

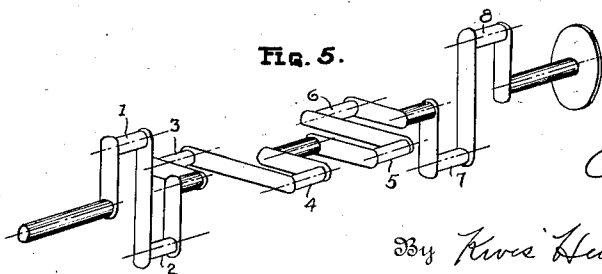
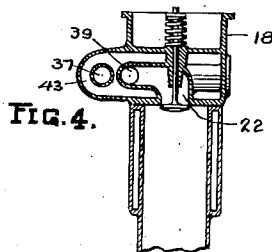
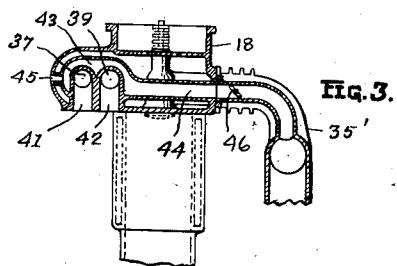
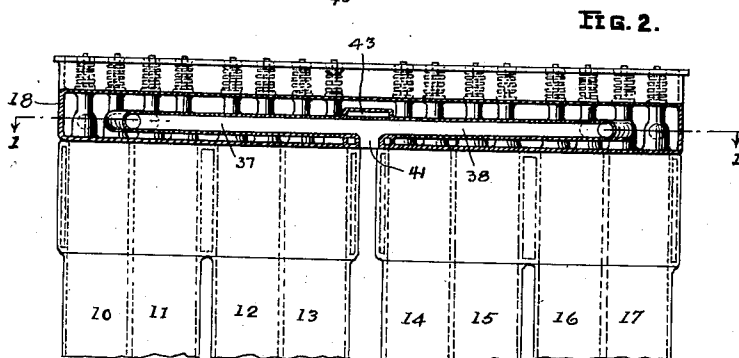
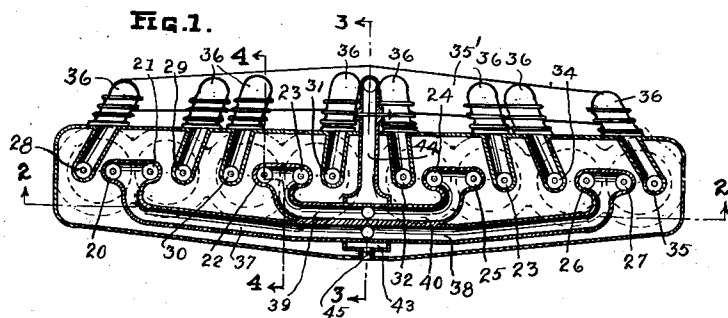
Dec. 16, 1930.

P. BASTIEN

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ENGINE

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ENGINE

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This invention relates to internal combustion engines of the eight-in-line type and more particularly to an improved type of manifold for supplying gases to the different cylinders.

It is an object of the invention to provide a head for all of the cylinders preferably formed in one piece, that will have arranged therein the different valves for controlling the inlet and exhaust of gases to and from the cylinders and suitable passages for the supply and discharge of the gases that will facilitate the distribution of the gases and result in high efficiency in the operation of the engine by improving the distribution of the mixture to the cylinders. It is also an object of the invention to provide a head, as above described, that will be thoroughly cooled, in accordance with the best practice.

Other objects of the invention and the features of novelty will be apparent from the following description taken in connection with the accompanying drawings, of which:

Figure 1 is a longitudinal sectional view of a manifold embodying my invention, the section being on the line 1—1 of Fig. 2;

Fig. 2 is a vertical section on the line 2—2 of Fig. 1;

Fig. 3 is a transverse section on the line 3—3 of Fig. 1;

Fig. 4 is a transverse section on the line 4—4 of Fig. 1; and

Fig. 5 is a diagrammatic view, in perspective, of a crank shaft which I prefer to use in connection with my improved manifold.

