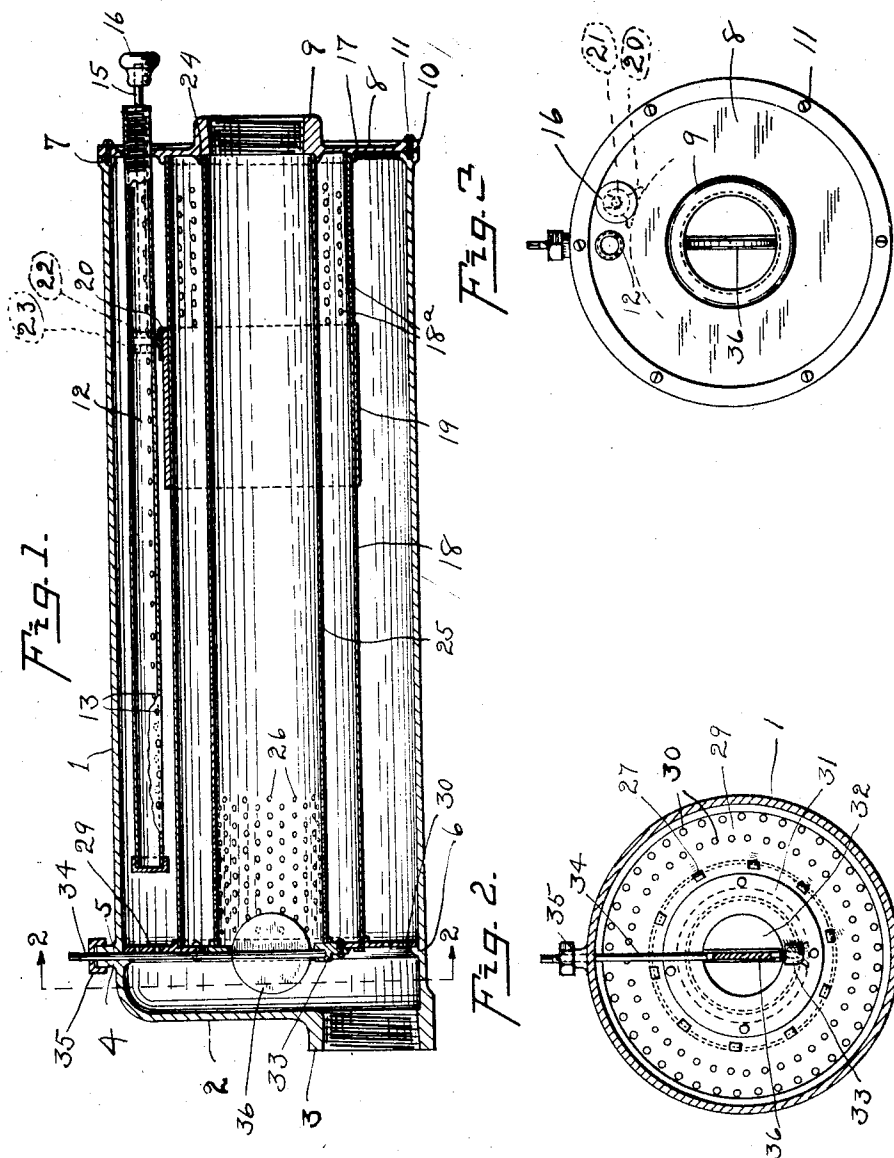


J. O. SCHMITT.
MUFFLER.
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996,800.

Patented July 4, 1911.



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UNITED STATES PATENT OFFICE.

JOHN O. SCHMITT, OF CLEVELAND, OHIO.

MUFFLER.

996,800.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JOHN O. SCHMITT, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Mufflers, of which the following is a specification.

This invention relates generally to mufflers for explosive engines and the like, and is particularly applicable to explosive engines used in motor boats and the like.

More specifically the invention relates to a cylindrical casing provided with an outlet at one end and an opening at the other adapted to permit the insertion of a series of tubular baffling members mounted in a head, all arranged in a manner such that the gases are baffled and expanded in a manner to deaden or dissipate the exhaust charge, together with a suitable device for regulating the passage through the muffler and means for supplying water in a manner such that the gases are cooled in their passage through the muffler.

