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L. E. RUSSELL

2,677,929

EXHAUST DEFLECTOR

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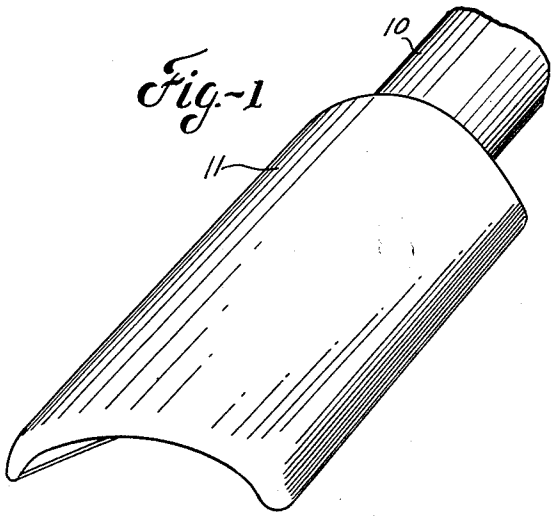

Fig.-1

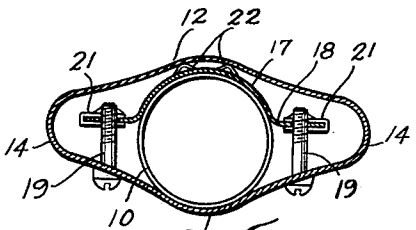

Fig.-2

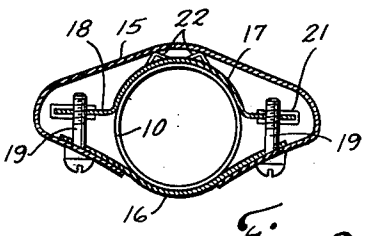

Fig.-3

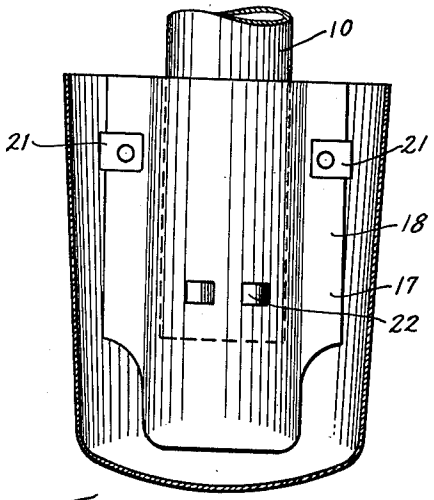

Fig.-4

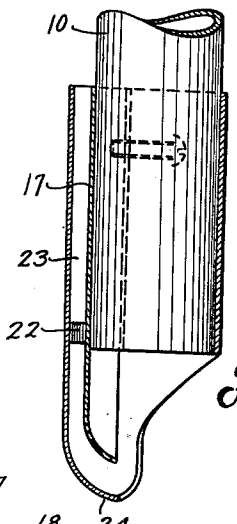

Fig.-5

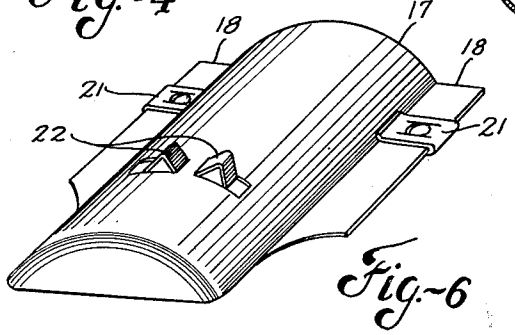

Fig.-6

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UNITED STATES PATENT OFFICE

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EXHAUST DEFLECTOR

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8 Claims. (Cl. 60—31)

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This invention relates to exhaust deflectors of the kind mounted as extensions upon the tail pipes of automobiles.

Devices of this class are the subject of not inconsiderable study and research, not only to the end that their utilitarian features may be improved, but also, that their character as a useful and ornamental accessory may be of long life, and that they may be easily and securely installed. A deflector is subjected to rapidly changing temperature extremes and to the corrosive influences of the exhaust gases, both of which tend to shorten its useful life.

Simple and secure fastening means for the deflector are desirable in order that the installation may be made by an unskilled person, and in order that vibration will not make of the deflector a source of noise, and perhaps result in its dropping from the automobile and becoming lost.

