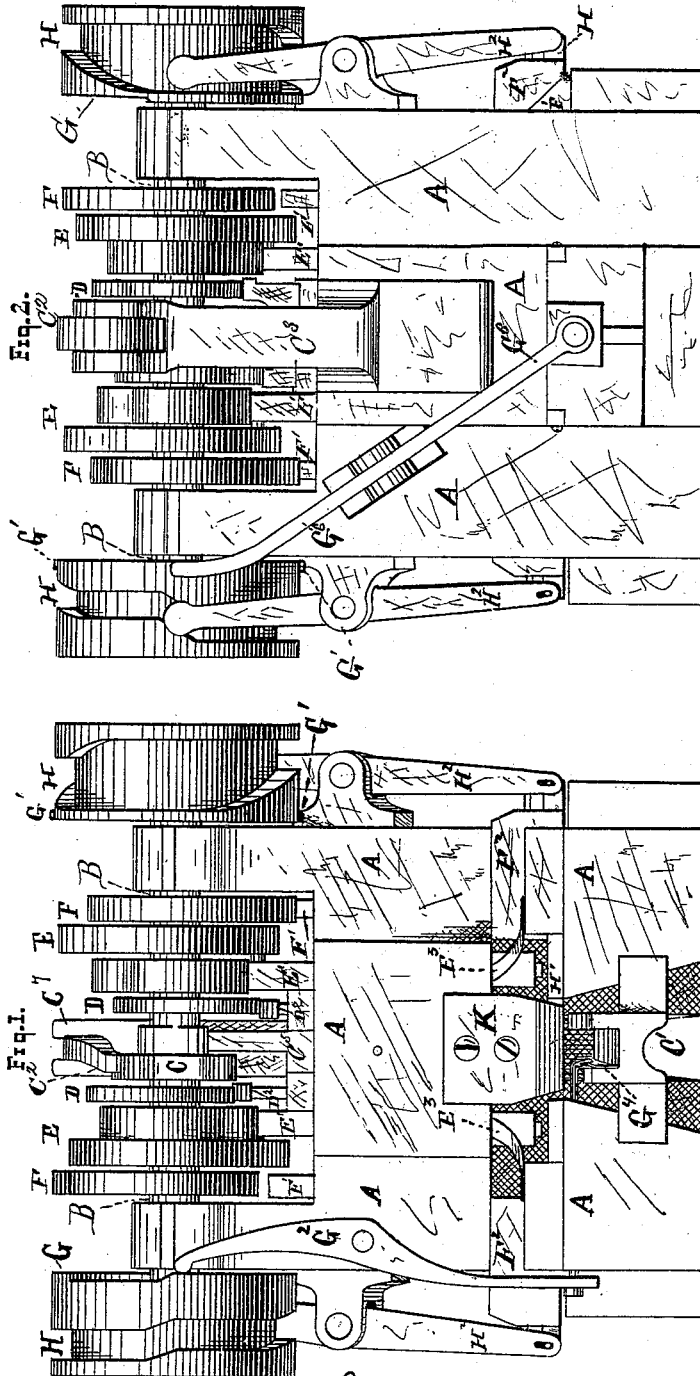


J. R. BLAKESLEE.  
Nut-Machine.

No. 204,705.

Patented June 11, 1878.



Witnesses.

