Nov. 7, 1944. A. M. CAMPBELL 2,362,241

CYLINDER CONSTRUCTION

Filed Jan. 24, 1944 3 Sheets-Sheet 1

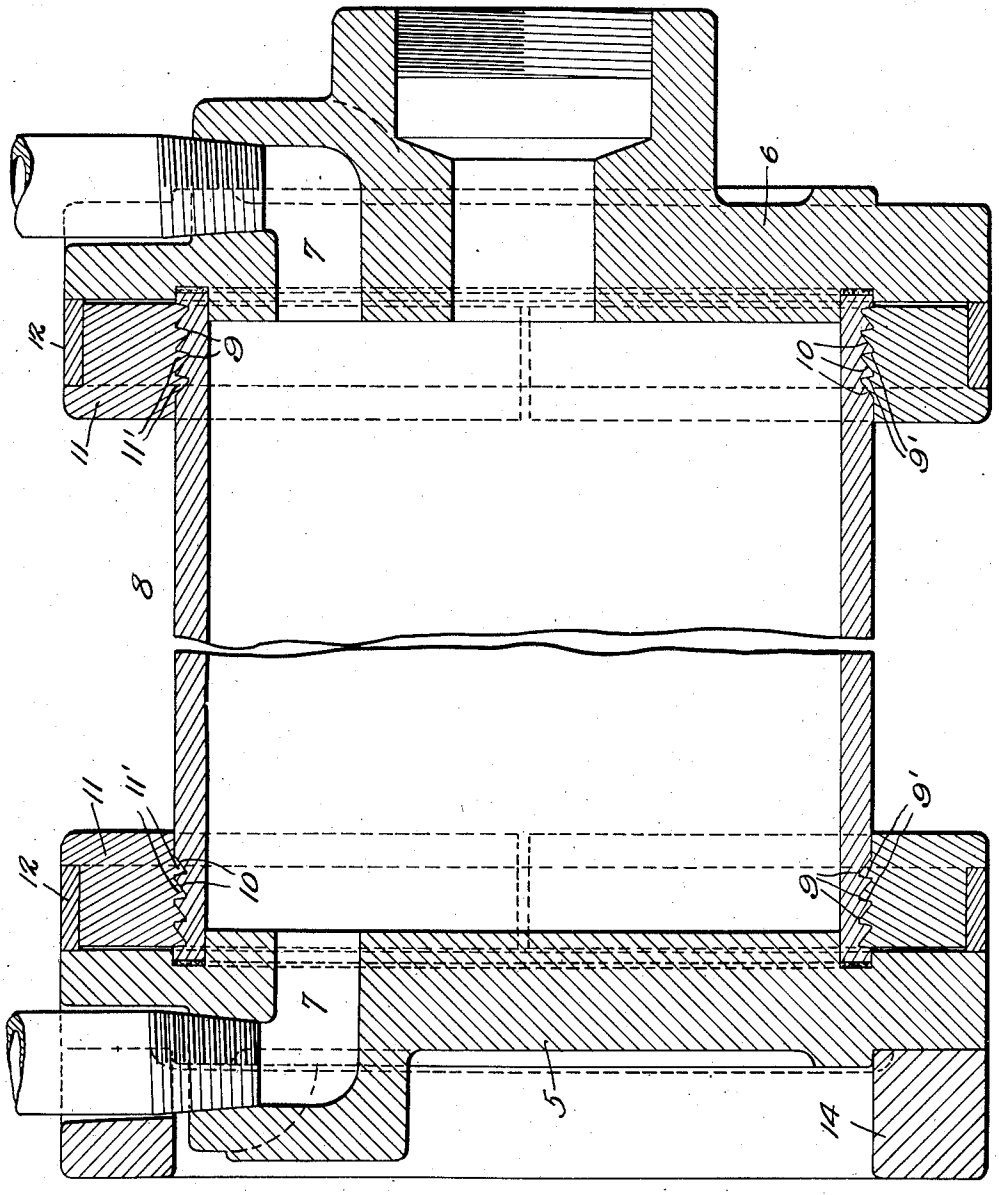


Fig. 1.

