

(No Model.)

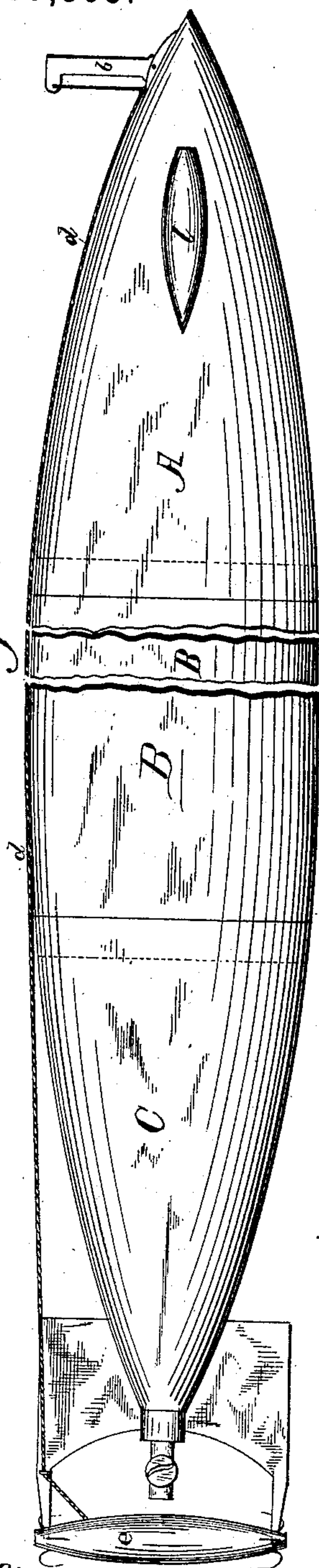
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M. E. HALL.  
AUTO-MOBILE TORPEDO.

No. 387,353.

Patented Aug. 7, 1888.

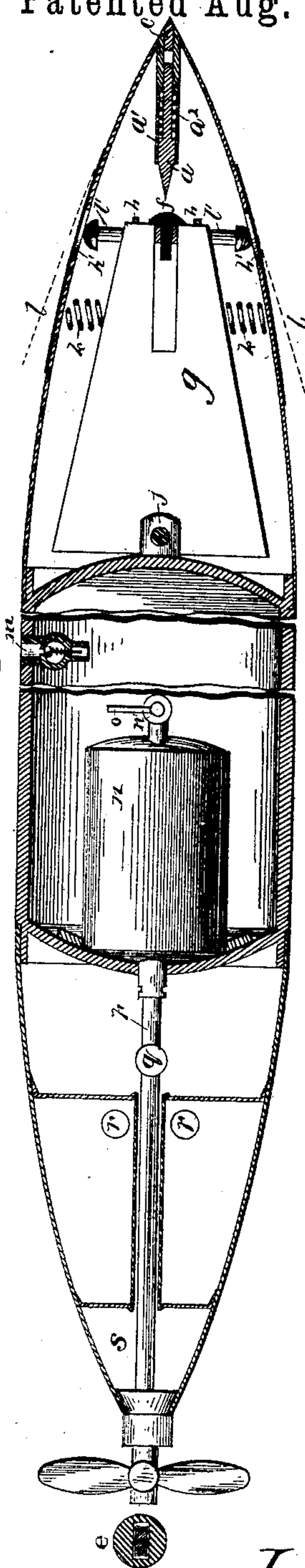
Fig. 1.



Witnesses:

J. B. McGirr.  
B. H. Lacy.

Fig. 2.



