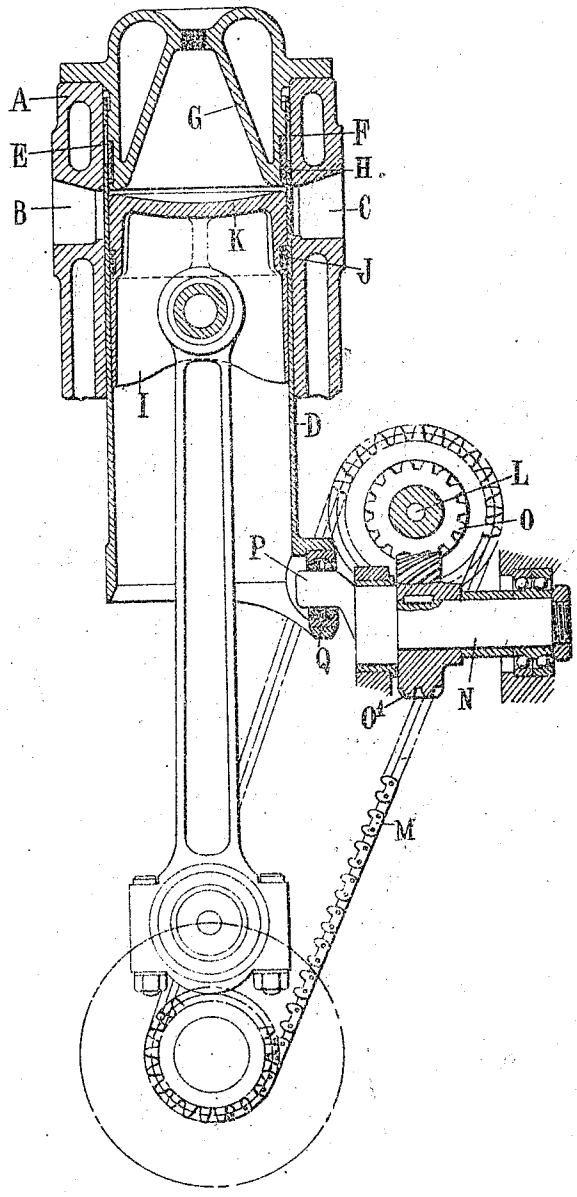
Dec. 14, 1926 1,611,074

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INTERNAL COMBUSTION ENGINE OF THE SLEEVE VALVE TYPE

Filed Dec. 31, 1924



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Patented Dec. 14, 1926. 1,611,074

UNITED STATES PATENT OFFICE.

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INTERNAL-COMBUSTION ENGINE OF THE SLEEVE-VALVE TYPE.

Application filed December 31, 1924, Serial No. 759,175, and in Great Britain February 23, 1924.

The present invention relates to internal combustion engines having a single sleeve valve, to which a combined reciprocating and oscillating motion is imparted to control the inlet and exhaust ports.

The invention consists in an internal combustion engine comprising in combination a cylinder having inlet and exhaust ports through the walls thereof, a piston, a single ported sleeve valve and means for reciprocating and oscillating said valve, that portion of said sleeve valve covering said cylinder inlet and exhaust ports being substantially shielded by said piston at that period of the cycle during which conditions of high temperature exist within said cylinder.

The accompanying drawing illustrates diagrammatically by way of example a form of construction according to the present invention.

In the drawing the cylinder, A, is provided with inlet ports, B, and exhaust ports, C, formed in it, the valve sleeve, D, operating within the bore of the cylinder. This sleeve has a combined reciprocating and oscillating motion imparted to it by any suitable mechanism and is provided with inlet and exhaust ports, E and F, respectively adapted to coact with the ports, B and C, of the cylinder. The cylinder head, G, upon which a packing ring, H, may be provided, is secured to the cylinder, A, and projects within the sleeve, D, in which the piston, I, reciprocates. The head, K, of the piston, I lying above the rings, J, extends so as to cover the portion of the sleeve which lies over the cylinder ports, B and C, the rings, J, themselves being arranged as shown so that they lie at all times below the edge of the sleeve ports.

Any convenient means may be employed for imparting to the sleeve a combined oscillatory and reciprocatory movement but in the particular example illustrated a lay shaft, L, driven from the crank-shaft by a chain, M, in turn drives the sleeve-operating shaft, N, through spiral gearing, O, O^1. On the shaft, N, is a crankpin, P, journalled in the spherical bearing member, Q, carried by the sleeve, D, the member, Q, being free to slide on the pin, P. By appropriate choice of the velocity ratios of the different parts of the drive, this rotation of the pin, P, imparts to the sleeve, D, a combined reciprocating and oscillating motion at half engine speed.

Due to the present invention, the following advantages are simultaneously secured:—
(*a*) only a single sleeve valve is required;
(*b*) the sleeve is almost wholly shielded both from direct contact with the hot working fluid and from radiated heat during a substantial part of the combustion period and that portion of the working stroke during which the gases are at high temperature and high density; and (*c*) the piston rings are at all times clear of the sleeve valve ports.

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

An internal combustion engine comprising in combination a cylinder having inlet and exhaust ports through the walls thereof; a piston, a single ported sleeve valve and means for reciprocating and oscillating said valve, that portion of said sleeve valve covering said cylinder inlet and exhaust ports being substantially shielded by said piston at that period of the cycle during which conditions of high temperature exist within said cylinder, as set forth.

In testimony whereof I have signed my name to this specification.

HARRY RALPH RICARDO.