March 15, 1955 E. W. DOWNING 2,704,055

AIR-SUPPLY MEANS FOR INTERNAL-COMBUSTION ENGINES

Filed May 5, 1953 2 Sheets-Sheet 1

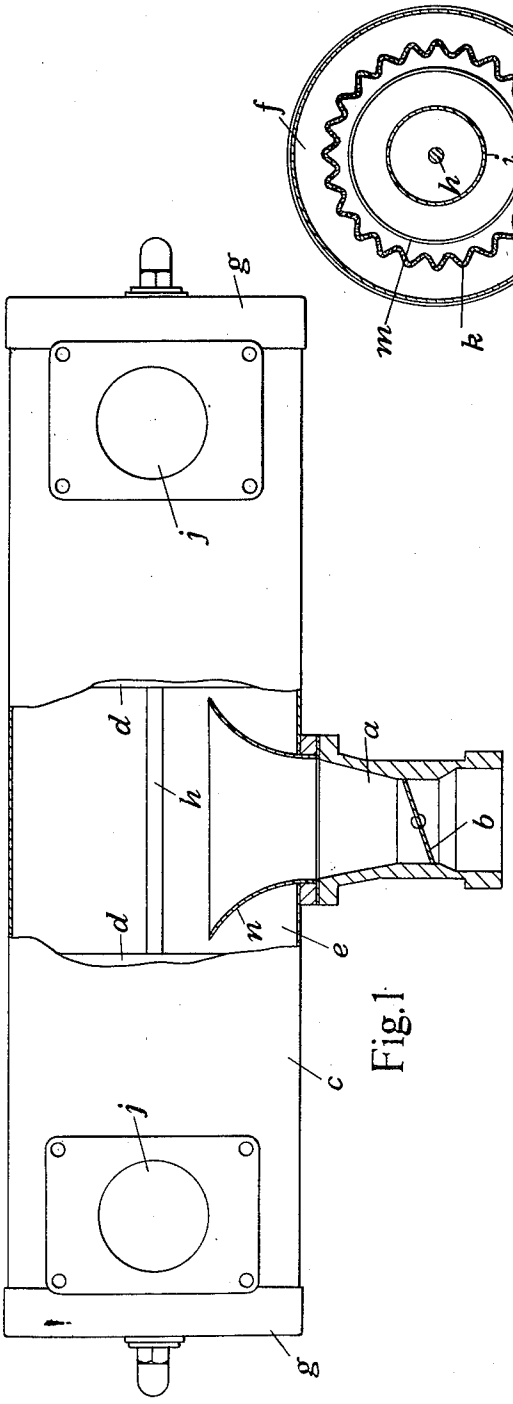


Fig.1

Fig.3

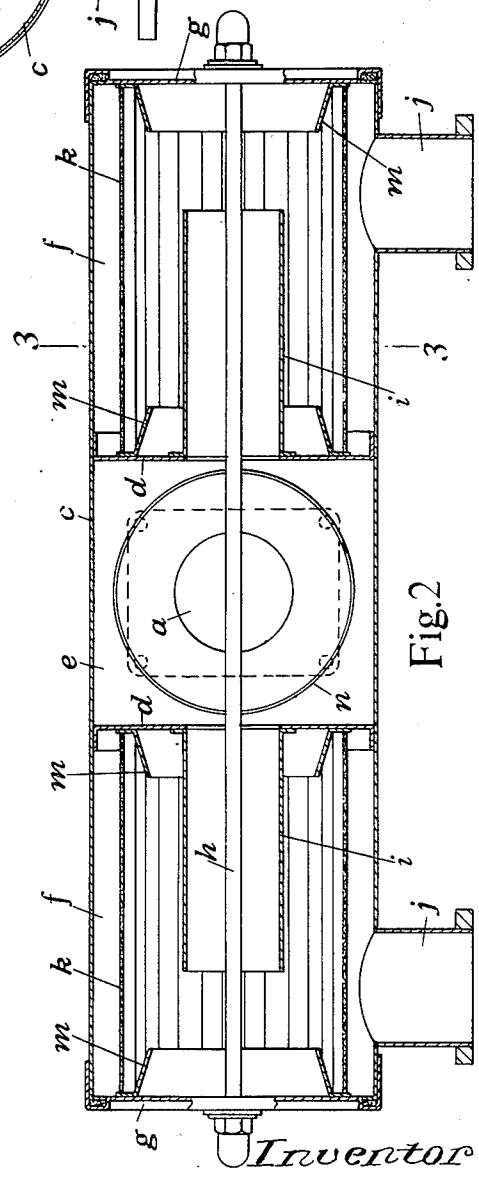


Fig.2

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2 Sheets-Sheet 2

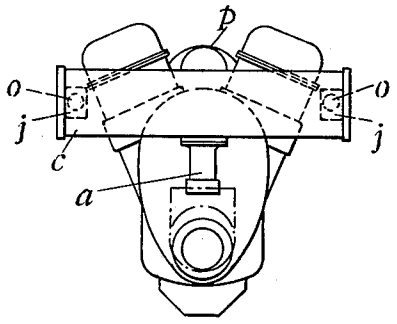


Fig.4

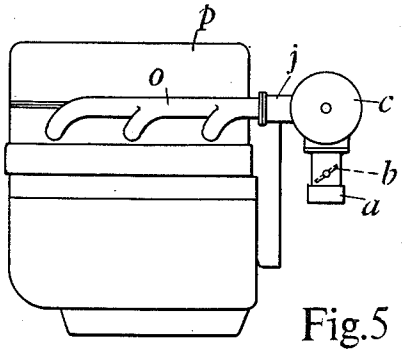


Fig.5

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AIR-SUPPLY MEANS FOR INTERNAL-COMBUSTION ENGINES

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Application May 5, 1953, Serial No. 353,046

Claims priority, application Great Britain May 5, 1952

2 Claims. (Cl. 123—52)

This invention relates to the air-supply means for internal combustion engines of the kind comprising two or more groups of cylinders.

When it is required to supply air to the cylinders from a common air inlet difficulty is experienced in ensuring equal supplies of air to each group, particularly when the induction strokes occur at uneven time intervals.

The object of the present invention is to enable the said difficulty to be avoided or reduced in a simple and convenient manner.

An air supply means in accordance with the invention comprises the combination of a single air inlet duct, and two or more pulsation damping chambers in communication with the exit end of the said duct, the said chambers being adapted to effect communication between the inlet duct and the air intake manifolds of the engine.

In the accompanying drawings:

Figure 1 is a part sectional inverted plan, Figure 2 a longitudinal section, and Figure 3 a cross section on the line 3—3 (Figure 2), illustrating one embodiment of the invention.

Figures 4 and 5 are side elevations taken at right angles to each other illustrating to a smaller scale the embodiment of the invention shown in Figures 1 to 3 applied to an internal combustion engine having two groups of cylinders.

Referring to the drawings, the construction there shown comprises an air inlet duct *a* which may contain a throttle valve *b* of the conventional butterfly type. A cap adapted to minimise hissing of the air entering the duct may be mounted over the entrance end of the duct. To the outlet end of the duct *a* is secured a transverse tube *c* which is divided internally by a pair of annular

