(No Model.)

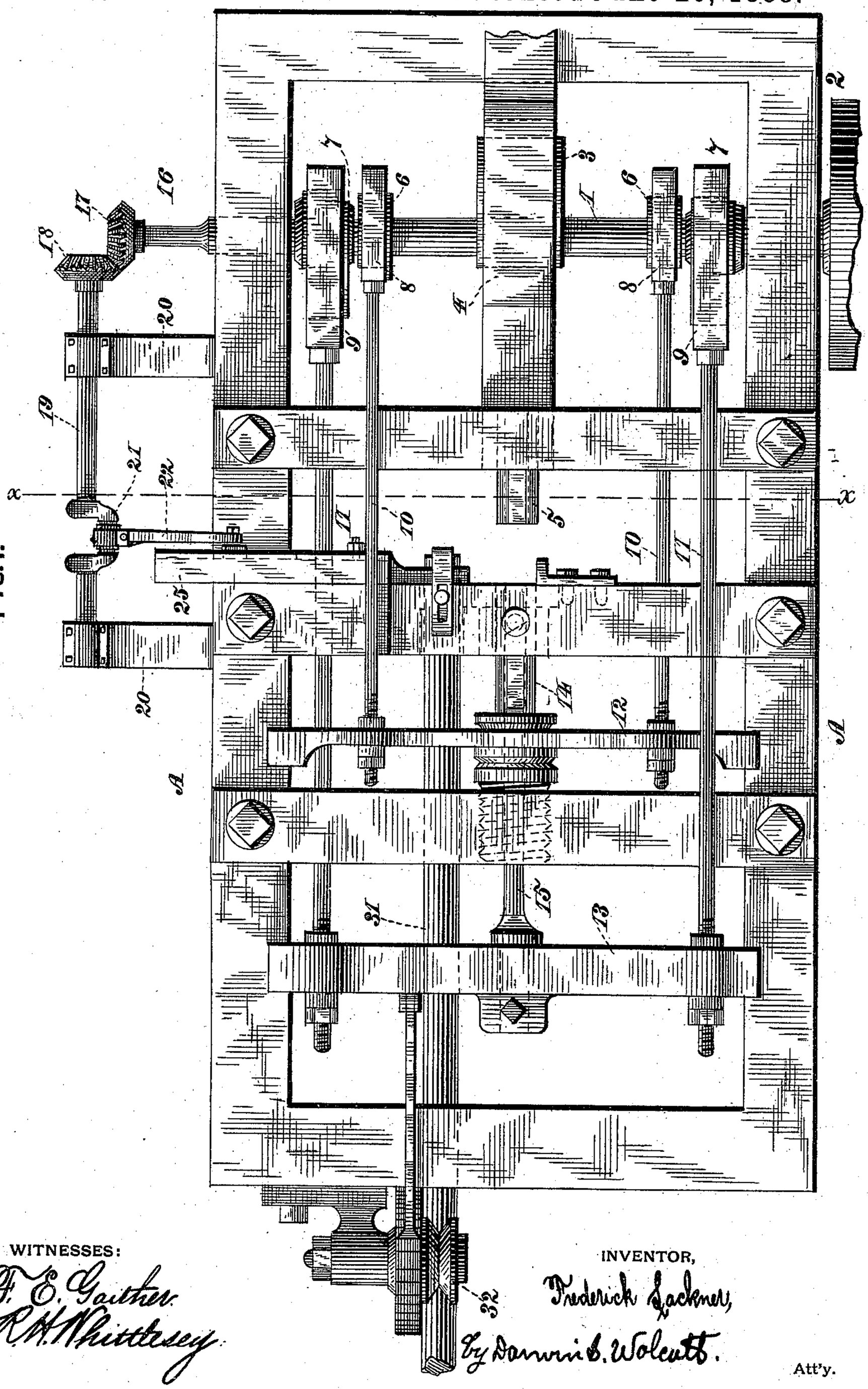
2 Sheets—Sheet 1.

F. LACKNER.

NUT MACHINE.

No. 385,187. Patented June 26, 1888.

FIG. 1.



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(No Model.) 2 Sheets—Sheet 2.

F. LACKNER.

NUT MACHINE.

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FIG. 2.

