

Henry A. Gore.

Sheet No 1.

Machine for Rounding & Dressing Regular & Irregular Forms.

104578

Figure 1.

PATENTED JUN 21 1870

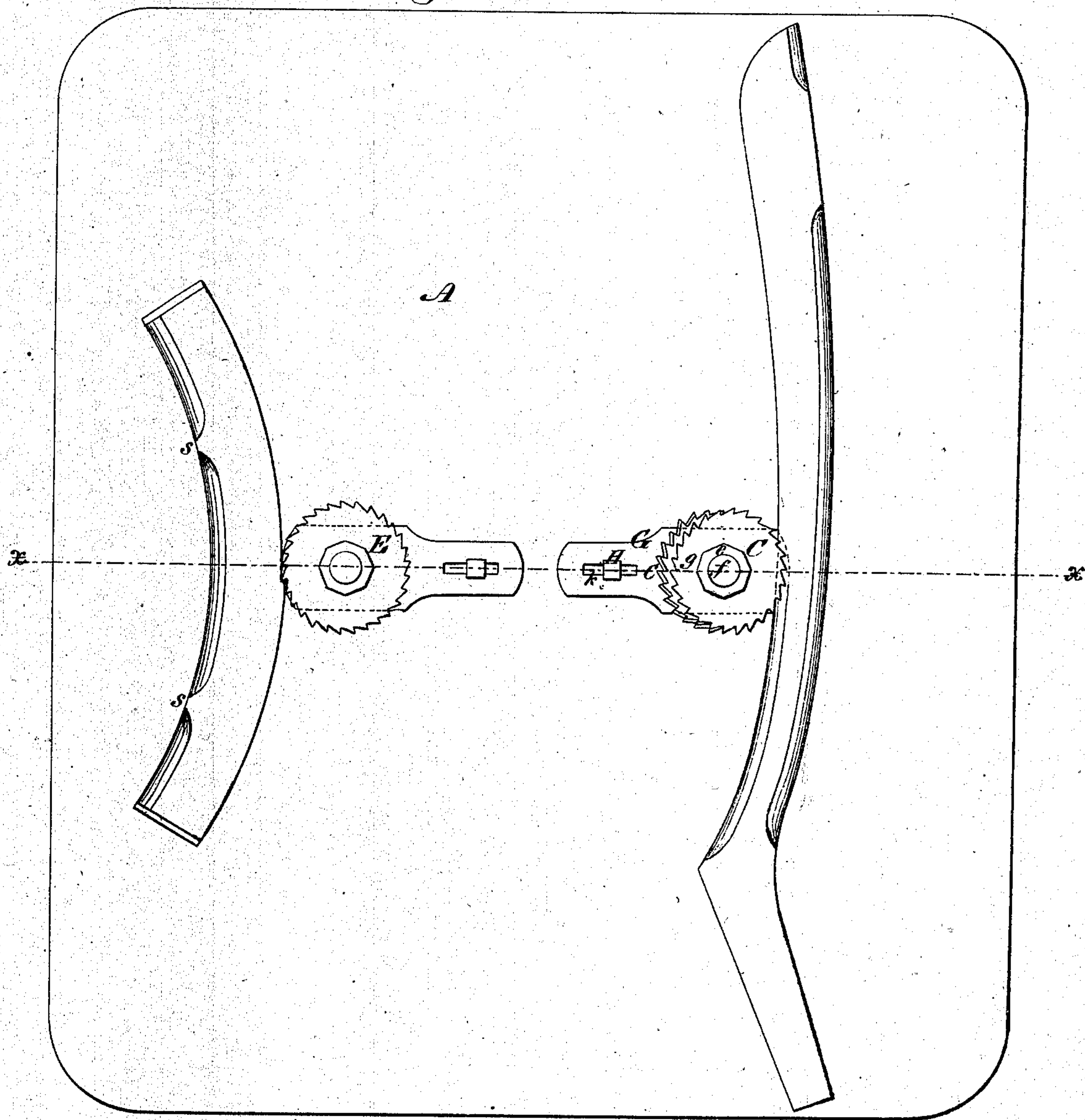


Figure 9.

