

[54] **CIRCLIP**
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Primary Examiner—Donald A. Griffin
Attorney—Richard K. Stevens et al.

[30] **Foreign Application Priority Data**
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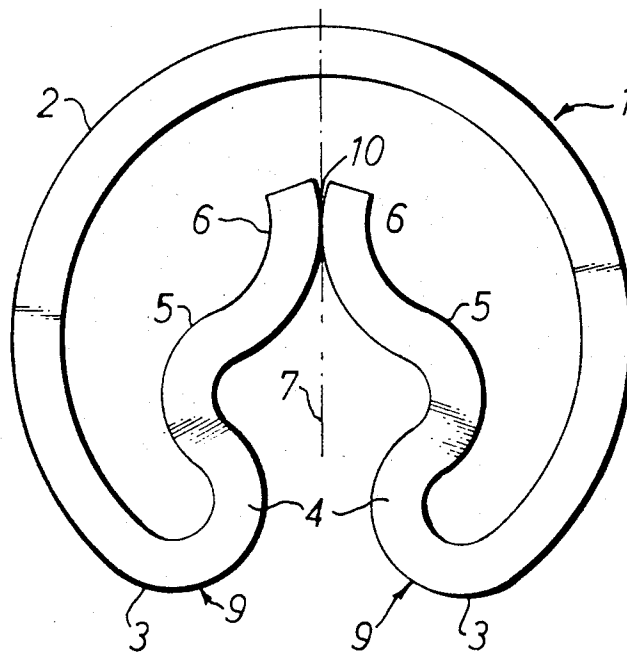
[52] U.S. Cl. 24/256, 24/137 R
 [51] Int. Cl. A44b 21/00
 [58] **Field of Search** 24/137 R, 255 C, 24/255 GC, 255 GP, 259 C, 255 P, 256, 261 PC, 261 N, 261 GC, 261 GF, 139, 67.9, 261 G, 261 R, 255, 261

[57] **ABSTRACT**

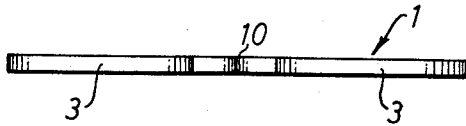
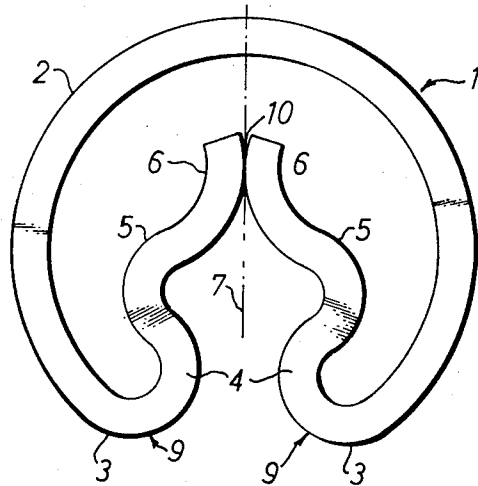
The invention comprises a circlip including a part-ring shaped body part with its end turned inwardly to form a pair of internal integral legs spaced apart where they turn inwardly and in back-to-back contact at their ends. The arrangement is such that three stressed working points of re-assertion are provided in triangular relationship.

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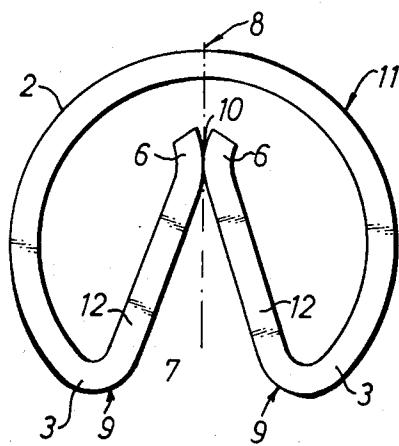
7 Claims, 4 Drawing Figures



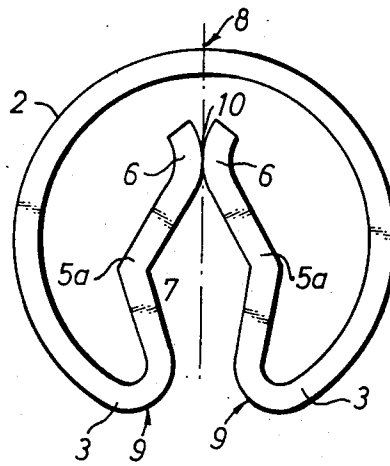
---FIG.1---



---FIG.2---



---FIG.3---



---FIG.4---

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CIRCLIP

This invention relates to circlips.

