A. B. Glover.

Nut Machine.

No. 42,654. Patented May 10, 1864.

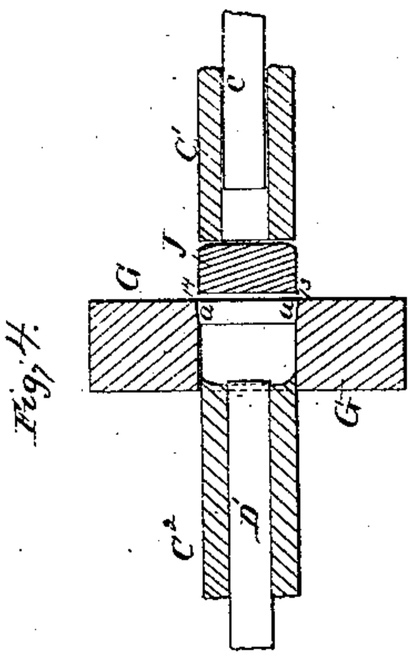
Fig. 4.

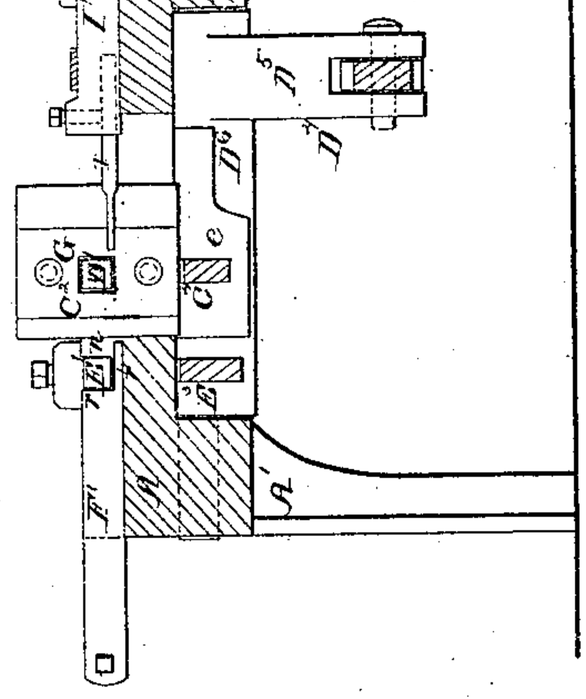
Fig. 3.

