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SILENCER FOR INTERNAL COMBUSTION ENGINES

Filed Jan. 26, 1937

2 Sheets-Sheet 1

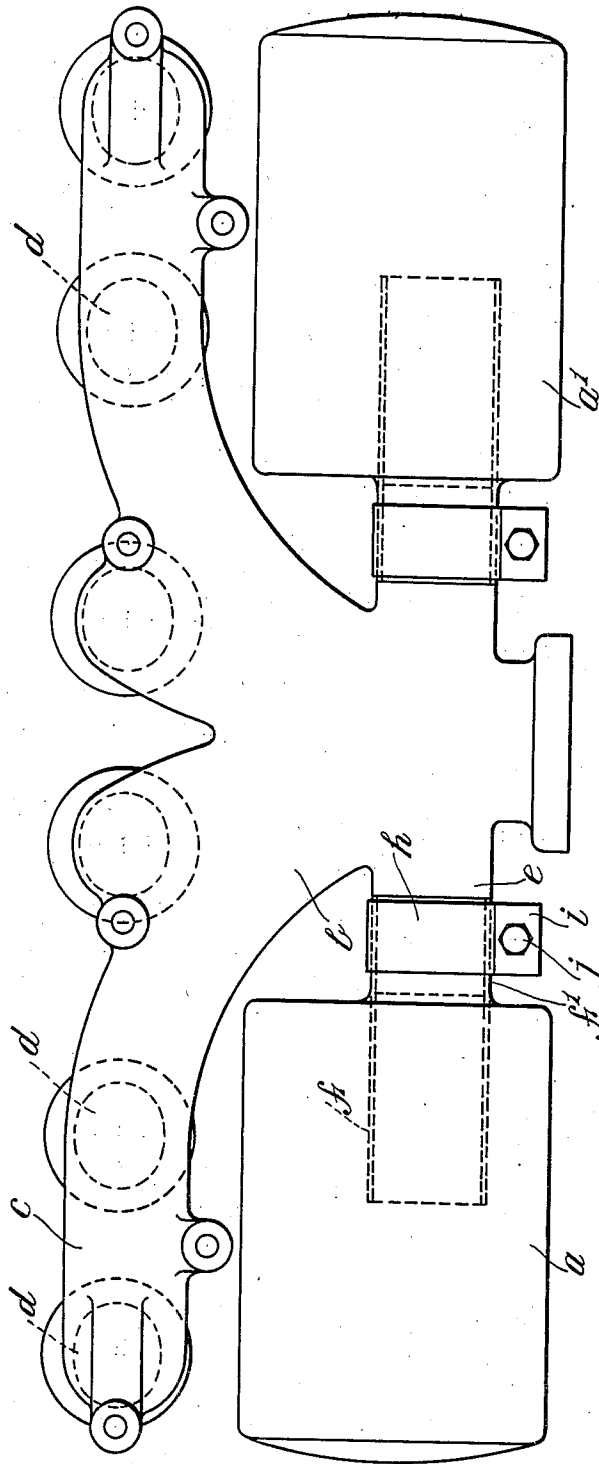


Fig. 1

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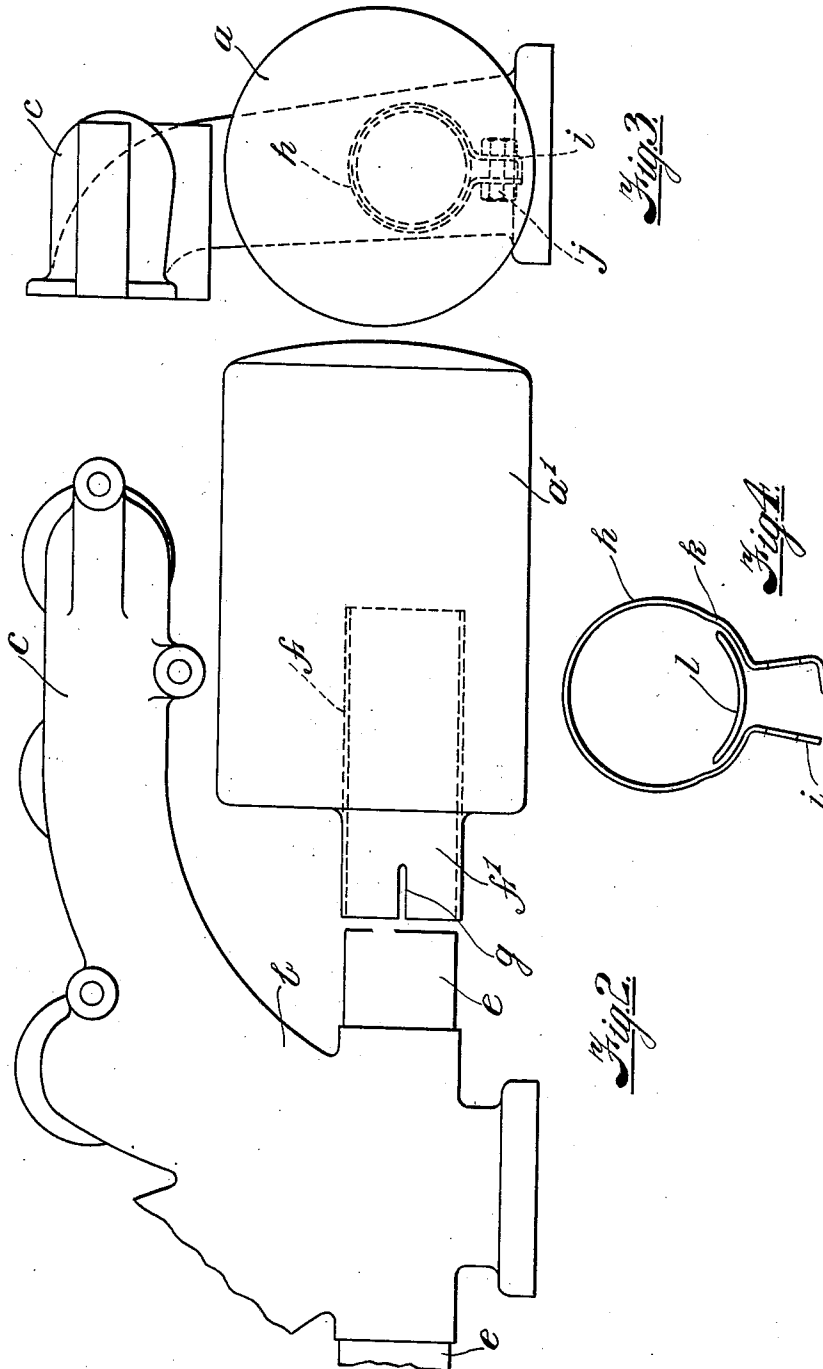
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SILENCER FOR INTERNAL COMBUSTION
ENGINESWilliam Albert Edward Hurlock, Thames Ditton,
EnglandApplication January 26, 1937, Serial No. 122,434
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2 Claims. (Cl. 181—48)

