

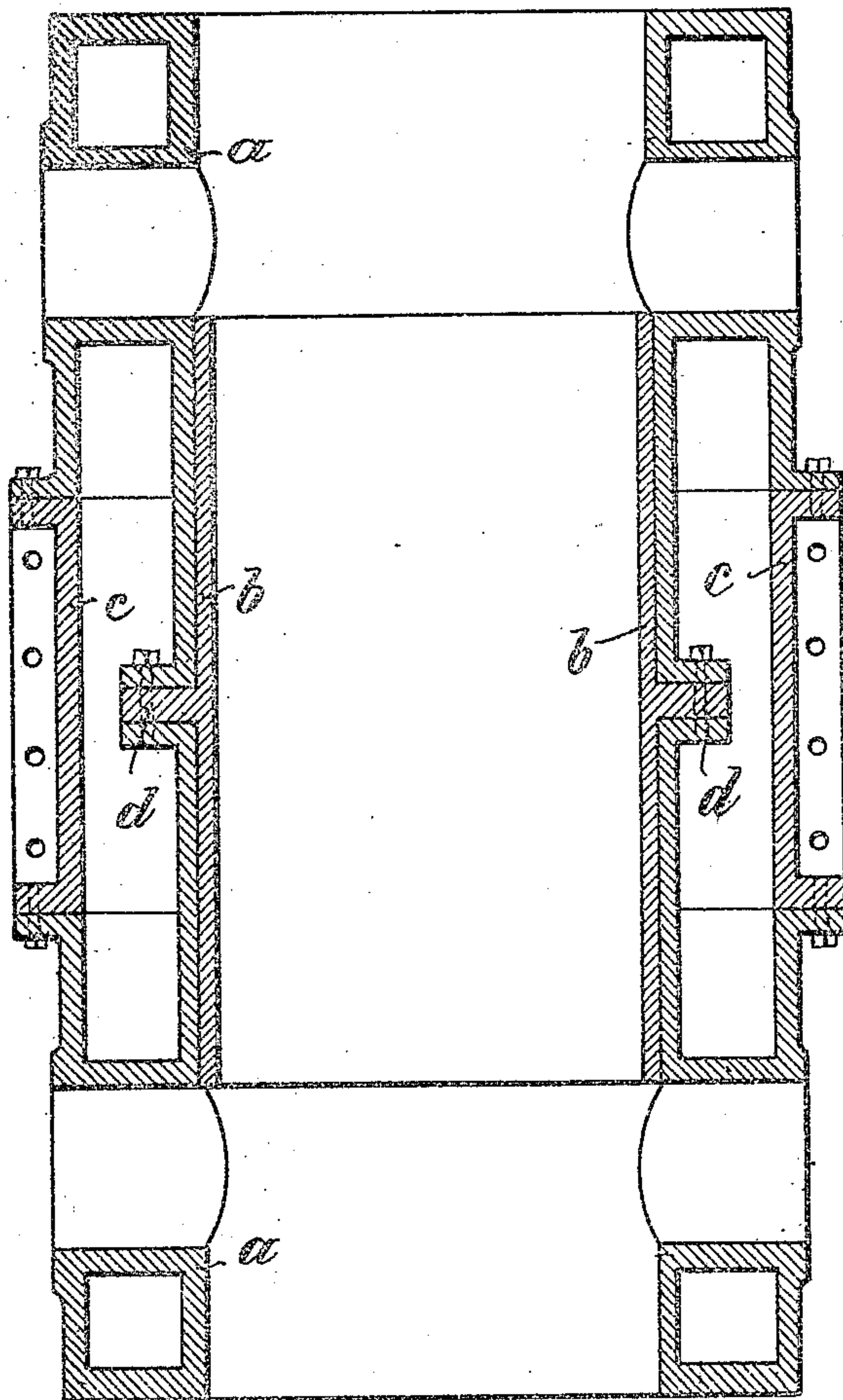
No. 894,380.

PATENTED JULY 28, 1908.