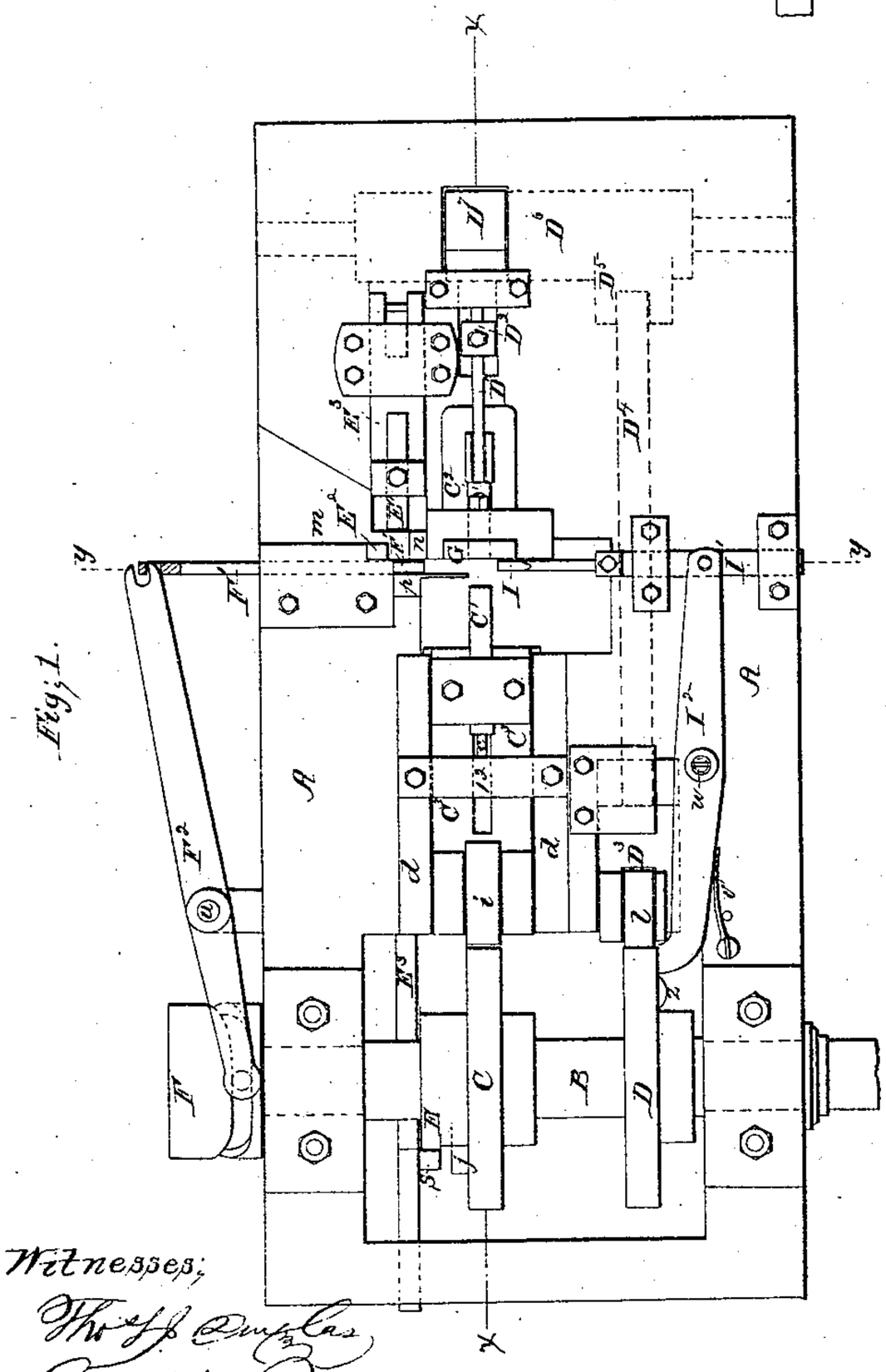
Fig. 1.

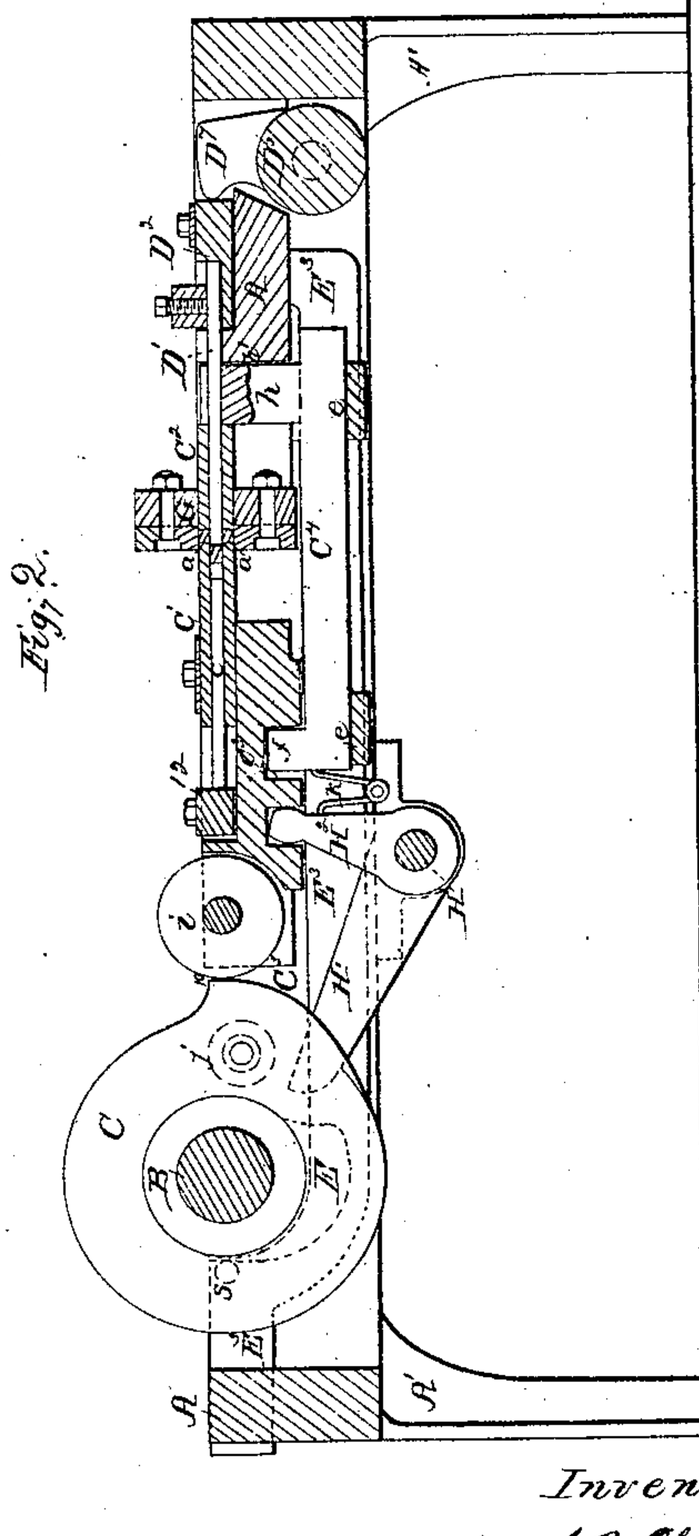
Fig. 2.

