

Full hull of 1-16 Iron and strong to stand the strain of towing, at least.....	127lbs.
Charge of nitro-glycerine.....	400 "
15 horse engine of the finest construction, including shaft, wheel, bearings, etc., complete.....	500 "
Rudder, bearing, etc.....	25 "
Fuse nipples and gravitation cylinders, etc.....	75 "
Total .....	920lbs.

This little comparison shows at a glance that Mr. Ericsson's torpedo, as described by him, would have about 1 10th more specific gravity than the element in which she is to float, and that consequently, her first action would be to go to the bottom, without stopping at the fifteen feet depth mentioned by the inventor. Such being a fact, there is no longer any necessity for wasting more time on this apparent incongruity, and I have now to add, that even if Mr. Ericsson's hull, etc., were a success, which seems very doubtful according to dimensions and description as given by him, that although small and easily transported, it is not in itself complete, as it requires the enormous reel to accommodate the two miles of tubular cable-engine, boiler, air pumps and other paraphernalia, which would be a cumbersome and complicated mass to handle, and would be exposed to destruction from an enemy's fire if placed on the open coast, without a fortification to defend it. While the Lay torpedo, when charged, is complete, offering only a single object 25 feet long and 3 feet diameter to be handled, and permitting the operator with his dial plate to find a place of protection anywhere where a hole large enough to hide a man can be excavated.

The employment of two separate propellers, wheels, turning in opposite directions, in order to prevent a rotary movement of the hull, is of itself sufficient proof of the want of practical experience in submarine boats; for, with a proper location of the machinery and other weights, it would be impossible to rotate the hull, supplied with the largest power which she could accommodate.

In conclusion I shall be gratified to learn that there be no other "fatal defects," than those already cited in Mr. Ericsson's submarine torpedo.

WILLIAM A. KIRKLAND,  
Commander United States Navy, and one of the Board ordered to inspect the Lay torpedo.  
Newport, R. I., December 17, 1872.

AMERICAN HARBOUR DEFENCE.

A fortnight ago we endeavoured to make the readers of the *Broad Arrow* acquainted with the present condition, and prospects of the United States Navy. We did not venture to suggest that the North American Government was rapidly ceasing to be a maritime Power; we preferred to say that the Navy was being starved to pay the national debt, since that date, however, we have official documents in which the larger fact is admitted. A system of harbor defence is being devised which is to protect the United States "against the Maritime Powers." A confession of this nature is worth a ton of criticisms by a foreigner. When Americans admit their inability to cope with other powers on the open sea, and contemplate the possibility of the unopposed invasion of their waters, their naval position sinks to that of a third rate Power, and the scream of the American eagle ceases to be more alarming than that of a parrot or a popinjay.

The new system of harbour defence has been indicated in the last two or three reports of the Chief of Engineers to the

Secretary of War, and it may be succinctly described as the gradual replacement of the old earthen barbette batteries by a different class of structures, something on what we know in this country as the Moncrieff style in which the gun shall rise to fire, and then return out of sight. Within the range of these harbor forts torpedoes are to be planted or placed in readiness for discharging against the enemy's vessels. In a few very wide channels ships are to be sunk, as in Sebastopol Harbour. By these means the Americans hope to give their harbours protection against even the most recently constructed and powerful "ironclad vessels of the maritime Powers." But even here we discern the influence of what Carlyle designates as the cheap and dastly. The Americans have not devised, and do not think of building, a single casemated structure. They allow that such forts afford adequate protection from a front, a flank, and on overhead fire, but they are frightened at the cost, as in the case of the struggle of armour *versus* guns. They propose to use high sand parapets, with substantial traverses on each side—a combination which will secure, they think, the necessary protection, and "substitutes sand, as a cheap material, "for the costly iron shield-turrets." The guns, as we have said, are to be so mounted as to run up to fire and down to load. Carriages for these purposes have been approved and constructed. But when all has been done the artillerymen will be but indifferently protected from a vertical fire, and from the explosion of heavy shells. They cannot live in sandbag forts, and hence a proportionate amount of barrack building will be necessary. The forts are to command the torpedo-line so that the enemy will have some clear indication as to the site or ground of their submarine engines. Trials have been proceeding for some time at Willett's Point, and the chief engineer states that investigations have gone so far as to enable the authorities to fix upon the special system that shall be adopted.

The sum which has been estimated as necessary to apply the system to the principal American harbour is £250,000 but of this only £60,000 is to be voted in the coming financial year, so that the most important harbours may be first protected. Upon these points we shall probably have more details after a time, should the Chief Engineer's recommendations be adopted, and should Congress see fit to vote the necessary supplies. At present, many of his suggestions are *sub judice*, and that all of them will be carried out is more than the most sanguine can expect. The United States is in no particular hurry in these matters, and feels a sense of security in its insecurity that would be foolishness in a European Power.

We may gather confidence from a comparison of our own efforts with what is doing on the other side of the Atlantic. Our important naval stations are tolerably secure. Our ironclads are both numerous and efficient, and we are not arrested by economic notions in the work of defence. Some commercial ports require immediate attention, but we shall hardly think of building sandbag forts because they will be cheap and may be thought efficient. Torpedoes will be employed, no doubt, in the event of a war, but to what extent, and under what system, we cannot yet precisely determine. But, under any circumstances, we have a respectable fleet, upon which we can rely and we have not yet consented to lose our rank as a maritime Power. *Broad Arrow*.

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NOTICE TO CONTRACTORS.

SEALED TENDERS, addressed to the undersigned and endorsed "Tender for Repairs of River Works," will be received until Friday, the 21st instant, at noon, for the performance of certain repairs at Calumet Mountain, Hull and South Chaudiere on the Ottawa River, and at certain Stations on the Gatineau and Madawaska Rivers.

Specifications can be seen at the office of the Superintendent of the Ottawa River Works, on and after Monday, the 20th instant, where printed forms of tender and other information can be obtained.

The Department will not be bound to accept the lowest or any tender.

By Order,

F. BRAUN,

Secretary.

Department of Public Works,

Ottawa, January 13th, 1873.

3-2in



NOTICE TO CONTRACTORS.

SEALED TENDERS, addressed to the undersigned and endorsed "Tender for Petewawa Works," will be received until Thursday, the 16th instant, at noon for the performance of certain repairs of Slides, Dams, &c., from the First Caste to Thompson's Rapids, on the Petewawa River.

Specifications can be seen at the office of the Superintendent of the Ottawa River Works on and after Friday, the 16th instant, where printed forms of Tender and other information can be obtained.

The Department will not be bound to accept the lowest or any Tender.

By Order,

F. BRAUN,

Secretary.

Department of Public Works,

Ottawa, 6th January, 1873.

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