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CYLINDER CONSTRUCTION

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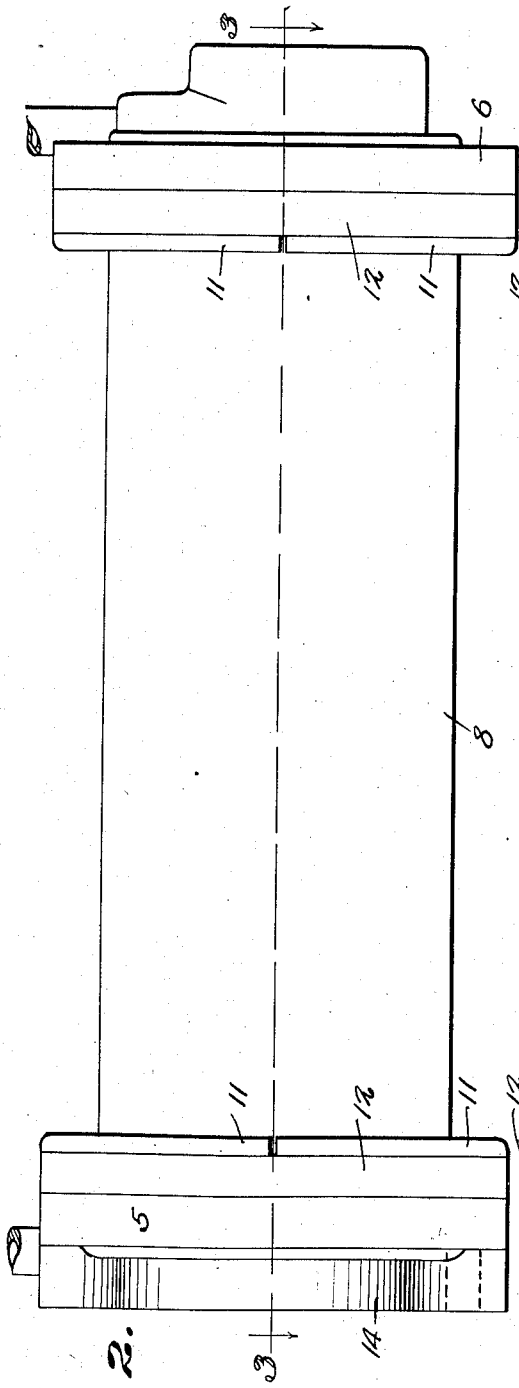


Fig. 2.

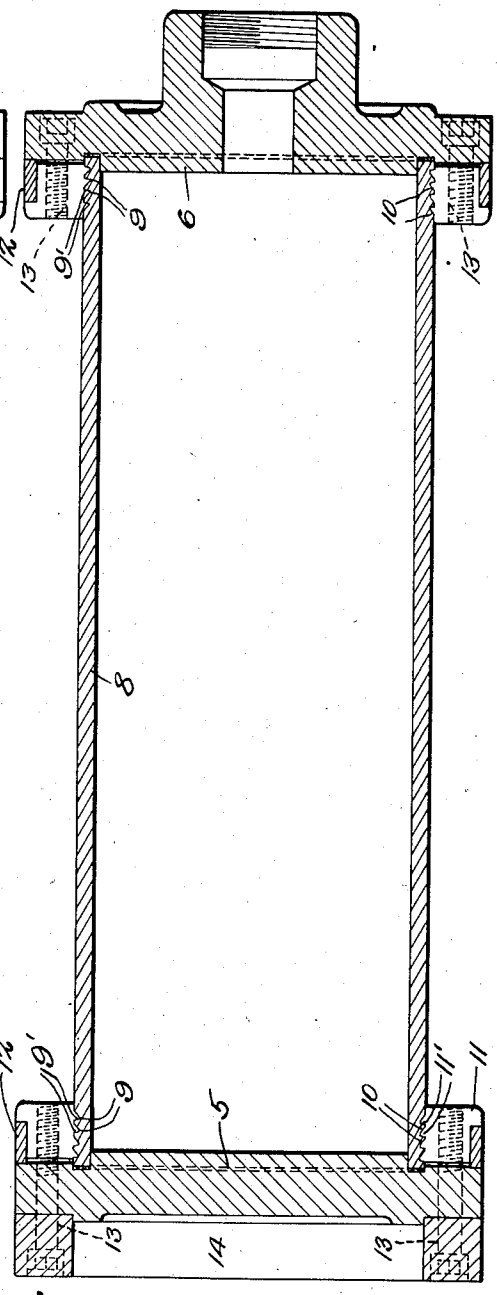


Fig. 3.

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CYLINDER CONSTRUCTION

Filed Jan. 24, 1944 3 Sheets-Sheet 3

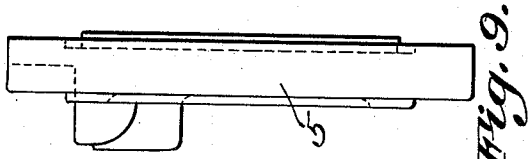


Fig. 9.

