T. LOHNER.

CYLINDER BUSHING.

APPLICATION FILED MAY 29, 1916.

1,204,674. Patented Nov. 14, 1916.

Fig. 1

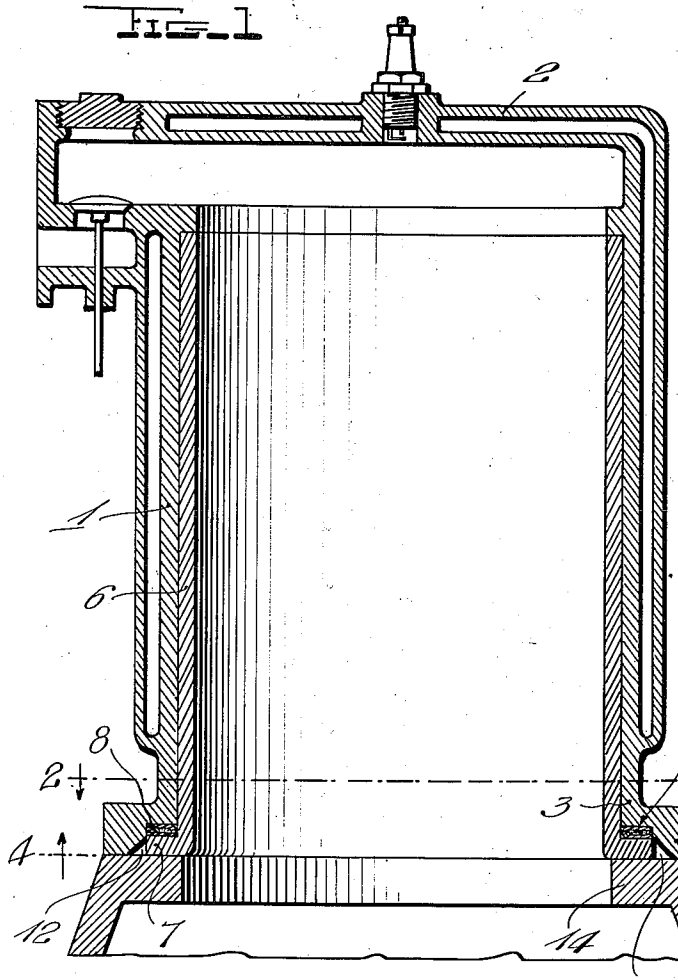


Fig. 2

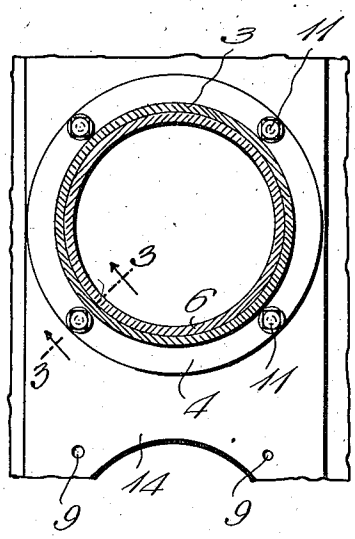


Fig. 3

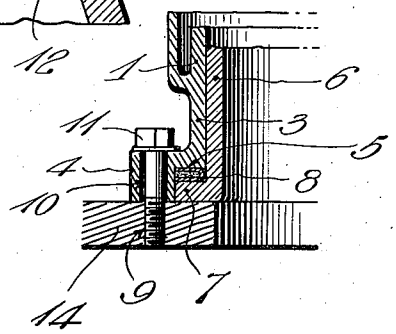
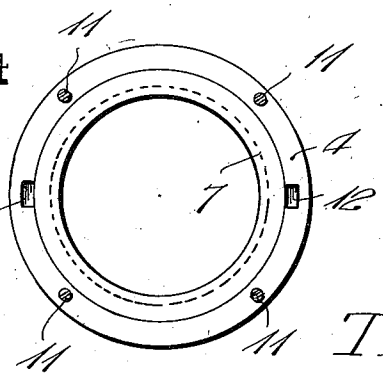


Fig. 4



Witness

Inventor

Thomas Lohner

By H. B. Williamson & Co

Attorneys

UNITED STATES PATENT OFFICE.

THOMAS LOHNER, OF WARREN, MINNESOTA.

CYLINDER-BUSHING.

1,204,674. Specification of Letters Patent. Patented Nov. 14, 1916.

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To all whom it may concern:

Be it known that I, THOMAS LOHNER, a citizen of the United States, residing at Warren, in the county of Marshall and State of Minnesota, have invented certain new and useful Improvements in Cylinder-Bushings; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to new and useful improvements in attachments for various kinds of cylinders, and the primary object of the invention is to provide a cylinder with a bushing or lining, which is removably attached to the same, so that when worn it may be removed and replaced by a new one. This attachment is especially applicable for use in cylinders of internal combustion engines, where a great amount of wear is placed upon the inner wall of the cylinder and by the use of my removable bushing or lining, when the same becomes worn, insertion of a fresh one will greatly lengthen the life of the cylinder.

