Sept. 2, 1958 E. HAIGH ET AL 2,850,314

BUMPER EXHAUST

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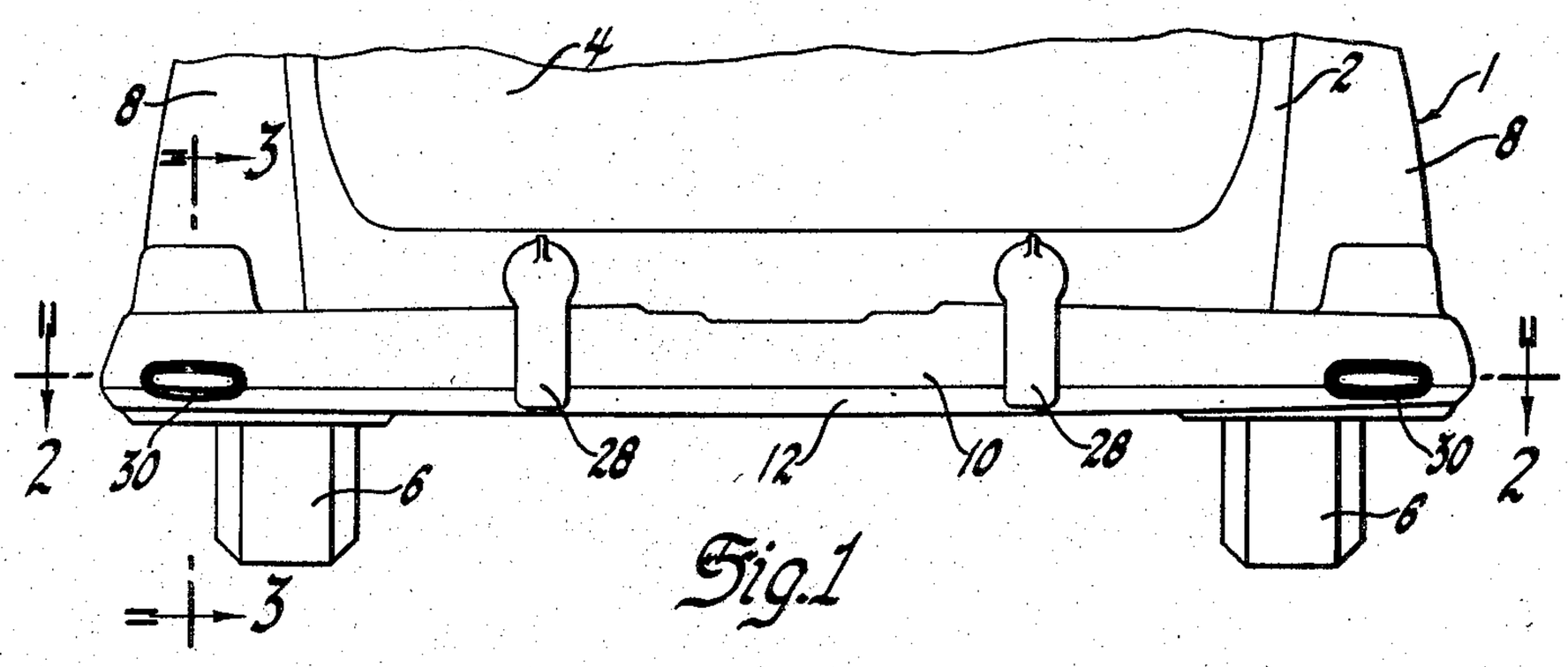

