

H. B. WINTERS.

MUFFLER.

APPLICATION FILED FEB. 5, 1909.

938,101.

Patented Oct. 26, 1909.

2 SHEETS—SHEET 1.

FIG. 1.

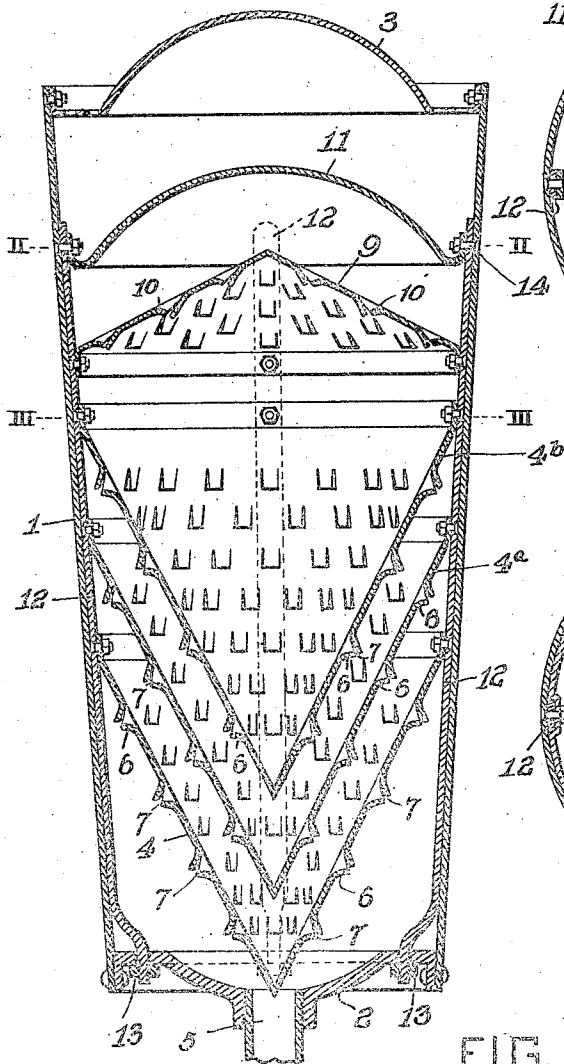


FIG. 2.

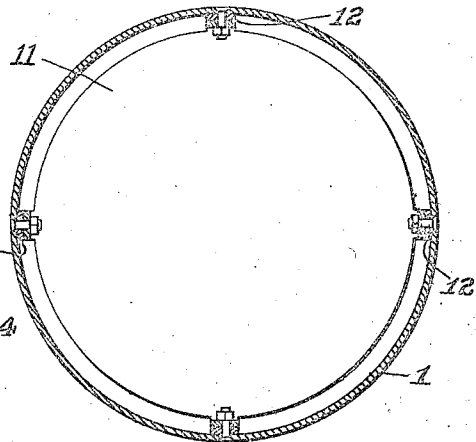


FIG. 3.

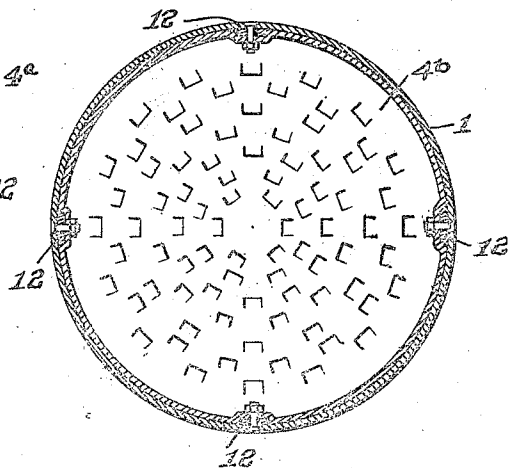
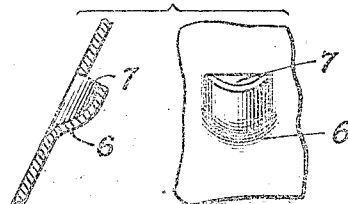
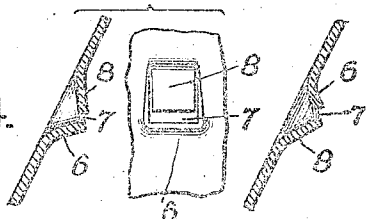


FIG. 5. FIG. 6.

FIG. 4.



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2 SHEETS—SHEET 2.

FIG. 7.

