Oct. 23, 1928. 1,688,488

A. F. DORMEYER

MUFFLER

Original Filed June 21, 1926

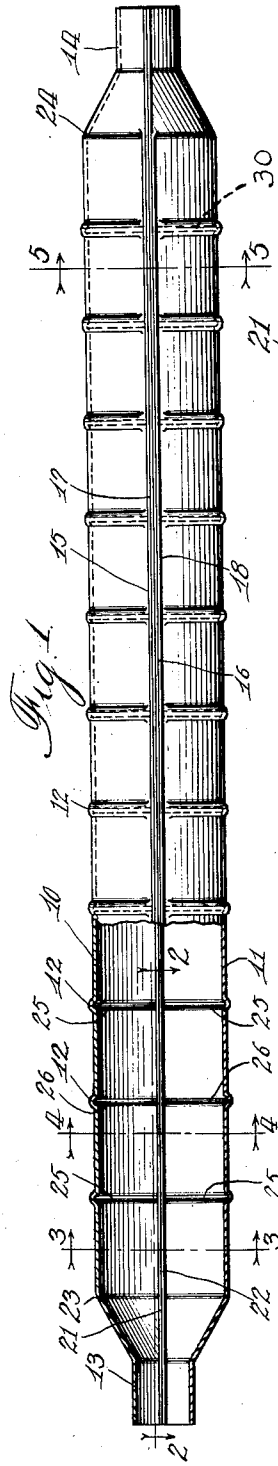

Fig. 1.

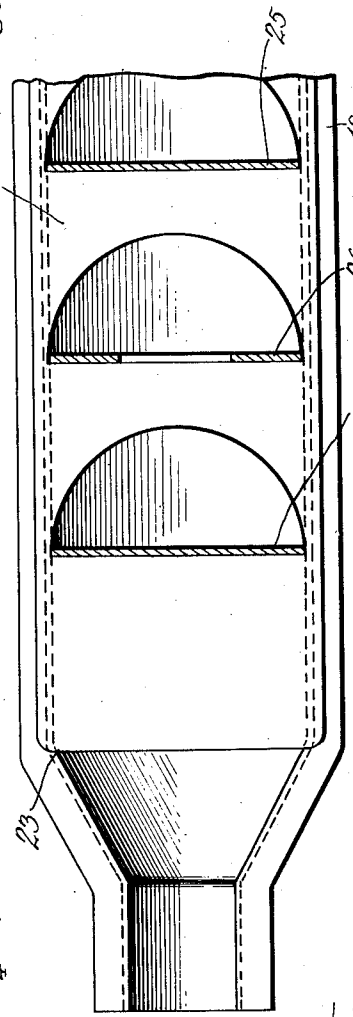

Fig. 2.

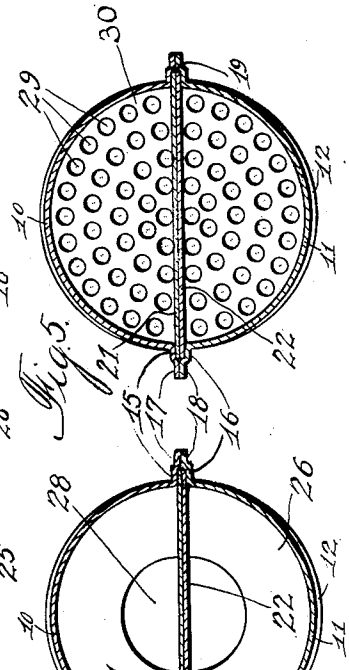

Fig. 5.

Fig. 4.

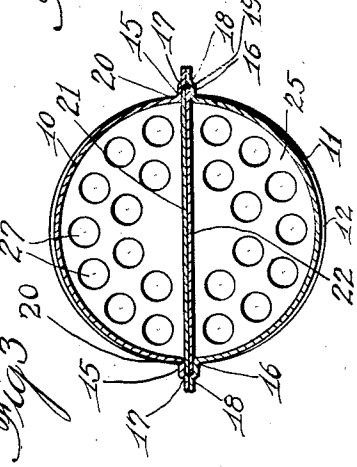

Fig. 3

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MUFFLER.

