June 23, 1931. J. G. HODGE 1,811,012

PISTON PACKING

Filed Nov. 28, 1930

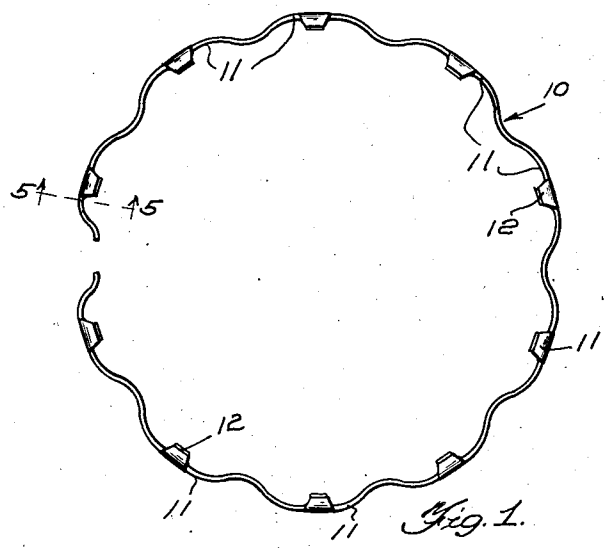


Fig. 1.

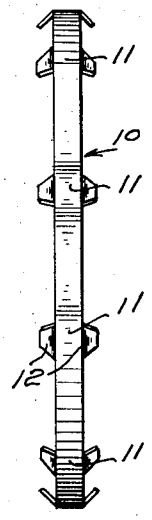


Fig. 2.

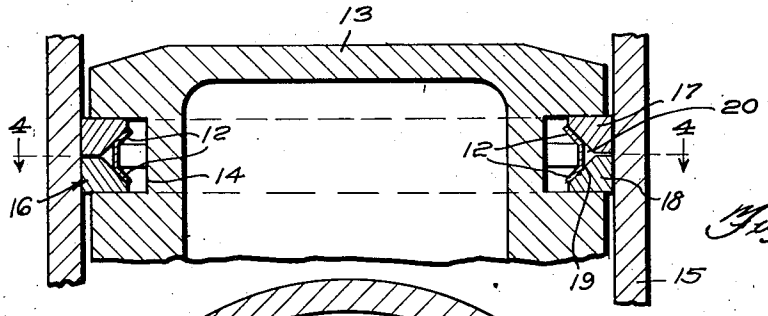


Fig. 3.

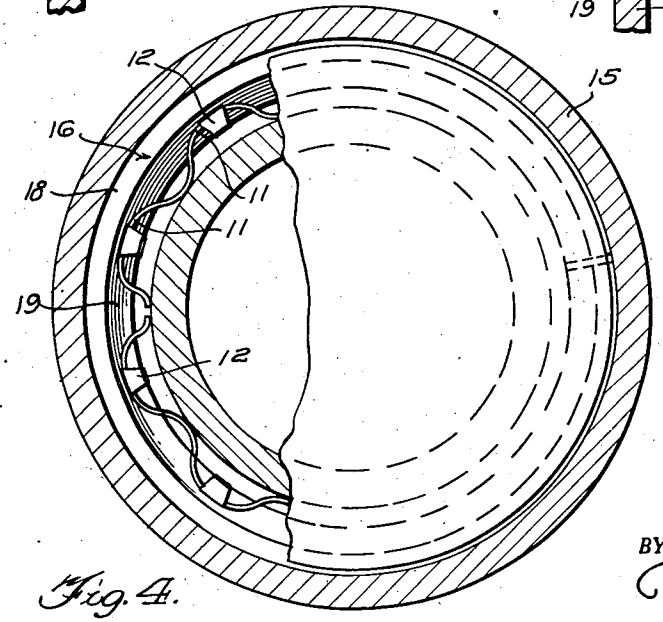


Fig. 4.

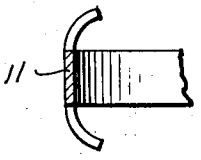


Fig. 5.

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UNITED STATES PATENT OFFICE

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PISTON PACKING

Application filed November 28, 1930. Serial No. 498,851.

