July 23, 1935. M. N. MIKULIC 2,008,964

MUFFLER

Filed Dec. 26, 1933

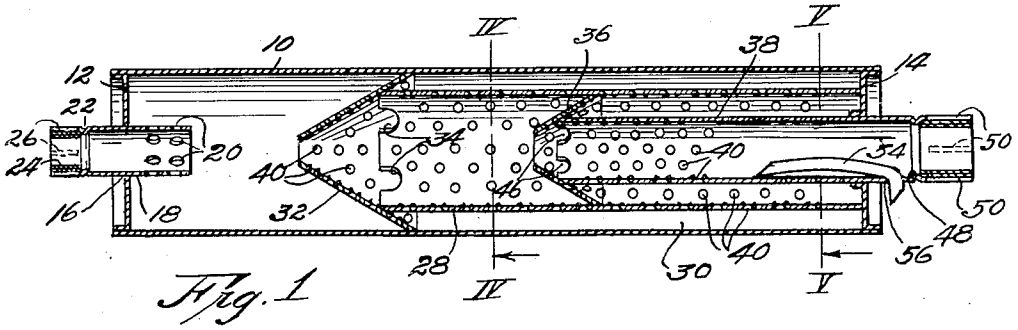


Fig. 1

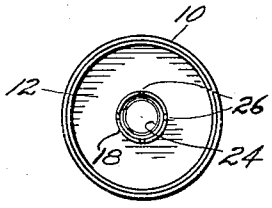


Fig. 2

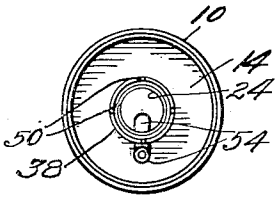


Fig. 3

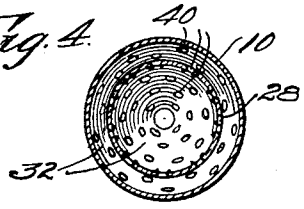


Fig. 4

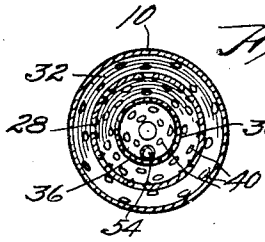


Fig. 5

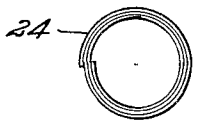


Fig. 6

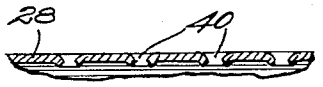


Fig. 7

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MUFFLER

Milos N. Mikulic, Independence, Mo., assignor of one-third to Ellsworth H. Munford and one-third to H. D. Pinkerton, both of Kansas City, Mo.

Application December 26, 1933, Serial No. 703,904

6 Claims. (Cl. 137—160)

This invention relates to mufflers for internal combustion engines, the principal object being to provide a muffler which is effective in operation and which causes a minimum amount of back pressure. The muffler is so constructed that while the exhaust is silenced, the consumption of fuel is reduced thereby effecting a saving in the cost of operating the engine.

A further object of the invention is the provision of a tubular muffler having a series of perforated tubular members arranged in a casing and having means for admitting air to fill the vacuum caused by the outgoing exhaust gases to prevent objectionable reactions.

Another object of the present invention is a muffler that is very economical and simple of construction, durable and easily installed, and which will not readily deteriorate or get out of order.

With these general objects in view, together with other objects which will appear during the course of the specification, reference will now be had to the accompanying drawing, wherein:

Figure 1 is a longitudinal, sectional view of a muffler embodying this invention.

Fig. 2 is an elevation of the exhaust end of the muffler.

Fig. 3 is an elevation of the intake end of the muffler.

Fig. 4 is a cross sectional view taken on line IV—IV of Fig. 1.

Fig. 5 is a cross sectional view taken on line V—V of Fig. 1.

