(No Model.) 4 Sheets—Sheet 1.

A. WEEKS.

ROCKET TORPEDO.

No. 274,067. Patented Mar. 13, 1883.

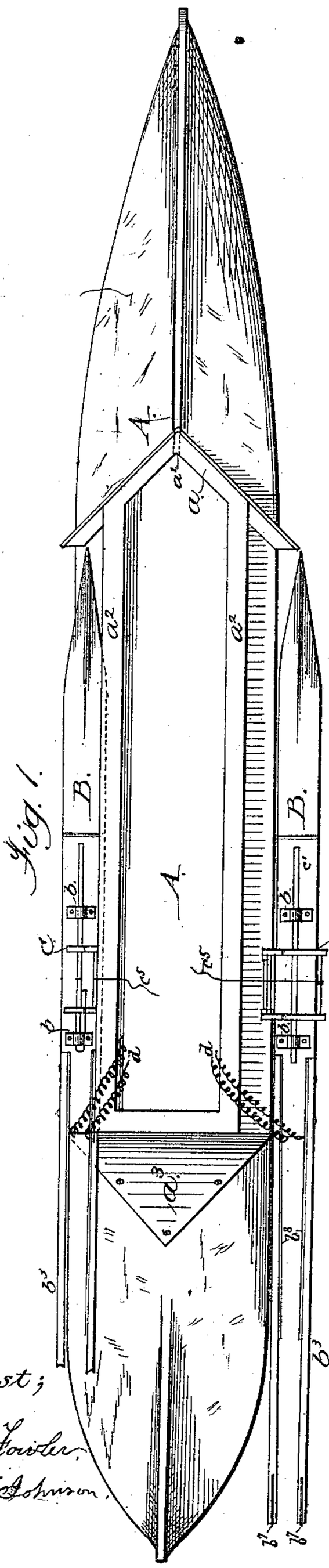

Fig. 1.

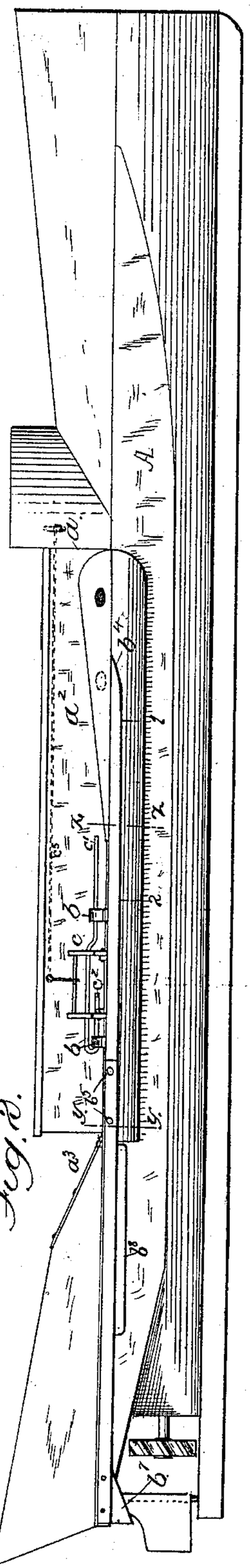

Fig. 2.

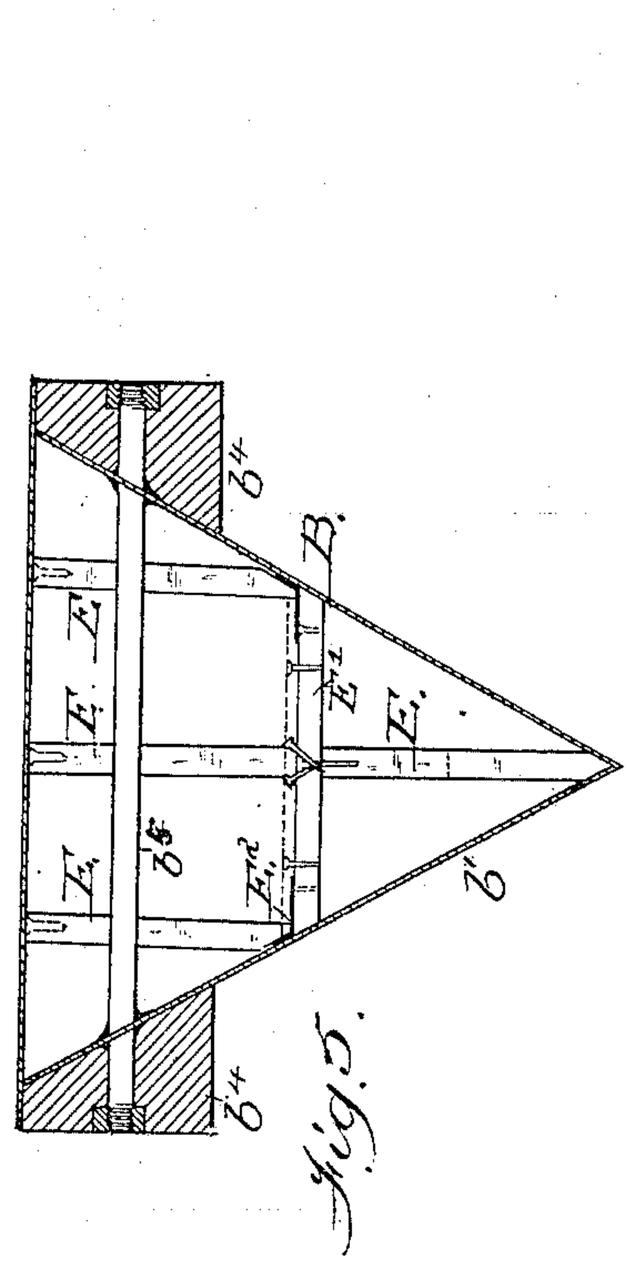

Fig. 3.

