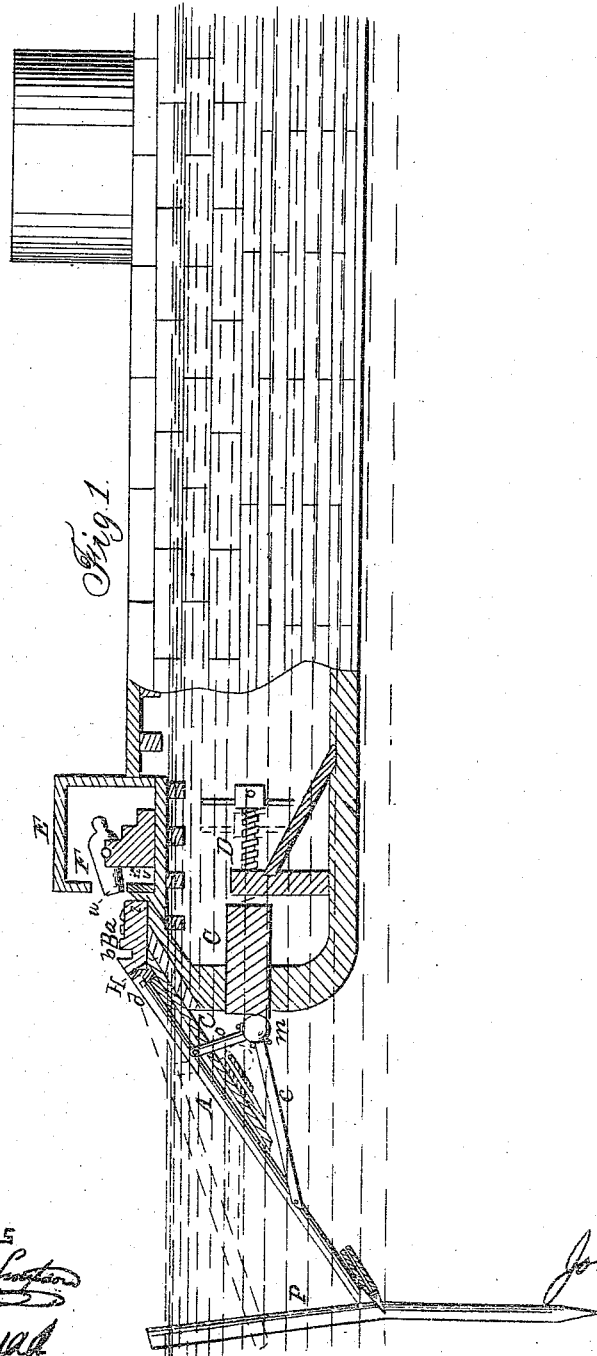


J. D. HALL.

Marine Torpedo.

No. 45,562

Patented Dec. 20, 1864.



Witnesses
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Inventor
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UNITED STATES PATENT OFFICE.

JOHN D. HALL, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO HIMSELF
AND OSBORN CONRAD, OF SAME PLACE.

IMPROVEMENT IN METHODS OF REMOVING HARBOR OBSTRUCTIONS.

Specification forming part of Letters Patent No. **45,562**, dated December 20, 1864.

To all whom it may concern:

Be it known that I, JOHN D. HALL, of the city of Philadelphia, in the county of Philadelphia, in the State of Pennsylvania, have invented a new and improved means for cutting, parting, or removing piles, chains, cables, booms, or similar obstructions from harbors, harbor-entrances, channels, rivers, or other places, for the purpose of enabling the ingress or egress or passage of vessels or ships of war, or for other purposes; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, in which—

Figure 1 is a longitudinal elevation of my invention attached to a vessel of the monitor class. Fig. 2 is a plan of the same. Fig. 3 is a cutting-shot suitable for cutting piles under water. Fig. 4 is a rectangular-faced shot suitable for parting cables or booms in connection with the massive iron jaw B.

Corresponding parts in the different figures are represented by the same letter.

This invention consists in constructing upon the fore part of an iron-clad or other suitable vessel a small turret or tower for the protection of a suitable cannon and the necessary men to operate the same, of placing upon the said vessel, at or near the intersection of the stem and water-line, a massive iron jaw, and of attaching to the bow of the said vessel a strong iron fork in such a manner that the same may be made to project directly and horizontally in front of the vessel or be inclined at an angle of about forty degrees, so that the front or forked-end shall be about as low in the water as the keel of the vessel, while the other end is in the proper position, at or near the said iron jaw, to carry any chain, cable, boom, or similar obstruction which may be placed, stretched, or supported across the channel, river, harbor, or passage-way into the said jaw or notch as the vessel moves forward, so that the same may be readily parted by the discharging of a suitable shot along one side of the said jaw, the shot and the jaw operating in the manner of a powerful shears.

It consists, further, in so attaching the said fork to the vessel that the same may be so elevated that as the vessel moves forward the fork will embrace any pile or similar obstruc-

tion which may be standing, driven, or supported in the channel or passage way of the said vessel at any desired height above the level of the vessel's keel, thus bringing the vessel into such a relative position to the pile or other obstruction that a suitable cutting-shot, discharged from the said cannon at a proper angle of depression and the proper instant, will cut the said pile at such a depth below the surface of the water as will enable the vessel to pass over in safety.

To enable others to construct my invention and apply the same to use, I will proceed to describe it with reference to the drawings.

This invention may be applied to any vessel of suitable size, though I will first describe it as applied to a vessel of the "monitor" class, on the supposition that the same is to be used within the range of an enemy's guns.