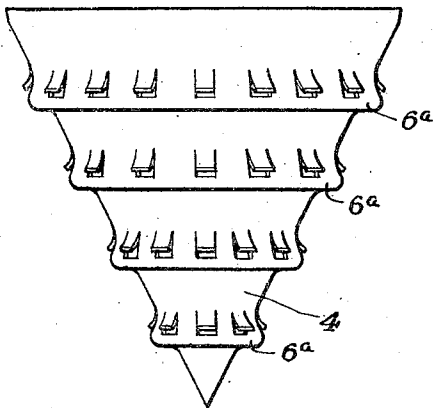
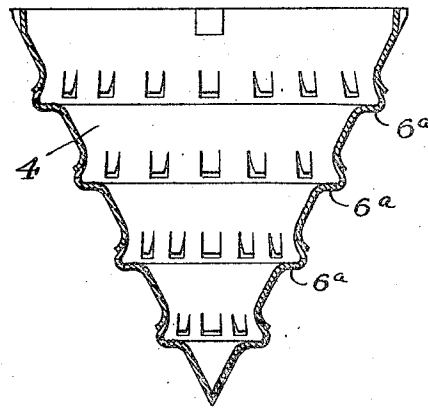


FIG. 8.



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# UNITED STATES PATENT OFFICE.

HARRY B. WINTERS, OF SEWICKLEY, PENNSYLVANIA.

## MUFFLER.

938,101.

Specification of Letters Patent.

Patented Oct. 26, 1909.

Application filed February 5, 1909. Serial No. 476,276.

*To all whom it may concern:*

Be it known that I, HARRY B. WINTERS, residing at Sewickley, in the county of Allegheny and State of Pennsylvania, a citizen of the United States, have invented or discovered certain new and useful Improvements in Mufflers, of which improvements the following is a specification.

The invention described herein relates to certain improvements in mufflers for gas engines, etc.

It is frequently the case that mufflers which will be effective to deaden the report of the exhaust without causing any detrimental back-pressure will become clogged in a very short time with soot, etc., thereby increasing materially the back-pressure and necessitating a removal and cleaning of the muffler.

The invention described herein has for its object a construction in which the exhaust gases are divided into a large number of streams which are directed by suitably inclined surfaces or abutments toward the outer wall of the muffler where soot may be deposited; the gases then flow through orifices into another chamber where the gases are again deflected outwardly to free them from the soot, etc.

The invention is hereinafter more fully described and claimed.

In the accompanying drawing forming a part of this specification, Figure 1 is a sectional elevation of my improved muffler; Figs. 2 and 3 are transverse sections on planes indicated by the lines II—II and III—III, respectively, of Fig. 1. Fig. 4 shows an enlarged section and elevation showing the preferred arrangement of deflecting surfaces or abutments and the perforations. Fig. 5 shows a reversed arrangement of the abutment and orifice; Fig. 6 shows views similar to Fig. 4 illustrating a modification; Fig. 7 is a side elevation and Fig. 8 a sectional elevation illustrating a modification of my improvement.

In the practice of my invention, I employ a shell 1 preferably slightly tapering to facilitate the removal of parts for cleaning, and provided with heads 2 and 3. The smaller head 2 is adapted to be connected through a central nipple with the exhaust pipe and the larger head is provided with a plurality of openings preferably arranged adjacent to its periphery as indicated in Fig. 1. One or more hollow cones 4 are arranged

within the shell with their apices pointing toward and in line or approximately in line with the axis of the port or opening 5 through which the exhaust enters the shell. The outer surfaces of the cones are provided with a plurality of abutments or inclined surfaces 6 against which the gases flowing along the surfaces of the cones will strike and be deflected outwardly away from the outer surfaces of the cones. The stream of gases flowing through the port 5 will by impact with the point of cone 4 be given an annular form which in the construction shown in Figs. 1 to 6 is broken up, into fragmentary streams by the inclined abutments or surfaces 6 which as shown are so arranged that those of one row will alternate with those of adjacent rows. In addition to dividing the gases into streams the inclined surfaces direct the gases outwardly so that gases deflected by the abutments or surfaces 6 of the first cone will be directed against the inner wall of the shell and soot, etc., carried by the gases will be deposited on such wall. As the angle of impact of the gases on the cones is small there will be little or no deposit of soot, etc., thereon and in case any such deposit should occur, the next volume of gases will sweep them away. From the chamber formed by the cone 4 and the shell of the muffler, the gases flow through openings 7 in the wall of the cone into the chamber formed by the cones 4, 4<sup>a</sup> and the shell of the muffler. These openings are preferably formed closely adjacent to the abutments or inclined surfaces 6. A convenient manner of forming the abutments, is by raising the metal of the cone at points where the abutments are to be formed as indicated in Figs. 1, 4, 5 and 6. The openings 7 for the passage of the gases are preferably formed by so cutting the tops of the raised portions and then slightly lifting the tongue metal 8 thus formed. In the form shown in Fig. 6 a straight cut is made before the metal is raised, so that an opening through the wall of the cone will be formed in raising the metal to form the abutment or inclined surface. It will be observed that the tongues 8 will direct gases flowing through the opening 7 in a direction at an acute angle to the surface of the next cone 4<sup>a</sup> or 4<sup>b</sup> which are similar in construction to the cone 4. The inclined surfaces or abutments of the succeeding cones will also break up the gases and direct them outwardly, so that soot, etc.,

