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1,747,876

MUFFLER

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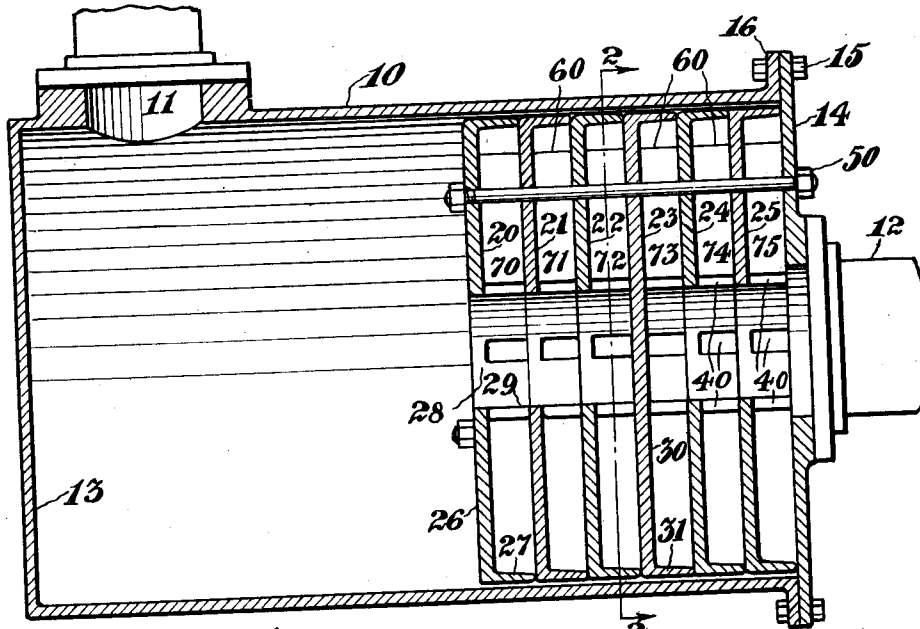


FIG.-1.

FIG.-3.

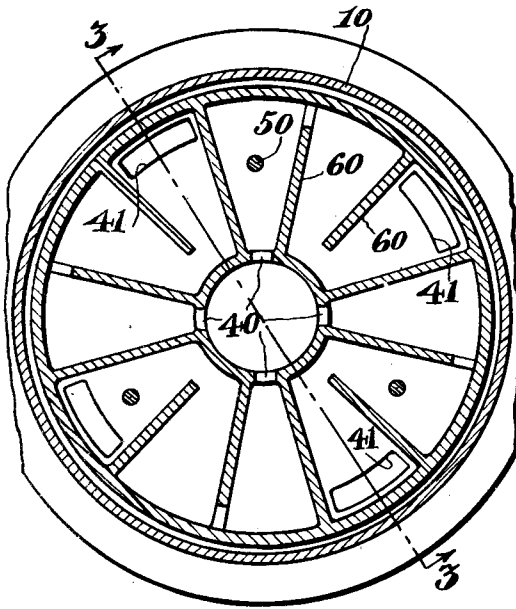
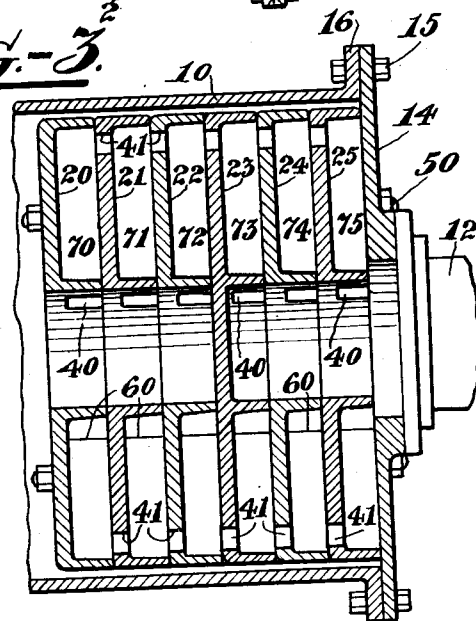


FIG.-2.

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MUFFLER

Application filed January 31, 1929. Serial No. 336,355.

This invention relates to silencers or mufflers for internal combustion engines for muffling or deadening the noise of the engine exhaust and to smooth out the exhaust impulses and pass the products of combustion to the atmosphere in a substantially steady flow.

A still further object of the invention is to provide a muffler which involves in its general organization a number of identical plates that may be made from the same pattern and which plates when assembled form a tortuous path, for the passage of the gas.