This invention relates to silencers for internal combustion engines and has for its object to provide an improved construction and arrangement applicable to the silencing of automobile and aircraft engines as well as to stationary engines of the internal combustion type.

Various devices have been proposed for silencing the noise produced by the explosion of gases in the cylinders of internal combustion engines but many of these have involved the use of baffles and similar means which set up a back pressure and cause loss of power. The present invention is designed to avoid this disadvantage and consists in providing an internal combustion engine with an exhaust outlet or manifold which provides a free and unrestricted passage of the combustion gases but which also provides for the rapid expansion of such gases shortly after leaving the cylinders so that they ultimately reach the atmosphere at a relatively low pressure and substantially constant velocity.

According to the preferred form of the invention a silencer for an internal combustion engine comprises an expansion chamber having a common inlet and outlet passage extending through one end and adapted to be detachably connected to an exhaust pipe or manifold at a point near the cylinder outlet.

Reference will now be made to the accompanying drawings which illustrate by way of example a construction according to the invention and in which—

Fig. 1 is an elevation showing the improved silencing devices in operative position,

Fig. 2 is a fragmentary view showing one of the silencing devices detached,

Fig. 3 is an end elevation of Fig. 1 and

Fig. 4 is an end elevation of the device for securing the silencer in position.

In the construction illustration the improved silencing arrangement comprises a cylindrical expansion chamber *a* which is connected to the exhaust manifold *b* at a point near the junctions *c* of the said manifold with the cylinder outlets *d*, the arrangement being shown on the drawings as applied to a six-cylinder engine. Preferably two expansion chambers *a* and *a'* are provided connected in parallel with the exhaust manifold *b*.

To enable the expansion chambers to be detachably connected to the manifold *b* the latter is formed with laterally directed branch pipes *e* and the expansion chambers are provided each with a tubular inlet *f* eccentrically mounted and extending partly within and partly without the chamber, the outer portion *f'* being slit at one or more places as shown at *g* (see Fig. 2). The

slit tubular portion *f'* is adapted to be forced over one of the branch connections *e* and secured in position thereon by passing around it a clip *h* consisting of a metal strap, the ends of which are formed as perforated lugs *i* which are adapted to be clamped together to secure the clip in position by a bolt and nuts *j*. Adjacent the lugs *i* the clip is shaped as shown at *k* (Fig. 4) to embrace a packing piece *l* which when the locking nut is tightened is forced into close contact with the tubular element *f'* to cause a fluid tight joint to be formed between this element and the branch connection *e*.

The expansion chambers *a* and *a'* are preferably filled with a sound absorbing packing material such as steel wool and in addition to or instead of such packing they may be provided with an external lagging of sound absorbing material.

With the arrangement above described the passages constituted by the branches *e* and the inlets *f* serve both as inlets and outlets for the expansion chambers so that the combustion gases entering the exhaust manifold *b* at a relatively high pressure enter and expand in the chambers *a* and *a'* which action deadens the noise by preventing the gases proceeding directly from the engine cylinders to atmosphere. As there will always be a residue of gas in each expansion chamber whilst the engine is running, this residue will act as a cushion to receive the impact of a fresh charge of gas at high pressure and thus assist further in deadening noise and exhaust vibrations.

I claim:

1. A silencer for an internal combustion engine comprising in combination a manifold having entrance portions to communicate with the exhaust outlets of a plurality of cylinders and a central outlet portion having branches extending laterally from opposite sides thereof, closed expansion chambers, a tubular inlet and exit passage extending partly within one end of each expansion chamber, and means for connecting the outer end of each passage to one of said branches.

2. A silencer for an internal combustion engine comprising in combination a manifold having entrance portions to communicate with the exhaust outlets of a plurality of cylinders and a central outlet portion having a pair of branches extending laterally from opposite sides thereof, closed expansion chambers, a tubular inlet and exit passage extending partly within and partly exteriorly of one end of each expansion chamber, and means for detachably clamping the exposed exterior end of each passage over one of said branches.

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