

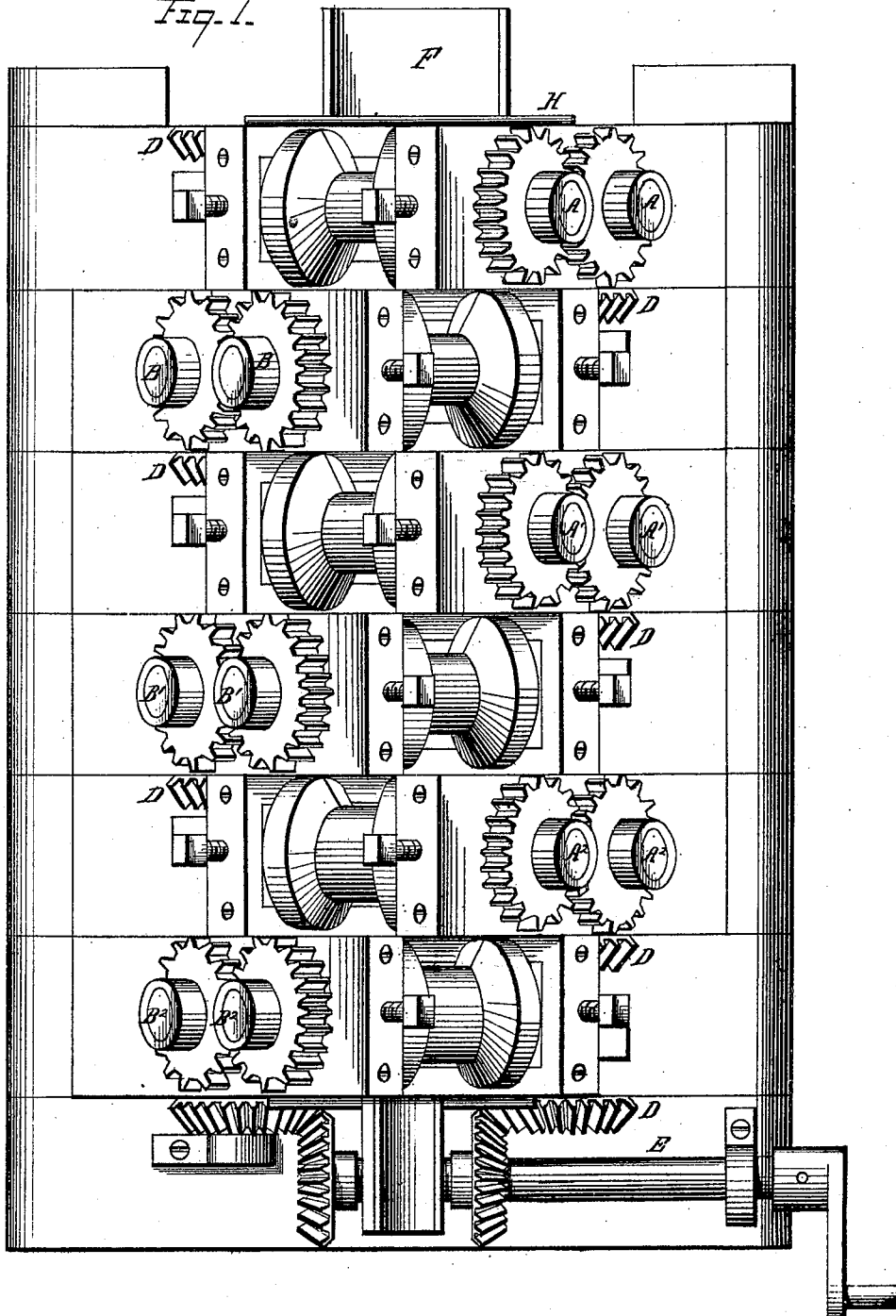
J. OSTRANDER.

MACHINE FOR ROLLING NUT-BLANKS.

No. 171,843.

Patented Jan. 4, 1876.

Fig. 1.



