

(No Model.)

3 Sheets—Sheet 1.

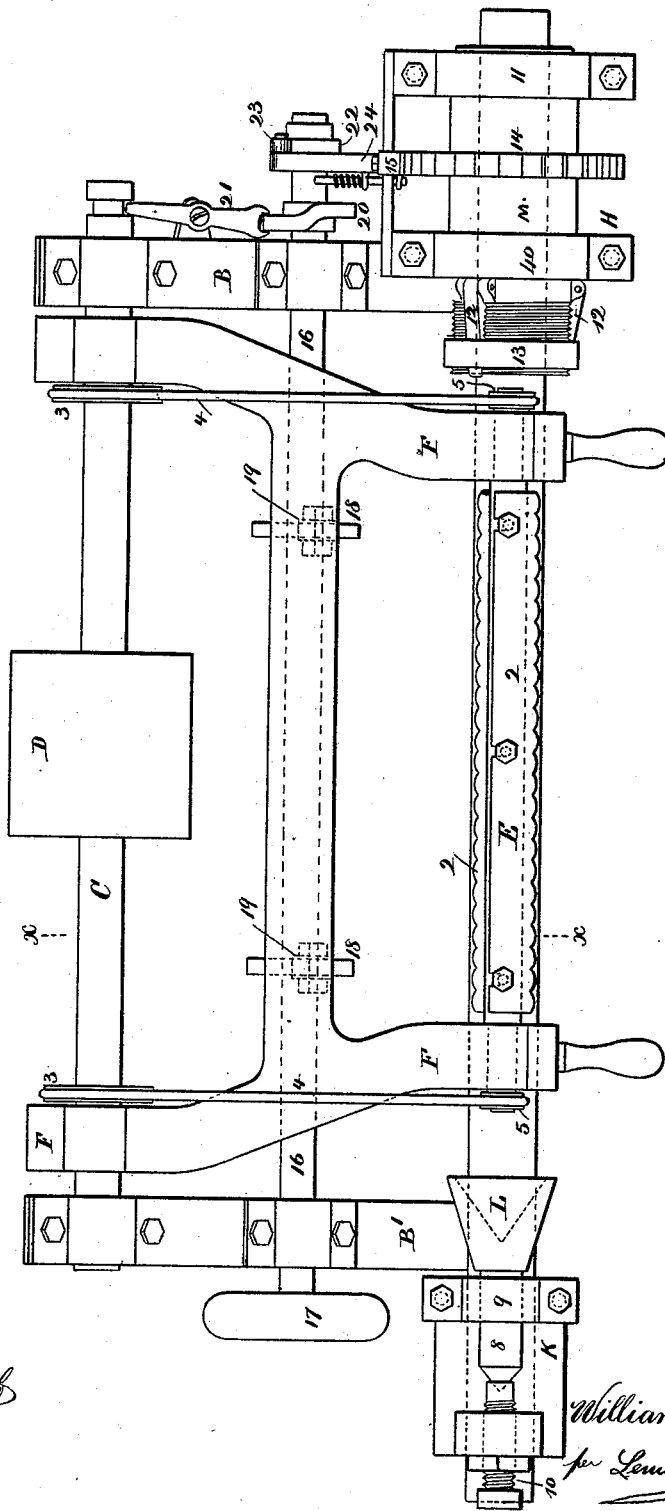
W. H. HAWLEY.

LATHE FOR IRREGULAR FORMS.

No. 347,036.

Patented Aug. 10, 1886.

Fig. 1.



Witnesses

Chas. H. Smith
J. Stacy

Inventor
William H. Hawley
per Lemuel W. Gerrell
Att'y

(No Model.)