*W. G. Donnelly*  
*Jno. C. Conwell Jr*

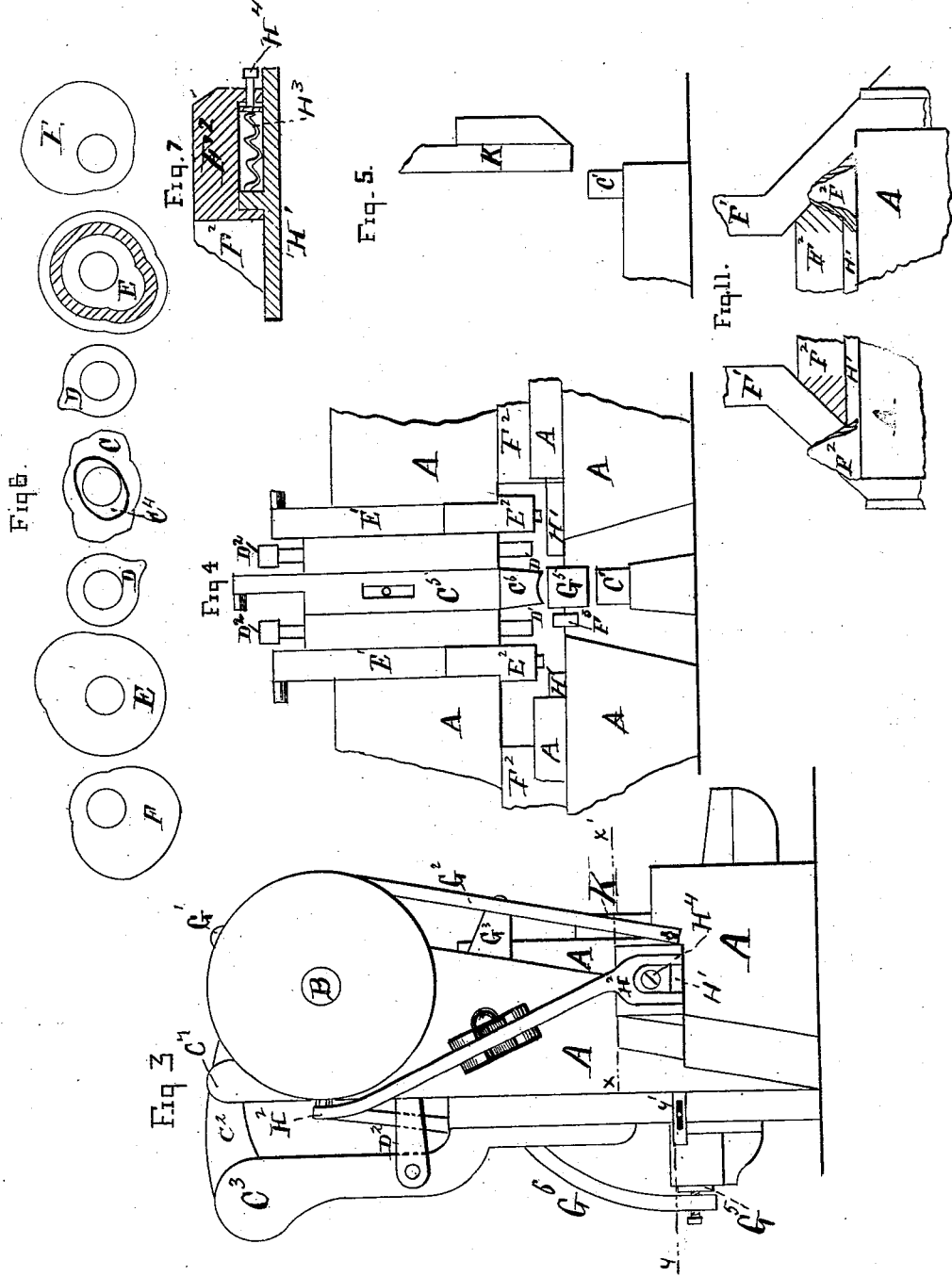
*John R. Blakeslee* Inventor.  
*By Lyggett & Lyggett.*