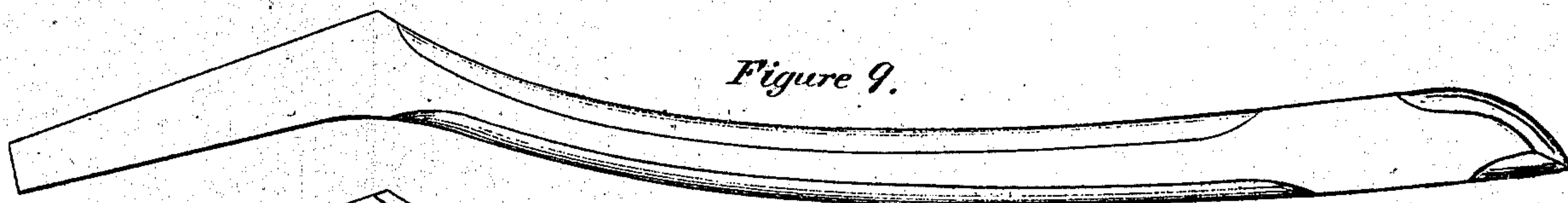
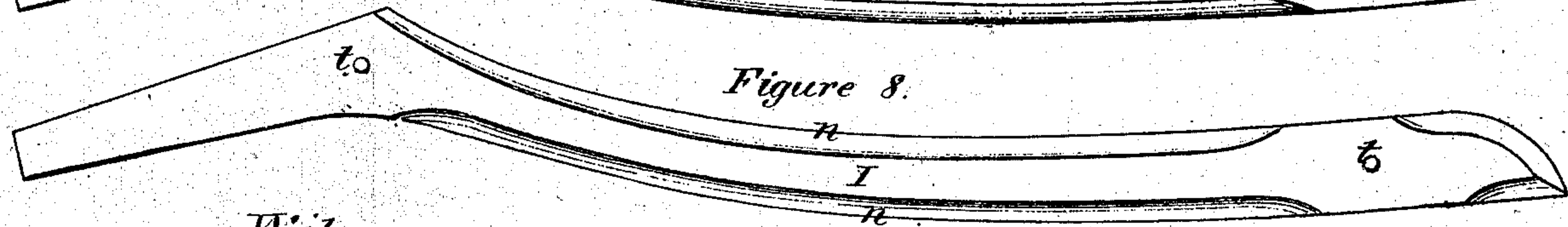


Figure 8.



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Sheet No. 2.

Machine for Rounding & Dressing Regular & Irregular Forms.

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Figure 2.