Fig. 1

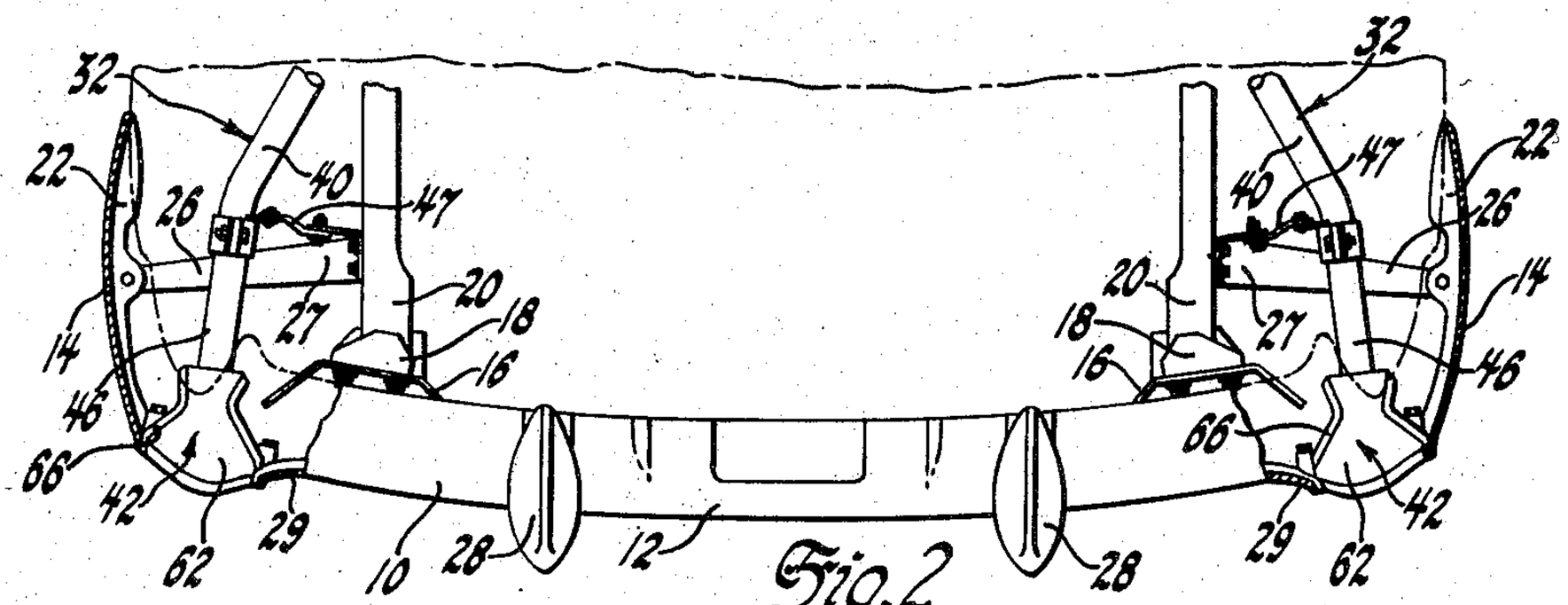

Fig. 2

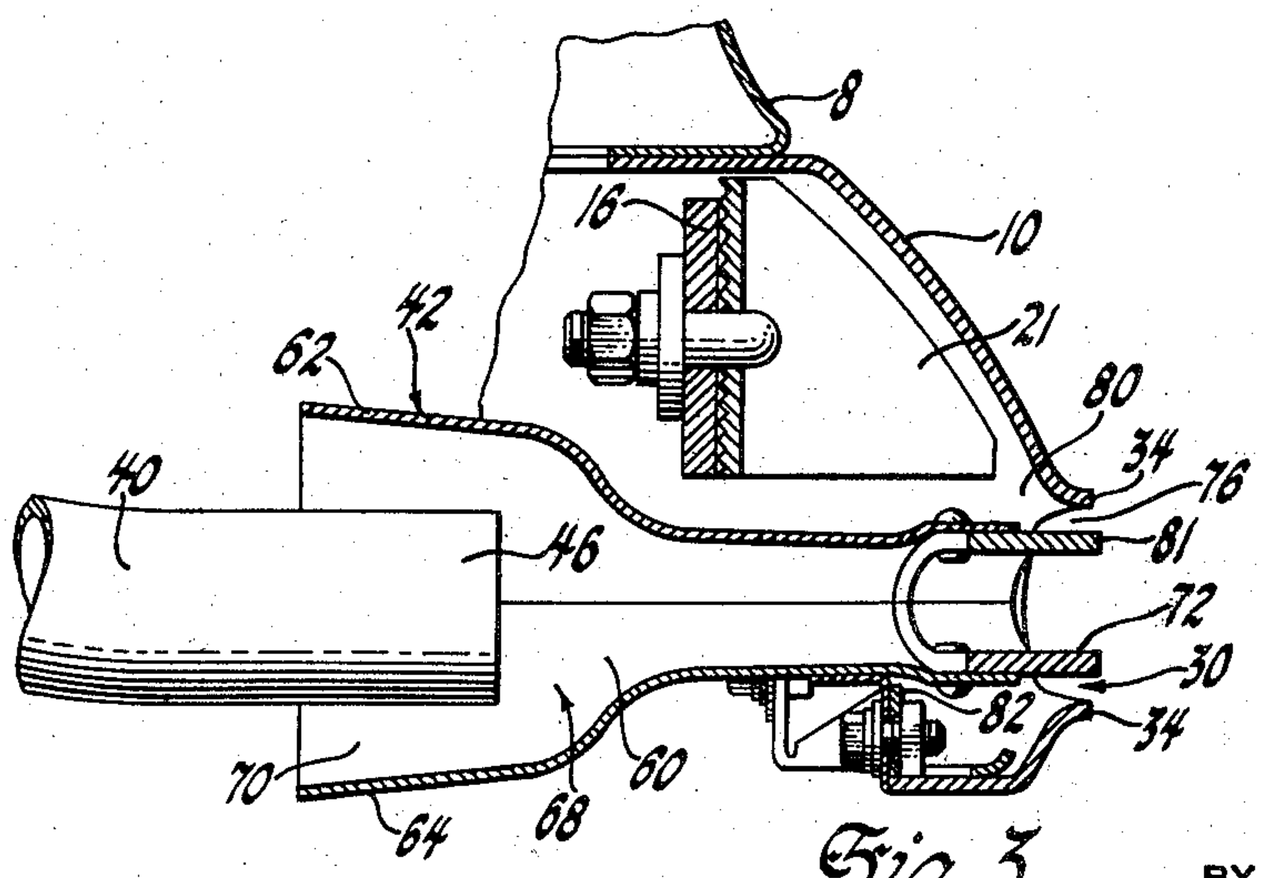