Inventor:  
Martin E. Hall.  
per Emerson Hodges.  
Attorney

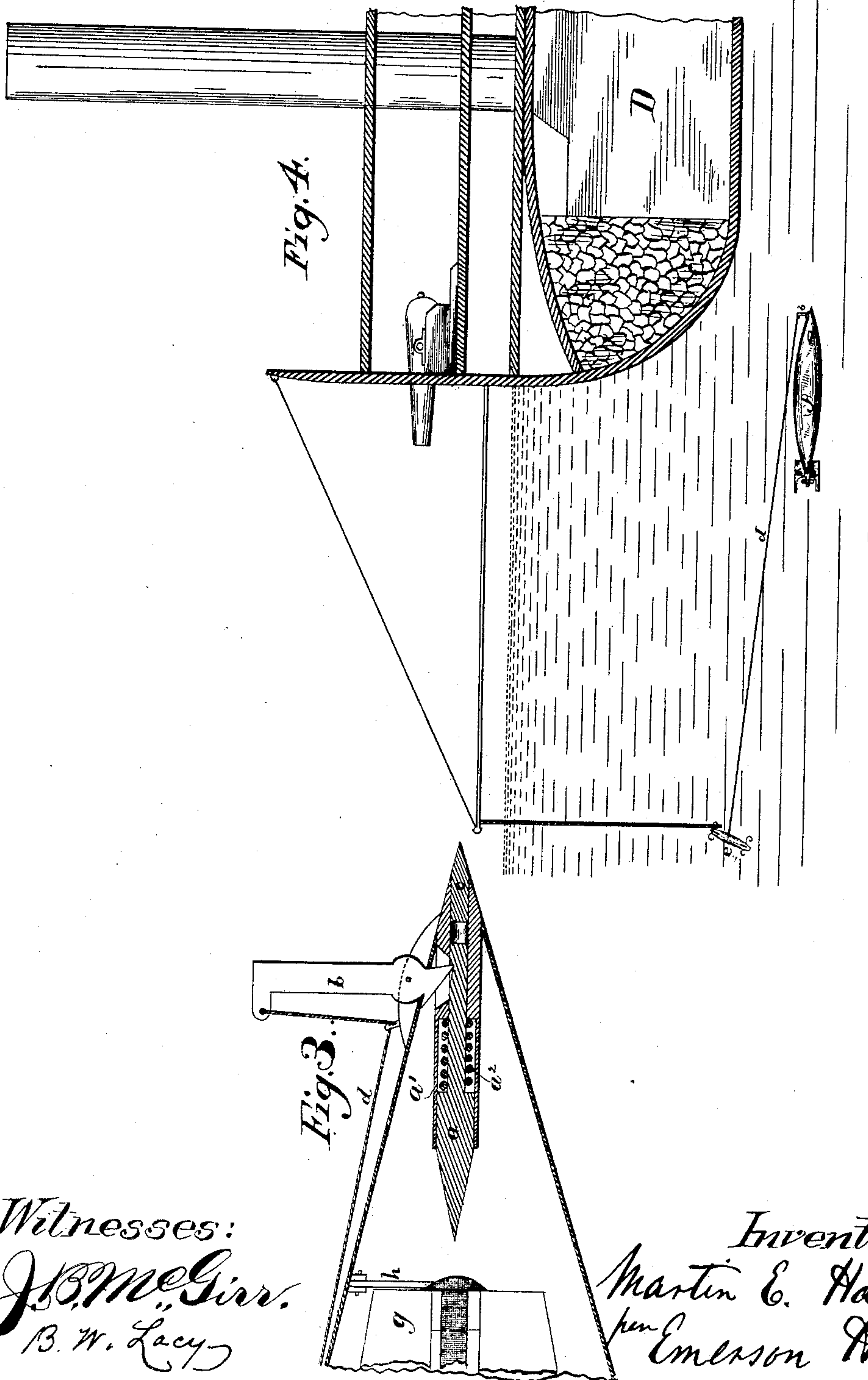
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# UNITED STATES PATENT OFFICE.

MARTIN ELLSWORTH HALL, OF THE UNITED STATES NAVY.

## AUTO-MOBILE TORPEDO.

SPECIFICATION forming part of Letters Patent No. 387,353, dated August 7, 1888.

Application filed August 1, 1887. Serial No. 245,875. (No model.)

*To all whom it may concern:*

Be it known that I, MARTIN ELLSWORTH HALL, of the United States Navy, a citizen of the District of Columbia, residing at Catskill, 5 in the county of Greene and State of New York, have invented certain new and useful Improvements in Auto-Mobile Torpedoes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in auto-mobile torpedoes.

