Dec. 24, 1929. W. T. SCARRITT 1,741,078

ENGINE MUFFLER

Filed Feb. 17, 1928

Fig. 1.

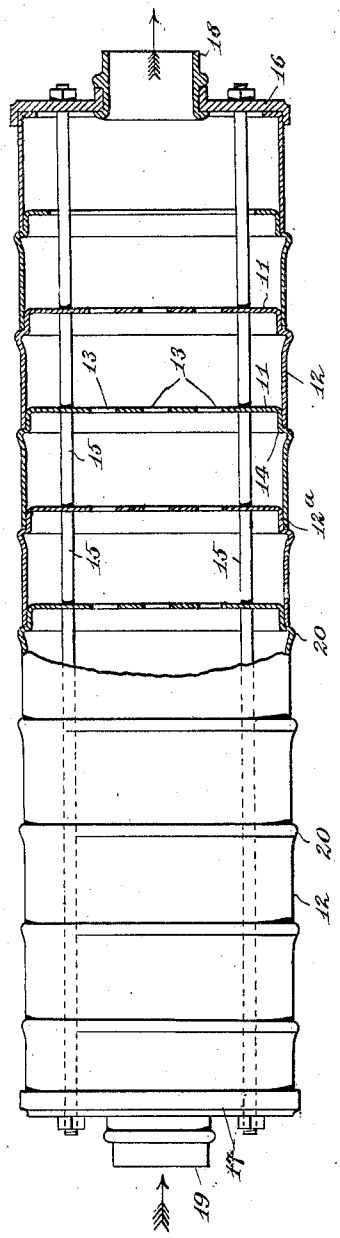


Fig. 2.

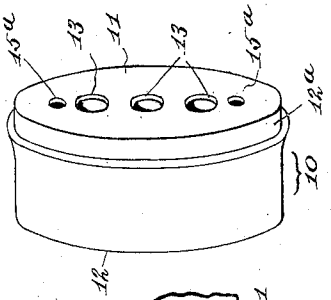


Fig. 3.

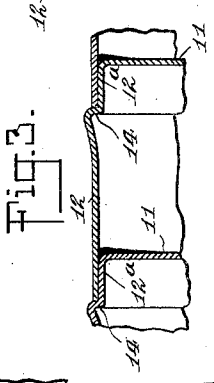


Fig. 4.

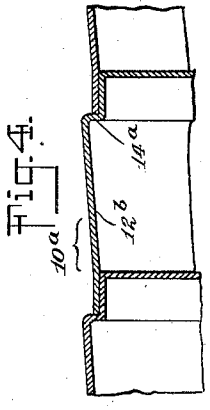
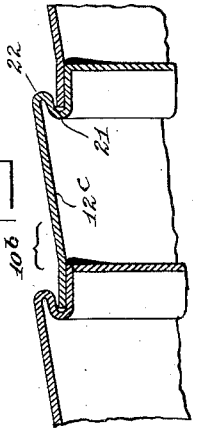


Fig. 5.



WITNESSES

William P. Goebel.

Franklin J. Foster

INVENTOR

Winthrop T. Scarritt

BY

Munn & Co.

ATTORNEY

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UNITED STATES PATENT OFFICE

WINTHROP T. SCARRITT, OF UTICA, NEW YORK, ASSIGNOR TO PRATT CHUCK COMPANY, OF UTICA, NEW YORK, A CORPORATION OF NEW YORK

ENGINE MUFFLER

Application filed February 17, 1928. Serial No. 255,111.

The present invention is concerned with a muffler for internal combustion engines. The muffler is of the type commonly used in connection with the engine exhaust pipe, and includes a series of compartments through which sound waves and exhaust gases must pass to reach the outer air. These various compartments communicating with each other only through restricted orifices, present a succession of baffle walls and sound wave interrupting surfaces which cause the sound waves to be completely broken up and subdued by the time they escape from the muffler.

A conventional method of construction heretofore used in connection with this type of muffler includes a plurality of cup-shaped muffler sections partially nested one within the other, and connected to form a long cylindrical muffler by the use of tie bolts passing through all of the sections. The bottoms of these partially nested sections constitute the baffle walls and are provided with openings therein which afford communication between the adjacent muffler chambers.

The cup shaped sections commonly employed are particularly desirable in that sections which have been burned out or otherwise injured may be readily removed and replaced at slight cost. The use of this type of muffler however, has always presented one major difficulty which rendered proper assembly of the cup shaped sections difficult. Each of the sections has been formed necessarily of rather thin gauge stock punched and rolled to define a cup having openings in its bottom and a narrow external shoulder near its bottom, defining a reduced portion over which the mouth of an adjacent cup fits. The width of this shoulder in accordance with conventional practice is identical with the thickness of the adjacent cup which abuts it. Consequently, when tie bolts have been passed through an aligned series of nested cups and tightened, the mouth of one cup frequently spreads, and slipping over the shoulder tends to telescope over an adjacent cup. Obviously, such telescoping would cause undesirably deep nesting of two cup sections and would also destroy the positive abutment between adjacent sections.

In accordance with the present invention, I have overcome this difficulty by the use of cups having shoulders of materially greater width than the thickness of the cup edges which rest upon them. Thus, the flaring or belling and consequent telescoping action is eliminated, and the adjacent partially nested cup sections may be clamped tightly together by the tie bolts.

