

A. MARLAND.

Manufacture of Hexagonal Nuts.

No. 162,837.

Patented May 4, 1875.

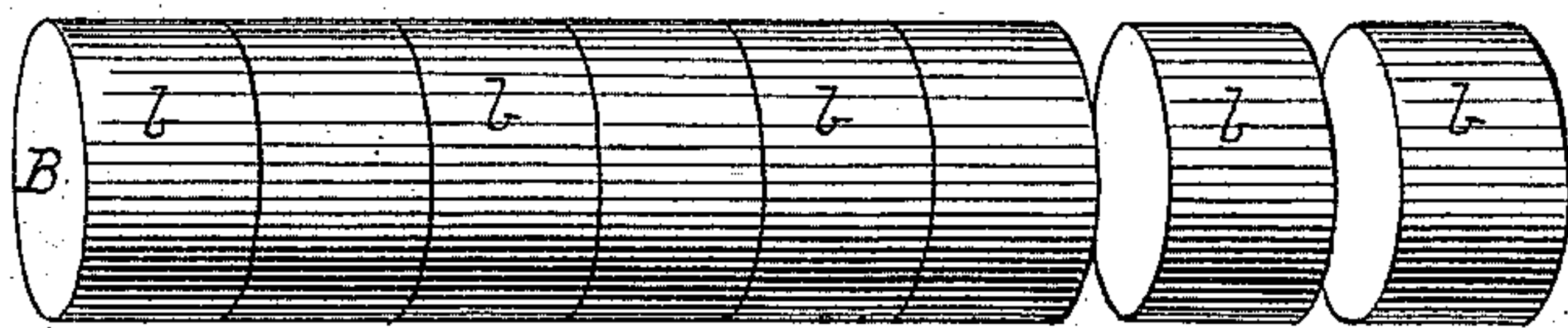


Fig. 1