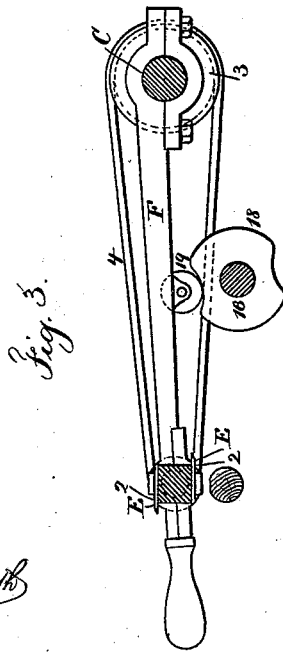
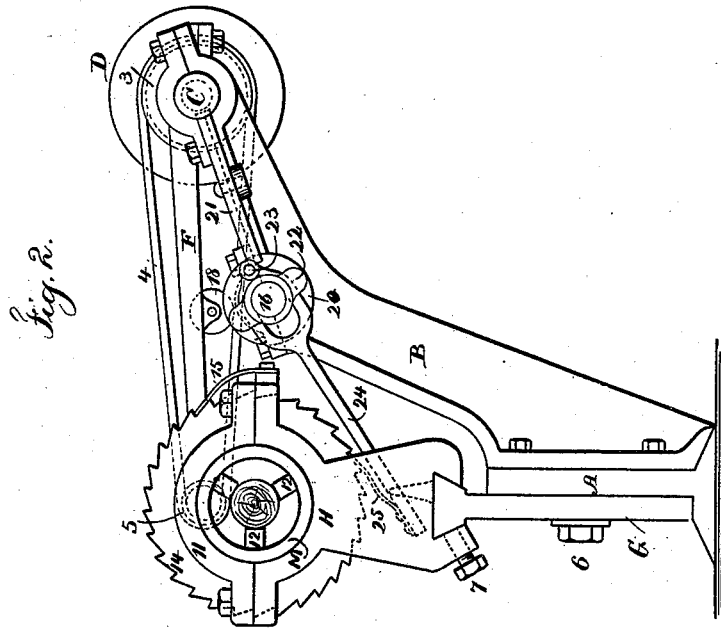
3 Sheets—Sheet 2.

W. H. HAWLEY.

LATHE FOR IRREGULAR FORMS.

No. 347,036.

Patented Aug. 10, 1886.



Witnesses

Chas. H. Smith
J. Haily

Inventor

William H. Hawley
per Lemuel W. Parrell
att'y

(No Model.)

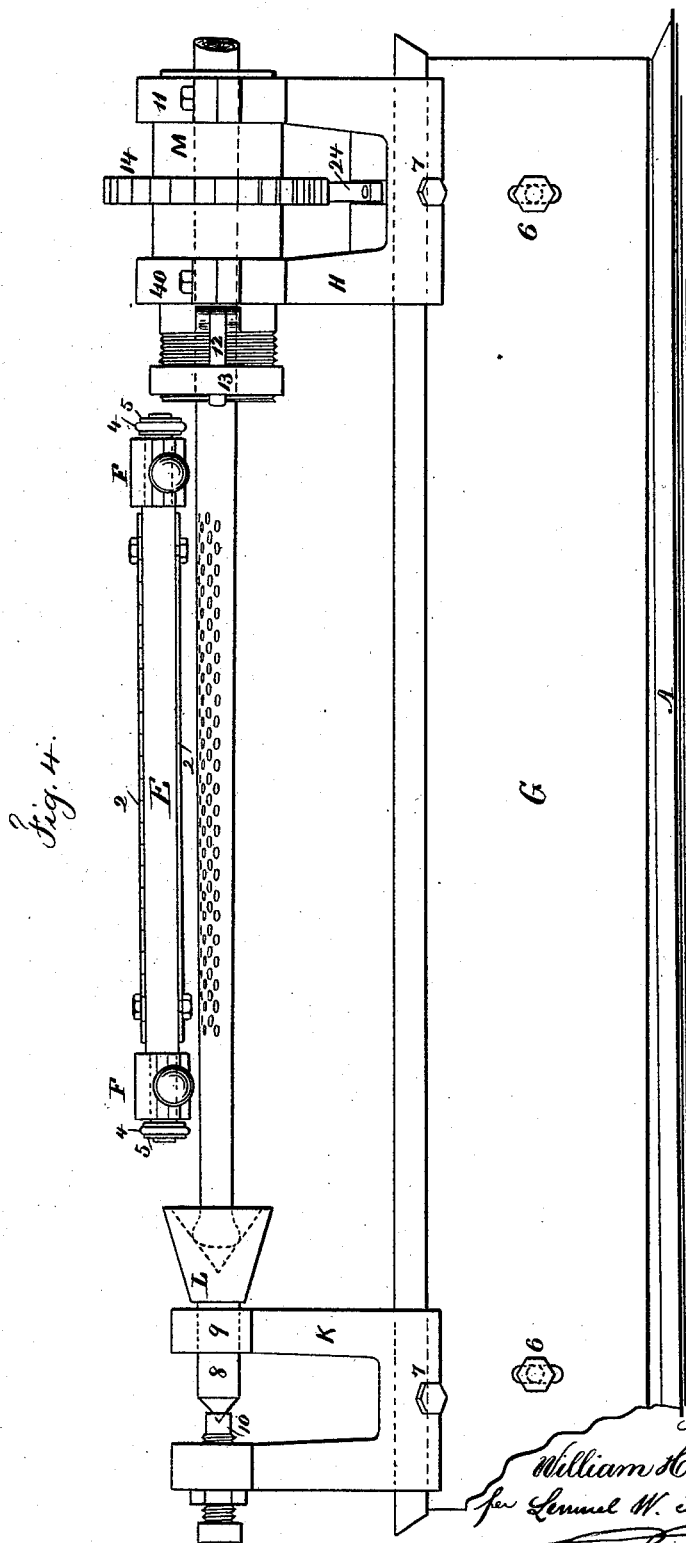
3 Sheets—Sheet 3.