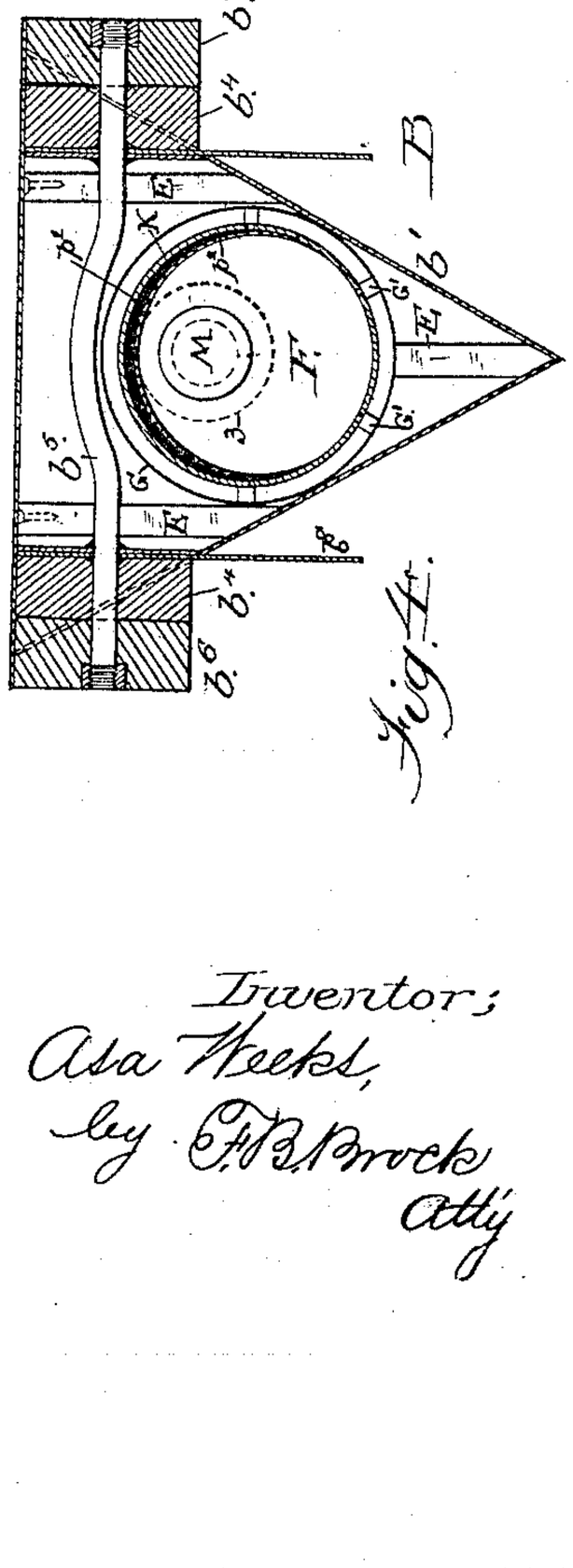

Fig. 4.

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(No Model.)

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A. WEEKS.

ROCKET TORPEDO.

No. 274,067. Patented Mar. 13, 1883.

Fig. 3.

