No. 620,867. Patented Mar. 7, 1899.

L. S. GARDNER.

EXHAUST MUFFLER.

(Application filed Apr. 5, 1898.)

(No Model.)

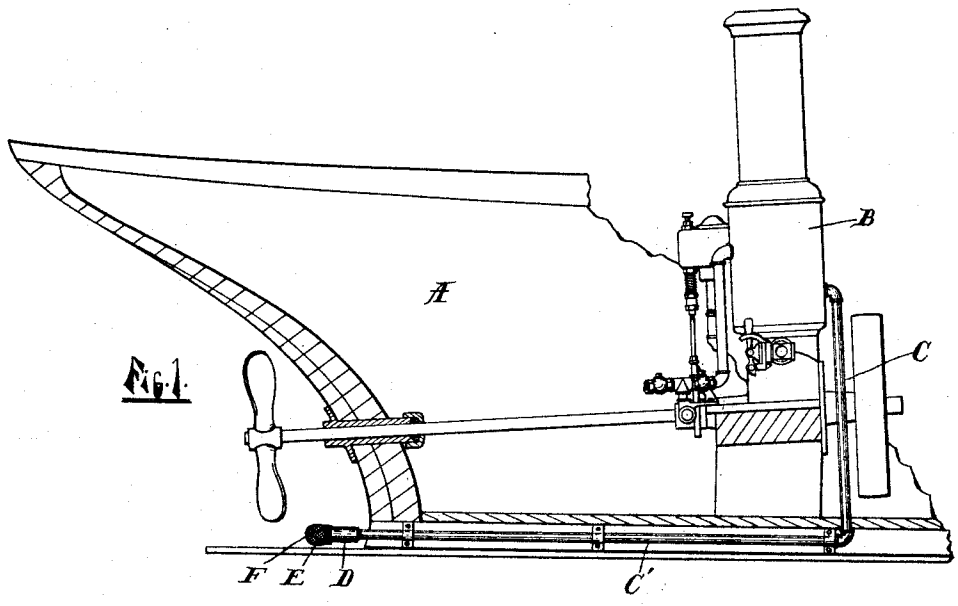


Fig. 1.

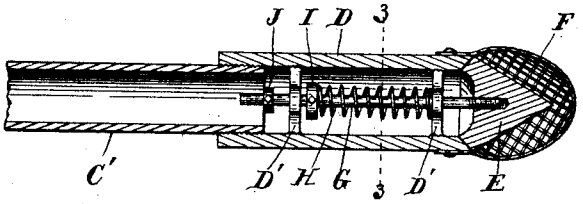


Fig. 2.

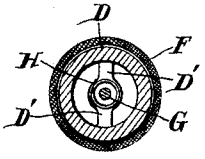


Fig. 3.

WITNESSES:

Myron C. Lisle

Palmer A. Jones

INVENTOR:

Levi S. Gardner.

By

Moulton & Flanders

Attorneys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

LEVI S. GARDNER, OF NEW ORLEANS, LOUISIANA, ASSIGNOR OF ONE-HALF TO WILLIAM S. McCAY, OF GRAND RAPIDS, MICHIGAN.

EXHAUST-MUFFLER.

SPECIFICATION forming part of Letters Patent No. 620,867, dated March 7, 1899.

Application filed April 5, 1898. Serial No. 676,511. (No model.)

To all whom it may concern:

Be it known that I, LEVI S. GARDNER, a citizen of the United States, residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented certain new and useful Improvements in Exhaust-Mufflers; 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 improvements in exhaust-mufflers, and more especially to mufflers for the exhaust of gasolene and other engines when used in launches or other boats; and its object is to provide the same with certain new and useful improvements hereinafter more fully described, and particularly pointed out in the claims, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of a device embodying my invention and a portion of a launch in vertical section; Fig. 2, an enlarged detail of the rear end of the exhaust-pipe and valve in longitudinal section, and Fig. 3 a transverse section of the same on the line 3 3 of Fig. 2.

Like letters refer to like parts in all of the figures.

A represents a portion of the stern of a launch in vertical section; B, a gasolene-engine of the usual construction; C, the exhaust-pipe of the engine, which pipe extends downward through the bottom of the boat and thence rearward alongside the keel of the same, as at C′, and projecting beyond the keel a short distance terminates in a detachable tubular extension D, screwed upon the end of the exhaust-pipe C′ and provided with a check-valve E at its rear end. Said valve is made conical at the rear end to pass more freely through the water and is protected from fouling by a netting F. Bridge-bars D′ D′ extend across the extension D, having central openings, in which openings is a longitudinally-movable valve-stem G, to the outer end of which stem the check-valve E is attached.

I is a collar on the valve-stem, against which a coiled spring H acts to close the check-valve, and J is a collar on the inner end of the valve-stem to limit its outward movement.

The check-valve E prevents water from entering the exhaust-pipe and allows the exhaust to escape when pressure rises sufficiently to overcome the weight of the water on the check-valve. By exhausting under water through an opening directed toward the rear of the boat the escaping gases assist in propelling the boat, and the sound of the exhaust is effectually muffled and the gases are prevented from escaping into the air to the annoyance of the occupants of the boat. The exhaust is also materially reduced in amount within the pipe C′ by the cooling action of the water on the same, thus forming a partial vacuum before each exhaust, and thereby assisting the operation of the engine and more effectually removing the burned charge from the cylinder of the same.

Having thus fully described my invention, what I claim, and wish to secure by Letters Patent, is—

1. In a launch having an engine, an exhaust-pipe to the engine extending through the bottom of the boat and opening rearwardly beneath the water, and having a considerable portion of its length exposed to the cooling action of the water, whereby a partial vacuum is formed just before each exhaust, and a check-valve on the end of said pipe, substantially as described.

2. In a launch, an engine, an exhaust-pipe extending from the engine through the bottom of the boat and thence alongside the keel and beyond the same, a check-valve on the end of said pipe and having a conical rear end, and a screen inclosing said check-valve, substantially as described.

3. In a launch, an engine, an exhaust-pipe extending through the bottom of the launch below the water-line and thence rearward, a detachable extension on said pipe and having bridge-bars, a check-valve engaging the rear end of said extension and having a stem passing through said bridge-bars and movable therein, a collar on said stem, and a spring engaging said collar to close the valve, substantially as described.

4. In a launch, an engine, an exhaust-pipe

extending from the engine through the bottom of the launch and thence rearward alongside the keel and beyond the same, a detachable tubular extension on said pipe and having bridge-bars, a check-valve engaging the rear end of said extension and having a conical rear end, a screen inclosing said valve, a stem on said valve engaging openings in said bridge-bars and longitudinally movable therein, a collar and a spring on said stem to close said valve, and a collar on the stem to limit its outward movement, substantially as described.

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

LEVI S. GARDNER.

Witnesses:
JOHN BRANDON,
CHAS. HERR.