

T. W. KEEN.
GAS ENGINE CYLINDER.
APPLICATION FILED JUNE 8, 1912.

1,057,741.

Patented Apr. 1, 1913.

2 SHEETS-SHEET 1.

FIG. 1

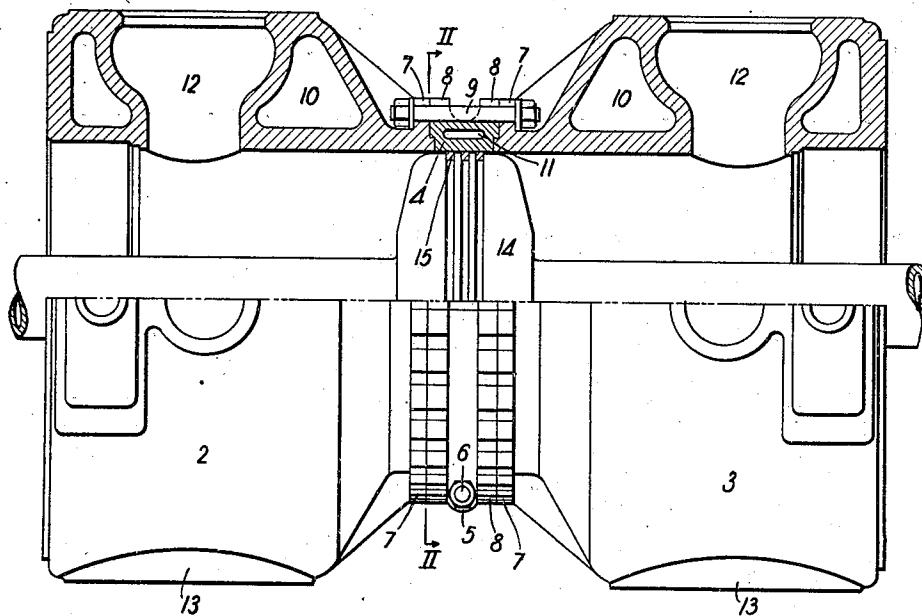
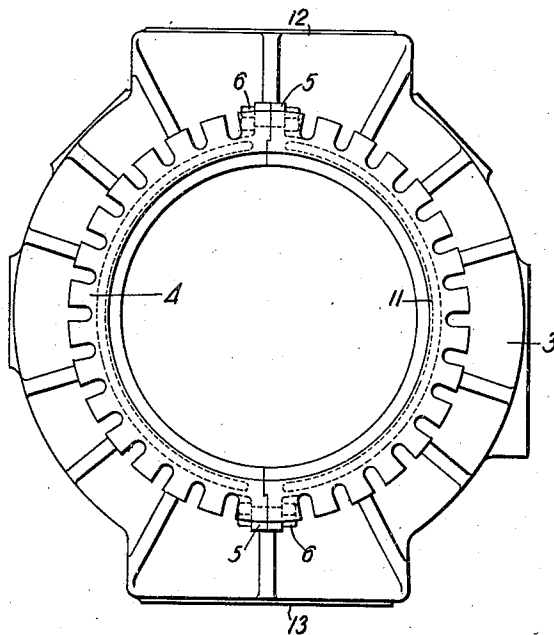