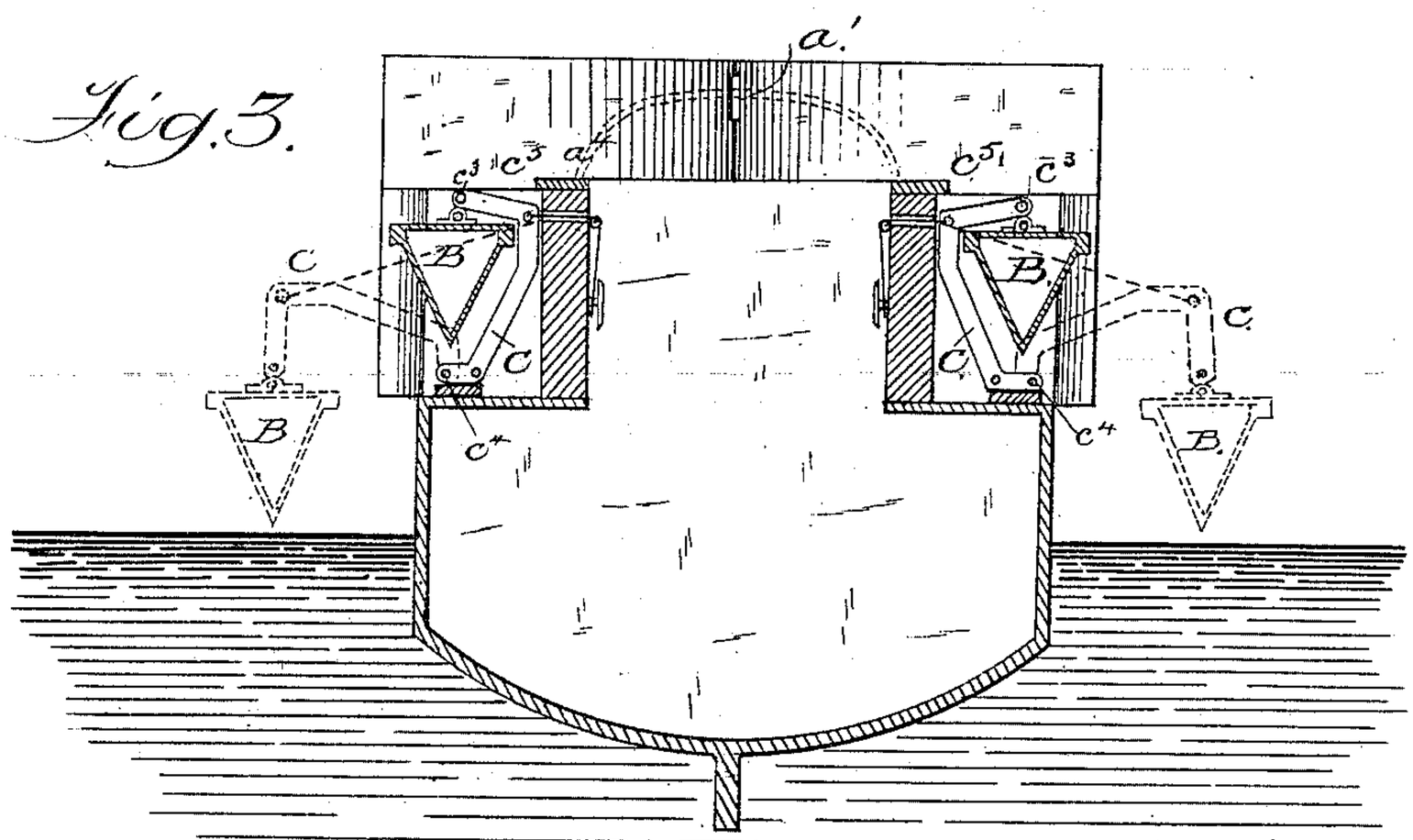
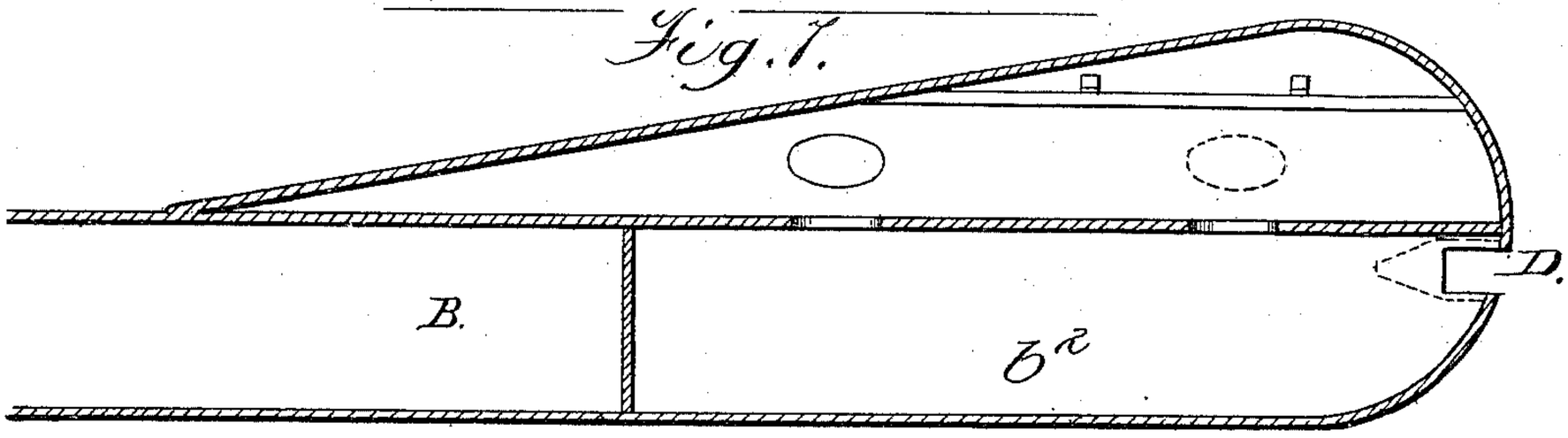


Fig. 1.



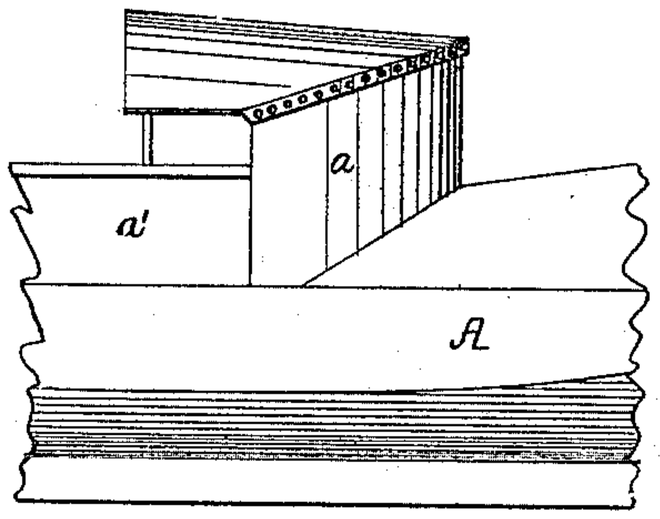


Fig. 11

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(No Model.)

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ROCKET TORPEDO.

No. 274,067. Patented Mar. 13, 1883.

Fig. 6.