W. GIEBFRIED.
ENGINE CYLINDER.
APPLICATION FILED NOV. 8, 1907.

2 SHEETS—SHEET 1.

Fig 1.



Witnesses:
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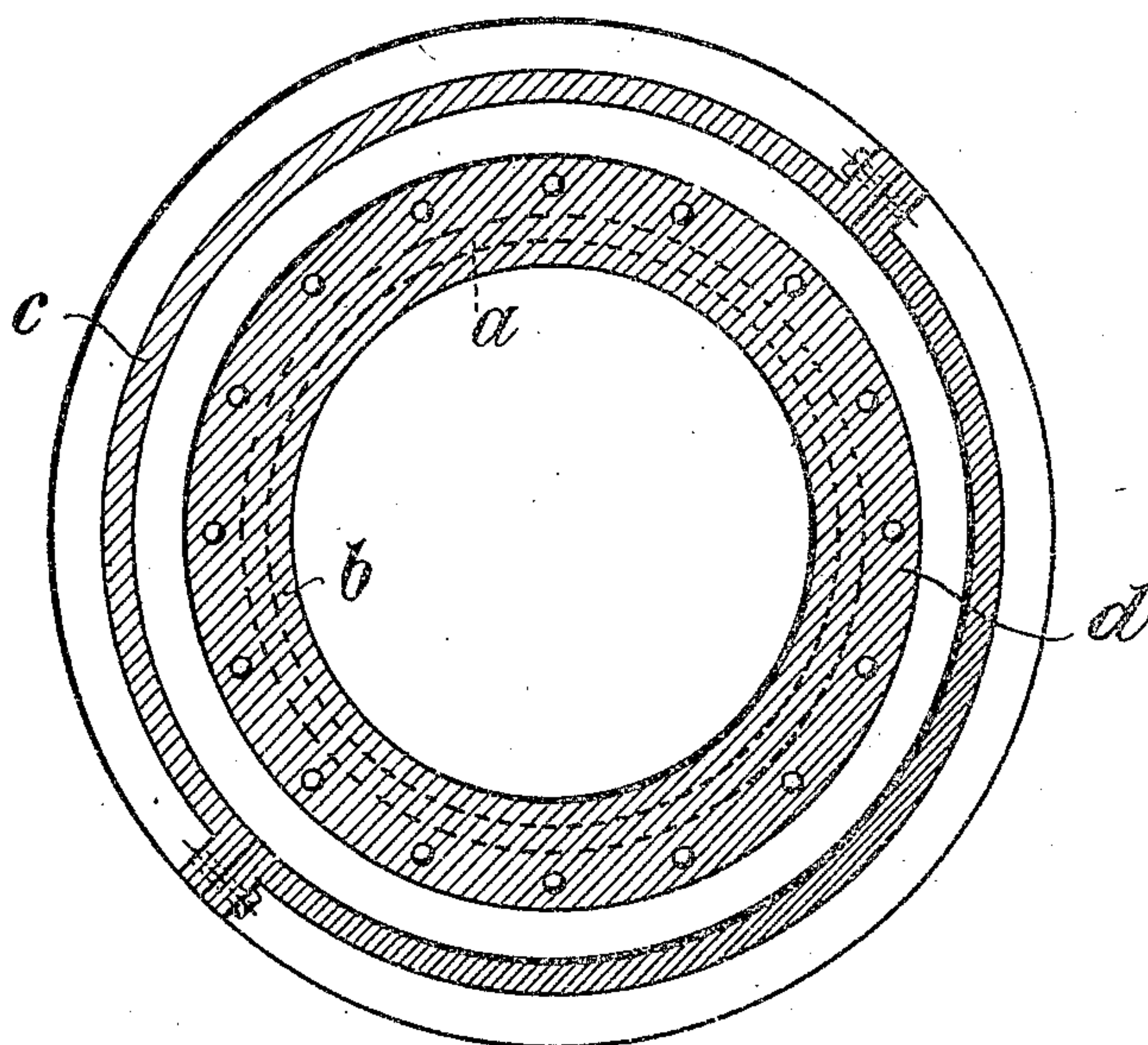
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2 SHEETS—SHEET 2.