Fig. 3

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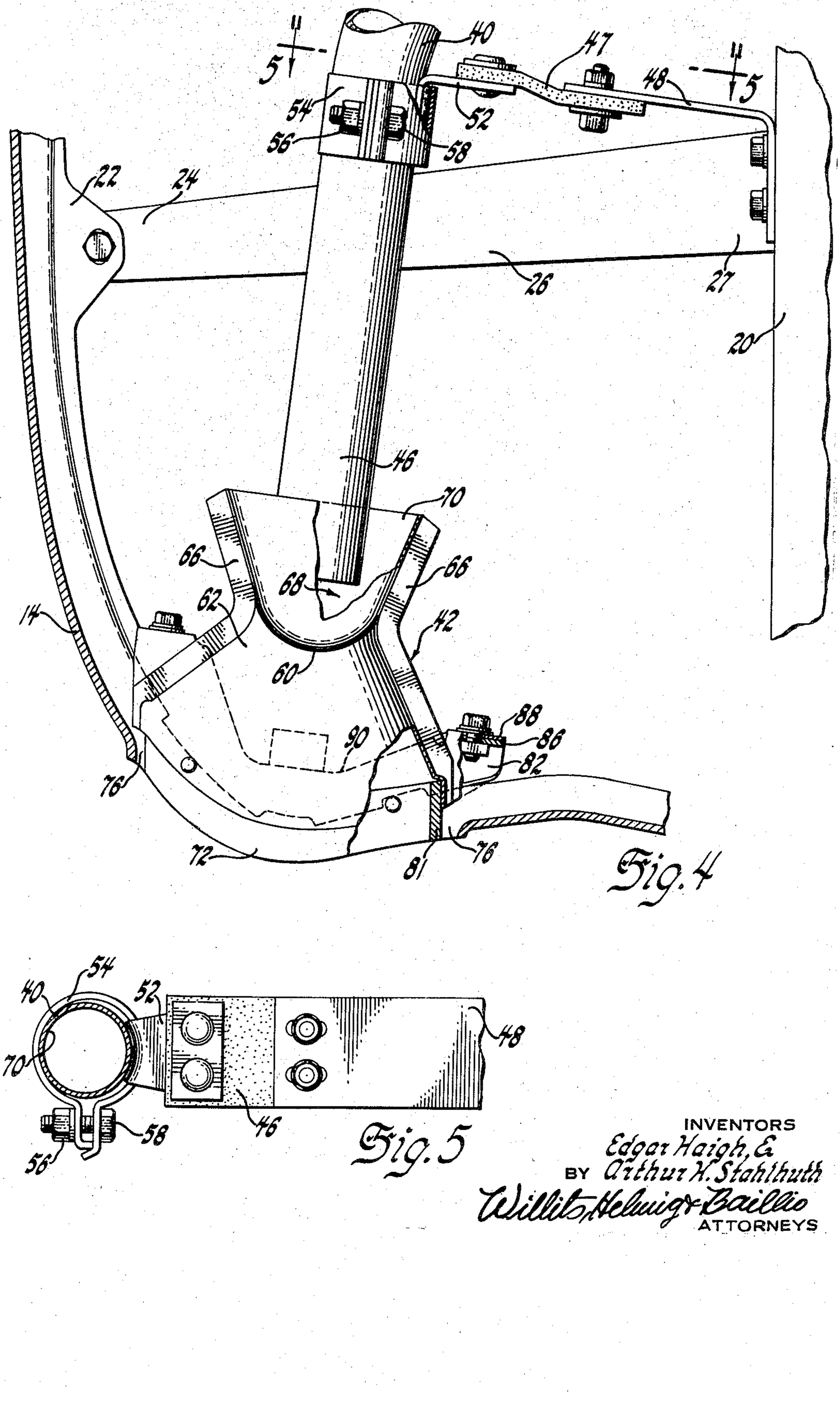

