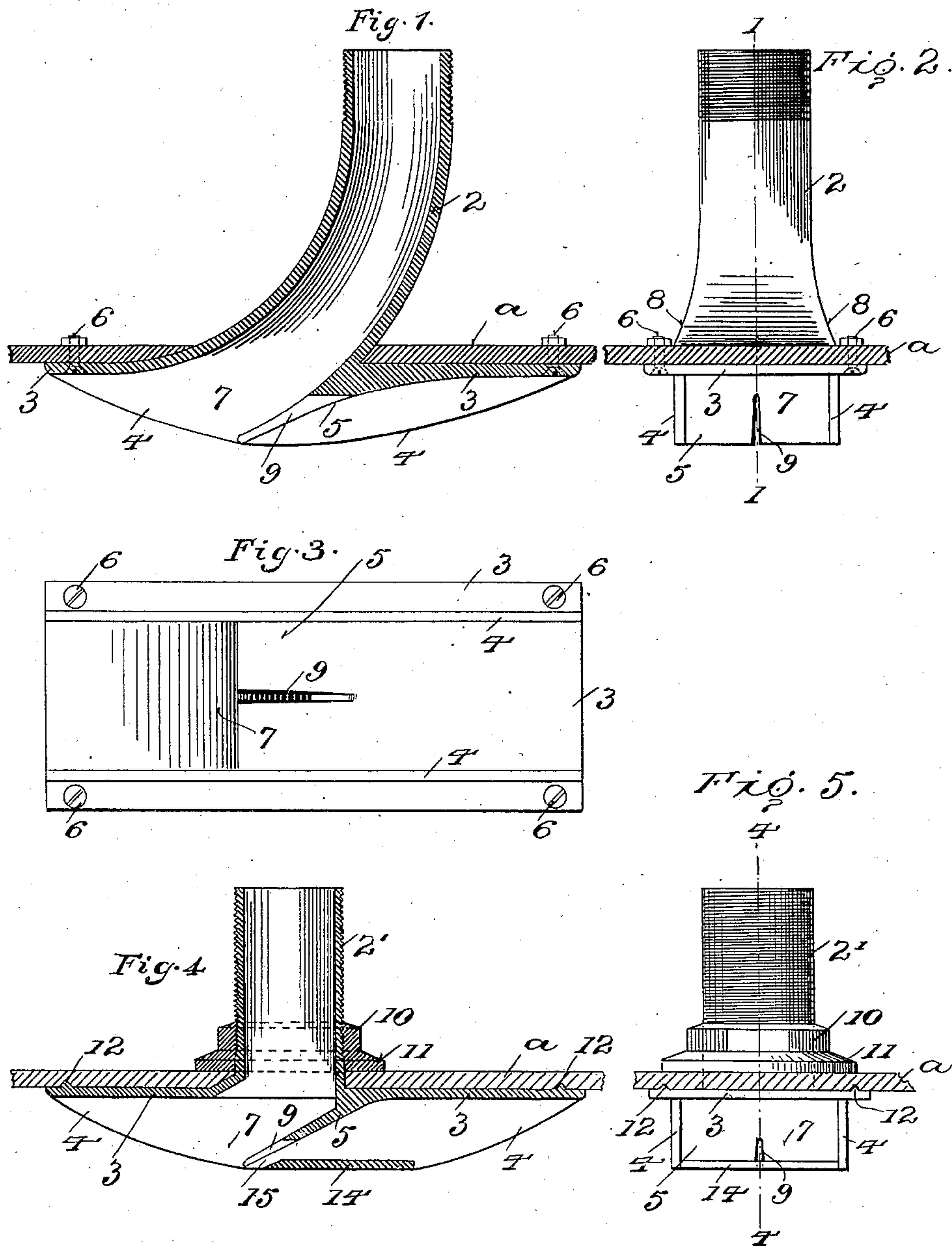


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PATENTED SEPT. 1, 1908.

C. B. CHATFIELD.
UNDER WATER EXHAUST.
APPLICATION FILED MAR. 28, 1908.



WITNESSES:

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CHARLES B. CHATFIELD, OF GRAND RAPIDS, MICHIGAN.

UNDER-WATER EXHAUST.

No. 897,586.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES B. CHATFIELD, a citizen of the United States, residing at Grand Rapids, Kent county, Michigan, have invented certain new and useful Improvements in Under-Water Exhausts; 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.

This invention relates to certain improvements in under water mufflers or exhausts; and the objects and nature of my invention will be readily understood by those skilled in the art in the light of the following description of the accompanying drawing illustrating what I now consider my preferred embodiment from among other formations and arrangements within the spirit and scope of my invention.

An object of the invention is to provide a simple and efficient under water exhaust adapted for use in connection with marine engines of the explosive, expansion and similar types, and whereby the exhaust can be effectively muffled and discharged without substantial back pressure, and which shall be so formed and constructed as to avoid, or reduce to the minimum, danger of becoming clogged or fouled by flotsam or the like.