Fig. 6 is an end elevation of the adjustable gasket used in uniting the muffler with engine exhaust and the exhaust pipe; and

Fig. 7 is an enlarged fragmentary section of one of the perforated baffle walls of the tubular member or of the frusto-conical walls.

Throughout the specification like reference characters designate similar parts and the numeral 10 indicates a jacket or casing, of any suitable size or shape, having end closure plates 12 and 14, which are securely attached to the jacket by welding or any other of the well known means.

End plate 12 is provided with an opening 16 through which is extended an outlet tube 18, which extends on both sides of the plate and is provided at its inner portion, positioned within the jacket, with perforators 20. That portion of 18 outside the jacket has an annular internal brad 22 against which is adjusted a suitable gasket 24. Gasket 24 as shown is made by rolling a strip of non-inflammable material, such as asbestos, into an open roll of sufficient diameter to fit the inside wall of 18 and the outside wall of any exhaust tube, not here shown, which might be fitted therein. It is apparent that a portion of the gasket might be cut away to properly fit between the two tubes. Furthermore, the outer end of 18 is provided with slots 26 to allow the compressing of 18 against 24 by means of any suitable clamp now commonly in use.

Positioned in jacket 10 and extending from end plate 14 to a point spaced apart from plate 12, is an intermediate, perforated, tubular baffle wall member 28 which is spaced apart from the inner wall of jacket 10 to form a compartment 30. Fitted over the inner end of 28 is perforated frusto-conical baffle wall 32 which has its enlarged end portion in direct contact with the inner wall of jacket 10 and its reduced open end directed toward the exhaust end of the muffler. The notches 34 in the inner end of 28 facilitate proper release of the gases from this intermediate tube.

Positioned in intermediate tube 28 is a perforated frusto-conical baffle wall member 36 which is pointed toward the exhaust end of the muffler and has its enlarged end positioned against the inner wall of 28. An inner perforated tubular member 38 is fitted at its inner end into 36 and extends outwardly through opening 40 formed in end plate 14 to a point therebeyond. The inner portion of 38 is perforated as at 42 to allow the passage of exhaust gases into chamber 44, which is formed between the intermediate and inner tubular wall members. Tubular wall 38 has slots 46 formed in its inner end. For the purpose of attaching the muffler to the engine exhaust pipe the outwardly extended portion of 38 is provided with an annular inturned bead 48, slots 50 and gasket 52 similar to that described on tube 18.

It has been found to great advantage to introduce into inner tube 38 a supply of outside air to prevent the formation of objectionable vacuums and to cool the incoming hot exhaust gases. The cooling operation facilitates the muffling or silencing by reducing the volume of gas by reducing its temperature. This is accomplished by passing an open duct 54 through opening 56 formed in the outer portion of tube 38 and into said tube to a point intermediate its outer end and the perforated portion thereof. With each pulsation of the gases past the inner end of duct 54 a quantity of cool air will be drawn into the muffler.

The baffling tubes and conical walls are provided with perforations 48, more clearly shown in the enlarged view 7, which are formed by punch-

ing the metal inwardly, thus producing a smooth outside surface and a roughened inside surface which serves to direct the flow of exhaust gases in such a manner as to prevent back pressure and the formation of undue vacuum effects.

It is obvious that with this structure a muffler is produced that will receive and silence the outgoing engine gases with a minimum of back pressure.

What is claimed as new and desired to be covered by Letters Patent is:

1. A muffler for internal combustion engines comprising a jacket having an outlet at one end thereof; an inner perforated tubular member positioned in said jacket with its outer end extending through the other end of said jacket and its inner end positioned intermediate the ends of said jacket; an intermediate perforated tubular member positioned in said jacket in spaced relation between said jacket and the first mentioned tubular member with its inner end extending beyond the inner end of said inner tube; a perforated frusto-conical tubular member positioned over the inner end of each of said tubular members respectively with the enlarged ends thereof engaging the inner walls of the said jacket and intermediate tubes respectively.

