

No. 867,075.

PATENTED SEPT. 24, 1907.

O. PODHAJSKY.
INTERNAL COMBUSTION ENGINE.
APPLICATION FILED NOV. 27, 1906.

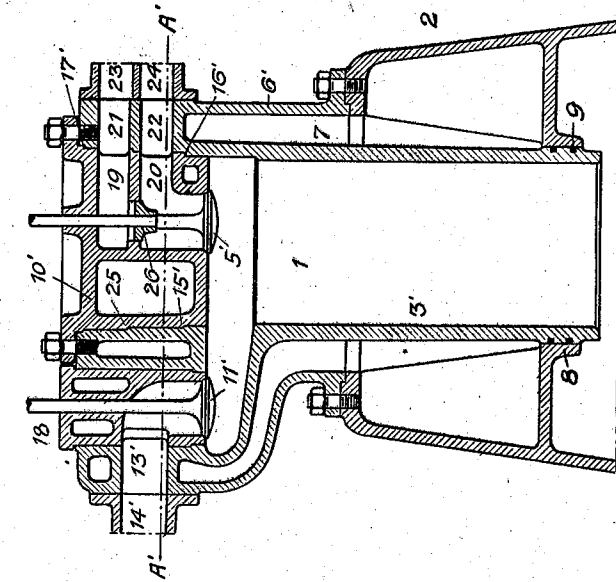


Fig. 1.

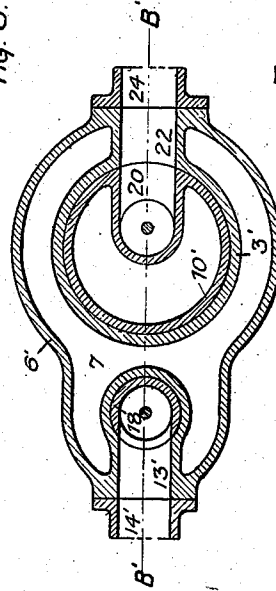


Fig. 2.

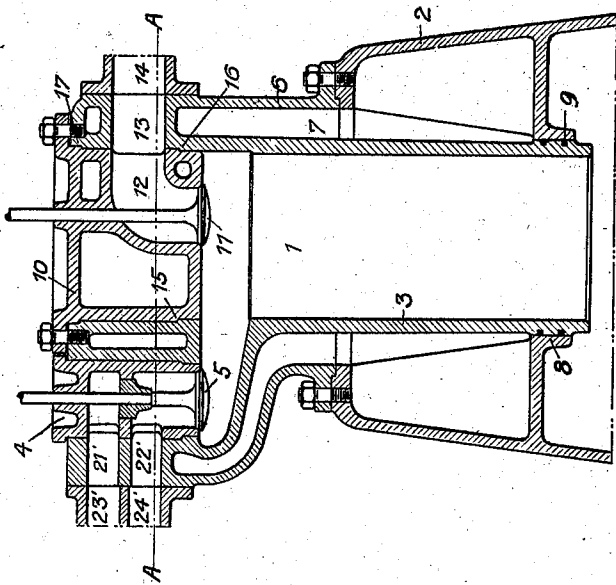


Fig. 3.

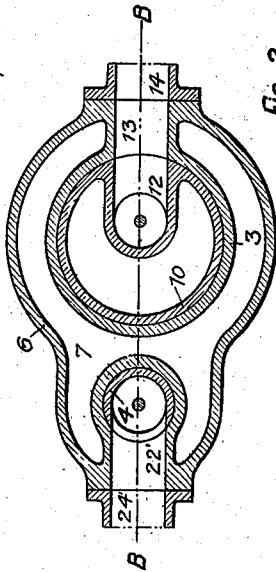


Fig. 4.

WITNESSES:

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UNITED STATES PATENT OFFICE.

OTAKAR PODHAJSKY, OF WARREN, PENNSYLVANIA

INTERNAL-COMBUSTION ENGINE.

No. 867,075.

Specification of Letters Patent.

Patented Sept. 24, 1907.

Application filed November 27, 1906. Serial No. 345,287.

To all whom it may concern:

Be it known that I, OTAKAR PODHAJSKY, a subject of the Emperor of Austria-Hungary, residing at Warren, in the county of Warren and State of Pennsylvania, have invented a new and useful Improvement in Internal-Combustion Engines, of which the following is a specification.

The object of my invention is to improve the construction of internal combustion engines of the class in which one or both valves are located in the cylinder head; and to this end it consists in means whereby a joint between the combustion chamber and the water-jacket is avoided, provision being made at the same time for keeping the cylinder walls cool and free from any strains due to unequal expansion or overheating.

