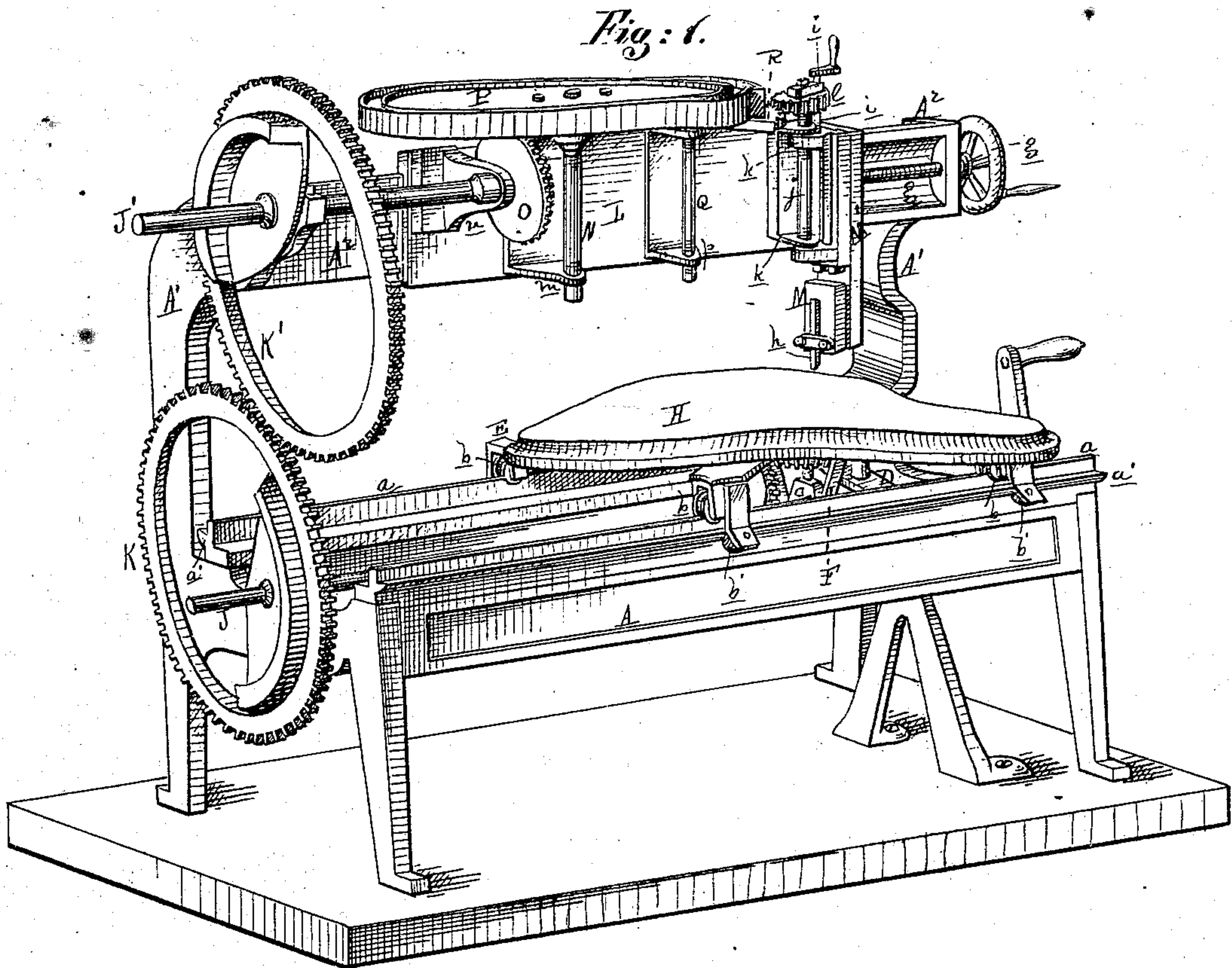


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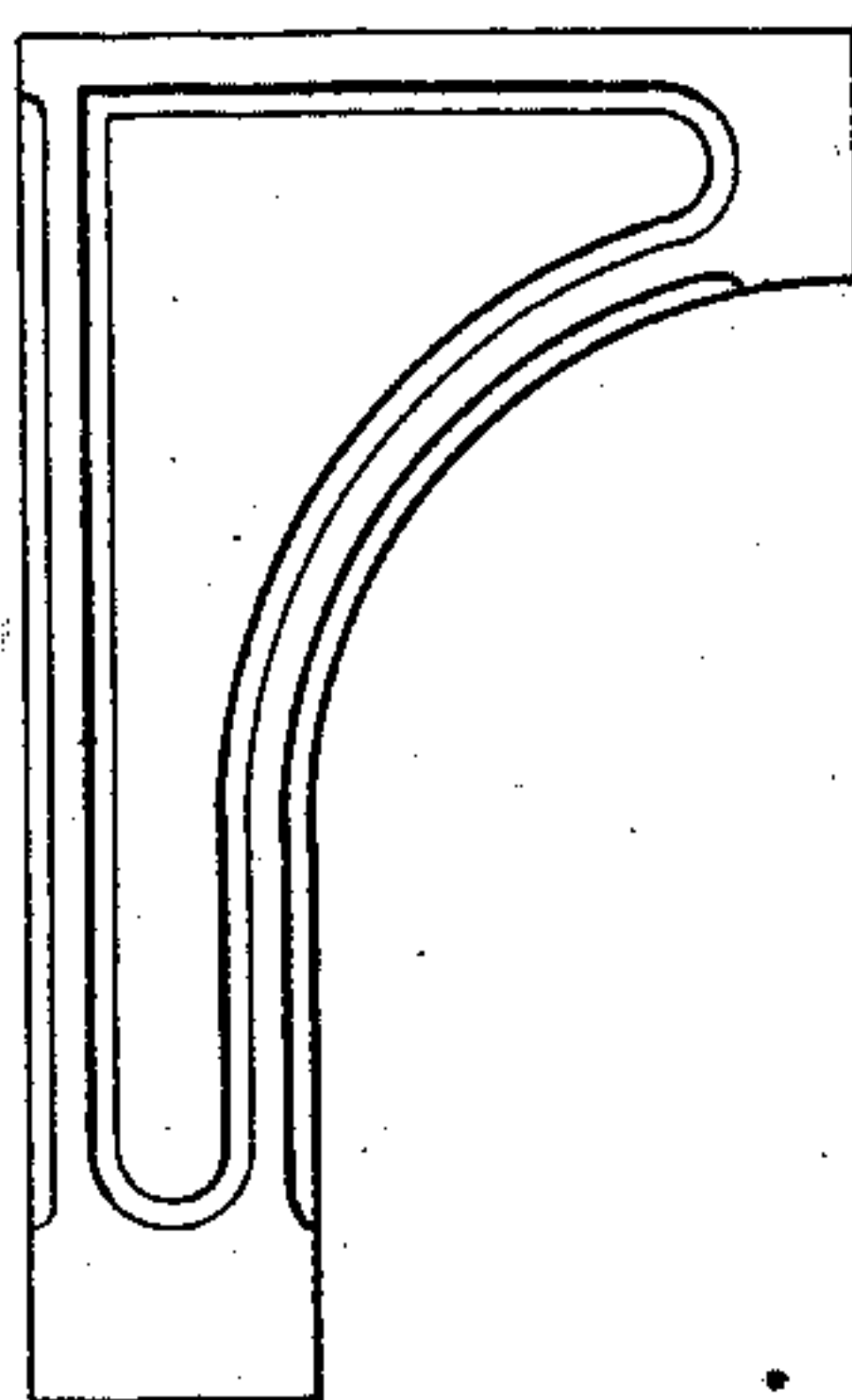
Machines for Cutting Irregular Forms.

No. 158,793.

Patented Jan. 19, 1875.



