(No Model.)

S. D. BARNETT.

DIE FOR MAKING LOCK NUTS.

No. 529,847. Patented Nov. 27, 1894.

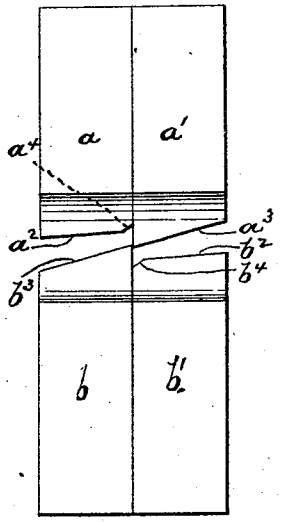

Fig. 2.

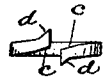

Fig. 3.

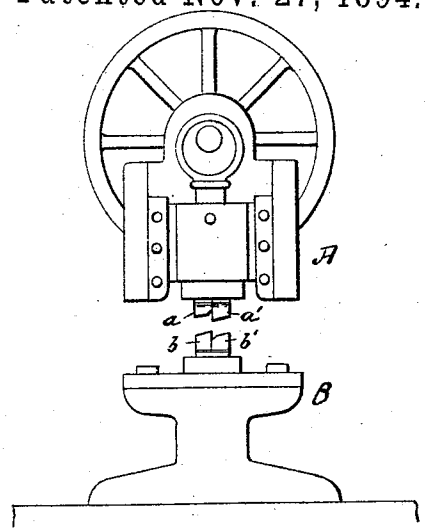

Fig. 1.

Fig. 4.

WITNESSES:

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UNITED STATES PATENT OFFICE.

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DIE FOR MAKING LOCK-NUTS.

SPECIFICATION forming part of Letters Patent No. 529,847, dated November 27, 1894.

Application filed March 9, 1894. Serial No. 502,962. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN D. BARNETT, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Dies for Making Nut-Locks; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates to the manufacture of nut lock washers, such as are of a helical form with or without projecting teeth or lateral biting projections. Heretofore the dies employed were the reverse or converse of the finished washer, and have proved inefficient and expensive to maintain, and have turned out a rough and unreliable article.

The objects of my invention are to manufacture such nut-lock washers at a reduced cost, to secure greater durability in the die, to enable the same to be more easily and quickly repaired after having become worn by use, to secure a more perfect finish in the washer and render the same more reliable in service, and to enable washers of the helical form referred to, and having ends of various inclinations suited to different kinds of work to be formed by the same dies.

My invention consists of the dies or formers, having the arrangements and combinations of parts, all substantially as will be hereinafter set forth and finally embraced in the clauses of the claim.

Referring to the accompanying drawings, in which like letters of reference indicate corresponding parts in each of the figures, Figure 1 is a front elevation of a power press having the dies or formers of my improved construction. Fig. 2 is an elevation, on an enlarged scale, of the said dies in detail. Figs. 3 and 4 are side views of the lock-washer in different stages of perfection.

In said drawings, A, B, indicate the upper and lower portions of any ordinary power press, having suitable bearings for the dies or formers to which my invention particularly relates.

a, a', are the upper sections of the dies and b, b', the lower sections thereof. Said sections are in pairs, each of which is provided with an inclined bearing a^2, a^3, the bearing a^2, having but a slight inclination to conform to the inclination of the end of the helix and the inclination of the bearing a^3, being of a greater inclination to form upon the opposite side of the helix end engaged thereby the taper shown in Fig. 3, at c. The opposite die sections b, b', are likewise provided with similar inclined bearings b^2, b^3, which engage the opposite side of the washer.

The bearing, a^3, of greater inclination, in the upper pair or sections, lies opposite the bearing, b^2, of the lower sections, and the bearing, b^2, of the upper, opposite the bearing a^3, of the lower, and thus, when the dies are brought into forming relation to the washer, the opposite ends of the latter are simultaneously beveled or provided with the desired tapering ends, the bevels being on opposite sides of the washers. Where the sections of each pair are in contact, the section of least inclination is, at its inner edge, given a short bevel a^4, b^4, forming when the sections are together, a transverse groove or recess into which when pressure is brought to bear, the compressed metal is caused to flow to produce in the washers at their extremities, the biting teeth d, d, in Fig. 4.

The sections a, a', and b, b', are separate where short bevels a^4 and b^4 lie close to the shoulders formed at the inner ends of the inclined bearings a^3, b^3, and said sections are thus adjustable so that the shoulder may be increased in depth, or diminished, at will to give greater or reduced inclination to the ends of the washer. At the front of the die sections, the same are recessed as shown in Fig. 2 at e, forming a step or receptacle for a block or support for the spiral to be operated upon.

In operating the device in accordance with the preferred method of manufacture, the wire is turned into a continuous helix by any suitable process, and is then cut into sections to form washers, such as are shown in Fig. 4. These are then placed in the recess, on said supporting block so that the extremities lie between the sections a, b, and a', b', respectively, so that the pressure of the surfaces hav-

ing the greater inclination forms the bevels, c, and the opposite sides from said bevels are given the biting teeth d, as indicated.

Having thus described the invention, what I claim as new is—

1. The improved washer-forming press or machine herein described in which is combined with a pressing mechanism, adjustable pairs of die sections a, a', b, b', each having an inclined surface or bearing, as a^2, a^3, b^2, b^3, of which the inclinations of surfaces a^2, b^2, differ in degree from the inclinations a^3, b^3, the inclination of the surface or bearing, a^3, being greater than that of the bearing a^2, and, similarly, the surface or bearing b^3, being of a greater inclination than the bearing b^2, the bearing or surface a^3, of greater inclination, of one pair of sections, lying opposite the bearing or surface, b^2, of less inclination in the other pair and, similarly, the surface or bearing, b^3, lying opposite the surface or bearing a^2, the section a, of one pair being separable from or jointed in its relation to the section a', and the section, b, of the opposite pair being likewise separable from its adjacent section b', the joints of separation being substantially in line in opposite pairs, and between the variously inclined surfaces or bearings of adjacent pairs, substantially as shown and described.

2. The improved lock washer machine herein described in which is combined with a press, die sections a, a', b, b', arranged in adjustable pairs, having inclined surfaces or bearings a^2, a^3, b^2, b^3, the inclined surfaces a^2, b^2, terminating at their inner edges in short bevels or inclined bearings, a^4, b^4, adapted for forming the biting teeth of the washers, and the lines of separation between said sections being between the respective short bevels and the shoulders adjacent thereto, substantially as set forth.

3. The improved dies for making lock-washers with tapering beveled extremities, consisting of upper and lower sections having the inclined bearings a^3, b^3, to form the said tapering or beveled opposite extremities, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 5th day of March, 1894.

STEPHEN D. BARNETT.

Witnesses:
OLIVER DRAKE,
CHARLES H. PELL.