2 Sheets—Sheet 1.

F. HANSON.

LATHE FOR TURNING FLUTED AND SIMILAR WORK.

No. 257,451. Patented May 2, 1882.

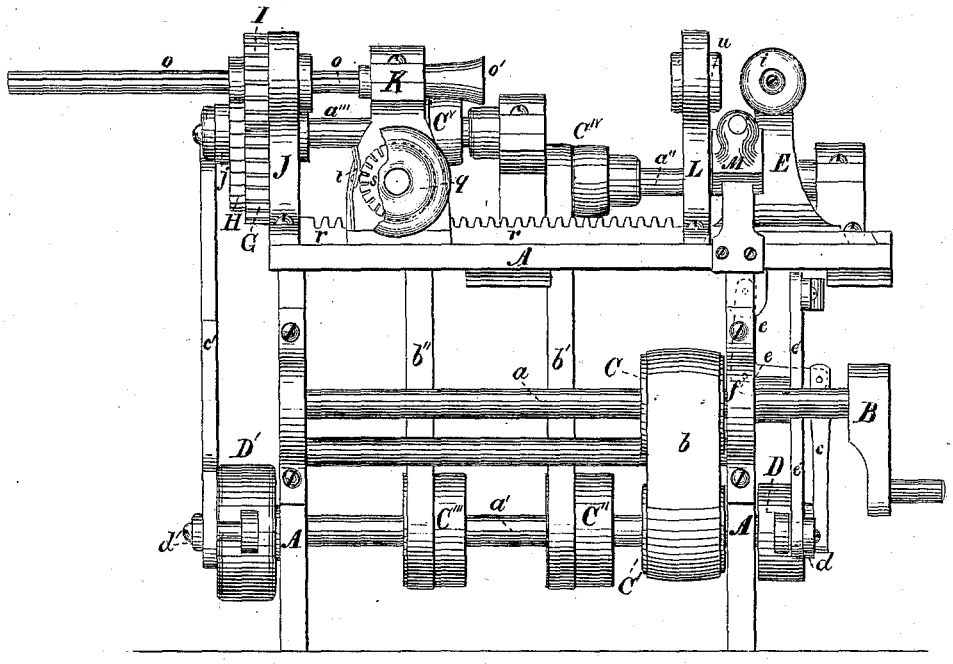

Fig. 2.

