July 7, 1931. W. J. MOORE 1,813,189

DIFFUSER FOR EXHAUST GASES

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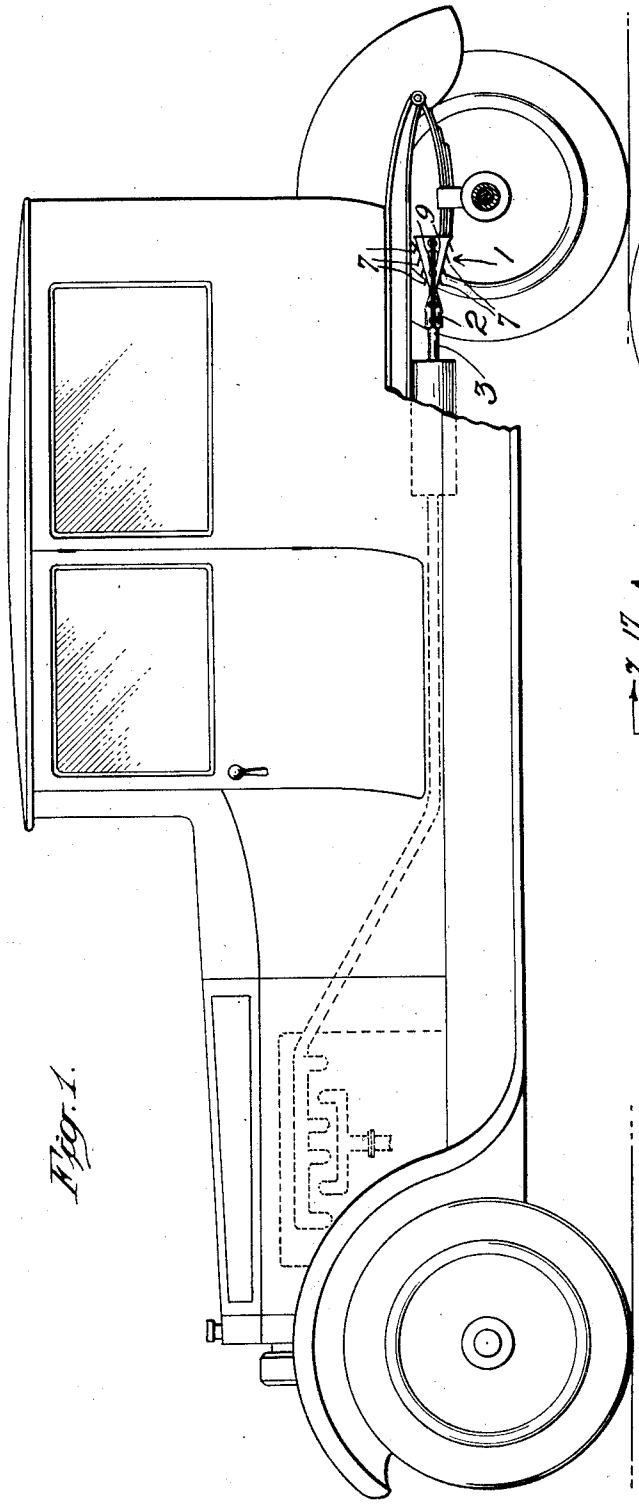


Fig. 1.

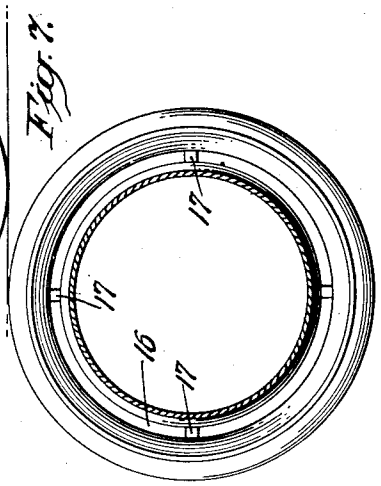


Fig. 7.