Referring to the drawings, 10, 11, 12, 13, 14, 15, 16 and 17 represent the different cylinders of an eight-in-line engine and 18 the cylinder head block. This cylinder head is in the form of an integral casting covering all of the cylinders and comprises, in addition to the usual outer wall, the valve controlled intake ports 20, 21, 22, 23, 24, 25, 26, and 27 and the valve controlled exhaust ports 28, 29, 30, 31, 32, 33, 34 and 35. Each of the exhaust ports extends laterally to the side of the head casting and, as will be clearly seen from Fig. 1, may be entirely surrounded by water space. An exhaust manifold 35' is secured against the side of the head casting

18 and has branches 36 connecting with the different exhaust ports. It will be observed that the intake ports 20 and 21 form a pair which are supplied by a common pipe 37 extending longitudinally of the head casting and preferably entirely surrounded by water space. In a similar manner the intake ports 26 and 27 form a pair and are supplied by the pipe 38 extending longitudinally of the manifold and connected with the pipe 37 at the middle of the head casting. In like manner the intake ports 22 and 23 form a pair and the ports 24 and 25 form a pair, these ports being supplied by longitudinally extending pipes 39 and 40, respectively, which are connected at the middle of the head casting. The pipes 37 and 38 are supplied from a downwardly extending port 41 to which a carburettor may be connected (see Fig. 3) and, similarly the pipes 39 and 40 are supplied by the port from a separate carburettor, or a dual carburettor may be employed to supply the ports 41 and 42.

For the purpose of heating the gases passing through the ports 41 and 42 I provide a jacket 43 around the middle portions of the longitudinally extending supply pipes 37, 38, 39 and 40 and connect these with the exhaust manifold by a port 44. A small discharge port 45 may be provided to exhaust the gas from the jacket 43 through any suitable pipe. A valve 46 may be provided in the port 44 to control the supply of exhaust gases to the jacket 43.

Referring to Fig. 5 it will be noted that the different cranks of the crank shaft are numbered from 1 to 8 and that the cylinders 1, 2, 7 and 8 make a combination constituting, in effect a four cylinder engine, while the cylinders 3, 4, 5 and 6 constitute another four cylinder engine. The firing order which I employ for the different cylinders is either 1, 6, 2, 5, 8, 3, 7, 4 or 1, 5, 2, 6, 8, 4, 7, 3 so that by my arrangement of the manifold ports, and by the firing order, I provide for an excellent distribution of the gases.

Having thus described my invention, what I claim is:

1. In an internal combustion engine having eight cylinders in line and all arranged on the

same side of the crank shaft, the combination of a shaft having cranks of which the four middle cranks are in a common plane and in which the two end pairs of cranks are in a common plane at right angles to the first mentioned plane, thereby permitting a firing order of four middle cylinders in regular sequence at each half revolution of the crank shaft and a firing order of four end cylinders in regular sequence and alternating with that of said four middle cylinders, a detachable head for said cylinders including a pair of parallel positioned vertical conduits positioned midway of the engine, a laterally extending manifold passage connected at one end by a branched passage to the third and fourth cylinders and at its opposite end to the fifth and sixth cylinders and at its mid portion to the top of the vertical conduit closest to the cylinders, a second laterally extending manifold passage substantially parallel to the first mentioned passage and similarly arranged relative to the end pairs of cylinders and the more remote vertical conduit, the lower ends of said vertical conduits being arranged for independent carburetor connection, and an outer wall associated with the exhaust passages and intake passage and fully inclosing the same and providing water jacketing space therebetween, and valves arranged in line and carried by the head for controlling the supply of fuel to and the exhaust from said cylinders.

2. A device as defined by claim 1 characterized by the addition of a valve controlled by-pass exhaust passageway enveloping the lateral manifold passageway and vertical conduits at the connection of the same for fuel preheating.

In testimony whereof, I hereunto affix my signature.

PAUL BASTIEN.

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