May 3, 1927. 1,626,908

F. A. ARMSTRONG

MUFFLER CUT-OUT

Filed Dec. 6, 1924

Fig. 1.

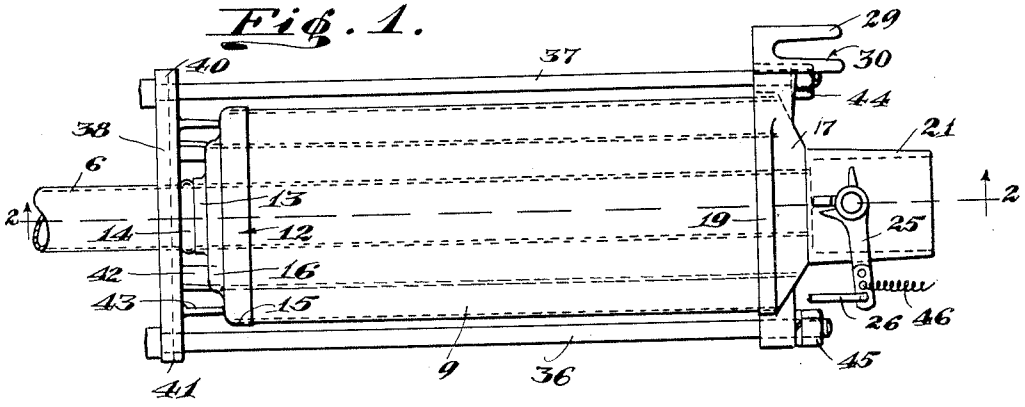


Fig. 2.

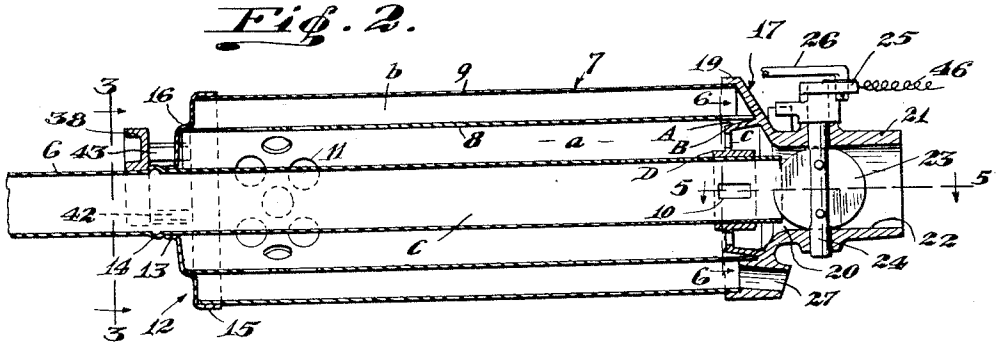


Fig. 3.

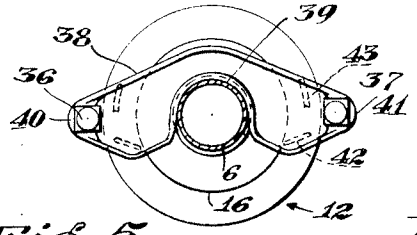


Fig. 4.

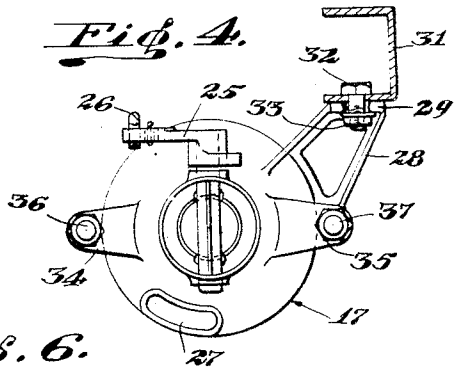


Fig. 5.

