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J. W. BIGSBY & F. W. BARHOFF.

EXPLOSIVE ENGINE CYLINDER.

APPLICATION FILED MAR. 9, 1906.

Fig. 1.

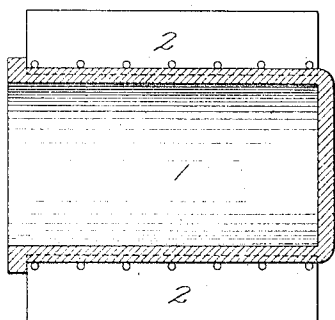


Fig. 2.

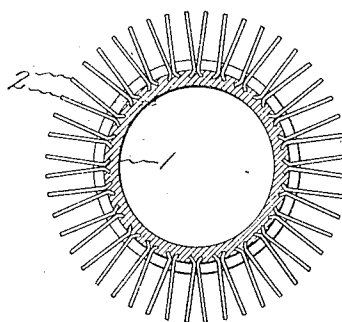


Fig. 3.

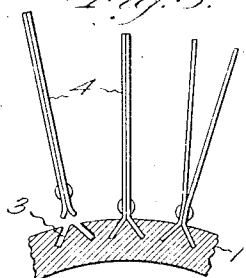


Fig. 4.

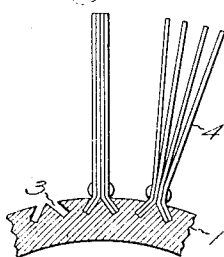


Fig. 5.

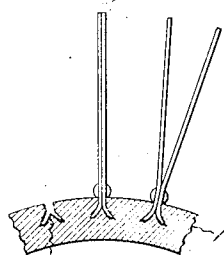


Fig. 6.

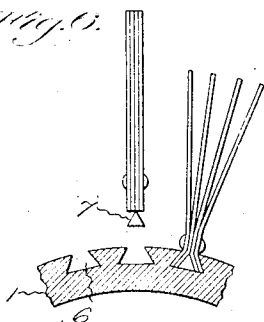


Fig. 7.

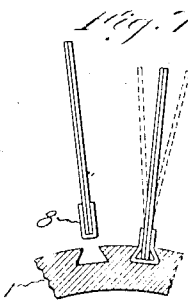


Fig. 8.

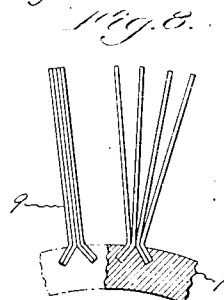
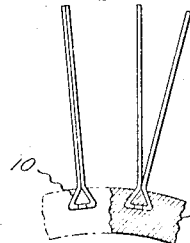


Fig. 9.



Witnesses.

C. H. Stone.

Echel M. Lowe.

Inventors

Jerre W. Bigsby

Fred W. Barhoff

per Harry P. Williams

Attorney.

UNITED STATES PATENT OFFICE.

JESSE W. BIGSBY AND FRED W. BARHOFF, OF HARTFORD, CONNECTICUT.

EXPLOSIVE-ENGINE CYLINDER.

No. 851,977.

Specification of Letters Patent.

Patented April 30, 1907.

Application filed March 9, 1906. Serial No. 305,059.

To all whom it may concern:

Be it known that we, JESSE W. BIGSBY and FRED W. BARHOFF, citizens of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented a new and useful Explosive-Engine Cylinder, of which the following is a specification.

This invention relates to a cylinder for an explosive engine which is provided with a large number of plates arranged to effect a rapid radiation of heat from the cylinder to the atmosphere.

The object of the invention is to produce a cylinder of this nature which is cheap to manufacture and efficient in use.

This cylinder has a cast metal body and plates extending longitudinally from the outer surface of the body, said plates having their outer edges substantially equi-distant from each other and their inner edges grouped together and tightly held in under-cut recesses in the body, as more particularly hereinafter described.

Figure 1 of the accompanying drawings is a longitudinal section of a cylinder that embodies the invention. Fig. 2 is a transverse section of this cylinder. Fig. 3 is a short section on larger scale of the cylinder showing an unoccupied under-cut recess, a pair of plates about to be driven into the unoccupied recess, a pair of plates driven into such a recess, and a pair of plates driven in and opened, as when finished. Fig. 4 is a similar view showing a larger number of plates in each recess. Fig. 5 is a similar view showing a different form of recess. Fig. 6 is a similar view showing a still different form of recess and another way of fastening the plates therein. Fig. 7 shows a different way of fastening the plates. Fig. 8 shows another way, and Fig. 9 shows still another way.

