Oct. 3, 1933. J. A. EDEN, JR 1,929,164

MAKING NUT BLANK

Filed April 11, 1931

Fig. 1.

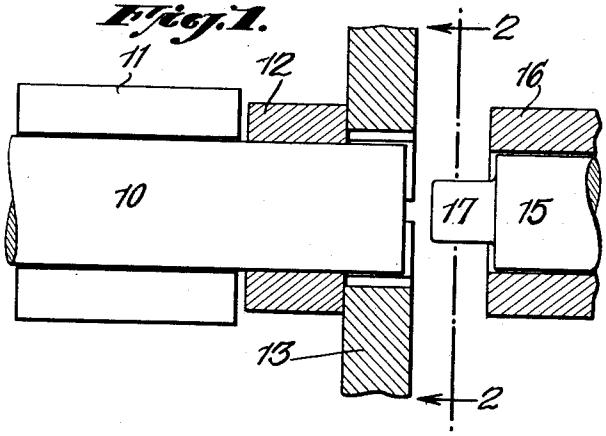


Fig. 2.

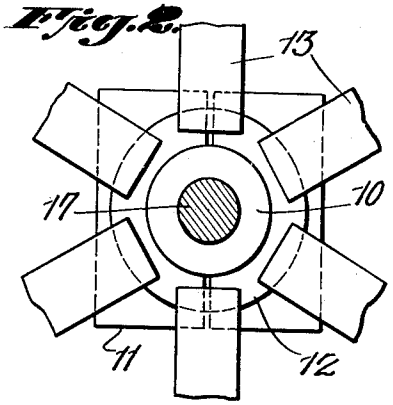


Fig. 3.

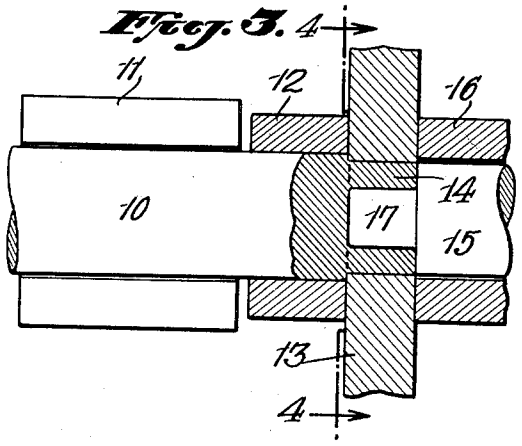


Fig. 4.

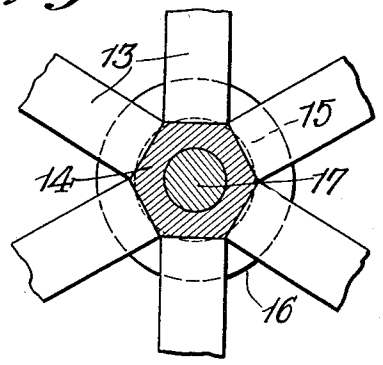


Fig. 5.

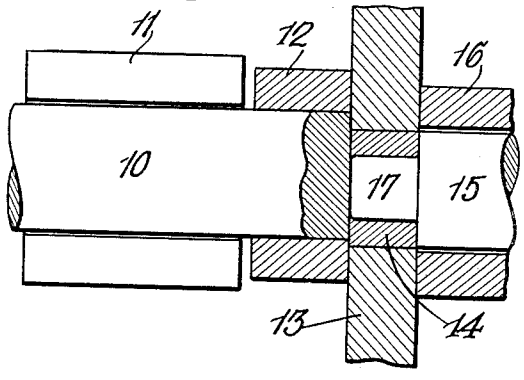
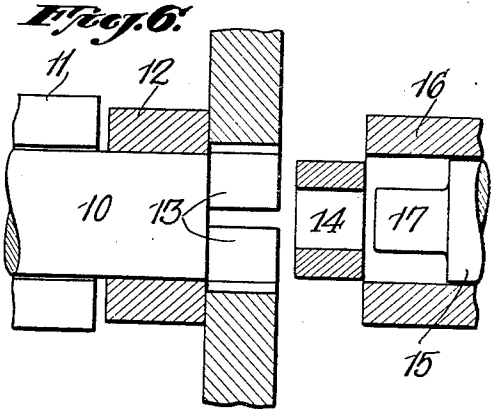


Fig. 6.



