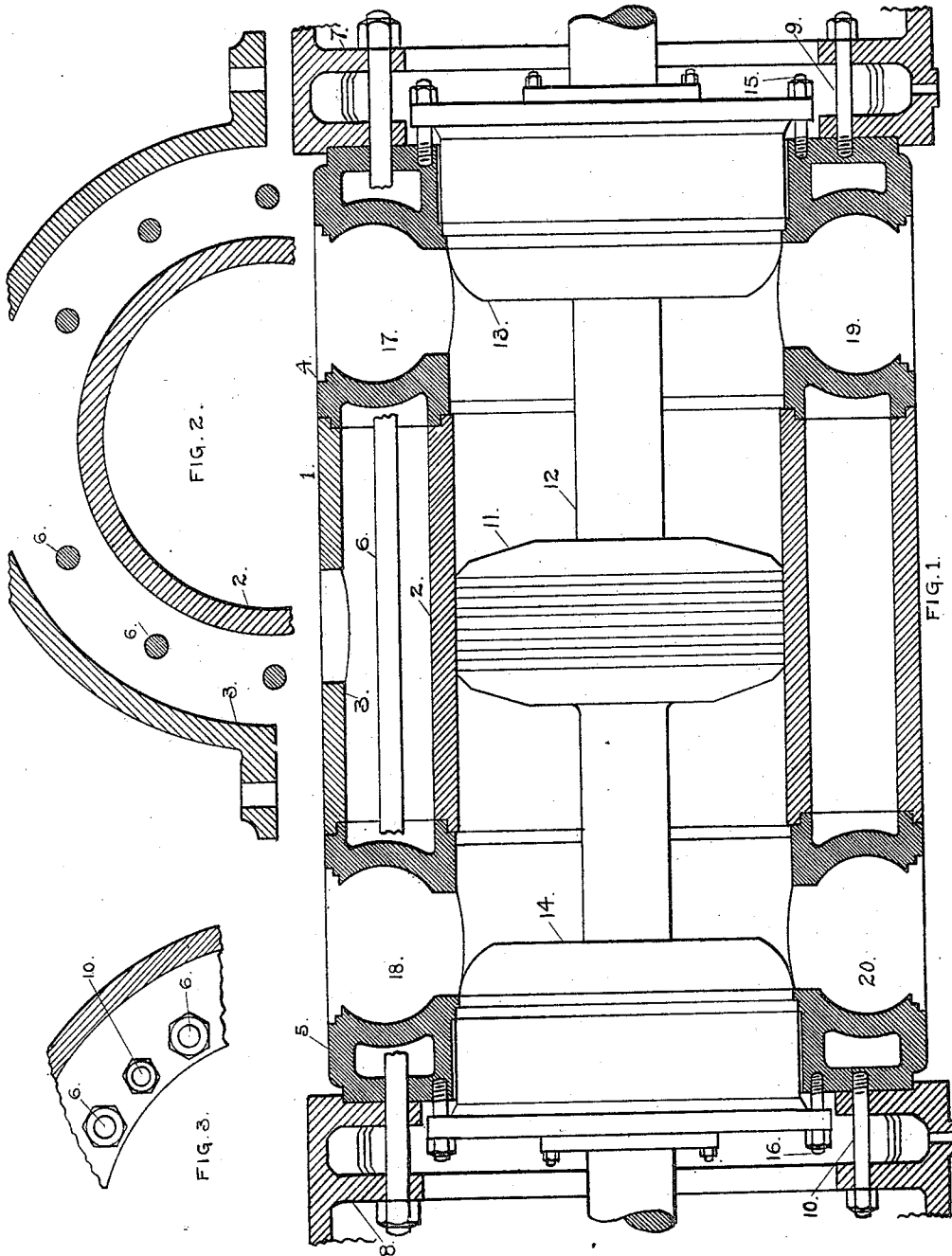


E. T. ADAMS.
GAS ENGINE CYLINDER.
APPLICATION FILED MAY 9, 1908.

1,045,766.

Patented Nov. 26, 1912.



WITNESSES.

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UNITED STATES PATENT OFFICE.