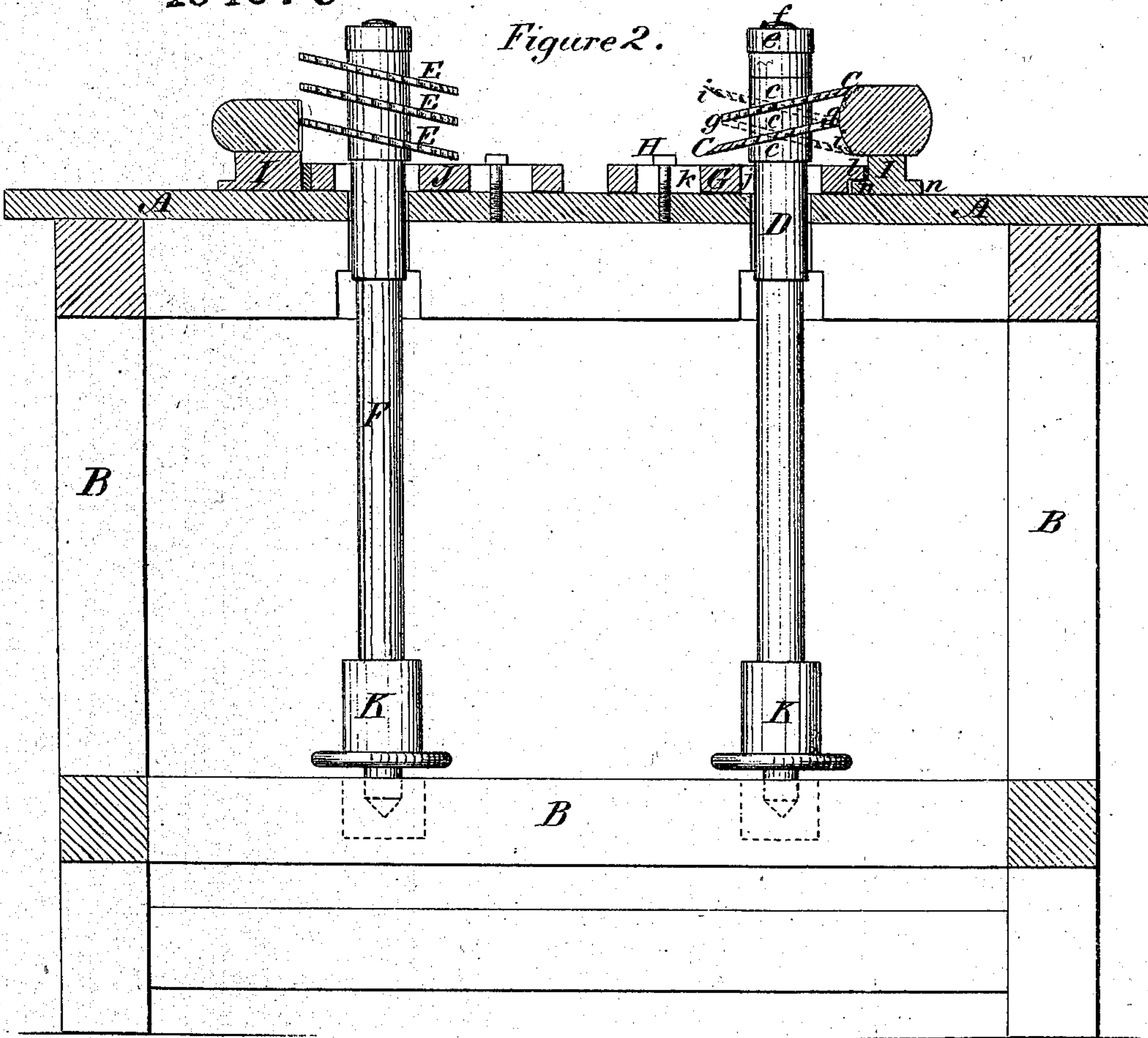


Figure 3.