The invention further relates to certain details of construction hereinafter set forth in the following description, drawings and claims.

Referring to the drawings, Figure 1 is a longitudinal sectional view of the muffler; Fig. 2 is a section upon the line 2--2 of Fig. 1; and Fig. 3 is an end elevation looking toward the left in Fig. 1.

In carrying out the invention any preferred form and construction of parts may be employed so long as they possess the necessary features, but I have shown one form in the drawings which is highly efficient in operation, and in such embodiment 1 represents a cylindrical casing open at one end and provided at the other end with a head 2 integral therewith having therein a pipe connection 3 for the exhaust from the muffler. Adjacent to the head 2 is a boss 4 having an opening 5 therein for a purpose to be described. The casing 1 is still further provided near the head 2 with an annular flange 6 for a purpose to be described. The edge of the casing about the open end thereof is provided with an enlarged portion 7 adapted to receive the bolts for securing the other head to the casing.

The right-hand end or the open end of the casing, as shown in the drawings, is provided with a removable head 8 having a centrally located pipe connection 9 and a rein-

forced edge portion 10 provided with holes for receiving clamping screws or bolts 11 which pass into the portion 7 of the casing. This head is further provided with a water supply pipe 12 threaded into the same and adapted to extend well into the casing and provided with perforations 13 which are adapted to project the inflowing water in two directions as will later be more fully described. This head is still further provided with a boss 14 to one side of the pipe 12 as shown in Fig. 3, and adapted to receive a rod 15, passing through a stuffing box about the boss 14, having on its outer end a suitable grip 16 and on its inner end a regulating device which will be disclosed later. The inner face of the head 8 has an annular flange 17 receiving a tubular member 18 provided with numerous perforations 18^a adjacent to the head 8, and holding this tubular member in concentric arrangement with respect to the casing 1.

Slidably mounted upon this tubular member 18 is a sleeve 19 provided with a clip 20 which has a bifurcated end portion 21 secured between nuts 22 and 23 on the rod 15. This sleeve may be slid upon the tubular member 18 to expose any desired number of perforations 18^a and to thereby affect the volume of the exhaust through the muffler. The head 8 has another annular flange 24 supporting a smaller tubular member 25 which is provided with perforations 26 at its inner end, and this tube is adapted to receive the exhaust gases from the pipe connection 9 and discharges them through apertures 26 at the inner end of the tubular member 18 so that they will pass between the two tubular members and out through the perforations 18^a. The inner end of the tubular member 18 is provided with lugs 27 passing through openings in an inner diaphragm 29 of sheet metal and bent over as shown to hold the parts together. Between the tubular member 18 and the casing 1 the diaphragm 29 has perforations 30 which permit the exhaust to discharge against the head 2 and pass out through the exhaust connection 3. This diaphragm 29 bears against the annular flange 6 and it is provided at the center with a cast butterfly valve frame 31 suitably secured to the diaphragm as by screws or rivets 37 and having an opening 32 at the center thereof and a boss 33 for receiving the lower end of the valve stem 34 which passes up

through the opening 5 in the boss 4 and through a stuffing box 35 upon said boss. A butterfly valve 36 is mounted upon this stem and may be arranged to close the opening 32 whereby the gases must pass through the muffler, but when this valve is open, the gases may pass directly through the inner tubular member 25 and out through the exhaust nipple 3. It will be seen from the foregoing construction that when the tubular member 18 is secured in the head 8 with the adjusting sleeve 19 and its operating rod arranged in conjunction with it, and with the diaphragm 29 secured to the end of the tubular member 18 by bending over the lugs 27 and the tubular member 25 in place within the same, that the entire internal mechanism with the exception of the butterfly valve 36 and its stem 34 may be moved into the casing 1, and after the screws or bolts 11 are applied the main part of the muffler is assembled. The butterfly valve 36 and its stem 34 may then be placed in position. It is also necessary to secure the pipe 12 in place before inserting the tubular members in the casing.

