Sept. 25, 1928. 1,685,262

W. R. WILEY

PROCESS OF MAKING GLAND NUTS

Filed Dec. 6, 1924

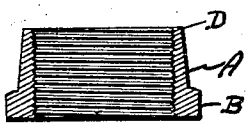


Fig. 1

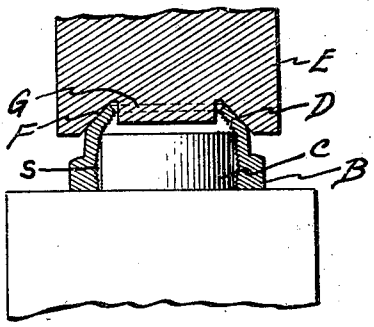


Fig. 2

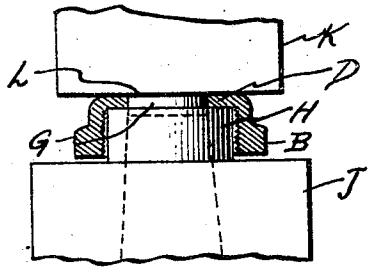


Fig. 3

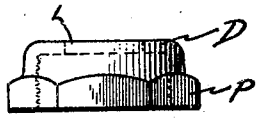


Fig. 4

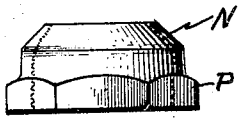


Fig. 5

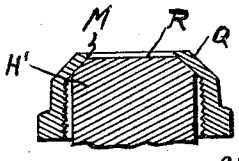


Fig. 6

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UNITED STATES PATENT OFFICE.

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PROCESS OF MAKING GLAND NUTS.

Application filed December 6, 1924. Serial No. 754,288.

This invention relates to a process of forming a nut, threaded washer or similar article, in which it is desired that one end be formed with an inwardly extending flange or overturn, which leaves a centrally disposed aperture of appreciably less diameter than the internal diameter of the threaded opposite end of the nut. Such articles have heretofore been made, but by laborious and expensive processes, both as regards the initial preparation of the rough slug, and its subsequent machining, and the object of my invention is to very appreciably reduce this cost without impairment of the efficiency or appearance of the finished nut.

In the drawings:

Figure 1 is a central sectional elevation of an interiorly threaded nut or washer, in the cheaply manufactured form furnished precedent to the process steps herein to be disclosed.

Figure 2 is an elevational view partly in section, showing the nut in position under a descending punch member, to effect the first bending.

Figure 3 is a similar elevational view of the next step in the process, showing the means employed to effect the bending over of the upper end of the nut or washer.

Figure 4 is an elevational view with its interior portions phantomed, showing a completed nut.

Figure 5 is a view similar to Figure 4, showing a nut treated only partially, because of its possibility of use thus, in some such case as the gland of a radiator valve or the like.

Fig. 6 is a sectional view of form illustrated in Fig. 5, showing the die.

The nut A as furnished, after being cheaply manufactured by means and processes now well known, is placed over the columnar projection C of a supporting die member, with its lower or collared end B at the bottom in such position that the top of the projection C rests appreciably below the top edge D of the threaded neck of the nut. In this position a power punch E is caused to descend heavily thereon, with its sloping under surface F acting on the top of the neck D to force the same inwardly. This operation, however, is often not sufficient to force the threaded interior surface of the extreme tip edge D of the neck against the top of the die projection C, and correspondingly and resultantly leaves a larger aperture between the bent over edges of the nut than it is intended that some forms at least of the finished nut should have. It is accordingly removed from the punch C, and placed over the top projection H of the die J, which is of such height that the partly deformed nut does not reach down to the top surface of the base of the die, being prevented therefrom by the overhanging of the then inbent edges of the neck D against the top or shoulders of the projection H. The plain punch K is then brought down with appropriate force upon the inwardly inclined top edges of the neck D, with such force as to complete their bending over into a plane substantially transverse to the sides of the nut and the axis thereof both as against the sides of the punch projection or sizing plug G, and as well to force the threaded interior faces of the upper portion of the neck D so heavily against the top surface of the projection H as to practically cause the threading to disappear therefrom. The now finished nut is removed from the die projection H with a top aperture L of the desired size, due to the inward bending of the neck portion D. While I have illustrated the finished nut as having hexagonal faces P, it is obvious that any desired exterior contour can be supplied in the nut as first roughly turned out, and as finished, without departure from the spirit of the disclosures herein made.