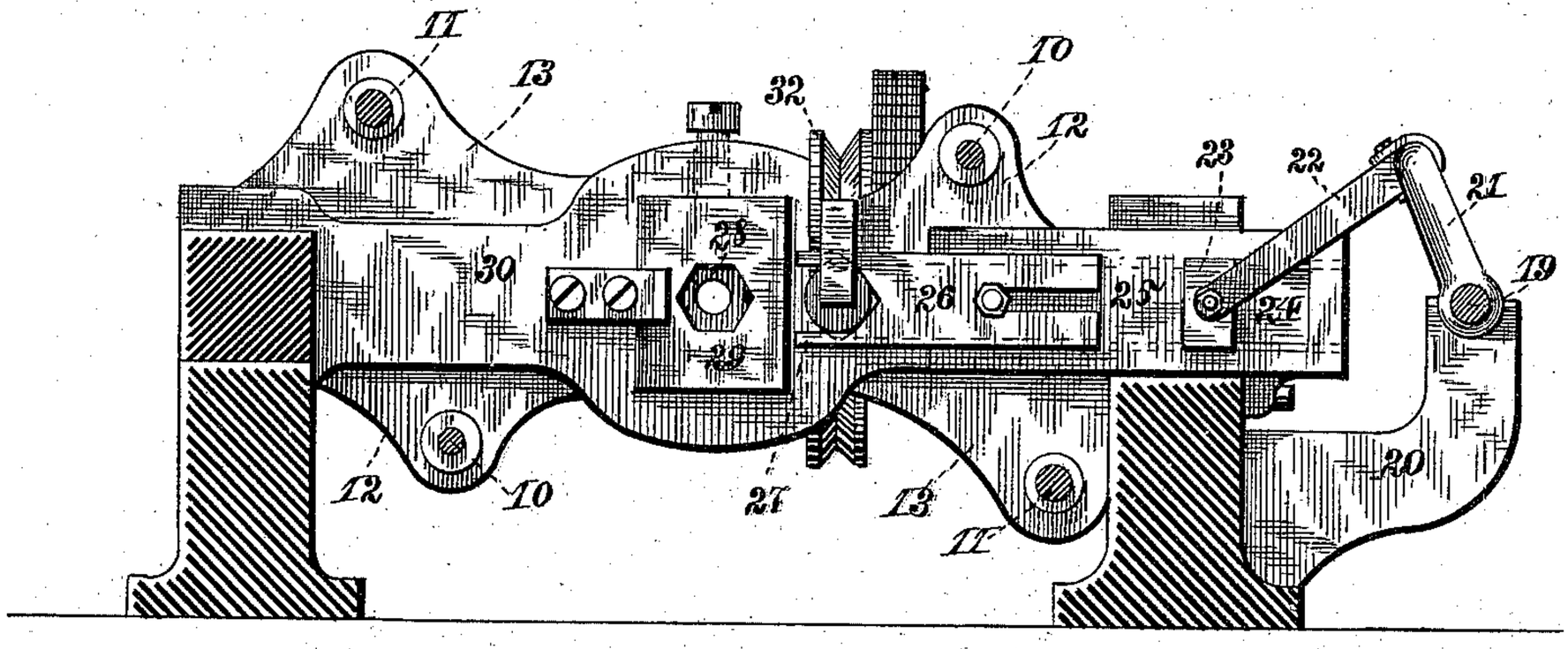

FIG. 3.

FIG. 4.