This invention relates to an improvement in piston packing, and has particular reference to metallic expanding means for such packing whereby a substantially gas-tight joint is assured between the piston and the walls of its cylinder.

The particular type of expander employed is adapted for use with a two-part split ring, whose inner meeting edges are beveled for forming jointly a V-shaped groove.

An object of the invention is the provision of a ring expander formed from a single piece of spring metal and so shaped as to engage both the V-shaped groove of the ring and the bottom of the ring groove in the piston, and adapted, when in use, to exert an outward and lateral pressure upon the ring, whereby the ring sections will firmly engage both the cylinder wall and the ring lands.

Another object of the invention is the extreme simplicity of the device, the cheapness of manufacture, and its high efficiency in use.

Other important objects and advantages of the invention will be apparent during the course of the following description, reference being had to the accompanying drawings.

Referring to the drawings:

Figure 1 is a plan view of a ring expander constructed in accordance with the invention,

Figure 2 is an edge view thereof.

Figure 3 is a vertical section of a piston and cylinder, parts in elevation, and showing the device in use.

Figure 4 is a fragmentary horizontal section taken on line 4—4 of Figure 3, and,

Figure 5 is a section taken on line 5—5 of Figure 1, illustrating a slight modification of the invention.

Referring, specifically, to the drawings, the numeral 10 designates a ring expander formed from a single flat strip of flexible spring metal, and shaped to conform generally to a ring having free ends. The expander is provided throughout its length with a plurality of equi-distantly spaced humps 11, having pairs of lateral integral extensions 12. The extensions 12 are bent inwardly at substantially 45° angle. The extensions 12, as clearly shown are relatively narrow, and are inclined at an abrupt angle from the flat face of the humps 11.

The numeral 13 designates a piston, having piston grooves 14, as is customary. The piston has sliding movement within a cylinder 15. Mounted within the grooves 14, are metallic packing rings 16, each complete ring comprising a pair of companion ring sections 17 and 18, having flat sides. The inner vertical walls of the rings 17 and 18 are beveled, as at 19, forming jointly a V-shaped groove 20. The outer vertical walls of the rings engage the wall of the cylinder.

In use, the expander ring 10 is placed within the groove 14, and the ring sections 17 and 18 fitted into the groove over the ring 10, in the usual manner. This action causes the several humps 11 to engage within the V-shaped groove 20 but spaced from the apex of the groove with the extensions 12 engaging the inclined walls, thereof. The valleys between the humps 11 obviously will engage the vertical wall of the groove.

The constant pressure upon the ring sections 17 and 18 is assured by reason of the spacing of the expander from the apex of the groove, permitting of the outward movement of the humps 11 as the rings become worn both upon their faces and sides.

From the foregoing, it will be seen that with the use of the expander above described, a ring of the character shown will be given a constant pressure outwardly, and laterally, to provide a good oil-tight bearing on the cylinder wall, and an equally good bearing of the outer flat faces of the ring sections 17 and 18, upon their respective lands.

If desired, the extensions 12 may be curved, as shown in Figure 5.

It will be apparent, therefore, that a highly efficient ring and expander has been provided. The constant outward and lateral pressure exerted on the ring sections will insure of a positive oil-tight joint, both between the face of the ring, and the ring lands. Heretofore, oil has been permitted to pass around the back of the ring, due to wearing of the lands, resulting in an up and down movement of the ring in its groove. The expander of the present invention will ef-

fectively overcome this objection. The equal spacing of the humps 11 will, likewise, insure of an equal pressure upon the ring sections throughout their circumference. The relatively long curve of the humps 11 will exert a maximum of outward pressure upon the rings 17 and 18 while the relatively narrow extensions 12 will insure a sufficient lateral pressure upon the rings for a proper seating upon their respective lands.

It is to be understood that the invention is not to be limited to the precise construction set forth, but that it includes within its purview whatever changes fairly come within either the terms or the spirit of the appended claim.

Having described my invention, what I claim is:

A corrugated piston ring expander comprising a body formed of a strip of flat spring sheet metal provided with spaced inwardly extending divergent wings connected to the opposite side edges of the body at their inner ends and having their outer ends freely flexible with respect to the body portion of said expander.

In testimony whereof I affix my signature.

JAMES G. HODGE.