May 15, 1934. J. E. OLEN 1,958,638

EXPANSION RING AND TOOL FOR CONTRACTING SAME

Filed July 19, 1932 2 Sheets-Sheet 1

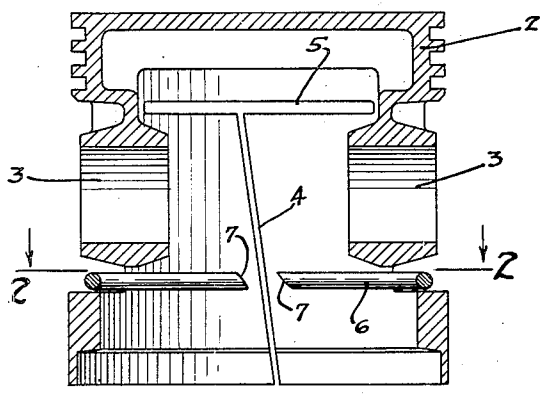


Fig. 1

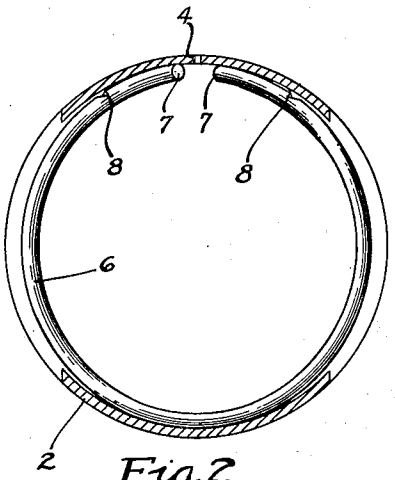


Fig. 2

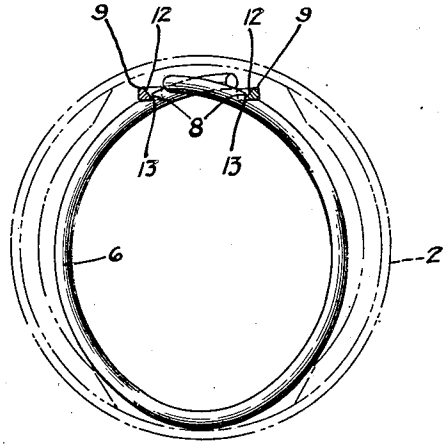


Fig. 4

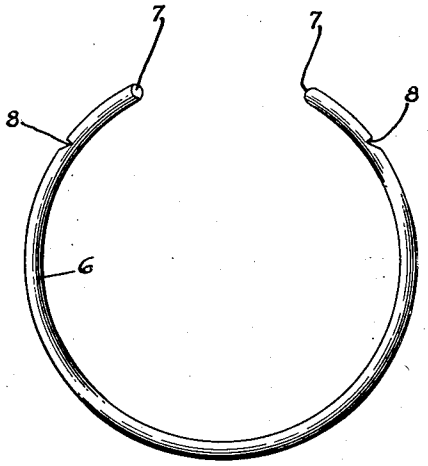


Fig. 3

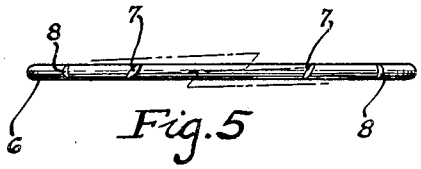


Fig. 5

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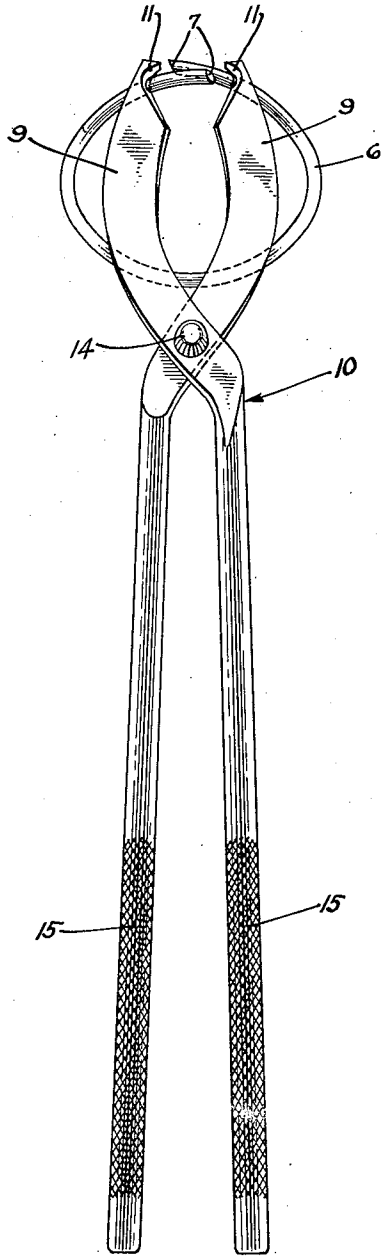