WITNESSES

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Wm. H. Brereton &

By

INVENTOR

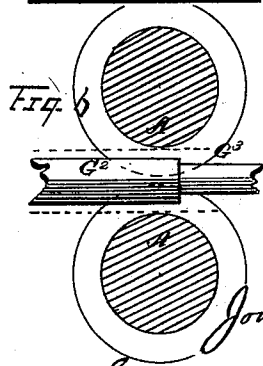
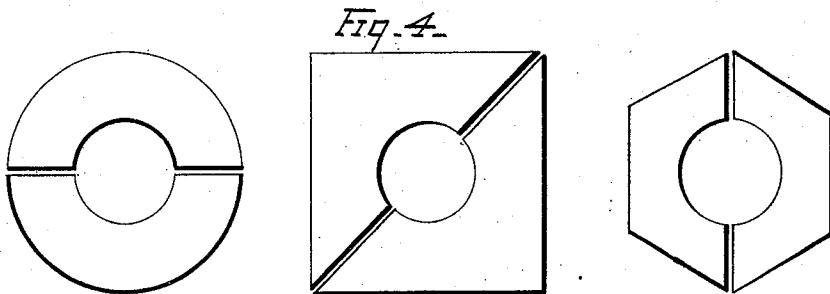
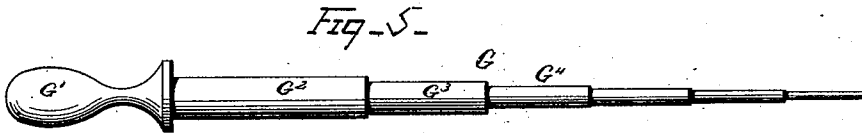
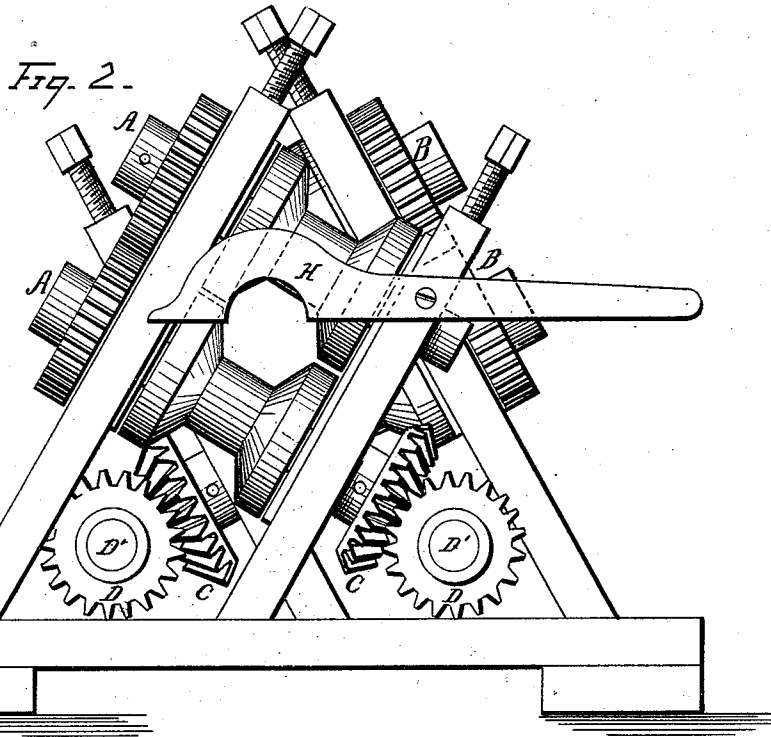
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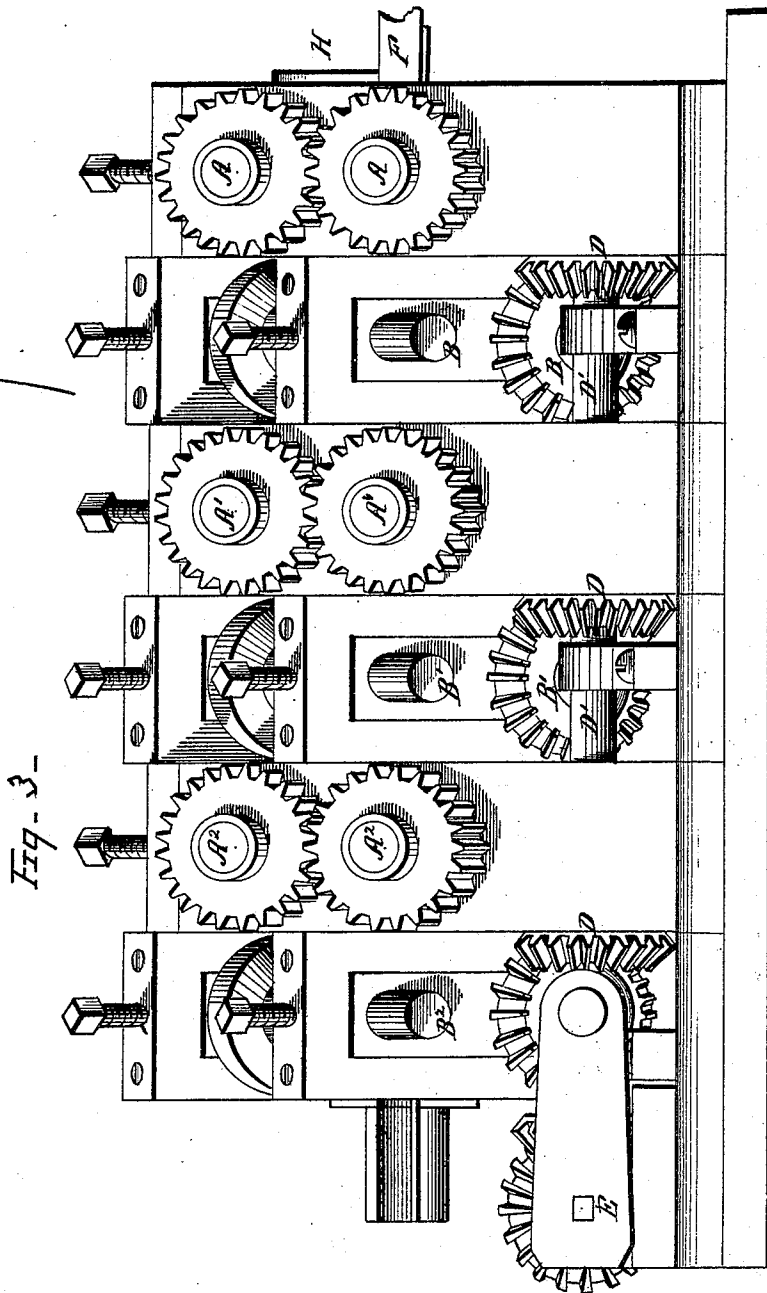
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UNITED STATES PATENT OFFICE.

