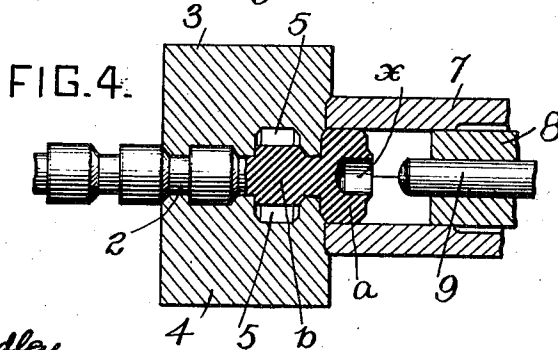
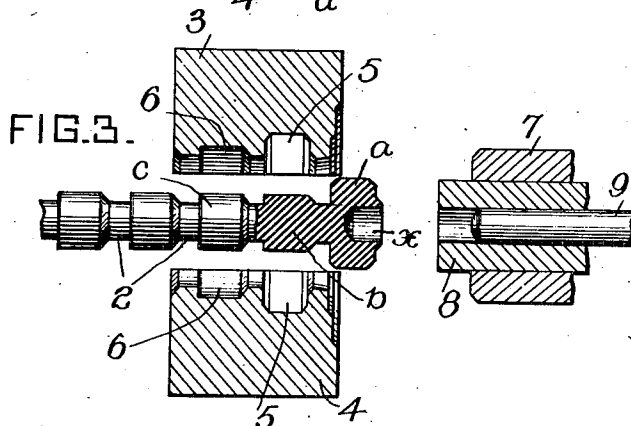
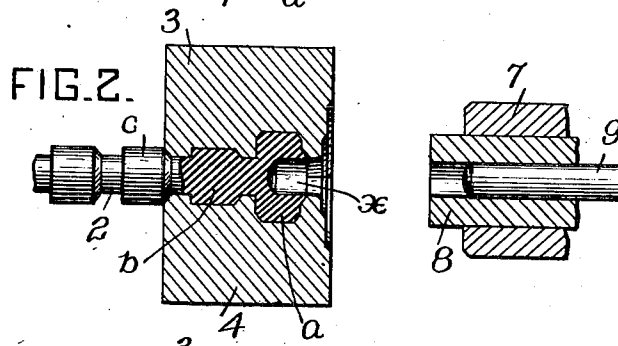
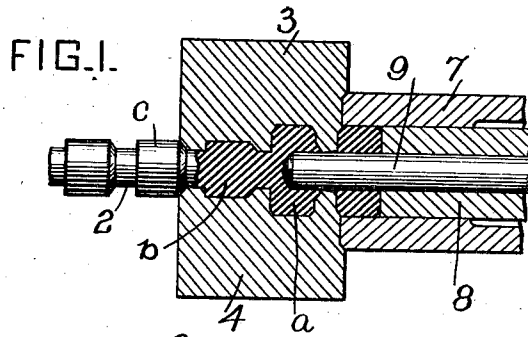


O. BRIEDE.
MANUFACTURE OF NUTS.
APPLICATION FILED OCT. 4, 1904.

2 SHEETS—SHEET 1.



WITNESSES:

Herbert Bradley
F. E. Gaither

INVENTOR

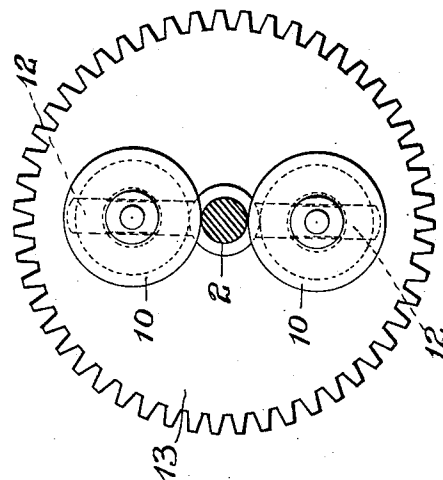
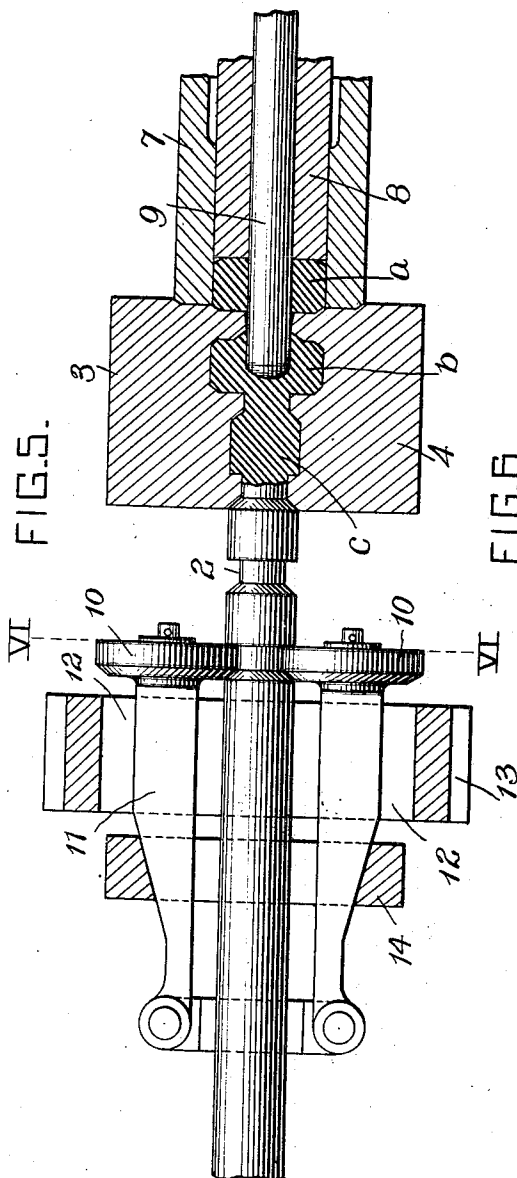
Otto Briede,
Christy & Christy, Attys