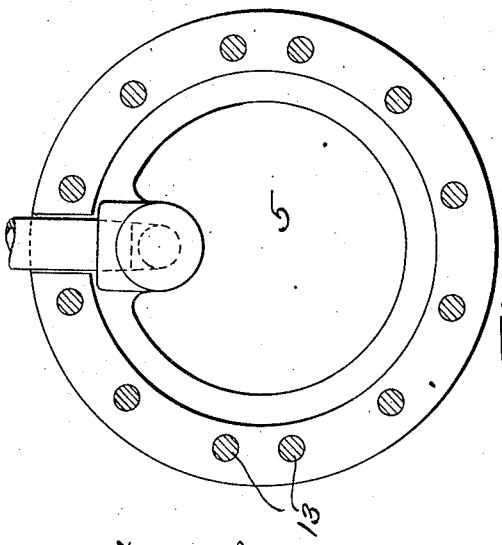


Fig. 5.

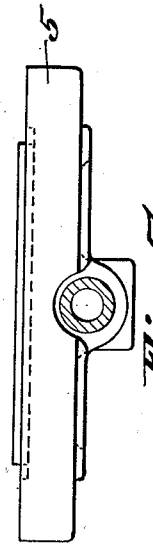


Fig. 7.

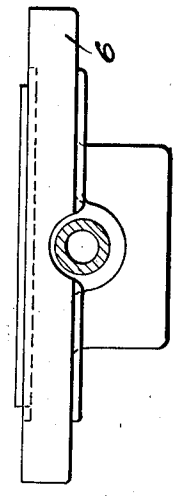


Fig. 8

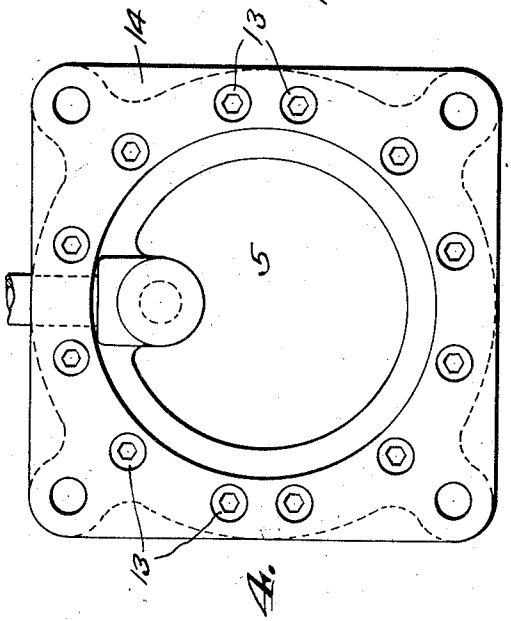


Fig. 4.

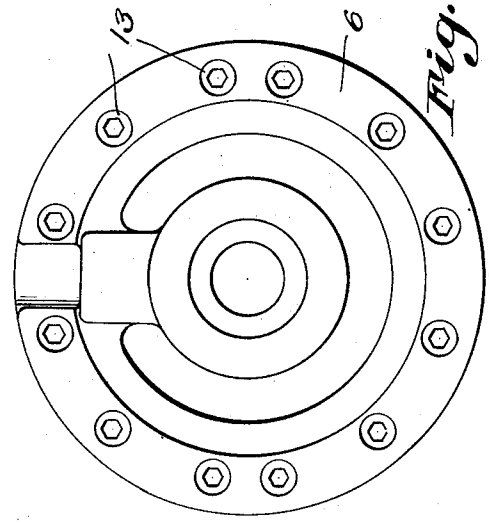


Fig. 6.

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Patented Nov. 7, 1944

2,362,241

UNITED STATES PATENT OFFICE

2,362,241

CYLINDER CONSTRUCTION

Allan M. Campbell, Detroit, Mich.

Application January 24, 1944, Serial No. 519,507

4 Claims. (Cl. 309—2)

This invention relates to cylinder construction, the primary object of the invention being to provide means whereby the cylinder heads of a cylinder may be secured in position, eliminating tie-rods, screw threads between the heads and cylinder, or the welding method commonly used in cylinder construction.

With the foregoing and other objects in view which will appear as the description proceeds, the invention consists of certain novel details of construction and combinations of parts hereinafter more fully described and pointed out in the claims, it being understood that changes may be made in the construction and arrangement of parts without departing from the spirit of the invention as claimed.