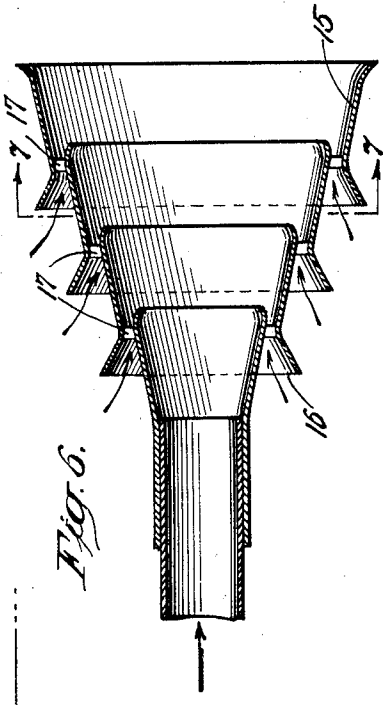


Fig. 6.

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Fig. 2.

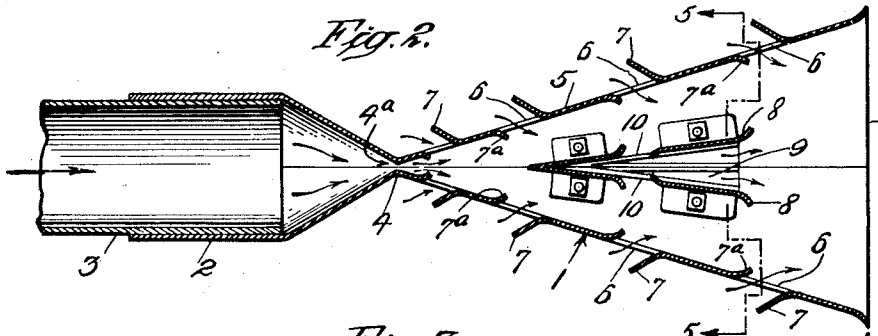


Fig. 3.

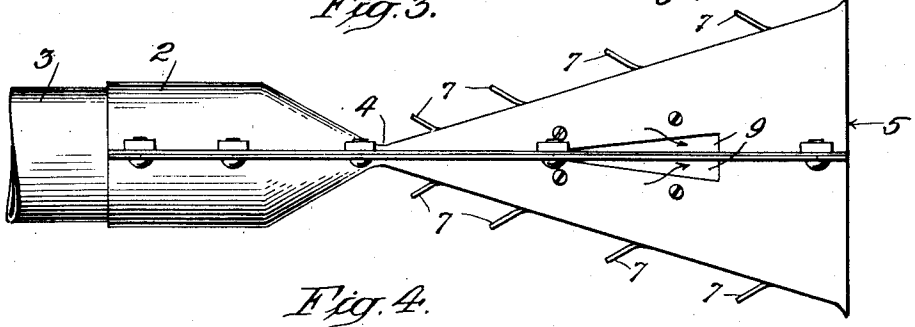
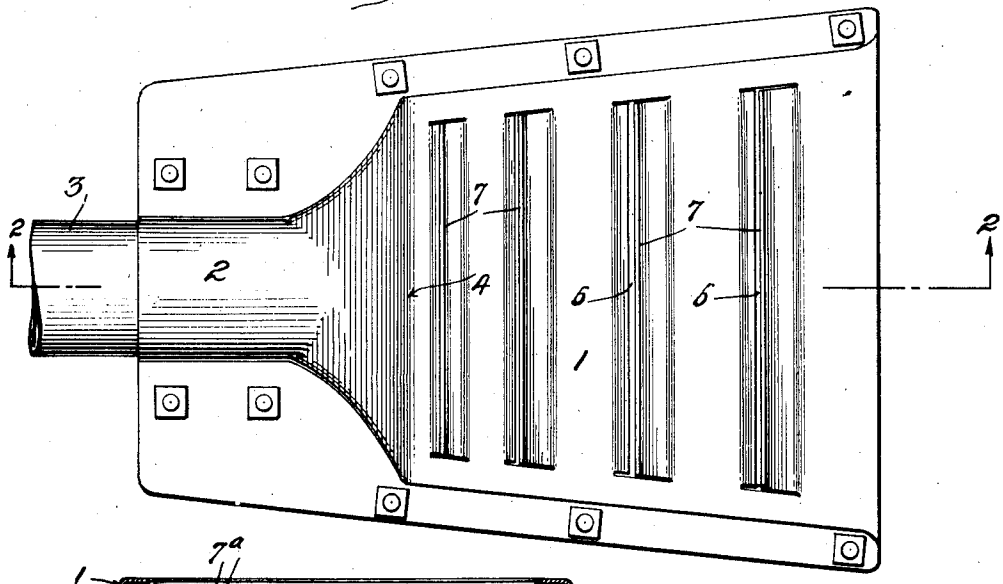