*Fig: 2.*



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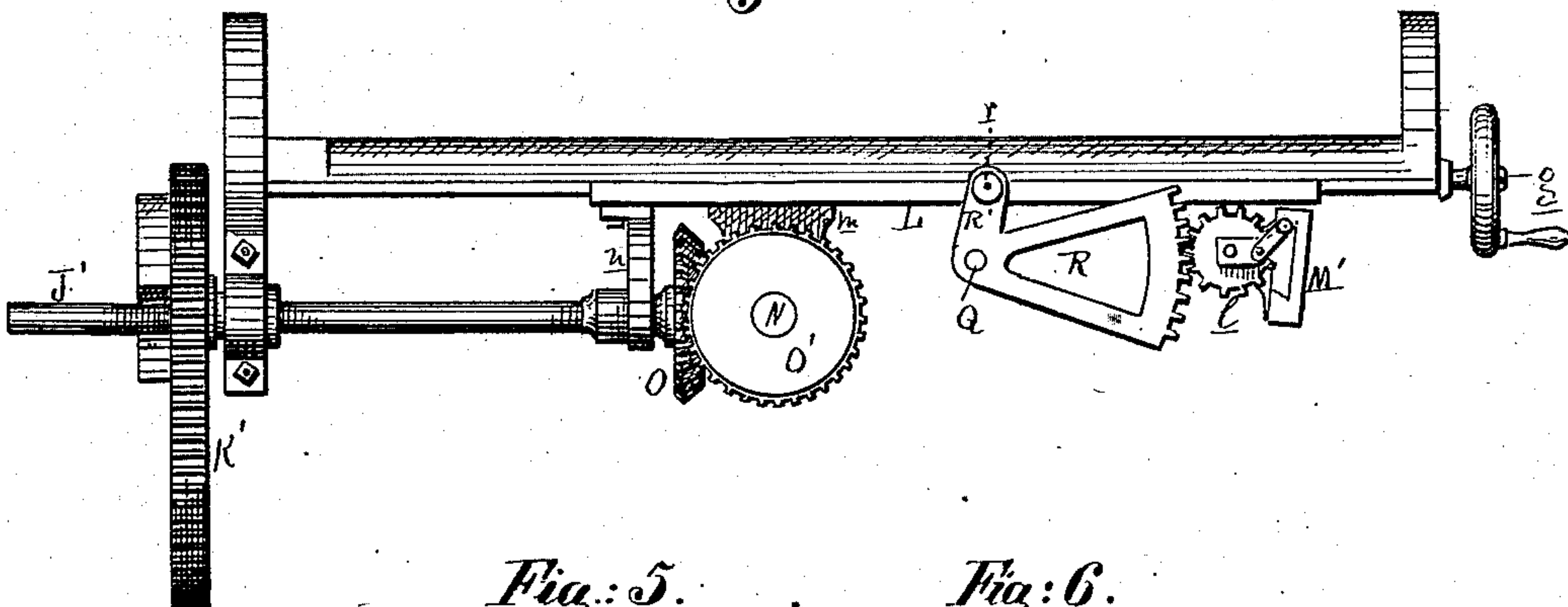
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## Machines for Cutting Irregular Forms.