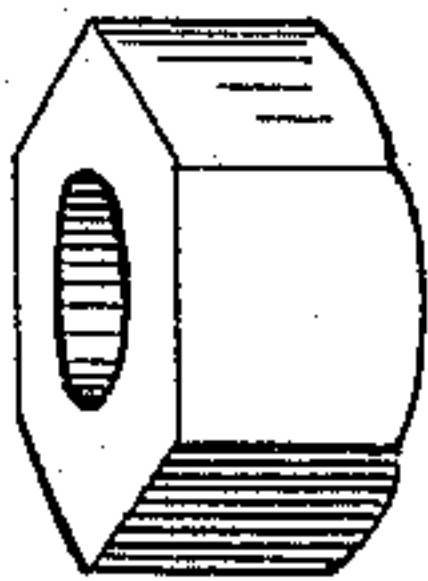


Fig. 2

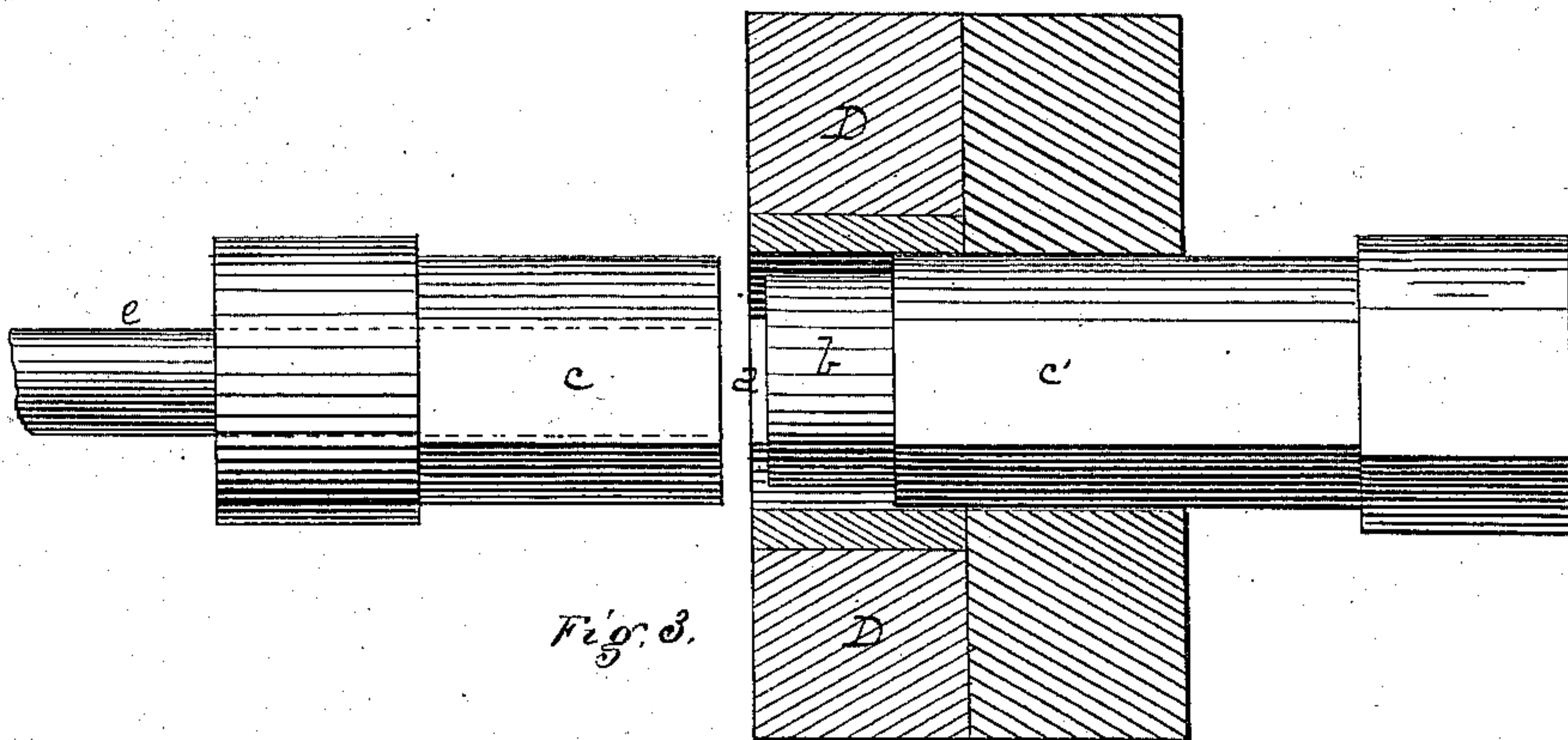


Fig. 3.

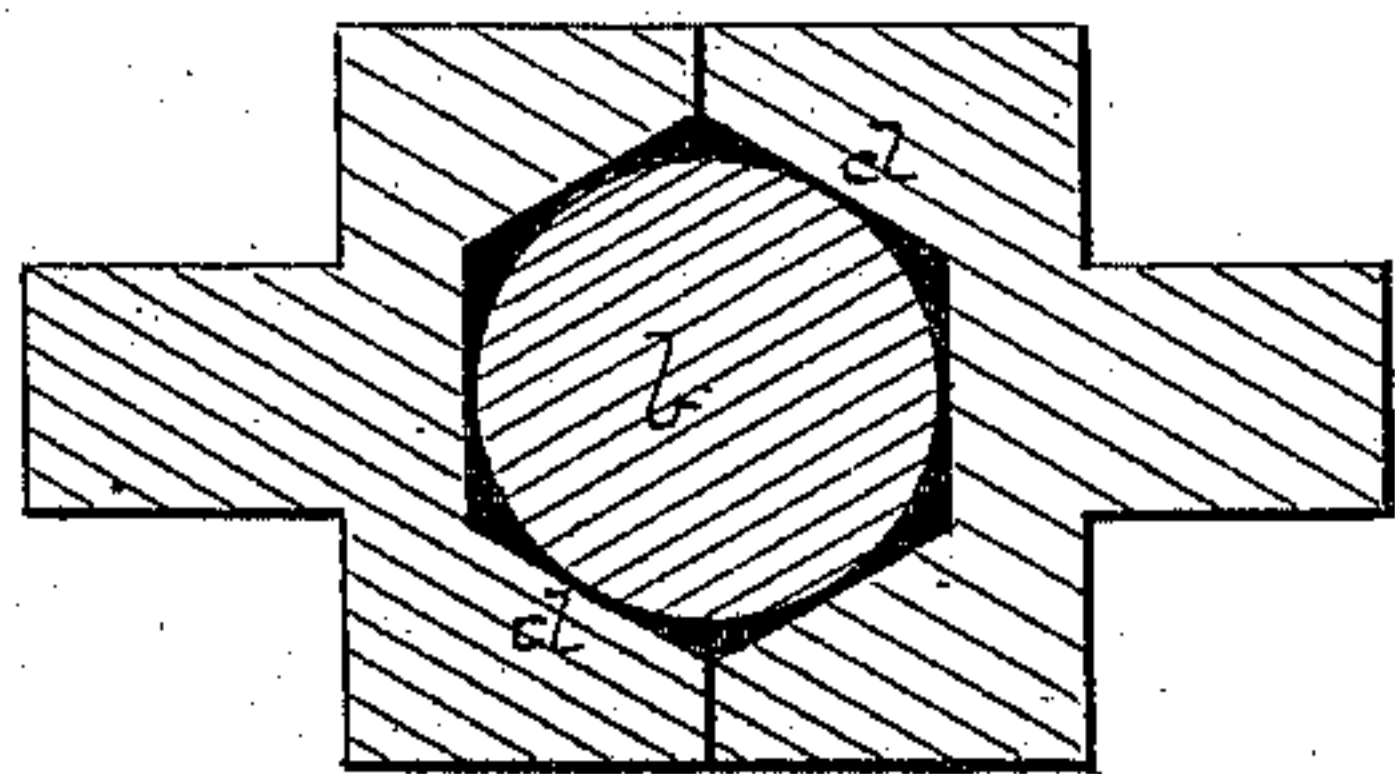


Fig. 4.

