

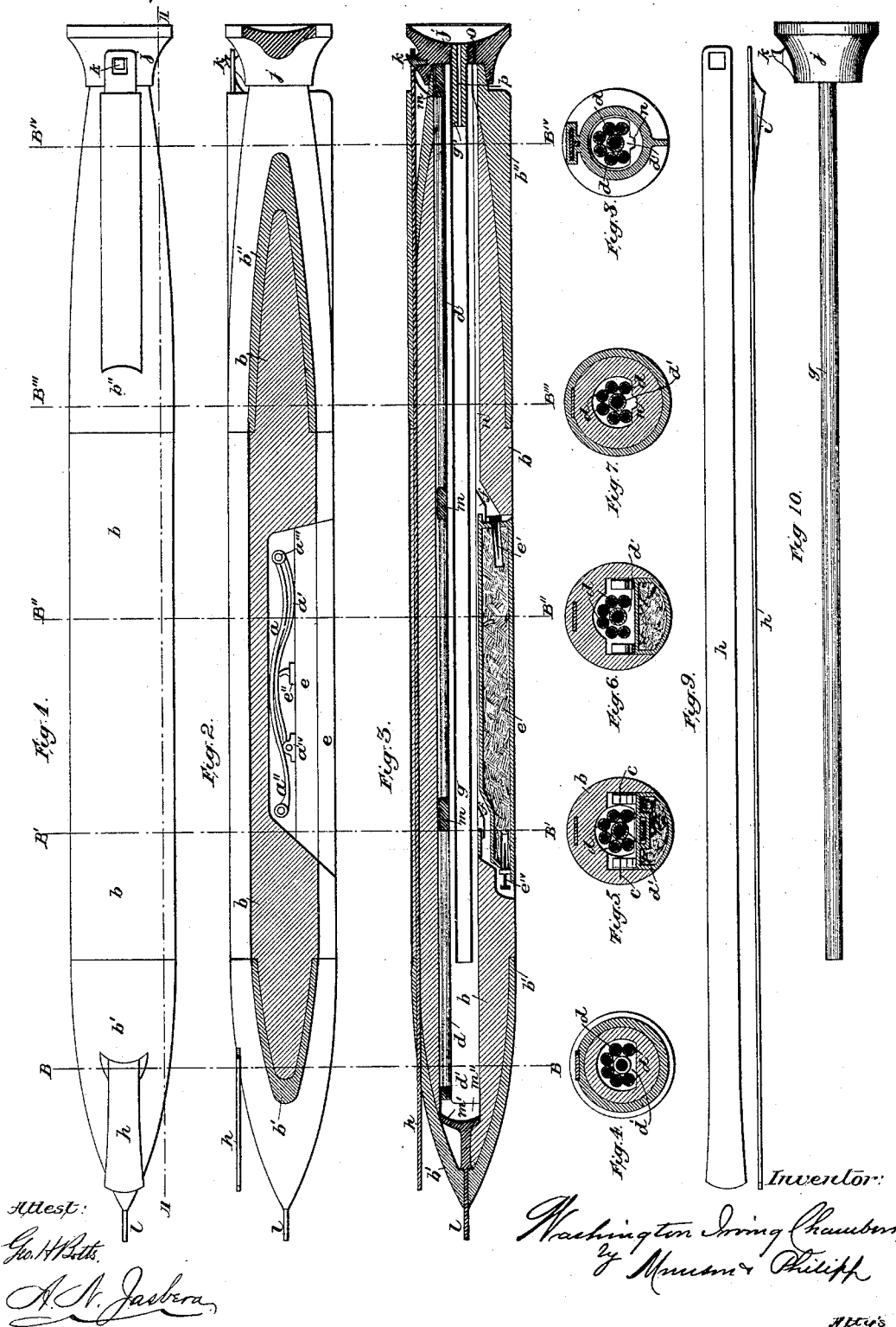
(No Model.)

2 Sheets—Sheet 1.

W. I. CHAMBERS.
MARINE TORPEDO.

No. 328,919

Patented Oct. 27, 1885.