In my improved construction the joints between the cylinder head and the cylinder wall proper are of circular form which secures the necessary resistance against explosion pressure, provides for an easy and accurate finishing of the same, and permits of the cylinder head being readily removed and the piston withdrawn through the opening made thereby for repacking or other repairs without disturbing the connections of the piping conveying the gases to and from the cylinder.

In the accompanying drawings, in which similar symbols of reference indicate like parts, Figure 1 is a vertical central section on the line B—B of Fig. 2 of an internal combustion engine constructed in accordance with my invention. Fig. 2 is a horizontal cross-section on the line A—A of Fig. 1. Fig. 3 is a section, similar to Fig. 1, of a modification of my invention, the section being taken on the line B'—B' of Fig. 4, said Fig. 4 representing a section on the line A'—A' of Fig. 3.

My invention is shown and described in connection with a vertically-acting engine and with an admission-valve controlling the gas and air supply; but this presentation of the invention is not intended as a limitation to engines and valves of any particular type or form.

Referring to the drawing; the cylinder 1 is suitably attached to the engine frame 2. The inner cylinder barrel 3, which is exposed to the explosive pressure, is of simple form, extending laterally at one side to receive the cage 4 of the admission valve 5. The outer shell 6 of the cylinder does not extend the entire length of the cylinder barrel, the frame 2 inclosing the lower part thereof. The lower open or crank end of the cylinder barrel fits against a circular rib 8 on the frame 2, and is packed in the same by means of a ring or rings 9 of some yielding material, preventing leakage of the cooling medium. This arrangement avoids entirely any joint in the inner wall of the cylinder and allows the cylinder barrel to expand independently of the outer walls of the cylinder jacket.

The cylinder head 10 is of substantially circular form, and sufficiently large in diameter to permit the piston to be removed through the top of the cylinder, and is provided with the exhaust-valve 11. The exhaust passage 12, controlled by said valve 11, registers with a similar passage 13 in the cylinder wall, and conveys the burned gases to the exhaust pipe 14 suitably attached to the cylinder. The cylinder head 10 is provided with a circular shoulder 15 extending entirely around the same and fitting against a similar shoulder 16 of the cylinder barrel, forming thus a metallic joint sufficiently strong to resist the explosive pressure. The outer end of the cylinder head is equipped with a similar joint 17 for preventing any leakage of the exhaust gases.

In Figs. 3 and 4 I show a modification of my invention, the inlet-valve being located in the removable cylinder head 10', and the exhaust valve 11' in the lateral extension of the cylinder. The cylinder head is provided with a plurality of passages 19, 20, conveying the air and gas which enter independently of each other, through the corresponding openings 21, 22, of the cylinder, from the pipe connections 23, 24. The cylinder head 10', in addition to the joints 16', 17', is equipped with another joint 25, which prevents the air and gas from becoming mixed before the inlet valve 26 is reached.

In Figs. 1 and 2, the air and gas passages in the cylinder are marked 22', and 21', respectively, and the air and gas pipes leading to said passages, 24', and 23', respectively.

It will be understood that the details of construction as regards form and dimensions of parts may be varied from what is shown, without departing from the spirit and scope of my invention, which is to provide an internal combustion engine with no joint between the inner cylinder wall and the water-jacket, and a removable cylinder head equal or larger in diameter than the cylinder bore and containing one or both valves and adapted to be readily removed from the cylinder without disturbing the connections of the pipes conveying the gases to or from the cylinder.

I claim:—

1. In an internal combustion engine, a cylinder, and a removable cylinder-head of substantially cylindrical form whose diameter is equal or greater than that of the cylinder bore, the outer surface of the cylinder head being provided with a plurality of shoulders fitting against similar shoulders on the cylinder bore; one of the valves controlling the cylinder being located in said cylinder-head and said head being provided with a passage controlled by said valve and registering with a passage in the cylinder bore, substantially as described.

2. In an internal combustion engine, a cylinder, and a removable cylinder-head of substantially cylindrical form whose diameter is greater than that of the cylinder bore, the outer surface of the said cylinder-head being provided

with a plurality of shoulders fitting against similar shoulders on the cylinder wall, the inlet valves controlling the cylinder being located in the cylinder head and said head being provided with passages controlled by said valves and registering with passages in the wall of the cylinder; substantially as described.

3. In an internal combustion engine, a cylinder, and a removable cylinder-head of substantially cylindrical form whose diameter is greater than that of the cylinder bore, the outer surface of the cylinder head being provided with a plurality of shoulders fitting against similar shoulders

on the cylinder wall; the exhaust valve of the cylinder being located in the cylinder head, said head being also provided with a passage located between said shoulders communicating with the exhaust valve and registering with a passage in the cylinder wall, substantially as described.

In testimony whereof I have hereunto set my hand.
OTAKAR PODHAJSKY.

Witnesses:

C. W. FOWLER,
W. B. CORWIN.