No. 819,844.

PATENTED MAY 8, 1906.

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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

OTTO BRIEDE, OF BENRATH, GERMANY.

MANUFACTURE OF NUTS.

No. 819,844.

Specification of Letters Patent.

Patented May 8, 1906.

Application filed October 4, 1904. Serial No. 227,149.

To all whom it may concern:

Be it known that I, OTTO BRIEDE, a citizen of the Empire of Germany, residing at Benrath, in the Province of the Rhine and Kingdom of Prussia, Germany, have invented or discovered certain new and useful Improvements in the Manufacture of Nuts, of which improvements the following is a specification.

The invention described herein relates to certain improvements in the manufacture of nuts, washers, &c.; and it consists, generally stated, in circumferentially grooving a rod smaller transversely than the nut or washer desired, thereby forming a series of connecting-blanks, bringing the said blanks to the desired external shape and dimensions by forcing thereinto metal from the previously-shaped blank and the neck connecting said blanks, and separating the first blank from the next adjacent blank by the operation of the punch, whereby a portion of the first blank is removed therefrom and forced with the neck portion into the succeeding blank.

The invention is hereinafter more fully described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a sectional elevation illustrating the dies, retaining or holding box, pressing-plunger, and punch in the position occupied by them on the completion of a nut-blank. Fig. 2 is a similar view illustrating the same parts, holding-box, pressing-plunger, and punch being removed and the finished blank also removed. Fig. 3 is a similar view of the same parts, showing the dies separated and the blanks fed forward one step. Fig. 4 is a similar view of the same parts, showing the dies closed, the holding-box shifted to operative position, and the pressing-plunger and punch about to descend to complete the blank. Fig. 5 is a view similar to Fig. 1, showing a means for circumferentially grooving a rod or bar, and Fig. 6 is a sectional elevation on a plane indicated by the line VI VI, Fig. 5.

In the practice of my invention a rod or bar is grooved circumferentially at intervals dependent upon the thickness of the nut or blank to be produced, thereby forming a se-

ries of blanks *a b*, &c., connected by necks of metal 2, which should not be greater in transverse dimensions than the diameter of the hole to be punched in the blank. These blanks are fed in between movable dies 3 and 4, which are provided with a shaping-matrix 5 and preferably with a holding cavity or matrix 6. At the beginning of the operation on a series of connected blanks the first blank will be fed into the shaping-matrix, the dies 3 and 4 closed, and the punch moved down so as to project into the first blank, displacing the metal thereof laterally. The punch is then withdrawn, the dies opened, and the series of blanks fed forward, the partially-shaped blank into position outside of the dies 3 and 4. The latter are now closed, a preliminary blank *a* being inclosed in the matrix 5 and another blank *b* in the gripping or support cavity 6, if such is employed. The retaining-box 7, the sides of which are preferably made in the form integral with each other and movable toward and from the dies 3 and 4, is moved in, inclosing the partially-formed first blank. The pressing-plunger 8 and the punch 9 are next moved in, the former bearing against the partially-formed blank and the punch entering the same. The inward movement of the punch is continued through the retaining-matrix formed by the box 8 and sides of the die-blocks 3 and 4 into the shaping-matrix 5, thereby forcing into the next blank a portion of the metal from the blank *a* in the retaining-matrix and from the neck 2 connecting the first and second blanks *a* and *b* held in the shaping-matrix, thereby causing the lateral enlargement of this blank in the shaping-matrix. It will be understood, of course, that the first blank of a series will be incomplete, no metal having been forced thereinto to produce the necessary lateral enlargement. On the completion of the inward movement of the punch the latter is withdrawn, together with the plunger and retaining-box 7. As the neck 2, connecting the adjacent blanks, is made of a diameter not greater and preferably equal to the diameter of the hole to be formed in the blanks, and consequently that of the punch also, the movement of the punch through the opening between the retaining and shaping

matrices will remove such neck, and consequently leave the blank *a* in the retaining-matrix wholly detached.