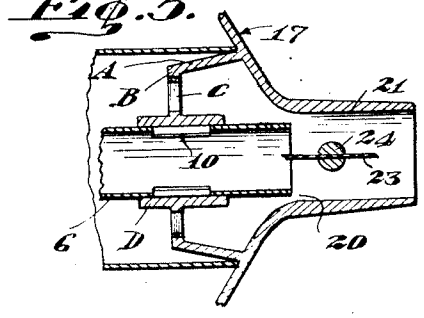
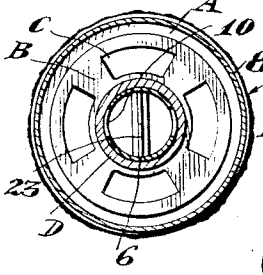


Fig. 6.



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UNITED STATES PATENT OFFICE.

FREDRICK A. ARMSTRONG, OF SAWTELLE, CALIFORNIA.

MUFFLER CUT-OUT.

Application filed December 6, 1924. Serial No. 754,325.

This invention relates to a cut-out for mufflers such as are employed on the exhaust pipes of internal combustion engines and particularly pertains to an attachment for mufflers of the type commonly employed on automobiles for placing the muffler in or out of operation.

An object of the invention is to provide a muffler cut-out which may be readily applied to the discharge end of a conventional type of muffler and also to provide an effective means for mounting the cut-out in substantial engagement with a muffler whereby it will be securely held in place and which will permit easy mounting and demounting of the cut-out.

A further object is to provide a muffler cut-out which may be applied without cutting or altering the exhaust pipe as is frequently necessary in applying muffler cut-outs of the types now generally in use.

With the foregoing objects in view, together with such other objects and advantages as may subsequently appear, the invention resides in the parts and in the combination, construction and arrangement of parts hereinafter described and claimed and illustrated by the way of example in the accompanying drawings, in which:—

Figure 1 is a plan view of muffler showing the invention as applied;

Figure 2 is a view in vertical section as seen on the line 2—2 of Figure 1;

Figure 3 is a view in section and elevation as seen on the line 3—3 of Figure 2;

Figure 4 is a view of the muffler cut-out as seen in end elevation;

Figure 5 is a detail in section as seen on the line 5—5 of Figure 2.

Figure 6 is a view in section and elevation as seen on the line 6—6 of Figure 2.

More specifically, 6 indicates an exhaust pipe on which is mounted a muffler 7 embodying spaced concentric inner and outer cylindrical side walls 8 and 9. The exhaust pipe is formed with the usual side openings 10 leading to the space *a* wthin the inner wall 8, and the wall 8 is formed with the usual openings 11 leading to the space *b* within the outer wall 9. The openings 10 in the exhaust pipe are to be closed as later described.

The muffler also includes an inner wall 12 which has a central opening through which the exhaust pipe extends; a marginal flange 13 around said opening being adapted to abut against an annular rib 14 formed on the exhaust pipe and spaced a suitable distance from the outer end thereof. The end wall 12 is formed with a peripheral flange 15 which encircles and engages the inner end of the outer wall 9, and is also formed with an annular shoulder 16 which engages the inner end of the inner wall 8.

The parts described in the foregoing are embodied in a well known type of muffler and constitutes no part of the present invention other than in conjunction with the features hereinafter described.

In carrying out my invention I provide a muffler with an outer end wall 17 which is formed with an inwardly projecting inclined annular wall A connecting at its reduced inner end with a wall B formed with openings C and which wall B connects with an annulus D adapted to receive the exhaust pipe and to close the openings 10 in the latter. The inclined wall A is adapted to extend into the outer end of the inner wall 8 and forms a support for the latter. The end wall 17 is formed with a marginal flange 19 adapted to encircle and engage the outer end portion of the cylindrical side wall 9. The inned end faces of the annulus D, wall A, and flange 19, are stepped successively relative to each other with the forward edge of the annulus D foremost which facilitates assemblage as will later appear.