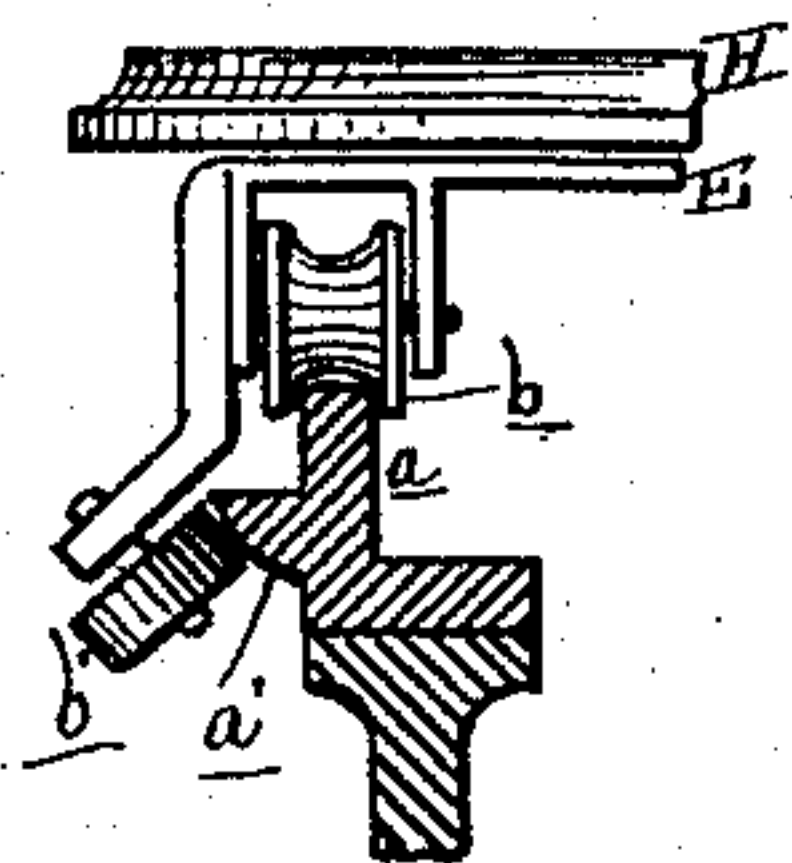
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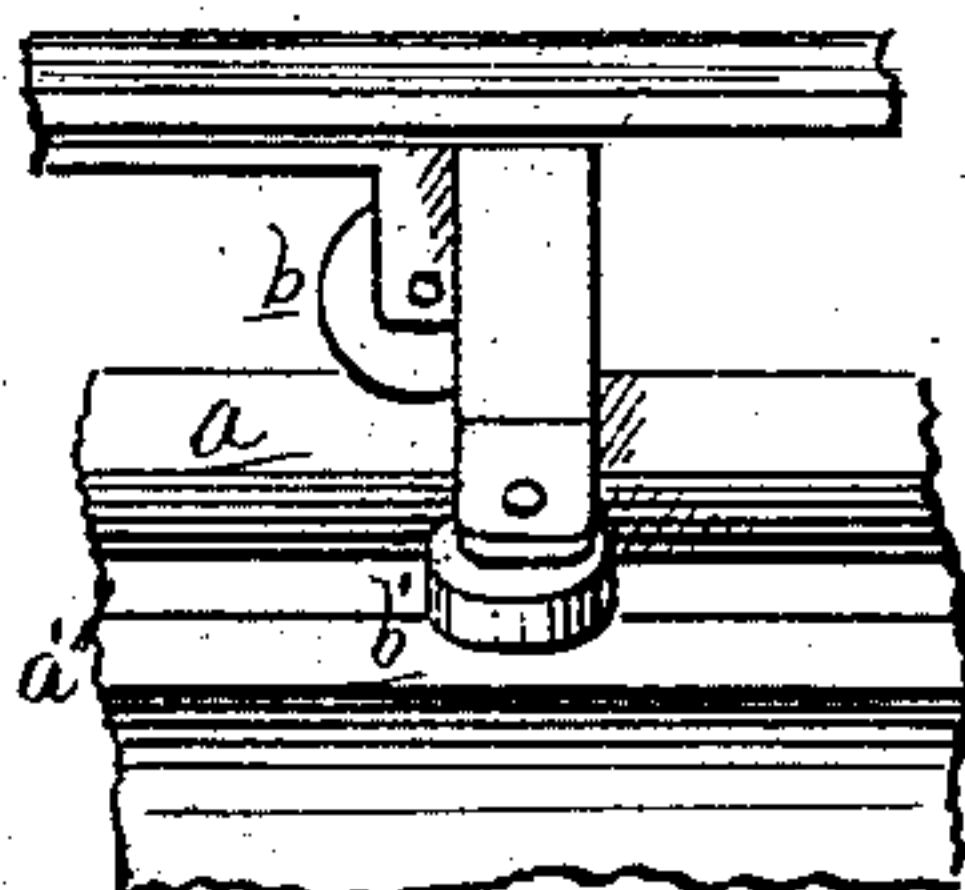
*Fig: 3.*



