

(No Model.)

G. E. HAIGHT.

GAS EXPANSION CHAMBER FOR TORPEDO BOATS.

No. 250,144.

Patented Nov. 29, 1881.

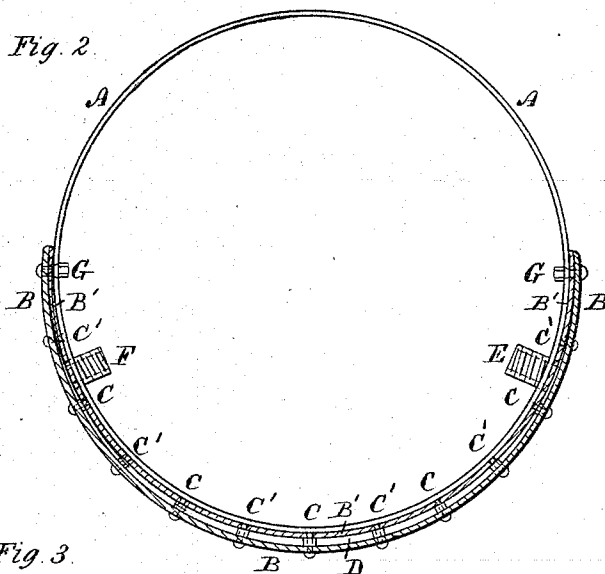


Fig. 1.

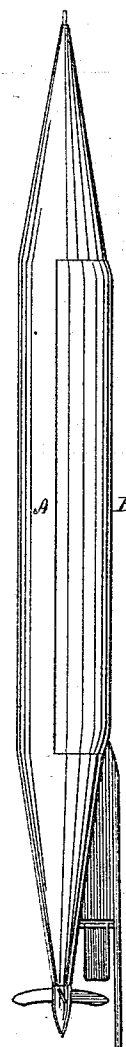
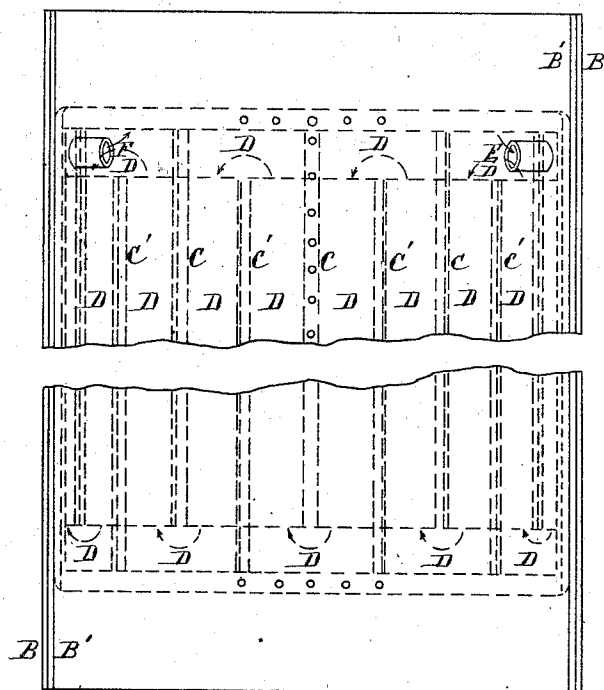


Fig. 3.



Witnesses.

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UNITED STATES PATENT OFFICE.

GEORGE E. HAIGHT, OF HARTFORD, CONNECTICUT.

GAS-EXPANSION CHAMBER FOR TORPEDO-BOATS.

SPECIFICATION forming part of Letters Patent No. 250,144, dated November 29, 1881.

Application filed October 17, 1881. (No model.)

To all whom it may concern:

Be it known that I, GEORGE E. HAIGHT, of Hartford, in the county of Hartford and State of Connecticut, have invented certain
5 new and useful Improvements in Expanders for Torpedo-Boats; and I do hereby declare that the following is a full, clear, and exact description thereof, whereby a person skilled in the art can make and use the same, reference being
10 had to the accompanying drawings, and to the letters of reference marked thereon.

Like letters in the figures indicate the same parts.

My improvement relates to torpedo-boats
15 which are furnished with a propeller for driving them through the water, which is operated by an engine the motive power of which is a condensed gas. Such boats are fitted with a flask or receptacle of great strength, which contains the condensed gas under a very high pressure, being generally under sufficient pressure to
20 be in a liquid form. This is allowed to escape from the flask as required for the engine, and upon being relieved from a part of the pressure suddenly expands to many times its former volume, and is then used in the engine. The gas in expanding develops a great degree of cold by abstracting heat from surrounding objects, and thus sometimes freezes the liquid
30 remaining in the flask, and the gas also requires to have a large amount of heat supplied to it in order to bring it up to a temperature at which it can be efficiently used in the engine.

35 The object of my invention is to provide a more efficient mechanism than has heretofore been in use for the purpose of raising the temperature of the gas by means of heat derived from the water through which the boat
40 passes.

In the accompanying drawings, illustrating my invention, Figure 1 shows a side view of a torpedo-boat furnished with my improvement. Fig. 2 shows a cross-section through the cylindrical part of the hull, with the interior parts
45 not relating to my invention omitted. Fig. 3 shows a top view of the lower half of the part of the hull containing my improvement, with a portion in the middle cut out, so as to show

the essential portions on a larger scale, the 50 scale of Figs. 2 and 3 being the same.

A is the ordinary exterior shell of a torpedo-boat.

B and B' are two semi-cylindrical metallic shells, bolted together at their edges, the upper one of which is intended to fit close to the
55 shell of the boat, and the other slightly separated from it, so as to leave a space between them. The ends of the lower shell are curved upward to meet the inner one, as shown in Fig. 1, thus entirely inclosing the space between
60 them.

C C' are partitions between the two shells B B', extending from one end nearly to the other. The partitions C commence at the upper end,
65 as shown in Fig. 3, and extend nearly to the lower end, and the partitions C' commence at the lower end, as shown in the same figure, and extend nearly to the upper end. These
70 partitions are held in place by bolts or rivets passing through the two shells, as shown in the drawings. This arrangement makes a continuous channel, D, from side to side of the boat.

E is the inlet-pipe from the gas reservoir or flask, through which the liquid condensed gas
75 is admitted by a suitable cock in the desired quantity to propel the engine.

F is the outlet-pipe, through which the heated gas, expanded to its full volume, passes to the
80 engine.

The gas, in passing from E to F, traverses a long distance through the channel D, moving in the direction of the arrows, and has a large surface exposed to the action of the sea-water
85 through the plate B, by which its temperature is raised nearly or quite to that of the surrounding water, which is constantly replaced by the boat passing through it. By this means a much greater efficiency is obtained
90 from the same amount of gas than by the ordinary methods of conveying the gas to the engine. This result is also obtained without materially increasing the resistance of the boat moving through the water or requiring any
95 regular projections from the hull.

My improved expander can be attached to the ordinary shell of the boat by means of the

bolts G, or in any other suitable and convenient manner; and it will be observed that the inner shell, B', may, if desired, form part of the ordinary shell of the boat.

5 What I claim as my invention is—

In a torpedo-boat, the exterior shells, B and B', having the partitions C C' between them, whereby a channel, D, is formed for the pur-

pose of bringing the condensed gas in contact with the surrounding water, to raise its temperature, substantially as described.

GEORGE E. HAIGHT.

Witnesses:

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