It is recognised that circlips of uniform material cross section in general have one stressed working point of re-assertion at the centre of the clip opposite to its gap. For this reason circlips are often increased in section in this region. Due to this single regional stress the working life of a clip can be curtailed particularly if the clip is closed and opened several times.

According to the present invention a circlip comprises a part-ring shaped body part having its ends turned inwardly to form integral internal legs in the same plane as the body part, said legs being spaced apart to form a gap between the root parts of the legs while the inner ends butt together back-to-back.

Said leg ends may be shaped to provide a rolling pivotal contact for the legs to act as levers to facilitate the springing open of the circlip to rest after the application of a closure force.

The spring steel wire or strip forming the circlip may be of substantially constant sectional size throughout.

The improved circlip provides three stressed working points of re-assertion.

Embodiments of this invention are shown in the accompanying drawings in which:

FIG. 1 is a face view of one form of improved circlip;

FIG. 2 is an edge view of FIG. 1;

FIG. 3 is a face view of a modified circlip; and

FIG. 4 is a face view of a further modified circlip.

The circlip 1 (FIGS. 1 and 2) is made of spring steel wire or strip with the part-ring shaped body part 2 made to a predetermined radius. This radius is shortened for the shoulder parts 3 which then turn inwardly at 4 in a much smaller curve to continue in opposite undulating form to produce inwardly directed legs 5 in the same plane as the said body part. Such internal legs are of double bend formation with their two terminal parts 6 butted together on the centre line 7 of the circlip in back-to-back arrangement.

The above circlip provides the usual stressed point 8 and it also provides two complementary stressed points 9 so that there is a total of three stressed working points of re-assertion. The additional points 9 are provided because of the internal leg arrangement which produce a rolling pivotal point at 10 where they are in contact and thus the legs 5 act as levers during flexion of the circlip.

The above circlip 1 can be modified to form a circlip 11, as shown in FIG. 3, by making the internal legs 12 straight between the shoulder parts 3 and curved back-to-back parts 6. Here again three stressed working points of re-assertion are provided.

In FIG. 4 the internal legs 5a are generally similar to those shown in FIG. 1 but made angular between the parts 3 and 6 with a similar result. The ends 6 may be shaped to form two contacting rounded noses.

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It will be understood that although the illustrated circlips have a constant section throughout, the section may vary such as by being increased in the region 8 in known manner.

The improved circlips can be made in a range of sizes.

What I claim is:

1. An internal circlip formed of spring steel and comprising a part-ring shaped body part, said part having its ends turned inwardly at shoulder regions in the form of a pair of integral internal co-operative legs extending beyond the centre of the body, said legs lying in the same plane as the body part and being spaced apart at their juncture with said body part to form a gap variable when the circlip is flexed, said legs having parts adjacent their inner ends with complementary curved faces in butt contact with one another so that said leg ends provide rolling pivotal contact when the body is compressed whereby the legs will act as levers to facilitate the springing open to rest of the circlip when it is released from compression.

2. A circlip according to claim 1, wherein the internal legs have curved shoulders where they join the circlip body, said shoulders being equally spaced on each side of a radial line extending from the circlip centre.

3. A circlip according to claim 1, wherein the legs are of opposite undulating formation.

4. A circlip according to claim 1, formed of spring steel wire or strip of substantially constant sectional size throughout.

5. A circlip according to claim 1, wherein the internal legs extend from their turned-in shoulders to their back-to-back curved contacting ends in the form of inclined straight parts.

6. An internal circlip formed of spring steel and comprising a part-ring shaped body, the end of said body being turned inwardly at shoulder regions in the form of a pair of side-by-side integral internal legs lying within the body and in the same plane, the ends of said legs terminating radially beyond the centre of the body, the roots of said legs at their juncture with the body forming curved shoulders spaced apart equally of a radial line, the inner ends only of said legs being in back-to-back contact with one another and curved to be capable of rolling pivotal relationship, said legs thus acting as levers and pivoting about said back-to-back contact when the circlip is compressed and then released, the circlip construction providing three stressed working points of re-assertion in triangular relationship at the normal peripheral centre of the part-ring shaped body and the two shoulder regions of juncture of the body and legs.

7. A circlip according to claim 6, wherein the three stressed points are at the normal peripheral centre of the part-ring shaped body and at the two curved shoulder regions.

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