JONATHAN OSTRANDER, OF CLEVELAND, OHIO.

IMPROVEMENT IN MACHINES FOR ROLLING NUT-BLANKS.

Specification forming part of Letters Patent No. **171,843**, dated January 4, 1876; application filed October 22, 1875.

To all whom it may concern :

Be it known that I, JONATHAN OSTRANDER, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Compound Mill for Making Nut-Blanks; 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 a part of this specification.

My invention relates to a compound mill for making blanks designed for nuts and for other similar purposes, and may likewise be employed for rolling heavy tubing of any description.

My invention consists, first, in a series of sets of rolls, arranged at angles to each other, alternately, but so that their grooves shall all be in a line with each other, the said grooves and each pair of rolls being of the requisite form to make a hexagonal, octagonal, round, square, or other sectional form, of metal, and each succeeding pair of rolls having its grooves somewhat smaller than the preceding pair, whereby the series of rolls are at the same time reducing-rolls, and whereby muck-bar, as it comes from the furnace, or after having passed through certain primary rolls, may be passed into the first series of rolls, and will emerge from the last series in a completed form; and in combination therewith of a compound mandrel, extending through the center grooves in the whole series of rolls over which the hollow muck-bar is drawn in its passage through the rolls, and whereby a hollow product is made to emerge from the ends of the rolls, which hollow product, having a sectional form, either square, hexagonal, octagonal, round, or of any other desired form, is suitable especially for nuts, and may be employed for any other purpose for which heavy tubing is usually employed.

My invention consists, also, in connection with the mandrel and the rolls, of a stop or gate, which may be closed down upon the metal before it enters the rolls, to enable the operator to force the mandrel through the hollow muck-bar past any blister or other obstructions in the said opening.

In the drawings, Figure 1 is a plan view of

a machine embodying my invention. Fig. 2 is an end view of that end where the metal enters the rolls. Fig. 3 is a side elevation of the said machine. Fig. 4 represents several different forms of muck-bar or piles which may be employed with advantage. Fig. 5 is a separate view of the compound mandrel. Fig. 6 is a separate view, representing the relative position of the mandrel with respect to any set of rolls.

We will proceed to describe the invention as adapted for the rolling of a hollow hexagonal nut-blank. $A A A^1 A^1 A^2 A^2$ are three sets of rolls, arranged in suitable oblique frames, and housed in the usual manner. $B B B^1 B^1 B^2 B^2$ are three similar sets of rolls, housed in oblique frames, but standing at an angle of sixty degrees with the other sets of rolls, and alternating with them, as shown—that is, so that the first set of rolls $A A$ shall incline in one direction. The next set of rolls $B B$ inclines in the other direction, at an angle of sixty degrees with the first. Then follows the rolls $A^1 A^1$, parallel to the rolls $A A$, which, in turn, are followed by the rolls $B^1 B^1$, parallel to the rolls $B B$, and so on, successively. The grooves in each set of rolls present a half-hexagon in each roll, as shown, and in each succeeding set of rolls the sectional dimensions of the grooves are made smaller than the preceding ones, so that the series will form a set of reducing-rolls. These rolls are each provided with suitable gearing E , which, by meshing into corresponding gearing D on the shafts D^1 , are all operated simultaneously in the proper direction by the power-shaft E . This method of gearing is not invariable, but any suitable gearing may be employed that will drive all of the series of rolls with uniform or proper speed to draw the metal forward from roll to roll, and cause it to emerge from the last series of rolls. The speed of each succeeding series of rolls should be properly governed, so as to receive and dispose of the metal as it comes from the preceding set of rolls, so as not to permit it to buckle up or bend between the rolls. The diameter of the rolls should also be sufficiently great that the metal, as it strikes the rolls, shall pass within such an acute angle as will be certain to gripe and carry the metal forward; for if the