W. H. HAWLEY.

LATHE FOR IRREGULAR FORMS.

No. 347,036.

Patented Aug. 10, 1886.



Witnesses
 Chas H. Smith
 J. Staley

Inventor
William H. Hawley
per Lemuel W. Perrell atty.

UNITED STATES PATENT OFFICE.

WILLIAM H. HAWLEY, OF NEW YORK, N. Y., ASSIGNOR TO HIMSELF AND
FRANK G. DU BOIS, OF SAME PLACE.

LATHE FOR IRREGULAR FORMS.

SPECIFICATION forming part of Letters Patent No. 347,036, dated August 10, 1886.

Application filed April 1, 1886. Serial No. 197,385. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. HAWLEY, of the city and State of New York, have invented an Improvement in Lathes for Irregular Forms, of which the following is a specification.

The object of this invention is to roughen or ornament the surfaces of billiard-cues and the handles of bats and other articles with concave recesses in alternate positions in imitation of hammered work in metal. This character of work has heretofore been done by hand, and it is very tedious and expensive.

I make use of revolving cutters with convex serrations adapted to the turning out of the concave recesses in the wood of the bat or billiard-cue handle, and I provide means for swinging the cutter-head out of action and moving the same endwise a distance equal to half the length of one of the serrations, and the handle is partially revolved the proper number of degrees, so that when the revolving cutter is again brought into action a second line of recesses is formed adjacent to the first, the concavities in one line being intermediate to those in the next line, and these operations are continued until the lines of recesses have been cut entirely around the handle, to both ornament and roughen such handle.

In the drawings, Figure 1 is a plan view of the machine. Fig. 2 is an end view of the same, and Fig. 3 is a section at the line $x x$, Fig. 1. Fig. 4 is a front view of the machine.

The bed of the machine is formed of a plate, A, supported on a suitable frame, and having near the ends the brackets B B', with journal boxes or bearings supporting the driving-shaft C, upon which is a pulley, D, driven by a belt.

The rotary cutter E is made of two or more blades, 2 2, secured upon the polygonal portion of a shaft, and the edges of these blades 2 are serrated or formed of convex scallops, and this rotary cutter is mounted in a frame, F, that is pivoted so that the said frame can be swung and the rotary cutter moved toward or from its work. I prefer to pivot this frame F upon the driving-shaft C, there being eyes at the back ends of such frames, through which said shaft C passes, and the power is communicated from this shaft C by the pulleys 3 and

belts 4 to the pulleys 5 on the shaft of the rotary cutter.

