C. A. MILLER.

MUFFLER.

APPLICATION FILED MAY 24, 1915.

1,153,097.

Patented Sept. 7, 1915.

FIG. 1.

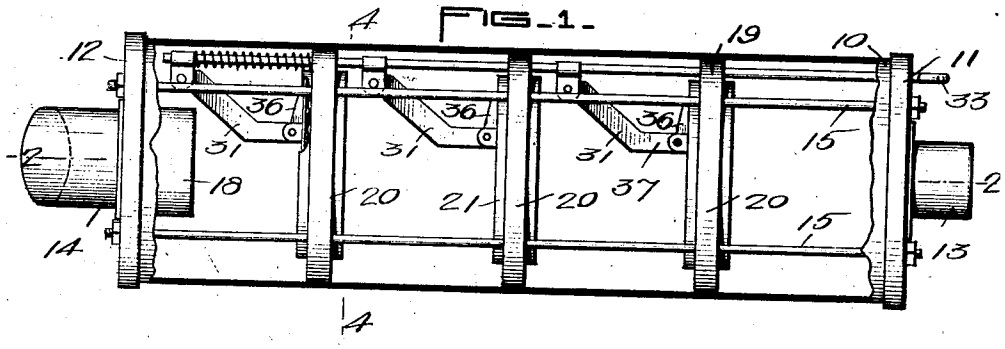


FIG. 2.

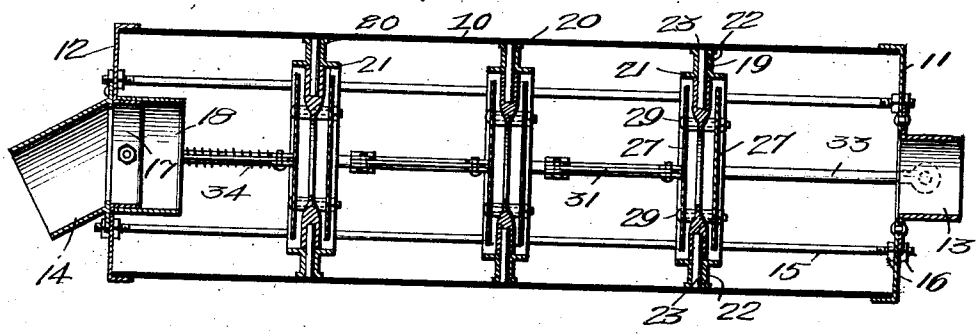


FIG. 3.

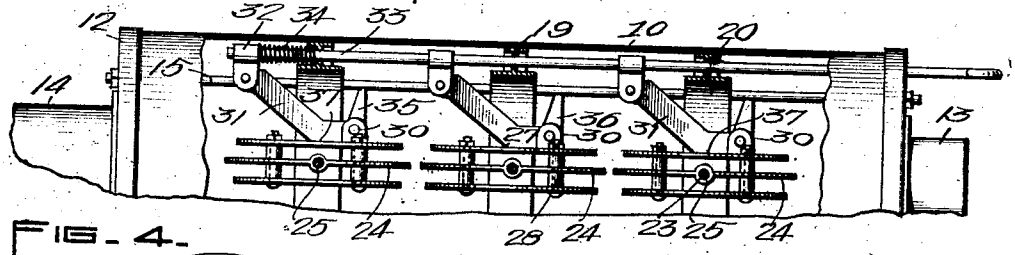


FIG. 4.

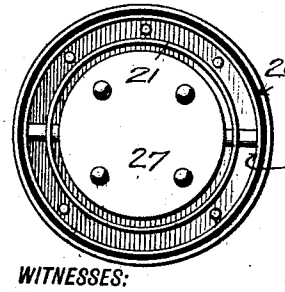
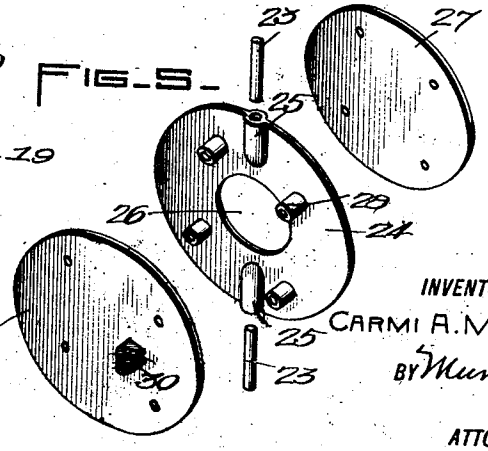


FIG. 5.



WITNESSES:

John Y. Phillips

E. L. Mueller

INVENTOR

CARMI A. MILLER,

BY Munn & Co.

ATTORNEYS

UNITED STATES PATENT OFFICE.

CARMI A. MILLER, OF SPRING VALLEY, ILLINOIS, ASSIGNOR OF ONE-HALF TO JOHN FENTON MILLER, OF SPRING VALLEY, ILLINOIS.

