

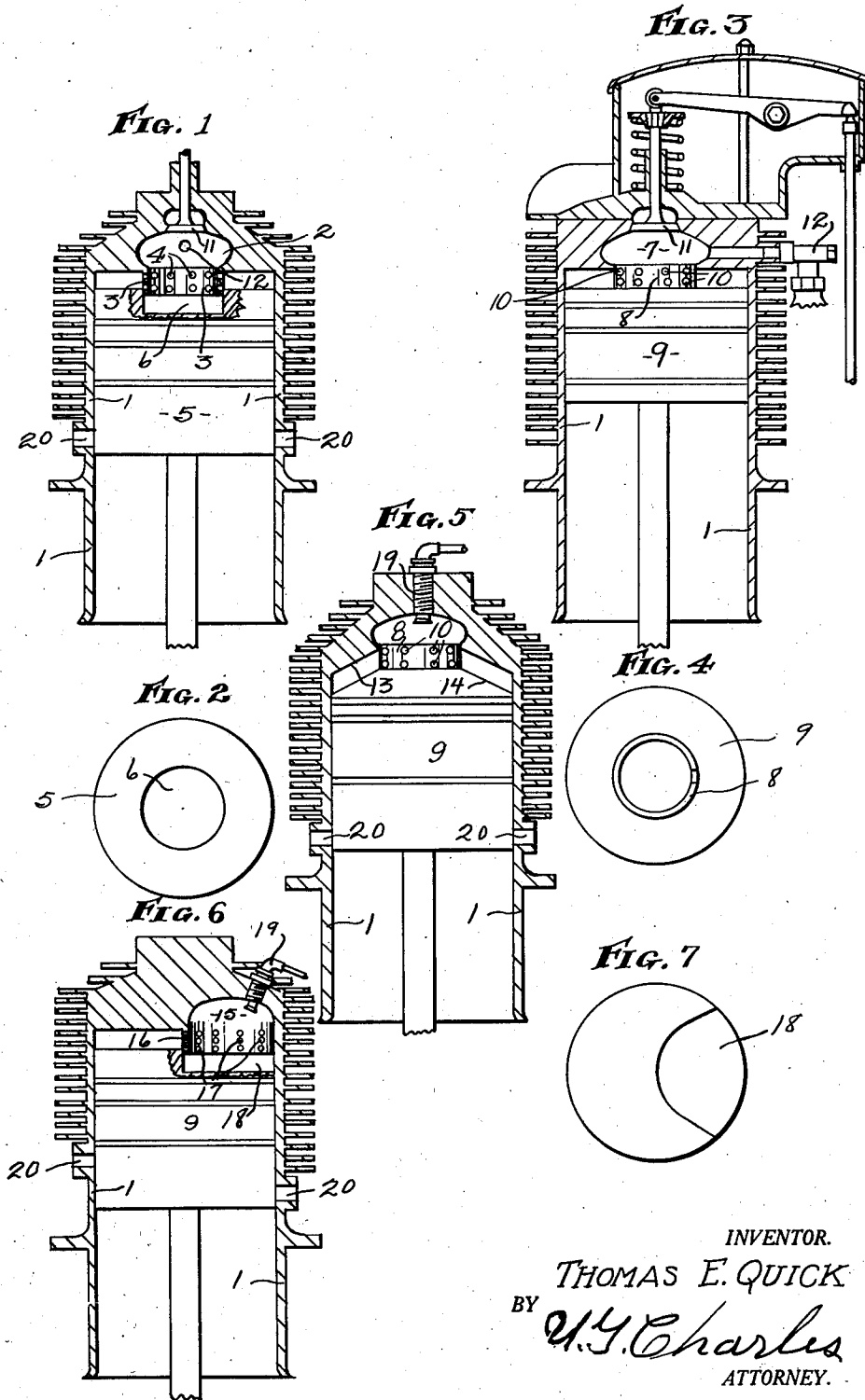
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INTERNAL COMBUSTION ENGINE

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## INTERNAL COMBUSTION ENGINE

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1 Claim. (Cl. 123—32)

My invention relates to improvements in internal combustion engines.

The object of my invention is to provide increased efficiency of ignition in an internal combustion engine at the high compression point by creating turbulent action of the fuel under high velocity.

A further object of my invention is to provide a reduced combustion chamber in the head of the cylinder, and means on the head of the piston coating therewith creating high velocity at the maximum compression stroke of the piston.

A still further object of my invention is to provide a means applicable to the piston or cylinder head that will function with equal efficiency with respect to turbulent mixing velocity and breaking up of the fuel compound at the maximum moment of compression.