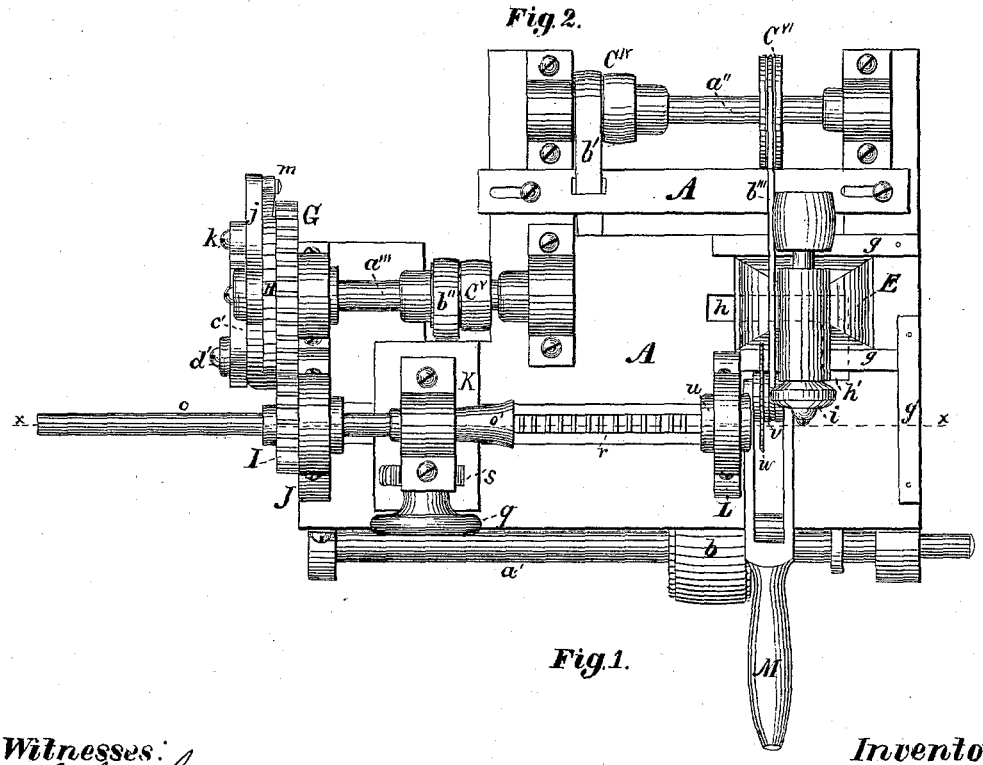

Fig. 1.

Witnesses:
H. J. Olmsted
W. P. Preble Jr.

Inventor:
Freeman Hanson

2 Sheets—Sheet 2.

F. HANSON.

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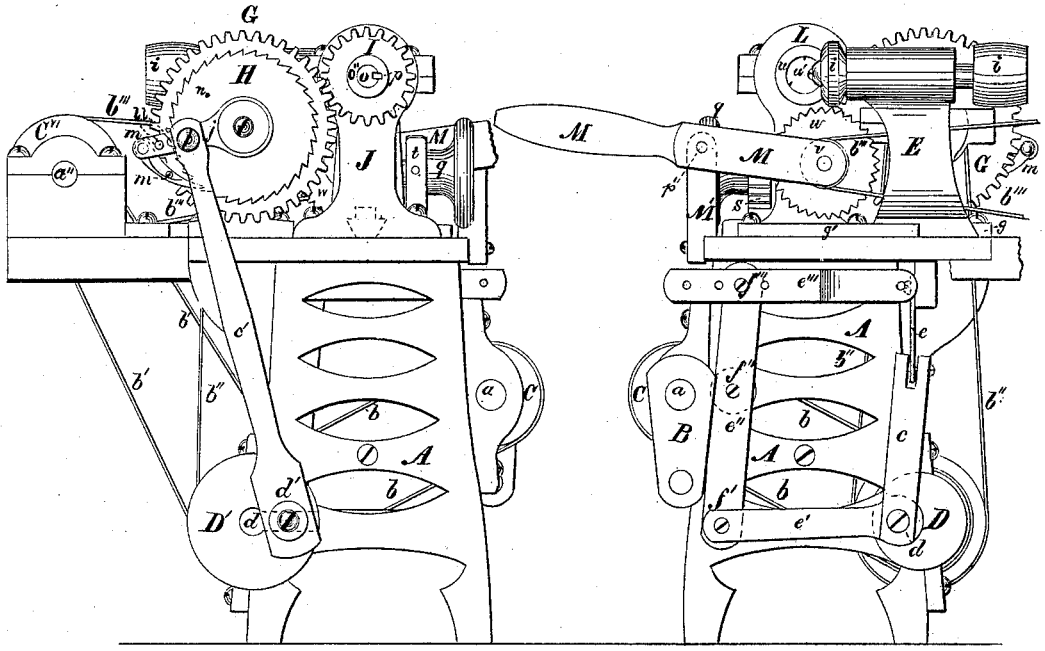

Fig. 3.

Fig. 4.