Another object of this invention is to provide a device of this character which is simple and durable in construction, inexpensive to manufacture, and one which will be very efficient in operation.

With these and numerous other objects in view, my invention consists of the novel features of construction, combination and arrangement of parts which will be hereinafter referred to and more particularly pointed out in the specification and claim.

In the accompanying drawings, Figure 1 is a central vertical section of the cylinder of an internal combustion engine, showing the bushing applied thereto; Fig. 2 is a horizontal section taken on the line 2—2 of Fig. 1; Fig. 3 is a detail vertical section showing the manner of fastening the cylinder to its base and the clamping of the inner end of the bushing therebetween; Fig. 4 is taken on the line 4—4 of Fig. 1.

In describing my invention, I shall refer to the drawings in which similar reference characters designate corresponding parts throughout the several views and in which I have shown my attachment applied to an internal combustion engine cylinder, although this type is applicable to other types of cylinders. The primary object, however, of the bushing or lining is for use on internal combustion engine cylinders, where the wear is greatest. The cylinder to which this attachment is applied is so cast that the bushing may be easily secured thereto and may be simply removed therefrom when worn.

The numeral 1 designates the cylinder which is of the ordinary type used on internal combustion engines, having in the head portion 2 thereof the usual type of inlet valves, etc. The cylinder 1 is provided at its inner end 3 with an enlarged rim 4 which consequently forms within the inner wall of this cylinder at its inner end, a shoulder 5. The inner wall of this cylinder is so formed from a point adjacent its outer end, to the inner end of the same so that it is adapted to receive therein a bushing or lining 6 which constitutes the subject matter of this invention. This bushing or lining 6 is formed of any desired material which is best applicable to withstand the wear placed thereon, and the same is formed so as to conform substantially to the shape of the cylinder and is adapted to be placed therein as clearly shown in Fig. 1 of the drawing. This bushing or lining 6 has formed on its inner end an outwardly projecting flange 7 which is adapted to be positioned within the enlarged bore at the inner end of the cylinder.

Interposed between the flange 7 disposed within the enlarged bore of the cylinder and the shoulder 5, is a gasket which is preferably formed of copper and asbestos which will make the two parts absolutely air-tight. This gasket which is designated by the numeral 8 may, however, be formed of any desired material, other than the one above mentioned, although this has been found the most practical in the use to which it is applied.

The base 14 on which the cylinder is supported is provided adjacent its outer edge with a plurality of openings 9 therethrough, which are adapted to aline with a corresponding plurality of openings 10 through the enlarged end of the cylinder. When these parts are in position, any desired type of fastening members, for instance, bolts 11 are adapted to be passed through these openings to securely hold the bushing in locked position as clearly shown in Fig. 3 of the drawings. These fastening members,

however, are removable so that when desired they may be taken out so as to remove the bushing.

The inner edge of the cylinder 1 is provided with a pair of diametrically opposed notches 12 which have inclined sides at their inner edges, so as to facilitate the removal of the bushing from the cylinder after the fastening members have been withdrawn. It will be obvious that upon the withdrawal of the fastening members, it will be a comparatively simple operation to withdraw the bushing, as the inclined faces of the notches allow tools to be driven beneath the flange of said bushing so as to facilitate its withdrawal. The positioning of these notches against the outer face of the flange 7, so as to expedite the removal of the bushing is a very essential feature of my invention, as by the use of the same the removal of a worn bushing from the cylinder is reduced to a comparatively simple operation and one which is easily and quickly accomplished.

The benefits derived from the attachment of a bushing of this character to the cylinder would be a great saving in the life of the cylinder as it will do away with the necessity of boring and grinding, which is now found necessary after the cylinder has become worn. Another advantage to be derived will be that the piston will always be brought to play upon a uniform surface. Ordinarily, when one of the cylinders in a large machine becomes worn or damaged, it is necessary to put in an entirely new block but by the use of my invention, it is only necessary to remove the worn bushing or lining and to replace the same by a new one, whereby the cylinder will be in perfect order.

From the foregoing description of the construction and operation of my improved attachment for cylinders, the manner of applying the same to use and the operation thereof will be readily understood, and it will be seen that I have provided a simple and efficient means for carrying out the objects of the invention.

I claim:

A device of the class described comprising a cylinder having an enlarged bore at its inner end and adapted to form a shoulder therein, a bushing in said cylinder extending from a point adjacent the outer end of the same to its inner end, an outwardly projecting flange on the inner end of the bushing positioned in the enlarged bore of said cylinder, a gasket interposed between said flange and shoulder in the cylinder, removable fastening members through the inner end of said cylinder to secure the same to its support, and notches in the lower edge of the enlarged bore of said cylinder to facilitate the removal of the bushing therefrom when the fastening members have been withdrawn.

In testimony whereof I have hereunto set my hand.

THOMAS LOHNER.