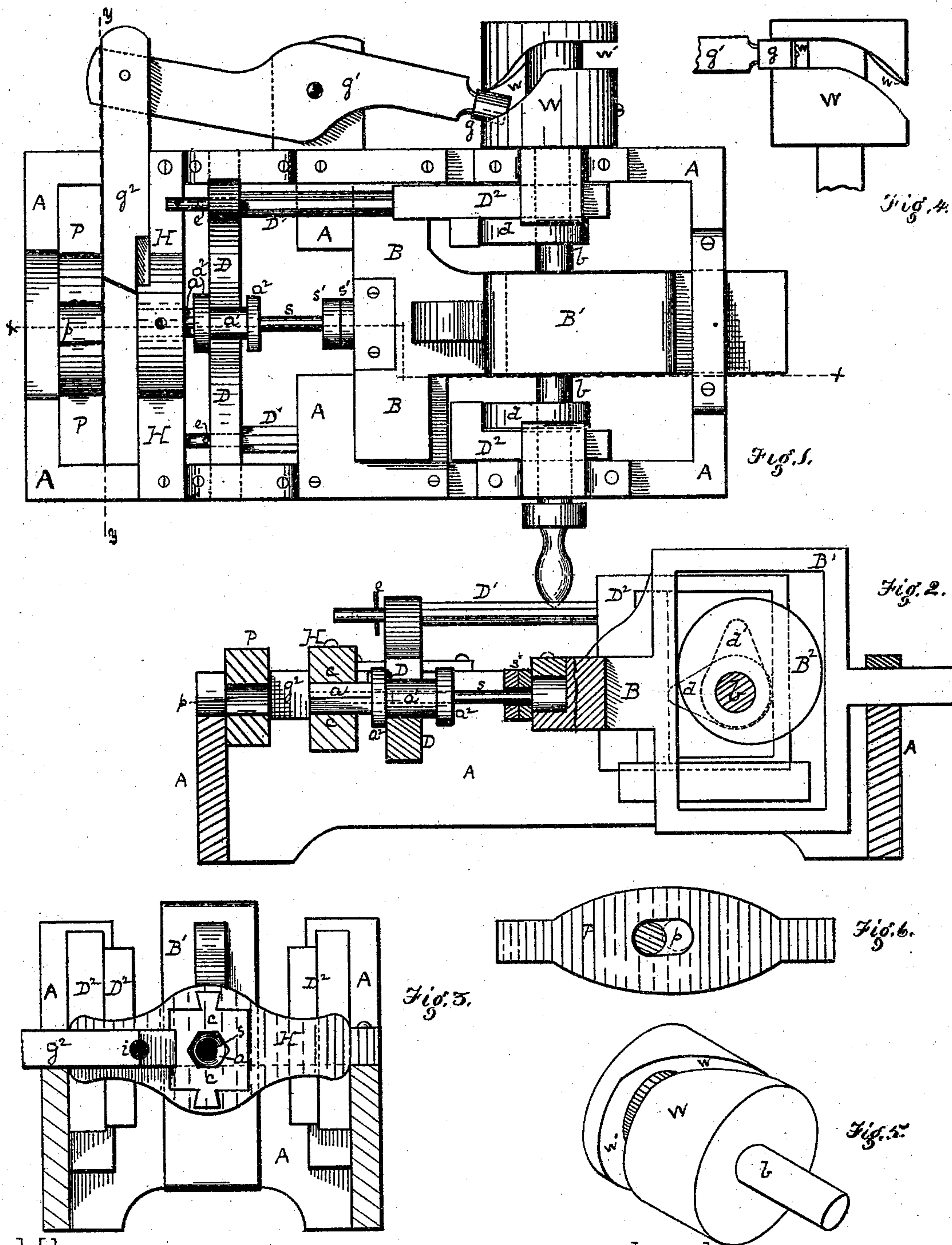


A. MARLAND.  
NUT-MACHINE.

No. 172,272.

Patented Jan. 18, 1876.



WITNESSES

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# UNITED STATES PATENT OFFICE.

ALFRED MARLAND, OF PITTSBURG, PENNSYLVANIA.

## IMPROVEMENT IN NUT-MACHINES.

Specification forming part of Letters Patent No. 172,272, dated January 18, 1876; application filed October 25, 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 Nut-Machine; 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 is a top or plan view of my machine. Fig. 2 is a longitudinal sectional view in the line *x x*, Fig. 1. Fig. 3 is a transverse sectional view in the line *y y*, Fig. 1. Fig. 4 is a plan, and Fig. 5 a perspective view, of the grooved eccentric wheel used in operating the knife; and Fig. 6 shows the elongated feeding-hole.

My invention relates to the manufacture of nuts, in which the blank is cut from the end of a bar or rod, and is punched in the line of the length of the bar or rod, and transversely to the plane of the cut; and the nature of it consists in the features of construction and operation hereinafter set forth and claimed.

The frame-work A of the machine is of any suitable form and construction suitable for carrying the operative devices. The sliding head B is attached to an eccentric yoke, B<sup>1</sup>, in which the eccentric B<sup>2</sup> gives the desired motions for punching the blanks and withdrawing the punch. This eccentric is securely affixed to the main driving-shaft *b*. Outside this eccentric B<sup>2</sup>, and in like manner affixed to the main shaft, are the double cams *d d'*, two on each side, which work in the cam-yokes D<sup>2</sup>. The latter, by connecting-rods D<sup>1</sup>, are connected with the sliding cross-head D. The main driving-shaft *b* also carries a wheel, W, with eccentric or worm-groove *w w'*, in which groove is a wrist, *g*, on the end of a lever, *g*<sup>1</sup>, to the opposite end of which is attached a reciprocating knife, *g*<sup>2</sup>.