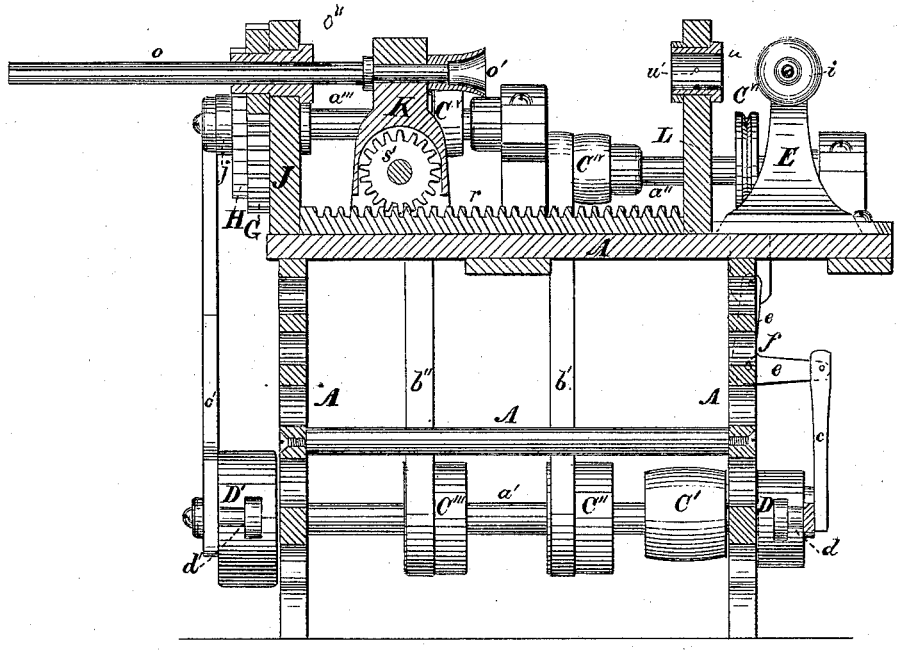

Fig. 5.

Witnesses:
H. J. Olmsted
W. P. Preble Jr.

Inventor:
Freeman Hanson

UNITED STATES PATENT OFFICE.

FREEMAN HANSON, OF HOLLIS, ASSIGNOR, BY MESNE ASSIGNMENTS, OF FOUR-FIFTHS TO THE AMERICAN TURNING COMPANY, OF PORTLAND, MAINE.

LATHE FOR TURNING FLUTED AND SIMILAR WORK.

SPECIFICATION forming part of Letters Patent No. 257,451, dated May 2, 1882.

Application filed February 9, 1880.

To all whom it may concern:

Be it known that I, FREEMAN HANSON, of the town of Hollis, county of York, and State of Maine, have invented a new and useful Improvement in Wood-Turning and Hub-Mortising Machines, of which the following is a specification.

My invention relates to improvements in wood-turning and hub-mortising machines, by which the wood to be operated upon is made to present a predetermined part of its surface to the action of the cutting device at proper intervals, and the mechanism which operates the cutting-device is so adjusted that it acts only when that part of the surface is presented to it, thus causing the desired number of edges, points, scallops, indentations, or other devices to be cut in regular succession. The mechanism by which this is done is shown in the accompanying drawings, in which—

Figure 1 is a top plan. Fig. 2 is a side elevation. Fig. 3 is a rear view. Fig. 4 is a front view. Fig. 5 is a vertical section at line *x x* of Fig. 1.

The same letters refer to similar parts in the different figures.

A is the frame-work or table, which supports the moving parts of the machine.

B is a crank or pulley, by which power is applied to the machine, and is carried on the shaft *a*, which also carries the pulley C. The shaft *a'* in the other side of the frame-work carries the pulleys C', C'', and C''' and the slotted socket-heads D and D'. The pulley C' is connected by the belt *b* with the pulley C on shaft *a*, and serves to turn the shaft *a'*. The pulley C'' is connected by the belt *b'* with the fast and loose pulley C^{iv} on a shaft, *a''*, which operates a saw for cutting off the wood when shaped, as hereinafter described. The pulley C''' is connected by a belt, *b''*, with the fast and loose pulley C^{v} on the shaft *a'''*, which carries the gear-wheel G.

