

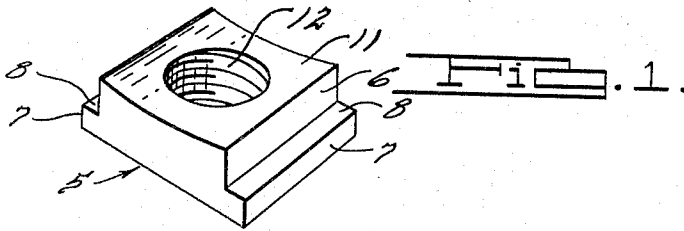
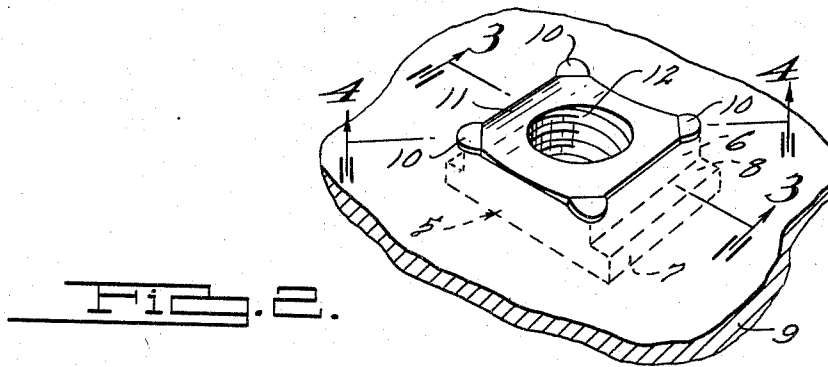
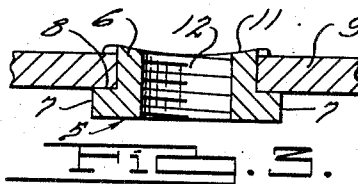
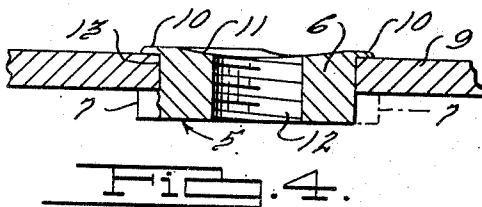
July 24, 1951

F. G. RICHARDSON

2,561,638

CLINCH NUT

Filed Aug. 6, 1948



INVENTOR.

Frederick G. Richardson.

BY

Hannus, Dickey & Pierce
ATTORNEYS.

UNITED STATES PATENT OFFICE

2,561,638

CLINCH NUT

Frederick G. Richardson, Detroit, Mich.

Application August 6, 1948, Serial No. 42,940

2 Claims. (Cl. 85—32)

1

2

My invention relates to improvements in clinch nuts which, as is well known in the art, comprise nuts that are secured to sheet metal or the like so that a bolt may be assembled thereto without the necessity of the operator holding the nut during the assembly operation.

The primary objects of my invention are simplicity of construction, economy of metal used in the fabrication of the nut, ease of assembly of the nut to a bolt and simplification of the assembly of the nut to its supporting structure.

In the accompanying drawings:

Figure 1 is a perspective view of my improved nut;

Figure 2 is a perspective view of the nut as assembled to a piece of sheet metal, parts of the sheet metal being broken away beyond the confines of the nut and parts of the clinch nut being shown in dotted lines;

Figure 3 is a sectional view taken on line 3—3 of Figure 2; and

Figure 4 is a sectional view taken on line 4—4 of Figure 2.

My improved nut comprises a base portion 5 having a flat-sided rectangular nut portion 6 extending upwardly from the base and intermediate the ends thereof so as to provide the two end portions 7, having flat upper faces 8. When assembling the nut to a piece of sheet metal or the like, designated as 9, a hole 13 is provided in the sheet metal of approximately the same size and shape as the outside of the nut portion 6 and the four corners of the nut portion 6 are upset or struck-over as at 10, so that the nut is securely held in place between the struck-over portions 10 and the flat surfaces 8.