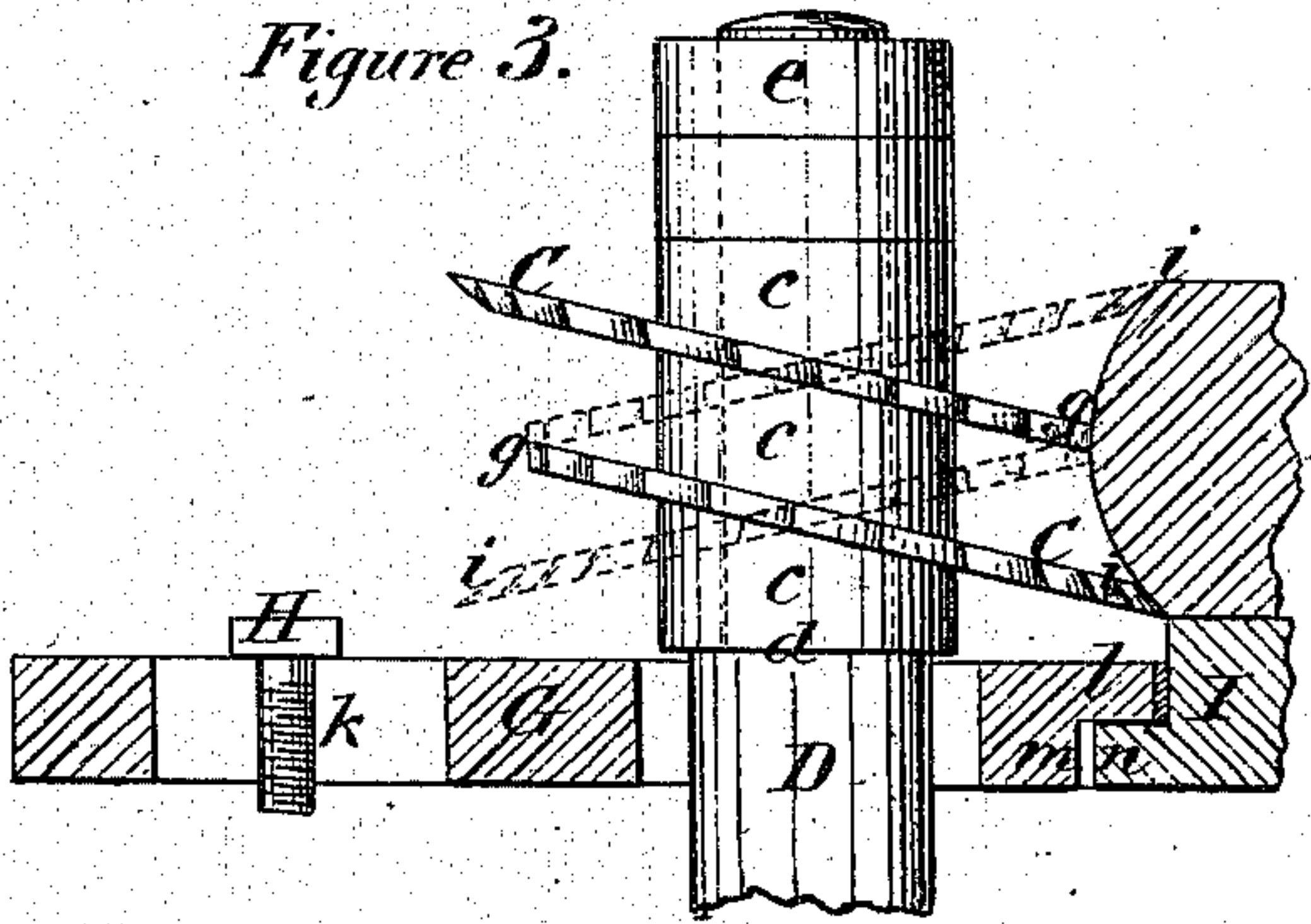


Figure 4.

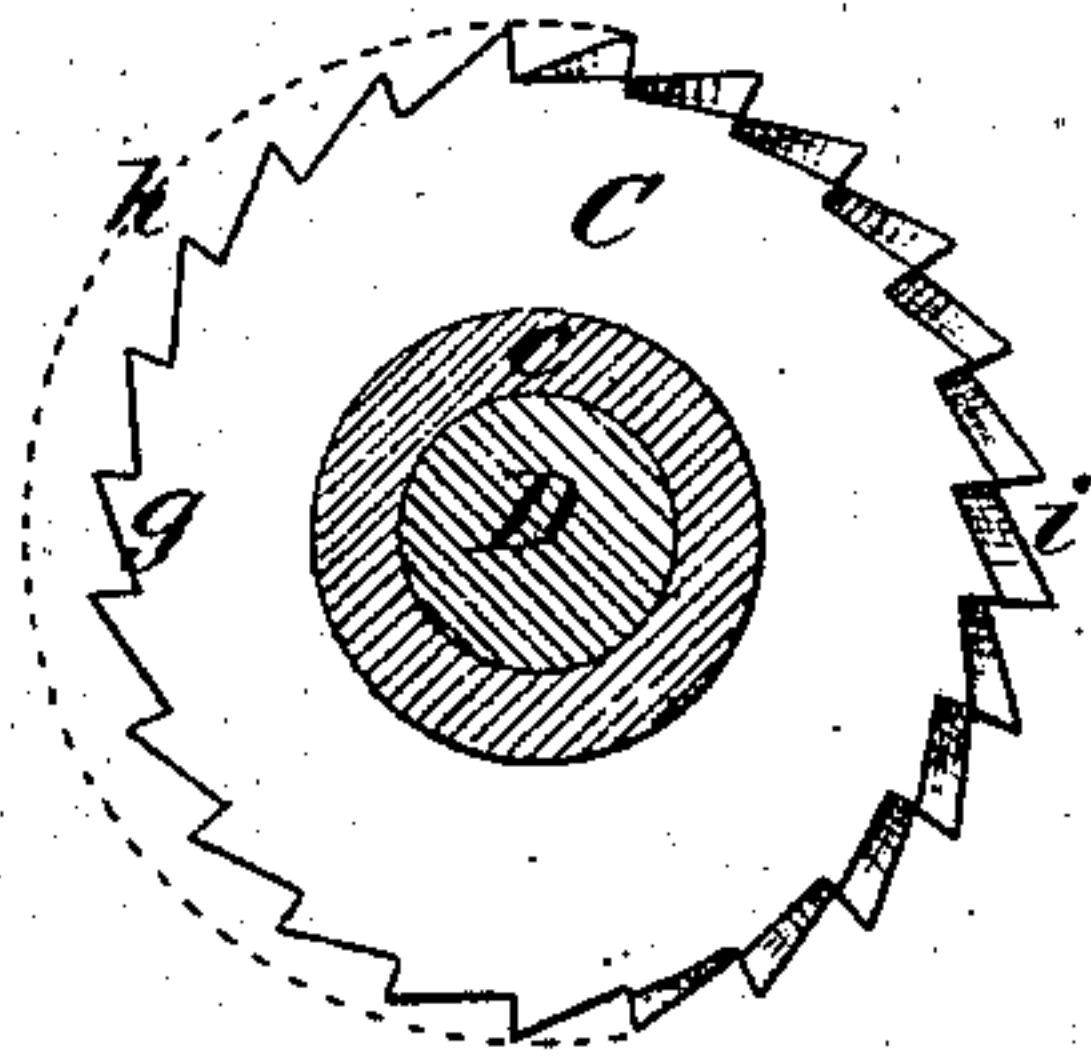


Figure 7.