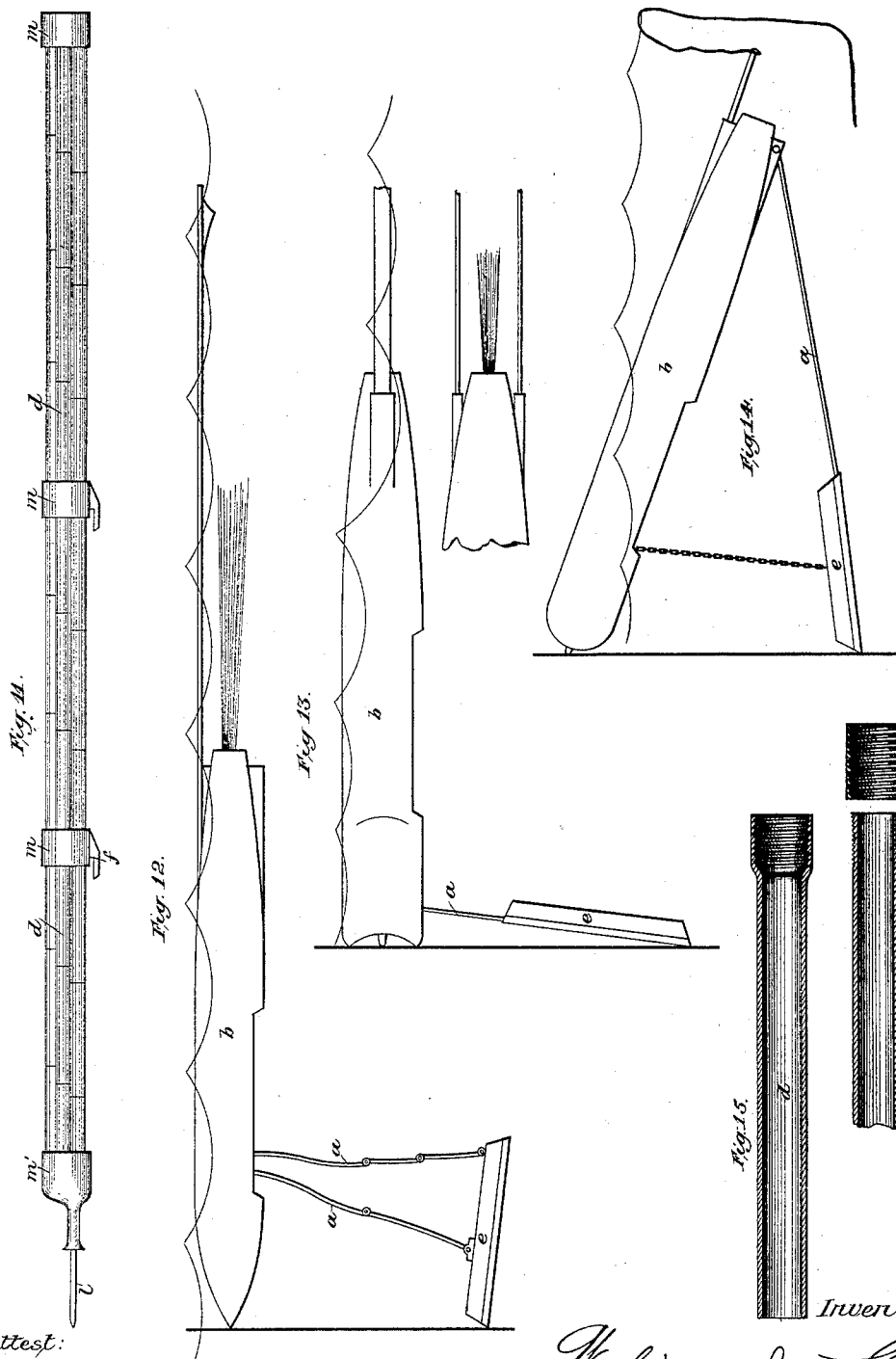
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Attest:
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UNITED STATES PATENT OFFICE.

WASHINGTON IRVING CHAMBERS, OF KINGSTON, NEW YORK.

MARINE TORPEDO.

SPECIFICATION forming part of Letters Patent No. 328,919, dated October 27, 1885.

Application filed March 13, 1885. Serial No. 158,673. (No model.)

To all whom it may concern:

Be it known that I, WASHINGTON I. CHAMBERS, a citizen of the United States, residing at Kingston, county of Ulster, and State of New York, have invented certain new and useful Improvements in Marine Torpedoes, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

My invention relates to that class of torpedoes commonly known as "rocket" torpedoes; and has for its object, first, to produce a projectile or float which shall carry the torpedo or magazine housed within to the objective point, to be there released and dropped a sufficient distance below the surface of the water and then exploded; second, to provide means for propelling this projectile or float upon or near the surface of the water after receiving its initial impulse; third, to provide means for steering or guiding the projectile; and, fourth, to provide a rocket-projectile which shall be simple in construction, capable of being taken apart for convenience and safety in transportation, cheap, and effective in operation. These objects I in part attain by the method of forming and packing the rocket composition chamber, which improvement is particularly hereinafter described, and specifically claimed.

To enable a more ready understanding of the invention, I have illustrated the same as embodied in a novel construction of torpedo which, though shown and explained herein, forms the subject-matter of a companion application, No. 118,769, filed January 26, 1884, of which this is a division.