carried thereby will be deposited against the inner wall of the preceding cone or of the shell 1. The number of cones employed will depend upon the volume of gases in each exhaust or the horse power of the engine. It is preferred to terminate the series of cones with an oppositely arranged flattened cone 9 provided with perforations for the escape of gases. This cone is also provided by preference with abutments or inclined surfaces 10 on its inner wall the perforations being formed adjacent to the abutments as before described.

A dome shaped partition 11 is preferably arranged between the cone 9 and the head 3, said partition having a diameter sufficiently less than the internal diameter of the shell 1, to provide an annular passage for the outward flow of the gases, as shown in Figs. 1 and 2.

While the several internal parts may be detachably connected to the shell 1, it is preferred to attach the cones to rods 12, which may be secured in place in any suitable manner. In the construction shown one end of the rods project through the head 1 and are threaded for the reception of the nuts 13. The upper ends of the rods are held in place by bolts 14.

In lieu of detached abutments or inclined surfaces, peripherally continuous abutments can be employed as shown in Figs. 6 and 7. These continuous abutments may be formed by so corrugating the cones as to form hollow ribs 6\* on the surface of the cones, the faces of such ribs toward the apex of the cone forming the deflecting surfaces. The openings for the passage of the gases into the interior of the cone, may be placed in any desired relation to the deflecting faces, but are preferably in the upper walls of the ribs in the manner shown in Figs. 1, 4 and 5.

I claim herein as my invention:

1. An exhaust muffler having in combination a shell provided with an inlet and outlet, a hollow cone arranged within the shell having a closed apex pointing toward and adjacent to the inlet, the cone being provided on its outer wall with abutments shaped outwardly to deflect gases flowing along the cone, and means permitting the escape of gases beyond the cone to the outlet.

2. An exhaust muffler having in combination a shell provided with an inlet and out-

let, and a hollow cone arranged within the shell having a closed apex pointing toward and adjacent to the inlet, the cone being provided on its outer wall with abutments shaped to outwardly deflect gases flowing along the cone and having perforations for the flow of gas into the interior of the cone.

3. An exhaust muffler having in combination a shell provided with an inlet and outlet, a hollow cone arranged within the shell having a closed apex pointing toward and adjacent to the inlet, portions of the outer surface of the cone being raised to form deflecting abutments, said abutments having openings therethrough for the passage of gases to the interior of the cone.

4. An exhaust muffler having in combination a shell provided with an inlet and an outlet and a hollow cone arranged within the shell having a closed apex pointing toward and adjacent to the inlet; portions of the outer surface of the cone being raised to form deflecting abutments, the wall of the cone being perforated in the rear of the deflecting faces of the abutments.

5. An exhaust muffler having in combination a shell provided with an inlet and outlet, a plurality of hollow cones arranged having closed apices toward the inlet, said cones being provided with abutments shaped to deflect the gases outwardly, and having perforations for the flow of gases to the interior of the cones, and an oppositely arranged hollow cone having perforated walls.

6. An exhaust muffler having in combination a shell provided with an inlet and outlet, parts or elements adapted to break up the stream of inflowing gases and to deflect the line of flow, a frame removably secured within the shell and having said parts or elements secured thereto.

7. An exhaust muffler having in combination a shell having a removable head, a plurality of hollow cones having perforated walls and provided with deflecting abutments, a series of bars removably secured within the shell and having the cones secured thereto.

In testimony whereof, I have hereunto set my hand.

HARRY B. WINTERS.

Witnesses:

ALICE A. TRILL,  
CHARLES BARNETT.