

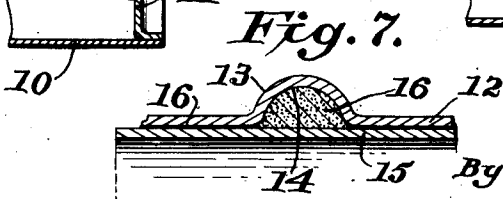
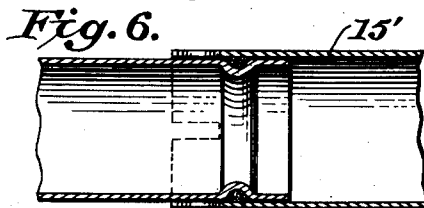
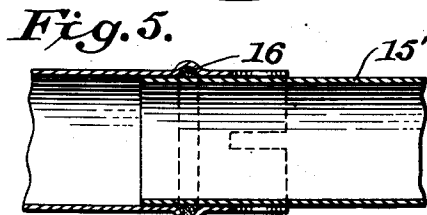
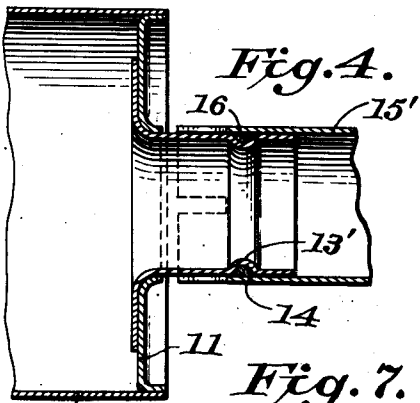
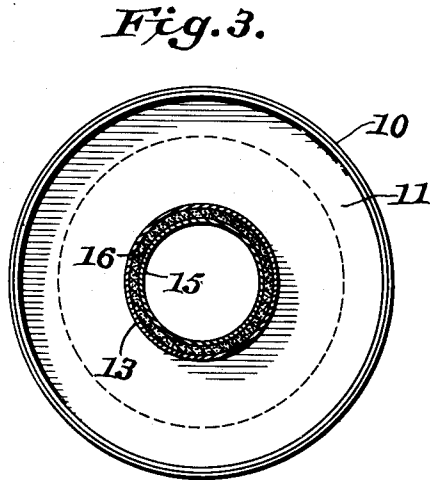
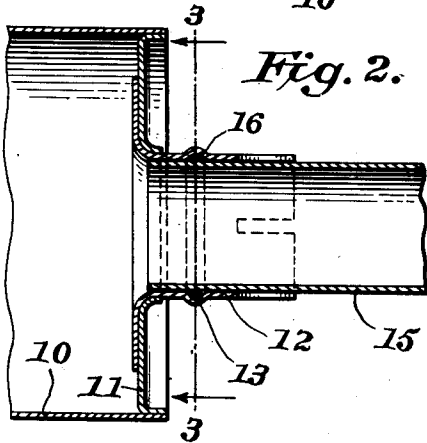
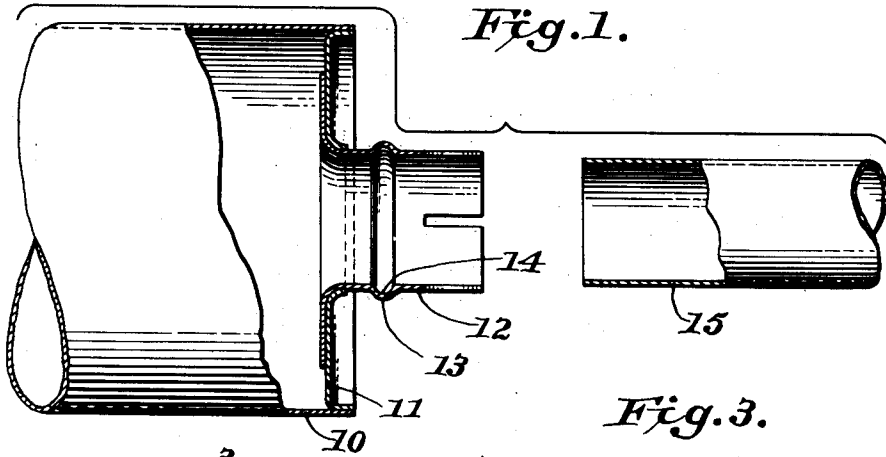
April 23, 1946.