On the fore part of the vessel I would construct an iron turret or tower, E, of suitable dimensions to admit of the cannon F being operated therein, and of sufficient impregnable to protect the said cannon and its operators. This turret may be comparatively small and low, as the gun F should be short, and the floor of the turret may be sunk some distance below the vessel's deck. The gun F may be quite short. Probably a bore of between thirty inches and four feet in length and between six and ten inches in diameter would be suitable for most practical purposes. This gun I would rifle with four straight grooves, one groove at each of the termini of the vertical and horizontal diameters, in such a manner that the wings or flanges of the shots represented in Figs. 3 and 4 will fit them, and thus cause the cutting-edge N, Fig. 3, to retain its horizontal position, and the rectangular face I, Fig. 4, its vertical position. The body of these shots from J to K should be of sufficient length to enable the piston-shaped end K to be pushed against the powder, while the portions L and M protrude from the mouth of the gun. The shot represented in Fig. 3 is intended for cutting or removing piles; the one in Fig. 4 for parting or removing chains, cables, booms, or similar obstructions. Probably a common cylindrical shot would answer all practical purposes for parting chains, cables, booms, or other similar obstructions; but as the one represented in Fig. 4 may be preferable, I have

concluded to represent it. The first object in making these flange or wing shots is to produce the proper reduction in their weight, notwithstanding their greater than usual length. The second object is to enable the pile-cutter, Fig. 3, to enter water at an acute angle and to proceed therein in a straight line.

To enable the gun to be sufficiently depressed for a shot to strike a pile at the desired point, I would construct in the prow or fore part of the vessel the inclined shot-channel H to as great a depth as practicable or necessary, and would then locate the turret E as far from the prow of the vessel as possible and yet accomplish that object. The lower end of this channel may reach two or three feet below the water-line and be readily closed when this invention is removed; or, if deemed best, this channel may terminate above the water-line, but the higher it terminates the farther forward will it be necessary to locate the turret. This channel may pass directly over or through the stem or at one side thereof. The inclined iron bar G may be attached to the vertical or inclined sides or walls of the said channel, the object of said bar being to prevent the shot from glancing or deflecting from a right line at or near the surface of the water, the shot being discharged in such a manner that the edge of the top flange thereof shall in its flight bear against the lower face of the said bar. This bar may, however, be entirely dispensed with in practice, as I am of the opinion that the shot shown in Fig. 3 will enter water at a small angle without being considerably deflected from a right line.

The massive jaw B may be of either cast or wrought iron. It should lie upon a plane level surface, and be so provided with a bolt or bolts, *a* and *v*, and the spring or cushion *w* and the slot *e*, or other suitable devices, as to permit the necessary recoil to relieve the vessel from shock.

The inclined iron frame, consisting of the pieces A, the braces *c*, *o*, and *n*, and the cross-piece *m*, turns on the bolt *d*, according as the slide C is forced forward or allowed to recede by the operation of the screw D, thus causing the pieces A to assume any desired angle of inclination between the one represented in the drawings and a horizontal line.

The slide C may consist of a simple iron bar, and should slide through a water-tight stuffing-box.

The aforesaid iron frame I would, as far as practicable, construct of wrought-iron pipes, the ends thereof being closed water-tight, so as to exclude the water therefrom; and thus render the frame buoyant. This frame may in this manner be made to contain the necessary strength without adding any considerable weight to the bow of the vessel. It will also, thus constituted, move easily through the water, and thus not materially interfere with the speed or management of the vessel.

The operation of this invention is as follows: Suppose an iron or other cable or boom

is suspended across a channel or vessel's path, and it be desired to pass along the said channel, I would load the gun F with the shot shown in Fig. 4, or any other suitable shot, the rectangular face standing vertically, and would so aim the said gun that the said shot in its flight will pass along and close to the jaw or notch *b*, and would so depress the frame or fork A that the force or forked end thereof will be about as low as the vessel's keel. Then as the vessel advances the frame A will run under any cable or boom which the vessel would not run over, and thus by the continued advance of the vessel carry the same upward until it falls into the notch *b*, at which instant the gunner discharges his gun, aimed as above described. The cable being thus instantly parted, the vessel may continue on in her course. The jaw B, having recoiled or been carried forward by the force of the shot, may now be drawn back to its original position by any suitable power applied to the bolt *v*. Again, suppose it were desired to remove piles or other similar obstructions from a channel or harbor or other place, so as to enable the passage of vessels, I would, by means of the screw D, or any other suitable device, force the slide C forward until the frame A assumes the position shown by the dotted lines, Fig. 1, or any other desired or suitable position, and the gun F being loaded with the shot, shown in Fig. 3, or any other suitable shot having the cutting-edge N in a horizontal position, and being aimed at the proper angle of depression, I would advance the vessel until the fork *n* embraces and comes in contact with the pile it is desired to remove, at which instant I would discharge the gun, the shot passing under the guide or bar G and cutting the pile, as shown in Fig. 1. It may be noticed that the advancing pressure of the vessel against the pile will render a comparatively light blow from such a shot sufficient to destroy a large pile when the shot is discharged at the proper instant.

To apply this invention to a common high-decked vessel, it would only be necessary to construct a suitable port-hole through or by one side of the stem at or near the water-line, the frame A being attached about at the water-line, the jaw B protruding a sufficient distance through the said port-hole, and the gun F being placed within the vessel in the proper relative position.

What I claim as my invention, and desire to secure by Letters Patent, is—

The employment of a cannon in connection with the jaw B and the adjustable inclined plane or spars A and fork *n*, attached to a monitor or other vessel, for the purpose of removing obstructions from harbors, channels, &c., substantially as described.

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Witnesses:

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