PATENT SPECIFICATION

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Complete Accepted: Oct. 23, 1930.

COMPLETE SPECIFICATION.

Improvements in or relating to Valve Gears for Internal Combustion Engines.

I, VINCENZO LANCIA, trading as LANCIA & C., of 99, via Monginevro, Turin, Italy, an Italian Subject, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to internal combustion engines with two rows of cylinders arranged close together, in which the cylinder covers are provided in a separate head and the cam shaft is mounted on the cylinder block.

The known constructions of this type are provided with oscillating levers each of which rests at one end on a cam, for the purpose of transmitting the movement of the cams to the stems of the valves.

According to the present invention the valves are controlled by a corresponding number of rods mounted in a central vertical plane of the head, each rod resting at one end on a cam of the cam shaft, while its other end controls the tail of a lever pivoted on the head and operating the stem of a valve in known manner.

In this way, the transmission of the drive between the cam shaft and the valve levers requires a minimum of space in the transverse direction of the head, whereby it is possible to bring the bores of the cylinders of the two rows as close together as may be desired. This arrangement also makes it possible to operate the valves in favourable conditions by utilising an intermediate cam shaft which is driven from the engine shaft.

The accompanying drawing shows by way of example a construction of an engine in which the control of the valve gear takes place according to the invention.

Figure 1 is a perspective view of the engine with the head raised.

Figure 2 is a cross-section of the body of the engine.

Figure 3 is a corresponding cross-section of the head.

Figure 4 shows in longitudinal section a part of the body of the engine, namely, that above the wall containing the bores of the cylinders.

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Figure 5 is the corresponding plan.

In the construction illustrated, the engine is constituted by a block 1 in which the two rows of cylinders 2 and 2^1 are arranged at a small angle to each other. In the said block the engine shaft 3 is mounted to which are attached the connecting rods 4 of the pistons 5 movable in the cylinders.

The block 1 is bounded at the top by a wall 6 into which the bores of all the cylinders 2, 2^1 open and to which is clamped the head 7. The latter comprises the covers 8 for the cylinders as well as the suction conduits 9 and exhaust conduits 10. The said head comprises the valves 11 with their springs 12 and levers 13 mounted on brackets 14 for the operation of the valves.

The driving of the levers 13 is effected by a cam shaft 15 mounted by means of bearings 16 on the wall 6 of the block 1, in the part of the said wall situated between the two rows of cylinders.

The rotation of the engine shaft may be transmitted to the cam shaft 15 by any desired suitable means, for instance by means of a chain 17 and wheels 18 and 19. Between each cam 20 of the shaft 15 and the head 21 of the corresponding lever 13 is interposed a rod 22 in a suitable guide, said rods 22 being arranged in a central vertical plane of the head.

The said guide is preferably constituted for all the rods 22, by a single part 23 arranged above the shaft 15 and used at the same time to form caps for the bearings 16 in which the cam shaft is mounted (Figures 2 and 4).

The head 7 is secured as usual to the engine block 1 by means of bolts 24 secured to the block 1 for the passage of which the head is provided with holes 25. The holes for the bolts 24 of the two inner rows are provided in the part occupied by the part 23 and they are limited so as to leave room for the said part 23. The part 23 is provided with notches or holes 26 (Figure 5) for affording passage to the bolts which in that way are utilised also to hold in place the part 23 so that the mounting of all the rods 22 is ensured.

The mounting of the cam shaft 15 on

the upper wall of the block of cylinders and the transmission of movement from the cams to the valve levers by means of rods, make it possible to obtain the best possible conditions for the operation of the valve gear in an engine with two closely arranged rows of cylinders, for in that way the transmission of movement to the cam shaft can be effected by means of a chain of the smallest possible length, and the head is not materially encumbered with the means for transmitting the movement to the valve levers. Moreover, the head comprising the cylinder covers, may be dismantled without having to dismantle the cam shaft, and the shaft can be utilised direct for mounting on it the fan.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. An arrangement for controlling the valves in internal combustion engines in which there are two rows of cylinders arranged close to one another, comprising as many rods as there are valves, the said rods being arranged in a central vertical plane of the head, each rod resting at one end on a cam of the cam shaft mounted on the cylinder block, while its other end controls the tail of a lever pivoted on the head and operating the stem of a valve in known manner.