MUFFLER.

1,153,097. Specification of Letters Patent. Patented Sept. 7, 1915.

Application filed May 24, 1915. Serial No. 29,991.

To all whom it may concern:

Be it known that I, CARMI A. MILLER, a citizen of the United States, and a resident of Spring Valley, in the county of Bureau and State of Illinois, have invented an Improvement in Mufflers, of which the following is a specification.

This invention relates to mufflers and more particularly to one adapted for use in connection with combustion engines.

An object of the invention is the provision of a plurality of baffle plates arranged in a novel manner in the casing of the muffler whereby the force of the exhaust gases is retarded and the noise occasioned thereby reduced to a minimum.

A further object is to provide means whereby the baffle plates may be adjusted in order that the same may be cleansed by the force of the exhaust passing through the cylinder, thus obviating the necessity of taking the plates and other connections out of the casing in order to remove accumulations of soot, grease and the like.

A still further object is the provision of baffle plates in which the area of the by-passes thereof is equal to or greater than the area of the engine exhaust pipe, thereby eliminating any back pressure to the engine.

The inventive idea involved is capable of receiving a variety of mechanical expressions, one of which, for the purpose of illustrating the invention, is shown in the accompanying drawing; but it is to be expressly understood that the particular construction shown in the drawing is used merely to facilitate the description of the invention as a whole and not to define the limits thereof, reference being had to the appended claims for this purpose.

In the drawings:—Figure 1 is a side elevation of the muffler, the casing being broken away to show the interior construction. Fig. 2 is a vertical longitudinal sectional view on the line 2—2 of Fig. 1 showing the parts in normal position. Fig. 3 is a fragmentary side elevation with the casing broken away and showing the parts in their adjusted position in order that the same may be cleansed by the passage of the exhaust through said casing. Fig. 4 is a transverse section on the line 4—4 of Fig. 1, and Fig. 5 is a perspective view of one group of baffle plates, the same being separated for purposes of better illustration.

Referring more particularly to the drawing, the numeral 10 indicates a cylindrical casing having the heads 11 and 12, the former being provided with a suitable inlet 13 while the latter is provided with the outlet 14. The heads 11 and 12 are detachably retained in position by means of a plurality of stay rods 15 which pass through openings formed in said heads and are secured in position by means of nuts 16 threaded from the ends thereof. The head 12 to which the outlet 14 is secured is provided with an inturned annular flange 17 upon which is mounted a baffle ring 18 which is in longitudinal alinement with the inlet 13.

A plurality of stationary rings 19 are preferably spaced equidistant apart in the casing 10 concentrically thereof and each ring is provided with an outer flange 20 which engages the inner periphery of said casing. Each ring 19 is also provided with an inner flange 21 arranged concentrically to the outer flange 20 and has therein the diametrically disposed radially extending openings 22 adapted to receive the pivot or swivel pins 23.

Each ring 19 has mounted therein exhaust retarding means consisting of a central baffle plate 24 having a diameter equal to the interior diameter of said ring and provided with diametrically disposed sockets 25 adapted to receive the inner ends of the pins 23 whereby said plate is pivoted or swiveled in the ring. The plate 24 is provided with a central opening 26 adapted for the passage of the exhaust gases therethrough when the parts are in the position shown in Fig. 2. A baffle plate 27 is secured on each side of the central plate 24 and spaced therefrom by means of sleeves 28 carried by said central plate and adapted to have the small bolts 29 passed therethrough whereby the plates 24 and 27 are retained in position. The plates 27 are of a smaller area than the plate 24 and are arranged concentrically within the peripheral edges of the flange 21 of the ring 19 whereby an annular space is formed between said flange and the periphery of the plates 27 to permit of the passage of the exhaust gases therethrough. It will thus be seen that the exhaust entering the inlet 13 will pass around the adjacent plate 27 of the first series, thence through the opening 26 in the central plate and then around the other plate 27 of said series and

so on through the casing to the outlet 14. It will be apparent from this construction that the force of the exhaust will be repeatedly retarded in its passage through the casing so that the noise occasioned thereby when passing through the outlet will be reduced to a minimum.

Means are provided in this invention for the adjustment of the groups of baffle plates whereby the same may be moved to positions parallel to the longitudinal axis of the casing and substantially in alinement with the inlet 13 and baffle ring 18, as shown in Fig. 3, in order that the direct force of the exhaust may be applied thereto to remove any accumulation of soot, grease or the like thereon. For this purpose the plate 27 of each group which is farthest away from the inlet 13 is provided with a pair of ears 30 adapted to have pivoted therebetween one end of a lever 31. The other end of the lever 31 is pivoted to a collar 32 secured to an operating rod 33 which extends longitudinally of the casing 10, said rod being connected to suitable means, not shown, for operating the same, preferably from the driver's seat of a vehicle. A coil spring 34 is mounted between one of the collars 32 and the adjacent ring 19 for returning the parts to normal position as shown in Fig. 2, said spring being compressed when a pull is exerted on said operating rod. The end of each lever 31 which is pivoted to the plate 27 is provided with an angular extension 35 forming the right angular faces 36 and 37, the face 36 of the extension 35 being adapted to engage the adjacent face of the plate 27, as shown in Fig. 1, whereby movement of the baffle plates of each series is limited in one direction and retained in positions extending transversely of the casing. The face 37 of each lever 31 is also adapted to engage the adjacent face of the plate 27, when the parts are in the position shown in Fig. 3, thereby limiting the movement of said plates to their adjusted positions.