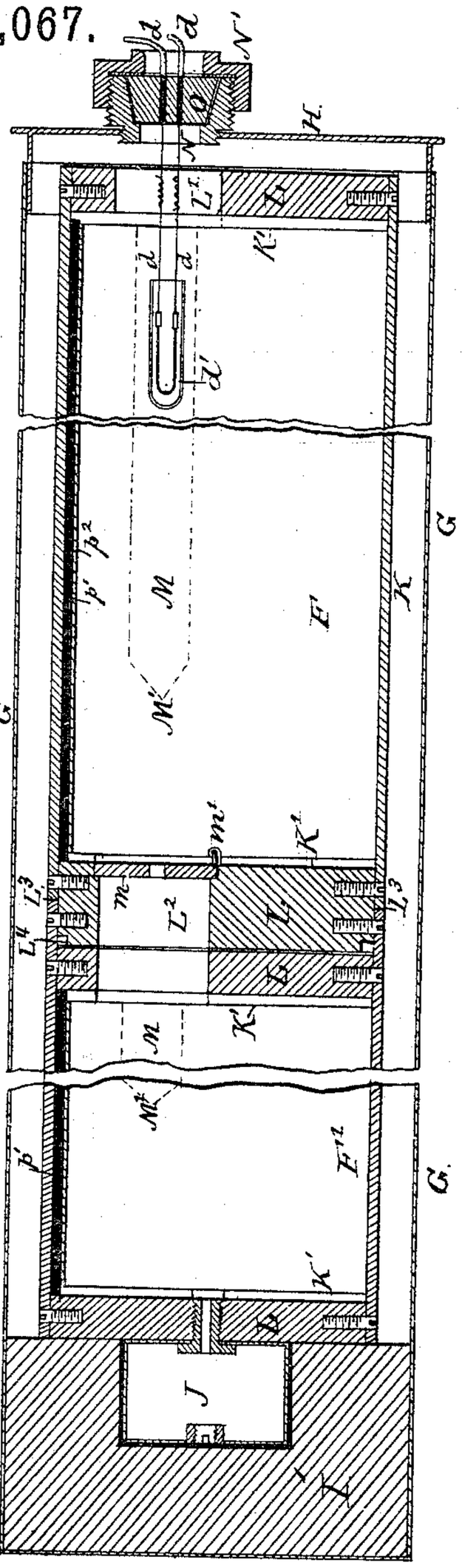
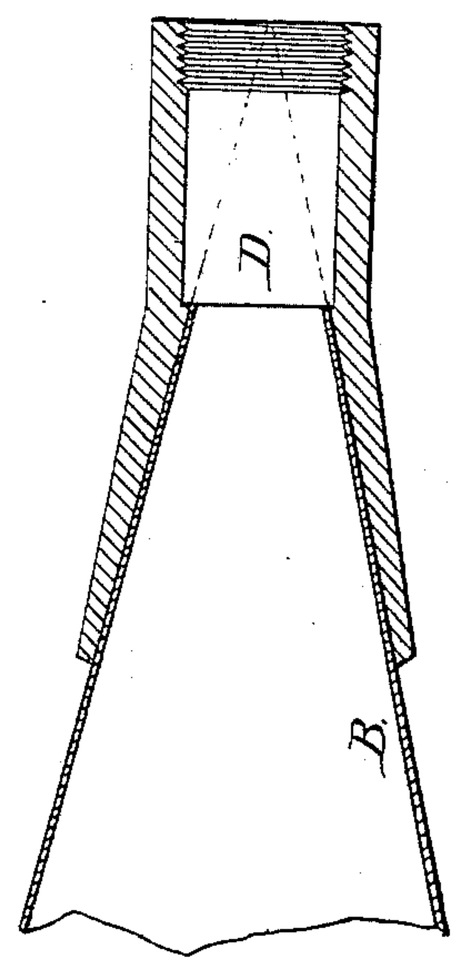


Fig. 8.



Attest;

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(No Model.)

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ROCKET TORPEDO.

No. 274,067. Patented Mar. 13, 1883.

Fig 10.