The body 1 of the cylinder is cast to shape of iron or steel and finished as usual. When the body is cast under-cut recesses are formed longitudinally in its outer surface. These recesses are adapted to receive and hold the edges of radiating plates 2 which may be stamped from iron, steel, copper or any other metal having suitable heat conductivity.

In the form first illustrated the under-cut recesses are made in the shape of two inclined grooves 3. Into these grooves the inner edges of the plates 4 are driven. There may be two of these plates, as shown in Fig.

3, or more, as shown in Fig. 4. The plates are fastened together flatwise by brazing or by rivets, as desired, and the inner edges are slightly separated so that when the plates are driven into the recesses the edges will be wedged apart into the under-cuts. After the edges have been driven in the outer portions of the plates may be separated.

Instead of making the recesses in the shape of two inclined grooves, as shown in Fig. 3, they may be made with small wedges 5 at the bottom, as shown in Fig. 5. In this case the wedges spread the lower edges of the plates into the under-cuts so that they will be tightly held in position.

The recesses may be made in the shape of plain dove-tails 6, as shown in Fig. 6. In this case a small wedge 7 may be started in between the plates before they are driven into the dove-tails. These wedges spread the lower edges of the plates when they are driven into the recesses.

Instead of using an independent wedge, as shown in Fig. 6, a trough of sheet metal 8 may be bent around the inner edges of the plates and after the plates and the trough have been placed in the under-cut recesses, the edges of the trough may be forced inwardly by hydraulic pressure and expanded so as to bind the plates and hold them in the recesses, as shown in Fig. 7.

If desired, the plates 9 with their inner edges spread apart, may be placed in the sand in the mold and the body of the cylinder cast about the spread inner edges, as shown in Fig. 8. In this case there is intimate contact between the faces of the spread inner edges and the walls of the under-cut recesses in the body which they occupy.

The plates can be doubled and formed with triangular heads 10 at the bends, as shown in Fig. 9. Plates doubled in this way can be put into the mold and the body of the cylinder cast about them so that they cannot be withdrawn after the body has hardened. These plates may be separated so that the air spaces between their outer edges will be practically uniform.

In all of the forms shown the mold is easily made so that the cylinder can be cast with a wall of uniform thickness, and the under-cut recesses can be conveniently formed either by providing for them when the cylinder is cast or by machining them after the cylinder is cast. These plates are easily placed in the recesses and they will not work loose after

they have once been secured therein. The inner edges of these plates make intimate junction with the body of the cylinder and as there are many of them a large quantity of heat is conducted from the body of the cylinder and radiated into the atmosphere.

The invention claimed is:—

1. An explosive engine cylinder having a cast metal body with under-cut grooves extending longitudinally in the outer surface of the body and metal plates located in groups with the plates of each group separated at their outer edges but secured together near their inner edges and having their inner edges occupying the under-cut grooves, substantially as specified.

2. An explosive engine cylinder having a cast metal body with under-cut grooves extending longitudinally in the outer surface of the body and metal plates located in groups with the plates of each group separated at their outer edges but secured together near their inner edges and having their inner edges spread apart and occupying the under-cut grooves, substantially as specified.

3. An explosive engine cylinder having a

cast metal body with under-cut grooves extending longitudinally in the outer surface of the body, and metal plates located in groups with the plates of each group separated at their outer edges but secured together near their inner edges and having their inner edges separated by wedge-like portions of metal and occupying the under-cut grooves, substantially as specified.

4. An explosive engine cylinder having a cast metal body with a large number of grooves extending longitudinally in the outer surface of the body, the walls of the adjacent grooves inclining oppositely with relation to each other, and metal plates located in groups with the plates of each group separated near their outer edges but secured together near their inner edges and having their inner edges separated and occupying the inclined longitudinal grooves, substantially as specified.

JESSE W. BIGSBY.
FRED W. BARHOFF.

Witnesses:

HARRY R. WILLIAMS,
ETHEL M. LOWE.