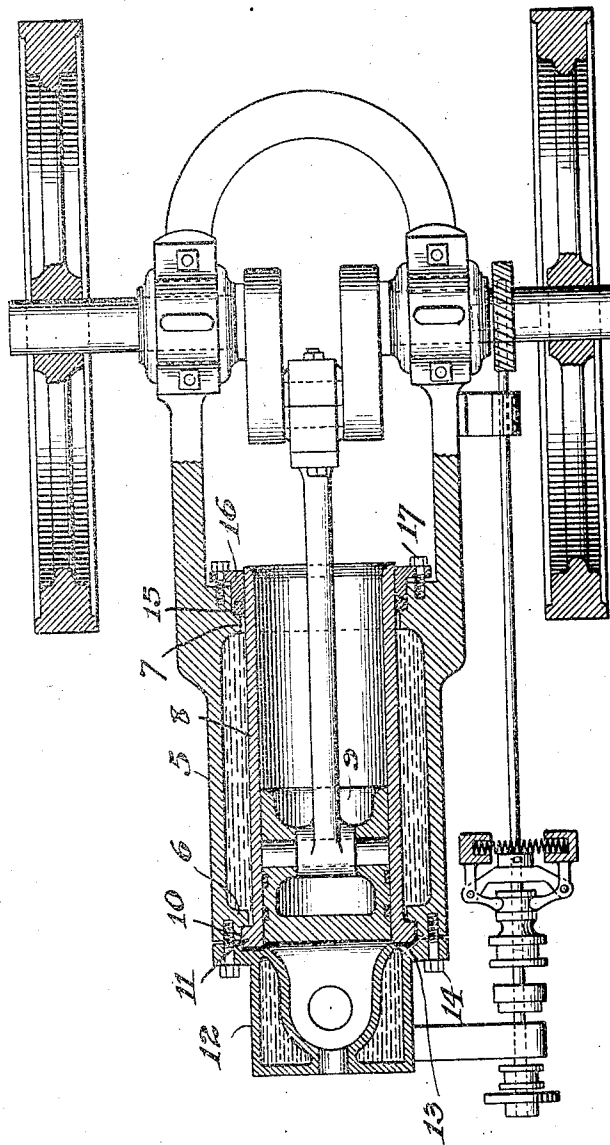


J. A. CHARTER.
 FRAME CONSTRUCTION FOR GAS ENGINES.
 APPLICATION FILED JULY 28, 1908.

955,632.

Patented Apr. 19, 1910.



Witnesses,
J. S. Mann,
James R. Offield.

Inventor,
James A. Charter.
 By *Offield, Towle & Lenthien*
Attys.

UNITED STATES PATENT OFFICE.

JAMES A. CHARTER, OF CHICAGO, ILLINOIS, ASSIGNOR TO AUSTIN MANUFACTURING COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

FRAME CONSTRUCTION FOR GAS-ENGINES.

955,632.

Specification of Letters Patent. Patented Apr. 19, 1910.

Application filed July 28, 1908. Serial No. 445,780.

To all whom it may concern:

Be it known that I, JAMES A. CHARTER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Frame Constructions for Gas-Engines, of which the following is a specification.

This invention relates to the art of gas engines, and has reference more especially to a novel frame construction therefor designed to facilitate the renewal of the working cylinder of the engine when required, as well as to permit its free expansion and contraction in service.

In carrying out my invention I provide, in combination with the engine frame, and more particularly that portion thereof forming the cylinder housing or shell of the usual water-jacket, a working cylinder which at one end is provided with an annular flange that is securely clamped between the cylinder head and the end of the water-jacket cylinder, while its opposite end lies within a suitably packed annular seat of the frame which permits longitudinal expansion and contraction of the working cylinder.

My invention will be readily understood when considered in connection with the accompanying drawing showing a simple mechanical embodiment thereof, in which the figure is a horizontal longitudinal section through the engine cylinder and frame.

Referring to the drawing, 5 designates that portion of the engine frame constituting the cylinder housing or shell of the usual water-jacket. The opposite ends of this water-jacket cylinder are formed with inwardly projecting annular ribs 6 and 7 forming seats within which is loosely fitted the working cylinder 8, provided with the usual piston 9. The forward end of the water-jacket cylinder 5 is formed with an annular counterbored seat 10 that is engaged by an annular flange 11 formed on the forward end of the working cylinder 8, and which is rectangular in cross-section to fit said seat. The flange is secured to its seat by the cylinder head 12, which latter is also provided on its inner face with a shallow annular counterbored seat 13 adapted to fit the outer face of the flange 11. The head is securely clamped to the forward end of

the water-jacket cylinder 5 by any suitable means such as the cap-screw 14, by which latter it will be observed the flanged end of the working cylinder is very securely and rigidly held in the frame.

The working cylinder at its opposite end loosely engages the seat 7 and is packed in a water-tight manner by suitable packing 15 secured by a gland 16, which latter is secured to the frame by bolts 17.

From the foregoing it will be observed that the working cylinder 8 may be easily removed when required as a result of wear or for any other cause, by simply unbolting and removing the head 12 and drawing the cylinder out of the frame. A further advantage of the construction resides in the fact that the described manner of mounting the working cylinder in the frame permits the free expansion and contraction of said cylinder to the maximum extent required in service, the longitudinal expansion and contraction being permitted by the capacity of the cylinder to slide through the packed bearing at its inner end, and its lateral expansion being possible by reason of the free fit in the annular seats 6 and 7.

The joints between the cylinder flange and the head of the frame, respectively, are preferably made metal to metal by grinding, thus requiring no form of soft packing; and by tightening up the cap-screws 14 a very strong and secure joint may be formed which is both water and gas tight, preventing the leakage of the cooling water from the space between the cylinders 5 and 8, and also preventing leakage of the exploded charge between the cylinder and cylinder head. It will be observed that the meeting faces of the water-jacket cylinder and cylinder head are blanked, or without ports, thus cutting off water communication and circulation between the cylinder and head, making this joint an explosion joint only.

I claim:

In a gas engine, the combination with an engine frame having a water-jacket cylinder formed with a counterbored ground annular seat at the outer end thereof, of a working cylinder mounted in said water-jacket cylinder and having an annular lateral flange fitting said seat and projecting widthwise beyond said outer end of said water-jacket

cylinder, a cylinder head having a counter-bored ground annular seat directly engaging the projecting portion of said annular flange, the opposed parts of said water-jacket cylinder and cylinder head surrounding said flange having clearance therebetween, and cap-screws directly connecting

the said opposed parts of the water-jacket cylinder and cylinder head around said flange, substantially as described.

JAMES A. CHARTER.

Witnesses:

L. F. MANN,

CLARE L. ROSENOW.