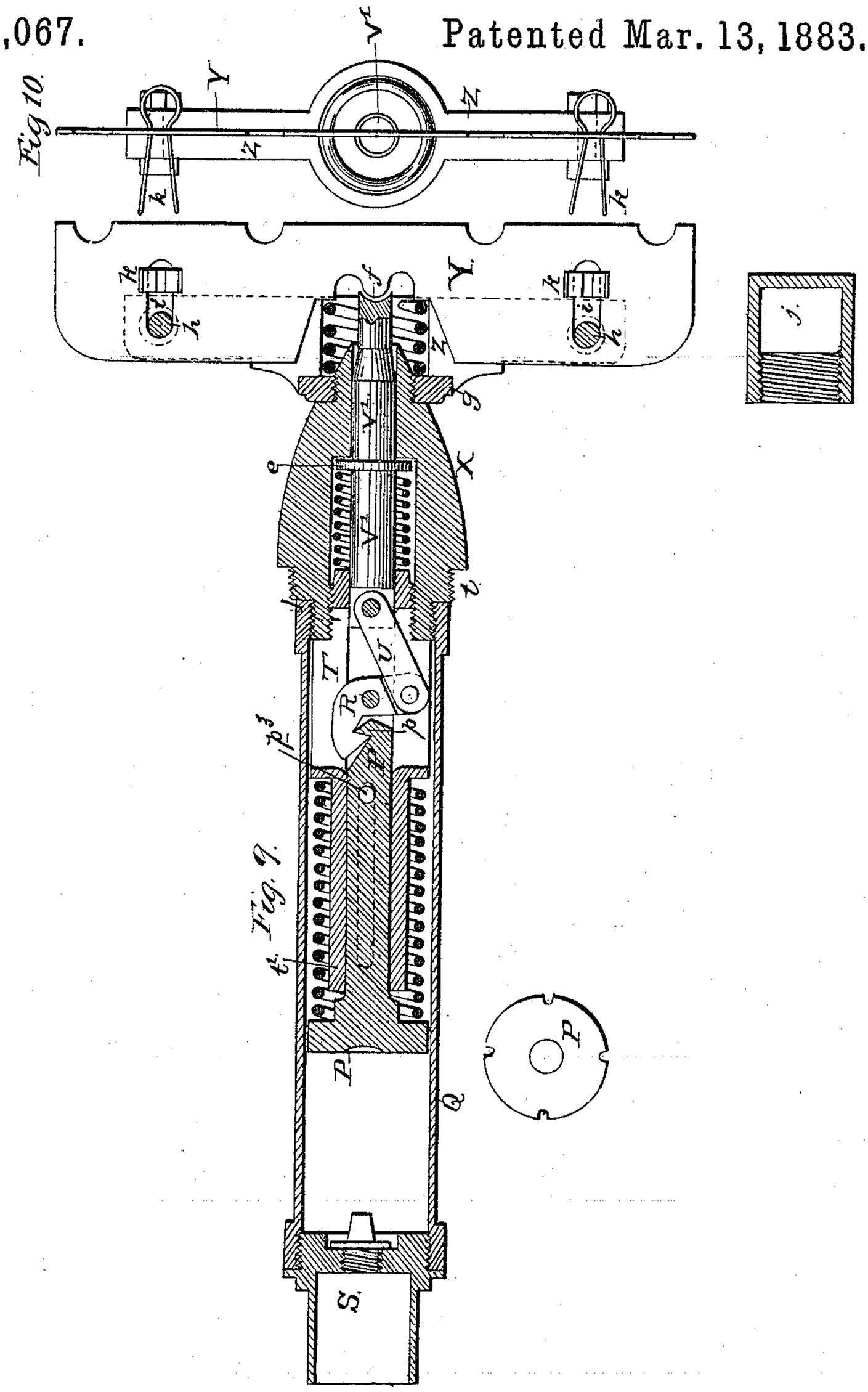

Fig. 9.

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James O'Marceron

Inventor:

Asa Weeks
by E. B. Brock,
Atty

UNITED STATES PATENT OFFICE.

ASA WEEKS, OF MINNEAPOLIS, MINNESOTA.

ROCKET-TORPEDO.

SPECIFICATION forming part of Letters Patent No. 274,067, dated March 13, 1883.

Application filed April 19, 1882. (No model.)

To all whom it may concern:

Be it known that I, ASA WEEKS, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvement in Torpedoes; and I do 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, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

Figure 1 represents a top plan view of a boat to which my invention has been applied. Fig. 2 represents a side elevation of the same. Fig. 3 represents an enlarged transverse vertical section through the torpedo-boat and floats. Fig. 4 represents an enlarged transverse vertical section, taken through the line *y y* of Fig. 2, of one of the floats; and Fig. 5, a similar view taken through the line *z z* of Fig. 2. Fig. 6 represents an enlarged longitudinal vertical section of the rockets. Fig. 7 represents an enlarged detail sectional view of the front end of one of the floats, and Fig. 8 a similar detail view of the same. Fig. 9 represents (full size) a central longitudinal section through the percussion-fuse, and Fig. 10 a detail end view of the same. Fig. 11 represents a modified form of deflecting armor-plate, designed to more completely protect the men operating the boat and floats.

My present invention relates to rocket-torpedoes; and it consists in the following construction, arrangement, and method of operation, which I will first fully describe, and then set forth in the claims the points of novelty therein.

Referring to the annexed drawings, A represent a boat adapted to be self-propelled by steam or other power. The boat may be of any desired shape or construction. It is desirable, however, to make some provision for keeping the floats B under cover when not required for immediate use. Any form of boat, therefore, which complies with the above condition, or that has recesses in its sides, will serve the purposes of my invention.

In the construction of the boat A, I prefer to provide it with a deflecting-armor, *a*, of sufficient thickness to withstand any projectile from machine-guns. It may be of the form shown in Figs. 1, 2, and 3 or of the shape illustrated in Fig. 11. Forward of this deflector *a* the boat A is decked over with steel plate, of the form shown in the drawings. The upper end of the prow of the boat is in line with a sight, *a'*, Fig. 3, in the armor-plate *a*, so that when the boat is in line with the object aimed at, the floats B, carried thereon, will also be pointed in the same direction. To the rear of the deflector *a* the main deck is inclosed by a railing, a^2, within which the men stand when operating the boat. This inclosure may or may not have a covering over it, shaped in cross-section as seen in dotted lines, Fig. 3. In the rear of the railing or bulwark is an inclined deflecting armor-plate, a^3, designed to deflect a ball should it pass over the deflector *a* and strike thereon. The boat A, aft of the inclosure and deflector a^3, is decked over in a manner similar to the forward part of the boat, for the purpose of glancing shot directed against the boat forward or in the rear of the same.

The rocket-torpedo floats B are preferably two in number, and are arranged upon the main deck so as to come behind the deflector *a* when not in use, sufficient space being provided on either side of the deck outside the bulwark a^2. In this position they are entirely covered by the deflector *a* from a forward shot of the enemy on line extending in the line of the length of the boat. These floats B are lowered for action on detaching davits C, the outer ends of which carry hooked-shaped rods *c*, which pass through eyes *b*, secured to the top of the floats B. The hook-bar *c* consists of two horizontal rods, c' c^2, each having a shoulder at their rear ends, or end next the stern of the boat, and their forward ends free and horizontal, so that the floats B may have a free clearing forward motion therefrom. Each hook-bar *c* is journaled at c^3 in the outer end of its davit C. These davits are made of the shape shown in Figs. 1, 2, and 3, and pivoted to the deck or upon a projection thereon, so that the floats B may, when not in use, hang therein behind the deflecting-armor. A line, c^5, is attached to each of the davits C, and passes over a sheave, a^4, on the railing a^2, inside the inclosure, and fastened to a cleat op-

posite the davits, or at a point in the forward part of the inclosure. (See Fig. 2, dotted lines.)

When it is desired to clear the floats B for action the lines c^5 are detached and the davits C swung outwardly, when the gravity of the floats will cause them to swing downwardly alongside the boat. They are shown in this last-named position by dotted lines in Fig. 3.

I prefer, in the construction of the surface-floats B, to employ V-shaped sides b', so that the ratio of displacement will increase very rapidly as the float is submerged, thereby giving great buoyancy. The sides b' are made of sheet metal and converge at their front ends, forming a sharp cut-water. In the lower part of the bow is located the dynamite or torpedo chamber b^2, having inclosing-walls to partition it off, (see Fig. 7,) and carries a percussion-fuse, Fig. 9, located in a socket, D, Figs. 7 and 8. Above this torpedo-chamber b^2, at the front end of the boat, is an air chamber or shell similar in shape to the lower front portion, but inverted thereon, the purpose of which is, in the event of the float kicking up behind or burying its prow in the water or waves, to cause it to more easily emerge or right itself. In this casing are formed arm-holes with suitable caps or covers, and with correspond holes pierced through the top partition of the chamber b^2, to admit of said chamber being charged with dynamite or other explosive compound.