In using the muffler the operator closes the butterfly valve 36 causing the exhaust gases to pass through the inner tubular member 25 to the perforations 26 where they are expanded upon the outside of the inner tubular member and within the tubular member 18 and must pass to the right end of the muffler where they may discharge through the perforations 18^a which may be regulated in number by the sleeve 19 controlled by the rod 15. In the meantime water is being discharged from the pipe 12 around the tubular member 18 by the perforations 13 so that the gases are cooled in their passage. After passing through the openings 18^a the gases pass to the left end, as shown in the drawings and through the perforations 30 in the diaphragm, 29 from whence they may pass out through the exhaust connection 3.

I do not desire to be confined to the exact details shown but aim in my claims to cover all modifications which do not involve a departure from the spirit and scope of my invention.

Having described my invention, I claim:—

1. In a muffler, in combination, a casing having one open end and closed at its other end by an integral fixed head, a removable head adapted to be secured to the casing at said open end, and a plurality of muffler tubes secured to and supported at one end by said removable head and provided at their respective opposite ends with perforations arranged in a manner to baffle the exhaust in its passage through the muffler.

2. In a muffler, in combination, a casing having an open end, a head for the open end

of said casing, a tubular member secured to such head at one end and carrying at its other end an inner diaphragm adapted to fit within the casing, said tubular member being provided with discharge openings near one end, another tubular member mounted between the diaphragm and the outer head and provided with perforations at its end opposite to the perforations of the first mentioned tubular member.

3. In a muffler, in combination, a casing having an open end, a head adapted to be secured to the casing at its open end, a cylindrical member, an inner tubular member mounted between the first mentioned head and the inner head and adapted to receive the exhaust gases, said inner tubular member being provided with perforations near its outer end, and said cylindrical member being provided with perforations adjacent to the first mentioned head, and a suitable by pass valve located in the inner head and adapted to discharge the gases directly from the inner tubular member.

4. In a muffler, in combination, a casing having an open end, an annular shoulder carried by the casing, an outer head for said casing and adapted to be secured to the same at the end thereof, a cylindrical member secured to the outer head, an inner head secured to the outer end of the cylindrical member, and adapted to take against the annular shoulder within the casing, an inner tubular member mounted between the outer and inner heads, said inner tubular member being provided with perforations adjacent to the inner head, and the cylindrical member being provided with perforations adjacent to the outer head, and a valve arranged in the inner head and adapted to discharge gases from the inner tubular member.

5. In a muffler, in combination, a casing, a tubular member mounted in said casing and provided with perforations for discharging the gases into the casing, and means for varying the number of perforations.

6. In a muffler, in combination, a casing, a tubular member mounted in said casing and provided with perforations for discharging the gases into the casing, and a sleeve slidably mounted on the cylindrical member for closing the perforations therein.

7. In a muffler, in combination, a casing, a tubular member mounted in said casing and provided with perforations for discharging the gases from the casing, and means for varying the number of perforations left for operation, a sleeve slidably mounted on the cylindrical member for closing the perforations therein, and means for shifting said sleeve.

8. In a muffler, in combination, a casing, tubular baffling members within said casing, and a water supply pipe extending above

said tubular baffling members and provided with openings in two directions for directing streams of water around the periphery of the cylindrical member.

5 9. In a muffler, in combination, a casing, a head for said casing, a cylindrical member supported by said head at one end and carrying at its other end an inner head adapted to be supported by the casing, said cylindrical member being provided with discharge openings, an inner tubular member mounted within the cylindrical member and supported between the two heads and provided with discharge perforations, and a butterfly valve located in the inner head for passing the exhaust from the inner tubular member.

10. In a muffler, in combination, a casing, a head for said casing, a cylindrical member

supported by said head at one end and carrying at its other end an inner head adapted to be supported by the casing, said cylindrical member being provided with discharge openings, an inner tubular member mounted within the cylindrical member and supported between the two heads and provided with discharge perforations, a butterfly valve located in the inner head for passing the exhaust from the inner tubular member, and a stem for said valve extending upon the outside of the casing.

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

JOHN O. SCHMITT.

Witnesses:

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