I will first explain my improvement as applied to the making of hexagonal nuts from cylindrical rods. A fixed cross-head, H, contains the dies *c*, which give a die-box or matrix of hexagonal shape in cross-section, and as long as may be desired. A movable hollow die, *a*, hexagonal in cross-section, closes up one end of the cavity, and the punch *s*, at-

tached to the sliding head B, plays through the hollow opening of the die, one being fitted properly to the other. The die *a* is made long enough to have the desired amount of motion in the die-box, and its outer end terminates in a neck, *a*<sup>1</sup>, and two collars, *a*<sup>2</sup>. The neck *a*<sup>1</sup> is seated in a recess or seat in the sliding cross-head D in such manner that, as the cross-head D bears against either collar, it will hold the die *a* in place or move it in the proper direction, and also, by supporting it from below, prevent its weight from resting on the punch, as is the case in most machines. This independent support lessens the wear of one on the other, and increases the durability of both. On or near the feeding end of the machine is a cross-bar, P, through an elongated opening, *p*, in which the feeding is done, such opening being in line with the cavity of the die-box. The knife *g*<sup>2</sup> plays closely between the end of the die-box and the bar P, so that the latter acts as a back support or buttress for the knife. The end of the knife has an edge of cutting form, and an opening, *i*, for the discharge of the punchings.

In operation, the heated rod or bar, preferably a round, is fed through the opening *p* into the die-box, the die *a* being in such position that the proper length of material may be fed past the edge of the knife for a single nut. The knife *g*<sup>2</sup> then advances, and, making a stroke across the die-box, cuts off a blank. The knife then remains in the forward position to which it was thus brought, so as to constitute a rear die to the die-box, until the punch *s* is caused to advance, pass axially through the blank, and, if pointed, force the material in its path outwardly into the body of the nut; or otherwise, force the usual punching out at the hole *i*. Then, or even previously, if so preferred, the die *a* is caused to advance, and bearing against the end of the nut-blank compresses, shortens, expands, and shapes it in the manner well known in the art. This forward motion of the die *a* is effected by means of a shoulder or collar, *s'*, on the punch *s*, coming against the base of the die; but it may be effected, if so preferred, by giving the moving cross-head D an advance motion by suitable eccentrics, so that, bearing against the forward collar *a*<sup>2</sup>, it shall cause the die *a*



to advance. The nut-blank is now punched and pressed. The knife  $g^2$  now begins its back stroke, so as to uncover the die-box. The cams  $d$  hold the cross-head D forward against the forward collar  $a^2$ , so as to cause the die to remain stationary while the punch is being withdrawn. As soon as this is done, or even before, (provided the knife is out of the way,) the cams  $d$  give the cross-head D a forward stroke, so that it shall, by pressing the die  $a$  forward, effect the discharge of the nut from its matrix. The cams  $d'$  next give a back stroke to the cross-head D, so that, engaging the rear collar  $a^2$ , it shall bring the die  $a$  back to the proper position for a new feed.

The forward and backward motions of the knife  $g^2$  are effected by the inclined parts  $w$  of the groove in the wheel W, and its stationary position while acting as a die is secured by the straight part  $w'$ . The elongated opening  $p$  is so made in order that the rod may not be bent as a result of being thrown to one side by the action of the knife.

The dies are removable and interchangeable, and to provide for making nuts of different lengths I use removable collars or washers  $s'$  on the punch  $s$ , so as in pressing short blanks to throw the die  $a$  farther forward; or the reverse on the removal of the same. At the same time the adjustment of the moving cross-head D is correspondingly changed by the use of adjustable pins  $e$ , stop-nuts, or other equivalent device, on the connecting rods D'; but instead of the collars  $s'$  a shoulder may be made on the punch, and such shoulder be set forward or back, as occasion may require, by means of a screw, wedge, or other equivalent device. Other suitable apparatus for giving the motions described may be substituted for the wheel W.

In the use of my improvements I do not limit myself to a die-box of any particular form in cross-section, and the form in cross-

section of the bars from which the blanks are cut may be correspondingly varied. Nuts round or polygonal may be thus made, and even irregular forms may be made, if so desired.

I claim herein as my invention—

1. In a nut-machine, the combination of a die-box, a punch working in the line of feed, and a knife working transversely to the line of feed, substantially as set forth.

2. In combination with a die-box which incloses the nut-blank circumferentially, a moving compressing-die, which closes one end, a transversely-operating knife which closes the other, and a longitudinally-moving punch, all operating simultaneously on the inclosed blank to punch and compress it, substantially as set forth.

3. In combination with a fixed die-box, a moving cross-head, D, moving die  $a$ , and punch  $s$ , substantially as and for the purposes set forth.

4. A moving cross-head, D, in combination with one or more cams,  $d$ , whereby the die is held forward while the punch is withdrawn, and is caused to advance to discharge the nut, and also is brought back into position for a new feed, substantially as set forth.

5. The knife  $g^2$ , having the triple function of severing the blank by a stroke transverse to the line of feed, of closing one end of the die-box during the operation of punching, or compressing, or both, and of affording a passage for the escape of the punchings, substantially as set forth.

6. The knife  $g^2$ , in combination with an unjointed die-box, substantially as set forth.

In testimony whereof I have hereunto set my hand.

ALFRED MARLAND.

Witnesses:

JAMES M. CHRISTY,  
GEORGE H. CHRISTY.