Nov. 8, 1932. H. SUDER ET AL 1,887,072

INTERNAL COMBUSTION ENGINE

Filed Sept. 22, 1931

Fig. 1

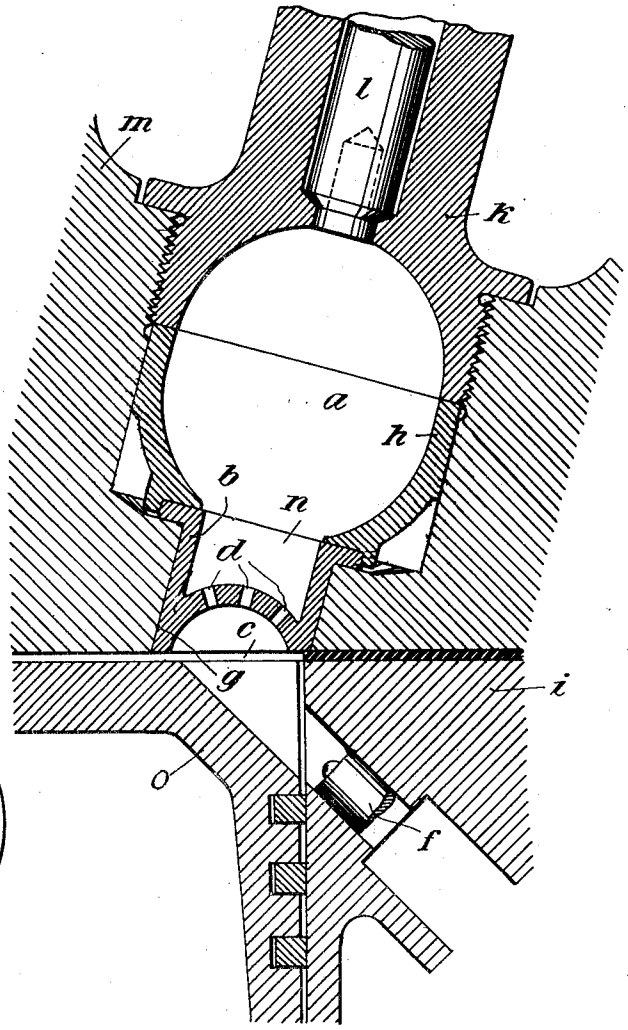
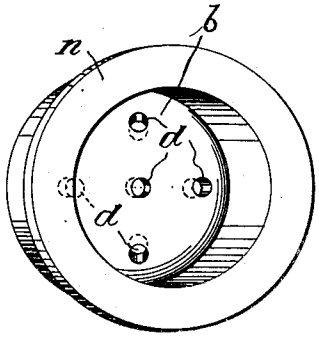



Fig. 2



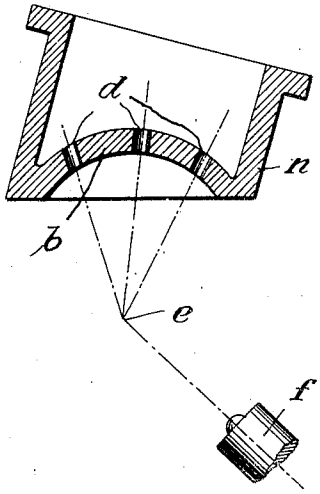




Fig. 3

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Patented Nov. 8, 1932

1,887,072

# UNITED STATES PATENT OFFICE

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## INTERNAL COMBUSTION ENGINE

Application filed September 22, 1931, Serial No. 564,366, and in Germany January 31, 1931.

The present invention relates to improvements in internal combustion engines and shows a further development of the Diesel-machine described in the U. S. Patent Letters No. 1,840,442 of Max Goth, filed February 23, 1928.

The Diesel machine according to the prior application has a chamber for the air compressed during the compression stroke. The chamber communicates with the combustion space of the cylinder through a throat closed by a perforated partition wall or screen. The fuel is injected against this screen so that only a small quantity of it enters the said air chamber while the bulk of the fuel is rejected into the cylinder.

Now we have found that it is of considerable advantage to give to the said screen a form concave against the interior of the cylinder. The screen has preferably the form of a segment of a sphere and its holes or bores converge against the combustion chamber of the cylinder. By this means a thorough mixture and a uniform distribution of the fuel within the said chamber is assured. The best results are obtained if the directions of the converging bores or of a great number of them meet in one point within the combustion chamber and the jet of the fuel is directed against this point.

The concave formation of the inner face of the screen is therefore the main feature of our invention. A further important feature of the invention is the arrangement of converging bores in the screen. Other features and combinations of parts will be more fully described in the following specification and illustrated in the annexed drawing, in which

Fig. 1 is a vertical section of a part of a cylinder of a Diesel-machine incorporating an embodiment of the invention;

Fig. 2 is a plan view of the screen; and

Fig. 3 illustrates the coincidence of the converging air jet with the fuel-jet.

In the drawing $i$ designates the cylinder-wall, $o$ the piston, and $m$ the cylinder-cover. The fuel-nozzle $f$ is seated in the cylinder wall $i$ at an inclination to the axis of the cylinder so that the fuel-jet is directed into the combustion chamber $c$. The air-storage-chamber $a$ is arranged within the cover $m$. It is built-up of the parts $h$, $k$ and is closed against the combustion chamber $c$ by the perforated screen $b$. The screen $b$ forms in the embodiment shown the bottom of a cup $n$ held in place by the part $k$ screwed into the cover $m$ and by the intermediate part $h$. The cup $n$ may be of a cylindrical or conical shape. The screen $b$ itself has preferably the form of a segment of a sphere and its bores $d$ are cylindrical although they may be conical. In the construction shown the axis of these bores are converging and meet in the point $e$ where they encounter the fuel injected by the nozzle $f$. The part $k$ accommodates an ignition cartridge $l$ or an incandescent electric plug. The part $h$ is at its inner end of a somewhat restricted diameter in order to prevent there the propagation of its heat by contact with the cover of the cylinder.

What we claim is:

1. In an internal combustion engine, a working cylinder, an ignition chamber at the head thereof and having an opening directed toward said cylinder, means in the side of the cylinder for projecting fuel toward said opening, and a perforated fuel deflecting wall or screen at said opening having the form of a segment of a spherical shell the concave surface of which is directed toward the cylinder.

2. In an internal combustion engine, a working cylinder an ignition chamber at the head thereof and having an opening directed toward said cylinder, means in the side of the cylinder for projecting fuel toward said opening, and a perforated fuel deflecting wall or screen at said opening having the form of a segment of a spherical shell the concave surface of which is directed toward the cylinder and bores in said shell converging with their axes to a point situated within the cylinder.

In testimony whereof we affix our signatures.

HEINZ SUDER.
MAX GOTH.