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WATER MUFFLER

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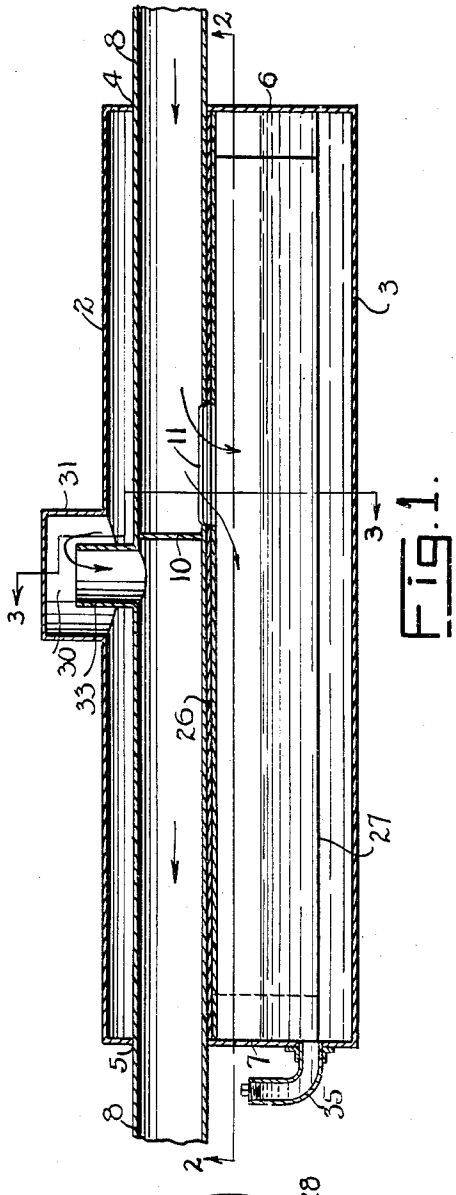


Fig. 1.

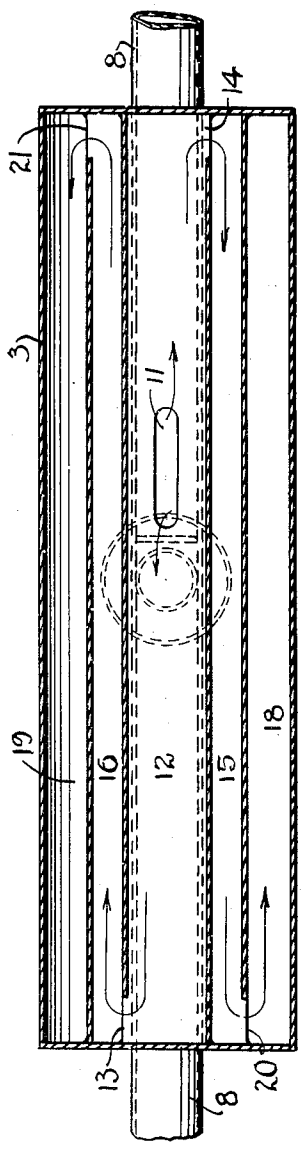


Fig. 2.

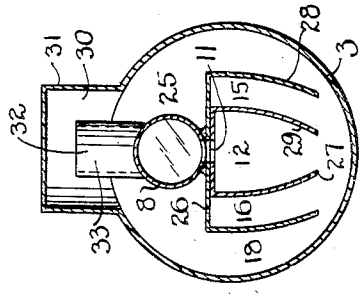


Fig. 3.

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UNITED STATES PATENT OFFICE

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WATER MUFFLER

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Application January 2, 1932, Serial No. 584,515

5 Claims. (Cl. 261—123)

The invention relates to an improvement in mufflers or silencers particularly adapted for use in muffling the exhaust of internal combustion engines.

The present invention relates to the type of muffler known as a water muffler and is somewhat similar to the type of muffler disclosed in my Patent 1,777,510, granted October 7, 1930.

It is one of the objects of the present invention to simplify the construction of water mufflers and provide a muffler wherein the discharge from the muffler occurs from the same pipe which serves as an inlet for the muffler.

Another object of the invention is to provide a muffler which may be inserted in the exhaust pipe line of standard types of vehicles without necessitating material alterations in the pipe supporting members.

Another object of the invention is to provide a plurality of curved baffles within the muffler in such a manner that there will be no sparks or fire discharged from the muffler.

Still another object of the invention is to provide a muffler wherein the exhaust gases are compelled to pass through a maze and to thereafter pass through the dome and discharge from the same pipe through which the gases entered the muffler.

Other and further objects of the invention will be readily apparent when the following description is considered in connection with the accompanying drawing wherein.

Fig. 1 is a central vertical section taken along the longitudinal axis of a muffler constructed in accordance with the invention.

Fig. 2 is a section taken on the line 2—2 of Fig. 1 and looking up on the bottom of the conduit pipe.

Fig. 3 is a section taken on the line 3—3 of Fig. 1 and looking in the direction of the arrows.