FIG. 2



WITNESSES

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FIG. 3

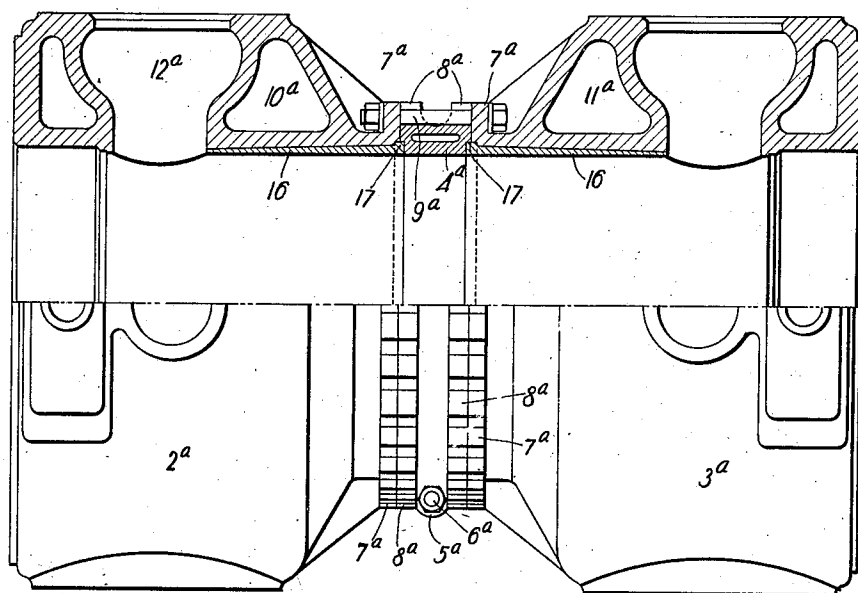
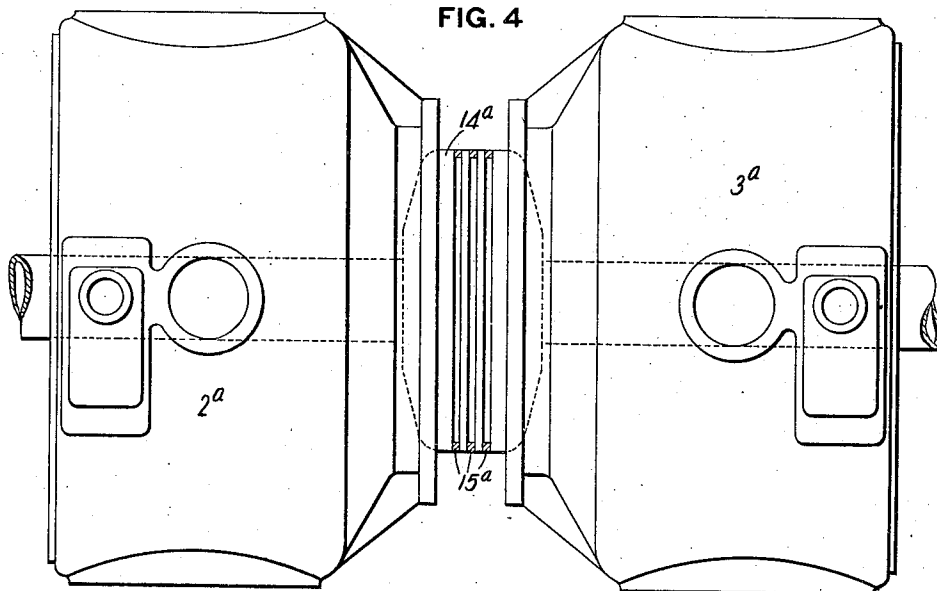


FIG. 4



WITNESSES

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UNITED STATES PATENT OFFICE.

THOMAS W. KEEN, OF SWISSVALE, PENNSYLVANIA.

GAS-ENGINE CYLINDER.

1,057,741.

Specification of Letters Patent.

Patented Apr. 1, 1913.

Application filed June 8, 1912. Serial No. 702,552.

To all whom it may concern:

Be it known that I, THOMAS W. KEEN, a citizen of the United States, residing at Swissvale, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Gas-Engine Cylinder, of which the following is a specification.

My invention relates to the construction of gas engine cylinders and more particularly relates to the construction of cylinders used on the large gas engines employing blast furnace gases as the motive power.

One object of my invention is to provide a gas engine cylinder of novel construction and having means whereby access to the piston is afforded and the renewal of the piston rings is made possible without removing the piston from the cylinder.

Another object of the invention is to provide a sectional gas engine cylinder having means whereby leakage from the water jacket into the interior of the cylinder, or vice versa, is prevented and overcome.

A further object of this invention is to provide a gas engine cylinder of improved construction having novel means by which the cylinder bushings are maintained in position within the cylinder and the possibility of endwise movement of the bushings in the cylinders is eliminated.

A still further object of my invention is to provide a sectional gas engine cylinder having novel means for clamping the cylinder sections together whereby all joints in the cylinder are without the water jacket.

Still further objects of the invention will be apparent as the invention is more fully described hereinafter.

In the accompanying drawings, forming part of this specification, Figure 1 is a plan half in longitudinal section showing a gas engine cylinder constructed and arranged in accordance with my invention. Fig. 2 is a sectional end elevation of the same, the section being taken on the line II-II of Fig. 1. Fig. 3 is a plan half in longitudinal section showing a modified form of cylinder having cylinder bushings in place therein, and the means employed in holding the bushing and preventing relative movement of the bushing in the cylinder. Fig. 4 is a plan showing the end sections of the sectional cylinder with the filling ring removed, as is done to uncover and give access to the piston while within the cylinder and permit the removal and replacement of packing

rings in the piston without removing the piston from the cylinder.

In the drawings, the numerals 2 and 3 designate the opposite end sections of a gas engine cylinder constructed and arranged in accordance with my invention, the sections 2 and 3 being similar in construction.

Interposed between the adjoining ends of the cylinder sections 2 and 3 is a segmental filling ring 4 which is divided transversely, the ends of the ring segments having flanges 5 for the bolts 6 by which the segments are fastened together to form the filling ring.

