INTERNAL COMBUSTION ENGINE

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3 Claims. (Cl. 133—33)

This invention relates to injection-type internal combustion engines, of the type in which liquid fuel is introduced through an uncooled wall separating the working chamber, for a distance extending up to an exciting shown extent, from an ignition chamber having approximately the diameter of the working chamber and lying approximately perpendicular to the working chamber axis.

The chief object of the invention to provide, in an engine of this kind, in the said separating wall, a constricted passageway extending transversely to the incoming part of the fuel jet and in a direction more or less parallel to the vertical axis of the engine cylinder; through which passageway compressed air can be made to flow from time to time; and through an upper face of which separating wall the jet will be made to be directed against the opposite wall of the cylinder or ignition chamber, this passageway to lie inclined with respect to the axis of the engine cylinder in such a way that the fuel jet is thrown upwardly and to the left, just after it enters into the ignition chamber.

The drawings show by way of example a form of execution of the concept of the invention.

Fig. 1 is an axial section of the cylinder and the piston.

Fig. 2 shows the distribution of the air and of the injected fuel.

The engine cylinder comprises a structure built in three parts and consisting of a working chamber proper, of a cylinder; of an intermediate part, including a separating wall and a port, and made of desired material from the other parts; and of a cylinder head containing ignition chamber and valve seat.

In the uncooled separating wall lies an injection nozzle, which opens into a constricted passageway, which extends obliquely to the cylinder axis, in the separating wall. The part is quite constricted, being shown, enlarged for purposes of clarity. The fuel jet is introduced through the upper aperture thereof. The part lies inclined with respect to the working chamber axis in such a way that the impinging jet is thrown upwardly and to the left, into the ignition chamber.

As can be seen, the part lies in the immediate vicinity of the port connecting the working chamber with the ignition chamber, so that extremely little material is present, at the between the face of the protuberance and the outer wall of the passageway at that point for diverting the fuel jet. This affords the advantage that the wall, against which the fuel strikes, becomes very warm, which contributes to the fine distribution, good intermixing and complete combustion of the fuel.

To further accelerate this current of air at the moment immediately before the ignition, which is an advantage, the piston is provided in a known way, not only with a front end fitting closely to the working chamber at the end of the compression stroke, but this front end is provided with a projection which fits into the port in member lying between the compressed chamber and the ignition chamber, and already closes it before the ending of the compression stroke. Fig. 2 shows the effect thereby accomplished, to wit, that at the end of the compression stroke a chamber is formed, the air content of which can only escape through the port. As the passageway is narrow and much narrower than the port, the air attains a much greater velocity there than it would if going through the port.

The arrows in full lines in Fig. 2 represent the air eddies of the air in the ignition chamber introduced through the port, while dotted arrows are shown to show the air eddies and fuel distribution at the end of the compression stroke, as they result through the action of the passageway. The spark plug is at 34.

What I claim is:

1. In an injection-type internal combustion engine including a piston in which liquid fuel is introduced through an uncooled wall separating a cylindrical working chamber from a circular-section ignition chamber and is sent up to a port lying eccentrically of the ignition chamber, said chamber having approximately the diameter of the working chamber and having its axis lying approximately coaxial with the working chamber axis; a constricted passageway in the uncooled separating wall, said passageway extending transversely to the fuel jet and running in a direction substantially parallel to the vertical axis of the working chamber, means for intermittently directing through the passageway compressed air and means including a flaring-formation at the upper end of said passageway and a sufficient inclination of said passageway from parallelism with the vertical axis of the cylinder, for aiming the fuel-jet against the cylinder-top wall that lies, in the prolongation of the axis of said passageway, above and adjacent to the impact-point of the
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fuel initially entering into the passageway, said passageway having the wall on one side shorter than on the other, whereby to deflect, as it enters the ignition chamber, one side of the fuel jet downwardly and backwardly with respect to the main body portion of the jet.

2. An engine according to claim 1, in which the said passageway lies in the immediate vicinity of the said port in such a way that extremely little material is comprised between its outer wall which deflects the fuel jet, and the port.

3. An engine according to claim 1, in which the piston's front-end fits closely to the upper boundary of the working chamber at the end of the compression stroke, and has a projection at this front end, said projection fitting into the port between said separating wall and the cylinder wall and closing it before the ending of the compression stroke, for the purpose of forcing the air through the passageway at the end of this stroke.

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