The instant invention is aimed at improvement in the manner of discharge of exhaust gases through a deflector, and in the means for attaching the deflector to the tail pipe. In regard to the former, it is contemplated that the initial deflection of the exhaust gases be accomplished by a supplemental deflector element contained within and hidden from view by a surrounding shell, the shell being rigidly held in spaced relation to the supplemental member to define an air flow passage therebetween for cooling purposes and to aid in evacuation of the gases. The shell, which is the principal element of the deflector and ornamentally plated and finished, thereby is protected in a large degree from direct contact with the gases and from wide temperature extremes.

In regard to the attachment feature of the invention, it is the object to utilize the aforementioned supplemental deflector to mount the assembly, including the outer shell, firmly upon the tail pipe using but a single set of attachment bolts. Heretofore, it has been the practice to effect a telescoping connection of the deflector with the tail pipe and to apply a plurality of adjustable clamping pressures at longitudinally spaced points to inhibit slippage and relative tilting movements. In the present construction a single adjustable clamping pressure is applied between the supplemental deflector and the bottom portion of the outer shell, and therethrough upon the tail pipe. Such pressure is exerted adjacent one end of the supplemental deflector, projected portions engageable with the top portion of the shell being formed on the supplemental deflector adjacent the opposite end thereof. Through the cooperation of the attachment bolts, which comprise the adjustable pressure applying means, and the projected portions, a substantially rigid spaced relation is achieved between the shell and supplemental deflector, and the complete assembly may be secured to the tail pipe by adjustment of but a single set of attachment bolts.

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The object of the invention is to simplify the construction as well as the means and mode of attaching exhaust deflectors to supporting tail pipes, whereby such deflectors may not only be economically manufactured, but will be more efficient and satisfactory in use, adaptable to a wide variety of tail pipes, having relatively few parts, and be unlikely to get out of repair.

A further object of the invention is to provide a supplemental deflector element having the novel functions and mode of cooperation with the main deflector element above described.

A further object of the invention is to improve the apearances and functioning of exhaust deflector attachment means.

A further object of the invention is the new and novel means of securing a supplemental deflector within the exhaust deflector head.

A further object of the invention is to reduce the vertical dimensions of an assembled exhaust deflector so as to conform with present day automobile styling.

A further object of the invention is to simplify the assembly of such double wall exhaust deflectors.

A further object of the invention is to provide an exhaust deflector possessing the advantageous structural features, the inherent meritorious characteristics and the mode of operation herein mentioned.

With the above primary and other incidental objects in view as will more fully appear in the specification, the invention intended to be protected by Letters Patent consists of the features of construction, the parts and combinations thereof, and the mode of operation, as hereinafter described or illustrated in the accompanying drawing, or its equivalents.

Referring to the accompanying drawing, wherein is found the preferred but obviously not necessarily the only form of embodiment of the invention:

Fig. 1 is a perspective view of an exhaust deflector in accordance with the instant invention, shown mounted upon an automobile tail pipe;

Fig. 2 is a sectional view of the deflector;

Fig. 3 is a view similar to Fig. 2 showing how

the outer shell of the deflector may be made of two-part construction rather than one-part, as shown in Fig. 2;

Fig. 4 is a top view of the deflector, the outer shell being shown in horizontal longitudinal section;

Fig. 5 is a view of the deflector in vertical longitudinal section; and

Fig. 6 is a detail perspective view of the supplemental deflector.

Like parts are indicated by similar characters of reference throughout the several views.

Referring to the drawing, a fragment of an automobile exhaust tail pipe is indicated at 10 with a deflector, in accordance with the instant invention mounted thereon. The deflector comprises an outer shell 11 having a substantially flattened tubular formation. For purposes of description, the shell 11 may be considered to be made up of a top portion 12 and a bottom portion 13 spaced apart and connected by side portions 14 (see Fig. 2). The top and bottom portions 12 and 13 are curved in their mid areas to approximately correspond to the curvature of the tail pipe, which is cylindrical, while the side portions 14 are radially spaced from the tail pipe and connected to the top and bottom portions by a curved configuration of the shell.

The shell 11 may be of unitary one-piece construction, as shown in Fig. 2, made and formed in a single operation as by drawing. Alternatively, the shell may be made of two-part construction as shown in Fig. 3. According to this form, a shell 15 has longitudinal edges in spaced apart relation at the bottom portion of the shell. The spaced apart edges are connected by an overlapping plate 16, which thus becomes the bottom portion of the shell and is curved to conform to the shape of the tail pipe.