2. An arrangement as claimed in Claim 1, characterised by the rods for the transmission of movement of the cams to the valve levers being mounted in guides provided in a part which forms the caps of the bearings for the cam shaft.

3. The valve gear substantially as described or substantially as shown in the accompanying drawing.

Dated this 20th day of November, 1929.

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Chartered Patent Agents.

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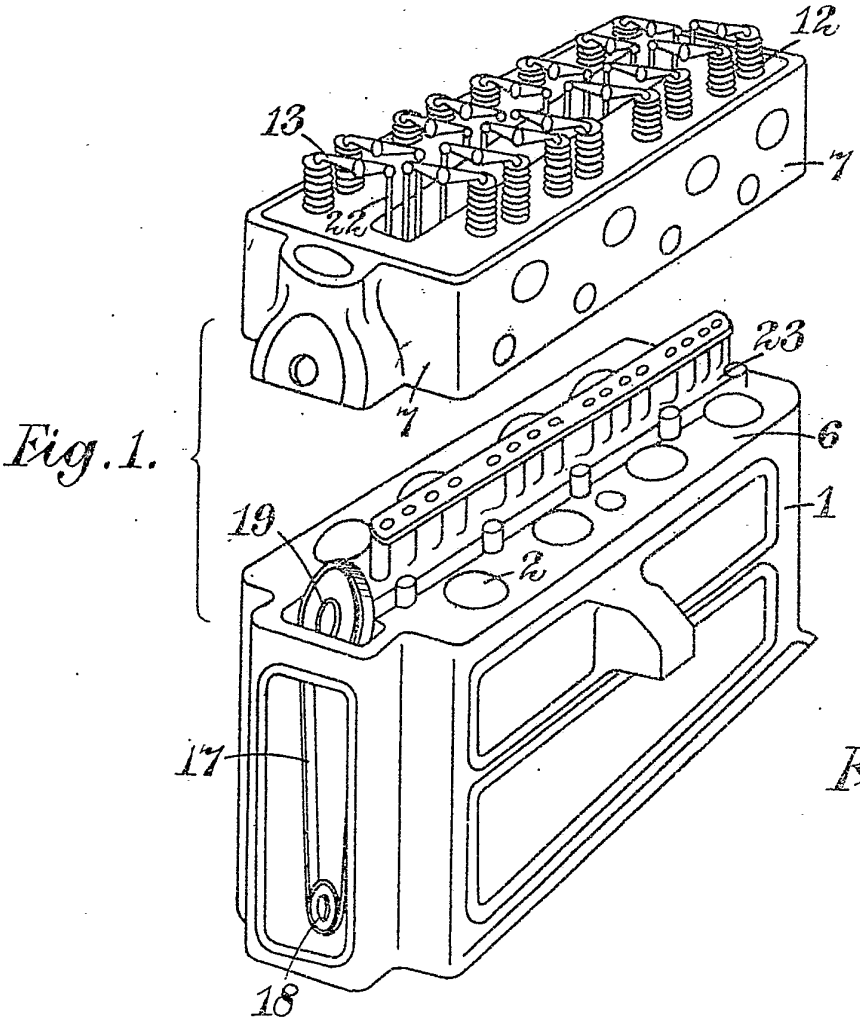

Fig. 1.

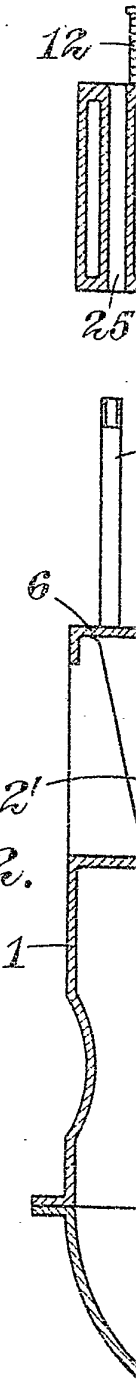

Fig. 2.

