Nov. 29, 1927. 1,651,145

D. MOLA

SELF SUCKING SILENCER FOR MOTOR CARS GENERALLY

Original Filed Aug. 27, 1925

Fig. 1

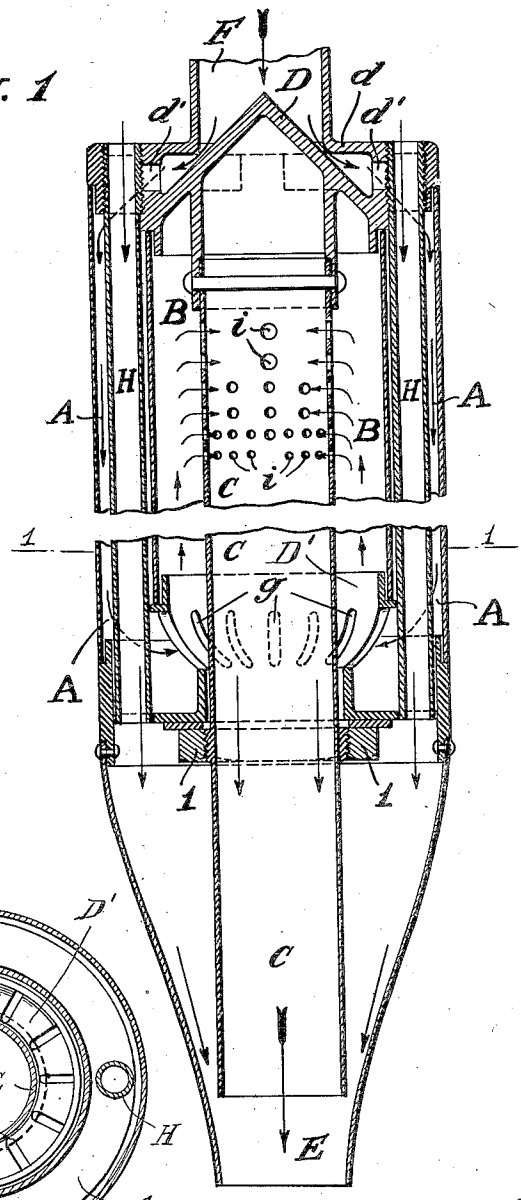
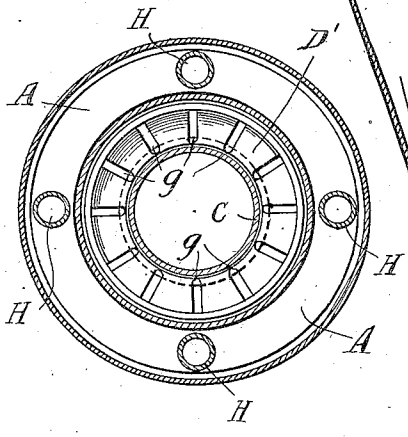


Fig. 2.



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UNITED STATES PATENT OFFICE.

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SELF-SUCKING SILENCER FOR MOTOR CARS GENERALLY.

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It is well known that by furnishing the exhaust tube of internal combustion engines and explosive motors with special self-sucking silencers the efficiency of the motors is increased with a remarkable economy of motor fuel.

There is, however, the drawback that the noise is greater than that produced by common silencers when the motor is running with closed exhaust.

The improvements according to this invention have the object of removing nearly all the noise while at the same time the efficiency of the motor is still more increased.

Said improvements are illustrated in the accompanying drawings, in which

Fig. 1 shows the longitudinal section of a silencer.

Fig. 2 shows a cross section on the line 1—1 of Fig. 1.

The improved silencer comprises an upper pointed conical-shaped diaphragm —D—, the base of which is provided with a flange —*d*—, with openings —*d*¹— communicating with a first expansion chamber —A—. Said flange is perpendicularly turned to form the cover of the silencer and the tube —F— connected to the exhaust tube. Moreover the part forming the cover is provided with holes in which the tubes —H— communicating at the top with the external air, are engaged, and after running through the whole length of the chamber —A— join the interior of the lower or depression chamber —E—. In the inside of the casing forming the chamber —A— there are arranged concentrically a second cylinder forming the chamber —B— and a tube —C— joined to the diaphragm —D— and on the side of this diaphragm the tube —C— is provided with holes —*i*— of different diameter. Said tube —C— runs through the lower diaphragm —D¹— and ends nearly at the mouth of the depression chamber —E—.

The diaphragm —D¹— is spheroidally shaped and provided with openings —*g*— for the flow of the gases from the first chamber —A— into the second —B— from which they pass through the holes —*i*— of the tube —C— in the interior of the same, and are ejected outside. Said diaphragm —D¹— closes the silencer at the bottom by means of a flange to which the lower ends of the tubes —H— are connected.

The depression chamber —E— is joined to the lower end of the casing forming the chamber —A—.

Operation.

The burnt gases entering the silencer from the tube —F— strike the diaphragm —D—, which is pointed enough to weaken the shock and facilitate the flow into the first chamber —A—, where the gases expand and their volume reduced owing to the very large peripherical surface of the chamber exposed to the external air and to the fact of the tubes —H— through which a fresh air draught passes at their outlet into the chamber —B— across the openings —*g*— provided in the diaphragm —D¹— their pressure is much reduced. The gases by expanding again change their direction and flow into the central tube —C— through the holes —*i*— provided near the upper diaphragm —D— to be rapidly sucked into the depression chamber —E— owing to the depression effect produced in this chamber by the flowing of the fresh air guided through the tubes —H—.

In consequence of the above described operation the residual noise of the gases, owing to their kinetic energy being diminished during their expansions and changes of direction, is completely removed by the opposed diametral directions of the holes —*i*— opening out into the central tube —C— so that the sound waves are reciprocally destroyed.

Having now particularly described and ascertained my said invention and the manner in which the same is to be performed, what I claim and desire to secure by Letters Patent is:

An exhaust silencer for internal combustion engines comprising in combination, a casing having concentric expansion chambers, a conically shaped diaphragm at the intake end of the casing, said diaphragm closing one end of the inner expansion chamber and having a flange portion provided with orifices to admit exhaust gases into the outer expansion chamber, a perforated

spheroidally shaped diaphragm at the opposite end of the inner expansion chamber, for the admission of gas from the outer to the inner expansion chamber, tubes open at one end to atmosphere and at the other end to a space beyond the casing, a second casing comprising a depression chamber at the discharge end of said first casing into which the said tubes discharge air, and an outlet pipe arranged coaxially of said first casing, one end of said pipe being provided with openings to admit gases from the said inner expansion chamber and the other end of said pipe discharging into said second casing.

In testimony whereof I have hereunto signed my name.

MOLA, DONATO.