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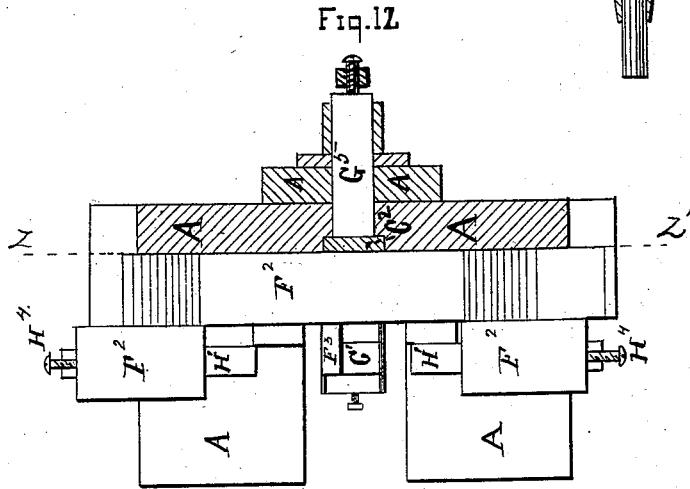
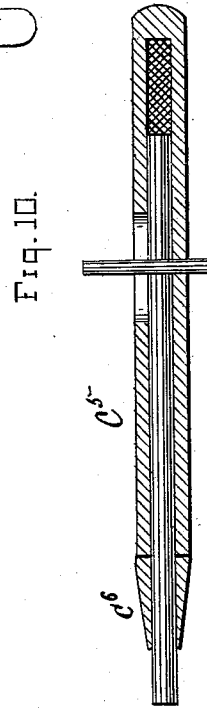
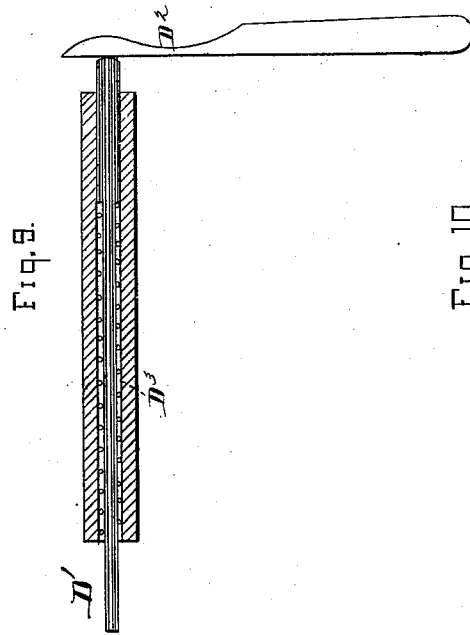
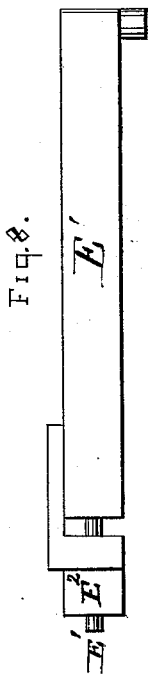
*John R. Blakeslee* Inventor.  
*By Leggett + Leggett*

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Witnesses.  
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# UNITED STATES PATENT OFFICE.

JOHN R. BLAKESLEE, OF CLEVELAND, OHIO.

## IMPROVEMENT IN NUT-MACHINES.

Specification forming part of Letters Patent No. 204,705, dated June 11, 1878; application filed April 3, 1878.

### *To all whom it may concern:*

Be it known that I, JOHN R. BLAKESLEE, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Machinery for Making Nuts; 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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to certain improvements in machinery for making hot forged nuts; and consists in the combination of parts hereinafter described and claimed.

In the drawings, Figure 1 is a view, in front elevation, of my machine; Fig. 2, a view, in rear elevation, of the same. Fig. 3 is an end view of the machine; Fig. 4, a partial front view of the machine, with portions removed to show the internal arrangement and operation of the parts. Fig. 5 is a detail view of certain parts. Fig. 6 represents the plan of all the eccentrics and cams of the main shaft, excepting the two end ones, showing their relation to the axis of the said shaft and their relation to each other. Fig. 7 is a detached view of a finger and finger-bar, shown in longitudinal section. Fig. 8 is a detached view, showing a punch-slide and flattener. Fig. 9 is a detached view, showing in longitudinal section a clearing or discharging pin; Fig. 10, a detached view, showing in longitudinal section the crowner and crowner-slide. Fig. 11 is a detached view, showing the manner of operating the central reciprocating finger-bar.

A is the frame, of any suitable fashion or material to accommodate the various parts of my machine and to permit of their operation. B is the main shaft, to which the initial power is applied for driving the machine. C is the center cam. This is double in character, operating by its periphery as a cam, and having also a cam-slot formed in its side. The peripheral cam operates to raise the cutter C<sup>1</sup> by raising its lever C<sup>2</sup>, which is pivoted to an arm, C<sup>3</sup>, which may be in the form here shown, or it may be a part of the general frame, which it essentially is.