Figure 5.

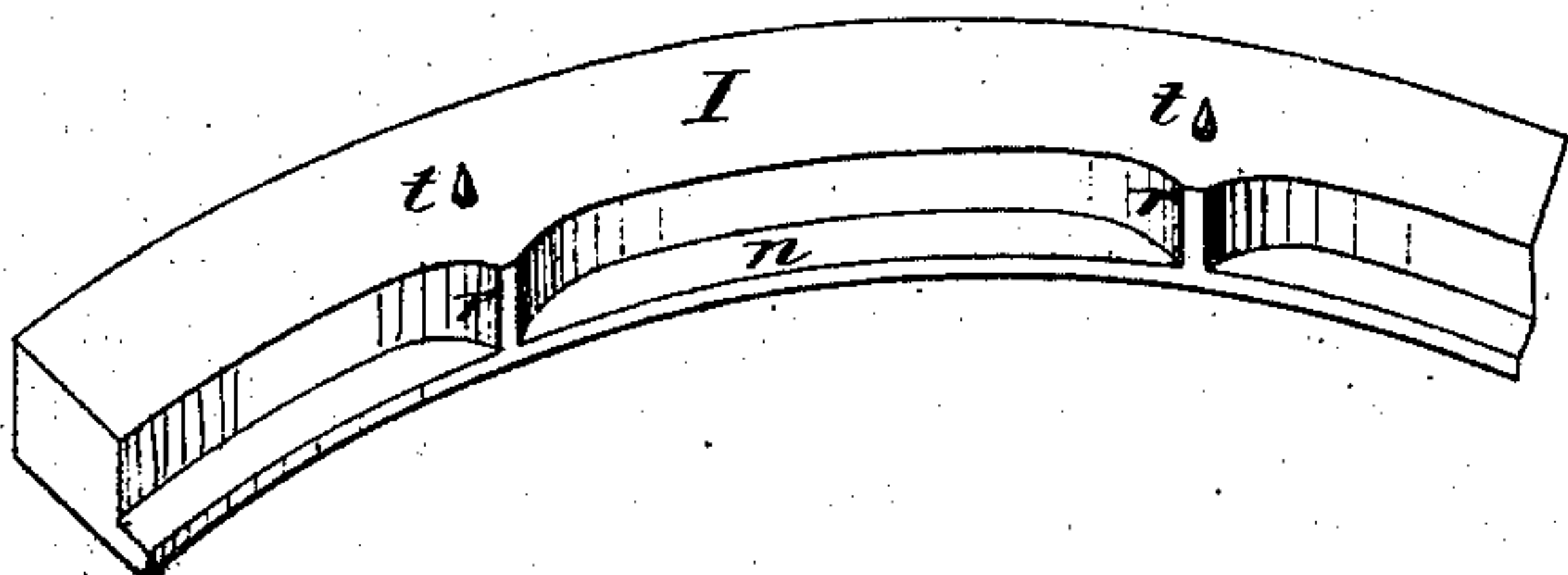
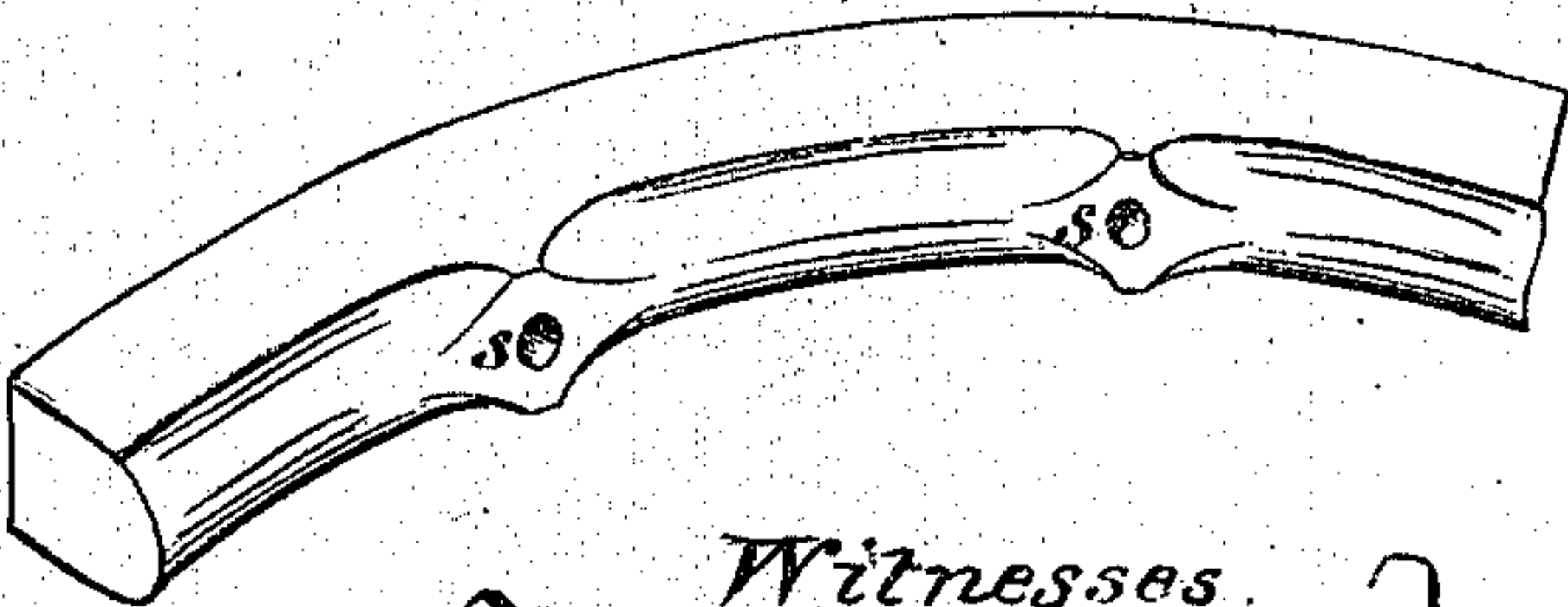