In Figure 5 I have illustrated a form of nut adapted particularly for some such use as for the packing gland about the stem of a radiator valve. In this form the finishing operation just described in connection with the die J, shown in Figure 3, is omitted, and the tapering top portion N of the walls of the nut is left to engage with its inner edges about the radiator seem, while the upper portion of the nut not occupied by the stem, may be filled with felt packing or the like, to prevent leakage.

In some instances nuts of this type last mentioned require so comparatively little of their top edge to be bent over that by the use of an appropriately shaped die such as shown in connection with a just finished nut in Figure 6 can be completed in but one punch operation. In this figure the flanges Q extend inwardly but a comparatively slight distance, as compared with the nut structures shown in Figures 2 and 3 and the central aperture R is correspondingly larger in diameter. It is also preferable in this instance to make the upstanding die projection H′ with tapered top edge as shown at M in Figure 6, in order to effect the flattening of the screw threads on the

inside face of the upper edge of the neck. The same principles of manufacturing economy hold true, however, in either case, since the threading of a cylindrical blank such as shown in Figure 1 is a comparatively inexpensive process compared with the boring out and threading of the closed or "blind" end of a slug, that when finished is designed for the same purpose as my finished nut; and either of the stamping-over processes hereinabove described adds to the cost of a finished nut thus made only a fraction of the saving effected by my process.

In following either process as above distinguished, I find by careful microscopic examination and measurements of completed nuts thus made that a slight bulging of the sides of the lower portion of the nut really takes place as a result of the subjection of the punch and die operations. I have illustrated this in exaggerated degree at S, in Figure 2. This makes easy the non-catching removal of the finished article from the supporting die projection C.

What I claim is:

1. The process of forming a partially headed nut, consisting in effecting the inward bending of the top edge of an interiorly threaded blank by pressure exerted thereon angularly to the axis of the blank contemporaneously with the rigid supporting of the base portion thereof, and thereafter pressing the bent-over portion into a plane surface perpendicular to the axis of the blank, thereby as well flattening the interior threadings initially present on the portion thus bent over.

2. The process of forming a terminally apertured cap nut, consisting in inwardly flanging the top edge of an interiorly threaded blank by pressure applied from without and acting thereon angularly to the axis of the blank, and thereafter stamping the inbent portion into a position whose plane is perpendicular to the axis of the blank, the screw threadings initially present on the portion thus treated being substantially flattened by such last named treatment.

3. The process of forming a gland packing nut from an interiorly threaded cylindrical blank, consisting in inbending the top edge thereof by the pressure thereupon of a descending member having in its under face an annular groove of corresponding peripheral size to that of the blank, the outer lateral wall of said groove being angularly inclined to cause an inward inclination of the top edge of the blank when engaged, and thereafter stamping the then inbent top edge of the blank into occupancy of a plane to which the axis of the blank is substantially perpendicular.

4. The process of forming a gland packing nut, consisting in rigidly supporting the lower end of an interiorly threaded cylindrical blank while subjecting the upper edge thereof to the applied pressure thereupon of a concaved forming member moved theretoward in axial alignment with the blank, and thereafter subjecting the portion thus inbent to further stamping action exerted lengthwise of the axis of the blank, whereby the same is forced into position of perpendicularity thereto.

In testimony whereof, I sign this specification.

WILLIAM R. WILEY.