To the free end of this lever the cutter-slide

C<sup>7</sup> is loosely connected, and this slide is adapted to have vertical reciprocation within the frame of the machine. To the forward lower extremity of said slide the cutter C<sup>1</sup> is suitably secured. The cam-slot C<sup>4</sup> in the side of the center cam C engages with a pin on an arm of the crowner-slide C<sup>5</sup>, to which the removable crowner C<sup>6</sup>, for shaping the upper face of the nut, is removably attached.

Here it may be mentioned that this crowner C<sup>6</sup> is in the form of a die, counter-shaped to correspond to any fashion of nut that is desired to be produced, and is removably attached to its slide C<sup>5</sup>, for the purpose of removal or replacement.

Upon either side of the center cam C are placed cams D E F G G<sup>1</sup> H, whose functions, attachments, &c., will be hereinafter specified. Both cams D are alike in shape and function, but are placed in opposite relations upon the main shaft B, so that they shall act alternately. The same may be said of the cams E, F, and G.

The functions of the cams D are to operate the discharging-pins D<sup>1</sup>. This operation is preferably accomplished by causing the cams D primarily to impinge upon levers D<sup>2</sup>, resting upon the discharging-pins D<sup>1</sup>. The lever D<sup>2</sup>, like the lever C<sup>2</sup>, is pivoted upon the arm C<sup>3</sup>, or to the general frame A. Each discharging-pin D<sup>1</sup>, after it has been driven downward and made to perform its function by the cam D, is returned to its original position with its lever D<sup>2</sup>, when released by said cam, by a coil-spring, D<sup>3</sup>, suitably arranged within the casing surrounding said pin.

It is obvious that a variety of modifications to this form of my invention may be had—as, for instance, a suitable attachment between the lever D<sup>2</sup> and the pin D<sup>1</sup>—and any weight or spring or cam motion may act upon the lever whereby it shall be caused to return after being driven by the cam D.

The cams E operate the piercers or punchers E<sup>1</sup> and flatteners E<sup>2</sup>. The punchers E<sup>1</sup> may be either round or square, or any other shape that is desired to be given to the hole through the nut. As a matter of course, in case of screw-nuts, this punch is always round.

To the ends of the puncher-slides are loosely attached the flatteners E<sup>2</sup>. These flatteners

when driven down by the action of the cams E and the puncher-slides, are made to operate against the resistance of the springs E<sup>3</sup>, which return them to their original positions when the actions of the cams E cease. These springs, however, may be replaced by any equivalent mechanism that shall operate to perform a similar function.

The cams F operate the slides F<sup>1</sup>, which, by their alternate action, give a reciprocating movement to the finger-bar F<sup>2</sup>. This is accomplished as follows: The finger-slides F<sup>1</sup> are each composed of a vertical and angular portion, the angular portions being inclined at about forty-five degrees. The angular portions of the finger-slides F<sup>1</sup> are made to diverge from each other, and between the inner faces thereof is placed the finger-bar F<sup>2</sup>, resting in frictional contact against said inner faces of the finger-slides F<sup>1</sup>, and shaped at its ends to correspond with the angle of the said finger-slides F<sup>1</sup>.

It will be obvious that as one or the other of the finger-slides F<sup>1</sup> is driven down by its cam its angular impingement against the finger-bar F<sup>2</sup> will operate to drive said finger-bar one way or the other, and thus cause it to lift or force the opposite finger-slide to the necessary position for its cam to operate in driving it down again, which operation will result in driving the finger-bar in an opposite direction, causing it to raise the opposite finger-slide F<sup>1</sup>, as just specified.

To the finger-bar F<sup>2</sup> is attached the central finger F<sup>3</sup>, whose function will hereinafter be pointed out.