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UNITED STATES PATENT OFFICE.

A. B. GLOVER, OF YONKERS, NEW YORK.

IMPROVEMENT IN MACHINES FOR MAKING NUTS.

Specification forming part of Letters Patent No. **42,654**, dated May 10, 1864.

To all whom it may concern:

Be it known that I, A. B. GLOVER, of Yonkers, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Machinery for Making Hot-Pressed Nuts; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a plan of a nut-making machine with my improvements. Fig. 2 is a longitudinal vertical section of the same in the plane indicated by the line *x x* in Fig. 1. Fig. 3 is a transverse section of the same in the plane indicated by the line *y y* in Fig. 1. Fig. 4 is a horizontal section on a larger scale than the other figures of the die-box, dies, and a blank, which is about to be formed into a nut.

Similar letters of reference indicate corresponding parts in the several figures.

This invention consists in certain improvements in nut-making machinery, whereby, first, its construction is considerably simplified; second, it is enabled to be run at a very high speed; third, the labor of the pressing-dies is reduced and they are enabled to be kept cool so that they wear longer; and, fourth, nuts of better quality are produced.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A is a stout bed-plate or horizontal frame supported upon suitable standards, A′ A′, and supporting all the working parts of the machine.

B is the rotating main shaft, arranged transversely to and near one end of the frame A, and carrying the four cams C D E F, the cam C being to operate the pressing-dies C′ C², the cam D to operate the punch D′, the cam E to operate the movable cutter E′, and the cam F to operate the carrier F′, by which the blanks after being cut from the bar by the cutter E′ are carried to the pressing-dies.