A still further object of my invention is to provide an apertured element carried by the piston or stationarily arranged in the cylinder head through which compressed fuel will circulate at the high compression point created by the piston movement as it advances toward the head of the cylinder.

These and other objects will hereinafter be more fully explained, reference being had to the accompanying drawing forming a part of this specification, and in which like characters will apply to like parts in the different views.

Referring to the drawing:

Fig. 1 is a longitudinal section through a cylinder, the piston in elevation.

Fig. 2 is an end view of the piston in Fig. 1.

Fig. 3 is a longitudinal section through a modified form of the cylinder embodying a rocker arm having housing therefor.

Fig. 4 is an end view of the piston shown in Fig. 3.

Fig. 5 is a similar view to Fig. 1 modified by a conical head and piston.

Fig. 6 is a sectional view thru a modified form of cylinder showing the combustion chamber eccentrically positioned and a depression in the head of the piston to receive the downwardly extending apertured flange of the combustion chamber.

Fig. 7 is an upper end view of the piston shown in Fig. 6.

My invention herein disclosed consists of a cylinder 1 having a combustion chamber 2 in the closed end thereof. The said combustion chamber may be arranged with an outwardly extending flange 3 concentric with the axis of the chamber and having a plurality of apertures 4 extend-

ing through the flange and spaced therearound as shown in Fig. 1, or the said flange may be carried by the piston as will be later described.

In conjunction with the above, I have arranged a piston 5 having an annular depression 6 in the head thereof in which the said flange is insertable to its full length, the view in Fig. 1 showing a partial stroke as the piston approaches its extreme position.

In Fig. 3 is shown a similar cylinder 1 having a combustion chamber 7 concentrically positioned in the head of the cylinder. Said chamber has an opening communicating with the cylinder reduced in size to form a throat in which an upwardly extending flange 8, integral with the piston 9, is insertable therein at each reciprocating movement of the piston. Said flange has a plurality of apertures 10 passing through the wall thereof, the function of which will hereinafter be explained.

The two latter described cylinders have horizontal inner surfaces transverse to the axis of their respective cylinders, and the top face of the piston in each coincides with the lower face of the cylinder head. Furthermore, a conventional type of valve 11 for controlling the air intake and exhaust, and also a fuel injector 12 is shown in Figs. 1 and 3.

In Fig. 5 the cylinder 1 has a frusto-conical head 13 and the piston 5 has a frusto-conical piston head 14 to coincide therewith. This type of cylinder and piston has a similar combustion chamber and annular flange insertable therein as shown and described in Fig. 3, the latter being a modification.

In Fig. 6 the cylinder 1 has a combustion chamber 15 eccentrically positioned and has a flange 16 outwardly extending and being apertured approximately as shown at 17, the said flange coincides with said walls of depression 18 in the piston head and is insertable therein at the maximum stroke of the piston.

The two latter described modifications of the cylinders have injectors 19 communicating with their respective combustion chamber, the source of fuel supply not shown in the drawing but properly arranged for operativeness. There is also arranged ports 20 for intake and exhaust. Fig. 1 has similar ports 20 arranged in the wall of the cylinder coating with its valve 11, said ports having free communication with the cylinder at the maximum outward stroke of the piston.

The arrangement of the apertured flange provides for turbulent action of the compressed fuel thoroughly mixing the same at the maximum

inward stroke of the piston, at which moment high velocity of the fuel displacement from the head of the piston thru the apertures creates a violent turbulent action thoroughly mixing the fuel and by high compression the same will be ignited which will accomplish the desired result of economy in fuel, efficiency of combustion, and power.

While I have shown an air cooled cylinder, the same principle will apply to a jacketed or water cooled cylinders, also the apertures of the flange may be radially or tangentially bored thru the same with respect to the center for the turbulent action, and such other modifications may be employed as lie within the scope of the appended claim.

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

In an internal combustion engine, the combination of a cylinder and a piston, the head end of said cylinder having an internal surface portion formed as a frustum of a cone with the base

diameter equal to the diameter of the cylinder, an ellipsoidal combustion chamber formed in the top portion of said head end and communicating with said surface portion through a peripheral opening concentric with upper surface of said frustum and of a diameter less than the major axis of said chamber, a fuel injection nozzle extending into said combustion chamber axially thereof, a frusto-conical head for said piston, and an apertured annular flange formed integral and concentric with said piston head and extending upwardly thereof, the apertures in said flange being formed in two rows lying in parallel planes spaced along the axis of the cylinder, one located near the upper end of said flange and the other located near the lower end of said flange adjacent said piston head, whereby turbulent movements of air charge are created at the upper dead center position of said piston head, facilitating thorough mixing of the fuel and air charges.

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