G. H. HEDRICK

2,398,788

MUFFLER

Filed Jan. 31, 1944



16 Inventor:

Gale H. Hedrick,

By Cushman, Dail & Cushman
Attorneys.

UNITED STATES PATENT OFFICE

2,398,788

MUFFLER

Gale H. Hedrick, Chicago, Ill., assignor to Marmont Automotive Products, Inc., Chicago, Ill., a corporation of Illinois

Application January 31, 1944, Serial No. 520,512

2 Claims. (Cl. 285—183)

This invention relates to mufflers and embodies an improvement which will substantially increase the safety of automotive vehicles with which the muffler is associated.

One of the great dangers present in all vehicles driven by internal combustion engines is the possibility of the occupants being subject to the ill effects of carbon monoxide poisoning. It has been found that even small leaks in the exhaust system cause sickness, drowsiness, and often death. Many fatal accidents have been caused by the operator being temporarily overcome by carbon monoxide gas and losing control of the vehicle.

I have discovered that a cause of this hazard is one which has generally been overlooked. That is to say, when a vehicle is first assembled at the factory all parts are new and free from rust or damage so that it is not difficult to secure a gas-tight joint between the muffler and exhaust (inlet side of the muffler) or tailpipe (outlet side of the muffler). However, after the vehicle has been driven for some distance and it becomes necessary to replace the muffler, conditions are different. The connections on the new muffler are round, true, and clean, but the pipe to which it will be attached, such as the exhaust pipe, is often rusted, pitted, and out of round due to corrosion and normal wear of usage.

It is an object of the invention to overcome this difficulty by constructing the muffler with means whereby a self-sealing leak-proof joint may be formed with the tailpipe.

Another object of the invention is to provide a muffler construction in which the means for obtaining the leak-proof joint are extremely simple and do not require any expert mechanical knowledge on the part of the mechanic employed to replace the muffler.

A further object of the invention is to provide a muffler construction which enables a reliable leak-proof joint to be produced which will retain the safety factor over substantially the life of the muffler.

An equally important object of the invention is to provide a muffler construction in which the leak-proof joint will be effective in all cases of deterioration of the tailpipe except where actual replacement of the tailpipe is necessary.

In the accompanying drawing, I have illustrated a preferred embodiment of the invention but it is to be understood modification may be resorted to, to the end that gas-proofness and improved safety be constantly maintained.

Referring to the drawing:

Figure 1 is a sectional view showing the muffler broken away and the tailpipe broken away, the two parts being separated but ready for engagement.

Figure 2 is a sectional view showing the parts of Figure 1 in engagement and the sealing material interposed between their co-extensive or telescoping areas,

Figure 3 is a sectional view on the line 3—3 of Figure 2,

Figure 4 is a sectional view similar to Figure 2 of a modification,

Figure 5 is a detailed sectional view of the construction shown in Figure 2,

Figure 6 is a detailed sectional view of the construction shown in Figure 4, and

Figure 7 is an enlarged detailed sectional view of the self-sealing joint.

Referring to Figure 1, numeral 10 indicates a conventional muffler having an end 11 and a connection 12 fitted thereto in the conventional manner as shown. The connection 12 is provided with a substantially circular, continuous external projection 13 providing an internal groove 14.

In Figure 4, the projection extends inwardly, as shown at 13', to form an external groove 14'.