With an outer shell constructed and arranged either as shown in Fig. 2, or as shown in Fig. 3, the deflector assembly further comprises a plate 17 arranged longitudinally within the shell and adapted to rest upon the tail pipe in overlying contacting relationship thereto. The plate 17 is arcuate shaped, viewed in cross section, conforming to the curvature of the tail pipe in such manner as to provide a wide bearing for the plate upon the tail pipe, and to inhibit relative lateral motion therebetween. Integrally formed with the plate 17 are side flanges or wings 18 projecting outward from the longitudinal edges of the plate toward the side portions 14 of the shell 11.

The side flanges 18 afford a place of attachment for connection means between the plate 17 and the shell 11. This connection means comprises a pair of bolts 19 passed through the bottom portion 13 of the shell at points adjacent the respective side portions 14 and extending into cooperative engagement with the respective side flanges 18. Nuts 21 are clamped upon the side flanges 18 and receive the threaded ends of the bolts 19, the bolts 19 and 21 comprising a form of commercially known speed-nut type fastener. The bolts 19 are accessible from outside the shell 11 for rotative adjustment whereby the plate 17 and the bottom portion 13 of the shell may be alternately caused to grip opposing surfaces upon the tail pipe or to be loosened to release such grip.

As shown in Figs. 4 and 5, the plate 17 and shell 11 lie in parallel longitudinal planes and are elongated to provide a relatively long axial bearing upon the tail pipe. The bolts 19 engage the side flanges 18 of the plate 17 at a point adjacent one end thereof. In both embodiments of the invention this is the inner end of the plate, or that end opposed to the discharge end of the deflector.

Longitudinally spaced from the bolted connection above described, the plate 17 is formed with extruded portions 22 in the form of lugs or projections struck upward out of the middle of the plate (Fig. 6). The projections 22 occupy a position substantially midway between the side edges of the plate 17, and are constructed and arranged to engage the internal surface of top shell portion 12. Through the cooperation of the attachment bolts 19 and the projections 22, a substantially rigid connection is effected between the shell 11 and plate 17, and there is, moreover, defined between the plate 17 and top portion 12 of the shell a continuously open air flow passage 23.

In the installed position of the deflector, the outer end of the plate 17 projects beyond the outer end of the exhaust tail pipe 10, and, as shown in Fig. 5, is curved outwardly and downwardly to effect a directed discharge of the exhaust gases. The outer shell 11 similarly is formed with an extension 24 conforming in shape to the outer end of plate 17 and retaining the spaced relation between the parts. Air flowing through the passage 23 thereby not only is enabled to cool the plate 17 and shell 11, but also may function to aid in the evacuation of gases from the tail pipe.

In mounting the deflector upon an exhaust tail pipe, the bolts 19 first are retracted relatively to the flanges 18 on the plate 17 a sufficient distance to permit the tail pipe easily to be received between plate 17 and bottom portion 13 of the shell. When the deflector has been placed upon the tail pipe substantially in the position shown in Fig. 5, the bolts 19 are turned inward to draw plate 17 downward into contact with the tail pipe and to effect a compressing action of the bottom portion 13 of the shell in such manner as to grip the tail pipe between the plate 17 and portion 13. Insasmuch as the attachment bolts 19 are located adjacent the inner end of plate 17, tightening of the bolts tends to elevate the opposite or outer end of the plate which is unattached to the bottom of the shell. Such motion is precluded or limited, however, by engagement of the extruded lugs or projections 22 with the top portion 12 of the shell. The tendency toward rocking motion of the plate 17, accordingly, is utilized to effect a tight connection between the parts whereby the desired positions and relation thereof may be achieved and preserved against the effects of vibration.

It will be observed that the plate 17 serves not only as a means for attaching the shell 11 to the tail pipe, but also as a means of first exhaust deflection. The hot exhaust gases reach the shell 11 only by secondary contact, and the shell is therefore protected to a large extent from the heating and defacing action of the gases so that its life as a useful and ornamental accessory is prolonged.

From the above description it will be apparent that there is thus provided a device of the character described possessing the particular features of advantage before enumerated as desirable, but which obviously is susceptible of modification in its form, proportions, detail construction and arrangement of parts without departing from the principle involved or sacrificing any of its advantages.

While in order to comply with the statute the invention has been described in language more or less specific as to structural features, it is to be understood that the invention is not limited

to the specific features shown, but that the means and construction herein disclosed comprise but one of several modes of putting the invention into effect.