15 The object is to provide an automatic fish-torpedo which, when propelled through the water, will take a course at a predetermined and an approximately constant depth.

20 A further object is to provide a torpedo which will right itself when tipped from its upright position.

A still further object is to provide a torpedo which will clear nets and obstructions and always explode beneath the bottom of a vessel.

25 To accomplish these objects I have devised the following mechanism, which is fully described and claimed.

In the accompanying drawings, Figure 1 is a side elevation of my improved torpedo. Fig. 30 2 is a horizontal section. Fig. 3 is a vertical section of the bow, showing the arrangement of the firing-trigger. Fig. 4 is a view showing the operation of my torpedo against a vessel protected by nets.

35 A, B, and C represent three separate sections or compartments into which my improved torpedo is divided. In the first of these is contained the firing apparatus, magazine, and pectoral fins. A sharp-pointed firing-pin, *a*, 40 is loosely fitted in a sleeve, *a'*, in the extreme end of compartment A. A spiral spring, *a''*, surrounds a portion of this pin and by its tension tends to force the pin inward; but the pin is normally held in check by a trigger, *b*, which 45 is pivoted in close proximity thereto, with one of its ends in engagement with the firing-pin. In front of the pin and in the end of the sleeve a short rod, *c*, is located and adapted to be driven against the pin and break the lock of 50 the trigger when the end of the torpedo strikes a vessel.

Immediately back of the firing-pin, and be-

tween the latter and the compartment B, is yieldingly suspended a magazine, *g*, by means of links or hangers *h*. The magazine is some- 55 what smaller than the compartment A, and it is pivoted at its rear end, *j*, so as to allow a slight lateral movement, the magazine being centered by springs *k* when the torpedo is on an even keel; but when the torpedo rolls the 60 pectoral fins *l* are brought into use. These fins normally rest over the ports *h'*, through which the rods *l'* project in resting against the fins. Now, on rolling, say, to starboard, the forward end of the magazine swings to the 65 right, pressing out the starboard fin, as shown by dotted lines, thus causing a greater resistance on that side than upon the other and righting the torpedo. A roll in the opposite direction will of course result in a similar 70 movement of the port fin. Upon the torpedo regaining an upright position the magazine is again centered by gravity and springs *k*.

A primer, *f*, located in the end of the magazine near the firing-pin *a*, explodes the charge 75 when the pin strikes it after being freed by the rod *c* or trigger *b*.

Contiguous to compartment A is compartment B. As a motive power I prefer to employ gas, air, or steam, and this compartment 80 B (which I shall henceforth term "flask" B) is charged with such material through a suitable cock, *m*, the flask being surrounded with some non-conductor of heat when steam is employed. Within this flask the engine *n* lies, 85 the gas (air or steam) being admitted thereto through throttle-valve *n'*, controlled by means of a lever, *o*. The engine exhausts through pipe or conduit *p*, which is provided with a check-valve, *q*, to prevent water from enter- 90 ing the torpedo at the end of the run. The pipe *p* passes through still another compartment, C, termed the "air-chamber," in which the depth of diving of the torpedo is regulated. This chamber has openings *r r* in the bottom 95 to admit water into it when the water-pressure exceeds that of the atmosphere. The stern of the torpedo is lighter than the bow when this chamber C is filled with air, so the bow is inclined slightly downward until sufficient wa- 100 ter enters the chamber to produce an equilibrium. The greater the difference in weight between the bow and the stern the larger the quantity of water that must enter the air-



chamber C. This necessitates higher compression of the air, and hence greater pressure of water (greater depth) to bring the torpedo to a horizontal position.

5 Should the torpedo be launched in a seaway, its initial angle of discharge might be so great as to carry it far below the required depth. In this case so much water would enter the air-chamber C that the stern of the torpedo would  
10 become heavier than the bow, and, being inclined upward, the torpedo would rise until an equilibrium was established.

