April 13, 1926. 1,580,186

W. R. WILEY

METHOD OF MANUFACTURING CAP NUTS

Filed Feb. 9, 1922

Fig. 1

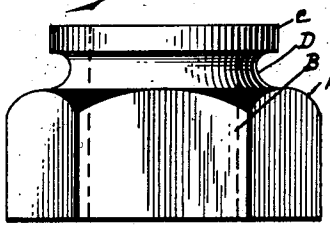


Fig. 5

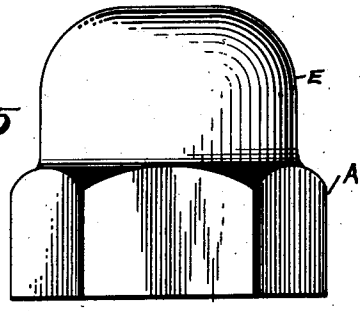


Fig. 2

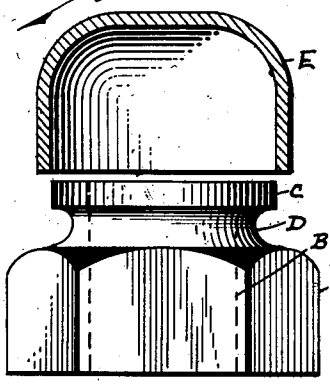
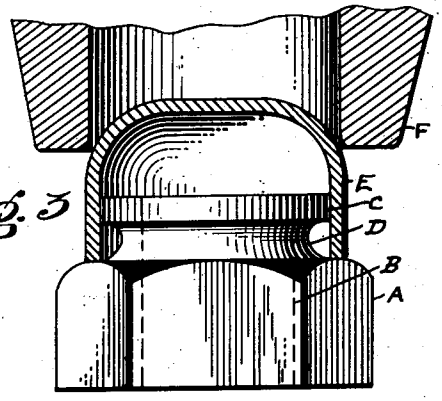


Fig. 3



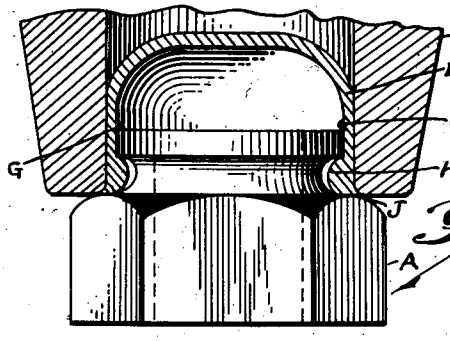
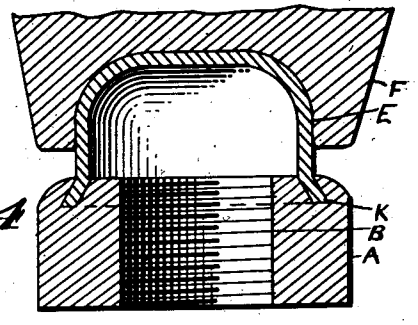


Fig. 4



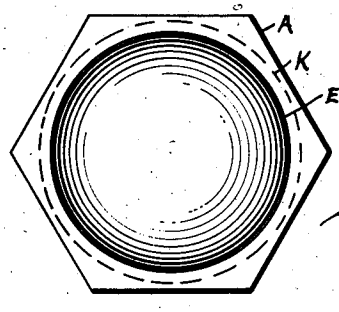


Fig. 6

Fig. 7

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UNITED STATES PATENT OFFICE.

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METHOD OF MANUFACTURING CAP NUTS.

Application filed February 9, 1922. Serial No. 535,288.

To all whom it may concern:

Be it known that I, WILLIAM R. WILEY, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in the Method of Manufacturing Cap Nuts, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to cap or "acorn" nuts, and a preferred process of manufacturing the same, and has for its object an improved article of this type, which can be made up from a centrally threaded body portion of cold-rolled steel, and a cap portion of stamped-out sheet metal, at a much less cost than is now involved in the production of unitary nuts of this type as now made entirely of cold-rolled steel, and subsequently machined to desired form at surprisingly heavy expense.

In the drawings:

Figure 1 is an elevation of the body of the nut.