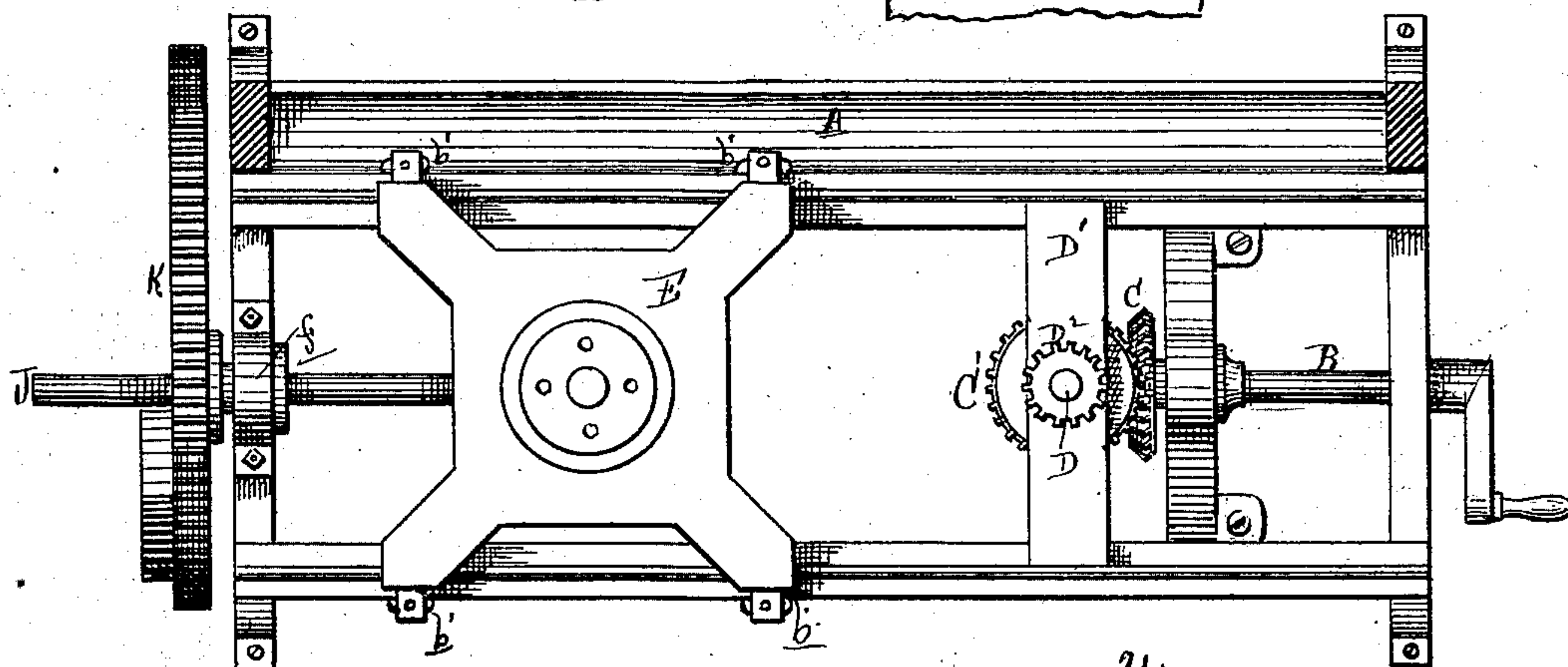
*Fig.: 5.*



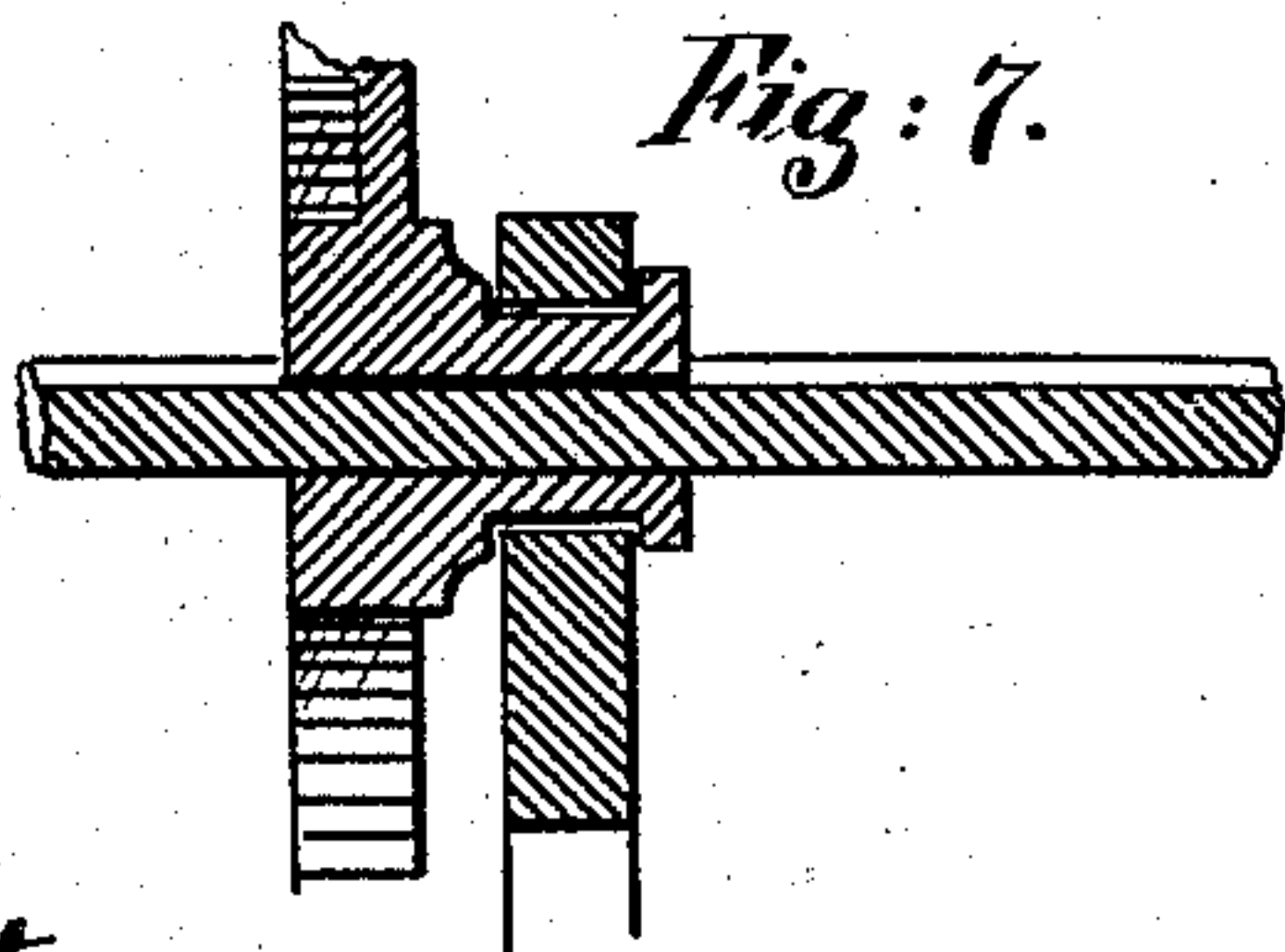
*Fig: 6.*