The muffler is indicated generally at 2 and includes a housing or body structure 3, which is preferably cylindrical in form and of the desired length. This housing is provided with openings 4 and 5 in the opposite end members 6 and 7, respectively. These openings are arranged to receive the pipe or conduit 8, which is preferably a single piece of pipe and extends completely through the housing 3. It is intended that this pipe 8 will be of sufficient length that it may be inserted as a section of the usual exhaust pipe in standard forms of vehicles. In other words, it is contemplated that the muffler provided with the vehicle as original equipment may be removed and the present muffler substituted therefor by merely removing the old muffler and inserting this one in its place in such a manner that the pipe 8 will form a continuation of the exhaust passage the same as the original muffler.

The pipe 8 is of special construction and is provided intermediate its ends with a stop plate or baffle 10. This may be inserted in the pipe in any desired manner such as cutting a slot in the pipe, inserting the disc, and welding the disc in place. The pipe is formed with an opening 11, which is best seen in Fig. 2, and serves as an outlet for the gases which enter the muffler through the pipe 8 from the engine as indicated by the arrow. This opening 11 communicates with the muffler chamber 12 which is best seen in Fig. 3. This chamber 12 forms a part of the maze which is used to increase the amount of travel required of the gases before they can be discharged from the muffler.

As seen in Fig. 2, the principal chamber is at 12 and there is an outlet such as 13 at one end of this chamber and 14 at the opposite end. In this manner the gases may flow from the chamber 12 in each direction and enter the intermediate passages 15 and 16. These intermediate passages communicate with the outside areas 18 and 19, respectively, by means of the outlets 20 and 21. In this manner the gases are caused to travel a considerable distance before they may pass upwardly around the baffles into the upper chamber 25 of the muffler. It should be noted that the top of the chambers 12, 15 and 16 are covered by the top plate 26 so that the gases can only escape by traversing the length of the passages.

The lower portion of the housing 3 is filled with liquid such as water which forms a seal about the lower ends 27 of the partitions or baffles in the muffler. Particular attention is directed to the curvature provided in the partitions 28, which has been found advisable due to the fact that the greatest pressure occurs in the central chamber 12 and tends to drive the water from between the lower end 27 and out of the chamber 12. With the curved form of partition the movement of the water is upwardly along the inside face 29 of the partition so that it will fall by gravity again to the base of the muffler housing. The curved baffles tend to discourage spraying of the water due to the gas pressure.

After the gases reach the upper chamber 25, they are required to enter the dome chamber 30, which is formed in the dome or the cap 31, before they can escape. This path it should be noted causes an additional reversal in the direction of

flow of the gases because they are compelled to enter the discharge neck 32. This neck 32 is in the form of a short piece of pipe 33, which is welded or otherwise affixed on the upper side of the conduit pipe 8 at a position beyond the baffle 10. The gases entering this neck will discharge through the continuation of the pipe 8, as indicated by the arrow in Fig. 1. The two outer baffles 28 are preferably formed of a single sheet of material bent as indicated in Fig. 3 to form a three-sided trough, which is inverted and has the conduit pipe 8 welded thereto. The two innermost baffles are similarly formed and are welded or otherwise affixed inside of the inverted trough forming the outer baffles or partitions.

Fig. 1 shows a connection 35 for placing the liquid in the muffler. The present muffler has been found exceptionally satisfactory in that the water does not spray from the muffler under any circumstances and the discharge of water when a backfire occurs in the engine has been entirely eliminated. The construction is simple and economical because a single pipe 8 is used which permits the discharge from the muffler to occur at the same elevation as the gases enter and permits the installation of the muffler in numerous makes of vehicles where special structures were heretofore required.

Having thus described my invention, what I claim as new is:

1. A water muffler including a housing, a pipe extending longitudinally of said housing, a partition in said pipe, an outlet from said pipe into said housing, an inlet to said pipe from said housing, said inlet and said outlet being separated by said partition whereby the exhaust gases enter and leave said housing by said pipe, and a maze arranged in said housing to receive the gases from said inlet whereby the gases are conducted longitudinally at least the length of said housing.

2. A water muffler including a housing, a pipe extending longitudinally of said housing, a partition in said pipe, an outlet therefrom into said housing, an inlet to said pipe from said housing, said inlet and said outlet being separated by said partition whereby the exhaust gases must pass through said housing, and a plurality of curved partitions suspended below said pipe in said housing to receive the gases and cause them to traverse said housing before reaching said inlet.

3. A water muffler including a housing, a dome thereon, a conduit pipe extending through said housing, a partition therein to cause gases entering said housing through said conduit to be discharged into said housing, and means in said housing to direct the exhaust gases into said dome, and a neck connected to said conduit beyond said partition to discharge the gases from said dome.

4. A water muffler including an elongated housing, an inlet pipe for the exhaust to said housing, baffles in said housing longitudinally thereof between which said pipe discharges, the lower edges of said baffles being submerged in liquid, outlets from said baffles to said housing, an outlet pipe connected with said housing and extending into the upper interior part of said housing, and formed as a continuation of said inlet pipe.

5. A water muffler including a housing, a combination inlet and outlet pipe extending through said housing, means in said pipe to direct the flow of exhaust gases into said housing, a plurality of baffles carried by said pipe and depending therefrom, and additional means carried by said pipe to direct the gases from said housing into said pipe.

ALBERT P. J. VOIGT.