Fig. 3.

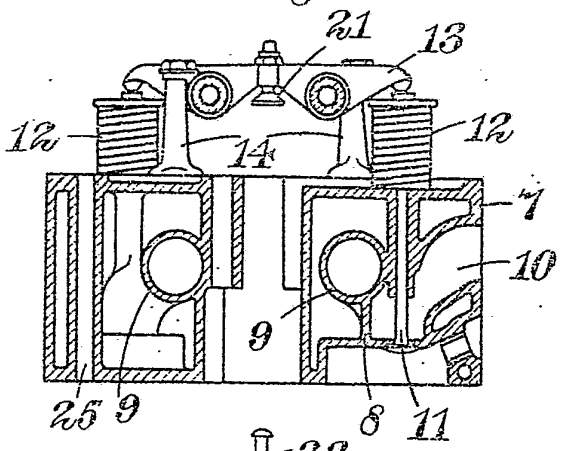

Fig. 4.

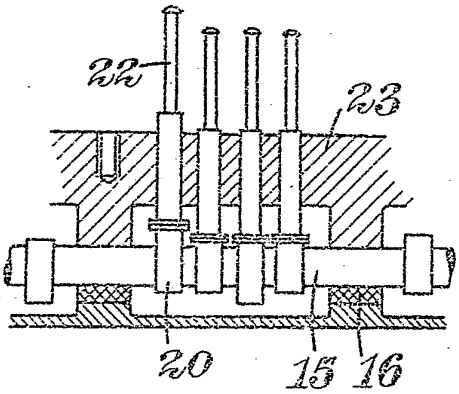

Fig. 5.

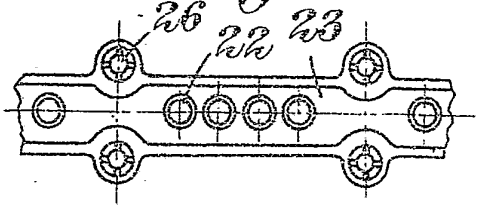

Fig. 2.