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This invention relates to a muffler which is particularly adapted for muffling the noise of exhaust gases from internal combustion engines and the like.

One of the objects of the present invention is to provide a simple, efficient and economical construction of a muffler.

Another object of the invention is to provide an improved muffler which shall consist of a minimum number of parts, each of which may be stamped out of sheet metal at small cost, and all capable of being quickly and easily assembled together into the completed structure.

A further object is to provide a novel form of core adapted to be made from flat metal strips formed to provide outwardly projecting baffling elements and capable of being positioned and secured within the shell of the muffler.

A still further object of the invention is to provide a novel muffler construction including a casing or shell formed with a plurality of peripherally arranged internal grooves for strengthening the shell and receiving and holding the circular baffles of the core mounted within the shell.

These and other objects are accomplished by providing a construction and an arrangement of the various parts in the manner hereinafter described and particularly pointed out in the appended claims.

Referring to the drawings:

Fig. 1 is a side elevational view partly in cross section showing the construction of my improved form of muffler,

Fig. 2 is an enlarged fragmentary cross sectional view taken on the line 2—2 in Fig. 1,

Fig. 3 is an enlarged cross sectional view taken on the line 3—3 in Fig. 1 showing the arrangement of the apertures in one set of the baffling elements.

Fig. 4 is an enlarged cross sectional view taken on the line 4—4 in Fig. 1 showing the arrangement of the apertures in another set of the baffling elements, and

Fig. 5 is an enlarged cross sectional view taken on the line 5—5 in Fig. 1 showing the construction of the last baffling element adjacent the exhaust end of the muffler.

One of the advantageous features of my muffler for reducing the noise of exhaust gases from internal combustion engines and the like is its simplicity made possible by the fact that the number of parts which go to make up the muffler are reduced to a minimum. In addition the construction can be economically produced and in use it is not only highly efficient and satisfactory but it is also very strong and durable.

A muffler made in accordance with my invention is preferably formed of sheet metal which may be readily stamped out and assembled. The form shown as illustrative of my invention comprises a shell consisting preferably, although not essentially, of two semi-cylindrcal sections 10 and 11 which in some instances are provided with peripheral grooves 12. These grooves, if employed, are disposed in spaced relation longitudinally of the shell and in addition to strengthening the shell, are also adapted to receive and hold therein circular baffling elements formed on the metal core in the manner hereinafter described.

These semi-cylindrical shell sections 10 and 11 are provided at both ends with reduced cylindrical portions 13 and 14 which, in the interests of economy, are formed during the stamping operation. The end 13 is adapted to be connected with the exhaust pipe of the internal combustion engine and the other end serves as the exhaust end of the muffler. Each of the semi-cylindrical shell sections 10 and 11 is provided along its longitudinal edges with laterally extending flanges 15 and 16. These flanges 15 and 16 are provided with offset portions 17 and 18, respectively, so as to form longitudinally extending sockets or grooves 19 and 20 to receive and retain therein the edges of the metal strips 21 and 22 of the baffling core. The offset portions 17 and 18 of the flanges 15 and 16, respectively, are in contacting relation and are secured together by soldering, welding, seaming or any other suitable method so as to make the casing substantially gas-tight.

The baffling core which is disposed within the shell comprises essentially a longitudinally extending web or body consisting of one or more elongated sheets of metal of suitable width to fit within the shell. The baffling elements themselves consist of substantially semi-circular wings cut from the body or web and bent at right angles thereto so as to be disposed transversely of the shell and divide the same into a series of baffling chambers. In the preferred construction illus-

trated, however, a larger number of baffling elements and baffling chambers is secured by forming the web of two sheets of metal, indicated by reference characters 21 and 22 respectively, which, after the baffling elements 25 and 26 are struck out from the ribs, are placed back to back, as shown on the drawings, forming thereby a heavier and stronger web and also providing twice as many baffling elements as could be struck out from a single sheet of metal.

Alternate baffling elements 25 are provided with a plurality of apertures 27, as shown in Fig. 3, and the intervening alternate elements 26 are provided with a central opening 28 as shown in Fig. 4. The last baffling element 30 at the discharge end of the muffler is preferably provided with a large number of relatively small apertures 29, as shown in Fig. 5.