Figure 6.



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UNITED STATES PATENT OFFICE.

HENRY A. GORE, OF GOSHEN, INDIANA.

IMPROVEMENT IN MACHINES FOR ROUNDING AND DRESSING IRREGULAR AND REGULAR FORMS.

Specification forming part of Letters Patent No. 104,578, dated June 21, 1870.

To all whom it may concern:

Be it known that I, HENRY A. GORE, of Goshen, in the county of Elkhart and State of Indiana, have invented certain new and useful Improvements in Machines for Rounding and Dressing Regular and Irregular Forms; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings of the same, making part of this specification, and in which—

Figure 1 represents a plan or top view of a machine embracing my improvements. Fig. 2 represents a vertical section of the machine, taken at the line *xx* of Fig. 1, the oblique rounding and dressing saws and their mandrels being shown in elevation. Fig. 3 represents on an enlarged scale an elevation of the oblique rounding-saws and their mandrels, the gage being shown in section, and also a portion of the article being rounded and the pattern. Fig. 4 represents a plan or top view of the lower of the two oblique rounding-cutters, showing its peculiar form, corresponding in scale to Fig. 3. Fig. 5 represents a view in perspective of a pattern for rounding and dressing fellies. Fig. 6 represents a view in perspective of one of the fellies of a wheel as produced by my improved pattern. Fig. 7 represents a cross-section of the double-tongued pattern as secured to the material to be rounded. Fig. 8 represents a plan of a pattern constructed to form plow-beams. Fig. 9 represents a plan of a plow-beam as finished by my improved pattern.

My invention relates to machines for dressing and shaping regular and irregular forms; and it consists in the employment of oblique saws of irregular shape, in their arrangement relatively to each other, and to the construction of their serrated edges or cutting-teeth; also, in the construction of an adjustable gage; and, finally, in the employment of a pattern of peculiar construction.

In the accompanying drawings, the frame of the machine consists of a table, A, supported by suitable frame-work, B, for sustaining the mandrels of the shaping and dressing saws. Two sets of saws or serrated plates are represented in the machine, one set consisting of two saws, C, placed obliquely upon their mandrel D for the purpose of rounding and dress-

ing material of different forms, and the other set consisting of three saws, E, designed to dress square surfaces, and are also secured obliquely upon their mandrels F. These several sets of saws are secured upon horizontal or vertical mandrels so as to project beyond the table to receive the material to be rounded, squared, and dressed.