The after compartment, s, of the air-chamber forms the controller. By simply placing  
15 therein a greater or less weight a proportionately less or greater quantity of water in the air-chamber C will produce an equilibrium of the torpedo, and hence it will dive to a less or greater depth.

20 The buoyant grapnel e is placed, as shown in Fig. 1, before the torpedo is discharged. Upon striking the water the grapnel e is dragged off and aft by the pressure of water against it, and, being quite buoyant, it floats  
25 at a less depth than that for which the torpedo is regulated, and thus fouls the protecting-net of a vessel that the torpedo itself passes under. The tow-line d, which connects with trigger b, is reeled up within the grapnel until the re-  
30 sistance of the water drags the grapnel aft. This tow-line is lightly stopped down along the top of the torpedo, and these stops are carried away before any strain is brought upon the trigger.

35 In Fig. 4 D, shows a vessel protected by nets. A is the torpedo, which, having passed under the net, is now in close proximity to the vessel's bottom. e is the buoyant grapnel afoul of the net, and d the tow-lines set taut  
40 by the strain and about to trip the trigger b and fire the magazine of the torpedo. The torpedo is propelled in the ordinary manner, and as constructed it may be discharged by running directly into or against a vessel, or  
45 by striking the trigger b, or by means of the grapnel and tow-line disengaging the trigger just as though the latter were struck. Ordinarily these provisions are sufficient to always warrant the discharge of the torpedo at just  
50 the proper moment and in the proper place; but other means might be employed to make the discharge even more certain; and hence I do not wish to limit myself to the exact construction of these parts or to the exact con-  
55 struction of any part of my invention; but,

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an auto-mobile torpedo, the combination, with a shell, of a movable magazine located in said shell, a firing-pin in position to discharge this magazine, and a trigger located in position to liberate the firing-pin, substantially as set forth.

65 2. In an auto-mobile torpedo, the combination, with a shell and a movable magazine lo-

cated in the shell or casing, of a set of pectoral fins connected with such shell, adapted to be outwardly extended by the movement of the magazine, substantially as set forth.

3. In an auto-mobile torpedo, the combination, with a shell and a magazine yieldingly supported therein, of a set of pectoral fins connected with the shell and adapted to be outwardly extended by the lateral movement of  
75 the magazine, and mechanism for discharging the magazine.

4. The combination, with a shell or casing and a magazine yieldingly supported in said casing, said magazine having a primer located  
80 therein, of a spring-actuated firing-pin in position, when released, to discharge the primer, and a trigger for liberating this pin, substantially as set forth.

5. The combination, with a shell, a magazine yieldingly supported in said shell by springs and hangers, and a primer located in one end of the magazine, of a pair of pectoral fins connected with the shell and in position to be alternately outwardly extended by the  
90 lateral movement of the magazine, a spring-actuated firing-pin adapted to strike the primer when liberated, and a pivoted trigger for engaging or disengaging the firing-pin, substantially as set forth.

6. In an auto-mobile torpedo, a shell provided with a magazine yieldingly suspended therein and suitable means for discharging the same, an immersion-chamber having unobstructed holes in its bottom, and a separate  
100 compartment of the air-chamber containing a suitable number of removable weights, whereby a proportionately less or greater quantity of water in the air-chamber will produce an equilibrium of the torpedo and control its  
105 submersion to a less or greater depth, substantially as described.

7. In a torpedo, the combination, with a pivoted trigger, a magazine, and a firing-pin normally held by said trigger, of a buoyant  
110 grapnel and a line connecting this grapnel to the trigger for the purpose of discharging the magazine when the grapnel is caught or obstructed, substantially as set forth.

8. The combination of a torpedo having a  
115 trigger thereon and a buoyant grapnel connected by a tow-line or cable to the trigger of the magazine for the purpose of discharging the same when the grapnel is caught or obstructed, substantially as set forth.

9. In a torpedo, the combination, with a shell, a magazine therein, and a firing device, of a buoyant grapnel connected to the firing device and adapted, when engaged, to discharge  
120 the magazine, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

MARTIN ELLSWORTH HALL.

Witnesses:

H. B. HILL,  
P. GARDNER COFFIN.