The base-bar G lies against the plate A, and is fastened to the same by the bolts 6, passing through elongated holes or slots, that allow the said base-bar G to be inclined to a greater or less extent, so as to bring the upper surface of a tapering handle or other article that is to be operated upon parallel with the axis of the rotary cutter E. Upon this base-bar G are the head-blocks H K, that can be moved nearer together or farther apart and held by the clamp-screws 7. Upon the head-block K is a conical socket, L, upon an arbor, 8, in bearings 9, and there is a set-screw, 10, to support the arbor 8 endwise. This conical socket L receives the end or head of the billiard-cue, handle, or bat, and said socket and arbor turn with the article that is being operated upon as said article is moved progressively in the manner next described.

Upon the head-block H are the bearings 11 for the tubular arbor M, the size of which is sufficient for the handle or other article to be operated upon to pass through freely, and at one end of this tubular arbor M is a clamp or chuck for centering and holding such handle or other article. I have shown the hinged clamps 12 and screw-ring 13 for forming the said chuck. Around the tubular arbor M is a ratchet-wheel, 14, and there is a spring-pawl, 15, for holding the ratchet-wheel arbor and the handle or other article while being operated upon.

The shaft 16 passes through bearings upon the brackets B B', and it has at one end a hand-wheel, 17, by which it can be turned by the attendant. Upon this shaft 16 is a double cam, 18, and this cam acts upon a projection or roller, 19, below the frame F. This cam will raise the frame and rotary cutter off the work when in one position, or allow the said cutter to descend and perform the cutting when in the other position. Upon this said shaft 16 is another cam, 20, that acts upon a short lever, 21, the other end of which is within a groove around the shaft C, near one end thereof, and there is a third cam, 22, on the shaft 16, that acts upon the roller 23, slide-bar 24, and spring-pawl 25, that gives motion to the

ratchet-wheel 14 and tubular arbor M. The number of teeth in this wheel 14 should correspond to or be a multiple of the number of ranges of indentations to be cut in the handle or other article, and the cams are shaped and placed so that when the hand-wheel 17 receives about a quarter-rotation the frame F and cutter-head are raised from off the work by the cam 18 acting upon the projection or roller 19, and at the same time the cam 20 acts upon the lever 21, and shifts the driving-shaft C and cutter-head endwise a distance equal to half the length of one of the serrations or scallops, and as the wheel 17 is turned by hand to complete a half-revolution the cam 22, roller 23, slide-bar 24, and pawl 25 give to the tubular arbor M and the article held by the same a partial revolution, and as the said half-revolution is completed the cam 18 allows the frame F and cutter-head to descend and cut the next row of concave recesses in the handle or other article, and these operations are performed successively until the entire handle is completed.

25 I claim as my improvement—

1. A rotary cutter having blades with ranges of serrations upon their edges, and a frame for supporting the same, in combination with head-blocks and mechanism, substantially as specified, for supporting and rotating progressively the handle or other article to be acted upon by the rotary cutter, substantially as set forth.

2. The rotary cutter E, having blades with ranges of scallops upon the edges, the shaft for the cutters, the pivoted frame F, with bearings for supporting the shaft, the driving-shaft

C, to which the power is applied, and the belts for rotating the cutter, the shaft 16 and cam thereon, for raising and lowering the frame and rotary cutter, and a cam and lever for giving an end movement to the frame and the rotary cutter; and the arbors for receiving and holding the handle or other article to be operated upon, substantially as set forth.

3. The tubular arbor M and chuck, the socket L and arbor S, and the respective head-blocks for supporting the parts, in combination with the adjustable base-bar carrying the head-blocks and the rotary cutter, the driving-pulleys and belts, and the swinging frame that supports the rotary cutter, substantially as set forth.

4. The shaft 16 and the cam 18 upon the same, in combination with the rotary cutter and its shaft, the frame for the same, pivoted on the shaft C, the driving-shaft and belts, the lever 21 and the cam 20 upon the shaft 16, for giving end motion to the driving-shaft, frame, and rotary cutter connected therewith, the tubular arbor M, for receiving the article to be operated upon, the ratchet-wheel and pawl for revolving the arbor progressively, the socket L and arbor, and the respective head-blocks for supporting the arbors, and the base-bar receiving the head-blocks, substantially as set forth.

Signed by me this 24th day of March, A. D. 1886.

W. H. HAWLEY.

Witnesses:

GEO. T. PINCKNEY,
WILLIAM G. MOTT.