Fig. 6

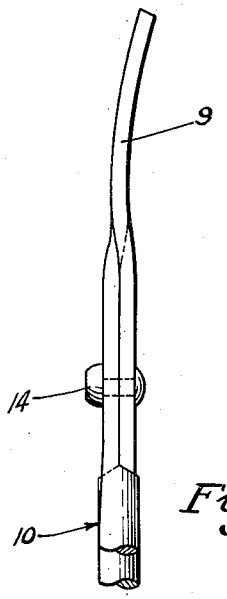


Fig. 7

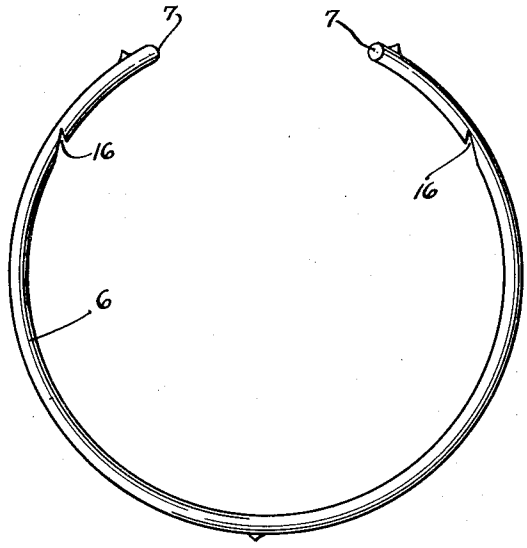


Fig. 8

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UNITED STATES PATENT OFFICE

1,958,638

EXPANSION RING AND TOOL FOR CONTRACTING SAME

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Application July 19, 1932, Serial No. 623,322

4 Claims. (Cl. 309—12)

This invention relates to an improved expansion ring particularly adapted for use in connection with a split piston to expand the walls thereof.

An object of the invention is to provide a novel expansion ring adapted to be inserted into a split piston to expand the walls thereof against the walls of the cylinder bore, and said ring having suitable notches in the periphery thereof adjacent to its ends adapted to be engaged by a suitable tool for contracting the ring, so that it may be conveniently inserted into a piston.

A further object is to provide an expansion ring of circular cross-section having notches cut in the outer surface thereof, and the ends of said ring being beveled in the same direction to permit said ends to pass one another when the ring is contracted.

A further object is to provide an expansion ring of the character described having means in the exterior surface thereof adapted to engage the walls of a piston to secure the ring against relative movement in the piston, and also whereby said ring may be conveniently contracted for insertion into the piston.

A further object is to provide an improved tool particularly designed for use to contract an expansion ring of the character above described, whereby the ring may be conveniently contracted and retained in such position while being inserted into a piston.

A further object is to provide an improved tool for contracting an expansion ring having suitable notches provided in the outer periphery thereof, and said tool comprising a pair of jaws having recesses therein provided with sharpened edges adapted to engage the bottoms of the notches in said ring, so that when the jaws are actuated, said ring will be contracted and may be supported in such position by the jaws while being inserted into a piston.

Other objects of the invention will appear from the following description and accompanying drawings and will be pointed out in the annexed claims.

In the accompanying drawings, there has been disclosed a structure designed to carry out the various objects of the invention, but it is to be understood that the invention is not confined to the exact features shown as various changes may be made within the scope of the claims which follow.

In the drawings:

Figure 1 is a cross-sectional view of a piston showing the improved ring positioned therein;

Figure 2 is a sectional plan view on the line 2—2 of Figure 1.

Figure 3 is a view showing the ring removed from the piston;

Figure 4 is a detail view showing the ring contracted so that it may be inserted into a piston;

Figure 5 is a side elevation of the ring, the full lines showing it in normal expanded position, and the dotted lines indicating relative positions of the ends of the ring when the latter is contracted;

Figure 6 is a view showing an improved tool adapted for use to contract the ring;

Figure 7 is a detail view showing the preferred shape of the jaws of the tool; and,

Figure 8 is a view showing a ring provided with notches on the inner side thereof, and also having means in the exterior surface thereof for securing the ring in the piston.

