Oct. 22, 1940. A. TEBALDI 2,219,241

EXPLOSION ENGINE

Filed April 26, 1939

Fig. 1

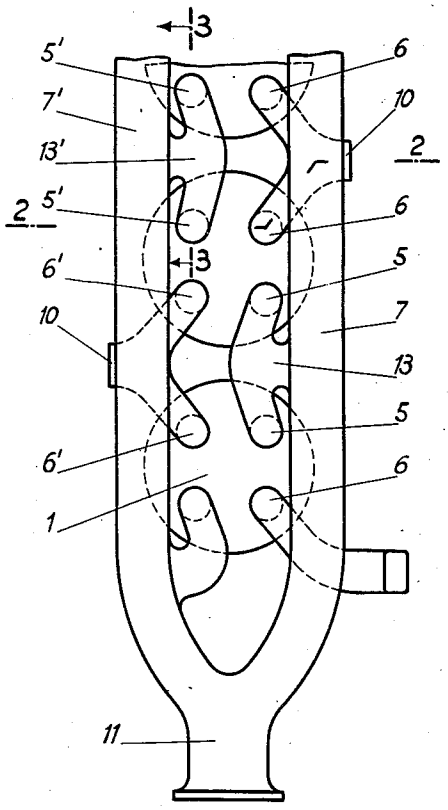


Fig. 2

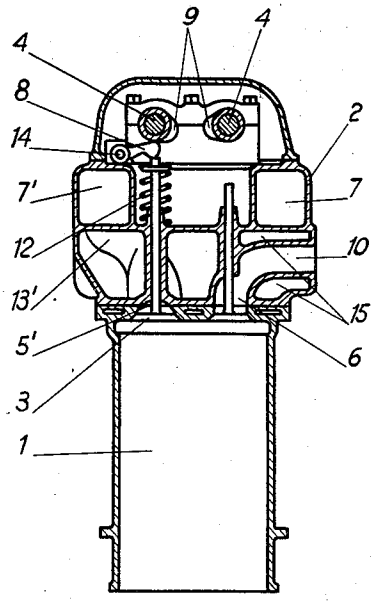
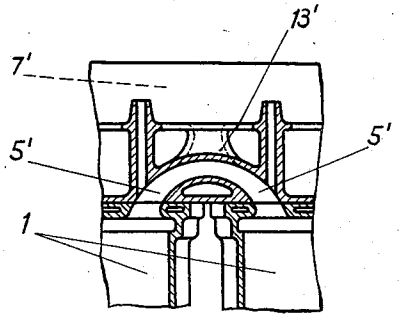


Fig. 3



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EXPLOSION ENGINE

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4 Claims. (Cl. 123—191)

The present invention relates to multi-cylinder explosion engines with aligned cylinders and it has for its object a head for the cylinder blocks of said engines which provides for feeding the operative mixture to the engine cylinders in conditions ensuring a satisfactory combustion of said explosive mixture said head having further a comparatively small size and a simple construction.

The head according to this invention includes for each engine cylinder at least two inlet ports and two outlet ports which alternate with each other around the cylinder axis in such a location as the equivalent ports in two adjacent cylinders are located near each other. Thus, in each cylinder the inlet ports are arranged in such locations as to provide for a satisfactory stirring of the mixture and at the same time a single manifold may cooperate with the corresponding ports of two cylinders; accordingly the space requirement depending upon a large number of tubes around the engine cylinder top is removed.

A construction of a head for a multi-cylinder explosion engine in accordance with this invention is shown by way of example on the annexed drawing and:

Fig. 1 is a diagrammatic plan view showing the interconnections of the cylinders with inlet manifolds and exhaust ducts;

Fig. 2 is a vertical transverse section on line 2—2 of Fig. 1, of the head with a cooperating cylinder;

Fig. 3 is a fragmentary sectional view to an enlarged scale on line 3—3, Fig. 1, of a portion of the head in register with two adjacent cylinders, some parts being omitted.

In said figures the engine cylinders are referenced 1 and the head is referenced 2, this head 2 having valves 3 and cam shafts 4 with cams 9 for the valve actuation mounted therein. As apparent the head 2 consists of a casing having partitions to provide ducts and a wall which extends over the cylinder tops and has ports as 5, 5', 6, 6' provided therein, said ports being connected with respective ducts and opening in ports of the cylinder tops which are controlled by valves 3.