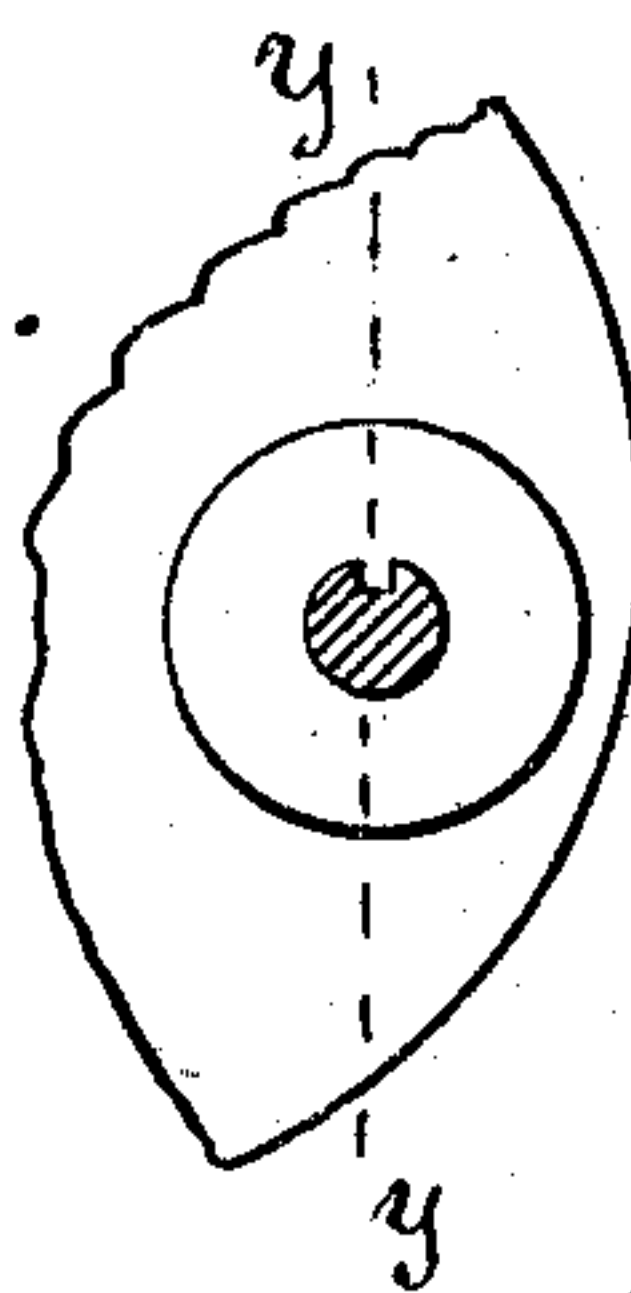
*Fig:4.*



*Fig: 7.*



*Fig: 8.*



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Fig: 9.