The cam G operates the feed-clutch, and is so placed as to release the bar and permit it to be fed twice at every revolution of the main shaft B. This is accomplished by the cam G impinging against the rocking lever G<sup>2</sup>, which, by its movement on the pivot G<sup>3</sup>, operates to release the feed-clutch G<sup>4</sup>. This feed-clutch may be in the form of a spring, as here shown, which, by its contact against the bar, shall keep it in proper position; or this clutch may be in the nature of a locking-cam or any other suitable device, the only object being to retain the bar and keep it from moving at such times as it is not desired to feed it to the machine, and to release said bar when a new blank is to be cut. The cam G<sup>1</sup> operates the hammer G<sup>5</sup>. This cam, as here shown, is peripheral in its character, although, of course, this is not essential. It is here shown as an abrupt or short cam, for the reason that it is desired to give the hammer G<sup>5</sup> a percussive movement. This movement is communicated to the hammer G<sup>5</sup> by the cam G<sup>1</sup> through the lever G<sup>6</sup>, pivoted suitably to the frame A, and connected in any suitable manner to the hammer G<sup>5</sup>. Preferably the hammer or its shank is made to project backward through the rear wall of the machine in such a manner that the blow of the cam G<sup>1</sup>, delivered through its lever G<sup>6</sup>, may be properly received. I provide two cams, G<sup>1</sup>, in this machine, for the rea-

son that two blows are required for every revolution of the shaft B, and these cams are placed opposite each other, as shown.

The cams H operate the lateral fingers H<sup>1</sup> in the manner as will hereinafter be shown, to wit: As either of the lateral fingers H<sup>1</sup> moves in toward the central finger F<sup>3</sup> it is caused so to move by the action of the cam H through the rocking lever H<sup>2</sup> attached to the frame A, substantially as shown. After one of the lateral fingers H<sup>1</sup> has finished its movement toward the central finger F<sup>3</sup>, it then is in position to receive a blank nut after it has been cut from the bar, and its next movement is to return to its original position before it was operated upon by the cam H. This return is effected by the operation of the finger-bar F<sup>2</sup>, that contains it.

It is necessary during this movement that a certain degree of tension and elasticity be given to the fingers H<sup>1</sup>. This is effected by the action of the spring H<sup>3</sup>, so attached and connected with the fingers H<sup>1</sup> that a certain degree of yielding elasticity is imparted to said fingers. The degree of this tension or elasticity may be governed by any suitable setting device, and a given method of accomplishing this is shown in the drawings by the set-screws H<sup>4</sup>. By driving these screws more or less the degree of tension is correspondingly determined.

K is the stationary cutter, so fixed in relation to the moving cutter C<sup>1</sup> that the bar, when placed between them, shall, by the operation of the two cutters aforesaid, be divided by a shearing cut. The stationary cutter K is so constructed that its cutting-edge proper can be readily detached and removed for the purpose of sharpening or renewal, and it is fixed in position in any suitable manner.

The operation of my machine is as follows: In the first place it is desired to operate in a given concert, to perform the following functions, in the following order: first, to release the bar from which the blank is to be cut, so that it can be fed to the machine; second, to cut the blank from the bar and swage the nut and form its face; third, to hammer the ends of the nut and properly shape this portion of the product; fourth, to carry the nut to its punch and flattener; fifth, to punch or pierce and flatten the nut; sixth, to deliver the nut from the machine in its finished state, ready to receive its screw-thread.

It will be observed, however, that instead of performing these functions upon a single nut at a time there are, while the machine is in full operation, always two nuts being operated upon at once, one upon either side of the finger F<sup>3</sup>. While being thus operated upon the nuts are held in position between either side of said central finger F<sup>3</sup> and the lateral fingers H<sup>1</sup>, and during the operation just mentioned, when necessary to be carried from one point to another, are carried over the space at the sides of the cutter C<sup>1</sup>.

Supposing, for the purpose of a clearer illus-

tration of the operation of the machine upon three successive nuts, we give the following description: The blank first is cut, crowned, and hammered upon its ends. It is then carried laterally to be punched and flattened, and while being so punched and flattened the blank of the second nut is cut, crowned, and hammered upon its ends. Now the first nut is returned until it reaches the space at the side of the cutter C<sup>1</sup>, when the delivery-pin over it is dropped upon it, and the nut is discharged from the machine. Meanwhile the second one is being carried to be punched and flattened, and the blank of the third nut is cut, crowned, and hammered upon its ends, and while the third nut is being carried laterally to be punched and finished the second nut is discharged upon the opposite side of the cutter from that which the first was delivered, and so on. This concert of action is continued, the machine, as it were, doing double duty with a single crown and cutter.