rolls are of a too small diameter they will present so obtuse an angle at the point where they are struck by the metal as it enters the rolls that the effect will be to stop the metal, instead of drawing it into the rolls.

F is a platform, upon which the hollow muck-bar or pile is received previous to rolling, and it is designed that this machine may be adapted to receive the pile; or the hollow pile may previously have been passed through primary rolls before it is passed through this series or train of rolls, as may be deemed most expedient or practicable, and which will, of course, vary with circumstances.

G is a compound mandrel. It is provided with a suitable handle, G^1 , and with a shaft of varying diameters, G^2 G^3 G^4 , &c. It is designed to draw out the hollow pile over this mandrel, the mandrel having first been inserted through the hollow pile and through all the grooves of the whole series of rolls, so that when the pile is ready to be passed between the first series of rolls the mandrel will be forced forward into position, and the pile be strung upon it and be resting upon the platform F. In this condition the first portion G^2 of the shaft of the mandrel will extend into the grooves of the first set of rolls A A, so that the end of this portion G^2 of the shaft shall project through the said grooves to a position just beyond the plane of the axes of the two rolls A A. The portion G^2 of the mandrel shall extend to a similar position with respect to the plane of the axes of the rolls B B, and so on, as more clearly indicated in the separate view, Fig. 6. The muck-bar is piled in any suitable manner, so as to leave a hollow pile preparatory to heating. There are forms of muck-bar, however, which are especially adapted for this purpose, being previously rolled to the proper form. Such forms are shown in Fig. 4, and may be of any shape, half hexagon, half octagon, half square or semicircular. If at any time the hollow or opening in the pile should become obstructed by a blister, or from any other cause, the pile may be placed on the platform preparatory to entering the rolls, and be held by the lever or gate H firmly while the operator forces the mandrel through the hollow or opening until the mandrel is in its proper position.

I do not know that a series of rolls of this nature has ever before been made for rolling a hollow pile over a mandrel, the said mandrel made to extend from one end to the other end of the series. And I do not know that a se-

ries or train of alternately-inclined reducing-rolls has ever before been made for the purpose of producing blanks for nuts and other purposes.

The foregoing description, as stated, refers only to the mechanism adapted particularly for rolling hexagon blanks. If the blanks are square, then the rolls should incline with each other at an angle of ninety degrees, so the inclination should be varied to suit the different styles of blanks. And the invention, it is apparent, is equally well adapted for rolling blanks of any desired sectional shape.

It is apparent that the mandrel acts at the same time as a guide to guide the metal forward in a direct line from roll to roll; so also it is apparent that it is not absolutely necessary to extend the mandrel clear through the whole series of rolls; thus it might extend through all but one series, or all but two series, the last series serving to finish rather than to materially change the nut-blanks. The blank thus produced becomes very highly compacted as it passes over the successive shoulders on the mandrel. The fiber is all in the direction of the length, and is nowhere wrenched or twisted in the process.

After the blank has emerged from the last roll it may be cut up into suitable lengths for nuts, or may be cut into suitable lengths for any other purpose, such as heavy tubing, &c. A nut produced by this means will be very much stronger, and be capable of sustaining very much greater strain, than any other cold or hot pressed nuts produced by any other process of which I am aware.

What I claim is—

1. In combination with rolls A^1 B^1 , &c., the compound mandrel G^1 G^2 , &c., constructed, when in use, to project its shoulders respectively just past the plane of the axes of the rolls A B A^1 B^1 , &c., substantially as and for the purpose described.

2. The combination, with the compound reducing-grooves, of the platform F, and the lever or gate H, whereby the hollow pile will be supported and held in position while any obstruction is removed by the mandrel, substantially as and for the purpose described.

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

JONATHAN OSTRANDER.

Witnesses:

FRANCIS TOUMBEY,
H. T. HOOVER.