The area of the opening 26 and the space between the plates 27 and the ring 19 of each group is equal to or greater than the area of the exhaust pipe of the engine whereby back pressure to the latter is avoided.

I claim:—

1. A muffler comprising a series of baffle plates arranged in groups, each group consisting of a central plate having an opening therein and another plate of smaller area arranged on each side of said central plate.

2. A muffler comprising a series of baffle plates arranged in groups, each group consisting of a central plate having a central opening therein, and another plate of smaller area arranged concentrically on each side of said central plate.

3. A muffler comprising a series of baffle plates arranged in groups, each group consisting of a pivoted central plate having an opening therein, another plate of smaller area arranged on each side of said central plate, and means for securing said plates together.

4. A muffler comprising a casing, a plurality of rings mounted in said casing, a central baffle plate swiveled in each ring and having an opening therein, and another baffle plate of smaller area than said central plate arranged on each side thereof and spaced therefrom.

5. A muffler comprising a cylindrical casing having an inlet and outlet therefor, a baffle ring mounted adjacent said outlet and in alinement with said inlet, a plurality of spaced rings mounted in said casing, a central baffle plate swiveled in each of said rings and having an opening therein, another baffle plate of smaller area than said central plate arranged on each side thereof and concentrically therewith, means for connecting said baffle plates in spaced relation, an operating rod extending longitudinally of said casing, and a lever pivoted to said rod and one of the last-named baffle plates of each series whereby said baffle plates may be swung about their pivots.

6. A muffler comprising a cylindrical casing having an inlet and outlet therefor, a baffle ring mounted adjacent said outlet and in alinement with said inlet, a plurality of spaced rings mounted in said casing, a central baffle plate swiveled in each of said rings and having an opening therein, another baffle plate of smaller area than said central plate arranged on each side thereof and concentrically therewith, means for connecting said baffle plates in spaced relation, an operating rod extending longitudinally of said casing, and a lever pivoted to said rod and one of the last-named baffle plates of each series whereby said baffle plates may be swung about their pivots, said lever being formed with abutting faces adapted for engagement with the adjacent baffle plate whereby movements of said plates to their adjusted and normal positions are limited.

7. A muffler comprising a cylindrical casing having an inlet and outlet therefor, a baffle ring mounted adjacent said outlet and in alinement with said inlet, a plurality of spaced rings mounted in said casing, a central baffle plate swiveled in each of said rings and having an opening therein, another baffle plate of smaller area than said central plate arranged on each side thereof and concentrically therewith, means for connecting said baffle plates in spaced relation, an operating rod extending longitudinally of said casing, a lever pivoted to said rod and one of the last-named baffle plates of each series whereby said baffle plates may be swung about their pivots, said lever being formed with abutting faces adapted for en-

gagement with the adjacent baffle plate whereby movements of said plates to their adjusted and normal positions are limited, and means carried by said operating rod for returning said plates to their normal position.

8. A muffler comprising a casing, a ring mounted therein and having radially extending and diametrically opposed pivot openings, pivots in said openings, and an exhaust retarding plate carried by said pivots and adjustable substantially as set forth.

9. A muffler comprising a casing a plurality of baffle members normally arranged transversely of said casing, means for adjusting said members so as to extend parallel to a plane of the longitudinal axis of said casing, means for returning said members to normal position, and means adapted for engagement with said members for limiting the movements thereof to their adjusted and normal position.

10. A muffler comprising a casing, exhaust retarding means in said casing, means for adjusting said retarding means whereby the latter are automatically cleansed by the exhaust, and means adapted to engage said retarding means to limit the adjustment thereof.

11. A muffler comprising a casing having an inlet and outlet therefor, spaced rings mounted in said casing, baffle members associated with each of said rings and adapted to normally extend transversely of said casing, and means in said casing extending longitudinally thereof and having a bearing in said rings for adjusting said baffle members to extend longitudinally of the casing.

12. A muffler comprising a casing having an inlet and outlet therefor, spaced rings mounted in said casing, baffle members associated with each of said rings and adapted to normally extend transversely of said casing, means in said casing extending longitudinally thereof and having a bearing in said rings for adjusting said baffle members to extend longitudinally of the casing, and means adapted to engage certain of said baffle members for limiting the adjustment thereof.

CARMI A. MILLER.

Witnesses:
GERALD R. BASS,
WM. F. GUNTHER.