One end of the cylinder sections 2 and 3 has a flange 7 which is slotted, the slots in the flanges 7 registering with similar slots in the flanges 8 on the ends of the sectional filling ring 4, and the cylinder sections and filling ring are fastened together by the bolts 9 in the registering slots 7 and 8.

Each of the cylinder sections 2 and 3 is provided with a space forming a water jacket 10 having inlet and outlet openings for the water used in cooling the cylinder sections. Each section of the filling ring 4 is made hollow also to provide a water jacket 11, separate water inlet and outlet openings being provided in each ring segment.

The engaging faces of the cylinder sections 2 and 3 and filling ring 4 are provided with registering tongues and grooves by which a tight joint is made between the cylinder sections and the filling ring.

Gas inlet openings 12 and exhaust outlet openings 13 are provided on each end of the assembled cylinder in which openings the inlet and outlet valves are located. The construction of the valves not forming part of this invention, is not shown, and will not be further described.

The customary cylinder heads, not shown, are mounted on the ends of the cylinder in any of the various known ways of attaching such heads to gas engine cylinders.

In the construction of Figs. 1 and 2, a piston 14 is shown having three packing rings 15 in the periphery thereof, the construction of the piston and packing ring being old.

In the construction of Fig. 3 the cylinder sections 2^a, 3^a, and filling ring 4^a, and the flanges 5^a, bolts 6^a, and slotted flanges 7^a, 8^a, employed in securing the cylinder sections 2^a, 3^a, to the filling ring 4^a, are the same as

in Figs. 1 and 2, like parts having the same numerals with the letter "a" added thereto. In the construction of Fig. 3, however, the inner surfaces of one end of the cylinder sections 2^a and 3^a are taper bored and a bushing 16 is inserted in the end of each cylinder section 2. The bushings 16 taper on their outer surfaces and the cylinder sections 2^a, 3^a, are bored to a corresponding taper, the outer ends of the bushings 16 having flanges 17 which are positioned within the recesses in the flanges 8^a, 7^a, of the filling ring 4^a and cylinder sections 2^a, 3^a. The sectional filling ring 4^a of Fig. 3 is the same as that in Fig. 4, in the construction of Fig. 3 the filling ring preferably being made of the same material as the bushings 16.

When the sectional cylinders have been assembled and the engines are in readiness for operation, the water used in the water jackets 10 and 11, or 10^a and 11^a, cannot in any possible manner leak into the engine cylinders, as each section of the cylinders has its own separate and independent water jacket and water inlet and outlet openings.

When it is desired to inspect the piston 14 or 14^a, and packing rings 15 or 15^a, the sectional filling ring 4 or 4^a will be removed, the cylinder sections 2 and 3 or 2^a and 3^a remaining in their erected position. After the sectional filling ring is removed from between the adjacent ends of the cylinder sections, the piston 14 or 14^a, when stopped in the middle of the length of the cylinder will be opposite the space ordinarily filled by the filling rings. The piston rings can then be readily inspected and when required can be removed, and replaced without the necessity, as has heretofore been the case, of removing the piston from the cylinder. In this way the necessity of removing the cylinder heads and disconnecting the piston rod from the engine cross head is avoided and rendered unnecessary. This is an important advantage which results in less time being required in making repairs and in maintaining the engines in operative condition.

Modifications in the construction and arrangement of the parts may be made without departing from my invention.

I claim:—

1. A gas engine cylinder comprising water jacketed cylinder sections and a segmental filling ring between the adjoining ends of the cylinder sections, said sections of the cylinder and ring having independent water jackets.

2. A sectional gas engine cylinder comprising end sections, a segmental filling ring between the adjoining ends of the cylinder sections, and bushings in the cylinder sections, the bushings being inserted in the cylinder from the adjoining ends of the cylinder sections and engaging the ends of the filling ring to prevent movement of the bushings in the cylinder.

3. A sectional gas engine cylinder comprising end sections, a segmental filling ring between the adjoining ends of the cylinder sections, and bushings in the cylinder sections, the outer surfaces of said bushings tapering and the bushings being inserted in the cylinder from the adjoining ends of the cylinder sections and engaging the ends of the filling ring to prevent movement of the bushings in the cylinder.

4. A gas engine cylinder made in sections and having a sectional filling ring between the adjoining ends of the cylinder sections, a bushing removably secured in each cylinder section, said filling ring being arranged to hold the bushings in place in the cylinder sections when the engine cylinder is assembled.

5. A sectional gas engine cylinder comprising end sections, a segmental filling ring between the adjoining ends of the cylinder sections, a bushing in each cylinder section, each of said bushings having an annular flange on one end thereof and the contacting faces of the cylinder sections and ring having annular grooves to receive said flanges and prevent relative movement of the bushings in said cylinder.

In testimony whereof, I have hereunto set my hand.

THOMAS W. KEEN.

Witnesses:

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T. J. O'BRIEN.