EDWARD T. ADAMS, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO ALLIS-CHALMERS COMPANY, OF MILWAUKEE, WISCONSIN, A CORPORATION OF NEW JERSEY.

GAS-ENGINE CYLINDER.

1,045,766.

Specification of Letters Patent.

Patented Nov. 26, 1912.

Application filed May 9, 1908. Serial No. 431,828.

To all whom it may concern:

Be it known that I, EDWARD T. ADAMS, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a certain new and useful Improvement in Gas-Engine Cylinders, of which the following is a specification.

This invention relates to engine cylinders and is specifically illustrated and described as a gas engine cylinder.

The object of the invention is to produce a cylinder comprised of sections of different materials so that each section is best adapted and most easily constructed for the purpose for which it is intended.

Another object of the invention is to so connect these parts that the strain of the connection will fall upon through bolts and thus obviate the necessity of flange connections by stud bolts or otherwise.

In the drawings,—Figure 1 is a central section through the cylinder and parts of the engine frame, certain of the bolt connections being swung into the plane of section for purposes of better illustration and location of the radial distance from the axis. Fig. 2 is a transverse section through the middle portion of the cylinder, certain of the parts being broken away and an outer half of such middle portion being omitted entirely. Fig. 3 is a fragmental sectional view of a portion of the frame looking toward the cylinder.

Referring to the drawings, the cylinder is composed of portions of different material, the middle portion 1 of which is composed of two separate cylinders 2, 3, the outer one of which is composed of two semicylinders bolted together at flanges formed on their edges, as shown in the drawings. This outer cylinder 3, may be made of cast iron. The middle portion 1 is preferably formed of relatively tough wear-resisting material such as steel.

At the ends, the engine cylinder is comprised of portions 4, 5, which coact and are in line with the middle portion 1, all three of these portions being suitably formed end to end so as to produce a tight joint. Gasket material may be used at these joints if desired. The portions 4, 5, are made of relatively weaker material, such for instance, as cast iron, and these can therefore be readily replaced in case of breakage or defect. This

will avoid the necessity of renewing or replacing the entire engine cylinder. The portions 1, 4, 5, are held together end to end in a firm and suitable manner by long through bolts 6, and these preferably also include the terminal flanges 7, 8, all parts of the engine frame. The engine cylinder is thereby firmly clamped between these parts of the engine frame. The parts of the engine frame are additionally secured to the cylinder by stud bolts 9, 10, screwing into the portions 4, 5, of the engine cylinder.

The usual piston 11, mounted on the piston rod 12, slides within the cylinder in contact with the middle portion 1. The tough wear-resisting quality of the middle portion 1, therefore tends to resist the wear due to friction between these parts. The usual heads 13, 14, are provided and these are firmly secured to the portions 4, 5, respectively of the cylinder by means of stud bolts 15, 16. The portions 4, 5, of the cylinder are provided with inlet ports 17, 18, and outlet ports 19, 20, as is usual in gas engine cylinder construction.

It should be noted that the cylinder is constructed to provide for water jacketing, that is the cylinder has hollow walls. This is done in the present case by coring out the end portions 4, 5, and by using the separate cylinders 2, 3, to coact with the end portions 4, 5, as heretofore described.

It should be understood that it is not desired to be limited to the exact details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

It is claimed and desired to secure by Letters Patent,—

1. In an engine cylinder, the combination of a cylinder proper comprising three transverse portions abutting together at substantially two planes, the mid portion comprising an inner piece of relatively tough wear-resisting material and an outer cylinder in sections, and the outer cylinder and end portions being of relatively weaker material, and through bolts for clamping the portions together.

2. In an engine cylinder, the combination of a cylinder proper comprising three transverse portions abutting together at substantially two planes, the mid portion comprising an inner piece of relatively tough wear-resisting material and an outer cylinder in

sections, and the outer cylinder and end portions being of relatively weaker material, frame portions abutting said outer portions, a piston slidable in the inner piece of the
5 mid portion, and through bolts for clamping together the portions of the cylinder and the frame portions.

In testimony whereof, I affix my signature in the presence of two witnesses.

EDWARD T. ADAMS.

Witnesses:

G. F. DEWEIN,
D. P. DAVIES.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