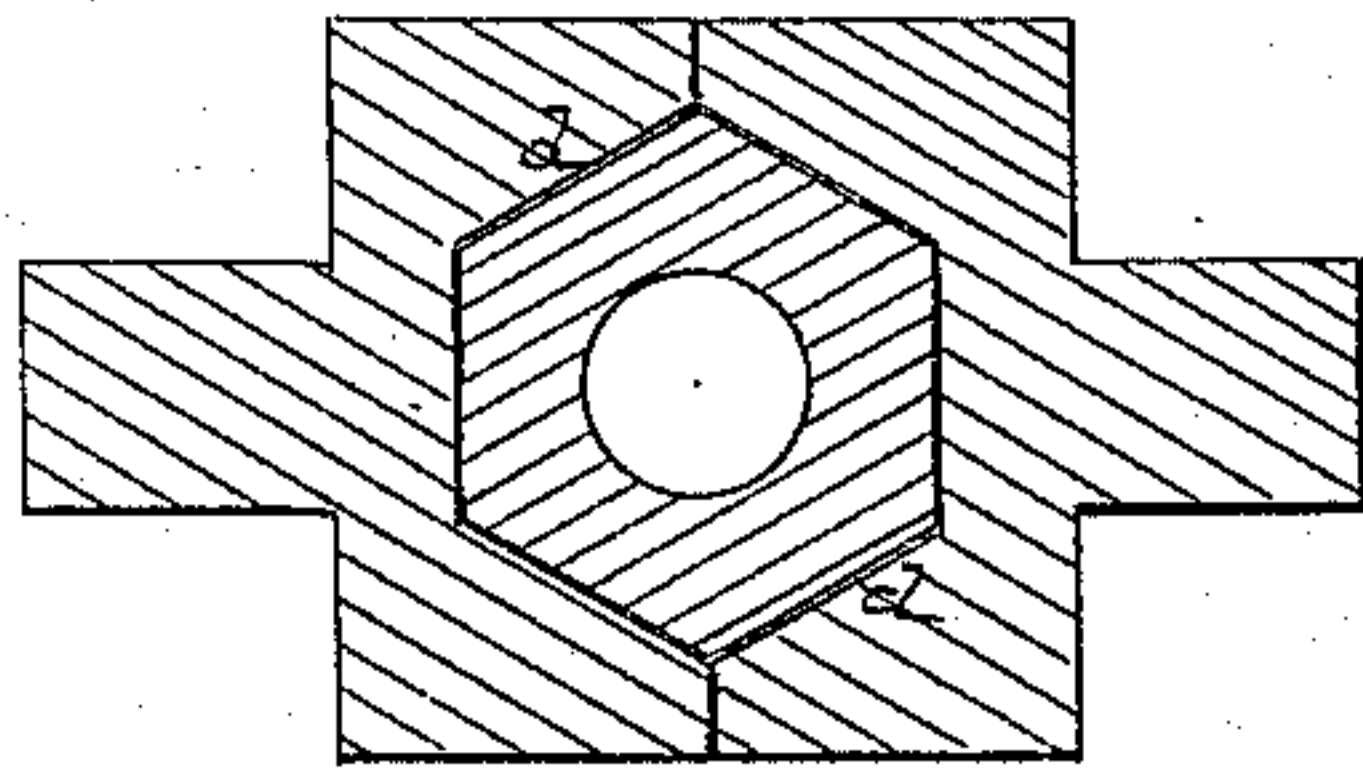


Fig. 5.

Witnesses / J. C. Christy.
/ C. G. Harvey

Inventor Alfred Marland
by George H. Christy
his atty.

UNITED STATES PATENT OFFICE.

ALFRED MARLAND, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN THE MANUFACTURE OF HEXAGONAL NUTS.

Specification forming part of Letters Patent No. **162,837**, dated May 4, 1875; application filed March 11, 1875.

To all whom it may concern :

Be it known that I, ALFRED MARLAND, of Pittsburg, county of Allegheny, State of Pennsylvania, have invented or discovered a new and useful Improvement in Manufacture of Nuts; and I do hereby declare the following to be a full, clear, concise, and exact description thereof, reference being had to the accompanying drawing, making a part of this specification, in which like letters indicate like parts.