Referring to the drawings:

Figure 1 is a longitudinal sectional view through a cylinder constructed in accordance with the invention.

Figure 2 is an elevational view thereof.

Figure 3 is a sectional view taken on line 3—3 of Fig. 2.

Figure 4 is an end elevational view.

Figure 5 is a sectional view through the cylinder end.

Figure 6 is an elevational view illustrating the opposite end of the cylinder.

Figure 7 is an edge elevational view of the form of cylinder end as shown by Fig. 4 of the drawings.

Figure 8 is an edge elevational view of the cylinder end as shown by Fig. 6 of the drawings.

Figure 9 is an edge elevational view, taken at right angles to Fig. 7.

Referring to the drawings in detail, the cylinder includes end sections 5 and 6. The end sections are formed with inlet ports 7. The end sections or cylinder heads 5 and 6 are formed with annular grooves, disposed in the inner surfaces thereof, which annular grooves receive the ends of the cylinder with which the cylinder heads are used, the cylinder in the present showing being indicated by the reference character 8. Gaskets are held within the grooves, and the ends of the cylinder are forced into close engagement with the gaskets, providing an air-tight connection between the main cylinder and cylinder heads.

The surface of the cylinder, at both ends thereof, is formed with series of annular grooves 9. The annular grooves 9 present straight annular shoulders 9' and inclined surfaces 10 that receive the correspondingly formed ribs 11' on the sectional ring members 11, which are shown as positioned on the cylinder. The ring sections are positioned on the ends of the cylinder 8 and clamped in position by the clamping rings 12. Rings 12 provide retaining members for the sections of the rings 11 to hold the sections in position against the cylinder.

The cylinder heads 5 and 6 are formed with bores that accommodate the bolts 13, which bolts also pass into thread bores of the sectional ring members 11, as clearly shown by Fig. 3 of the drawings.

Thus it will be seen that due to this construction, the cylinder heads will be drawn into close engagement with the ends of the cylinder, when the bolts 13 are rotated to secure the heads.

The bolts 13 at one end of the cylinder, also pass through openings into ring 14, the openings of the ring 14 aligning with the bolt openings in the head with which the ring member 14 is used.

From the foregoing it will be seen that due to the construction shown and described, I have provided a cylinder designed primarily for use as air or hydraulic cylinders, wherein connecting rods which are usually employed for drawing the cylinder heads toward each other, are eliminated. By this construction, the heads are firmly held to the cylinder, eliminating excessive weight and materials.

What is claimed is:

1. A cylinder construction, comprising a body portion having a plurality of annular grooves formed in the outer surface thereof adjacent to its ends, sectional ring members having ribs, fitted within the grooves, and having a plurality of screw-threaded bolt openings, rings in which said sectional ring members are held, cylinder heads having annular grooves in which the ends of the body portion are positioned, and a plurality of bolts extending through said heads, the inner thread ends of said bolts being disposed in the bolt openings of the sectional ring members, and adapted to draw the heads into close engagement with the ends of the body portion.

2. A cylinder construction, comprising a cylindrical body portion, sectional ring members removably secured to the ends of the cylindrical body portion, interlocking means between the sectional ring members and body portion, bands fitted over the sectional ring members adapted to hold the sections of the ring members together, cylinder heads fitted over the ends of the cylindrical body portion, said cylinder heads having openings, said sectional ring members having openings adapted to align with the openings of the cylinder heads, bolts extending into the align-

ing openings, and said bolts adapted to draw the cylinder heads into close engagement with the ends of the cylindrical body portion, securing the heads to the body portion.

3. A cylinder construction comprising a cylindrical body portion having grooves formed adjacent to its ends, a sectional ring member, ribs extending inwardly from the ring member and adapted to fit within the grooves of said cylindrical body portion, a retaining ring fitted over each ring member and adapted to hold the sections of the sectional ring member together, cylinder heads, said cylinder heads and sectional ring members having aligning openings, and bolts extending through said aligning openings and adapted to draw the cylinder heads into close engagement with the ends of the cylindrical body portion, securing the heads to the ends of the body portion.

4. A cylinder construction comprising a body portion of cylindrical formation, a sectional ring member fitted on each end of the body portion, means for removably securing the sectional ring members in position on the body portion, a cylinder head fitted against each end of said body portion, said sectional ring members and cylinder head having aligning bolt openings, and bolts adapted to extend through the aligning openings for drawing the cylinder heads into close engagement with the ends of the body portion.

ALLAN M. CAMPBELL.