Fig. 4

Fig. 5

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BUMPER EXHAUST

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1 Claim. (Cl. 293—69)

The present invention relates to mounting means for exhaust systems and more particularly to mounting means for supporting the exhaust system in an elevated position whereby the exhaust gases from the engine may be discharged through one or more openings in the rear bumper of a motor vehicle.

It is the present practice to discharge the exhaust gases from the engine of an automotive vehicle into the atmosphere adjacent the rear end of the vehicle. This practice requires that the exhaust system include a conduit which extends from the exhaust manifold to the rear end of the vehicle. The end of the exhaust conduit is accordingly suspended under the chassis of the vehicle and terminates somewhere below the rear bumper. Since the end of the exhaust conduit is suspended an appreciable distance below the elevation of the bumper, it is frequently damaged by striking obstructions in the road. Numerous attempts have been made to raise the level of the exhaust system by discharging the exhaust gases through a portion of the vehicle body. However, these attempts have generally proved to be impractical, since the exhaust gases contain numerous deleterious substances which cause discoloration and even destructive corrosion of the surrounding body structure. Moreover, these arrangements frequently transmit the exhaust vibrations to the vehicle body and thus cause objectionable noises inside of the passenger compartment.

Accordingly it is proposed to provide a mounting means which permits the exhaust gases to be discharged from one or more apertures through the rear bumper without the exhaust gases contacting the surface of said bumper. This thereby allows the exhaust system to be given a greater road clearance.

In the drawings:

Figure 1 is a fragmentary rear end elevational view of a motor vehicle having an engine exhaust system embodying the present invention.

Figure 2 is a horizontally sectional view taken substantially in the plane of line 2—2 of Figure 1 with certain portions of the vehicle body shown in outline by dot-and-dash lines.

Figure 3 is a vertical sectional view of a portion of the vehicle bumper illustrated in Figure 1 and taken substantially in the plane of line 3—3 in Figure 1.

Figure 4 is a fragmentary enlarged view of one end of the structure illustrated in Figure 2.

Figure 5 is a vertical sectional view of a portion of the mounting means taken substantially in the plane of line 5—5 of Figure 4.