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MAKING NUT BLANK

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Application April 11, 1931. Serial No. 529,339

14 Claims. (Cl. 10—86)

The invention relates to a method of production which is economical and rapid for making nut blanks from a bar or rod, and which results in a superior blank and nut.

The accompanying drawing illustrates an embodiment of the invention.

Fig. 1 is a vertical section illustrating more or less diagrammatically the original position of the parts;

Fig. 2 is a cross-section thereof on the line 2—2;

Fig. 3 is a section similar to Fig. 1, illustrating a second stage in the operation;

Fig. 4 is a section thereof on the line 4—4;

Figs. 5 and 6 are vertical sections of succeeding operations.

The blanks are produced from a round bar 10, which is shown in Fig. 1, held by clamping blocks 11, with its end protruding through a close-fitting cut-off bushing 12. The extension beyond the bushing is substantially the thickness of the nut blank to be formed.

Located against the face of the cut-off bushing is a set of hexing slides 13 which are forced radially inward to give to the projecting portion a hexagonal periphery. Instead of the hexing slides 13, slides of other desired number and shapes may be used to clamp the end of the bar, and generally to re-shape it. Figs. 3 and 4 illustrate the position when the slides are forced inward. The end of the bar has been upset to the hexagonal shape 14.

In line with the rod and beyond the slides 13 is a punch 15 reciprocating in a holder 16. The punch has an end projection 17 which, when the punch is advanced as in Fig. 3, pierces a hole in the end of the bar. The punch is substantially flat on the point and enters the bar to a distance substantially equal to the depth of the blank to be produced.

While the shaped end of the bar is held by the slides 13 and the punch 17, it is cut off by a relative transverse movement between the slides and the punch on the one hand and the cut-off bushing 12 and clamp 11 on the other. This operation is shown in Fig. 5. Either or both of the two relatively movable instrumentalities may be moved, or either one may be held fixed while the other is moved sufficiently to cut off the formed blank.

The punch and holder are then retracted, as in Fig. 6, to leave space for the blank to be dropped out or ejected sidewise. The blank adheres to the end of the punch in this movement. The punch at the same time, or in a separate later movement, is withdrawn into the holder 16. The latter is smaller than the largest dimensions of the blank and engages the corners thereof to push it off the end of the punch.

After the ejection of one blank the clamping bars 11 (Fig. 1) are loosened and the bar again fed forward, and the previous operations are repeated.

The mechanism for effecting the feed of the bar and the movements of the various operating devices described is not illustrated, forming no part of the invention. It may be of various designs and may be arranged to execute the movements described in any convenient direction, preserving, of course, the relation of the described movements to each other.

The described method gives us a nut blank without waste, excepting the slight amount subsequently faced for the top and bottom where a presentable finish is required. The operation is preferably performed on a cold bar; and this cold working results in a substantial advantage, increasing the strength of the metal. Tests have shown that the resulting nut is approximately forty per cent stronger than the bar from which it is made. This fact permits the use of a bar of steel which can be easily shaped and cut off, being softer than the steel in the nut produced.

The entrance of the punch in the axial direction spreads the metal of the projecting end radially outward, and tends to form a cleavage or weakness along the plane of the rear end of the nut blank, which is particularly marked when working on a cold bar. This facilitates the lateral movement by which the projecting end is cut off from the portion of the bar within the bushing 12. Because of this weakened plane, the punch 17 may be withdrawn before the lateral shearing action is effected. The punched portion will hold its shape even without retaining the punch in the blank during the shearing operation.

Spreading of the metal by the punch makes it possible also to use a hexing or other shaping die which is in one piece; or in which the several slides 13 are fixed in position during the piercing operation and the metal is spread so as to fill the space within them.

It is not essential to have a cut-off bushing 12 in addition to the gripping dies 11. Any clamping or holding means which will hold the stock during the shearing operation can be used.

While it is preferable to use a punch with a flat point, and of substantially the depth of the blank to be produced, it is possible to use a punch of a little greater or less length and of a modified shape. It is only essential to extend the

punch to such a point that the shearing operation will effect a cut-off at practically the length of nut required.

The transverse dimensions of the hole and of the periphery of the nut may be varied as desired. In Fig. 4, the shortest diameter of the blank 14 is less than the diameter of the bar 10. But, by making the punch larger in diameter in proportion to the diameter of the original bar, the entire periphery of the blank may be made large enough to extend outside of the circle of the original bar; in which case the re-shaping of the outer contour of the blank can be effected by a fixed die or dies, as above explained.

Other modifications may be made by those skilled in the art without departing from the invention as defined in the following claims.