The greatest width of the floats B is at a point about the rear end of the torpedo-chamber, (seen at line 1, Fig. 2,) and from that point to the rear of the float and of its steering-rods b^3 the sides are parallel, or they gradually taper, as shown in Fig. 1. A strip or overhanger, b^4, extending from near the bow to the rear, is secured to the sides of the floats, a continuation of which, bolted to the rear of the rocket by the bolts b^5, forms the steering-rods b^3. These steering-rods are made of any shape, either of wood or metal, solid or hollow, as may be found expedient, in order to properly weight and balance the float B. The rear ends of these steering-rods b^3 have fixed rudders b^7, while the forward ends of the overhangers b^4 are beveled or sharpened, so that the tendency is, when striking the water in the forward movement of the float, to ride upwardly.

Sectional Fig. 5 shows the detailed construction for bracing and securing the frame and sides of the surface-float B. It consists of vertical strips E, cross-bolts b^5, cross-brace E', angle-irons E^2, &c.; but any other suitable means for bracing the boat B may be adopted.

The dynamite-magazine chamber extends rearward to a point about the dotted line 1, Fig. 2, and the propelling rocket or rockets of the floats B and their inclosing-tube extend from the rear to about a point indicated by the dotted line 2, same figure.

The rockets proper, F, furnish the power which drives the floats B. Either single or double rockets may be used. In practice I prefer to employ a double rocket, F F', Figs. 4 and 6, in each float B.

G represents a sheet-metal tube resting upon and between the supports E and the sides b' of the float. This tube G and the double rocket F F' are shown in enlarged section, partly broken away, in Fig. 6. The end of tube G at the rear of the float B is open, and has a cap, H, fitting snugly thereon. The other end of the tube G is closed by a head, and a wooden block, I, inserted therein, having a central cylindrical cavity, J, for the reception of an explosive charge, for a purpose hereinafter referred to.

F F' represent the double rocket. They comprise a shell, K, with heads L L, in which the rocket composition or powder is placed. Before, however, the composition is placed therein, a layer of clay, K', is placed against the inner walls of the heads, so as to shield them from direct contact with the fire, and thereby prevent undue expansion and the escape of the gases. The composition powder is bored out at M eccentric to the longitudinal axis of the shell, as shown in Figs. 4 and 6. The bore, moreover, does not extend clear through the rockets, but ends at the points M', Fig. 6, so that the end of the bore of the rocket F shall be nearer the end of its inner head than to the bottom of the shell, and so that, also, the end of the bore of rocket F' shall be the same distance from the end or farther than to the lower part of the shell, for a purpose shortly to be described. The inner head, L, of the rocket F is made double the thickness of the contiguous head, L, of the rocket F', and the shell K of the latter made to overlap the adjacent face of the head to a point, L^3, half the thickness of the head L of rocket F. This latter head has a peripheral recess, L^4, adapted to be filled in with clay or other packing. This construction prevents the escape between the heads of the gases generated when the rockets are fired.

L' represent an eccentric opening in the outer head of rocket F in a line with the bore M thereof, and L^2, a similar opening through the contiguous heads of the rockets F F'. The cap H, which closes the end of the tube G, has also an opening, N, concentric to the bore of the rocket F. In this opening is placed a rubber packing or insulator, O, having holes, through which pass the electric wires d d for firing the rocket.

N' is a screw-cap for compressing the rubber O to make a water-tight joint.

d' represents an igniter of the usual construction in electrical connection with the wires d d. It consists in this case of a platinum loop in a casing containing powder. Beyond or outside of the cap H the wires d d are insulated, and are led aboard the boat A to a suitable battery and operating-key. The shell K is kept concentric within the tube G by a series of projections, G', Fig. 4, arranged at suitable points and intervals.

The percussion-fuse is shown full size by Figs. 9 and 10.

P represents the firing-pin, and is provided

at one end with a head fitting loosely the inner diameter of the casing Q. This head has a series of peripheral channels cut therein, through which the air may escape (between said head and the nipple which receives the percussion-cap) when the firing-pin is released from its trigger. The other end of the firing-pin P has a catch, *p*, over which the pawl or trigger R engages when the firing-pin is forced back and cocked.

S represents the chamber into which the nipple is screwed, which carries an ordinary cap containing fulminate. The chamber S is itself screwed into the inner end of the casing Q, and its open end is in direct communication with the dynamite in the chamber b^2, Fig. 7. In this chamber additional fulminate may be placed, if desired.

T represents an inner shell, the inner extension of which forms a sleeve, *t'*, through which the firing-pin works. Said pin P is prevented from turning round in the sleeve by a stud, p^3, operating in a slot of suitable length in the sleeve. Surrounding this sleeve *t'* is a coiled spring under compression when the firing-pin is cocked, and resting between the head of the firing-pin and the shouldered end of the sleeve. The trigger R is pivoted in the shell T. A link, U, connects the trigger with the spring-bolt V' by being pivoted respectively thereto.

X represents the portion of the percussion-fuse which, by means of the exterior thread, *t*, is screwed into the socket D, Fig. 8, in the bow of the float B. This casing X is perforated to receive the spring-bolt V'. The bolt V' is provided with a collar, *e*, working within a shouldered recess in the casing X. In this annular recess, between the collar *e* and the end of the casing T, is a coiled spring having a constant tendency to shove the spring-bolt V' outwardly, and thereby hold the trigger R normally within the catch *p* of the firing-pin through the link U. The outer end of the spring-bolt V' projects beyond the casing X, so that contact with any obstacle will operate it by shoving it inwardly. The bolt has a beveled shoulder just within the end of the casing, so that tallow, grease, or other packing may be placed around the bolt V' to keep out the water. A cap, *j*, screwed on the end of the casting X, provides against accidental discharge when not in use. A percussion-fuse is secured to the bow of each float B.