The first set of saws, C, are secured upon the end of the mandrel D at suitable distances apart, obliquely to the axis thereof, parallel to each other, and securely clamped by collars *c*, their adjacent surfaces corresponding in form to the oblique position of the saws. The saws thus arranged are clamped between a shoulder, *d*, and a screw-nut, *e*, on the end *f* of the mandrel, fitted with a screw-thread to receive said nut. These saws, while being relatively to each other of the same size, are not, however, of the same diameter throughout their circumference, but are flattened on one side of their diameter, as represented at *g* in Fig. 4 of the drawings—that is to say, one half, or thereabout, of the cutting-edge of these saws is coincident with a circle, *h*, whose center is the axis of the mandrel, while the other half, or thereabout, is of equal radius with the first, but is not coincident with the axis of the mandrel, being eccentric therewith, so as to bring the cutting-edge of this portion within the circumference of the circle *h* of the first half of the cutting-edge, thereby forming a saw having one of its sides flattened or reduced in diameter. The amount of this reduction of the diameter in one side of the saws is shown by the red line *h* in Fig. 4, and this diminution or flattening is diametrically opposite to the concentric portion of the saw. The saws thus constructed of diminished diameter on one side are not arranged so that their cutting-edges will be flush with a line parallel to the axis of the mandrel, but they are placed in reverse positions to each other, so that the flattened portion *g* of one of the saws will be opposite the full diameter of the other, thus causing that portion of each saw having the full diameter to extend beyond that portion of the saw of diminished diameter, as shown in Figs. 2 and 3.

It will be seen that the saws thus constructed and arranged would not operate if their cutting-edges were parallel to the axis of the mandrel. The teeth, therefore, are of peculiar con-

struction, those only of the middle of the flattened portion of each cutter being parallel, or thereabout, to the axis of the mandrel, as shown at *g*, Figs. 1 and 3, while those of the opposite portion of the saw having its cutting-teeth coincident with a circle whose center is the axis of the mandrel are beveled off at an angle to the axis of the mandrel, as shown at *i*, Figs. 2 and 3. The teeth of the flattened portion *g* gradually change the angle of their cutting-edge as they approach the full-diameter side of the saw, and the beveled teeth *i* of the opposite side gradually change the angle of their inclination as they approach the teeth of the flattened portion *g* of the saw, so as to present to the material a series of chisel-edges varying in their inclination to a greater or less extent, which cut and dress a rounding surface, as represented in Figs. 2 and 3. The effect of these irregularly-shaped oblique saws *C*, revolving upon their mandrel *D*, it will be seen, will be to produce a round from a square surface, the flattened or reduced portion *g* of the saws operating to cut and form that part of the curve nearest the axis of the mandrel, while the other portion of the saws, having the full diameter, will cut and round that part of the curve of the material farthest from the axis of the mandrel, and thus produce a molding or curve of the required form, the angles or inclinations of the teeth of the saws changing as the latter revolve to correspond to the curve being cut and dressed. The degree of obliquity which the saws maintain to the axis of the mandrel should be such as that the distance or depth between their greatest projecting edges, embraced between two parallel lines at right angles to the axis of the mandrel, shall be equal to the thickness of the material to be rounded, whereby the surface to be operated upon will be equally divided between the two cutters, as shown by the blue lines in Figs. 2 and 3. The saw next to the table traverses from the under side to the middle of the thickness of the material, and the outer saw commences where the other leaves off, and cuts or shapes the outer or remaining half of the material, and thus they shape and dress the material at one and the same operation, without changing the latter or reversing its position upon the pattern.

Round forms or moldings of any desired curve may be cut by making the saws of the required irregular shape and beveling the teeth accordingly. I also propose to use one or more saws, according to the work to be done, and to vary the degree of obliquity of the saws whenever desired.