Referring to the drawings in more detail, a motor vehicle 1 having a body portion 2 with a hinged rear deck lid 4 is supported by a pair of rear wheels 6. To conceal the rear wheels 6 and also to prevent the wheels 6 throwing road dirt against the body 2, a pair of rear fenders 8 are secured to said body 2 so as to encase the rear wheels 6. To reduce or eliminate injury to the rear of the vehicle 1, a bumper 10 may be positioned to extend transversely across the lower portion of the body 2. The central portion 12 of the bumper 10 conforms generally to the shape of the body 2 while the ends thereof are curved to form wrap around sections 14. The wrap around sections 14 extend forwardly along the fenders 8 to provide protection for the rear portions thereof. The central portion 12 of the bumper 10 is supported by means of the U-shaped arms 16 which are bolted or otherwise secured to the plates 18 on the rearwardly projecting end of the body sills 20. The ends of arms 16 are bolted to the flanges 21 projecting from the bumper 10. The wrap around sections 14 of the bumper 10 are provided with flanges 22 on the inside thereof to which the outer ends 24 of rigid members 26 are secured. The other ends 27 of the members 26 are bolted to the sides of the body sills 20. Intermediate the ends of the bumper 10, a pair of spaced vertical bumper guards 28 may be provided to prevent the front end of a following vehicle from riding over the bumper 10.

Adjacent either one or both of the curved portions 29 of the bumper 10 an aperture 30 is provided therethrough. If a dual exhaust system is employed, a pair of elongated apertures 30 may be utilized. It is preferable that the major axes of the apertures 30 be disposed in substantially the same horizontal plane. The edges 34 of the bumper 10 forming the apertures 30 may be rolled outwardly to form a lip that extends around the periphery of the apertures 30.

One or more exhaust conduit means 32 may be provided for disposing of the engine exhaust gases. The conduit means 32 include a pair of exhaust pipes 40 and a pair of venturi members 42 that are joined together to form an outlet member. The forward ends of the exhaust pipes 40 are operatively secured to the exhaust manifolds of the engine while the rear or discharge ends 46 of each pipe 40 are spacially positioned in one of the venturi members 42. The ends of the venturi members 42 are disposed in spaced relation to the apertures 30 through the bumper 10 so as to discharge the exhaust gases therethrough.

To prevent the vibrations present in the exhaust conduit 32 means creating noises in the passenger compartment, they may be resiliently secured to the vehicle frame by any suitable means. One means for mounting the exhaust pipes 40 is to employ resilient sound absorbent members 47 such as pieces of an old tire carcass. One end of each of the members 46 are bolted to brackets 48 projecting horizontally from the body sills 20 and the other ends are bolted to the horizontally disposed L-shaped brackets 52 on the exhaust pipes 40. The first brackets 48 are directly bolted to the body sills 20 while the other brackets 52 are clamped to the exhaust pipes 40 intermediate the ends thereof by collars 54 which are tightened by means of nuts 56 and bolts 58.

The discharge ends of the exhaust pipes 40 are spacially disposed within the venturi members 42 and discharge the engine exhaust gases into the throats 60 of said members 42. By eliminating contact between the exhaust pipes 40 and the venturi members 42, the transmission of noises to the body 2 will be reduced. Each member 42 comprises upper and lower stampings 62 and 64 which are provided with outwardly projecting flanges 66 that may be secured to each other by any suitable means such as welding. When the flanges 66 are secured together the members 42 will form hollow structures having ducts 68 extending therethrough. The intake ends of the venturi members 42 comprise inwardly converging scoops 70 while the other ends comprise outwardly flaring nozzles 72. The nozzles 72 terminate in the apertures 30 in substantially flush relation to the edges 34 of the bumper 10. The exterior of the nozzles 72 are substantially uniformly spaced from the edges 34 of the bumper 10 forming the apertures therethrough 30 thus forming annular orifices

76. Passages 80 are formed between the exterior of the venturi members 42 and the inside of the bumper 10 that communicate with the orifices 76. Air will flow through the passages 80 and out of the orifices 76 as a result of the bumper 10 acting as a scoop when the vehicle 1 is moving and as a result of the entrainment of air in the exhaust gases. This flow of air will cool the venturi members 42 and form envelopes that will surround the exhaust gases and prevent them from contacting the exterior of the bumper 10.