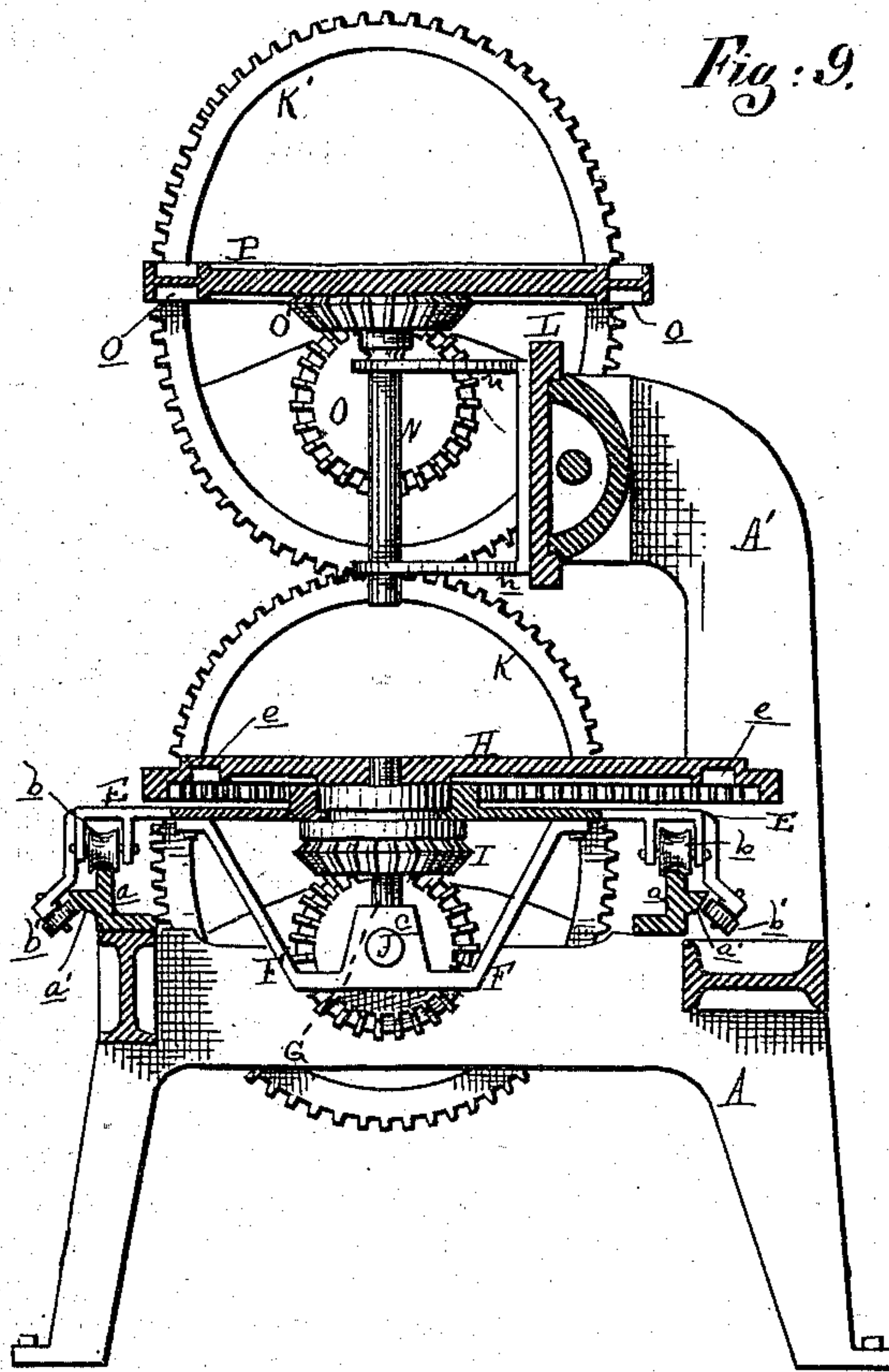
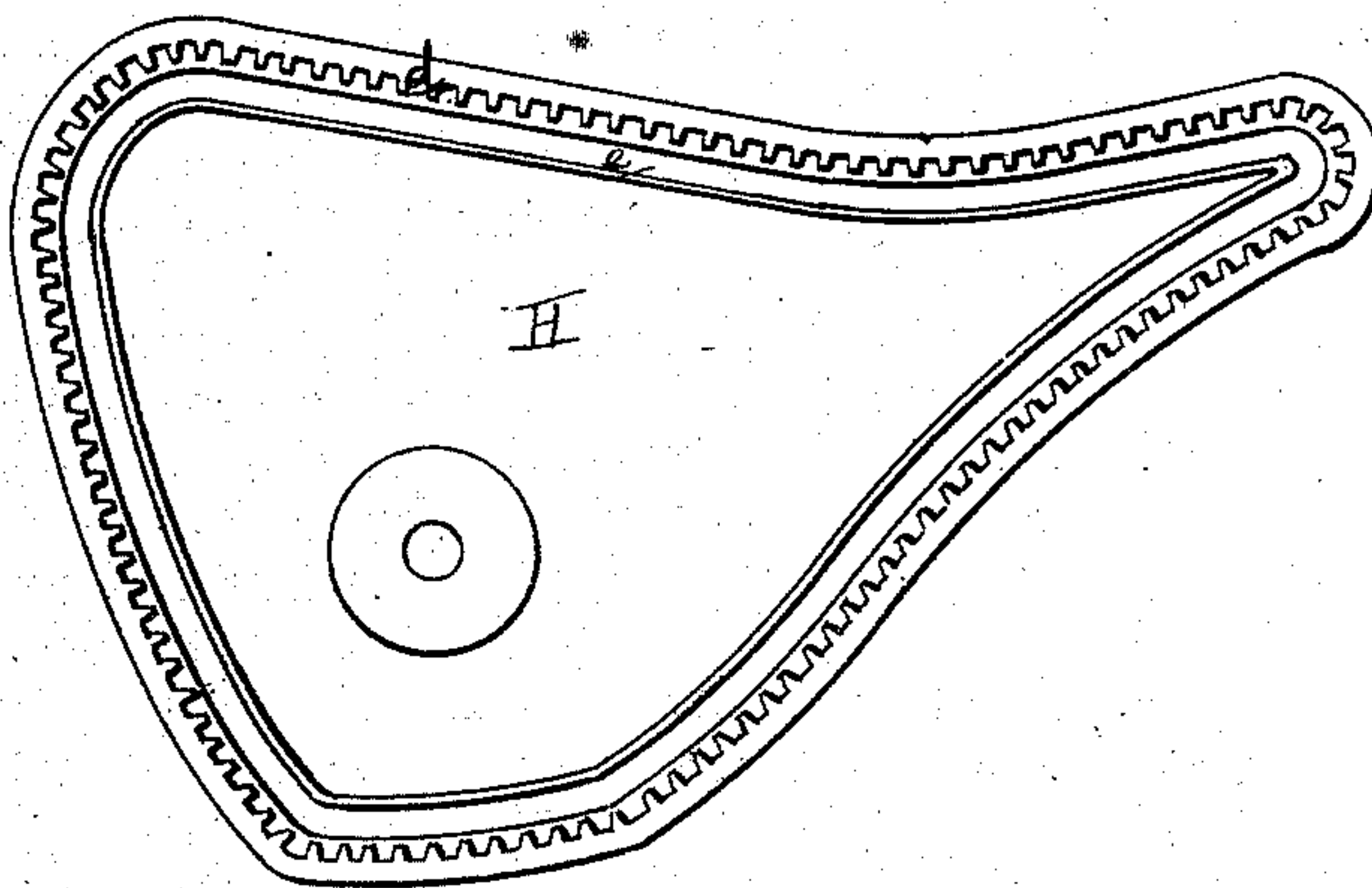