Fig. 4.



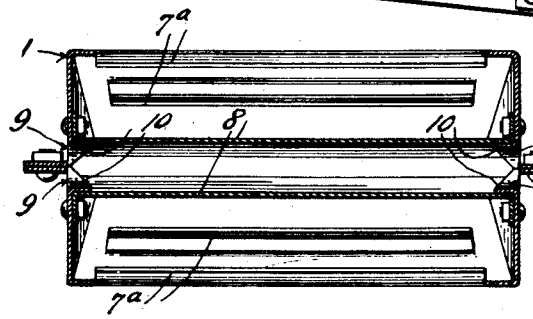


Fig. 5.

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UNITED STATES PATENT OFFICE

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DIFFUSER FOR EXHAUST GASES

Application filed March 10, 1928. Serial No. 260,568.

This invention relates to a device adapted to be attached to the exhaust pipe of an internal combustion engine as, for example, the motor of an automobile, and has for its principal object the dilution of the exhaust gases with atmospheric air so as to render the gases less obnoxious. It is well known that such gases being heavier than air have a tendency to lie close to the ground where they remain, for a period of time, more or less undiffused in the surrounding air. These gas bodies are often shot out of the exhaust pipe with considerable velocity so that they reach a point far enough removed from the machine to envelop passers-by before a sufficient diffusion takes place to render such immersion disagreeable if not injurious.

It is the purpose of this invention to give the gases an initial dilution so that the gas cloud shall contain a smaller percentage of of the obnoxious gases, such as CO, as it emerges from the exhaust pipe. Such dilution will not only lessen the percentage of the gases, but the diluted mixture will have a less specific gravity and will therefore be carried more easily over the heads of people. The visibility of smoke will also be reduced by such dilution. The diffusion also results in a decreased velocity of ejection whereby the gases are caused to remain closer to the rear of a car, thus bringing about a still greater dispersion before the gases reach the neighborhood of passers-by.

According to my present invention the dilution of the gases is desirably accomplished by means of an attachment to the discharge end of the exhaust pipe, the diffuser utilizing the velocity of the exhaust gases to draw air into it and mix it with the gases previous to their discharge into the atmosphere. The device acts therefore as an aspirator, and the invention also contemplates a special form of aspirator for more efficiently accomplishing this purpose.

Some preferred forms that the invention may take are illustrated in the accompanying drawings, in which:

Figure 1 is a side view of an automobile equipped with my invention, part of the car body being shown broken away to disclose the attachment and its relation to the exhaust pipe;

Fig. 2 shows a longitudinal section of the device on the line 2—2 of Fig. 4;

Fig. 3 is a side view of the same;

Fig. 4 is a plan view;

Fig. 5 is a transverse section on the line 5—5 of Fig. 2;

Fig. 6. is a longitudinal section of a modification, and

Fig. 7 is a transverse sectional view of such modified form on the line 7—7 of Fig. 6.

The diffuser 1 has a tubular neck 2 adapted to fit over the end of the exhaust pipe 3, the joint between the two being preferably packed.