The end wall 17 is formed with a central opening 20 adapted to receive the outer end of the exhaust pipe, and which opening leads to a short tube 21 formed on the end wall 17 and having a passage 22 extending in continuation of the passage *c* in the exhaust pipe in axial alignment therewith and opening to the atmosphere.

Arranged in the passage 22 is a disc valve 23 mounted on a stem 24 extending through the tube 21 and turnable therein whereby the valve may be positioned to extend transversely of the passage 22 to close the latter or be disposed to extend longitudinally of the passage when it is desired to open the exhaust pipe directly to the atmosphere through the passage 22 and thereby cut out the muffler. One end of the stem 24 is fitted with a crank arm 25 to which is connected a rod 26 leading to a suitable operating lever (not shown).

The end wall is formed with an outlet opening 27 communicating with the space *b* between the walls 8 and 9.

Formed on the end wall 17 is an upwardly

extending bracket 28 terminating in a horizontally extending flange 29 having an open ended slot 30, and which bracket is adapted to be secured to the side frame 31 of a motor-vehicle chassis by means of a bolt 32 and nut 33 engaging the flange 29 and the side frame 31 whereby the outer end of the muffler and the exhaust pipe are supported by the side frame.

Oppositely extending lugs 34 and 35 are formed on the end wall 17 and project horizontally beyond the outer margin thereof, which lugs are apertured to receive bolts 36 and 37 extending longitudinally alongside the muffler and engaging an anchoring yoke 38 carried on the exhaust pipe.

The yoke 38 is positioned astride the exhaust pipe 6 alongside the rib 14 on the latter and at the side of the rib opposite that against which the end wall 12 of the muffler abuts; the yoke having its underside formed with an arcuate saddle portion 39 which is adapted to conform to the upper half of the outer periphery of the exhaust pipe and the sides of which extend below the horizontal center line of the exhaust pipe. The sides of the yoke are extended to form ears 40 and 41 which project beyond the outer margin of the end wall 12 and are apertured to receive the bolts 36 and 37. Formed on the inner face of the yoke adjacent each apertured end thereof is a pair of vertically spaced lugs 42 and 43 arranged on the opposite sides of the horizontal center line of the exhaust pipe and which lugs are adapted to seat on the outer face of the muffler end wall 12. The lowermost lugs 42 are disposed so as to extend astride the shoulder 16 on the end wall 12 with their adjacent edges disposed contiguous to the shoulder at points below the horizontal diameter of the end wall, thereby effecting such engagement with the latter that when the yoke is positioned astride the exhaust pipe with the lugs abutting against the end wall 12, the yoke cannot be lifted vertically clear of exhaust pipe.

In the application and operation of the invention, in assembling the device the muffler including the end walls 12 and 17 with the cylindrical side walls 8 and 9 interposed therebetween is slipped over the outer end portion of the exhaust pipe 6 with the latter extending through the opening in the end wall 12 and projecting into the opening 20 of the end wall 17. The yoke 38 is then positioned astride the exhaust pipe 6 rearward of the rib 14 on the exhaust pipe and is then advanced on the exhaust pipe to dispose the lugs 42 and 43 against the end wall 12 with the lower lugs 43 seating astride the shoulder 16. The bolts 36 and 37 are then arranged to connect the yoke 38 with the end wall 17; nuts 44 and 45 being screwed on the threaded ends of the bolts and tightened thereon in such manner as to draw the yoke 38 and end plate 17 toward each other whereby the yoke 38 will be advanced against one side of the rib 14 while the flange 13 on the end wall 12 will be advanced in the opposite direction against the other side of the rib 14 by reason of the longitudinal pressure imparted to the cylindrical walls 8 and 9 from the end wall 17 as the latter is advanced relative to the yoke 38. The muffler with the cut-out attachment embodied on the end wall 17 will thus be securely fastened to the exhaust pipe in demountable engagement therewith; the rib 14 on the exhaust pipe being positioned between the yoke and the inner end of the muffler serving to hold the latter against longitudinal movement on the exhaust pipe and the yoke being anchored on the exhaust pipe by reason of the lugs thereon extending beneath the shoulder 16 on the muffler end wall.

