May 19, 1936. B. LOEFFLER 2,041,078

HEAD FOR INTERNAL COMBUSTION ENGINES

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Fig. 1

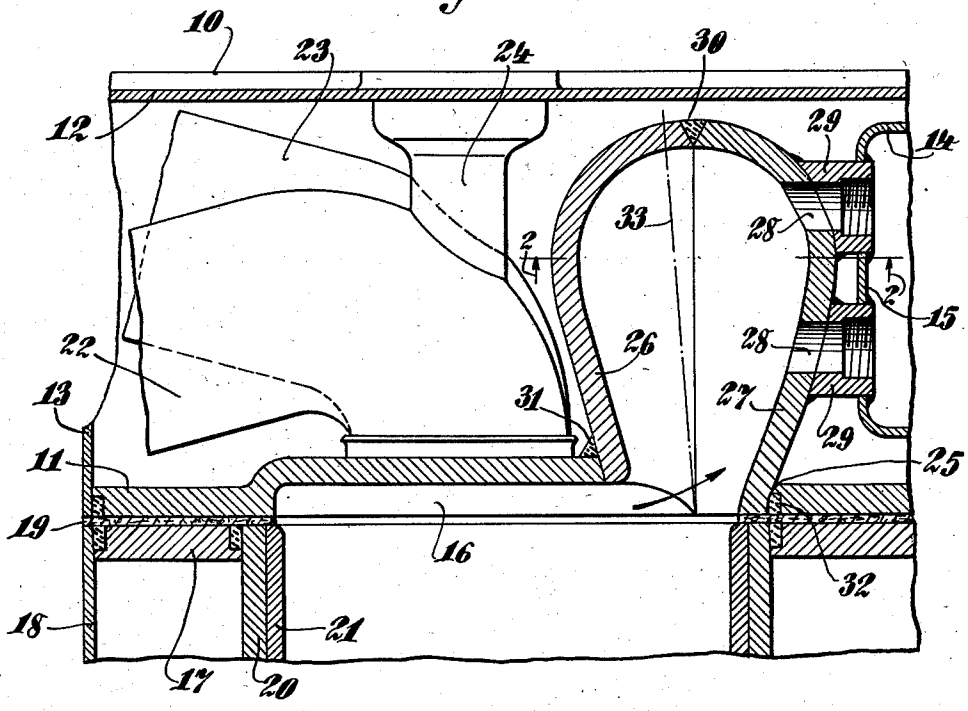
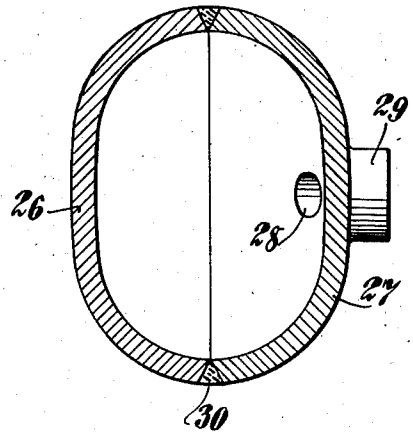


Fig. 2



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HEAD FOR INTERNAL COMBUSTION ENGINES

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3 Claims. (Cl. 123—191)

The present invention relates to internal combustion engines and embodies, more specifically, an improved head for internal combustion engines by means of which high compression operation can be accomplished in an efficient manner. The present application relates to subject matter somewhat akin to that described in applicant's copending application Serial No. 694,043, now Patent No. 2,011,642.

More particularly, the invention relates to internal combustion engine heads which are formed in such fashion that a combustion chamber is provided which may conveniently be made with a desired volume and which is of such character that, upon the compression stroke of the engine, a combustible mixture is directed into the chamber and circulates therein with great turbulence.

It is generally known that satisfactory operation of high compression engines can only be had where a head is provided of such character as to produce a high turbulence of the combustible mixture. In order that a head of this character may be provided, the present invention has been developed and an object thereof is to provide a head for internal combustion engines by means of which great turbulence is produced in the combustible mixture.

A further object of the invention is to provide a head of the above character wherein the elements thereof are formed and assembled in such fashion that a head having the desired volume may be formed and assembled effectively.

A further object of the invention is to provide a head for internal combustion engines having a combustion chamber so disposed within the head that the compression stroke of the engine forces the combustible mixture thereinto with great velocity and high turbulence.

Further objects, not specifically enumerated above, will be apparent as the invention is described in greater detail in connection with the accompanying drawing, wherein:

Figure 1 is a view in section, taken through a head constructed in accordance with the present invention.