For attacking vessels protected by torpedo-nets, I use the plate Y, (shown in Figs. 9 and 10.) This plate has a lug, *f*, centrally arranged, which takes into a cavity formed in the end of the spring-bolt V'. The plate is screwed into a slotted guide, Z, having a central hub or barrel, *g*, provided with a screw-thread for securing it to the end of the casing X. In the outer ends of this guide are pins *h h*, passing through slots *i i* in the plate Y. A spiral spring coiled within the barrel *g* and resting between shoulders on the plate Y and the barrel serves to keep the plate at the inner ends of the slots *i i* and the actuating-lug *f* from contact with the end of spring-bolt. When this plate is attached to the percussion-fuse it is certain, by reason of its width, to catch in the meshes of the net, cause a compression of the spring in the barrel *g*, and shove the bolt V' inwardly, which in turn will operate the link U, causing it to pull the trigger out of its catch and release the firing-pin P. The same result takes place should one end only of the plate Y strike the netting or obstacle. In that event the end of the plate opposite the end struck would act through the pin *h* as a fulcrum to the power, the resistance being at the lug *f*, which operates the percussion-fuse. These plates Y may be used in case a vessel is or is not provided with a protecting netting; but it is preferred to dispense with them when a ship is unprotected thereby, and allow the spring-bolt V' to make direct contact. Safety-pins *k* are inserted in the slots *i* in front of the guide Z, to provide against accidental discharge when not in service. This percussion-fuse (shown in Figs. 9 and 10,) is screwed into a casting or socket having the opening D, Fig. 8, and which is secured to the bow of the float B. It is then soldered or otherwise made perfectly watertight. The attack is made with the boat "bow on." When holding this course everything is under cover from the enemy. The two floats B are swung in upon their davits C behind the deflecting-armor *a*, and the peculiar shape given the deck-plate of the boat forward and aft of the inclosure wherein the men operate the apparatus will serve to glance all light shot. When within desired distance from the vessel to be attacked, and the steersman has got the boat in line with the sight through *a'* and the prow of the boat A, word is given to detach the ropes from the cleats which hold the davits C and to launch or clear the floats B for action. (Seen in dotted lines, Fig. 3.) In this position I prefer that the keel of the floats be slightly above the water-line, especially in rough water. The floats B being held in the same line with the direction of the boat A, it is obvious that they will point in the same direction as the boat.

When the word "fire" is given the circuits through the pairs of wires *d d* are closed, which causes the igniter *d'* to explode and sets the charge of the rockets of the floats B on fire. At the same instant a pressure is generated, which drives out the cap H over the wires *d d*, and a stream of fire issues through the hole N', giving a forward impetus to the float. The bore M being eccentric or out of the center of the rocket-shell K, it is evident that the rocket composition will burn away at the upper portion of the shell before the powder in the lower portion has been consumed. The circle of fire from the bore M as a center grows larger till it reaches the form indicated by dotted line 3, Fig. 4. From that stage of the burning rocket the surface of the slow-burning powder presented to the action of the fire does not increase in a line transverse to the

length of the rocket, for beyond the point indicated in Fig. 4 by the dotted circle 3 the area of the burned-out segment of the rocket increases in the same ratio as the area of the burning bore of the rocket, or nearly so. In order to prevent the shell K, at its upper periphery, from becoming heated red-hot and unduly expanding from prolonged and direct exposure to the fire, as above set forth, a crescent of calcined plaster, p', is used. (Shown in Figs. 4 and 6.) To keep this plaster in place, a plate of thin sheet metal, p^2, extending about three-fourths of the inner circumference, is employed. The end M′ of the bore M of the rocket F is preferably less distant from the inner head of the rocket than the distance to the lower circumference of said rocket, in order that the fire may reach the hole L^2, connecting the two rockets, before the rocket F has burned out. This opening L^2 has a plate, m, having a small central aperture, through which the flames may pass to set the rocket F′ on fire. It is proposed to make this plate m either of metal fusible at low temperatures—such as zinc—or it may be made of iron. The function of this plate is to prevent the gases generated in the rocket F from bursting prematurely through the head into the rocket F. When made of zinc it is melted or burst through after a brief contact with the flames, and the forward rocket thereby provided with a free exit through the opening L^2 for the gases generated. When the plate m is made of iron it is provided with a hinge, m', so that when the fire through the opening in the plate communicates itself to the powder in rocket F′ the back-pressure instantly generated will force out the plate, when it will swing downwardly alongside the head and allow of the free escape of the gases, and not cause an obstruction, which it might otherwise do if not hinged.

It is not essential that the bore of the rocket be made in the upper portion of the same, as it may be placed at any point out of the center, though I prefer the former construction. The end M′ of the bore M of rocket F′ is about the same or a greater distance from the inner end of said rocket than the distance to the lower periphery of the shell. This is rendered desirable in order that the rocket may burn completely out at its forward end and mid-length at the same time, or before it reaches the inner end of the rocket, whereby the small magazine of powder located in the block of wood I, and which has communication with the inner end of the rocket, may not be exploded till the rocket has burned itself out. This magazine is provided in the event of the float B missing the object aimed at, and so that said float may be blown up when its motive power is spent.

The advantages which result from making the bore of the rocket or rockets eccentric to or off the center is that the distance is increased from the bore M to the lower side of the shell K, thereby increasing the time of consumption of the slow-burning composition, and so that the whole force or power of the rocket is distributed more evenly over a longer period of time. When the bore of the rocket has burned to the dotted line 3, Fig. 4, the surface area of the burning composition does not increase, but assumes constantly-changing arc or crescent shapes till completely burned out, as has been heretofore described. The speed of the rocket-floats is about seventy-five feet per second, and the entire distance traveled over by the rocket-float depends upon the structure and time of burning of the rocket.