Since the ends of the venturi members 42 project through the apertures 30 in the bumper 10 and are visible, it is desirable that the nozzles 72 be provided with a finish compatible with the exterior of the bumper 10. A convenient means for doing this is to provide finished members 81 which are bolted or riveted in the end of the venturi members 42.

To rigidly secure the venturi members 42 to the bumper 10 upwardly projecting flanges 82 are provided on the bumper 10, and members 82 having ears 86 thereon are bolted to the flanges 82. The ears 86 in turn are bolted to the downwardly projecting ears 88 on the end of the straps 90 which are welded or otherwise secured to the lower stampings 64 of the venturi members 42.

It will be apparent from the foregoing that the exhaust gases from the engine will be discharged through the exhaust pipes 40 into the venturi members 42. The flow of exhaust gases into the members 42 will entrain air and create a flow of air through the scoops 70 and into the ducts 68. Once the air is in the members 42 it will mix with the hot exhaust gases and this will cool both the exhaust gases and the venturi members 42. When the vehicle 1 is moving, air will be caught by the inwardly converging scoops 70 thus further increasing the flow of air through the ducts 68. The flow of the large volume of gases through the reduced area of the throats 60 of the venturi members 42 will create zones of reduced pressure. If the ends of the exhaust pipes 40 are positioned in this partial vacuum the discharge of the exhaust gases will be materially assisted. The nozzles 72 are preferably disposed so that the mixture of the exhaust gases and air will flow outwardly through the nozzles 72 in direction substantially normal to the surface of the bumper 10. This flow will reduce the amount of contact the gases will have with the bumper surface 10. To further reduce the injurious effects of the soot, acids and other deleterious substances in the exhaust gases, air may flow through the passages 80 and out of the annular orifice 76 thus creating a protective envelope of clean air about the exhaust gases. This flow will be induced by entrainment of air in the discharge from the nozzles 72 and the scoop action of the bumper 10 when the vehicle 1 is in motion.

While but one embodiment has been illustrated and described, it will be apparent to anyone skilled in the art that the invention may be embodied in numerous other specific forms than that described without departing from the spirit thereof. It is therefore, desired that the present embodiment be considered in all respects illustrative and not restrictive, reference being had to the appended claim rather than to the foregoing description to determine the scope of the invention.

What is claimed is:

In an automotive vehicle the combination of an impact bumper supported by the frame of said vehicle and having an aperture therethrough, an outlet member secured to said impact bumper to be supported thereby, the oulet end of said member forming a discharge nozzle disposed in said aperture in spaced relation to the periphery thereof to form an annular orifice, the inlet end of said outlet member forming an enlarged scoop, an exhaust conduit, an insulating member secured to said frame to form a terminal support for said exhaust conduit remote from the discharge end thereof for supporting said discharge end inside of said intake scoop in spaced relation thereto, the portion of said scoop encompassing said discharge end of said exhaust pipe having a sufficiently large cross section to permit relative movement between said discharge end and said outlet member without contact therebetween and being free of any attachment therebetween.

References Cited in the file of this patent

UNITED STATES PATENTS

1,110,040	Chatain	Sept. 8, 1914
1,217,615	McDowell	Feb. 27, 1917
1,813,189	Moore	July 7, 1931
2,121,504	Martin	June 21, 1938
2,138,001	Fluor	Nov. 29, 1938
2,160,808	Bradley	June 6, 1939
2,242,494	Wolf	May 20, 1941
2,290,621	Riesing	July 21, 1942
2,376,550	May	May 22, 1945
2,489,480	Chester	Nov. 29, 1949
2,489,481	Chester	Nov. 29, 1949
2,568,409	Phillips	Sept. 18, 1951

FOREIGN PATENTS

112,684	Australia	Mar. 20, 1941
771,314	France	Oct. 5, 1934
866,150	Germany	Feb. 9, 1953
424,469	Great Britain	Feb. 21, 1935
678,688	Great Britain	Sept. 3, 1953