The slotted socket-head D has a crank-rod, *c*, fastened to it by the connecting-pin *d*, which is adjustable in the slot and regulates the throw of the crank-rod. The other end of the crank-rod is fastened to an elbow-lever, *e*, with its fulcrum in the frame-work at *f*, the other end of the elbow-lever being fastened to the sliding head-stock E, which, when thus connected, slides backward and forward in the slot *h* and guide-cleats *g g*, parallel to the shafts and the wood to be cut. The slotted socket-head D has also a connecting-rod, *e'*, fastened to it by the same adjustable connecting-pin, *d*, pivoted at *f'* to a lever, *e''*, which has its fulcrum at *f''*, and is fastened at *f'''* to a reciprocating arm, *e'''*, the other end of which is fastened to the sliding head-stock E when the elbow-lever *e* is disconnected therefrom. When thus connected the head-stock faces at right angles to its former position, and has a backward and forward motion in the slot *h'* and guide-cleats *g' g'* across the plane of the wood to be cut and at right angles to the shafts.

The head-stock E has a rotating and sliding arbor, *i*, in which the cutting device is held. When the cutter-head slides in the slot *h*—that is, parallel to the wood to be cut—the arbor holds a circular saw or an auger. When in the slot *h'*—that is, when it slides across the plane of the wood to be cut—the arbor holds a turning chisel or knife. The length of slide in either case is determined, as before explained, by the adjustment of the connecting-pin *d* in the slot of the slotted socket-head D.

The slotted socket-head D' has a crank-rod, *c'*, fastened to it by the connecting-pin *d'*, which is made adjustable in the slot to change the eccentricity of the crank-rod, as desired. The other end of the crank-rod *c'* is fastened to an arm, *j*, hung loosely on the shaft *a'''*, but not revolving with it. This arm carries the pawl *m*, and is fastened to the crank-rod *c'* by the screw *k*. The throw of the arm *j*, and hence of the pawl *m*, is determined by the particular hole *l l l* in the arm *j*, in which the screw *k* for the time being is fastened.

G is a gear-wheel carried by the shaft *a'''*.

H is a ratchet-wheel rigidly fastened to the gear-wheel G by the pin *n*, but removable to allow the substitution of ratchet-wheels of a different number of teeth.

At the beginning of each throw of the crank-rod *c'* the pawl *m* leaves the tooth last engaged by it, and, passing over several teeth

during the outward and upward motion of the crank-rod, engages another tooth of the ratchet-wheel H at the moment the crank-rod has reached the end of its upward motion. This tooth is held by the pawl *m*, and the wheels are thereby turned a given fraction of a revolution until the crank-rod reaches its lowest position, when the tooth is released, and the wheels cease moving until a new tooth is engaged, as before. Thus if there are thirty-five teeth in the ratchet-wheel H the pawl *m* and crank-rod *c'* may be so adjusted as to engage every fifth or every seventh tooth, and there will be seven or five stops during one revolution of the gear-wheel G. If the ratchet-wheel has thirty-six teeth, there may be three, four, six, nine, or twelve stops during one revolution, according to the adjustment.

I is a gear-wheel on the collar *o''*, which turns in a journal-case on the fixed post J and rotates the chuck-shaft or mandrel *o*, which carries the chuck *o'*. This gear-wheel I, having half the number of teeth of the gear-wheel G, into which it meshes, makes double the number of revolutions and half the number of stops in one revolution. The mandrel *o* is slotted nearly its whole length, so that it can be turned by the gear-wheel I by means of the spline without preventing its sliding forward when desired. The other end of the mandrel *o* is held by a traveling post, K, moving by a pinion, S', on its under side, which engages with the teeth of the rack *r*. This motion is given to the post K through the wheel *q* by the hand of the operator, and to prevent its moving too far it may be provided with a ratchet-wheel, *s*, and a pawl, *t*, which allows only one tooth to escape at a time. L is a fixed post at the other end of the rack *r*, and is provided with a revolving collar, *u*, through which the wood passes from the chuck *o'*. The wood is made to revolve with the collar by the spikes *w'*. Thus two motions may be imparted to the wood to be cut—an intermittently-rotating motion by means of the pawl *m* and ratchet-wheel H, or a constant rotation by disengaging the pawl and turning the wheels by the pulley C^{v} and shaft *a'''*. In addition to these the bed-plate or that part of the frame which holds the uprights J, K, and L and the rack *r*, instead of being stationary, may be made to rock from side to side, as shown in my Patent No. 214,652, dated April 22, 1879, for improvements in wood-turning machines, or to slide transversely or longitudinally, as shown in my Patent No. 221,303, dated November 4, 1879, for improvement in scalloping-machines; or the bed-plate may have both these motions or any other motion which will not interfere with the working of the pawl and ratchet, chuck-shaft, and traveling post. These different motions of the bed-plate change the character of the shapes to be cut, as explained in said patents.

