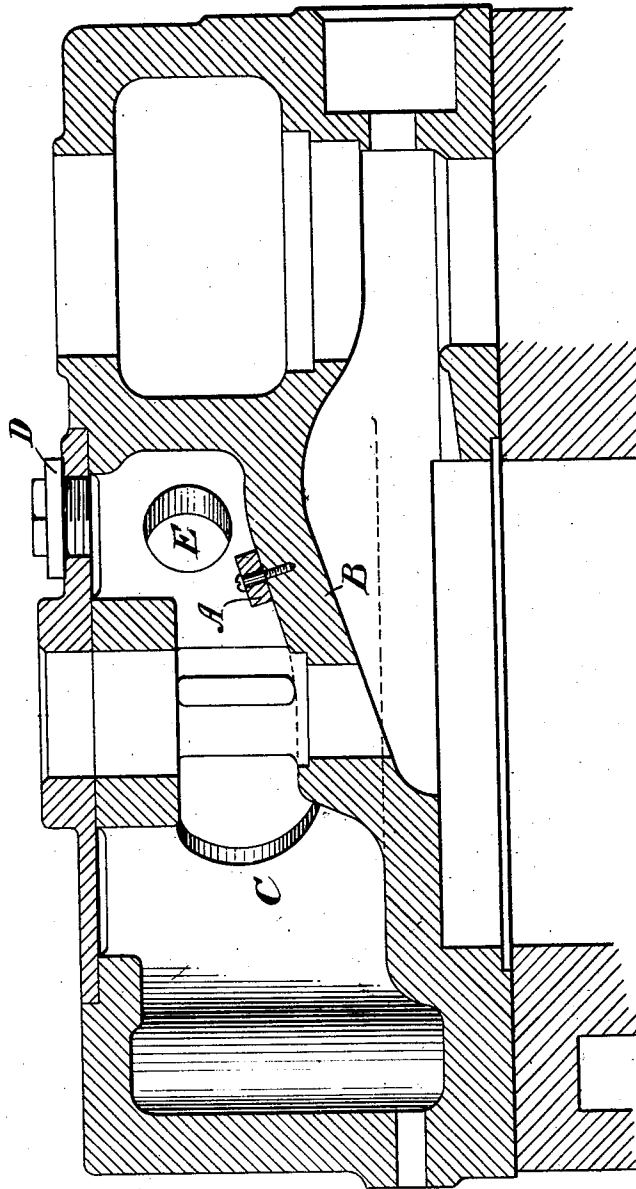


E. D. MEIER.
INDICATOR FOR INTERNAL COMBUSTION ENGINES.
APPLICATION FILED APR. 17, 1908.

977,419.

Patented Nov. 29, 1910.



Attest:
W. H. H. H. H.
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UNITED STATES PATENT OFFICE.

EDWARD D. MEIER, OF NEW YORK, N. Y.

INDICATOR FOR INTERNAL-COMBUSTION ENGINES.

977,419.

Specification of Letters Patent.

Patented Nov. 29, 1910.

Application filed April 17, 1908. Serial No. 427,752.

To all whom it may concern:

Be it known that I, EDWARD D. MEIER, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Indicators for Internal-Combustion Engines, of which the following is a full, true, and concise specification.

This invention relates to internal combustion engines and is more particularly an indicator or tell-tale device for use with the water-jackets of such engines and adapted to afford an infallible indication of the occurrence of excessive or abnormally high or dangerous temperature therein.

In the drawing forming a part of this specification, my invention is indicated as applied to the water-jacket of the cylinder head of an ordinary internal combustion engine.

It frequently occurs in the operation of internal combustion engines, and particularly of those which operate on high temperatures, that the supply of cooling water becomes exhausted through carelessness of the attendant, and the excessive and abnormal heat to which the cylinder walls and adjacent parts are then subjected, warps or cracks the metal and seriously affects the efficiency and durability of the apparatus. It has heretofore been difficult, if not impossible, to ascertain, and in any event to prove, whether such impairment of the metal has been due to faulty casting or forging, the fault of the manufacturer, or to excessive heat from exhaustion of the cooling water, the fault of the user. My invention aims to provide means for definitely determining the responsibility of accidents of this kind, and consists of a piece of metallic alloy or similar material, such as shown at A in the drawing contained within the water-jacket of the cylinder-head itself, where it will be normally submerged or in contact with the water therein. This alloy has a fusing point which approximates the predetermined maximum temperature for which the apparatus is intended for use, say from 212 degrees Fahrenheit to 300 degrees Fahrenheit, which is above the normal working temperature and below the danger-point, and said alloy may be composed of any proper admixtures of metals, such as lead and antimony, for giving the desired

fusing point, which is a matter well known in the art of low-fusing alloys. I prefer to use an alloy fusing at approximately 230 degrees Fahrenheit. The small piece of alloy is preferably secured to the inner wall B of the jacket by means of a small screw and is disposed opposite to a window D or similar opening in the outer wall, through which it may be inspected, and which is closed by a suitable plug or cover.

In the normal and proper operation of the engine the temperature of the indicator will not materially differ from the temperature of the cooling water, *i. e.* approximately 200° to 212° but upon the absence of water and the subsequent rise of temperature, the said alloy will become fused, and its fused condition will thereafter be visually apparent upon inspection, as conclusive evidence of the fact that the safe limit of temperature for the jacket or the cylinder casing has been exceeded.

In the drawing hereto, the water-jacket is supplied with interior partitions C and passage E for providing a circuitous path for cooling water, which enters and leaves the jacket in any appropriate manner. The valve chambers are shown at the right-hand side, and the relation of the head to the cylinder is also indicated, these parts being of well known construction, as above stated.

Having described my invention, what I claim and desire to secure by United States Letters Patent, is:

The combination with the water-jacket of an internal combustion engine having a normally closed window opening therein from the exterior, of a fusible metallic indicator within the water-jacket opposite and in the line of vision from said opening and consisting of a metallic alloy having a fusing point approximating a predetermined maximum temperature for the operation of the engine, being thereby adapted to indicate the occurrence of an excess above said temperature.

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

EDWARD D. MEIER.

Witnesses:

H. G. KIMBALL,
CLIFFORD H. KLOS.