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L. J. WOLFORD

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EXHAUST SILENCER

Filed April 6, 1929

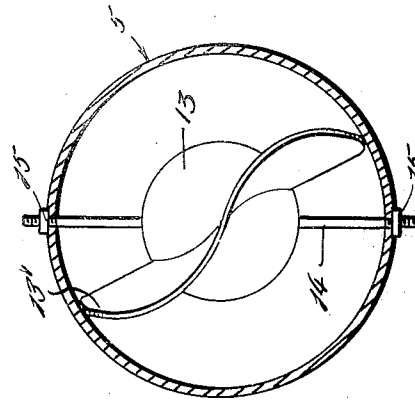
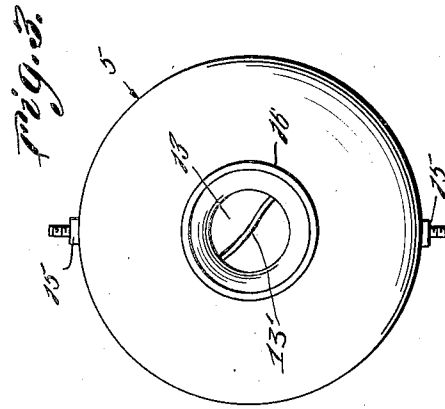
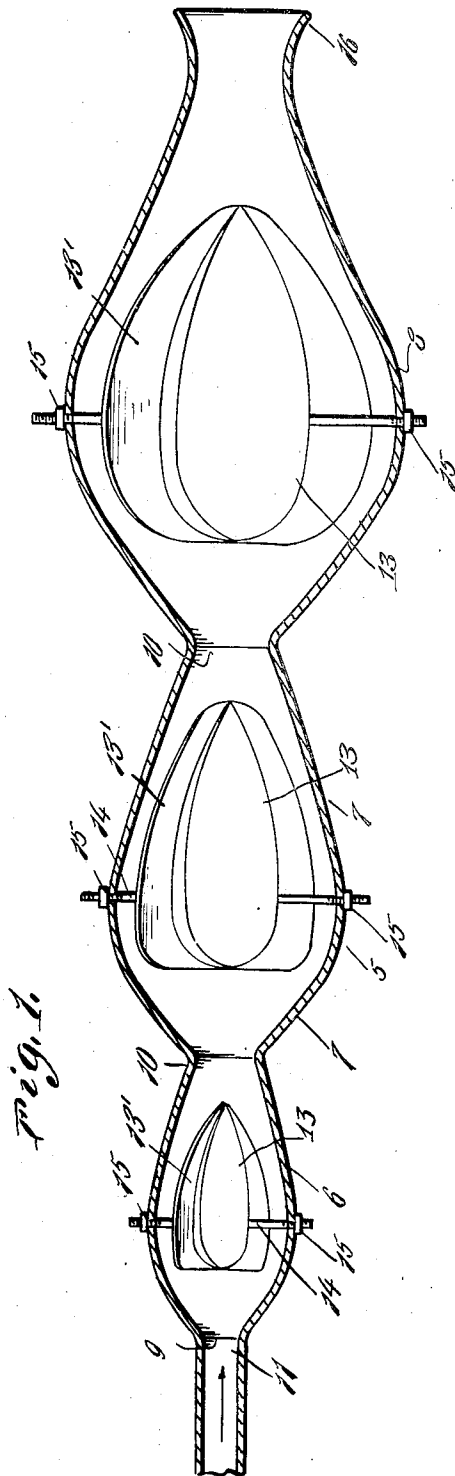


Fig. 2.

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EXHAUST SILENCER

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This invention relates to a silencer, and more especially to an exhaust silencer for use on any kind of an internal combustion engine, and the primary object of the invention is to provide an exhaust silencer which will allow exhaust gases to escape without offering any resistance to the flow of gas, and yet at the same time muffle the sound of the explosion.

10 A still further object of the invention is to provide a silencer of the type described which is comparatively simple in structure, inexpensive, and comprises a casing having baffles disposed therein whereby the exhaust
15 gases will encounter no direct opposition, and wherein the gases are directed through the silencer in a circular motion.

With the above and numerous other objects of the invention will become readily
20 apparent during a study of the following description taken in connection with the accompanying drawings, wherein:

Figure 1 is a longitudinal sectional view of the casing showing the manner of positioning the baffles therein.

Figure 2 is a transverse sectional view, and Figure 3 is an end view of the silencer.

With reference more in detail to the drawing it will be seen that my improved silencer
30 embodies a casing designated generally at 5, which casing comprises a plurality of sections, the sections being designated by the numerals 6, 7 and 8, respectively. While I have herein shown the casing as comprising
35 but three sections, it is to be understood of course that the casing may have more or less sections as desired.