Figure 1 shows, in perspective, a cylindrical rod cut into blanks, from which the nuts are to be made. Fig. 2 is a like view of a hexagonal nut as made from the cylindrical blanks of Fig. 1 by my improved method of operation. Fig. 3 shows the end-compressing dies and the punch, also a nut-blank in side elevation, and a sectional view of the matrix as formed by a plane passing along the axial line of the punch. Fig. 4 is a transverse section, showing the blank in the matrix before compression; and Fig. 5 is a like view, showing the nut as compressed in the matrix and punched.

My present improvement relates to the manufacture of nuts from cylindrical blanks, by compressing and punching the same in a close die-box or matrix in the direction of the axial line of the blank, the diameter of the blank before compression being equal or about equal to the diameter of the inscribed circle of a cross-section of the polygonal nut to be made. In making these nuts, I take a round or oval bar or rod, B, of the diameter (as near as may be) of the circle inscribed in the polygonal figure of a cross-section of the nut to be made, and either by a suitable cutting device on the machine which does the pressing and punching, or on a separate machine such as will not materially change the cylindrical form of the blank, divide it into blanks *b*, each of the length necessary for giving the required amount of material for making the nut, regard being had to the amount of material needed to fill the polygonal corners, and as to whether the material which comes in the path of the punch is cut out and discharged, or is displaced laterally and forced into the body of the nut. In my improvement either mode of making the eye may be adopted.

In the drawing I have shown, as the most convenient for illustration, a die-box and dies for making hexagonal nuts. The head D is affixed securely to the frame work of the machine. A cylindrical blank, *b*, is placed or fed into the hexagonal matrix *d*. The dies *c c'*, having each a hexagonal-shaped end in cross-section, close up the die-box or matrix at its opposite ends, and so inclose the blank on all sides. These dies are made hollow along their axes, so as to afford a path for the action of the punch or punches *e*, and for the discharge of the punchings (when necessary) motion such as is common in nut-machines by the use of cams or eccentrics, or by a series of blows, as in upsetting-machines, is employed to operate the dies *c c'* and punch *e*. By such or other known suitable means one of the end dies is caused to advance, (the other being stationary or moving, as may be preferred,) so as to apply end compression to the blank, and thereby cause the blank to expand laterally, so as to fill and in form take the shape of the matrix in which it is compressed, as illustrated in Fig. 5. And either before compression, or afterward, the punch or punches are caused to advance and form the eye along the axial line of the cylindrical blank in either of the ways known to the art, as above referred to. After the nut is thus compressed, so as to fill the cavity of the die-box or matrix, and is punched, it is discharged on the back stroke of one of the end-compressing dies, and a further advance stroke of the other, being stripped off the punch at the same time; or after being stripped off the punch it may be discharged by the opening of the die-box, it in such case being jointed for that purpose. The construction and arrangement of cams and eccentrics and connections suitable for such purposes are already well known in the art, and need not here be more particularly described.

By changing the form of the die-box, dies, and punches, the same mode of operation may be employed in the manufacture of polygonal nuts generally. But in carrying out my improvement I do not limit myself to any particular construction of dies and die-boxes, since any may be employed which are suitable for receiving the cylindrical blank de-

scribed for the end compression of the same to secure its lateral expansion, and for the punching of the eye along the axial line of the cylinder. But in cases where a conical punch is used to displace laterally the material which lies in the path of the punch, and force all or the greater part of it into the body of the nut, the amount of end compression required, if the punch is relatively a large one, may be comparatively small, but it should be sufficient to cause the material, as it expands laterally, to fill well into the corners so as to give a well-shaped product.

One great advantage of my improvement is the preventing or lessening of waste. In making nuts heretofore (except square ones, and my improvement is of greatest advantage in making polygonal nuts other than square) some portion of the outer lateral surface of the blank has commonly been sheared or cut off, and went into the scrap-pile, or else the nut was hammered or swaged down by power applied laterally, which involved more time and labor.

What I claim as my invention, and desire to secure by Letters Patent, is—

In the manufacture of polygonal nuts from cylindrical blanks, the combination of the following steps: first, severing the blanks transversely, without materially distorting their cylindrical form, from cylindrical rods or bars of a diameter equal or about equal to that of the inscribed circle of a cross-section of the nut to be made; second, inclosing the same in a close die-box of polygonal form in cross-section; third, expanding the same by end compression so as to fill the polygonal corners; and, fourth, punching the eye in the axial line of the blank, substantially as set forth.

In testimony whereof I have hereunto set my hand.

ALFRED MARLAND.

Witnesses:

JAMES M. CHRISTY,
GEORGE H. CHRISTY.