

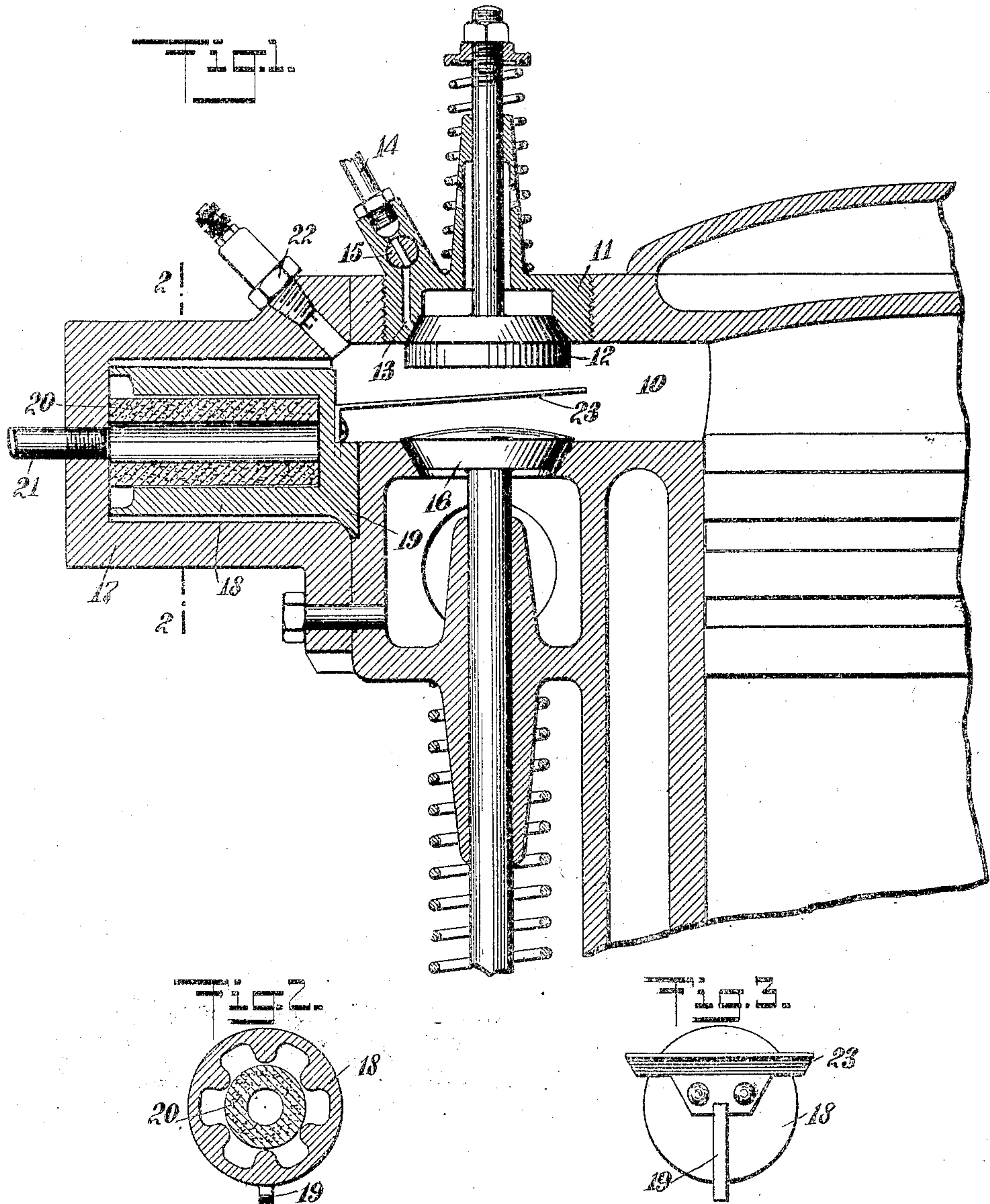
O. PEARSON.

IGNITER.

APPLICATION FILED JULY 27, 1909.

953,488.

Patented Mar. 29, 1910.



WITNESSES

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# UNITED STATES PATENT OFFICE.

OTTO PEARSON, OF WORCESTER, MASSACHUSETTS.

IGNITER.

953,488.

Specification of Letters Patent. Patented Mar. 29, 1910.

Application filed July 27, 1909. Serial No. 503,821.

*To all whom it may concern:*

Be it known that I, OTTO PEARSON, a subject of the King of Sweden, and a resident of Worcester, in the county of Worcester and State of Massachusetts, have invented a new and Improved Igniter, of which the following is a full, clear, and exact description.

This invention relates to certain improvements in igniters for internal combustion engines; and more particularly to a type of igniter in which the heat of one explosion is conserved and utilized in the ignition of the next succeeding charge.