Fig: 10.



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# UNITED STATES PATENT OFFICE.

GEORGE A. HALEY, OF CHICAGO, ILLINOIS.

## IMPROVEMENT IN MACHINES FOR CUTTING IRREGULAR FORMS.

Specification forming part of Letters Patent No. 158,793, dated January 19, 1875; application filed October 2, 1874.

*To all whom it may concern:*

Be it known that I, GEORGE A. HALEY, of Chicago, in the county of Cook and State of Illinois, have invented an Improvement in Machines for Cutting Irregular Forms, of which the following is a specification:

The nature of this invention relates to machine for planing grooves and moldings of irregular outline in mantels and other objects of marble, which are mounted on a revolving bed under a pendent planer-tool, which bed has a reciprocating movement on the ways of the frame, while the tool-holder is automatically turned on its axis, so as to present at all times the face of the tool to the advancing work.

The invention consists in the novel and peculiar construction and arrangement of the various parts, as more fully hereinafter set forth.

Figure 1, Sheet 1, is a perspective view of the machine. Fig. 2 is an elevation of one-half of a mantel-face, showing the groove planed in it by the machine. Fig. 3, Sheet 2, is a plan of the cross-head and top-girt with the upper cam removed. Fig. 4 is a plan of the table and bed, the lower cam being removed. Fig. 5 is a cross-section. Fig. 6 is a side elevation of one of the corner legs of the table, showing the arrangement of the supporting and guiding rollers. Fig. 7 is a longitudinal section of one of the cam-wheels and its shaft. Fig. 8 is a sectional side elevation of the same. Fig. 9, Sheet 3, is a cross-section of the machine. Fig. 10 is a bottom plan of the lower cam.