In the accompanying drawings, Figure 1 is a plan view of the projectile or rocket arranged to be fired by a gun situated either above or below the surface of the water. Fig. 2 is a vertical longitudinal section on the line A A of Figs. 1 and 6. Fig. 3 is a vertical longitudinal section through the axis of the projectile. Figs. 4, 5, 6, 7, and 8 are cross-sections on the lines B B' B'' B''' B''', respectively. Fig. 9 represents in plan and side view a sliding bar to be arranged in the upper side of the projectile to form what I shall herein denominate the "tail." Fig. 10 is an elevation of the sabot and its stem. Fig. 11 is a side view of a series of tubes, which contain rocket-

composition arranged around a central unfilled tube, which, when all parts are assembled, receives the stem of the sabot. Figs. 12, 13, and 14 represent modifications which will be hereinafter described; and Fig. 15 is a sectional detail showing the construction of the tubes containing the rocket composition.

In carrying out my invention I take a cylindrical body of wood, cork, or other buoyant material, *b*, of suitable diameter to loosely fit the bore of the gun from which it is to be fired, and of a length of, say, from fifteen to twenty diameters. This body of wood is pointed at both ends, as shown in Fig. 3, and is bored out centrally from the rear nearly its entire length, as shown in Figs. 3 to 8. To receive the series of tubes shown in Fig. 11 it is also provided with a recess in its lower side near or slightly in front of its longitudinal center, which recess extends into the central bore, and the purpose of which is to receive the magazine *c* charged with dynamite, gun-cotton, gum-gelatine, or other suitable high explosive.

The pointed ends of the body *b* are covered and protected by shells or cases *b'* *b''* of cast-iron, bronze, or suitable alloy, and the cylindrical portion is covered with thin sheet metal—such, for instance, as common sheet-iron, the ends lapping over those of the end casings, as shown in Fig. 3.

In order that the tail hereinafter described shall be enabled to guide the projectile as desired, the center of gravity should fall below the longitudinal axis. This is accomplished by placing the magazine in the lower recess, before mentioned.

Heretofore it has been customary in constructing rocket-torpedoes to pack the rocket composition in one mass within the body of the projectile and to ignite at and burn from the rear. According to my invention I separate it into several masses—six being shown in the drawings—by packing it into separate tubes *d*, which are arranged longitudinally around a central tube, *d'*, as shown in Figs. 4 to 8, which central tube subserves a purpose to be hereinafter explained.

The tubes *d d* are each composed of several short lengths screwed together, forming continuous tubes, and are bound together by rings or bands in any suitable number—three

being shown in Fig. 11—and their front ends are secured within a head, m' , all opening into a chamber, m'' , within said head. The head m' is provided with a point or projection, l , which projects through the point of casing b , and which I denominate the "trigger."

All the tubes, except the larger central tube, may be filled with rocket composition, or one or more of them may be left vacant to serve as an air-space or air-cushion for regulating the even discharge of gases, hereinafter described. The tail of the projectile, which guides and steadies the latter in its flight, is illustrated in Fig. 9. It consists of a bar, h , made of wood or other suitable material, and of a length about the same as or greater than that of the body b . This bar is arranged in a suitable opening or channel in the body of the projectile, as shown in Fig. 3. The front end of the bar is broader than the main body thereof, and the channel in which it is arranged is narrower at its rear end to prevent the bar from being entirely withdrawn rearward. Instead of the enlarged and a narrowing channel the bar may be provided with a slot of sufficient length corresponding with the longitudinal movement which it is desirable to allow it, and a pin or bolt may be passed partly through it into the body b . To the under side, at the rear end of this bar, is attached a fin or blade, i , which serves as a rudder or guide to direct the movement of the projectile in water, and this fin or blade i I make adjustable on the bar, so that it may be set at an angle in order to provide against the deflecting force of currents or tides.

The sabot j , which is affixed to the rear end of the projectile, is made to snugly fit the bore of the gun, and may be made expansible to provide, as is usual, against the escape of gases from the firing-charge. Its rear face is preferably concaved, as shown in Fig. 3. It tapers toward the front, and its front face is recessed or chambered to fit over the rear end of the casing b'' .

A metal projection, g' , externally screw-threaded, is either cast or screwed into a central opening in the sabot, its front end extending through the chamber in the front face, and upon this projecting end is screwed a tube, g , which may be called the "stem" of the sabot. This stem, when the parts are in position for firing, lies within the tube d' , which it should snugly fit.

The sabot j is provided with a projecting pin or hook, k , which engages in an opening in the rear end of the bar h to connect the two together.

The magazine e may be made of any suitable metal, and of shape to fit snugly into the opening in the bottom of the projectile. It is provided with flanges or loops to engage hooks $f f$ on two of the bands, $m m$, which surround the series of tubes $d d'$, the bands carrying said hooks being so disposed that the latter project into the magazine loops or flanges and hold it in place.