In the construction shown in Figure 1, the tail pipe 15 fits within the connection 12 as shown in Figures 2 and 5, while in Figures 4 and 6, the connection 12 is received within the tail pipe 15. In order to provide a leak-proof seal which will be reliable and self-sealing, the groove 14 or the groove 14' is filled with a suitable thermoplastic material, preferably one which will (a) flow under heating and (b) set under heating. There are many thermoplastic materials available which will meet these conditions and which will not be affected by the operation of the vehicle. That is, the sealing material will not corrode the metal members or be dissipated by heat and will not lose its effectiveness in the presence of heat or the exhaust gases.

Preferably, the thermoplastic material is introduced into the groove in a solvent or plasticizer which is volatilized by heating and thereafter the sealing material hardens or solidifies and remains unaffected by the conditions of operation of the motor.

When the parts have been assembled as shown in Figures 2 to 7, notwithstanding that the tail pipe 15 is rusted, pitted or otherwise deteriorated, operation of the vehicle whereby hot gases pass through the muffler and heat the joint 16 will cause the thermoplastic material to flow as best shown in Figure 7 to fill in any openings in the

joint. As explained, the solvent or plasticizer will be evaporated and the sealing material will solidify in its sealing relation to the respective connections and the joint and this sealed relation will be maintained substantially throughout the life of the muffler.

It is to be understood that the muffler is installed in the regular manner, using present clamps or other conventional means and when the new installation is first subjected to use the parts become warm, the thermoplastic material expands, filling in all flat spots or points causing leakage and then sets solidly to effectively seal the joint against the passage of carbon monoxide and other gases.

With reference to the solvent or plasticizer which may be used to facilitate the introduction and flow of the sealing material, I have in mind a volatile material which will be dissipated when the joint is heated to a temperature of about 200° F. and then the residual material will become solid and remain in that condition without being affected by heating and cooling within the normal life and the normal use of the muffler. The important characteristics of the sealing material are that it be (1) self-sealing and (2) remain effective to prevent leakage throughout substantially the life of the muffler.

The muffler may be supplied with the sealing material in the groove 14 or 14' so that it is only necessary to introduce the tail pipe so as to form a joint and thereafter the leak-proof seal is automatically formed in the operation of the vehicle.

The assembly shown in Figure 2 may also be made as a unit to include the muffler with its connection, the tail pipe and this sealed joint between the interfitting pipe and connection.

The tubular interfitting connections 12 and 15 are readily detachable since the sealing material 16 is not necessarily adhesive but simply has the qualities above set forth of flowing in a

manner to close any declivities or openings in the joint to thereby seal the same and form a permanent gas-tight joint which is unaffected by temperature changes either produced from operation of the motor or occasioned by seasonal changes in climate.

While the groove to receive the sealing material may be formed in the exhaust pipe 15, it is preferable to form the same in the muffler outlet connection 12 as shown.

In some cases only the outlet connection 12 requires replacement and in that event, it is simply necessary to provide the muffler with a new end 11 or a new connection 12 constructed as shown and described herein.

It will be noted upon reference to Figure 7 that the sealing material is present in the groove forming the joint between the connection 12 and the pipe 15 and that the sealing material flows in a manner to be disposed between the adjacent contiguous areas of the interfitting pipe and connection and form a continuous sealing layer enclosed by the pipe and connection.

I claim:

1. As a new article of manufacture a muffler for internal combustion engines having a reduced end for connection to a pipe, said end connection being provided with an annular groove having a sealing material disposed therein, said sealing material being heat responsive to the extent that hot engine exhaust gases passing through the pipe and the muffler modify the sealing material to produce a seal between the pipe and the reduced end of the muffler.

2. As a new article of manufacture a muffler for internal combustion engines according to claim 1, wherein a pipe is telescopically connected with said reduced end of the muffler and overlaps said groove and the sealing material disposed therein.

GALE H. HEDRICK.