In the manufacture of my improved muffler, the casing sections, which are duplicates of each other, are stamped from sheet metal into the desired form having the contracted ends, and are provided during the stamping operation with the circumferential ribs 12, if these be employed. While the ribs 12 serve to strengthen the shell and at the same time afford seating grooves for the perimeters of the baffling elements and assist in locking and holding the elements in place, nevertheless in the cheaper constructions these ribs may be dispensed with, if preferred. The baffling core, consisting of a central web or body provided with laterally projecting semi-circular baffling elements struck from the metal of the web and provided with suitable openings, as hereinbefore explained, is also produced by a stamping operation. In the preferred form illustrated which consists of two sheets of metal placed back to back, each sheet is stamped to provide the requisite perforations and to cut and strike up the baffling elements. These sheets are then placed back to back to form the central web with the baffling elements projecting laterally from opposite faces thereof. The core thus constructed is then disposed within one of the shell sections and the other shell section is disposed over the core and the two sections are then connected together along their edge to form an assembled, completed structure consisting in its entirety of but four pieces, all of which are produced by stamping operations. Each longitudinal half of the muffler being a duplicate of the other half, there are in fact only two sets of dies required for stamping out the whole structure.

It should be apparent from the foregoing that I have provided an extremely simple, but at the same time, a strong and durable muffler which, while capable of being produced very economically, is highly efficient in operation since it provides a series of baffling chambers through which the exhaust gases must pass in a tortuous path, so as to reduce the back pressure and permit the ultimate discharge of the gases in a steady and noiseless stream.

While in the above specification I have described one embodiment that my invention may assume in practice, it will, of course, be understood that the same is capable of modification and that modification may be made without departing from the spirit and scope of the invention as expressed in the following claims.

What I claim as my invention and desire to secure by Letters Patent is:

1. A muffler construction comprising two semi-cylindrical members, said members having oppositely disposed laterally extending flanges formed integrally therewith, a core mounted within the confines of said members comprising two longitudinally extending strips, oppositely disposed transverse baffling elements formed integrally with said strips, and means whereby the longitudinal edges of said strips are secured between the flanges of said semi-cylindrical members.

2. A muffler construction comprising two semi-cylindrical members, said members having oppositely disposed laterally extending flanges formed integrally therewith, said flanges having offset portions so as to form longitudinally extending recesses substantially throughout the entire length of said muffler, and a baffling core comprising two oppositely disposed metal strips having baffling elements extending outwardly at right angles with respect to each of said strips and in transverse alignment with respect to each other, said strips mounted in the recess formed between the flanges of said semi-cylindrical members for securing said core within said members.

3. A muffler comprising a shell and muffling means therein including a diametrally disposed web extending longitudinally of the shell and transversely disposed baffle elements arranged in spaced relation, the edge of each element contacting with the inner periphery of the shell continuously from one diametrically opposed position therein to the other and dividing the interior of said shell into a plurality of baffling chambers.

4. A muffler comprising a shell, and muffling means within said shell including a longitudinally disposed web and transversely disposed muffling elements projecting laterally from both faces of said web, the edge of each element contacting with the inner periphery of the shell contnuously from one diametrically opposed position therein to another and dividing the shell into a plurality of baffling chambers.

5. A muffler comprising a cylindrical shell, a web extending longitudinally thereof, and baffling elements struck out from the body of

said web and projecting laterally from the opposite faces thereof, the edge of each element contacting with the inner periphery of the shell continuously from one diametrically opposed position therein to the other whereby the interior of the shell is divided into a series of baffling chambers.

6. A muffler comprising a shell provided with circumferential corrugations, and a muffling core comprising a longitudinal web provided with transversely disposed baffling elements engaged in the corrugations of said shell.

7. A muffler comprising a shell formed of opposed sections, and a muffling core consisting of a central web disposed longitudinally of the shell and transverse perforated baffling elements extending laterally from said web, the longitudinal marginal edges of said web being secured between the opposing sections of said shell.

8. A muffler comprising a shell provided with circumferential corrugations, and a muffler core comprising a longitudinal web provided with transversely disposed baffling elements having the outer edges thereof seated in the corrugations of said shell.

9. A muffler comprising a shell provided with circumferential corrugations, and a muffling core comprising a longitudinal web provided with transversely disposed semicircular baffling elements having the outer edges thereof seated in the corrugations of said shell.