G is the die-block in which the nuts are pressed between front and back dies C′ C². This block, which is secured firmly in the frame in the usual or a suitable manner, has its opening of a size and form to correspond with that of the finished nuts, except that the entrance on the front is made slightly flaring or enlarged in taper form at each side, as shown at *a* in Fig. 4, for a purpose which will be hereinafter explained. The dies C′ C² fit easily to the die-block, and both are hollow, the back one, C², for the passage of the punch, and the front one, C′, for the reception of the burrs that are cut out from the blanks in the punching operation, and of the plunger C for expelling the said burrs. The front die, C′, is attached rigidly to a slide, C³, which works in guides *d d* on the frame A, and the back die, C², is attached to a sliding bar, C⁴, which works in guides *e e* below the frame, and this bar C⁴ is connected with the slide C³ by means of a turned-up tongue, *f*, on the said bar and a mortise, *g*, in the said slide, for the purpose of enabling the back die to be operated to expel the nuts from the die-block by the same cam by which the front die is operated, thereby dispensing with the back shaft commonly used to operate that die, and so simplifying the machine; but, in order to permit the necessary movement of the front die independent of the back one, the mortise *g* is made longer than the tongue *f*, that the slide C³ and front die may continue advancing into the die-block after the back one has been arrested by the portion *h* of the bar C⁴ coming, as shown in Fig. 2, against a stop, *h′*, formed by the back of a slot in the frame. The advance of the front die into the die-block and retirement of the back die therefrom are effected by the action of the peripherical surface of the cam C upon a friction-roller, *i*, attached to the slide C³, and the drawing back of the front die and advance of the back one are effected by a friction-roller, *j*, attached to one side of a cam and acting upon the arm H′ of a rock-shaft, H, and their arm H² of which is connected with the side C³.

In order that the retirement of the back die may be effected during the first part of the advance of the front one, there is a spring, *k*, applied between the bar C⁴ and the arm H² of the rock shaft H, the said spring always pushing against the said rod. The punch D′ is attached to a slide, D², which is arranged to work in suitable guides provided in the frame A in rear of the back die, C², and the cam D acts upon the said punch to make it punch the hole in the nut through a slide, D³, which is arranged to work parallel with C³ in suitable guides provided in the frame A. This slide is fitted with an anti-friction-roller, *l*, for

the cam to act upon, and is connected by a rod, D^4, with the arm D^5 of a rock-shaft D^6, which is arranged at the opposite end of the frame to the main shaft B and parallel with the latter shaft. Another arm, D^7, of the rock-shaft D^6 projects upward through an opening in the frame A and comes behind the punch-slide D^2 to push it forward into the nut-blanks as the said blanks are pushed into the die-block by the front die. The rod D^4 is connected with the rock-shaft H by means of a spring which keeps the roller *l* in contact with the cam.

The movable cutter E′, before mentioned, is secured in a slide, E^3, which is arranged side by side with the back die, C^2, in suitable straight guides, and operates in combination with the stationary cutter E^2, which is secured to the frame A at one side of the die-block. The cutting-edge of this cutter E^2 is arranged in the same plane with a fixed straight guiding surface, *m*, which is at right angles to the movements of the dies and the movable cutters, and the bar from which the nuts are to be made is placed against this guide and fed forward till it comes in contact with and is stopped by a fixed gage, *n*, which is arranged at the side of the die block. The movable cutter E′, in advancing, cuts off the blank from the bar and pushes or places it against a fixed but adjustable guide, *p*, which is so set parallel with the face of the die-block that there will be just room enough for the thickness of the blanks to pass between it and the die-block.

The carrier F′, already mentioned, consists of a straight sliding bar, which is arranged and suitably guided to work between the said guide *p* and the die-block at right angles to the dies and cutter E,′ is made with an angular recess, *r r*, in its inner extremity, as shown in Fig. 3, into which the blank is deposited by the cutter E′ as it is cut from the bar, and in which it rests while the said carrier carries it to a position opposite the opening of the die-block, and while the front die, C′, advances far enough to push the blank into the said block. The cam E, which operates the cutter E′, acts upon a stud, *s*, in one side of a sliding bar, E^3, which works in suitable guides at the respective ends of the framing. The cutter is drawn back after its operation by means of a spring. The cam F, which operates the carrier F′, does so through a lever, F^2, which works horizontally on a fixed fulcrum, *u*, one end of the said lever entering a slot in the carrier and the other carrying a pin or roller, which enters the groove in the periphery of the cam F.

I is a finger for knocking off the finished nuts from the end of the back die, C^2, in case of their sticking to the latter after it has pushed them out of the die-block. This finger is attached to a slide, I′, which is arranged opposite to the carrier F, and which is attached to one end of a horizontally-moving lever, I^2, which works on a fixed fulcrum, *w*, the other end of which is so acted upon by a protuberance, *z*, on the outer side of the cam D, that the said slide and finger are thrown forward very suddenly just after the nuts have been pushed out from the die-block. The said slide and finger are drawn back by a spring, *v*, which keeps the lever I^2 in contact with the cam.