partitions *d* to form an air distribution chamber *e* and a pair of pulsation damping chambers *f*. The ends of the tube *c* are closed by covers *g* which are held in position by a tie rod *h*. To each partition *d* is attached a tube *i* by which air is conveyed from the distribution chamber to the interior of the associated damping chamber, the tube *i* being arranged to extend along the greater part of the length of the said chamber. The damping chambers are provided with lateral exit ducts *j* for connection to the air intake manifolds *o* of the engine *p*. Preferably each damping chamber is provided with a permeable partition *k* of cylindrical or other convenient form which serves as an additional means for suppressing air pulsations. This partition may be made from wire gauze, and it may also serve as an air filter. Also it is preferably corrugated as shown in Figure 3. The partitions *k* surround the tubes *i*, and air conveyed by these tubes passes through the partitions *k* before entering the ducts *j*. For supporting the partitions *k* centrally on the tube *c*, the ends of the partitions are carried by frustro-conical parts *m* secured to the parts *d*, *g*.

If desired a flared tube *n* may be arranged at the exit end of the inlet duct *a* for conveying air into the distribution chamber *e* with a minimum of turbulance.

When the engine comprises more than two groups of cylinders, corresponding additional pulsation chambers are connected to the distribution chamber *e*.

By the use of pulsation damping chambers between a common air inlet duct and the air-intake manifolds of the engine, it has been found that substantially equal supplies of air to each group of cylinders with consequent equalisation of the power developed in each group can be ensured in a satisfactory manner. Also effective silencing of the air inflow is obtained, thus rendering unnecessary the use of separate silencers.

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

1. Air supply means for an internal combustion engine of the kind specified, comprising the combination of a single air inlet duct, and two or more pulsation damping chambers in communication with the exit end of the said duct, the said chambers being adapted to effect communication between the inlet duct and the air intake manifolds of the engine.

2. Air supply means as and for the purpose claimed in claim 1, in which each damping chamber is provided with an air-permeable partition.

No references cited.