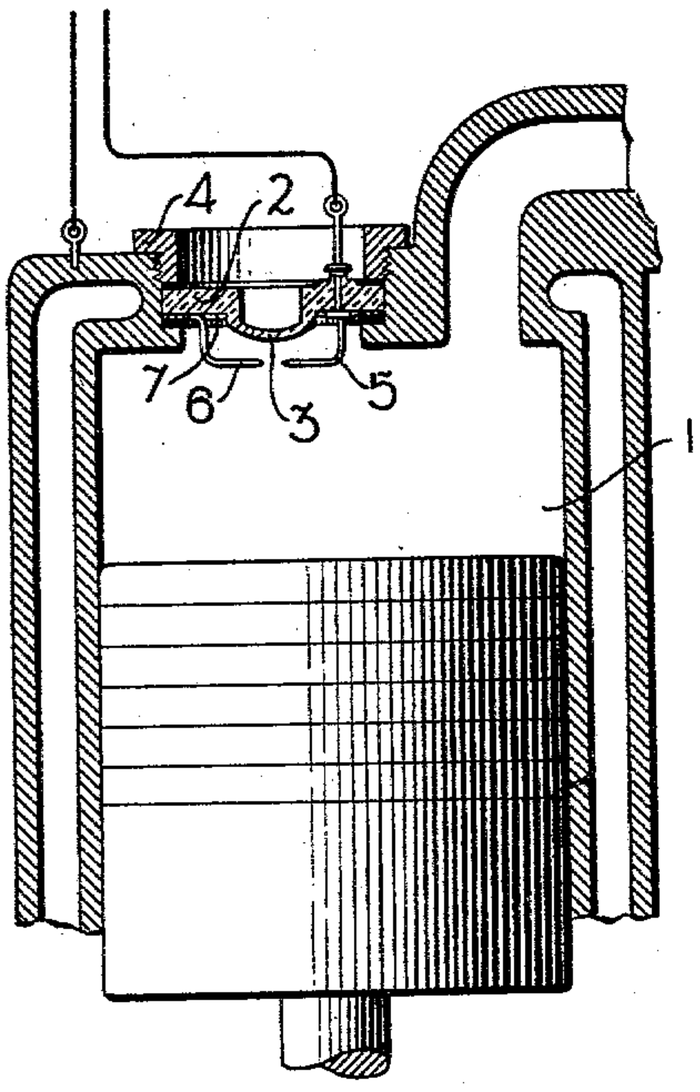
No. 745,465. PATENTED DEC. 1, 1903.

E. THOMSON.

TRANSPARENT REFRACTORY OBSERVATION PLATE.

APPLICATION FILED OCT. 14, 1902.

NO MODEL.



Witnesses.
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No. 745,465. Patented December 1, 1903.

UNITED STATES PATENT OFFICE.

ELIHU THOMSON, OF SWAMPSCOTT, MASSACHUSETTS.

TRANSPARENT REFRACTORY OBSERVATION-PLATE.

SPECIFICATION forming part of Letters Patent No. 745,465, dated December 1, 1903.

Application filed October 14, 1902. Serial No. 127,226. (No model.)

To all whom it may concern:

Be it known that I, ELIHU THOMSON, a citizen of the United States, residing at Swampscott, county of Essex, State of Massachusetts, have invented certain new and useful Improvements in Transparent Refractory Observation-Plates, of which the following is a specification.

This invention relates to devices for observing the condition of a chamber in which the flame or explosion takes place. It is especially useful in gas-engines to permit the character of the mixture to be discovered when it burns or to determine if the sparking devices are working properly.

The invention comprises a plate or block of transparent or translucent material of a highly-refractory nature in which are mounted or embedded one or more of the conductors which carry current to the arcing electrodes. The plate or block has a portion somewhat reduced in thickness and arched to give it strength, through which the action of the electrodes can be observed while the engine is in operation. The electrodes are located in line with or substantially in line with said portion of reduced thickness, and one of the terminals may with advantage pass through the block or plate, since it is of insulating material, while the other terminal may with equal advantage be connected by a washer that is in contact with the metallic portion of the machine. The opposing surfaces of the block are preferably flat and are clamped in place between asbestos or similar washers by a nut. The construction of the sparking device can be varied as desired, but should be in line with the thin portion of the plate. In addition to observing the action of the spark the character of the mixture can readily be determined from the color of the flame. The material I use is fused quartz or pure silica, which is highly refractory and is exceedingly strong, so that it can withstand the force of the expanding gases when the mixture is exploded in the engine-cylinder.

The accompanying drawing illustrates a section of a portion of the head of a cylinder, showing a sparking device and observation-plate.

In the wall of the cavity or chamber to be observed, such as a cylinder 1 of a gas or gasolene engine, is formed an opening, which is preferably countersunk to receive a transparent or translucent plate 2, of fused silica or quartz, having a thin arched portion 3. If desired, the parts of the observation plate or block may be opaque, with the exception of the thin central portion, which is transparent to permit inspection from the outside of the sparking terminals. The thin portion of the plate is arched inwardly to give it the necessary strength to resist the pressure of the exploding mixture. This plate is held in place by the nut 4. Electrode 5 passes through the observation-plate, while electrode 6 is formed on or attached to the washer 7, which is in electric connection with the engine-cylinder.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In combination, a chamber in which a gas burns explosively, a firing device located within the chamber, and a plate made up of fused silica that has thickened edges and a thin transparent arched portion through which the explosive action within the chamber can be observed.

2. A spark-plug for a gas-engine, comprising a plate of fused silica having a thin transparent portion, and a sparking terminal passing through said plate and terminating in line with said thin portion.

3. The combination with a gas-engine, of an inwardly-arched plate of fused silica in a hole in its cylinder-wall, and a sparking terminal supported in said plate in line with said transparent portion.

In witness whereof I have hereunto set my hand this 10th day of October, 1902.

ELIHU THOMSON.

Witnesses:
DUGALD MCK. MCKILLOP,
JOHN A. MCMANUS.