

1,264,853.

Fig.1.

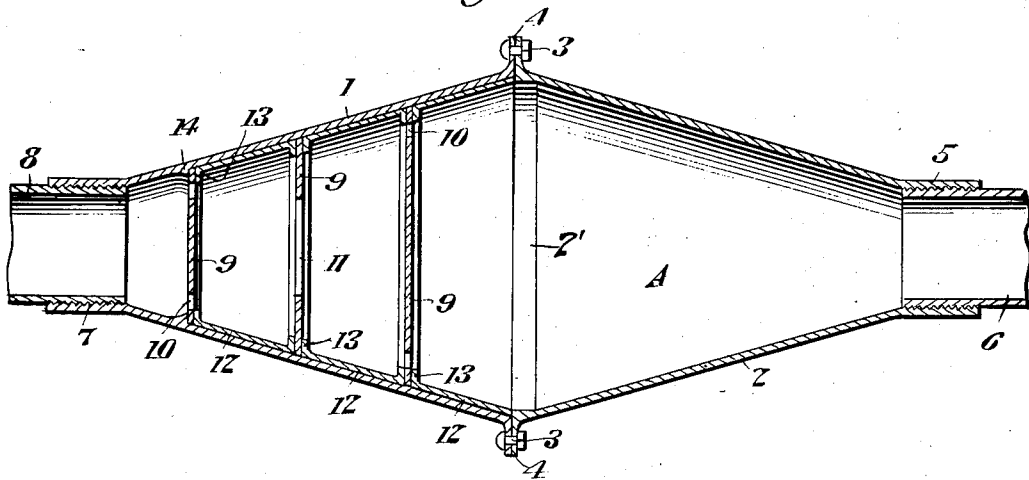


Fig. 2.

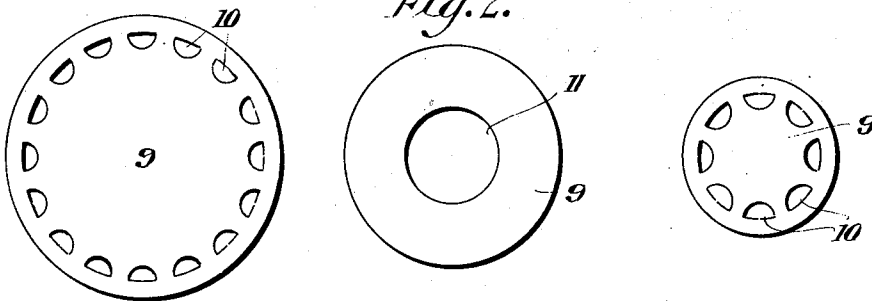
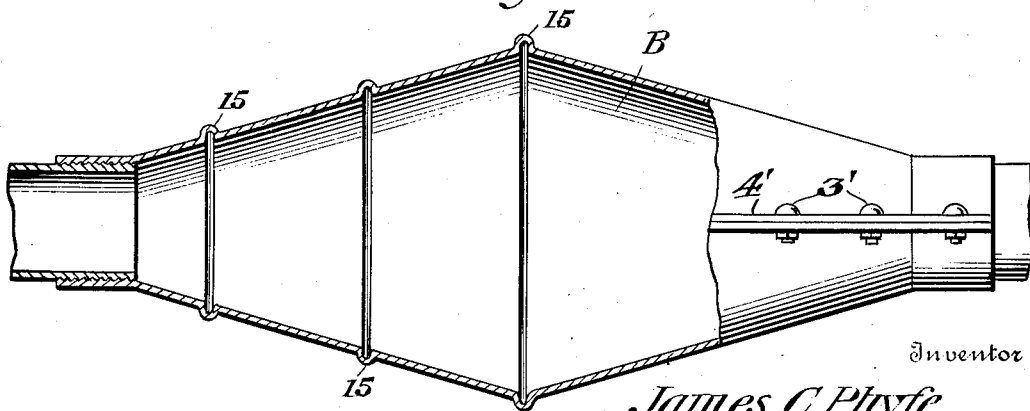


Fig. 3.



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GAS-ENGINE SILENCER.

1,264,853.

Specification of Letters Patent.

Patented Apr. 30, 1918.

Application filed December 22, 1916. Serial No. 138,420.

To all whom it may concern:

Be it known that I, JAMES C. PHYFE, a citizen of the United States, residing at Peekskill, in the county of Westchester and State of New York, have invented new and useful Improvements in Gas-Engine Silencers, of which the following is a specification.

This invention relates to mufflers and more particularly to that class of mufflers for use on the exhaust of gas engines to reduce the sound of the explosions to a minimum.

One object of the invention is the provision of a silencer for the exhaust of gas engines which reduces the sound of the explosions to a minimum and also decreases back pressure to such an extent that it obviates the disadvantages resulting therefrom.