In the drawing, A represents the main frame or bed of the machine, provided with longitudinal ways *a a*, like an iron-planer, and a flange, *a'*, Figs. 5, 6, and 9, outside each way. The frame A is carried up at each end on the back side, forming an overhanging standard, *A*<sup>1</sup>, the two being united by a horizontal girt, *A*<sup>2</sup>. B is the driving-shaft, longitudinally journaled in bearings at one end of the bed, with a bevel-gear, C, at the inner end thereof, meshing with a bevel-pinion, C', keyed on the pendent end of a vertical shaft, D, journaled in a transverse girt, D<sup>1</sup>. Near its top is a spur-pinion, D<sup>2</sup>. E is a table, with a double-flanged roller, *b*, journaled in a pair of pend-

ent jaws at each corner riding on the ways *a*. A guard-wheel, *b'*, mounted under the outwardly-bent end of a brace at each corner of the table, runs under the flange *a'*, and serves not only to guide the table, but also prevents it from being lifted off the ways, as shown in Figs. 5 and 6. A stirrup, F is bolted to the under side of the table, with a step, *c*, at the middle, in which is stepped a vertical shaft, G, on the upper end of which a bevel-gear, I, is keyed. The cam-plate H is bolted to the table. The periphery of the cam H is a pendent flange, internally toothed, as at *d*. Inside the flange a groove, *e*, is cut in the under surface of the said cam-plate, as seen in Fig. 10. The top end of the shaft D runs in this groove, while the spur-pinion D<sup>2</sup> meshes with the gear *d* of the said cam, which is rotated, and through it the shaft G and its attachments, by said pinion D<sup>2</sup>, while the groove in said cam slides the table and its attachments back and forth. The mantle-front to be grooved is secured to the top of the cam-plate. J is a shaft, journaled through a bearing in the end of the bed, while its inner end is journaled in the lower part of the step *c*, and confined by a pin and collar, so that said shaft will slide with the table. K is an oval eccentric gear, whose hub is the bearing for the shaft J, on which it is feathered. The hub is journaled in a box, *f*, at the end of the frame-bed. K' is an oval eccentric pinion, in like manner journaled in the overhanging standard A<sup>1</sup>. Through its hub is inserted a counter-shaft, J', splined on a projecting feather in the eye of the hub. L is a cross-head, gibbed on the girt A<sup>2</sup>, adjusted thereon by a traverse screw, *g*, threaded in a nut at the back of said cross-head. M is a tool-holder, like that of an ordinary iron planer, carrying a pendent tool, *h*. The tool-holder is gibbed on a head, M', and is fed up or down the face thereof by a feed-screw, *i*. A lug, at the back, upper, and lower end of the head, is pinned on a vertical shaft, *j*, passing and journaled through bracket-lugs *k*, secured to the face of the cross-head, and which shaft *j* has a pinion, *l*, keyed to its upper end. The screw *i* extends up through this pinion, and has a hand-crank at the top to rotate it. N is a shaft, vertically journaled in brackets *m*, projecting from the face of the cross-head.



At its top is a bevel-pinion,  $O'$ , meshing with and receiving motion from a bevel-gear,  $O$ , on the inner end of the shaft  $J'$ . The hub of the pinion  $O$  is journaled in a bracket,  $n$ , projecting from the face of the cross-head.  $P$  is a cam-plate, secured to the top of the shaft  $N$ , and has a groove,  $o$ , cut in its under surface at the periphery.  $Q$  is a vertical rock-shaft, journaled in brackets  $p$ , projecting from the face of the cross-head, and to its top is keyed a geared segment,  $R$ , having a lateral projecting arm,  $R'$ , on which there is journaled a friction-roller,  $r$ , on a stud, which projects into the groove  $o$  of the upper cam-plate, while the segment-gear meshes with the pinion  $l$ , the office of which is to turn the tool holder and head on their bearing so as always to present the face of the tool to the advance of the work squarely across the plane of the cut.

For turning the tool at difficult points, such as at a square corner, or in rounding a short curve, the eccentric gears are necessary in order to give the upper cam a quick-enough motion.

The upper cam-plate may be made reversible, for right and left mantle-faces, by forming a groove upon both faces. The lower cam-plate requires to be made with right and left shapes, or two of them are required for each style of mantle made.

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

1. The tool-holder  $M$ , as described and shown, oscillating on an upright spindle,  $y$ , and operated by a grooved cam,  $P$ , so as to be always at right angles with the cut, as and for the purpose set forth.

2. The combination of the table  $E$ , supporting the cam-plate  $H$ , and reciprocating upon the ways  $a$  of the guard-wheels  $b'$  on the corners of said table, and flanges  $a'$  of the frame  $A$ , as set forth.

3. The combination, with the table  $E$ , of the stirrup  $F$ , step  $c$ , shaft  $G$ , gear  $I$ , shafts  $J$   $J'$ , eccentric oval gears  $K$   $K'$ , shaft  $N$ , and bevel-gears  $O$   $O'$ , for communicating an irregular rotary movement to the upper cam-plate  $P$ , mounted on the cross-head  $L$ , substantially as described.

4. The combination, with the adjustable cross-head  $L$  and cam-plate  $P$ , of the rock-shaft  $Q$ , geared segment  $R$ , and arm  $R'$ , the tool-holder  $M$ , head  $M'$ , feed-screw  $i$ , shaft  $j$ , and pinion  $l$ , as and for the purposes set forth.

GEORGE A. HALEY.

Witnesses:

WM. H. LOTZ,

HERMAN A. KROESCHELL.