Figure 2 is a view in section, taken on line 2—2 of Figure 1, and looking in the direction of the arrows and showing the combustion chamber of the present invention.

Referring to the above drawing, a head 10 of an internal combustion engine is shown as being formed of a bottom plate 11 and top plate 12. A side plate 13 is welded thereto and an opposite side plate 14 also secured thereto, said plate 14 being formed with a recess 15 within which spark plugs may be received.

Bottom plate 11 is formed with a chamber forming recess 16 and is adapted to be secured to a deck 17 formed upon a suitable cylinder block 18. A gasket 19 spaces the deck 17 and plate 11 apart. Cylinder wall 20 and sleeve 21 cooperate with the chamber forming recess to form a closed cylinder in which reciprocates the piston of the engine.

A fuel mixture inlet pipe 22 communicates between a suitable inlet manifold and the recess 16 while exhaust pipe 23 communicates between the recess 16 and an exhaust manifold. Valve guides 24 are provided between the top plate 12 and the respective pipes 22 and 23 to receive the valve stems of suitable valves and the above described elements form a hollow head through which circulates a suitable cooling fluid for effecting the cooling of the head.

At the right hand side of the recess 16, as viewed in Figure 1, an aperture 25 is formed, this aperture being adapted to receive cooperating combustion chamber sections 26 and 27. Section 27 is formed with apertures 28 which cooperate with spark plug bushings 29, welded between the section 27 and recessed wall 14. The sections 26 and 27 are welded at 30 to secure the adjacent sides thereof together and the lower portions of the sections are welded at 31 and 32 to the sides of the aperture 25. If the volume of the chamber is to be changed, it may be reduced by cutting a segment from the section 26, as indicated by the dot and dash line 33, the portions so cut away being removed and the remainder of the section 26 welded at 30 to the section 27. Obviously, an insert could be placed between the sections to afford a larger volume if desired.

The foregoing structure affords a combustion chamber which produces high turbulence in the combustible mixture. Upon the compression stroke of the piston the combustible mixture is directed with high velocity in a direction generally parallel to the plane of the plate 11. When the high velocity stream of the combustible mixture strikes the lower inside surface of the section 27, it is deflected upwardly and along the inner surface of such section and a violent eddy is formed within the combustion chamber thus intimately mixing the combustible mixture prior to the ignition thereof by the spark plugs.

By forming the area of the aperture 25 considerably smaller than the area of the cylinder, a rapid and turbulent flow of the combustion

mixture is produced and the above described operation is more effectively carried out.

While the invention has been described with specific reference to the accompanying drawing, it is not to be limited, save as defined in the appended claims.

I claim as my invention:

1. An engine head adapted for use with engines having cylinder blocks with cylinders formed therein, the head being formed of top, bottom and side plates secured together, one of the side plates having a spark plug recess formed therein, inlet and exhaust ducts mounted between the top and bottom plates, said bottom plate being formed with a recess cooperating with the engine cylinder and having an aperture formed therein at one side of the recess, cooperating combustion chamber forming members secured at adjacent edges and mounted between the top and bottom plates, said members being formed with an opening, the edges of which are secured to the edges of the aperture in the bottom plate, and a bushing extending between one of the chamber forming members and the said recess in the said side plate and forming a spark plug mounting means.

2. An engine head adapted for use with engines having cylinder blocks with cylinders formed therein, the head being formed of top, bottom and side plates secured together, one of the side plates having a spark plug recess formed therein, inlet and exhaust ducts mounted between the top and bottom plates, said bottom plate being formed with a recess cooperating with the engine cylinder and having an aperture formed therein at one side of the recess, means forming a combustion chamber over the engine cylinder and between the top and bottom plates and secured to the edges of the aperture in the bottom plate, the chamber being formed with curved walls and a curved deflecting entrance adjacent the aperture in the bottom plate adapted to form a vortex of fluids directed thereinto.

3. An engine head adapted for use with engines having cylinder blocks with cylinders formed therein, the head being formed of top, bottom and side plates secured together, one of the side plates having means therein for mounting a spark plug, inlet and exhaust ducts mounted between the top and bottom plates, said bottom plate being formed with a recess cooperating with the engine cylinder and having an aperture formed therein at one side of the recess, means forming a combustion chamber over the engine cylinder and between the top and bottom plates and secured to the edges of the aperture in the bottom plate, the chamber being formed with curved walls and a curved deflecting entrance adjacent the aperture in the bottom plate adapted to form a vortex of fluids directed thereinto.

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