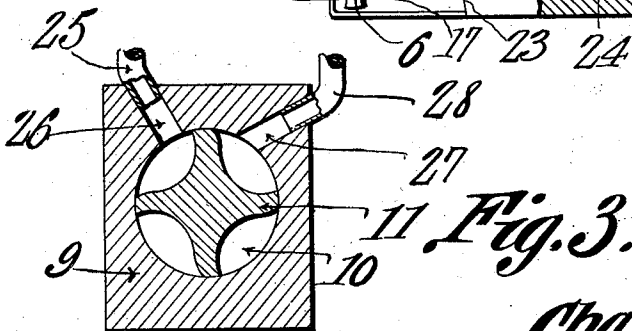
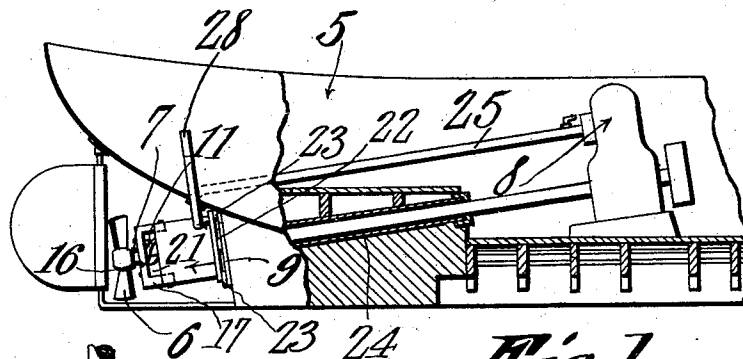
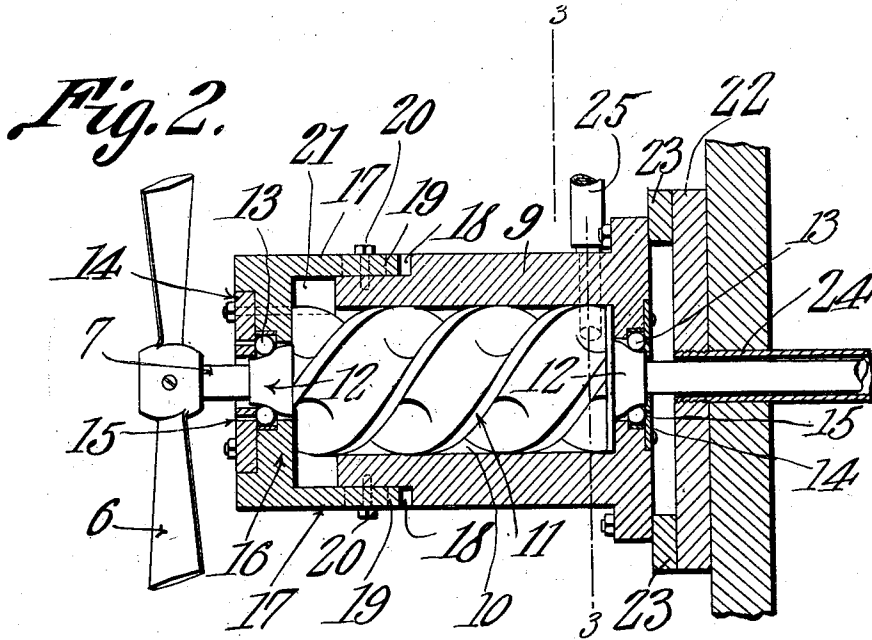


C. F. SMITH.
EXHAUST MUFFLER.
APPLICATION FILED MAY 31, 1910.

979,041.

Patented Dec. 20, 1910.



Witnesses

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UNITED STATES PATENT OFFICE.

CHARLES F. SMITH, OF MIAMI, FLORIDA.

EXHAUST-MUFFLER.

979,041.

Specification of Letters Patent.

Patented Dec. 20, 1910.

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To all whom it may concern:

Be it known that I, CHARLES F. SMITH, a citizen of the United States, residing at Miami, in the county of Dade and State of Florida, have invented a new and useful Exhaust-Muffler, of which the following is a specification.

This invention relates to devices for lessening the noise resulting from the discharge of the exhaust gases of internal combustion or other engines, and it is the object of the invention to provide an improved device of this kind which not only acts as a muffler, but which also utilizes the impulsive force of the exhaust gases.

With these objects in view, the invention consists in a novel construction and arrangement of parts to be hereinafter described and claimed, reference being had to the accompanying drawing, in which,

Figure 1 is an elevation showing the application of the invention. Fig. 2 is an enlarged sectional detail. Fig. 3 is a cross section on the line 3—3 of Fig. 2.

