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AUTOMOBILE ACCESSORY FOR BURNING EXHAUST GASES

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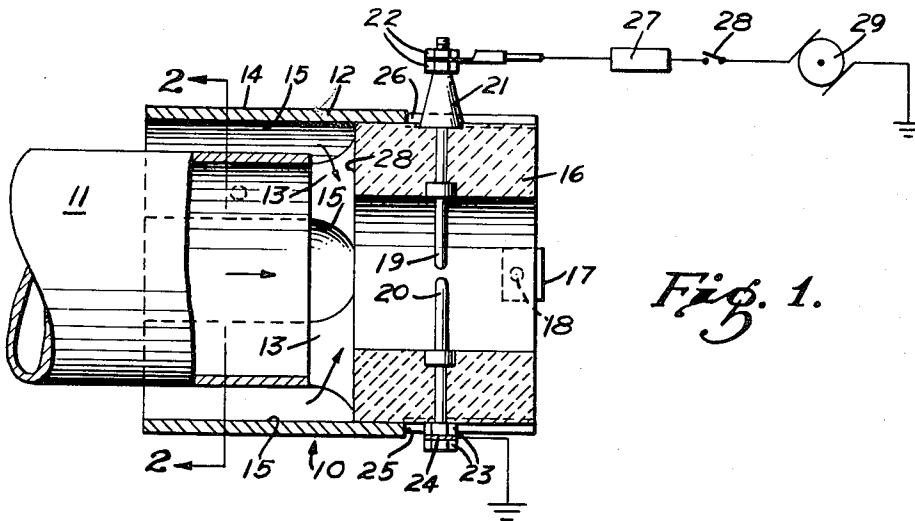


Fig. 2.

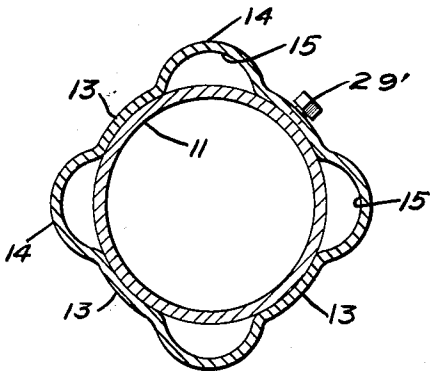
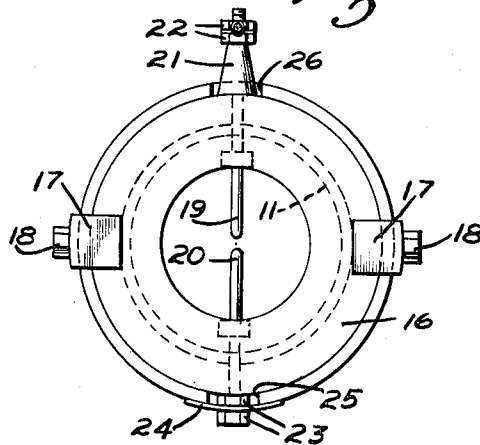


Fig. 3.



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AUTOMOBILE ACCESSORY FOR BURNING
EXHAUST GASES

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2 Claims. (Cl. 183—6)

The present invention relates generally to an accessory for an automobile, and is more particularly concerned with an attachment for the exhaust pipe of an internal combustion engine for burning of hydrocarbons in the exhaust, which have not been fully burned during the normal engine operation.

Tests made of the exhaust from internal combustion engines such as utilized in automobiles indicate that the hydrocarbons therein resulting from incomplete combustion during engine operation constitutes a source for noxious gases which materially contribute to the formation of smog and air pollution in metropolitan areas.

It is an object of the present invention to provide unique means by which these noxious gases may be substantially eliminated from the engine discharge exhaust.

A further object is to provide an attachment which may be secured to the exhaust or tail pipe of an automobile, and which is so arranged that combustion supporting air may be introduced to form a burnable combustion mixture.

A further object of the invention is to provide an exhaust burner as an automobile accessory which may be attached to the exhaust pipe of an automobile and by means of which the unburned hydrocarbons therein may be burned prior to being discharged into the atmosphere.

Briefly the invention consists of a generally tubular structure arranged to be secured at one end concentrically to the end of the exhaust pipe. Supported in the other end of the tubular structure is an insulating insert which supports spark-gap electrodes which project toward the axis of the tubular structure into the path of flow of the exhaust gases, means being provided for the introduction of combustion supporting air into the gases prior to reaching the electrodes.

Further objects of the invention will be brought out in the following part of the specification, wherein detailed description is for the purpose of fully disclosing the invention without placing limitations thereon.

Referring to the accompanying drawings, which are for illustrative purposes only:

Fig. 1 is a longitudinal section through a device embodying the features of the present invention, the device being shown as attached to the exhaust pipe of an automobile engine;

Fig. 2 is a transverse section taken substantially on line 2—2 of Fig. 1; and

Fig. 3 is an end view of the device.

Referring more specifically to the drawings, the device of the present invention is shown as comprising an attachment, as generally indicated by the numeral 10, adapted to be secured in operative position on the end of an exhaust tail pipe 11 of conventional construction by which the exhaust gases from an internal combustion engine such as used in automobiles is discharged into the atmosphere.

More specifically, the device comprises a tubular sleeve 12 of metal or other suitable material, which is preferably of larger diameter than the diameter of the exhaust pipe.