As well understood in each of the cylinders 1 reciprocates a piston whose connecting rod engages a crank of a crank shaft mounted to rotate in a crank case on which the cylinders 1 are fast, and an appropriate gear connects said crank shaft with the cam shafts 4 under a proper ratio for the conventional engine operation, only the parts located in the engine head being shown in the drawing while the other parts are not illustrated nor further described being well known and conventional ones.

In the illustrated construction the head 2 has four ports 5, 5', 6, 6' in register with each cylinder two of said ports, as 5, 5', being inlet ports and connected with a source of explosive mixture of any known class, while the ports 6, 6' are outlet ports; said ports 5, 5', 6, 6' alternate with each other around the cylinder axis and are arranged in such positions as an inlet port and an outlet port of each cylinder are within a short distance with respect to the equivalent ones of an adjacent cylinder.

All the inlet ports 5 located on one side of the engine are connected by means of ducts as 13 with a manifold 7 which extends along the same side of the head and all the inlet ports 5' located on the other side are similarly connected by ducts as 13' with a side manifold 7'.

The manifolds 7, 7', may, with advantage, be provided by casting in the head and their top walls cooperate to support the pivots 14 of tappets 8 by means of which the action of cams 9 is imparted to the valves 3 to open them against the action of respective return springs 12.

The manifolds 7, 7' join each other at the head end to provide a single duct 11 in which a throttle valve (not shown) or other control member may be located.

The outlet ports 6 and 6', respectively, of adjacent cylinders are connected by pairs to common outlet ducts 10, as shown in Fig. 1, the said ducts 10 opening directly in the atmosphere and being encircled by spaces 15 for cooling fluid circulation. The number of outlet ducts as 10 is thus reduced with respect to that of the valves.

The provision of at least two inlet ports in each cylinder and their arrangement at diametrically opposed points around the axis of the respective cylinder cause the explosive mixture fed into each cylinder to be satisfactorily stirred.

What I claim as my invention and desire to secure by United States Letters Patent is:

1. A head for multi-cylinder explosion engines with cylinders in line comprising a casing which extends over the tops of said cylinders and partitions in said casing, said casing and partitions therein providing a number of inlet ports and a number of outlet ports opening in each cylinder and ducts connected therewith, said inlet ports and outlet ports for each cylinder alternating with each other around the axis thereof and the ports of all the cylinders being grouped in lines extending in the direction of the line of cylinders

and with an inlet port of each cylinder adjacent in the same line to an inlet port of an adjacent cylinder and an outlet port of each cylinder adjacent in the same line to an outlet port of the adjacent cylinder.

2. A head for multi-cylinder explosion engines with aligned cylinders comprising a casing which extends over the tops of said cylinders and partitions in said casing, said casing and partitions therein providing a number of inlet ports and a number of outlet ports opening in each cylinder and ducts connected therewith, said inlet ports and outlet ports for each cylinder alternating with each other around the axis thereof and the ports of all the cylinders being grouped in lines extending in the direction of the line of cylinders and with an inlet port of each cylinder adjacent in the same line to an inlet port of an adjacent cylinder and an outlet port of each cylinder adjacent in the same line to an outlet port of the adjacent cylinder, said outlet ports of each pair of adjacent cylinders leading to a common outlet duct.

3. A head for multi-cylinder explosion engines with aligned cylinders comprising a casing which extends over the tops of said cylinders and partitions in said casing, said casing and partitions therein providing a number of inlet ports and a number of outlet ports opening in each cylinder and ducts connected therewith and a manifold in said casing on each side thereof, said inlet ports and outlet ports for each cylinder being arranged around the axis thereof and alternating with each other and the equivalent ports of each pair of adjacent cylinders being adjacent with each other and said inlet ports on each side of said head being all connected with said manifold at the respective side.

4. A head for multi-cylinder explosion engines with aligned cylinders comprising a casing which extends over the top of said cylinders and partitions in said casing, said casing and partitions therein providing a number of inlet ports and a number of outlet ports opening in each cylinder and ducts connected therewith and a manifold in said casing on each side thereof, said inlet ports and outlet ports for each cylinder being arranged around the axis thereof and alternating with each other and the equivalent ports of each pair of adjacent cylinders being adjacent with each other, said inlet ports on each side of said head being all connected with said manifold at the respective side and said two side inlet manifolds joining in a single duct at the longitudinal end of said head.

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