The invention is shown applied to the propeller shaft of a motor boat. In the drawing, the hull of the boat is indicated at 5, and the shaft of the propeller 6 at 7. The propeller is driven by a motor 8, the same being shown diagrammatically in Fig. 1. This motor may be an internal combustion or other engine, and it is the exhaust of this engine which is to be muffled and utilized as will be described hereinafter.

The deadwood of the stern carries a casing 9 through which the propeller shaft 7 passes, the propeller 6 being carried at the outer end of said shaft on the outside of the casing. This casing has a cylindrical bore 10 in which operates a multiple threaded screw 11 formed integral with the propeller shaft, or separate therefrom, and fastened to the shaft in any suitable manner. At the ends of the screw, the propeller shaft is formed with bearing cones 12 engageable by anti-friction balls 13 seating in ball races made in the end walls of the casing 9. The balls are held in place by retaining plates 14 seating recess made in the outer surface of the end walls of the casing, and closing the ball races, as shown in Fig. 2. The retaining plates are formed with perforations 15 leading to the ball races, these perforations being provided in order that water may enter the ball races and wash away any grit or foreign matter which might settle therein. The ends of the

screw 11 form shoulders which abut against the inner surface of the end walls of the casing 9.

The outer end wall of the casing is made adjustable, in order that the ball bearings herein described may be properly tightened up. This end wall is indicated at 16, and it carries one of the bearings described. At the top and bottom of the wall 16 are tongues 17 which fit in grooves 18 made in the outer surface of the casing 9 at the top and bottom thereof. The tongues have slots 19 through which bolts 20 pass into the wall of the casing, the slots being provided to permit adjustment of the wall 16 for the purpose stated. The slots extend in such a direction, that the wall 16 may be moved in the direction of the length of the propeller shaft, to effect the adjustment of the bearings.

The wall 16 is spaced a short distance from the opposite end of the casing 9, which leaves openings 21 in opposite sides of the casing through which the exhaust gases escape. The casing carries at its inner end a plate 22, whereby it is rigidly secured to the dead wood of the stern. The plate 22 is spaced a short distance from the end of the casing by spacing blocks 23. Into the plate 22 is screwed a tube 24 through which the propeller shaft 7 passes, this pipe going through the dead wood of the stern, and into the boat, the inner end being provided with the stuffing box, as usual, to pack the propeller shaft, and prevent water entering the boat through said tube.

At 25 is indicated the exhaust pipe of the engine 8. This pipe passes through the stern of the boat, and into a port 26 in the casing 9, said port opening into the bore 10 thereof, on one side of the axis of the propeller shaft. Upon the opposite side of said axis, is a port 27 to which is connected a pipe 28 extending upwardly on the outside of the stern, a short distance above the water line.

In operation, the exhaust enters the bore 10 of the casing 9 through the port 26, it being conducted to said port by the pipe 25. The gases strike the blades of the screw 11, and they travel rearwardly between the same, and finally escape through the side openings 21. The impact of the gases against the screw blades assists the rotary movement of the propeller shaft, and the energy contained in said gases is thus utilized and not wasted. The noise resulting

from the discharge of the gases, is also eliminated as well as the bad odor. When the boat is backing, the blades of the screw carry the exhaust gases over into the port 27, and the pipe 28 discharges the same above the water. When the boat is again going ahead, the exhaust gases are discharged under the water without noise and smell, as before.

What is claimed is:

- 10 1. The combination with a propeller shaft and its drive motor, of a muffler casing through which the propeller shaft passes, said casing having an exhaust inlet, and separate exhaust outlets, the inlet being located
 15 on one side of the propeller shaft axis, and one of the outlets being located on the opposite side of said axis, and an impelling member on that portion of the propeller shaft which extends through the casing, against
 20 which member the exhaust is discharged.
2. The combination with a propeller shaft and its drive motor, of a muffler casing through which the propeller shaft extends, the ends of the casing being provided with
 25 bearings for said shaft, and one of said ends being adjustable to take up wear of the bearings, means for carrying the exhaust of

the motor into the casing, said casing having an outlet, and an impelling member on that portion of the propeller shaft which extends
 30 through the casing, against which member the exhaust discharges.

3. The combination with a propeller shaft and its drive motor, of a muffler casing through which the propeller shaft extends, said casing having end walls provided with bearings for said shaft, one of said end walls being spaced from the casing to provide an outlet therefor, tongues on the last mentioned end wall, said tongues being fastened
 40 to the casing to secure said end wall in the aforesaid spaced relation, an impelling member on that portion of the propeller shaft which extends through the casing, and means for carrying the exhaust of the motor
 45 into the casing, to discharge against the impelling member.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

CHARLES F. SMITH

Witnesses:

MITCHELL D. PRICE,
 GRACE S. MILLER.