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The end of the tubular sleeve which is to be attached to the adjacent end of the exhaust pipe is inwardly deflected at spaced intervals, as indicated by the numeral 13, to provide exhaust pipe engaging portions which act to position the tubular sleeve in concentric relation to the associated tail pipe. Such construction also forms alternately positioned flutes 14 which cooperate with the adjacent surface of the exhaust pipe to form a plurality of air passages 15, the purpose of which will be subsequently explained more fully. The innermost ends of the deflected portions at 13 merge between the ends of the tubular sleeve with the full diameter portion thereof and form abutments against which the inner end of an annular insert 16 engages to position the insert in the opposite end of the tubular sleeve.

The annular insert 16 may be constructed of any suitable insulating material which will stand up under the operating temperatures of the device, and for such purpose a ceramic material has the proper characteristics. Suitable means are provided for retaining the annular insert against endwise removal from the tubular sleeve 12, and for such purpose angle lugs 17 are provided, each lug having one leg which overlies the adjacent end of the insert, while the other leg of the lug is secured as by a screw 18 to the sleeve.

The annular insert serves as a carrier for spark-gap forming electrodes 19 and 20 which are supported in the annular insert and project radially inwardly towards the axis of the insert. These electrodes are preferably adjustable to permit variation of the gap formed thereby. One of the electrodes, in this instance the electrode 19 is provided at its outermost end with an insulated bushing 21 with terminal nuts 22—22 by which connection may be made with a suitable source of electricity. The other electrode, electrode 20, is likewise provided with terminal nuts 23—23 by which connection may be made to ground. This connection may be made through a separate conductor or by a grounding strip which is adapted to bridge a slot 25 in the sleeve which enables in cooperation with a similar slot 26 removal of the annular insert with the electrodes mounted thereon as a unit.

Any suitable source of electricity may be utilized. For example, the bushing 21 may be electrically connected with a circuit containing a conventional induction coil 27 in circuit with a control switch 28 from one side of a generator 29 having its other side grounded. With such an arrangement the induction coil will furnish a high potential current which during operation of the automobile, the switch 28 being closed, will produce a spark between the adjacent ends of the electrodes 19 and 20 for burning carbohydrates in the exhaust, which may not have been entirely burned during the normal operation of the engine.

The device is mounted on the exhaust pipe 11, as shown in Fig. 1, at a position in which the inner end of the annular insert 16 is spaced from the adjacent end of the exhaust pipe so as to form an entering passage for air. This air is inducted by the flow of exhaust, the air entering through the air passages 15 and the space between the inner end of the annular insert and the adjacent end of the exhaust pipe. It will be observed that the diameter internally of the annular insert is smaller than the internal diameter of the adjacent end of the exhaust pipe. The inner end of the annular insert therefore projects inwardly of the wall of the exhaust pipe and thus forms an annular wall 28 at the conflux of the entering air and exhaust gases from the exhaust pipe, this annular wall forming an obstruction which causes turbulent mixing of the air and exhaust gases so as to produce with the carbohydrates therein a combustible mixture which is carried downstream to the spark-gap formed by the electrodes 19 and 20. The combustible mixture is thus ignited and

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will be burned generally within the confines of the annular insert 16 rather than in the atmosphere adjacent the discharging end of the annular insert.

As shown in Fig. 2, the device is releasably and adjustably secured to the exhaust pipe by means of a suitable set screw 29' located in one of the deflected portions at 13.

Various modifications may suggest themselves to those skilled in the art without departing from the spirit of my invention, and, hence, I do not wish to be restricted to the specific form shown or uses mentioned, except to the extent indicated in the appended claims.

I claim:

1. An exhaust burner attachment for an internal combustion engine, comprising: a tubular sleeve having a fluted end adapted to fit over an engine exhaust tail pipe and form with the pipe air flow passages into the sleeve interior; an annular ring insert of insulating material in the other end of said tubular sleeve, said ring having an internal diameter less than the internal diameter of the adjacent end of the exhaust pipe, whereby an annular wall is formed at the conflux of air and exhaust gases; and a pair of spark-gap electrodes supported by said ring, and projecting radially inwardly toward the ring axis in the path of flow of exhaust gas-air mixture from said exhaust pipe.

2. An exhaust burner for an automobile internal combustion engine having an exhaust tail pipe, comprising:

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a tubular sleeve having a fluted end adapted to slip over the end of the tail pipe and concentrically position the sleeve, the sleeve flutes cooperating with the associated end of the tail pipe to form flow passages into the sleeve interior outwardly of the end edge of the tail pipe; means for securing said sleeve at its fluted end to said tail pipe; an annular ring of insulating heat resistant material in the other end of the tubular sleeve, said ring forming an annular shoulder spaced from the end edge of the tail pipe and adapted to be engaged by the entering air as it leaves said flutes, and by exhaust gases issuing from the end of the tail pipe, whereby the air and gases are intimately mixed; and electric igniting means supported by said ring in the path of flow of said exhaust-air gas mixture through said ring.

References Cited in the file of this patent

UNITED STATES PATENTS

1,605,484	Thompson et al.	Nov. 2, 1926
1,848,990	Boyd et al.	Mar. 8, 1932
1,858,637	McDonald	May 17, 1932
1,877,523	Gordon	Sept. 13, 1932
1,953,120	Miller	Apr. 3, 1934
1,985,713	Bartlett	Dec. 25, 1934
2,203,554	Uhri, Jr., et al.	June 4, 1940
2,492,947	Bellstedt	Jan. 3, 1950