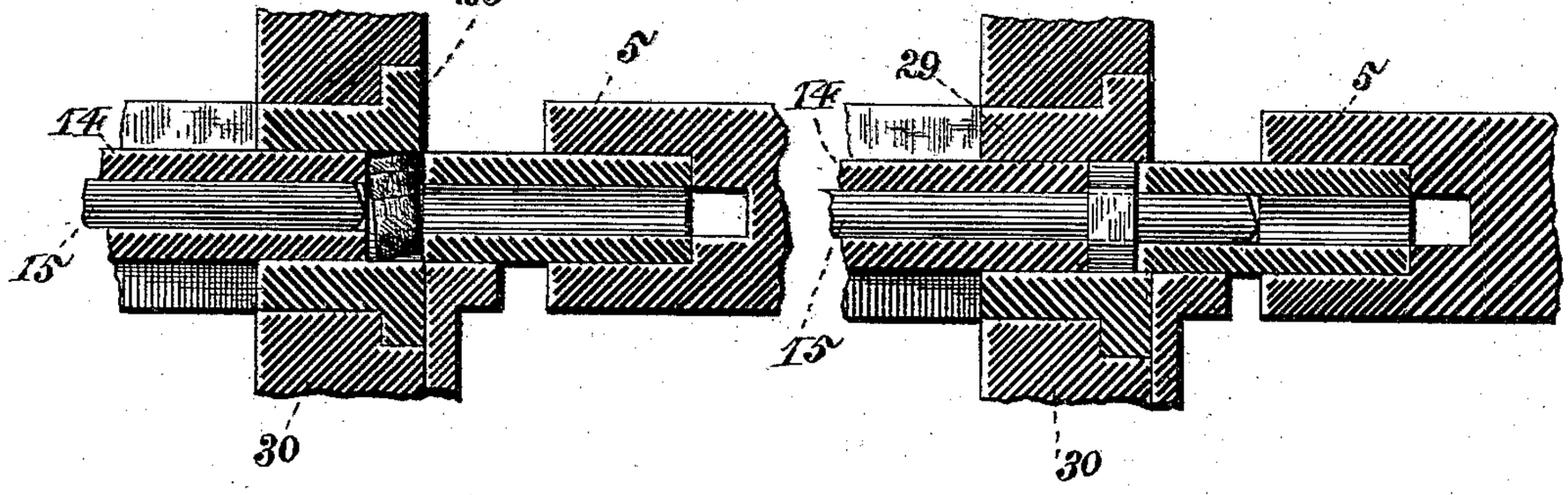

FIG. 5.

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UNITED STATES PATENT OFFICE.

FREDERICK LACKNER, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO THOMAS NEELY, EDWIN BINDLEY, AND JOHN BINDLEY, ALL OF SAME PLACE.

NUT-MACHINE.

SPECIFICATION forming part of Letters Patent No. 385,187, dated June 26, 1888.

Application filed March 22, 1887. Serial No. 231,989. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK LACKNER, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, a citizen of the United States, have invented or discovered certain new and useful Improvements in Nut-Machines, of which improvements the following is a specification.

In the accompanying drawings, which make part of this specification, Figure 1 is a top plan view of a nut-machine embodying my invention. Fig. 2 is a sectional elevation of the same, the section being taken on the line *x x*, Fig. 1. Figs. 3 and 4 are sectional views showing the operation of the compressing and perforating punches or dies upon the blank. Fig. 5 is a perspective view of the perforating-punch.

The invention herein relates to certain improvements in machines for forming hexagonal nuts.

The operation of machines of the class to which my invention pertains is, generally stated, somewhat as follows: Short sections are severed by a suitable knife from a round or hexagonal bar and then transferred to a die-box or matrix having a hexagonal contour, in which the severed section or blank is compressed by oppositely-acting dies, and also perforated by a punch operating through one of the dies. As the severed section or blank is greatly distorted by the action of the knife, great difficulty is experienced in causing the metal of the blank to "flow" under the action of the compressing-dies and completely fill the die-box or matrix. Hence great care must be exercised both in selecting the material and in operating the machine in order to obtain perfect nuts. The distorted blank above referred to is generally wedge shape—*i. e.*, thicker on one side than the other. It is therefore necessary, in order to obtain perfect nuts, to cause the excess of metal of one side to flow over to the opposite and thinner side. This flow of the metal is exceedingly difficult to obtain by direct pressure on opposite sides of the blank. I have discovered by experiment that if the point of the perforating-punch be located on that side of the axis of the punch operative on the thicker part of the blank, sufficient metal will be forced over by the action of the punch in connection with the action of the compressing-dies to cause the blank to completely and uniformly fill the die-box and matrix; and to this end the invention herein consists in a punch and parts of the machine operative therewith constructed and combined substantially as hereinafter more fully described and claimed.