10. A muffler comprising a shell provided with circumferential corrugations, and a muffling core comprising a longitudinal web provided with transversely disposed baffling elements having the edges thereof continuously engaged in the corrugations of said shell from one diametrically opposed position therein to the other.

11. A muffler comprising a shell and muffling means therein including a diametrically disposed web extending longitudinally of the shell and transversely disposed baffle elements arranged in spaced relation, the edge of each element contacting continuously with the inner periphery of said shell from one edge of said web to the other.

12. A muffler comprising a shell, and muffling means within said shell including a longitudinally disposed web and transversely disposed muffling elements projecting laterally from both faces of said web and arranged substantially perpendicular to the axis of the shell, the edge of each element contacting continuously with the inner periphery of said shell between opposite edges of said web.

13. A muffler comprising a cylindrical shell, a web extending longitudinally thereof, and baffling elements struck out from the body of said web and projecting laterally from opposite faces thereof, the edge of each element contacting continuously with the inner periphery of said shell between opposite edges of said web.

14. A muffler comprising a shell provided with circumferential corrugations, and a muffling core comprising a longitudinal web provided with transversely disposed baffling elements having the edges thereof continuously engaged in the corrugations of said shell between opposite edges of said web.

15. A muffler construction comprising two semi-cylindrical casing members, a baffling core mounted within the confines of said casing members and consisting of a longitudinal web having transverse baffles in spaced relation, and means extending longitudinally of said casing members for securing said core and said casing members together.

16. A muffler construction comprising two semi-cylindrical casing members, laterally extending flanges formed integrally with said casing members and a baffling core mounted within the confines of said casing members and consisting of a longitudinal web having transverse baffles in spaced relation, said core being secured between the flanges of said casing members.

17. A muffler construction comprising a sectional conduit, a baffling core mounted within the confines of said conduit and consisting of a longitudinal web having transverse baffles in spaced relation, and means formed integrally with the sections of the conduit and engaging said core for securing said core and sections together.

18. A muffler construction comprising two semi-cylindrical members each having oppositely disposed laterally extending flanges, and a muffling core comprising an element having its side edges between said flanges of said members and having a portion forming a web directed longitudinally of said members and baffling elements secured to said web and extending to the interior walls of said members transversely thereof.

19. A muffler construction comprising a substantially cylindrical shell, and a muffling core disposed and secured within said shell, said core comprising means extending longitudinally of a portion of said shell parallel a plane containing the axis of the shell and partitioning said portion into separate parts, and baffle means secured to said longitudinally extending means directed transversely thereof at spaced intervals from opposite sides of said longitudinally extending means, said baffle means having perforations, the perforations of adjacent baffles being of different size.

20. A muffler comprising a generally cylindrical shell provided with a semi-circumferential inwardly opening slot intermediate its ends on one side and a second semi-circumferential inwardly opening slot spaced longitudinally from the first slot on the opposite side of said shell, and a muffling core

having a web portion directed longitudinally of said shell and baffle portions directed transversely of said shell into said slots.

21. A muffler comprising a substantially longitudinal shell casing having substantially perimetrically extending recesses at longitudinally spaced intervals opening to the interior of the casing, and a muffling core element in said casing, said core element having a transversely directed web portion lying in a longitudinal plane through said casing and a transverse baffle portion extending from each side of the web portion into a recess in said casing adjacent the side of the web from which the baffle portion extends.

22. A muffler comprising a longitudinal casing having transversely extending longitudinally spaced, and inwardly opening recesses in the opposite walls thereof, and core means in said casing comprising a transverse baffle having edge portions engaged in certain of the recesses in opposite walls of the casing and having a portion between its said edge portions directed longitudinally of said casing.

23. A muffler comprising a longitudinal casing having transversely extending longitudinally spaced, and inwardly opening recesses in the opposite walls thereof, and core means in said casing comprising a transverse baffle having edge portions engaged in certain of the recesses in opposite walls of the casing and having a portion between its said edge portions directed longitudinally of said casing, said baffle having perforations between each of said edge portions and said portion therebetween.

In witness of the foregoing I affix my signature.

ALBERT F. DORMEYER.