In the selected embodiment of the invention here shown, there is illustrated, for purposes of disclosure, a piston 2 of ordinary construction, provided with the usual wrist pin bearings 3, and having a slot 4 cut in a wall thereof which communicates with a horizontally disposed slot 5 provided at the upper portion of the piston. These slots are well-known to the automobile trade, and provide means whereby the walls of a worn piston may be expanded to substantially fit the bore of the cylinder in which it is mounted.

The novel ring herein disclosed comprises a body portion 6, preferably made from spring steel wire, and bent as shown in Figure 3. The ends 7 of the wire or body 6 are preferably beveled as shown in Figure 5, so that when the ring is contracted, said end will engage and pass one another, as indicated by the dotted lines in Figure 5.

An important feature of the invention resides in the means provided to facilitate contracting the ring, and whereby it may be supported in a contracted position while being inserted into the piston. The means herein disclosed for thus facilitating contracting the ring, consists of suitable notches 8—8, preferably cut in the outer surface of the ring adjacent to the ends thereof, as shown in Figure 3. The walls of the notches 8 adjacent to the ends of the ring, are preferably radially disposed, as shown in Figure 3, and are adapted to be engaged by the jaws 9—9 of a suitable tool 10, best shown in Figures 6 and 7.

The jaws 9 of this tool are shown provided with recesses 11, the walls of which are beveled, as indicated at 12 in Figure 4, so as to provide knife edges 13 adapted to engage the bottoms

of the notches 8—8, as clearly illustrated in Figure 4. The jaws 9 are preferably shaped as shown in Figures 6 and 7, and are pivotally connected together by a pivot pin 14. Each jaw has a handle 15 whereby said jaws may be conveniently operated to contract the ring as will readily be understood by reference to Figure 6.

By shaping the jaws, as shown in Figures 6 and 7, when the tool is engaged with a ring and the latter is contracted as shown in Figures 4 and 6, the ring may readily be supported by the tool in such a manner that it may conveniently be inserted into a piston without danger of the ring accidentally becoming disengaged from the tool, and also without removing the piston from the cylinder block. This may readily be accomplished when the oil pan is removed from the crank case, as the ring may then be slipped over the connecting rod while in its normal expanded position, as shown in Figure 5, after which the tool is engaged with the ends thereof and contracted as shown in Figure 6, whereupon the ring may readily be inserted into the lower portion of the cylinder to assume the position shown in Figure 1.

By notching an expansion ring as herein disclosed, the ring may readily and quickly be contracted, by the novel tool shown in Figure 6, whereby the operation of inserting the rings in the pistons of an engine is greatly expedited.

Figure 8 illustrates a ring of slightly different construction, wherein notches 16 are provided in the inner surface of the ring. When the notches are thus provided upon the inner side of the ring, it may be necessary to slightly change the shape of the jaws 9 of the tool so that they may engage the notches without slippage. In this Figure I have also shown the ring provided with means for securing it to the walls of the piston so as to prevent it from relatively moving with respect thereto. Such means may consist of a plurality of pointed or sharpened protuberances 17, provided in the exterior surface of the ring so that they may frictionally engage, or bite into the wall of the piston to thereby secure the ring in place therein.

I claim as my invention:

1. An expansion ring having notches in its periphery adapted to receive a suitable tool for contracting the ring, said notches being spaced from the ends of the ring whereby said ends may pass each other when the ring is contracted, and the walls of said notches on the sides thereof towards the ends of the ring being substantially radially disposed whereby they may readily be engaged by a tool.

2. An expansion ring having V-shaped notches therein adapted to receive a suitable tool for contracting the ring, said notches being spaced from the ends of the ring whereby said ends may pass each other when the ring is contracted, and the walls of said notches on the sides thereof towards the ends of the ring being substantially radially disposed whereby they may readily be engaged by a tool.

3. An expansion ring for expanding the walls of a split piston, said ring having notches in its periphery adjacent to the ends thereof, and the ends of said ring being beveled whereby they will pass one another when the ring is contracted.

4. An expansion ring for expanding the walls of a split piston, said ring being of circular cross section and having notches in its periphery adjacent to the ends thereof, and the ends thereof being beveled in the same direction to permit said ends to pass one another when the ring is contracted.

JOHN E. OLEN.