2. A muffler for internal combustion engines comprising an elongated jacket having an outlet at one end and having a closure plate at the other end thereof; a perforated frusto-conical baffle wall positioned within said jacket, intermediate the ends thereof, and engaging its inner wall; a perforated, intermediate tubular member extending from the inner surface of said frusto-conical wall to said closure to form a chamber between said jacket and the intermediate tubular member; an inner tubular member extending through said closure plate and into said intermediate tubular member and having its inner end portion perforated; a frusto-conical, perforated baffle wall positioned over the inner end of said inner tubular member with the enlarged end thereof engaging the inner wall of said intermediate tubular member; and a duct terminating in said inner tubular member adjacent the perforated portion thereof and its outer end extending exteriorly of said jacket and of the inner tubular member.

3. A muffler for internal combustion engines comprising a jacket having an outlet at one end thereof; an inner tubular member positioned in said jacket with its outer end extending through the other end of said jacket and spaced apart from the inner wall of said jacket; perforations formed through the wall of said tubular member at its inner end; an intermediate, perforated tubular member positioned in said jacket in spaced relation between said jacket and said inner tubular member, and with its inner end positioned between the outlet end of said jacket and the inner end of said inner tubular member; a frusto-conical, perforated baffle wall member positioned over the inner end of said inner tubular member with the enlarged end thereof engaging the inner wall of said intermediate tubular member; a frusto-conical perforated baffle wall positioned over the inner end of said intermediate tubular member with the enlarged end thereof engaging the inner wall of said jacket; and a duct terminating in said inner tubular member, intermediate its outer end and the perforated portion thereof, and extending exteriorly of said jacket and of the inner tubular member.

4. A muffler for internal combustion engines comprising an elongated jacket having closure plates at its opposite ends; an outlet tube extending through one of said plates and having its inner end perforated; a perforated frusto-conical baffle wall positioned within said jacket, intermediate the ends thereof, and engaging its inner wall; a perforated, intermediate tubular member extending from the inner surface of said frusto-conical wall to the other of said closure plates to form a chamber between said jacket and said intermediate tubular member; an inner tubular member extending through said last named closure plate and into said intermediate tubular member having its inner end portion perforated; a frusto-conical, perforated baffle wall positioned over the inner end of said inner tubular member with the enlarged end thereof engaging the inner wall of said intermediate tubular member; and a duct terminating in said inner tubular member intermediate the perforated portion thereof and its outer end extending exteriorly of said jacket and of the inner tubular member.

5. A muffler for internal combustion engines comprising an elongated jacket having closure plates at its opposite ends; an outlet tube extending through one of said plates and having its inner end perforated; a perforated frusto-conical baffle wall positioned within said jacket, intermediate the ends thereof, and engaging its inner wall; a perforated, intermediate tubular member extending from the inner surface of said frusto-conical wall to the other of said closure plates to form a chamber between said jacket and said intermediate tubular member; an inner tubular member extending through said last named closure plate and into said intermediate tubular member having its inner end portion perforated; a frusto-conical, perforated baffle wall positioned over the inner end of said inner tubular member with the enlarged end thereof engaging the inner wall of said intermediate tubular member; and a duct terminating in said inner tubular member intermediate the perforated portion thereof and its outer end extending exteriorly of said jacket and of the inner tubular member.

6. A muffler for internal combustion engines comprising an elongated jacket having an outlet at one end and having a closure plate at the other end thereof; a perforated frusto-conical baffle wall positioned within said jacket, intermediate the ends thereof, and engaging its inner wall; a perforated, intermediate tubular member extending from the inner surface of said frusto-conical wall to said closure plate to form a chamber between said jacket and said intermediate tubular member; an inner tubular member extending through said closure plate and into said intermediate tubular member having its inner end portion perforated and having its outer end slit to allow contraction; a frusto-conical, perforated baffle wall positioned over the inner end of said inner tubular member with the enlarged end thereof engaging the inner wall of said intermediate tubular member; and a duct terminating in said inner tubular member intermediate the perforated portion thereof and its outer end extending exteriorly of said jacket and of the inner tubular member.

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