It was found in practice that the stream of fire issuing from the rockets at the rear of the floats had a tendency to get under the steering-rods b^3, between them and the water, lifting the rear of the float, and consequently burying the bow. In order to prevent this tendency, gas-guides b^8, Figs. 1, 2, and 4, are provided, consisting of strips of sheet metal, which guide the escaping gases between the steering-rods, to which they are secured. To prevent the tendency, also, of the fire and gases getting under the steering-rods, the eccentric hole M of the rockets is preferably put above the center of the same, Fig. 4. The upper portion of the rocket burning away first, the boat at its rear end lightens up at that point, thereby relieving it from top-heaviness and keeping it trim. The rocket-float, also, when first started, and before its rocket-powder has burned itself out, is of sufficient weight to partially submerge the steering-rods b^3. As the rocket composition burns away, lessening the weight at the rear of the float, the tendency of the rocket-float at that point is to rise and to depress the bow of the float. This tendency is counteracted by the dead-weight of the steering-rods, as they are lifted out of the water when the float is lightened at the rear, and said steering-rods thus act as a compensator in trimming the boat during the burning of the rocket.

The steering-rods may be detached from the float for convenience of stowage and transportation.

The floats B are self-starting and self-clearing. They may vary, however, in contact by a few seconds if not started at the same instant. This variation of time of contact is utilized in attacking vessels protected by torpedo-nets. The first float reaching the net will explode, raising the net and débris into the air, before the falling of which the other float has made contact with the vessel.

More than two rockets may be used in each float, if desired.

Throughout the specification the floats B have been described for use only on a boat of special construction. I do not wish it understood, however, that I confine my invention to the particular form of boat for carrying the floats herein described, or, in fact, to any boat. I propose to construct the floats and davits independent of each other and of the boats for carrying them, or in combination with each other, as may be found desirable and expedient.

It is proposed to use the floats B, with or without the davits C, for harbor-defense by arranging them under coverts (capable of standing the largest projectiles) along the shore. The floats may also be towed by any boat, with any means for firing them.

What I claim is—

1. A swinging detaching-davit having its outer end provided with a double-hook horizontal guiding-rod, substantially as described, in combination with a rocket-float having eyes adapted to slide upon said guiding-rod, whereby the float may have a free clearing motion on and off the same.

2. A float for marine rockets, having a body of substantially the form described, and provided with two fixed steering-rods extending astern and parallel with each other, substantially as set forth.

3. A float for marine rockets, having a body of substantially the form described, and provided with two fixed steering-rods having fixed rudders extending astern and parallel with each other.

4. A rocket-float having an air-chamber triangular in cross-section and provided with a vertical apex, located above the explosive charge on the front half of the float, to give increased buoyancy at that point, whereby the float is prevented from diving or burying its bow, as set forth.

5. A float for marine rockets, having a body of substantially the form described, and provided with two parallel fixed steering-rods extending astern, the forward continuation of which steering-rods form overhangers running alongside the float to a point near the bow, as set forth.

6. A float for marine rockets, having a body of the form substantially as described, and provided with overhangers at its sides and two parallel steering-rods extending astern, having fixed rudders, substantially as set forth.

7. A float for marine-rockets, having a body of the form substantially as described, and provided with overhangers at its sides and two parallel fixed steering-rods extending astern, with gas-guides, as described, secured upon and between said rods.

8. A rocket having a cylindrical charge of firing composition bored out eccentrically.

9. A rocket having a cylindrical charge of firing composition bored out eccentrically, and a segmental fire-proof lining arranged on the sides of rocket-shell nearest the bore.

10. A double rocket having a cylindrical charge of firing composition bored out eccentrically, except at a point about midway of the double rocket, and which forms a temporary fire-wall, so that one end of the rocket may burn out before the other is fired.

11. Two cylindrical rocket-shells, arranged end to end, and having three heads, the middle one of which is common to both, with an eccentric opening in the middle, and outer heads of substantially the same diameter as the eccentric bores of the rockets.

12. A double rocket having a middle partition or head, provided with an opening having a temporary metallic partition plate or plug adapted to be destroyed or thrust aside in the burning of the rocket, as set forth.

13. A double rocket having a middle partition or head, provided with an eccentric opening having a temporary partition plate or plug adapted to be destroyed or thrust aside in the burning of the rocket, as set forth.

14. In combination with a rocket-float, a single or double rocket having spuds or projections G, and a tube inclosing the rocket, so as to form an annular air-space between the two latter, substantially as described.

15. In combination with a rocket-float, a single or double rocket having spuds or projections G, a tube inclosing the rocket, so as to form an annular air-space between the latter two, and a removable cap for inclosing the end of the tube, substantially as set forth.

16. The percussion-fuse, substantially as described, comprising an outer casing carrying the anvil or nipple and an inner shell carrying the operating parts, consisting of a spring-impelled firing-pin, a pivoted trigger engaging a catch on the firing-pin, a contact-bolt, a pivoted link connecting the trigger and said bolt, and a spring which thrusts the contact-bolt outwardly and keeps the trigger normally within its catch.

17. In combination with the firing or contact bolt of a torpedo, a plate or bar of sufficient length to catch the strands of a torpedo-net, having slots in its opposite ends working in pins in a guide, and an operating lug or detent in line with the contact-bolt, whereby, if one end only of the bar or plate were to strike the said net or obstacle, the opposite end and its slot would act as a fulcrum on its pin to a resistance applied to the contact-bolt by the operating-lug.

18. The plate Y, having slots in its opposite ends, which normally extend without the guide of the said plate, in combination with the spring Z and safety-pins adapted to be inserted in the said slots when the torpedo is not desired for immediate use.

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

ASA WEEKS.

Witnesses:
F. B. BROCK,
W. T. JOHNSON.