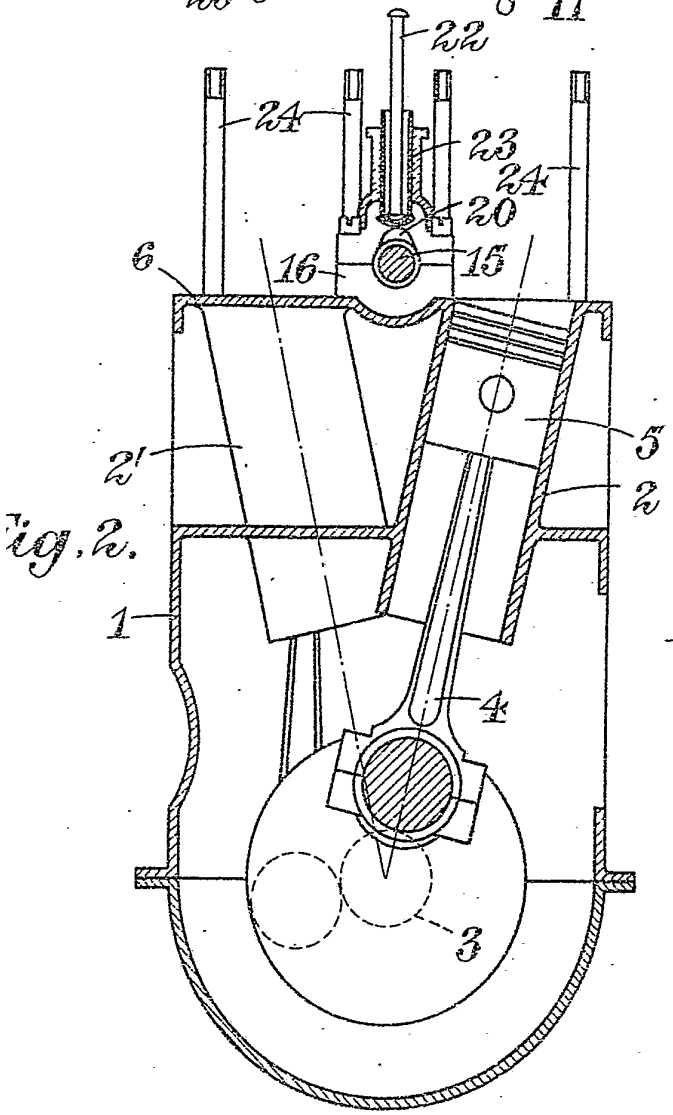

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Fig. 1.

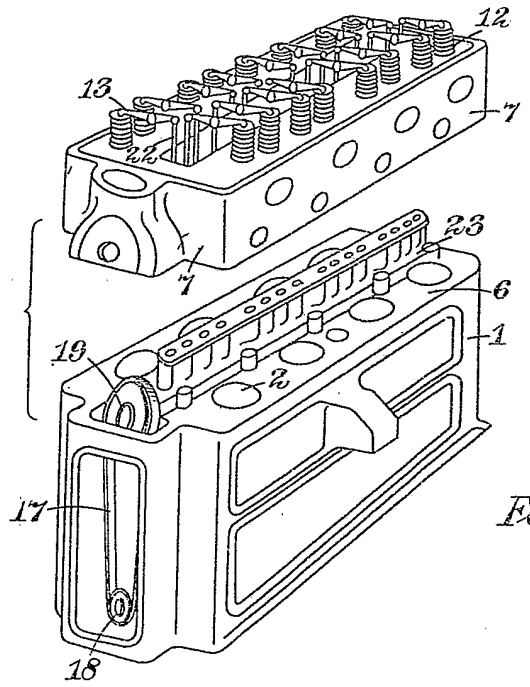


Fig. 3.

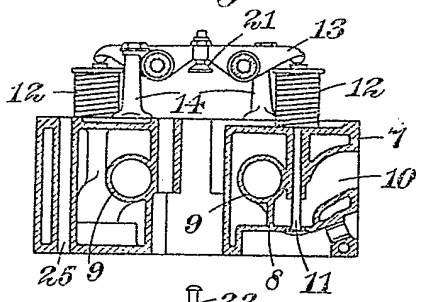


Fig. 2.

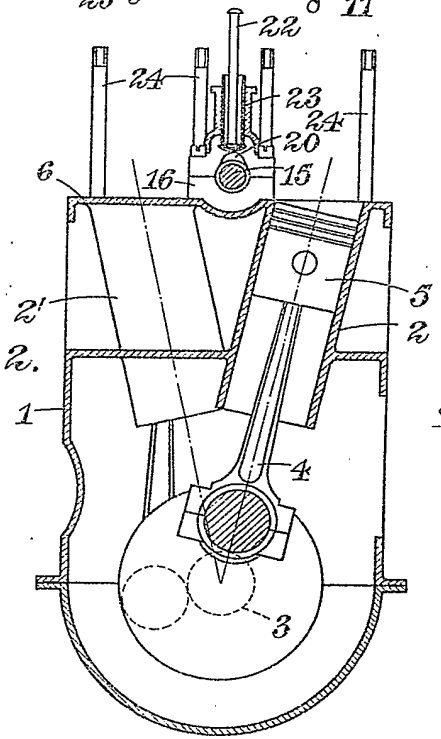


Fig. 4.

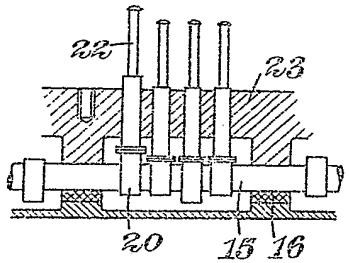
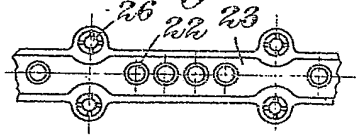


Fig. 5.



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