After the withdrawal of the retaining-box, punch, and plunger the first blank *a* is removed, the dies opened, and the series of blanks fed forward, thereby bringing the blank *b* complete as regards transverse external dimensions into position on top of the dies 3 and 4, as shown in Figs. 3 and 4. The dies 3 and 4 are now closed, the blank *b* being in position on top of the dies 3 and 4, preliminary blanks being inclosed in the matrix 5 and retaining-cavity 6. The retaining-box is next brought into position around the blank *b*, the plunger and punch forced downward, the former compressing the nut vertically and completing its external shape. The punch during the operation of the compressing-plunger has entered cavity *x*, formed in the previous operation. The punch continues its movements inward, forcing the metal out of the central portion of the blank *b* and the metal of the neck connecting such blank with the next adjacent preliminary blank down into the shaping-matrix, thereby enlarging the preliminary blank contained therein laterally and completely filling the matrix.

A gripping or supporting cavity 6 is not necessary, but is preferred, as it will prevent any material flow of metal out from the shaping-matrix during the operation of the punch.

The grooving of the bar or rod may be effected during the rolling of the same or subsequent thereto and either before the bar is fed into the shaping-machine or while it is being fed thereinto, as shown in Fig. 5. This grooving may be done by reciprocating blades or by rollers 10, which are carried around the rod and forced inwardly while the rod is held in the shaping-dies. In the construction shown in Fig. 5 these rollers are loosely mounted on pivotal arms 11, arranged in radial slots 12 in the driving-wheel 13. These rollers are carried around the rod by the wheel 13 and 14 and are forced inwardly to groove the rod by means of a collar or sleeve 14, provided with inclined surfaces bearing on inclined surfaces on the arms 11.

It is characteristic of the operation described that the blanks are enlarged by forcing thereinto an additional body of metal, which is preferably taken from a preceding blank in part at least; also, that in so doing each punch-stroke completes the perforation of one nut-blank and partially perforates the next blank, and as all the displaced metal may be forced into the body of the nut the operation can be carried on without waste of material; also, that a blank is severed or separated from an adjacent blank by the displacement of metal connecting it with such

next adjacent blank; also, that the final or complete perforation of the blank, the severance of such blank from the parent rod, and a partial or preliminary perforation of the next blank are all effected by a single punch-stroke.

It will be understood by those skilled in the art that the several matrices hereinbefore referred to may be formed in any substantial manner, as in the adjacent faces of separable die-blocks; but it is preferred that the retaining-matrix in which the punching operation is performed should be formed by a box or cylinder 8, arranged around and movable parallel with the pressing-plunger and punch. It will also be seen that the distance which the punch enters each blank in the making of the cavity *x* may be varied somewhat, as also the length of the neck *c*, and while I have described the metal at the bottom of the cavity *x* and lying in the path of the punch as being forced forward into the body of the next blank it may be that more or less of it sometimes will be displaced laterally.

I claim herein as my invention—

1. As an improvement in the art of manufacturing nuts, the method herein described which consists in peripherally grooving a rod or bar thereby forming a series of preliminary blanks connected by necks of metal, and enlarging said blanks by forcing thereinto a portion of the metal of the adjacent blank and the neck of metal connecting said blanks, substantially as set forth.

2. As an improvement in the art of manufacturing nuts, the method herein described which consists in forming a series of blanks smaller than the desired article and then laterally enlarging said blanks, by forcing into one blank a portion of the metal of an adjacent blank.

3. As an improvement in the art of manufacturing nuts, the method herein described which consists in forming a series of connected blanks having reduced connecting-necks and separating one of the blanks from the succeeding blank by forcing the connecting-neck into the succeeding blank.

4. As an improvement in the art of manufacturing nuts, the method herein described which consists in transversely grooving a rod or bar thereby forming a series of connected blanks, and by a single punch-stroke punching out the metal at the center of one blank and forcing the metal so removed into the next blank.

5. As an improvement in the art of manufacturing nuts, the method herein described which consists in transversely grooving a bar or rod thereby forming a series of connected blanks, punching out the metal at the center of one blank and forcing the metal so re-

moved and the connecting-neck into the next blank, thereby severing the first blank from the next adjacent blank.

5 6. As an improvement in the art of manufacturing nuts, the method of operation herein described which consists of completing the perforation of a previously-formed and partially-perforated nut-blank, severing the same from the parent rod, and effecting the

partial or preliminary perforation of another blank, and all at and by a single punch-stroke, substantially as described.

In testimony whereof I have hereunto set my hand.

OTTO BRIEDE.

Witnesses:

WILLIAM ESSENWEIN,
PETER LIEBER.