What I claim is:

1. In making nut blanks from a bar, the method which includes clamping the bar at a point rearward of its end, piercing the projecting end of the bar to a depth equal to the desired depth of the nut by a punch entering the bar in the axial direction and spreading the metal of said projecting end, then shearing off the pierced end along a plane coinciding with the bottom face of the pierced recess.

2. In making nut blanks from a bar, the method which comprises piercing the end of the bar with a substantially flat ended punch to a distance practically equal to the length to be cut off, and then shearing off the pierced end along a transvere plane approximately coinciding with the bottom of the punch while the punch is in it.

3. In making nut blanks from a bar, the method which includes clamping the bar at a point rearward of its end, piercing the projecting end of the bar by a substantially flat ended punch entering the bar in the axial direction and spreading the metal of said projecting end and shaping it to the desired periphery of the nut, and then shearing the pierced and shaped end from the bar along a transverse plane intersecting the pierced recess at substantially its bottom face.

4. In making nut blanks from a bar, the method which comprises punching the end of the bar with a punch which is substantially flat on the end, carrying such punching operation to a distance practically equal to the length to be cut off, and then shearing the punched end from the bar along a transverse plane intersecting the recess left by the piercing punch at approximately the bottom of said recess.

5. In making nut blanks from a bar, the method which includes clamping the bar at a point rearward of its end, and shaping the projecting end to the desired periphery of the nut and forming a central substantially flat bottomed hole in the projecting end, and then shearing off the projecting hollow end along a transverse plane intersecting said hole, at approximately its bottom by a relative transverse movement between the clamping means and the shaping means.

6. In making nut blanks from a bar, the method which consists in piercing the end of the bar with a substantially flat bottomed punch to a depth corresponding to the length of the nut, shaping the end to the desired periphery of the nut, and thereafter shearing the pierced and shaped end of the bar along a transverse plane coinciding with the bottom face of the said punch while it is held in engagement with the piercing and shaping tools.

7. In making nut blanks from a bar, the method which comprises punching the end of the bar with a substantially flat ended punch to a distance practically equal to the length to be cut off, shaping the pierced end to the desired configuration and thereafter shearing off the punched and shaped end along a transverse plane approximately coinciding with the bottom surface of the punched recess while the punch is in it, and then withdrawing the punch from the blank.

8. In making nut blanks from a bar, the method which comprises punching the end of the bar with a substantially flat bottomed punch, spreading the metal and producing a cleavage line between the punched and the unpunched portions said cleavage line coinciding with the bottom of the recess formed by said punch and then shearing the punched end from the unpunched portion along said cleavage line.

9. In making nut blanks from a bar, the method which comprises punching the end of the bar while cold and while located within a shaping die and thus spreading the metal, shaping it and producing a cleavage between the punched and the unpunched portions and thereafter shearing off the punched end from the unpunched portion along a transverse plane intersecting the punched recess at substantially its bottom surface.

10. The method of making nut blanks from a metal bar comprising piercing the end of the bar to a depth at least equal to the depth of the nut blank, shaping the pierced end to the desired configuration and thereafter shearing the shaped and pierced end from the bar.

11. The method of making nut blanks from a metal bar comprising piercing the end of the bar to a depth at least equal to the depth of the nut blank, shaping the pierced end to the desired configuration and thereafter shearing the shaped and pierced end from the bar along a transverse plane approximately coinciding with the bottom of the pierced depth.

12. The method of making nut blanks from a metal bar comprising piercing the end of the bar with a flat bottomed punch to a depth at least equal to the depth of the nut blank, shaping the pierced end to the desired configuration and thereafter shearing the shaped and pierced end from the bar along a transverse plane approximately coinciding with the bottom of the pierced depth.

13. The method of making nut blanks from a metal bar comprising piercing the end of the bar with a flat bottomed punch to a depth at least equal to the depth of the nut blank, shaping the pierced end to the desired configuration and thereafter shearing the shaped and pierced end from the bar along a transverse plane approximately coinciding with the bottom of the pierced depth, the flat bottomed punch being retained in the pierced end during shearing.

14. In making nut blanks from a bar, the method which comprises piercing the end of the bar while cold and while located within a shaping die with a substantially flat bottomed punch to a depth approximating the depth of the nut blank, shaping the pierced end to the desired configuration and thereafter shearing off the pierced and shaped end along a transverse plane intersecting the recess formed by said punch at approximately its bottom.

JAMES A. EDEN, JR.