It is to be noted that the casing is substantially circular in cross section and that
40 each of the sections of the casing is relatively wide intermediate its ends and tapers towards its ends. By so forming the sections relatively small inlets 9 and outlets 10 are formed at the opposite ends of the respective sections.
45 As illustrated, the casing is preferably formed of one piece, and it is to be noted that the sections graduate in size beginning at the inlet 11 of the casing, the last section, counting from the left to the right in Figure 1, being
50 the largest. Within each of the sections 6, 7,

and 8, there is disposed an especially shaped baffle 13 extending longitudinally of the section. The baffle 13 is of hollow construction and is of a shape conforming to the shape of its section. As illustrated to advantage in
55 Figure 2 each baffle 13 is spaced from the wall of its section and is provided with diametrically opposed fins 13' extending for the full length of the baffle between the baffle and the wall of the section. Each of the said
60 fins are twisted in a manner best shown in Figure 2. If desired, the baffle may be anchored within its section by means of a bolt 14 passing through the center of the baffle, and the opposite ends of the bolt 14 project-
65 ing outwardly from opposite sides of the section. Nuts 15—15 are threadly mounted on the respective ends of the bolt 14 for rigidly securing the bolt in place in the section. It is to be noted that each of the respective
70 sections of the casing are practically identical in shape, except that the last of the sections is provided with a flared mouth 16 to insure there being no obstruction in the path of the discharge gases. It is also to be noted
75 that the baffle 13 in each of the sections is of substantially the same shape differentiating in size only. Each of the baffles 13 is of a size corresponding to the size of the respective
80 sections.

The fins of the baffles may be disposed at any angle within the sections and have their longitudinal edges disposed in contact with the walls of the sections, and the fins running parallel with the gas flow to provide a greater
85 sound absorbing surface.

Thus it will be seen that I have provided a casing so shaped as to allow baffles of a stream line or aerodynamic shape or both to be contained therein, and it is further ob-
90 vious that the first baffle, that is, the baffle disposed in section 6 of the casing which the gas will encounter gives to the gas outward motion toward the wall of the casing where it is cooled by the casing, since the casing is cooled by the outside air. The fins on the
95 baffles, due to their peculiar shape as shown will also serve to give the gas a circular motion which enables the gas to flow more easily and in a natural manner. This cir-
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cular motion will give an added force to the gas, sending the same through the small opening 10 into the next section. Thus the action is repeated during the flow of gas through the casing in passing from one section to the other so that by the time the gases have been exhausted through the flared opening they have so increased in velocity as to completely eliminate all back pressure upon the motor. In providing the casing with the flared opening 16 the outside air is thrown away from the gas flow and thus eliminates the pressure due to exhaust gases coming directly in contact with the air. The action of the air being thrown outwardly by the flared mouth leaves a slight vacuum within the casing which the gas must relieve and so consequently causing the gases to leave the last section more quickly which in turn draws the gas from the sections more rapidly. Another advantage of so forming my casing is that the outside air will come in contact at the point of greatest diameter, thus cooling the casing and in turn cooling the gases inside which will then contract, thus decreasing in volume and leaving more space for the oncoming gas thus tending to eliminate back pressure.

From the foregoing, it will be apparent that the baffles 13 extend longitudinally of the casing and in the line of flow of the exhaust gases entering the casing and flowing there-through in the direction indicated by the arrow in Figure 1, the baffles thus affording little or no obstruction to the flow of gases through the casing progressively from one section to the other.

While I have herein shown the preferred embodiment of my invention it is to be understood that certain changes in details, and the construction thereof may be resorted to without departing from the spirit of the invention as herein described and claimed.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent is:—

1. An exhaust silencer comprising a plurality of integral sections progressively increasing in length and mean diameter from one end to the other of the silencer, each of said sections being relatively wide adjacent one end thereof and tapering towards its opposite end, a baffle arranged in each of said sections and being of a shape corresponding approximately to the shape of its section, said baffles respectively provided with diametrically opposed fins contacting at their free edges with the walls of the casing, said fins extending longitudinally of the respective baffles, and each of said fins being twisted.

2. An exhaust silencer comprising a plurality of integral sections progressively increasing in length and mean diameter from one end to the other of the silencer, each of said sections being relatively wide adjacent

one end thereof and tapering towards its opposite end, a baffle arranged in each of said sections and being of a shape corresponding approximately to the shape of its section, said baffles respectively provided with diametrically opposed fins contacting at their free edges with the walls of the respective sections, said fins extending longitudinally of the respective baffles, each of said fins being twisted, each of said baffles being of a length less than the length of its section, and bolts extending diametrically through the baffles and having their respective ends extending through the walls of the respective sections, and nuts threaded on the ends of the bolts.

In testimony whereof I affix my signature.
LESTER J. WOLFORD.

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