If found desirable, I may modify my machine as follows: Instead of the nut receiving its fashion from the crowner C<sup>6</sup>, this operation may be performed by dies placed upon the ends of the flatteners E<sup>2</sup>, and the same result produced without any variation from the spirit of my invention.

What I claim is—

1. The combination, with the crowner, central finger, and lateral fingers, said fingers respectively having movement as described, of the punching, flattening, and discharging devices, substantially as set forth.

2. The combination, with the cutters, central finger, and lateral fingers, said fingers respectively having movement as described, of the crowner, the punching, the flattening, and the discharging devices, substantially as set forth.

3. The combination, with the cutters, feed-clutch, crowner, central finger, and lateral fingers, said fingers having movements as described, of the punching, the flattening, and the discharging devices, substantially as set forth.

4. The combination, with the cutters, feed-clutch, crowner, hammer, central finger, and lateral fingers, said fingers having movements as described, of the punching, the flattening, and the discharging devices, substantially as set forth.

5. The combination, with the central finger F<sup>3</sup>, of the lateral fingers H<sup>1</sup>, the latter adapted to have alternate reciprocation to and from said central finger, substantially as set forth.

6. The combination, with the lateral reciprocating fingers H<sup>1</sup>, adapted to have an adjustable tension or elasticity imparted thereto,

of the finger F<sup>3</sup>, formed on the finger-bar F<sup>2</sup>, substantially as set forth.

7. The combination, with the upper stationary cutter, lower vertically-reciprocating cutter, and central finger F<sup>3</sup>, which latter is adapted to have lateral reciprocation relative to the machine, of the lateral fingers H<sup>1</sup>, which are respectively adapted to have reciprocation relative to said central finger and on opposite sides of the same, substantially as set forth.

8. The combination, with the cutters, central finger F<sup>3</sup>, and lateral fingers H<sup>1</sup>, of the hammer G<sup>5</sup>, substantially as set forth.

9. The combination, with central finger F<sup>3</sup> and lateral fingers H<sup>1</sup>, the same being adapted to have lateral movements relative to the machine, of the crowner C<sup>6</sup>, substantially as set forth.

10. The combination, with the cutters C<sup>1</sup> and K, central finger F<sup>3</sup>, and lateral fingers H<sup>1</sup>, of the crowner C<sup>6</sup> and hammer G<sup>5</sup>, substantially as set forth.

11. The combination, with the central finger F<sup>3</sup> and lateral fingers H<sup>1</sup>, the same having movements as described, of the punchers E<sup>1</sup>, substantially as set forth.

12. The combination, with central finger F<sup>3</sup> and lateral fingers H<sup>1</sup>, the same having movements as described, of piercers or punchers E<sup>1</sup> and flatteners E<sup>2</sup>, substantially as set forth.

13. The combination, with central finger F<sup>3</sup> and lateral fingers H<sup>1</sup>, the same having movements as described, of the discharging-pins D<sup>1</sup>, the latter being adapted to have vertical reciprocation alternately, respectively on opposite sides of said central finger, substantially as set forth.

14. The combination, with central finger F<sup>3</sup> and lateral fingers H<sup>1</sup>, the same having movements as described, of punchers E<sup>1</sup>, flatteners E<sup>2</sup>, and discharging-pins D<sup>1</sup>, substantially as set forth.

15. The combination, with the cutters C<sup>1</sup> K, fingers F<sup>3</sup> H<sup>1</sup>, and hammer G<sup>5</sup>, of crowner C<sup>6</sup>, punchers E<sup>1</sup>, flatteners E<sup>2</sup>, and discharging-pins D<sup>1</sup>, substantially as set forth.

16. The combination, with central finger F<sup>3</sup> and lateral fingers H<sup>1</sup>, the same having movements as described, of the cutter C<sup>1</sup>, which vertically reciprocates within a recess formed in the frame of the machine, as shown, and having an open space upon both sides thereof, through which latter the nuts are alternately discharged, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN R. BLAKESLEE.

Witnesses:

F. TOUMBEY,

W. E. DONNELLY.