No. 710,911. Patented Oct. 7, 1902.

H. E. EBBS.

GAS ENGINE CYLINDER.

(Application filed May 29, 1902.)

(No Model.)

Fig. 1

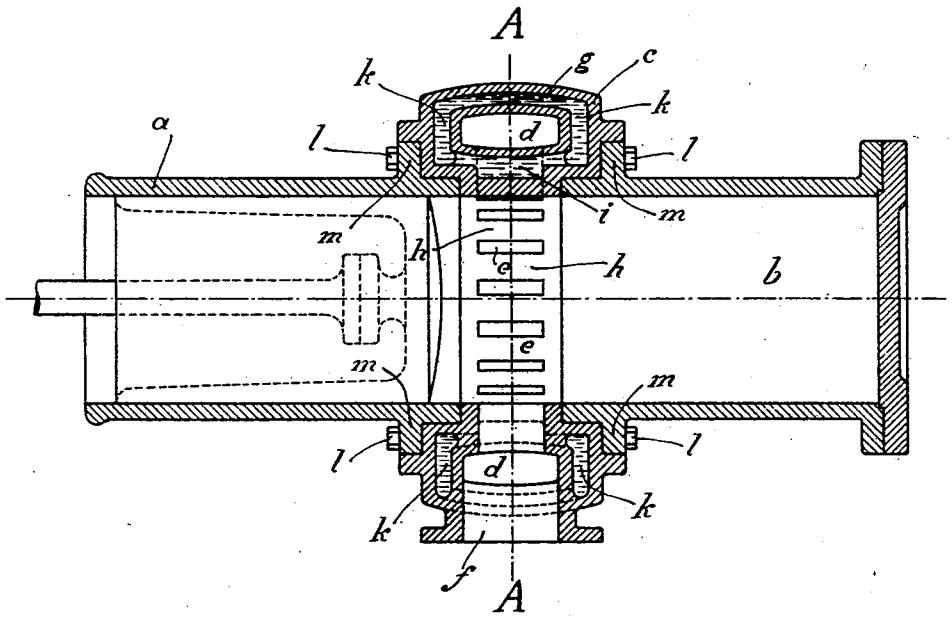
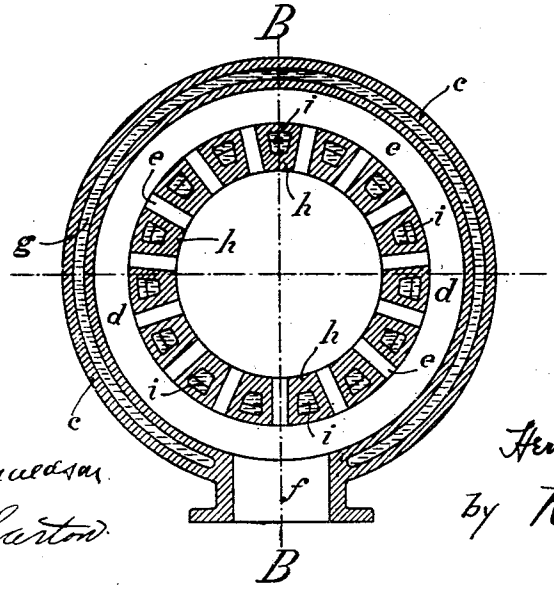


Fig. 2



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GAS-ENGINE CYLINDER.

SPECIFICATION forming part of Letters Patent No. 710,911, dated October 7, 1902.

Application filed May 29, 1902. Serial No. 109,462. (No model.)

To all whom it may concern:

Be it known that I, HERMANN EDGAR EBBS, a subject of the King of Great Britain, residing at Nuremberg, Bavaria, Germany, have invented an Improvement in Gas-Engine Cylinders, of which the following is a specification.

In the form of gas-engine in which the exhaust-gases escape through notches, slots, or the like formed in the cylinder-wall, as is the case, for instance, in the two-stroke engines of Clerk, Oechelhäuser, and Körting, the drawback has been found that as a rule the uncooled webs or bars which lie between the said slots and around or between which the hot exhaust-gases of the engine pass easily crack by reason of the great heating produced by these waste gases. As, further, these bars are exposed to great strains, owing to the tractile force arising in the engine, they make the working of the gas-engine insecure and render a replacement of the entire cylinder necessary whenever such cracks arise.

Now the present invention has for its object to avoid too great a heating of the bars by an improved arrangement, on the one hand, and, on the other hand, to render unnecessary the renewal of the entire cylinder in case cracks should develop. For this object the part of the cylinder containing the notches or slots is formed of a separate inserted piece which contains the annular exhaust-passage and is provided with cooling-chambers traversed by water in such a way that each bar lying between two adjacent apertures is cooled separately, and therefore a great heating of the bars by the waste gases of the engine can no longer take place. If, however, this annular piece should be damaged, it can be changed or replaced without rendering necessary the renewal of the entire cylinder.

This improved gas-engine cylinder is shown in the accompanying drawings.

Figure 1 is a longitudinal sectional view on lines B B of Fig. 2, and Fig. 2 is a transverse sectional view on line A A of Fig. 1.

A separate annular intermediate piece *c* is arranged between the two parts *a* and *b* of the cylinder, the internal diameter of the part *c* exactly corresponding to that of the bore of the cylinder. The said intermediate piece contains the annular exhaust-passage *d*, which is connected with the interior of the cylinder by radial slots *e*, distributed uniformly over the entire periphery, and from which the waste gases of the engine are conveyed away through the pipe-socket *f*.

The wall of the intermediate piece *c* is traversed on all sides by cooling-passages through which water flows, which passages consist of an annular space *g* in the outer wall of the intermediate piece and passages *i*, lying in the inner wall—that is to say, traversing the bars *h* in an axial direction—and annular side passages *k*, connecting the passages *g* and *i* with one another. The water admitted at a suitable point into this cooling-chamber flows around the radial slots *e*, through which the hot gases escape from the cylinder, so that a strong heating of the bars situated between the slots can no longer take place. Should the intermediate piece become damaged, it may be taken out and repaired or replaced by a fresh one by loosening the screws *l*, which hold the intermediate piece to the flanges *m* of the parts *a* and *b* of the cylinder, and pushing the latter apart.

I declare that what I claim is—

A removable insertion for engine-cylinders having exhaust-slots for carrying off the waste gases, comprising an outer casing, cooling-passages in said casing, an annular exhaust-passage, slots through the inner wall of said insertion communicating with the interior of the cylinder and the annular exhaust-passage, a discharge-socket for the exhaust-gases communicating with the annular exhaust-passage, and cooling-passages in the outer wall of the insertion, in the bars between the inner exhaust-slots, and extending radially between said inner and outer cooling-passages, substantially as and for the objects set forth.

In witness whereof I have hereunto set my hand in presence of two witnesses.

HERMANN EDGAR EBBS.

Witnesses:

ED. THOFEBRU,

LEONORE RASCH.