Rotary motion being imparted to the shaft B, the operation of the machine is as follows: The attendant standing on that side of the machine where the cutters are placed takes a white-hot bar of iron of suitable size for the nuts, and, placing it upon the frame A, against the straight guiding-edge *m*, slides it up to the gage *n*. The advance of the cutter E′ cuts off a piece or blank of proper size and pushes it into the carrier F′, which immediately carries it in front of the die-block. The front die then advances and pushes the blank into the die-box, the back die in the meantime receding, and as soon as the blank has fairly entered the die-box the punch D′ advances with a quick movement toward and through the blank, pushing the core into the front die. The cam C is of such shape that the front die is moved forward slowly and time is allowed for the punch to do its work before any pressure is brought upon the sides of the blank; but after the hole has been punched the stoppage of the back die by the projection *h* of the bar C^4 coming into contact with the stop *h′* causes the necessary pressure to be produced by the continued advance of the front die to force the sides of the nut out against the sides of the opening in the die-block and the nut to be shaped and finished, the finishing being effected as the point 10 of the cam C arrives opposite the center of the roller *i*. As soon as the cam has passed that position the roller *j*, attached to it, comes into operation on the arm H′ of the rock-shaft and draws back the front die and causes the back one to advance through the die-block and push the nut out of the die-block, the spring *k* in the meantime separating the dies, so that the nut may drop out from between them or be knocked out by the finger I, which advances at this time. As the front die comes back the plunger *c* is brought into contact with a fixed stop, 12, arranged over the slide C^3, and thereby stopped, and the continued retirement of the said die causes the bar to be pushed out by the said plunger. These operations are all repeated during every revolution of the main shaft, and hence a nut is formed at every revolution.

The several cams are so arranged that the time which the iron is in the die-block and between the dies is not more than one-quarter of the time occupied in each revolution of the main shaft, leaving the dies at rest during the remainder of the revolution, with a stream of water upon them to keep them cool; and, owing to the time thus allowed for cooling, the shaft B may be driven at a higher velocity than the driving-shaft of other machines, and a greater number of nuts produced in a given

time without injury to the dies. The durability of the front die is also increased by relieving it of the duty of cutting off the blanks (which it has to do in other nut-machines) and employing a separate cutter for that purpose. The nuts, too, owing to the short time occupied in forming them, are finished before the metal has time to chill, and are thus made of better quality and appearance.

It has been hereinbefore stated with reference to Fig. 4 that the entrance of the opening of the die-block is flared or enlarged at the sides in taper-form. I will now describe the object of such enlargement. In cutting off the blank J there is unavoidably formed thereon a rough or projecting edge, 13, on the side against which the movable cutter comes into operation, and a corresponding rough edge on the opposite side of the remaining portion of the bar. Now by turning over the bar after each nut is made the rough or projecting edge 14, left on its end by the cutting off of the last nut, will come on the same side upon which the edge 13 will be formed upon the next blank in cutting it off, and both rough edges will be on that side of the blank which first enters the die-block, as illustrated in Fig. 4, and in the act of pushing the blank into the taper or flaring entrance of the die-block this superfluous metal forming the edges will be forced into the body of the blank, so as to form square corners. The bar, therefore, should always be turned over by the attendant before being presented anew to the cutters.

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

1. In combination with the dies the stationary and movable cutters E' E^2, gage *n*, carrier F, and guide *p*, the whole constructed and arranged relatively to each other and to the dies, and operating substantially as herein specified.

2. The tongue *f* on the bar C^4, and longer mortise, *g*, in the front die-slide, C^3, the projection *h* on the bar C^4, and stop *h'* in the frame, and the spring *k*, or their equivalents, all in combination with each other and with the front and back dies, substantially as and for the purpose herein set forth.

3. The combination of the shaft B, cams C D E, dies C' C^2, punches *c* D', rod D^4, sliding bar E^3, die-block G, and cutters E' E^2, all arranged and operating substantially as specified.

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Witnesses:
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