The muffler is then secured to the side frame of the motor vehicle chassis through the medium of the bracket 38 and bolt 32 as before described.

It is contemplated that the invention will be applied to mufflers already in use, in which event the end wall 17 will be substituted for the usual muffler end wall which latter is removed thereby leaving the ends of the cylindrical walls 8 and 9 free. In applying the end wall 17 the annulus D is slipped over the end of the exhaust pipe and the tapered wall A is directed into the end of the inner cylindrical wall 8 as the end wall is advanced on the muffler, and on continued advance of the end wall 17 the flange 19 will be brought to its position around the end of the outer wall 9.

When it is desired that the muffler act to muffle the exhaust from the exhaust pipe, the disc valve 23 is positioned to extend transversely of the passage 22 to close the latter to the exhaust pipe, whereupon exhaust gases pass from the end of the exhaust pipe into the passage 22 rearward of the valve 23 and thence pass through the opening C into the space *a* and thence through the openings 11 in the wall 8 into the chamber *b* and thence pass to atmosphere through the outlet opening 27 in the end wall 17 as is common in muffler operations. When it is desired to place the muffler out of operation the disc valve 23 is turned to extend longitudinally of the passage 22 as shown in Figures 2 and 5 whereupon the exhaust gases will be discharged from the exhaust pipe directly to the atmosphere through the passage 22. The operation of the disc valve 23 is effected by the crank arm 25 through the medium of the rod 26. It is desirable however, that the valve 23 be normally dis-

posed in a closed position, and for this purpose a spring 46 is connected to the crank arm 25 in such manner as to exert a pull thereon to normally maintain the valve 23 closed, to yieldably oppose opening thereof, and to restore the valve to its normal position.

In adapting the invention to be applied to the ordinary type of mufflers now in general use in which the exhaust pipe is formed with side openings, it is necessary to close these openings when fitting the discharge end of the exhaust pipe with a control valve in order to prevent an objectionable whistling noise which is caused by the rapid flow of exhaust gases through the exhaust pipe past the side openings therein. As here shown this is accomplished by providing the end wall 17 with the annulus D which is arranged so that when the end wall is seated on the ends of the cylindrical side walls of the muffler it will extend over the side of the exhaust pipe.

It is understood that the manner of carrying the invention into effect is herein specifically set forth to enable those skilled in the art to make and use the same and is to be considered as illustrative and not in a limiting sense; and that various changes may be made in the parts and in their construction and arrangement within the meaning of the terms and scope of the appended claims without departing from the spirit of the invention.

I claim:—

1. In a muffler, the combination of an exhaust pipe formed with an annular rib, spaced from its outer end, a muffler housing embodying end walls formed with openings through which said exhaust pipe extends, said muffler being arranged with its inner end wall abutting the rib on the inner side thereof, a yoke positioned astride said exhaust pipe adjacent the rib thereon, bolts connecting said yoke to the outer end wall of said muffler for retaining said inner end wall in place and also securing the muffler to the exhaust pipe, and a valve in said outer end wall adapted to open or close direct communication between the outer end of said exhaust pipe and the atmosphere.

2. In a muffler, the combination of an exhaust pipe formed with an annular rib spaced from its outer end, a muffler housing embodying end walls formed with openings through which said exhaust pipe extends, said muffler being arranged with its inner end wall abutting the rib on the exhaust pipe, a yoke positioned astride the exhaust pipe and abutting against the rib on the inner side thereof, bolts connecting said yoke to the outer end wall of said muffler, and lugs on said yoke abutting against the inner end wall of said muffler and projecting beneath a shoulder on the latter to hold the yoke against vertical movement.

FREDRICK A. ARMSTRONG.