A further object of the invention is to provide certain improvements in details of construction and arrangements of features with the end in view of producing a highly efficient and simple under water exhaust.

The invention consists in certain novel features in construction and arrangement as more fully and particularly set forth herein-after.

Referring to the accompanying drawings, Figure 1, is a vertical longitudinal section taken in the plane of the line 1—1, Fig. 2. Fig. 2, is a front elevation of the exhaust, a portion of the boat hull being shown in section. Fig. 3, is a bottom plan view. Fig. 4, is a vertical longitudinal section taken in the plane of the line 4—4, Fig. 5, showing a modified form of exhaust. Fig. 5, is a front elevation showing a modified form, a portion of the boat hull being shown in section.

I show in the drawings a portion *a*, of the hull of a boat, such for instance as what is commonly called a motor boat provided with and propelled by a gasoline, kerosene, or alcohol engine of the explosive or expansion

types, and having pipe or other connections from its exhaust port or ports; such connections if so desired including an expansion chamber, whereby the exhaust from the engine can be conducted to the exterior of the boat hull and discharged below the water line. I have not in the drawings disclosed such engine, exhaust pipe and expansion chamber, as my present invention relates to the form of the exhaust nozzle or under water discharge.

In the form of my invention, as illustrated by Figs. 1 to 3, inclusive, the exhaust nozzle can be made as a single casting comprising the pipe or elbow 2, the base or securing plate 3, longitudinal exterior guard flanges or side walls 4, and the deflecting plate, flange or wall 5. The plate 3, is arranged longitudinally or fore and aft of the exterior of the boat hull below the water line thereof and is secured thereto in any suitable manner as by bolts, or screws 6.

The pipe 2, extends into the interior of the boat through an opening in the hull thereof, and the inner end of said pipe can be threaded or otherwise formed for coupling with or joining to the exhaust pipe from the engine or from an expansion chamber within the boat. This pipe 2, usually from its inner end curves rearwardly and opens through the plate 3, intermediate the length thereof, with the rear wall of the pipe curving rearwardly and outwardly and merging longitudinally into the plate to form the rearwardly directed and outwardly opening discharge nozzle 7. Just within the boat, the side walls of the pipe 2, preferably, gradually flare or expand laterally, see 8, Fig. 2, to the full width of the discharge opening 7, between the guards 4, and merge into the same and the plate, so that the outer end of the pipe is approximately rectangular in cross section with an enlarged outlet or discharge opening 7. The discharge opening 7, is arranged between the parallel guards 4, spaced apart approximately the full width of the plate 3, and arranged longitudinally throughout the length of the plate. These guards are longitudinally reduced or tapered in opposite directions toward their ends where the guards usually merge into the plate ends. The guards are hence of greatest depth at their centers and from thence taper off longitudinally in opposite directions.

The front wall of the rearwardly directed discharge is formed by an outwardly and

rearwardly inclined plate, wall, or flange 5, arranged transversely between the guards 4, and extending from and merging into the plate 3, and in effect forming an outwardly and rearwardly inclined continuation of the front wall of the pipe or elbow 2. This wall or deflector bridges the space between the two guards, at about the central portion of the length thereof, and its outer rear transverse edge preferably does not extend outwardly beyond the outer longitudinal edges of the guards. I preferably form this deflector with a transverse opening for the passage of a small stream of water, during the forward movement of the boat, into and rearwardly of the discharge 7.

In the specific example illustrated, I show this opening in the form of a narrow slit 9, extending through the deflector about centrally between the two guards 4, and arranged transversely of the deflector and opening and extended through its outer or rear edge. Also, if so desired, this slit can taper or increase in width outwardly to its outer or rear end to permit the rush of water to readily clear the same of dirt, grass, weeds, or other obstructions tending to clog the slit.

On the forward movement of the boat, the inclined deflector 5, forces and throws outwardly and rearwardly the body of water confined between the guards in advance of the deflector, and hence forms or creates what might be termed a cavity behind the deflector and a strong suction which aids the outward discharge of the exhaust, and this outward suction through the exhaust pipe is aided and increased by the injector-like thin rapidly moving film or stream of water discharged rearwardly through the slit in the deflector. The guards 4, not only serve to protect the parts against damage but perform an important function in deflecting or throwing off weeds, grass or other material, thereby reducing to the minimum danger of the exhaust becoming choked or clogged by floating material, whether the boat is going forward or backing. The inclined deflector is also formed and arranged to throw off floating material and to so direct the water and the exhaust gases as to cause the same to clear both the front and rear walls of the deflector and its slit of floating and other material tending to clog the same.

The device can be secured to the boat hull by other means than the bolts or screws 6. For instance, in Figs. 4 and 5, I show the device secured by a nut 10, within the boat and screwing on the longitudinally threaded exterior of the straight pipe 2', and against a washer 11, thereby clamping said washer against the inner surface of the hull and the plate of the exhaust against the exterior surface of the hull, whereby the device can be readily secured and leakage around the opening through the hull can be prevented. If

so desired, the inner surface of the body or plate 3, can be formed with spurs 12, to bite into the hull and hold the device against turning or loosening movement.