Clinch nuts of this general type are old in the art as shown, for instance, in United States Patent No. 2,110,039 to Double, but my clinch nut has certain definite and decided advantages over the one shown in the said Double patent.

My improvements largely flow from the fact that in the formation of my nut the upper face of the nut portion is provided with an arcuate concavity extending across the upper face of the nut. The nut portion is provided with a screw threaded bolt receiving hole 12 and the upper end of the hole lies within the arcuate portion of the free end of the nut portion. The concavity effects material savings in metal over the nut of uniform thickness shown in the Double patent, and the total saving of metal thus effected is quite large when consideration is given to the enormous quantities of these nuts which are used. The extension of the screw threaded

hole into the concavity also makes for a simpler and easier assembly of the bolt in that the bolt is better centered for engagement with the screw threads. Moreover, the assembly of the nut portion to its sheet metal support is materially facilitated because the concavity thins the cross section of metal along the free edges of the nut portion, thus making it easier to upset the metal in the four corners of the nut portion than is true in the case of a nut of uniform thickness. I have found the nut to be equally as strong and reliable with the reduced quantity of metal used, as a triangular bracing effect is provided between the edges of the nut and the screw threads of the opening in the center thereof.

It will readily be seen that my improved clinch-nut lends itself to manufacture by upsetting or drawing processes from bar, rod or wire stock, wherein the desired formation may be obtained without waste of material and, after forming in a continuous piece, a number of clinch-nuts may be cut from a single piece.

Nuts of the type shown in the said Double patent have been known and manufactured for many years—the same type of nut having been shown in other and previous patents, but I believe my construction has for the first time brought out the simplest, most economical and easiest to assemble of any nut of this character.

Having thus described my improved construction and the advantages thereof, what I claim is,

1. A plate and nut assembly comprising a plate having a substantially square opening therein, and a clinch nut having lateral shoulder means engageable with one side of said plate and a substantially square projection extending into said square opening, the entire top of said projection conforming with a portion of the surface of a cylinder so as to provide said top with an arcuately concave recess, said clinch nut having a threaded opening substantially centrally thereof and extending thereinto from the bottom of the arcuately concave recess of said top, said projection also having relatively elevated substantially parallel top edge portions on opposite sides of said recess, the height of said projection between said shoulder means and the top of said relatively elevated substantially parallel edge portions of the projection being greater than the thickness of said plate and the depth of said arcuately concave recess being such that said top edge portions extend beyond the other side of the plate and are adapted to be deflected laterally into overhanging relation to said other side of the plate substantially without distortion of the portion of

3

the nut immediately surrounding said threaded opening and said nut in its clinched condition on said plate having a portion of said recess remaining in said top in surrounding relation to the end of said threaded opening.

2. A clinch nut adapted to be connected to a plate, said nut having lateral shoulder means adapted to engage one side of the plate, and having a substantially square projection adapted to extend into a similar opening in the plate, substantially the entire top of said projection conforming to a portion of the surface of a cylinder so as to provide said top with an arcuately concave recess, said clinch nut having a threaded opening substantially centrally thereof and extending thereinto from the bottom of the arcuately concave recess of said top, said projection also having relatively elevated substantially parallel top edge portions on opposite sides of said recess, the height of said projection between said shoulder means and the top of said relatively ele-

4

vated substantially parallel edge portions of the projection being greater than the thickness of the plate and the depth of said arcuately concave recess being such that said top edge portions will extend beyond the other side of the plate and are adapted to be deflected laterally into overhanging relation to said other side of the plate substantially without distortion of any portion of the nut immediately surrounding said threaded opening.

FREDERICK G. RICHARDSON.

REFERENCES CITED

15 The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,281,699	Langmaid et al. _____	May 5, 1942
2,310,316	Renner _____	Feb. 9, 1943