M is a handle pivoted at *p'* to a post M', which is fastened to the frame-work, and holding a small pulley, *v*, kept in rotation by a belt, *b'''*, from the pulley C^{vi} on the shaft *a''*, which is rotated as before described. This handle also carries a circular saw, *w*, which, being kept in rotation by the pulley *v*, if desired, cuts off the end of the wood when shaped. It is raised into contact with the wood and lowered again by the hand of the operator.

The operation of the machine is as follows: To turn disks or buttons with scalloped, pointed, regular or irregular outlines, &c., the wood is intermittently rotated by the pawl *m* and ratchet-wheel H, as before described, adjusted to make the desired number of stops in one revolution, which, for the gear-wheel G, is twice the number of the points or scallops to be cut. The cutting-tool or chisel carried by the head-stock E, which in this case slides across the plane of the wood to be cut, is in rapid rotation, and is brought up to the edge of the wood while stationary. When the head-stock E slides back from the wood the wood is turned another given fraction of a revolution and presents another edge to be shaped by the cutting-tool when again brought forward. The whole disk having been shaped, it is cut off and the wood moved forward by the wheel *q* into position for a new disk to be formed. The edges of the disks will be straight, curved, or hollowed, according to the supplemental motions given to the wood by the movements of the bed-plate before described.

To cut pointed figures other than disks, the head-stock E carries a circular saw in rapid rotation and slides parallel to the wood to be cut. In other respects the operation is the same as before.

To turn crescents, the crank-rod *c'* and pawl *m* are disconnected and the belt *b''* shifted to turn the pulley C^{v}. A constant rotation is thus imparted to the wood, as before mentioned. By setting the head-stock E upon a sliding bed, which moves in the guide-cleats *g g g' g'*, and pivoting the lower end of the head-stock on two set-screws in the sliding bed, a lateral rocking motion may be imparted to the upper part of the head. This may be done by a handle or by a belt running to a treadle, as most convenient. In this way a portion of the circle which would otherwise be formed is cut away, leaving a crescent, which may be made full or thin, as desired. A kind of double crescent may be made by cutting from the opposite edges of the circle toward the center.

I claim—

1. The combination of a slotted socket-head, D', adjustable crank-rod *c'*, adjustable arm *j*, and pawl *m*, carried by said arm and engaging the teeth of a ratchet-wheel, H, all as hereinbefore shown and described.

2. The combination of the crank-rod *c'*, made adjustable at both ends, with an arm, *j*, and pawl *m* to act upon a system of gear-wheels and impart an intermittent rotation to the wood to be cut.

3. The combination of the chuck-shaft *o*,

gear-wheels G and I, ratchet-wheel H, pawl *m*, and adjustable crank-rod *c'*, arranged to impart a definite intermittent rotation to the chuck-shaft, as hereinbefore described.

4. A sliding head-stock, E, and revolving arbor *i*, armed with any suitable cutting-tool, in combination with an intermittently-rotated chuck-shaft, *o*, as hereinbefore shown and described.

5. A sliding head-stock, E, and revolving and sliding arbor *i*, moved by adjustable crank-rods and slotted socket-heads, in combination with the chuck-shaft *o*, and gear-wheels G and I, arranged to impart alternately a constant or intermittent rotation to the lathe-chuck *o'*, as and for the purposes described.

FREEMAN HANSON.

Witnesses:
GEO. E. BIRD,
DANL. H. BACON.