If so desired, the water can be partially confined in a pocket just in advance of the inclined deflector and discharged rearwardly across the edge thereof in a thin stream or transversely arranged jet, to increase the speed or pressure of the body of water moving rearwardly across the edge of the deflector. For instance, in Figs. 4 and 5, I show a transverse wall 14, between the outer edge portions of the guards in advance of the outer edge of the deflector, with the rear transverse edge of the wall spaced from the outer edge of the deflector to form a narrow transverse water discharge slit 15, from guard to guard and forming the rear outlet for the water in advance of the deflector and between the guards and wall 14. During the forward movement of the boat, the water will rush downwardly along the deflector and hence will leave the edge thereof with a downward deflection, and the pressure of the water passing from the deflector will be increased by the plate or wall 14, but I do not wish to restrict my invention to the employment thereof.

It is evident that various changes and modifications might be resorted to in the forms, constructions and arrangements of the parts and features described, and hence I do not wish to limit all features of my invention strictly to the constructions disclosed but consider myself entitled to all variations within the spirit and scope of my invention.

What I claim is:—

1. An under water exhaust having a rearwardly and outwardly opening discharge and an outwardly and rearwardly inclined deflector arranged transversely in front of and opposite said discharge and having an exposed transverse outer edge.

2. An under water discharge comprising a body plate provided with longitudinally arranged guards, an inclined deflector arranged transversely of said plate and between and connecting said guards intermediate the length thereof, and an exhaust pipe opening outwardly through said plate between said guards and behind said deflector.

3. An under water exhaust having an outwardly opening discharge and a transversely arranged rearwardly and outwardly inclined deflector arranged in advance of and forming the exterior front wall of said discharge to deflect the water downwardly, substantially as described.

4. An under water exhaust comprising a body adapted to be secured longitudinally along the outer surface of a boat hull, and an exhaust pipe opening through the body intermediate its length and extending inwardly therefrom to pass through the hull into the

boat, and a transversely arranged outwardly and rearwardly inclined deflector immediately in advance of the exhaust opening from said pipe to deflect the water downwardly therefrom, substantially as described.

5 5. An underwater exhaust having an outwardly and rearwardly opening discharge, and a transversely arranged inclined deflector forming the front wall of said discharge and having a water passage slit arranged transversely of said deflector and opening through the outer edge thereof.

15 6. An underwater exhaust comprising a longitudinal plate having a pair of external guards arranged longitudinally of the plate and oppositely reducing toward their ends, a discharge nozzle or pipe extending inwardly from the plate and opening therethrough between said guards, and an outwardly and rearwardly inclined deflector spanning the space between said guards and formed with a water-passage slit extending outwardly through the outer transverse edge of said deflector.

25 7. An under water exhaust comprising a longitudinal body at its exterior having a longitudinal discharge and expansion nozzle open at the rear and at its longitudinal outer side and formed by longitudinal side walls or guards and a transversely arranged inclined front wall having an outer rear transverse edge, and an exhaust pipe extending inwardly from said body and opening outwardly in rear of said front wall and between said side walls.

35 8. An underwater exhaust comprising a longitudinal body having longitudinal exterior side walls or guards and a transverse inclined wall between intermediate portions thereof having an exposed transverse outer edge, said body being open outwardly and rearwardly in rear of said transverse wall and between said side walls, and an exhaust pipe opening outwardly through said body in rear of said transverse wall and between said side walls, the sides of said pipe flaring

laterally toward said body and joining said side walls.

9. An underwater exhaust comprising a body adapted to be secured at the exterior of a boat hull, an exhaust pipe opening outwardly through said body and adapted to extend inwardly to the interior of the boat, and a water and exhaust gas deflector arranged transversely at the exterior of the body and inclined outwardly and rearwardly opposite said exhaust pipe opening.

10. An under water exhaust having a discharge opening, and an inclined water deflector to deflect the water downwardly away from said opening, said deflector having an exposed transverse outer edge past which the water sweeps.

11. An under water exhaust having a discharge opening, and a deflector to deflect the water therefrom, said deflector formed with a slit like water passage therethrough extending through the outer edge thereof.

12. An under water exhaust having an exhaust pipe terminating in an enlarged discharge opening, and a rearwardly inclined water deflector to deflect the water away from said opening, said deflector having an exposed outer edge.

13. An under water exhaust comprising a body having an inclined water deflector, and being open at its rear end and open longitudinally throughout its outer side in rear of said deflector, and having an exhaust opening behind said deflector.

14. An under water exhaust comprising a body having means to deflect the water outwardly therefrom, and an outwardly opening exhaust discharge behind said means, said body being longitudinally open at the outer side from its rear end to said means.

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

CHARLES B. CHATFIELD.

Witnesses:

ALEXANDER S. PALMER,
JOHN WOLTERS.