G. F. SWAIN.

EXHAUST MUFFLER.

APPLICATION FILED APR. 6, 1910.

1,020,163. Patented Mar. 12, 1912.

Fig. 1

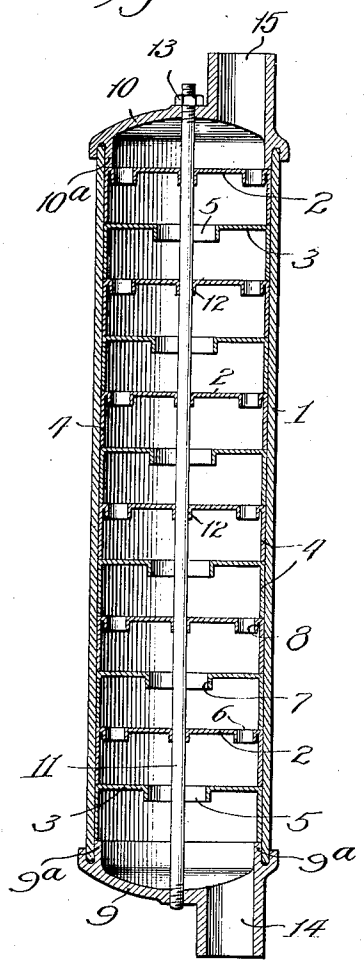


Fig. 2.

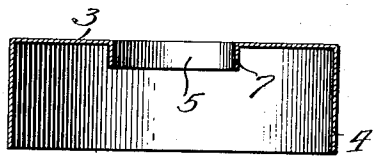


Fig. 3

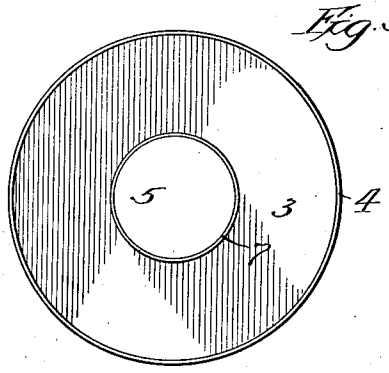


Fig. 4

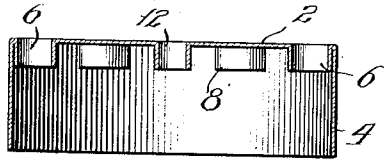
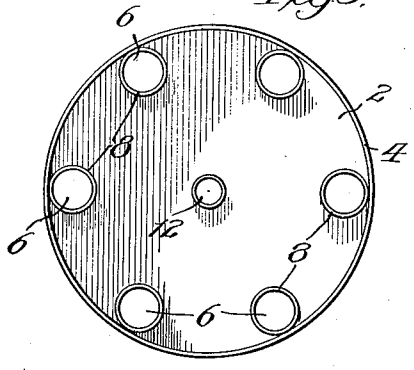


Fig. 5.



Witnesses
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UNITED STATES PATENT OFFICE.

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EXHAUST-MUFFLER.

1,020,163. Specification of Letters Patent. Patented Mar. 12, 1912.

Application filed April 6, 1910. Serial No. 553,689.

To all whom it may concern:

Be it known that I, GEORGE F. SWAIN, citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Exhaust-Mufflers, of which the following is a full, clear, concise, and exact description.

My invention relates to exhaust mufflers for internal combustion engines.

The object of my invention is to provide a muffler of simple construction, which can be readily assembled or taken apart, which is cheap to manufacture, and which will so diffuse the exhaust gases that the final escape thereof in the atmosphere will be free from the disagreeable noise incident to a free exhaust of the gases.

My invention consists of a casing providing a chamber for confining the exhaust gas, a series of diaphragms or baffles, preferably cup-shaped and resting one on top of the other, fitting within said chamber transversely thereof, said diaphragms being provided with openings or perforations surrounded by flanges. Said diaphragms are preferably provided in alternation with apertures near their peripheries and at or near their centers to provide a tortuous passage for the gas through said chamber. The casing is provided with a cap or cover having an inlet and an outlet opening, respectively, said covers being held in position in some suitable manner, as for example, by a rod which extends centrally through the diaphragms in the casing and which is threaded at one of its ends into the cover and which is provided at its opposite end with threads for receiving a clamping nut.

One feature of my invention consists in the structure of the diaphragms or baffles, said baffles being provided with flanges surrounding the openings through which the exhaust gas flows.