In the form shown in Figs. 1 to 5 the diffuser is made with a restricted neck 4 that acts somewhat as a Venturi tube whereby suction is produced along the inner walls of the outwardly flaring extension or conduit 5. Orifices or slots 6 in these walls permit the outside air to be drawn in in a direction substantially paralleling the gas stream, and this drawing in of outside air is accelerated by wings 7 that act as louvers to guide the air into the diffuser as the car moves forward. The suction effect is also increased by the inward lips 7*a*. The entering air will mix in vortices with the gases in the chamber of the flaring extension 5, and give such a dilution of the gases as to render them practically unobjectionable when inhaled.

As there may be more or less of a neutral zone or core in the center of the stream of gases which issue from the contracted orifice 4*a* in the neck, I may add an additional set of louvers 8 within the aspirator, that will cause air to flow in through additional, preferably side, apertures 9 and be discharged at openings or ports 10 in an interior chamber in the center of the aspirator to break up and dilute the gases in the central gas zone.

In Figs. 2–5, the diffuser or aspirator is shown as having its flaring extension 5 flattened, so that it has considerable width, while the tubular neck 2 is gradually thinned to the neck 4 and enlarged laterally, the result being that the contracted orifice 4*a* partakes of the form of a narrow slot. The diffuser shown

in Figs. 2–5 may be conveniently made of two similar sheet metal sections rigidly secured together to provide closed joints at their opposite edges.

In Fig. 7 a modified form is shown, where there is no restriction of the exhaust passage and where the flaring extension 15 is made up of a series of overlapping conical louvers united by bridge pieces 17, and having induction passages 16 on their smaller inner ends that give by the combined aspirating action of the gaseous velocity and the forced draft action of the motion of the car the desired effect of diluting and diffusing the gases.

It is an important feature of the diffuser that the gases enter a chamber having a larger cross section and that the air openings lead into this chamber from the side or end opposite the discharge opening so that the air is inducted or drawn into the chamber. This is aided by the chamber having a flaring shape.

With a diffuser such as described attached to a car the engine may even be run in a confined space without danger of asphyxiation by the CO, while in the open street it dissipates the gases, even when smoky, so as to make them quite innoxious to persons in the vicinity.

It is evident that the diffuser or aspirator may be made in many different forms from those shown and still come within the scope of the appended claims.

What I claim as new, is:

1. A diffuser for exhaust gases, comprising a chamber adapted to be attached to an exhaust outlet and having a maximum cross section greater than that of the exhaust outlet, and external louvers adjacent to openings in the wall of the chamber and projecting in the direction of the exhaust outlet, for deflecting air into said chamber, and internal rearwardly and inwardly projected lips at the said wall openings through which outside air is inducted into the chamber.

2. A diffuser for the dilution of exhaust gases, comprising a chamber adapted to be attached to an exhaust outlet and form an extension thereof, said chamber having a maximum cross section greater than that of the exhaust outlet and formed with openings in its wall for permitting induced air to enter the chamber to mix with the gases adjacent to the chamber walls, said chamber being formed with additional air inlet openings and conduits leading therefrom to an innermost zone of the chamber.

3. A diffuser for exhaust gases having an opening for admission of gases, a larger opening for the discharge of diffused gases outwardly, flaring walls from the smaller toward the larger opening, air admission openings in the flaring walls, an interior chamber having conduit connection to air inlet openings in the sides of the diffuser and enlarged ports opening into the central zone of the diffuser.

4. A diffuser for exhaust gases, comprising a chamber having upper and lower rearwardly diverging walls formed with openings for entrance of external air to dilute the gases, louvers externally located adjacent the openings and projected in the direction of the exhaust pipe for deflecting air into the chamber, and a neck positioned to connect with the exhaust pipe and having top and bottom walls converging towards said chamber and flared sidewise to form a restricted communication between the neck and chamber for passage of exhaust gases into the chamber.

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