In my improved engine, I deliver the crude oil or other fuel directly to the interior of the engine and vaporize it by the heat remaining from the last prior explosion. The fuel is preferably admitted simultaneously with the air, and the liquid strikes upon a heated baffle plate supported below the inlet valve. To facilitate the heating of this plate and to avoid any interference with the proper working of the valves, I preferably support the plate directly upon the igniter, which latter comprises a hollow body containing a heat-conserving material.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures, and in which—

Figure 1 is a vertical section through the inlet, exhaust and igniting means of an engine embodying my invention; Fig. 2 is a transverse section on the line 2—2 of Fig. 1; and Fig. 3 is an inner end view of my improved igniter and heating plate.

In the specific construction illustrated, the interior of the engine cylinder is provided with a chamber or recess 10, adjacent the cylinder head, and the walls thereof constitute a valve casing serving for the delivery of the fresh charge to the cylinder and the escape of the exhaust gas from the cylinder. A plug 11 is screwed into the upper wall, and this plug has a passage therethrough and a valve seat at its inner end closed by an inwardly-opening inlet valve 12. A small passage 13 leads to the valve seat, so as to be normally closed by the inlet valve. A fuel delivery conduit 14 leads to this passage and is provided with a turnip plug 15 for shutting off the supply of fuel independently of the valve 12.

Upon opening the inlet valve, liquid fuel may enter through the passage 13 and air may enter through the body of the plug, so that the two will become mixed as they enter the engine cylinder. Directly below the inlet valve is an upwardly and inwardly-movable exhaust valve 16, normally held to its seat but mechanically opened in any suitable manner to permit the escape of the exhaust gas.

Secured to the end of the engine casting and closing the end of the recess 10, is a casing 17 containing my improved igniter. This casing is substantially cylindrical in cross section and within the casing is a cylindrical metal sleeve 18, having the end toward the recess 10 closed and having the end toward the outer end wall of the casing open. The sleeve loosely fits the casing but is prevented from any material longitudinal or rotative movement by a lug 19 at the inner end of the sleeve. This lug extends radially in respect to the sleeve and fits in a groove in the outer surface of the engine casting. The upper end of the lug terminates at approximately the center of the sleeve and upon approximately the level of the lower wall or floor of the recess 10. Within the sleeve is a second sleeve 20, preferably formed of refractory material, for instance, lava, which when heated will conserve the heat for a considerable time. The inner sleeve 20 is hollow and open at both ends, although one end abuts against the outer end wall of the casing 17. The inner surface of the outer sleeve 18 is preferably provided with a series of longitudinal corrugations, so as to provide longitudinal air chambers between the two sleeves. The corrugations extend inwardly to engage with the outer surface of the inner sleeve 20, to support the latter. A tube 21 extends through the end wall of the casing substantially in alinement with the hollow center of the sleeve 20, and serves for the delivery of flame or hot gas to the interior of the sleeve to preliminarily heat the latter before starting the engine in operation. After the two concentric sleeves have been highly heated in this manner, the engine may be readily started without the aid of the other igniting means. In case it is not convenient to preliminarily heat the igniter in this manner, an ordinary spark plug 22 may be employed upon starting the engine and until the other igniter becomes heated to the



desired temperature. A sleeve or tube 18 is maintained at a high temperature and serves to ignite the gas by direct contact therewith when the gas is compressed. The inner sleeve 20 serves to conserve the heat particularly when the latter is being heated by the delivery of a flame through the tube 21. Secured to the inner end wall of the igniter is a baffle plate 23, extending between the inlet and the exhaust valves but out of engagement with either. This baffle plate is preferably formed of sheet metal and is of such size and so disposed that the liquid fuel entering through the passage 13 upon the opening of the inlet valve, will be delivered to the upper surface of this plate. The plate being supported solely by the igniter is slightly heated and tends to vaporize the fuel, so that a rapid and uniform mixture of the latter will be obtained during the admission of the air. As far as the operation of the igniter itself is concerned, this baffle plate 23 might be supported from the side walls of the recess 10 rather than from the end of the igniter itself. It might be supported directly upon and constitute a part of the exhaust valve, as illustrated in my prior patent, No. 942,587, issued December 7, 1909, although I preferably support it independently of said exhaust valve, so as

not to interfere with the free movement of the latter.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

An internal combustion engine having a valve casing, a casing secured thereto and closing one end of said valve casing, an inlet valve at the upper side of said valve casing, separate air and liquid passages leading to said inlet valve and both controlled thereby, an exhaust valve at the lower side of said valve casing, a hollow sleeve within said second-mentioned casing and having a lug at one end thereof for engaging with the side of the valve casing for preventing longitudinal movement of said sleeve and preventing rotation thereof, a refractory body within said sleeve and a sheet metal vaporizing plate extending between the inlet valve and said exhaust valve and receiving the liquid fuel upon the opening of the inlet valve.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

OTTO PEARSON.

Witnesses:

AUGUST SELEN,  
ERHARD B. ARNSTROM.