The several features of my invention may be more readily understood by reference to the accompanying drawings in which,

Figure 1 is a central, longitudinal section of the muffler; Figs. 2 and 3 are a central, vertical section and a plan view, respectively, of one of the alternating series of diaphragms; and Figs. 4 and 5 are a central, vertical section and plan view, respectively, of the other alternating series of diaphragms.

Similar letters of reference indicate like parts throughout the several views.

The main body 1 of the casing of the chamber which receives the exhaust gas may be of the usual construction. Fitting within and transversely of said casing are a series of diaphragms 2 and 3, respectively, which are shown as cup-shaped, the flanges 4 of one cup fitting against the internal wall of the casing 1 and resting upon the bottom of the preceding cup, thus spacing said diaphragms at suitable distances apart. Each of the diaphragms 3 is provided at or near its center with an opening for the passage of the gases, preferably with a single large opening 5. Each of the diaphragms 2 is provided near its periphery with a series of smaller apertures 6. The cup-shaped diaphragms 2 and 3 are drawn into suitable shape from sheet metal, and upon the interior of the cups about the openings 5 and 6 are provided flanges or short tubes 7 and 8, respectively.

The ends of the casing 1 are closed by caps or covers 9 and 10, respectively, which may have annular grooves about their periphery for receiving the ends of the casing. The covers 9 and 10 have flanges which project a short distance into the casing, the flange 9^a upon the cover 9 serving as a stop for the flange 4 of the cup 3, while the flange 10^a of the cover 10 rests upon the bottom of the end cup 2. The covers may be secured in place upon the ends of the casing in any desired manner, but I preferably employ a rod 11 which extends longitudinally and axially of the casing through the openings 5 in the cups 3 and through central perforations 12 in the cups 2. The ends of the rod 11 project through the covers 9 and 10 and are screw threaded. The rod 11 is threaded in one of the covers 9, and receives a clamping nut 13 upon its opposite end. The covers are thus securely locked in place, and the cups 2 and 3 are suitably spaced apart and are held against displacement.

The cover 9 is provided, preferably near its periphery, with an inlet opening 14 for exhaust gases from the engine and the cover 10 is likewise provided with outlet opening 15 through which the gases escape from the muffler. The inlet opening 14 is preferably of the same size as the central opening 5 of the diaphragm 3, and the sum total of the apertures 6 of each of the diaphragms 2 are

likewise equivalent to the opening 5 of each of the diaphragms 3.

As shown, the openings 5 and 6 in the diaphragm are relatively so arranged as to provide a tortuous path for the exhaust gas and thus to prevent a flow of gases in a direct path through the muffler, and the flanges 7 and 8 about the said openings still further diffuse the gases without any appreciable back pressure. As a result of the structure, the gases escape from the muffler unaccompanied by disagreeable noises and without interfering with the proper exhaust from the internal combustion engine to which the muffler is attached.

Having thus described my invention, what I claim is:

1. In an exhaust-muffler for internal combustion engines, the combination with a chamber for confining the exhaust gas, said chamber having an inlet and an outlet port, of a series of diaphragms fitting within said chamber transversely of the same, said diaphragms being provided alternately with a single large, central opening and with a plurality of smaller peripheral openings for the passage of the exhaust gas, said diaphragms being provided with open-ended flanges surrounding said openings on the inlet side of said diaphragms.

2. In an exhaust-muffler for internal combustion engines, the combination with a chamber for confining the exhaust-gas, said chamber having an inlet and an outlet port, of a series of diaphragms fitting within said chamber transversely of the same, said diaphragms being provided alternately with openings near their peripheries and their centers for the passage of the exhaust gas, said diaphragms being provided with open-ended flanges surrounding said openings on the inlet side of said diaphragms.

3. In an exhaust-muffler for internal combustion engines, the combination with a chamber for confining the exhaust-gas, said chamber having an inlet and an outlet port, of a series of cup-shaped diaphragms fitting within said chamber transversely of the same, the flanges of said diaphragms serving as spacing members for the diaphragms, and said diaphragms being provided with openings disposed so as to provide a tortuous path through said chamber for the exhaust-gas, said diaphragms being provided with open-ended flanges surrounding said openings on the inlet side of said diaphragms.

In witness whereof, I hereunto subscribe my name this thirty-first day of March A. D. 1910.

GEORGE F. SWAIN.

Witnesses:
GEO. C. DAVISON,
MCCLELLAND YOUNG.