At one end of the frame A is mounted the power-shaft 1, having the driving-pulley 2 secured thereto, and on this shaft is mounted the eccentric 3, connected by the yoke 4 to the compressing-die 5, the eccentrics 6 and 7 having their yokes 8 and 9 connected by the rods 10 and 11 to the slides 12 and 13, carrying the compressing-die 14 and the perforating-punch 15. The parts above mentioned are constructed and arranged substantially as set forth in Letters Patent No. 326,762, granted September 22, 1885, to Alfred Marland.

On one end of the power-shaft 1 is formed or so secured an extension, 16, having the bevel-pinion 17 attached thereto, said pinion intermeshing with a corresponding pinion, 18, in the counter-shaft 19, mounted in suitable bearings on the brackets 20, projecting from the side of the frame A. In the counter-shaft 19 is formed a crank, 21, the pin thereof being connected by the rod 22 to a block, 23, mounted in the slot 24 in the cutter-carrier 25. This construction—*i. e.*, the slotted connection of the rod or pitman 22 with the cutter-carrier—permits of a short stop or rest of the carrier at the opposite limits of its stroke, the stop at its rearward limit being for the purpose of permitting of the feed of the bar from which the blanks are cut, and that at its forward limit for the purpose of allowing the die 5 to push the blank from the prongs of the cutter into the shaping-matrix.

The cutter 26, which is adjustably secured to the carrier, as shown in Fig. 2, is formed with a V-shaped cutting-edge, and is provided with forwardly-projecting prongs 27, for the purpose of holding the blank after its severance from the bar until the cutter has reached the forward limit of its movement, at which time the die 5 moves forward and pushes the blank from between the prongs 27 into the

shaping-matrix. This shaping-matrix 28 is formed in a block, 29, which is secured in any suitable manner within an opening through the transverse beam 30 of the machine, suitable guides being also formed in the front of the beam for the cutter-carrier 25. The matrix is formed of a size and shape corresponding to the size and shape of the nut to be formed, and is located in the line of movement of the dies 5 and 14, which are made of an external size and shape to fit within the matrix. Through each of the dies is formed an axial opening—that in the die 14 being for the purpose of permitting of the movement of the punch 15 therethrough, and that in the die 5 for the discharge of any scraps or punchings removed from the blank by the punch 15, said scraps or punchings being removed from the opening in the die through a lateral opening at its end. (See Figs. 3 and 4.)

The bar 31, from which the blanks are cut, is fed forward through an opening in the beam 30 across the path of the cutter 26 by the rolls 32, operated by a pawl connected with the slide 13; but any other suitable means may be employed for that purpose.

As the cutter advances and shears off a section of the blank, its forward pressure on one side of the blank and the resistance on the opposite side of the bar distort the shape of blank and effect such a compression on one side of the blank as to impart to it a wedge-like appearance—that is to say, the blank is somewhat thicker on one side than the other and one end is of smaller diameter than the other. This distortion of the blank is so great that it is very difficult with the ordinary pencil-point punch and the compressing-dies to cause the blank to spread out and completely fill the matrix. As the greater bulk of metal in the blank is on the side opposite that operated on primarily by the cutter, I provide a punch having its operative point *a* formed on that side of the axial line of the punch farthest from the cutter, as shown in Figs. 3 and 4. After the blank has been forced into the matrix by the die 5, the die 14 and punch 15 are moved forward, the punch preferably somewhat in advance of the die, in order that it may operate in the blank before it has been condensed by the action of the dies. The eccentric point of the punch will cause the metal of the blank to flow over to one—*i. e.*, the thinner—side of the blank, and thereby effect such an even distribution of the metal that the subsequent action of the compressing-dies will cause a complete filling of the matrix.

The punch 15 is formed with its point eccentric to the axis, but within the perimeter of the punch, as shown in Fig. 5.

I claim herein as my invention—

1. In a nut-machine, the combination of a cutter, adapted to sever the section or blank and transfer it to a position in front of the nut-forming matrix, and a crank having a loose connection with the cutter, said parts being so constructed and combined as to permit of a stop in the movement of the cutter at the opposite limits of its stroke, substantially as set forth.

2. In a nut-machine, the combination of a nut-forming matrix, oppositely-acting compressing-dies, and a punch having its entering point or edge eccentric to the axis, but within the perimeter of the punch, substantially as set forth.

In testimony whereof I have hereunto set my hand.

FREDERICK LACKNER.

Witnesses:

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R. H. WHITTLESEY.