Having thus described my invention, I claim:

1. A deflector for use on the exhaust tail pipes of automobiles and the like, including a main deflector element having a top portion arranged to overlie the tail pipe and formed with side portions extending downwardly and inwardly in spaced underlying relation to said top portion, a plate arcuate shaped in cross-section to rest upon and conform to the shaft of said tail pipe, said plate lying within said main element, projections on said plate to engage the underside of the top portion of said main deflector element, side flanges on said plate, and attachment bolts interconnecting said flanges with said underlying side portions of said main deflector elements, said attachment bolts and said projections being located at longitudinally spaced points along the length of said plate.

2. A deflector for use on the exhaust tail pipes of automobiles and the like, including a main deflector element formed with spaced top and bottom portions arranged to receive the tail pipe therebetween, a plate arcuate shaped in cross-section to rest upon the tail pipe and substantially surrounded by said main deflector element, projections on said plate engageable with the underside of the top portion of said main deflector element, and adjustable rigid connection means between said plate and the bottom portion of said deflector element longitudinally spaced from said projections.

3. A deflector for use on the exhaust tail pipes of automobiles and the like, including a main deflector element formed with spaced top and bottom portions arranged to receive the tail pipe therebetween, a plate resting upon the tail pipe and extending longitudinally between the top and bottom portions of the main deflector element, projections on said plate engageable with the underside of the top portion of said main deflector element to maintain a spaced relation between said element and said plate, and adjustable connection means between said plate and the bottom portion of said deflector element.

4. A deflector for use on the exhaust tail pipes of automobiles and the like, including a main deflector element formed with spaced top and bottom portions arranged to receive the tail pipe therebetween, a plate arcuate shaped in cross-section to rest upon the tail pipe and extending longitudinally between the top and bottom portions of said main deflector element, side flanges on said plate lying approximately mid-way between the top and bottom portions of the deflector element, attachment bolts extensible through the bottom portion of said deflector into cooperative engagement with said flanges adjacent one end of the said plate, and projections on said plate adjacent the opposite end thereof engageable with the underside of the top portion of said deflector element.

5. A deflector according to claim 4, characterized in that said plate and the top portion of said deflector element are formed with downwardly and outwardly flaring extensions to effect a directed discharge of the exhaust gases, said attachment bolts and said projections cooperating to space said plate and the top portion of said deflector element apart to permit a flow of air therebetween for cooling purposes and to aid in evacuation of the exhaust gases.

6. A deflector for use on the exhaust tail pipes of automobiles and the like, including an approximately tubular outer shell constructed and arranged to be slipped over the outer end of the tail pipe, a plate extending longitudinally within said shell to be arranged in contacting and overlying relation to the tail pipe, side flanges on said plate, attachment bolts extensible through that side of the shell occupying an underlying relation to the tail pipe into cooperative relation with said side flanges, said bolts being adjustable to cause said plate and the underlying side of said shell to grip opposing surfaces of the tail pipe, and projecting lugs on said plate longitudinally spaced from the point of attachment of said bolts and engageable with the opposite side of said shell on the interior thereof.

7. A deflector for use on the exhaust tail pipes of automobiles and the like, including a deflector plate engageable with the tail pipe in overlying relation thereto, the outer end of said plate being curved downwardly and outwardly to effect a directed discharge of the exhaust gases, laterally extending flanges on said plate, a shell surrounding said plate and having underlying and overlying portions with respect to said plate, the tail pipe being received between said plate and the underlying portion of said shell, the underlying portion of said shell being in contact with and substantially conforming to the shape of the tail pipe, an extension on the overlying portion of said shell conforming in shape to the curved outer end of said plate, attachment bolts passed through the underlying portion of said shell into cooperative relation with the laterally extending flanges on said plate, spacing means in the form of projections on said plate engageable with the overlying portion of said shell and operative in conjunction with said attachment bolts to maintain a spaced relation between said plate and the overlying portion of said shell.

8. A deflector for use on exhaust tail pipes of automobiles and the like, including a deflector plate engageable with the tail pipe in overlying relation thereto, lateral flanges on said plate, a shell surrounding said plate and having overlying and underlying portions with respect thereto, the distance between said overlying and underlying portions exceeding the diameter of said tail pipe which is received between said plate and the underlying portion of said shell, adjustable attachment bolts passed through the underlying portion of said shell into cooperative engagement with the lateral flanges on said plate adjacent one end of the plate, said bolts being adjustable to draw up the underlying portion of said shell into contact with the tail pipe, and means projecting upward from the surface of said plate adjacent the opposite end thereof engageable with the overlying portion of said shell.

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