Figure 2 shows the sheet metal cap in position over the nut and before being slipped over the projecting grooved collar portion thereof.

Figure 3 shows the cap in place over the collar portion, and with the clinching die in initial position with respect thereto.

Figure 4 shows the die in the position attained at the end of its stroke, and with the cap in clinching position relatively to the collar.

Figure 5 is an elevation of the completed nut as thus assembled.

Figure 6 shows a die in position upon a cap which is adapted to be locked to its nut in a slightly modified manner.

Figure 7 is a plan view from above of the type of construction illustrated in Figure 6.

Cap nuts which are made entirely from cold-rolled steel bars now require several expensive machining steps to transform the cut-off slugs of steel into the completed hexagonal nut, with the centrally threaded bore extending up into the dome; and especially if the threading is at all carelessly done, it frequently happens that when a threaded bolt is inserted therein, the tip of the bolt cannot be screwed far enough into the cap, because not sufficient material has been cut away from the interior of the dome, whose walls are of course needlessly thick, and correspondingly heavy. The greatest objection however, is the cost, both in machining operations, and in waste material from the cut.

Cap nuts have been attempted along the lines of clinching or forcing a sheet metal thimble about the hexagonal sides of a nut, and even with its edges bent under the lower edge of the nut in the attempt to clinch the cap tightly in place. This however is objectionable, not only because of the tendency to loose fit of the nut within the cap, but also because of the tendency of a wrench, when applied to the completed hexagonal faces of the cap, to tear and crack the relatively thin sheet metal.

To obviate this, I provide in the first instance a nut A, provided with the usual centrally threaded bore B, and with an upwardly projecting collar or neck C, which is preferably cut or annularly grooved, as at D. Over this I fit a cap or thimble piece E, which is of such internal diameter that it just slips over the edge of the collar C, and so that its lower peripheral edge will rest upon the top or surrounding shoulder portion of the nut A. I then place this in a die press, whose forming member F is of very slightly less internal diameter than the external diameter of the cap E. When this is forced down, it pinches the cap or dome member inwardly slightly, thus forcing a very slight shoulder or annular projection of metal against the upper edge of the collar C; this I have illustrated in exaggerated proportion at G in Figure 4. The further downward travel of the forming die continues the distortion of the metal of the cap, and as the line of pressure reaches the level of the groove B, some of the metal flows inwardly thereinto, as shown at H in Figure 4, while some of the rest tends to flow slightly outward at the very edge, as shown at J, thus effecting a sealing between the cap and the body of the nut bolt as regards exterior appearance, and space of any consequential size therebetween. The inward projections G and H interlocking with the top of the collar C on each edge

thereof, serve to hold the cap in place most efficiently, and the space within the dome of the cap is thus left of ample size for the threaded end of a bolt to project as far beyond the end of the nut as could possibly be required. The stamping of these caps in place can be effected in very rapid succession, and the loading of the cap or thimble pieces upon a nut body can be attended to by an inexperienced helper.

In Figures 6 and 7, I have illustrated a slightly modified form of construction, wherein, in place of the projecting neck C, an under-cut groove K is located in the body of the nut, the diameter and width thereof at the level of the top of the nut being exactly that of the cap, which, when first positioned therein, can reach only slightly beneath the top surface of the nut body. With the exertion of downward pressure upon the cap, due to the presence of the die F, the relatively soft sheet metal of which the cap is composed is forced to yield in the only direction which the contour of the groove makes possible, that illustrated in Figures 6 and 7, being outwardly, though the same clinching effect would be secured if the inclination of the groove were inward. When the stroke of the die has been completed, the cap is clinched in this form, the then position of the extreme peripheral edge being not only shown clearly in section in Figure 6, but indicated by dotted lines in Figure 7.

What I claim is:

The process of manufacturing a cap nut, consisting in fitting over the projecting end of a centrally threaded body portion a cupped sheet metal member of closely similar internal diameter, and subjecting the component metal of the latter to the centripetally deforming influence of an axially applied member of slightly lesser internal diameter than the initial external diameter of said cupped member, thereby pressing the edges of the latter into interlocking engagement with said projecting end of the body portion.

In testimony whereof, I sign this specification.

WILLIAM R. WILEY.