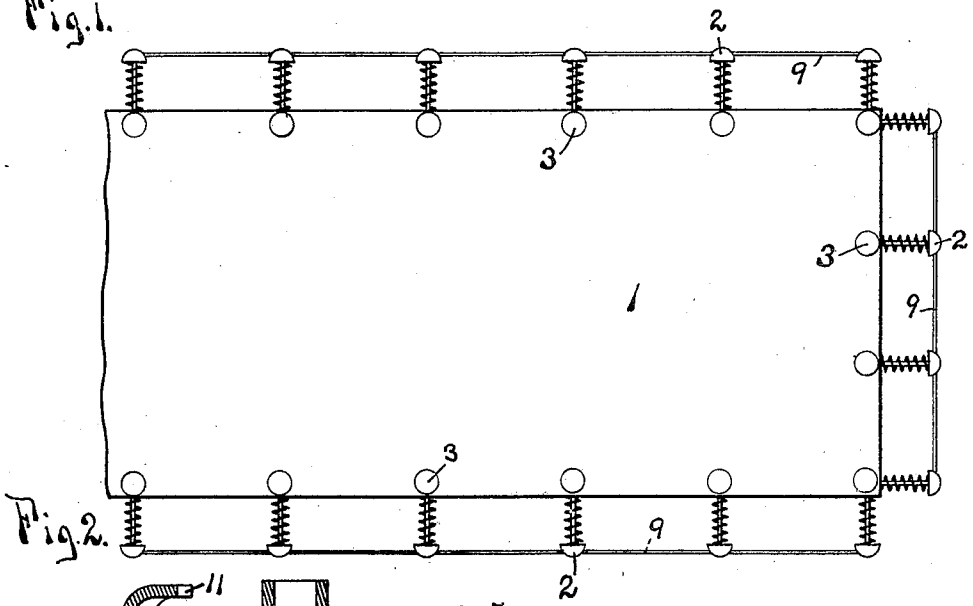


Fig. 2.

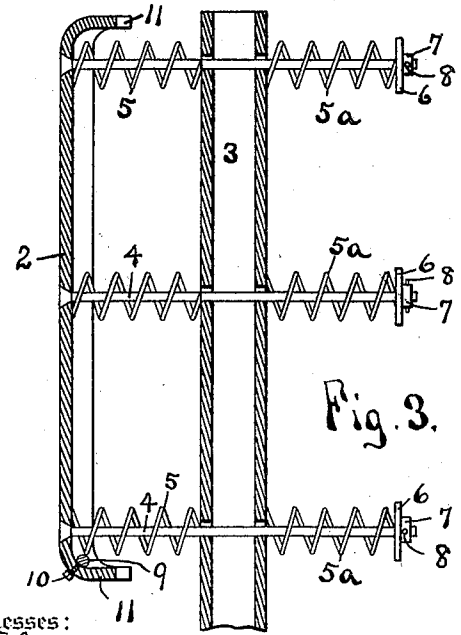


Fig. 3.

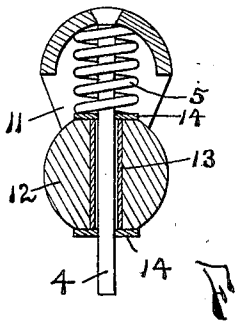


Fig. 4.

Witnesses:
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UNITED STATES PATENT OFFICE.

JOHN TRUAX, OF LONG BRANCH, NEW JERSEY.

FENDER.

No. 821,770. Specification of Letters Patent. Patented May 29, 1906.

Application filed October 23, 1905. Serial No. 283,900.

To all whom it may concern:

Be it known that I, JOHN TRUAX, a citizen of the United States, and a resident of Long Branch, in the county of Monmouth and State of New Jersey, have invented a new and Improved Fender, of which the following is a specification.

This invention relates to yieldably-mounted means for taking the place of the spring-piles now commonly employed for the easing of the contact between vessels and docks, piers, and similar structures; and the object of my improvement is to provide yieldable means to prevent destructive and dangerous shocks of contact between moving vessels and stationary structures, which means shall be strong, which cannot decay, and which may be replaced when injured. I attain this object by the construction illustrated in the accompanying drawings, in which—

Figure 1 is an elevation, and Fig. 2 a plan, of the end of a dock or pier provided with my improved fenders. Fig. 3 is a vertical longitudinal cross-section of a fender and its supporting-pile. Fig. 4 is a transverse cross-section of a fender secured to a solid pile.

Similar reference characters refer to like parts throughout the several views.

Piers, docks, and abutments against which vessels, particularly steamers, are to land must be protected, so that there shall be no unyielding impact between them and the vessels. If the stationary structure is of stone or concrete, there is danger of the side of the ship being caved in, while if the dock is of timber the vessel may crumple it up. To prevent this, heavy piles are often driven some distance from the dock, either singly or in groups, as the necessity may require, and the resilience of these piles is relied upon to overcome the moving inertia of the vessel and lighten the blow between it and the dock. The objection to such piles is that they do not last, being broken off, cut off by insects, rotting, pulling out by ice, and are very unsightly.

In the construction shown in the drawings a dock or pier 1 is shown provided with fenders 2, which are supported by piles 3 or other portions of the structure. Where metal piles are inclosed in concrete docks, open spaces must be left for the rods 4, upon the outer ends of which the fenders are supported. Strong springs 5 between the fenders and piles and 5^a between the piles and the washers 6 hold the fenders in position. The nuts 7 are held on the ends of the rods by pins 8. To hold the fenders from swinging laterally, the rods 9 are secured in the bottoms of the fenders by set-screws 10. Any other desirable connecting means may be employed. The fenders preferably extend down below low-water mark. (See A A, Fig. 1.) Wood piles 12, Fig. 4, are preferably provided with sleeves 13 and washers 14 to protect them from excessive wear.

The number and size of the rods 4 and springs may be varied as the service may demand. The fenders are preferably of hollow half-round of good thickness and provided with inwardly-extending lugs 11 at top and bottom, which may contact with the piles before the spring 5 gets ground to pieces.

By the use of a plurality of springs it will be seen that inward pressure on the lower rods will cause the middle rods and their springs to act as fulcrums, transmitting some of the pressure on the springs 5 on the lower rods to the springs 5^a on the upper rods.

Having now explained my improvements, what I claim as my invention, and desire to secure by Letters Patent, is—

1. In a dock construction, the combination of a series of piles, a plurality of rods slidably mounted in each pile, a fender mounted on the outer ends of said rods, springs between said fender and said pile, washers on the inner ends of said rods, springs mounted between the said pile and washers, and means connecting the lower ends of adjacent fenders, said fenders having inwardly-projecting lugs at each end adapted to contact with the pile to prevent injury to the springs.

2. In a dock construction, the combination of a series of piles, a plurality of rods slidably mounted in each pile, a fender mounted on the outer ends of said rods, springs between said fender and said pile, washers on the inner ends of said rods, springs mounted between the said pile and washers, and means connecting the lower ends of adjacent fenders.

3. The combination of a pile, a plurality of rods slidably mounted in each pile, a fender mounted on the outer ends of said rods, springs between said fender and said pile, washers on the inner ends of said rods, and springs mounted between said pile and washers.

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

JOHN TRUAX.

In presence of—
FRANK VAN BRUNT,
JOHN A. MANEE.