With the above noted and other objects in view, the invention consists in certan novel features of construction, and combinations and arrangements of parts, as will be more fully set forth and pointed out in the claims. The invention may be more fully understood from the following description in connection with the accompanying drawings, wherein—

Fig. 1 is a view partly in side elevation and partly in longitudinal section through a muffler embodying the present invention.

Fig. 2 is a perspective view of one of the cup-shaped muffler sections.

Fig. 3 is an enlarged detail sectional view through several adjacent sections.

Fig. 4 is a view similar to Fig. 3, but illustrating a modification.

Fig. 5 is a view similar to Fig. 3, but illustrating a further modification.

In Figs. 1 to 3 of the drawings I have used the reference numeral 10 to indicate generally each cup shaped section, which section includes a bottom 11, circular side wall 12, and openings 13 in the bottom through which exhaust gases may pass. Each cup shaped section 10 adjacent its bottom 11 is provided with an external shoulder 14 defining a reduced portion 12^a of the wall 12, which reduced portion is adapted to conveniently fit within the mouth of an adjacent cup 10.

Shoulder 14 contrary to the conventional practice is of materially greater width than the thickness of the metal used in forming the cups, so that it will form a substantial abutment for the mouth of an adjacent cup, and the series of cups will not tend to telescope one upon the other when the tie bolts 15 are tightened. The shoulder 14, as shown in Figs. 1 and 3, is of rolled formation as differentiating from an angled shoulder. This formation provides a corrugation in conjunction with the shoulder, thus to provide compensating means for the contraction and expansion of the associate members.

These tie bolts pass through suitable openings 15^a (not shown) in the bottoms 11 of all of the cup-shaped sections, and through head plates 16 and 17 at opposite ends of the muffler; these plates carrying the outlet and inlet pipes 18 and 19 through which the gases are conducted.

With particular reference to Fig. 3, it will be noted that the shoulder 14 is produced by rolling, and is disposed at right angles to the cup wall 12 and the reduced portion 12^a of said wall, whereby it defines a flat substantial abutment for the lip of an adjacent cup, and when the cups are partially nested within each other, the shoulders, or rather the outwardly extending cup portions which form the shoulders, define a series of annular ribs 20 which materially assist in strengthening the muffler against transverse bending strains.

In Fig. 4 I have illustrated a modification in which a shoulder 14^a similar to the shoulder 14 is used. This shoulder, however, instead of being abruptly formed as by the ribs 20 is formed by gradually tapering the side walls 12^b of the cups 10^a. In the modification shown in Fig. 5, the cup 10^b also includes a gradually tapering wall 12^c. Instead of forming simply a shoulder, however, the metal of the cup wall 12^c is rolled into a substantially S configuration in cross section defining an actual groove 21 receiving the lip of an adjacent cup section.

With this form of the invention, one side of the S-curve constitutes the groove, and the other side constitutes a rib 22 serving as a strengthening rib much in the manner of the ribs 20 in Fig. 1.

In all forms of the invention, a substantial shoulder is provided which prevents the cups from telescoping one upon the other when the tie bolts 15 are tightened. In other words, the shoulders accurately predetermine the extent to which the cups may be nested one within the other. An extremely rugged construction is had due to the fact that the bolt 15 may be tightened to firmly jam the cups against each other, and due to the further fact that the ribs 20 or 22 serve to strengthen the sectional muffler against transverse strains.

Obviously, various changes and alterations might be made in the general form and arrangement of the parts described without departing from the invention. Hence I do not wish to limit myself to the details set forth, but shall consider myself at liberty to make such changes and alterations as fairly fall within the spirit and scope of the appended claims.

I claim:

1. In an engine muffler, a plurality of generally cup shaped members partially nested one within the other and defining chambers, said members having openings in their bottoms providing communication between the chambers, tie bolts or the like connecting all of said members and holding them in properly nested relationship, each of said cup-shaped members including a rolled external annular shoulder extending beyond the periphery of the bottom of said cup-shaped member and located between its bottom and lip against which the lip of an adjacent cup abuts, the shoulder being of greater width than the thickness of the cup lip which abuts it, the shoulder presenting an annular reinforcing rib extending laterally beyond the lip of the adjacent cup and providing a compensating means for the expansion and contraction of the members.

2. In an engine muffler, a plurality of generally cup shaped members partially nested one within the other and defining chambers, said members having openings in their bottoms providing communication between the chambers, tie bolts or the like connecting all of said members and holding them in properly nested relationship, each of said cup-shaped members including an external annular shoulder between its bottom and lip against which the lip of an adjacent cup abuts, the shoulder being of greater width than the thickness of the cup lip which abuts it and constituting the bottom of an annular groove produced by rolling part of the cup side wall back upon itself.

3. In an engine muffler, a plurality of cup-shaped members partially nested one within the other and defining chambers, said members having openings in their bottoms providing communications between the chambers, tie bolts or the like connecting all of said members and holding them in properly nested relationship, each of said cup-shaped members including portions overlapping in spaced relation to provide a receiving groove for the lip of the next adjacent cup-shaped member.

4. In an engine muffler, a plurality of cup-shaped members partially nested one within the other and defining chambers, said members having openings in their bottoms providing communications between the chambers, tie bolts or the like connecting all of said members and holding them in properly

nested relationship, each of said cup-shaped members including a slanting side wall terminating in overlapping portions provided with spaced angularly related walls adapted to form a groove for guiding and receiving the lip of the next adjacent cup-shaped member.

Signed at Utica, in the county of Oneida and State of New York, this 15 day of February, A. D. 1928.

WINTHROP T. SCARRITT.