

Aug. 22, 1939.

H. G. RENNER

2,170,290

CLINCH NUT AND METHOD OF FORMING SAME

Filed July 8, 1937

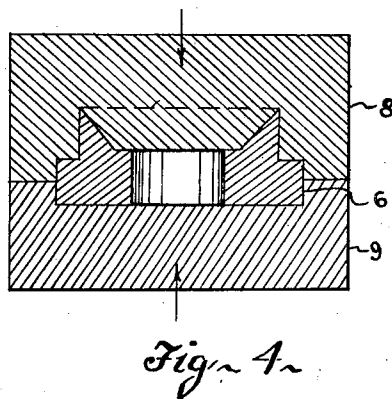
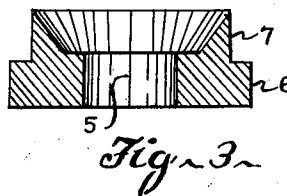
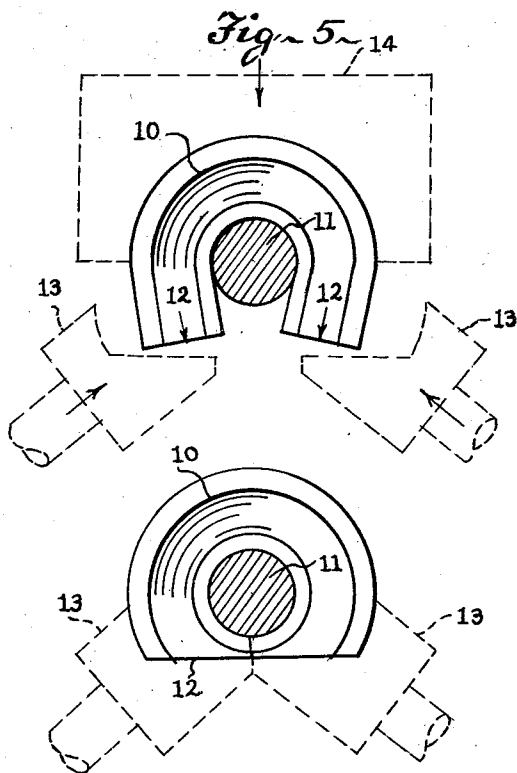
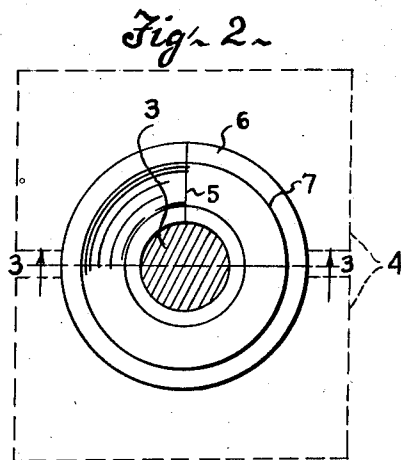
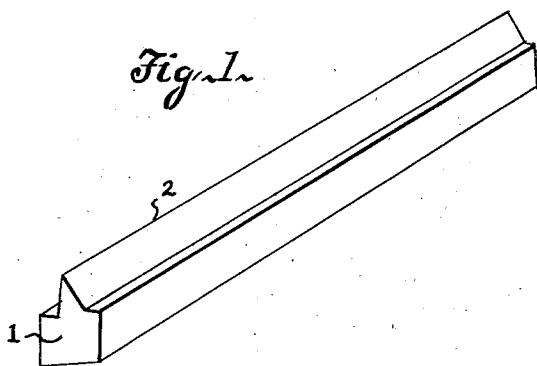


Fig. 6

Inventor
H. G. Renner

J. S. Murray
Attorney

UNITED STATES PATENT OFFICE

2,170,290

CLINCH NUT AND METHOD OF FORMING
SAME

Harold G. Renner, Detroit, Mich.

Application July 8, 1937, Serial No. 152,597

7 Claims. (Cl. 10—86)

This invention relates to clinch nuts and methods of forming such nuts.

It is common to form a nut with a reduced integral projection from a lateral face thereof, to be inserted in an opening in a sheet of metal and clinched or riveted against such sheet to secure the nut thereto. The quantity production of such nuts by methods in present industrial use requires complex automatic machinery, and involves considerable waste.

An object of the invention is to produce nuts of the described character less expensively than heretofore and without waste, by forming the riveting projection initially as a fin or rib on an extruded or rolled strip of metal, cutting such strip to suitable lengths, and rolling or otherwise bending such lengths into split rings, laterally carrying the riveting projections.

Another object is to form a flat side on a nut of the described character by bending a length of stock initially to an approximate U-shape, and thus establishing the end faces of the stock in approximately the same plane, and then pressing the ends together and at the same time establishing a definite coplanar relation between said end faces.

A further object is to correct any imperfections of the blanks resulting from the described operations, by applying die pressure to the sides thereof.