Fig. 2.



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WILHELM GIEBFRIED, OF SAARBRÜCKEN, GERMANY, ASSIGNOR TO EHRHARDT & SEHMER
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ENGINE-CYLINDER.

No. 894,380.

Specification of Letters Patent.

Patented July 28, 1908

Application filed November 8, 1907. Serial No. 401,287.

To all whom it may concern:

Be it known that I, WILHELM GIEBFRIED, a subject of the German Emperor, and residing at Pfählerstrasse 9, Saarbrücken, Germany, have invented certain new and useful Improvements in Engine-Cylinders, of which the following is a specification.

The present invention relates to engines and an important object is an improved cylinder for the same.

Under certain circumstances there is considerable wear in the running surfaces of cylinders of large gas engines. In such a case the cylinders must be bored again and they must finally be replaced by new ones. As the casting of cylinders is a very difficult matter, it is exceedingly expensive to replace such a cylinder. It is therefore attempted to prevent the exchange of the entire cylinder by arranging bushes within the same. Hitherto that has generally been done by a special bush being set hot or by hydraulic pressure in a cylinder of the customary construction, the bush being then fastened in any suitable manner by pins or the like inserted from the outside.

Now the present invention consists in a special manner of arranging the bush in the cylinder, whereby substantial advantages are obtained.

In order that the invention may be clearly understood reference is made to the accompanying drawing in which one form of the new cylinder is represented by way of example in section.

Figure 1 is a central longitudinal sectional view of my improved cylinder; and, Fig. 2 is a central transverse sectional view thereof.

The cylinder consists of the two parts *a*, the bush *b* having an exterior flange *d* in the center, and a two-part annular member *c*.

A special feature of the cylinder is, firstly, the manner in which the bush *b* is held by means of the flange *d* between flanges of the two head-pieces *a* constituting the cylinder proper. With this form of attachment of the bush, the substantial advantage is obtained that even if the joints should in themselves become loose, no water can enter into

the interior of the cylinder, because the bush which has been shrunk in the two cylinder sections forms a perfect closure. Thus although the cylinder proper is divided in the center, its running or working face is nevertheless not divided, and the closure against water is practically perfect.

After the screws which connect the two head-pieces *a* and the bush *b* with one another have been tightened, the two-part annular piece *c* is placed round the cylinder and is likewise screwed to the head-pieces. When that has been done, so far as tightness is concerned the cylinder corresponds exactly to cylinders of the old construction, in which interior and exterior casings are cast in one piece.

It will be observed that the invention is shown applied to a cylinder of the hollow wall type and that the flanges bolted to the annular flange *d* are formed on the exterior of the inner wall of the cylinder, while the annular two-part member *c* forms a portion of the outer wall or water jacket.

What I claim as my invention and desire to secure by Letters Patent is:—

1. A cylinder of the type described comprising a bush having an annular exterior flange, and a cylinder proper composed of two sections tightly fitting over the respective ends of the bush and bolted against the opposite faces of said flange, whereby the bush is rigidly fastened to the cylinder proper and covers the joints between the sections thereof.

2. In combination, a hollow-walled cylinder divided transversely into two sections midway its length, the inner wall of each section being provided with an outwardly turned flange, and a bush fitted tightly in the cylinder and extending across the transverse joint between the sections thereof, and means exterior to the bush for rigidly attaching it to said flange.

3. A cylinder of the hollow wall type divided transversely into two sections or head pieces, a bush fitted tightly in the cylinder and extending across the transverse joint between the sections thereof, means exterior to

the bush for rigidly connecting the bush and the two sections of the cylinder together, for the purpose set forth.

4. A cylinder of the hollow wall type divided transversely into two sections, the inner wall of each section being provided with an outwardly turned flange, and a portion of the outer wall adjacent said flanges being in sections and being removable, a bush fitted

into the cylinder and provided with an external flange bolted between the aforesaid flanges, for the purpose set forth. 10

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

WILHELM GIEBFRIED.

Witnesses:

THEODOR ENGELHARDT,
WALTER HAUSING.