Other objects of the invention not particularly enumerated, will become apparent as the nature of the invention is better understood, and the same consists in the novel construction, combination and arrangement of parts shown in the accompanying drawings, in which,

Figure 1 is a sectional view taken through a muffler embodying the principles of my invention.

Figure 2 is a sectional view taken along the line 2—2 of Figure 1.

Figure 3 is a sectional view taken along the line 3—3 of Figure 2.

In all of the above mentioned views, like characters of reference are employed to designate like parts throughout and the device involves an outer casing 10 provided with an inlet opening 11 and an exhaust opening 12. The casing 10 has a wall 13 at one end and a plate 14 forms a closure for the other end and may be held in position by any suitable means such as cap screws 15 which extend through the plate 14 and through a flange 16 on the casing 10.

Within the casing 10 are disposed a plurality of baffle plates designated by 20, 21, 22, 24 and 25 and an intermediate baffle plate is shown at 23. The plates 20, 21, 22, 24 and 25 are identical in construction and are preferably in the form of flat discs 26 having marginal flanges 27 and central apertures 28 extending therethrough bounded by flanges 29. The baffle 23 may be in the form of a flat plate 30 having a marginal flange 31.

As illustrated in Figures 1 and 3, a plurality of apertures 40 extend through the central flange 29 and a plurality of peripheral

apertures 41 are formed in each plate and extend through the flat portion thereof. These apertures 41 are preferably in alignment as shown in Figure 3. In the assembled position of the plates the flanges 27 abut the adjacent plate to form annular compartments 70, 71, 72, 73, 74 and 75 between the plates. The plates are secured in position and to the plate 14 by means of through-bolts 15 which clamp these plates together. The plates are preferably of smaller diameter than the interior of the casing, so that the peripheries thereof will be spaced a slight distance from the wall of the casing 10 and each plate is provided with a plurality of radial baffles 60 in the form of webs of a width substantially equal to that of the flanges 27 so that they will also abut adjacent plates. When the plates are in assembled position these baffles form tortuous paths leading from the apertures in the central flanges 29 to the apertures in the peripheries of the plates, or vice versa, as will be more fully outlined later.

The products of combustion coming from the engine enter the casing 10 of the muffler in a series of sudden impulses. It is the purpose of the baffles 20, 21, 22, 23, 24 and 25 to break up these impulses and so nullify them by providing a plurality of paths of different length through which the products of combustion may travel so that some internal interference or back pressure may be set up in the gases.

By referring to Figure 3, it will be seen that the gases entering the muffler will pass to the atmosphere through a series of associated paths of varied lengths and directions. The exhaust gases may enter the apertures 40 in the plates 20, 21 and 22 and follow the tortuous paths provided for them by the various baffles 60 in the different plates, or may flow directly through the aligned apertures 41 and back to the central passageway to the atmosphere on the other side of the plate 23.

The apertures 40 in the plates 20, 21 and 22 are inlets, and gas entering the first of these apertures is forced to travel a greater distance along the paths provided between the plates than the gas entering the second of

these apertures. Similarly, gas entering the second of these apertures must travel further than gas entering the third. The central plate 23 seals off the central bore formed by the flanges 29 and all of the gas must pass
5 through the apertures 41 in this plate 23, but by the time it has reached the apertures 41 in the plate 23 it will have been considerably broken up.

10 The apertures 40 in the plates 23, 24 and 25 respectively, are outlets and such gas as passes through the apertures in the plates 24 and 25 travels a longer distance than the gas which is expelled from the apertures in the
15 plate 23. Thus it will be seen that any combination of a multitude of various paths may be followed by the exhaust gases. Consequently, the impulses of the gases are effectively broken up and smoothed out so that
20 they issue from the exhaust opening 12 in a substantially steady stream.

I claim:

1. A device of the character described, comprising a shell, a plurality of plates in
25 the shell forming annular compartments, radial baffles in each compartment, there being radial and peripheral openings leading into the compartments whereby a gas injected into the shell may pass directly through each com-
30 partment to an adjacent compartment or pass in a tortuous path around said baffles through each compartment to an adjacent compartment.

2. A device of the character described,
35 comprising a shell, a plurality of plates dividing the shell into compartments, annular flanges on the plates forming a central bore through said compartments, there being pas-
40 sageways through each annular flange and peripheral passageways in each plate, radial baffles between the peripheral passageways and the passageways in the flanges whereby
45 a gas injected into the shell may pass directly through each compartment to an adjacent compartment or pass in a tortuous path around said baffles through each compart-
ment to an adjacent compartment.

In testimony whereof I have signed this specification.

50 CHESTER W. METZGAR.

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