A further object is to so shape the extruded or rolled strip, in cross section, as to compensate for the tendency thereof, when rolled or otherwise bent to ring form, to increase in thickness from its outer to its inner periphery.

These and various other objects are attained by the construction hereinafter described and illustrated in the accompanying drawing, wherein:

Fig. 1 is a perspective view of a metal strip, serving as stock for the production of clinch nuts.

Fig. 2 is a top plan view of a nut blank formed from a length of said stock, sectionally showing a mandrel on which the blank is curled, and indicating curling dies.

Fig. 3 is a cross sectional view of the blank, taken on the line 3—3 of Fig. 2.

Fig. 4 is a view showing finishing dies engaging the curled blank.

Fig. 5 is a view showing a blank of a D-form, as partially curled on a mandrel.

Fig. 6 shows such blank fully curled on the mandrel.

In these views, the reference character 1 designates an elongated metal strip, approximately rectangular in cross section, but preferably tapered

slightly between two of its opposed faces, and having a riveting rib or fin 2 projecting from one of its other faces and continuously extending from end to end of the strip. The projection 2 is preferably progressively reduced in thickness as it projects from the body of the strip, one side of such projection being substantially perpendicular to the face of said body from which the projection rises, and the other being acutely angular to said face. The projection is set back from both of the aforementioned opposed faces of the strip. The described strip may be inexpensively formed by extrusion or rolling in a manner well known in the art.

In forming a circular nut, a suitable length of the strip 1 is bent about a mandrel 3 to form the split ring shown in Figs. 2 and 3. Such bending is preferably effected by a set of curling dies as indicated at 4, the bent length being such that its ends may meet radially of the ring, as at 5. The face of the stock engaged with the mandrel is that toward which the stock is tapered, in cross section. As the strip assumes a ring form 6, the rib or fin 2 assumes the form of a collar 7 projecting from a side face of the ring, the outer face of such collar being cylindrical and thus adapted to fit freely in an opening of a sheet metal member (not shown), and the inner face conically flaring as it extends from the body of the nut, so that a force applied to such face along the nut axis may upset the collar outwardly.

For some purposes, the nut will be complete, when removed from the mandrel 3 and tapped. If desired, however, pressure may be applied to the opposite faces of the curled blank by a pair of suitable dies 8 and 9, prior to tapping to eliminate any slight imperfections of shape.

In a modification of the method, illustrated in Figs. 5 and 6, an originally straight length of stock is curled to an approximate U-shape 10 on a mandrel 11, so as to bring the end faces 12 of such length into approximately the same plane. A pair of dies 13 are then advanced toward a holding die 14 from the position shown in Fig. 5 to that appearing in Fig. 6 to bring the ends of the blank into proximity and establish said end faces in a definitely coplanar relation. Thus the finished nut has its circular outer periphery interrupted by a plane face 12, which may be utilized to lock the nut against rotation.

The described method permits of quantity production of clinch nuts at a lower cost than heretofore, and the machinery required to practice the method is also less expensive than heretofore employed.

The invention is presented as including all such modifications and changes as come within the scope of the following claims.

What I claim is:

5 1. In a method of forming a clinch nut from an elongated metal strip having a riveting projection substantially coextensive in length therewith, the step of fashioning the strip into a split ring having said riveting projection at one side thereof, while imparting a substantially circular
10 form to the opening of the ring.

2. The method of forming clinch nuts from an elongated metal strip having a riveting projection continuously extending from end to end thereof, comprising cutting such strip into equal
15 lengths, and fashioning each length into a split ring having oppositely adjoined ends and having said riveting projection at one side thereof.

3. The method of forming clinch nuts from an elongated metal strip formed with a riveting projection substantially coextensive in length therewith, comprising fashioning the strip into a split ring having said riveting projection at one side thereof, and applying die pressure to the side
20 faces of the ring to accurately shape such faces and the riveting projection.

4. In a method of forming a clinch nut having a substantially annular riveting projection from a metal strip formed with a riveting projection extending substantially continuously from
25 end to end thereof and set back from one face

thereof, the step of fashioning said strip into a split ring, with said face forming the outer periphery of such ring, and said projection at one side of the ring.

5. In a method of forming a clinch nut from
5 an elongated metal strip with a riveting projection substantially coextensive in length therewith, the step of fashioning the strip into a split ring and simultaneously fashioning said projection into a riveting collar coaxial with and at
10 one side of such ring.

6. The method of forming a clinch nut from an elongated strip having a riveting projection extended lengthwise of such strip, comprising bending the strip to an approximately annular
15 form and thereby substantially abutting the ends of the strip one against the other, and forming the end portions of the strip with substantially coplanar faces chordal to the outer periphery of the annulus.
20

7. In a method of forming a clinch nut from an elongated metal strip with a riveting projection approximately coextensive with such strip, the steps of severing from the strip sufficient material to form a nut blank across which said projection extends, and fashioning the blank under
25 pressure to a desired nut form and simultaneously fashioning said projection to an arcuate form.

HAROLD G. RENNER. 30