Another object in view is the provision of a silencer of very simple construction, employing but few parts, which are inexpensive to manufacture, thoroughly reliable and efficient in operation and easy to assemble and take down.

Other objects and advantages will be apparent as the nature and operation of the device is better understood from the reading of the description and claims, taken in connection with the accompanying drawing in which,

Figure 1 is a vertical longitudinal section through the silencer.

Fig. 2 is a collective view of the disks employed.

Fig. 3 is a vertical longitudinal section of a slightly modified form of casing.

In the drawing, A, represents a casing composed of two conical shaped sections, 1 and 2, which are clamped together at their larger ends by means of the fastening members 3, passed through flanges 4, with which the sections are provided at the meeting ends thereof. The section 2 is made thicker at its larger end than the section 1, or its internal circumference is smaller so as to provide a shoulder 2' as shown in Fig. 1. Its smaller end is provided with an interiorly threaded inlet 5, adapted to receive the exhaust pipe 6, which leads from the manifold of the engine, while the section 1, is provided with an outlet 7, adapted to threadedly receive the pipe 8, which leads to the rear of the vehicle.

Secured to the interior of the section 1, and removably retained in spaced relation

therein, is a series of baffle disks 9, any number of which may be employed to best suit the exigencies of the case. The first and third disks are provided with a plurality of openings 10, arranged near the periphery of each disk. The intermediate disks are provided with a single opening 11, arranged approximately at the center thereof, said openings being of substantially the same area as either the inlet or outlet opening, while the combined area of the openings 10, in each of the other disks also approximates the area of either the inlet or the outlet opening. This fact practically eliminates any back pressure of the gases, while at the same time the sound waves resulting from the explosions are effectively broken up, due to the fact that the baffle disks obstruct the sound waves, causing them to pursue a tortuous course in passing through the casing. The sound waves must of course, to be heard, pass out the outlet rather than through the inlet and back toward the engine. I have therefore provided the baffle disks within what might be called the outlet section 1, but left the interior of the inlet section 2 free and uninterrupted so as to produce a chamber as seen at the right of both Figs. 1 and 3, and this chamber grows larger from the inlet end to the center of the silencer. Therefore the gases coming from the engine are permitted to expand within this chamber before striking the baffles, and their force is to an extent diminished. Later they are broken up by the baffle disks within the outer chamber, and I find that this combined action of the gases interrupts the passage of the sound waves through the muffler and the latter becomes in fact a silencer.

The means employed in Fig. 1, for retaining the disks, consist of a series of spacing and retaining elements 12, of frusto-conical formation provided with flanges 13, adapted to bear against the disks, and clamped in place in the section 1, by the shoulder 2' of the section 2, when the flanges 4 are brought together and secured by the fastening members 3. The disk nearest the outlet is seated against a fixed flange 14, provided on the interior of the section 1, as shown.

In the modification shown in Fig. 3, the casing B, is split longitudinally and provided with flanges 4' at the meeting edges thereof, to receive the usual fastening de-

vices 3'. The casing is provided with circumferentially arranged depressions 15 forming internal grooves adapted to receive the disks described and retain them in their spaced relation.

While I have described and shown several forms I do not wish to limit myself to the exact details of construction contained therein, but wish to have it understood that alterations and modifications may be resorted to when desired which fall within the scope of the appended claims.

What is claimed as new is:—

1. In an engine silencer, the combination 15 with a shell made up of two conical sections having inlet and outlet openings in their smaller ends respectively and radial abutting flanges at their larger ends, one section being internally slightly smaller at its 20 larger end than the other to produce a shoulder; of a series of transverse perforated baffle disks disposed within the other section and spaced from each other, and frusto-conical spacing elements interposed between the 25 edges of said disks and between the edge of the larger disk and said shoulder.

2. In an engine silencer, the combination with a shell made up of two conical sections having inlet and outlet openings in their 30 smaller ends respectively and one section be-

ing provided at its larger end with a shoulder; of a series of transverse baffle disks disposed within the other section, a fixed shoulder within this section against which the edge of the smallest disk lies, spacing elements between the edges of the several disks to hold them spaced and to hold the smaller disk on said fixed shoulder, and a final spacing element between the edge of the largest disk and said shoulder on the other section. 35 40

3. In an engine silencer, the combination with a shell made up of two sections having inlet and outlet openings in their smaller ends respectively and radial abutting flanges at their larger ends, one section being internally slightly smaller at its larger end than the other to produce a shoulder; of a series of transverse baffle disks disposed within the other section and spaced from each other, a fixed shoulder within this section against which the edges of the smaller disk lie, frusto-conical spacing elements between the edges of the several disks to hold them spaced and to hold the smaller disk on said fixed shoulder, and a final spacing element 50 55 between the edges of the larger disk and said shoulder on the other section.

In testimony whereof I affix my signature.

JAMES C. PHYFE.