A sufficient space is left between the table *A* and the oblique saws *C* to receive an adjustable gage, *G*, having a slot, *j*, through which the mandrel passes, and another slot, *k*, on one side of the mandrel, through which a clamping-screw, *H*, passes into the table, in order that it may be adjusted to regulate the depth to which the saws shall penetrate in cutting and shap-

ing the material, by gaging the distance of said material from the saws, and for making the material being rounded larger or smaller than the pattern. The other or outer end of this gage *G* is constructed with a projecting tongue or lip, *l*, so as to form a recess, *m*, between it and the table *A*, for a purpose to be presently described. The end or tongue *l* of the gage *G* is convex, having a curve whose center is the axis of the mandrel, and may be of any suitable material; but I prefer to make it of wood, having its acting end shod with a metallic plate, as shown in Fig. 3, to prevent it from wearing away. The pattern *I*, used in connection with this gage *G*, is of peculiar construction, having a tongue, *n*, formed upon one or both sides thereof, so as to fit within the recess *m*, formed in the gage between the projecting tongue *l* and the table for the purpose of holding the pattern *I* to the table, and thus prevent it from jumping from its seat under the action of the saws. The lips *n* of the pattern *I* extend beyond that side which lies on the table, and the projection of the tongue *l* of the gage should be sufficient to project over the lip *n* of the pattern and against the side *I* thereof, as shown in Figs. 2 and 3, so that this portion of the pattern against which the tongue *l* acts serves as the guide or pattern for the material, and enables me to cut said material rounding without cutting into the pattern. The pattern, of course, must be the counterpart of the form which it is desired the material should have when finished; and in the examples of patterns represented one is for producing the felloes of wheels and the other plow-beams. In these two articles it will be seen that the pattern is constructed so as to round and square at the same time and by the same saws of irregular shape, the projections *r* on the pattern forming the square portions *s* on the inner side of the felly around the openings for the spokes, so that the irregular-shaped saws will round and square at one and the same operation, and by the same pattern.

The saws or serrated plates *E*, for dressing the square sides of the material, are of equal diameter, and are secured upon their mandrel *F* at suitable distances apart obliquely to the axis thereof, parallel to each other, and securely clamped by collars corresponding in form to the oblique position of the saws, so that their cutting-edges will be in a vertical plane parallel to the axis of the mandrel. The cutters, being arranged oblique to the axis of the mandrel, will traverse and dress the surface to be squared, and their distances apart may be increased or diminished by collars of greater or less thickness; or the saws may be increased or diminished in number for the purpose of dressing and squaring materials of different thickness.

A gage, *J*, is secured to the table and adjusted in the same manner as the gage of the rounding-cutters; but it differs in construction

from the latter in having a plain round end only against which the pattern acts to regulate the depth of the cut by gaging the distance of the material from the saws.

The material to be squared or rounded is placed upon and secured to the pattern by pins *t*, projecting from the upper surface of the latter, as shown in Figs. 5 and 8 of the drawings, so that the material projects beyond the pattern the distance required to be reduced or dressed.

The mandrels and their saws are driven by bands leading from pulleys *K* to the motive power.

The shaping-machines now in use are constructed with bits or knives and gouges; and it is necessary to have two heads of such cutters revolving in right and left directions, because with such bits or knives the material cannot be cut across the grain, and it is necessary, therefore, to change from one to the other to cut with the grain of the material, and if the material is to be finished part round and part square it is necessary to change the cutters and patterns and go through the same operation again. There is also great danger in the use of bits or knives, because they often draw the hands of the operator into the bits in cutting across knots or knurls. By the use of my irregular-shaped saws this danger is entirely avoided, and the article may be cut from one end to the other without regard to knots or knurls, or the grain of wood, without reversing the motion of the saws and with one set only.

In the operation of this machine the article to be dressed and rounded is first cut of the required shape from the plank or material and secured to the pattern placed upon the table, as shown in the example in Fig. 1; and moved back and forth against the saws, the pattern, when used, being always in contact with the gage. In this way, when articles of square form are to be dressed they are pressed and held by the hands to the squaring-saws, and when curved or round articles are to be formed they are presented to the irregular rounding-saws, and thus change from one to the other, and shape both sides of the article by the same pattern and by the same motion of the saws.

Having described my invention, I claim—

1. The arrangement upon a table, *A*, of the vertical mandrels *D F*, with their saws *C E*, and gages *G J*, the several parts constructed and operating as and for the purpose specified.

2. The combination of the irregularly-shaped oblique saws herein described with the adjustable gage *G*, substantially as and for the purpose specified.

3. The gage *G*, constructed with a tongue, *l*, in combination with a pattern constructed substantially as before described.

In testimony whereof I have hereunto set my hand.

HENRY A. GORE.

Witnesses:

DANIEL HABERSTICH,
FREDERICK HOWENSTINE.