The series of tubes is capable of rearward movement within the body of the projectile, and this movement is effected when the point or trigger l strikes an object, whereby the hooks $f f$ are disengaged from the magazine, and the latter is allowed to drop out of its chamber before exploding, so as to be exploded at a distance below the surface of the water, which distance is regulated by the length of the connecting-bars by which it is hung to the body of the projectile. These connecting-bars are jointed spring-bars joined to the body b and to the magazine e , and arranged to fold together, as shown in Fig. 2, where a represents one of the bars, which is hinged to the body b at a'' , and a' represents the other bar, which is hinged to the torpedo at a^{iv} and to the first bar at a''' . The hinge or joint a''' has a bearing in the top of the magazine-chamber, and both bars are bent or sprung over a bearing, e' , on the top of the magazine. Thus, when the magazine is released from the hooks $f f$ by the backward movement of the tubes $d d'$, the spring-bars force it out of its chamber, and after it has dropped support it until the explosion takes place.

The magazine is provided at its rear end with a time-fuse, e' , which is ignited through a channel, n , in the bottom of the central bore by the gases of the firing-charge, the gases entering said channel through a small opening, o , in the sabot j .

In addition to the time-fuse a percussion-fuse may be arranged in the front end of the magazine, as shown at e^{iv} , to be fired by striking against the side of a vessel or other objective point, when the magazine drops and swings forward.

The operation of the devices thus far described is as follows: The parts being adjusted, as shown in Fig. 3, the projectile is placed in a gun to the caliber of which it is adapted. The gases generated by the burning of the firing-charge at the same time that they drive the projectile from the gun enter the openings o and p in the sabot j and ignite the time-fuse e' and the rocket composition contained in the tubes d through the passages n and o , respectively. The gases from the rocket composition pass into the tube d' through the chamber m'' . The backward pressure of these gases forces the tube or stem g and the sabot to which it is attached backward until the stem is entirely forced from the tube d' . This backward movement of the sabot and stem also draws back the bar h by reason of the connection k . As soon as the stem g is entirely withdrawn from the tube d' it is free to disconnect itself from the bar or tail h , leaving the latter projecting from the rear end of the projectile to steady and guide the latter in its flight, as above stated. As soon as the stem g leaves the tube d' the gases from the rocket composition are free to escape therefrom and act against the water, as in other projectiles of this class.

Igniting and burning the rocket composition

thus from the frontends of a number of tubes, each made up of several short lengths of tubing screwed together, and discharging the gases through a long tube or passage extending to the rear end of the body of the projectile, I regard as an important feature, as it affords a body of gas under pressure, which, as thus controlled, compensates for any unevenness or irregularity in the burning of the rocket composition, and produces a more even action of the gases against the water.

In packing even short lengths of tubes with rocket composition it will be difficult to secure entire uniformity or regularity of density throughout their length; but when packed under the same conditions and with the same pressure the density of the packed composition will be more or less uniform at corresponding points in the length of the several tubes. I so arrange the short lengths as to "break joints," as shown in Figs. 11 and 15, and by this means, together with the air-cushion before mentioned, arising from burning the composition at the front end, I secure comparative uniformity by burning from several tubes at the same time. These short lengths may be packed to different degrees of density or with different kinds of composition, so as to give the intensity of the burning composition from front to rear in tubes a progressive action, ending in explosion of the tubes, if desirable, as the last lengths burn out.

Dividing these several tubes into short lengths also facilitates packing the composition and transporting or storing the tubes, as it enables them to be easily handled and stowed away.

Fig. 12 shows the rocket after it has struck the object aimed at and before the explosion has taken place, the magazine and tail being disposed in the body, as above set forth, and released and fired by the means described.

Fig. 13 shows a rocket in the same position, provided with two tails—one at each side—the magazine being disposed as before, and connected to the body by a spring-bar hinged near the front end of the body.

Fig. 14 shows a rocket provided with a short tail and a length of rope attached thereto, which trails behind after having been pulled out, as in the other cases. It also shows the magazine attached to the rear end of the projectile by a hinged spring-bar, on which it may slide, its downward movement being limited by a chain or cord, which also operates either a friction or percussion fuse.

What I claim is—

1. The method of forming and packing the composition-chamber of rocket-torpedoes, which consists in packing a series or number of short tubes separately, of different density, or with different kinds of composition, and then joining these packed tubes, end for end, to form a continuous chamber, as and for the purpose described.

2. The method of forming and packing the composition-chamber of rocket-torpedoes, which consists in packing a series or number of short tubes separately, joining or connecting these packed tubes to form continuous tubes, and forming the charge of a series of such compound tubes so arranged as to break joint, all as and for the purpose set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

WASHINGTON IRVING CHAMBERS.

Witnesses:

F. M. POTTS,
ALEX. SHARP, Jr.