S. Huntington,

Turning Irregular Forms.

No. 6,131. Patented Feb. 20, 1849

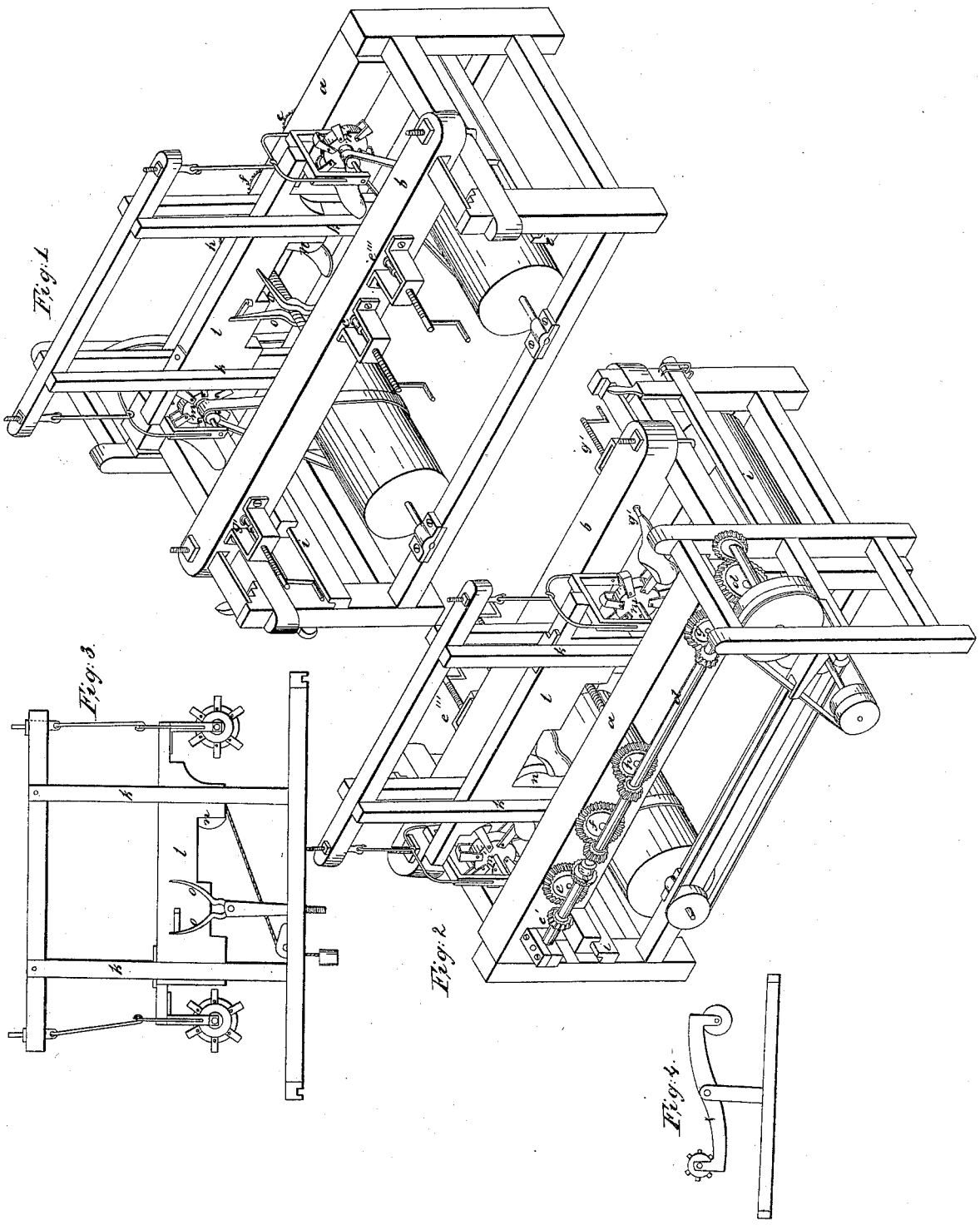

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

UNITED STATES PATENT OFFICE.

SAMUEL HUNTINGTON, OF MIDDLEFIELD, NEW YORK.

IMPROVEMENT IN MACHINERY FOR TURNING RIGHT AND LEFT LASTS, &c., FROM THE SAME PATTERN.

Specification forming part of Letters Patent No. 6,131, dated February 20, 1849.

To all whom it may concern:

Be it known that I, SAMUEL HUNTINGTON, of Middlefield, in the county of Otsego and State of New York, have invented a new and Improved Machine for Turning Irregular Shapes; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a perspective view of the front of the machine. Fig. 2 is a perspective view of back of the machine. Fig. 3 is an elevation of the cutter-frame. Fig. 4 is an elevation of another form of cutter-frame.

Similar letters refer to similar parts throughout the description.

The nature of my invention consists in the construction of a machine for turning irregular shapes. The mechanism of my machine runs upon a substantial frame of an oblong shape, which may be made of timber or metal. The top of the frame is crossed at each side by a strong tie-beam, the beam *a*, which is on the back, being stationary, while *b* is movable. These two beams form the bearers for the centers on which the rough materials and models revolve, and also hold the feed-motion. The beam *b* is held in place by a screw and bolt placed at each end, which hooks onto the cross-frame timber, as represented. To prevent the possibility of the beam slipping back by reason of pressure upon the turning-centers, I add at each end a stop or pawl, which works in a rack upon the frame.

Through the beam there are three holes for bearings for the revolving centers. These consist of a metal pin having one end pointed, forked, or chisel-shaped, as may be best adapted to hold on to the last or rough material, the other end furnished with a concave center to receive the point of an adjusting-screw, which is held in place upon the beam by a saddle in the manner represented. The center *c* is that which is represented in the drawings as having one end of the model-last within it, while the two centers on either side are for holding one end of the rough materials. Immediately opposite these centers are others to match, placed within the stationary beam *a*. These opposite centers are the driving-points. In construction they have a chisel or forked point, in order to prevent the slipping of the materials placed upon them. Immediately behind this point a collar is turned up to form a shoulder, bearing upon the end of the box in which it plays, and on the opposite end a key-seat is cut, to receive a bevel-wheel. These bevel-wheels are driven by bevel-pinions on a horizontal shaft, *d*, suspended outside the frame *a*. Each center is driven by a bevel-wheel of the same size, and consequently must rotate alike with respect to each complete revolution, but are not required always to rotate in the same direction; but, on the contrary, I give at times different directions to these centers, making some revolve to the right and some to the left at the same time, although the time each takes to make a complete revolution is the same. In order to give these different motions, I place an additional bevel-pinion on the shaft, so that it will gear into the opposite side of the main wheel by sliding it along, as seen at *e*. The pinion *e'* being thrown out of gear and the pinion *e''* put in gear on the opposite side, reverses the motion.

In the drawings, *f* and *g* are revolving in the same direction, but *e* in a contrary direction. The result of this will be the production of lasts from the rough material on the centers *c* and *g*, right and left to each other, the pattern-last being on *f*. The fourth bevel-wheel, *h*, in *a* is for the production of the sliding motion in the cutter-frame.

The cutters are suspended in a frame of peculiar construction, whereby three motions can be given to them, one of which is swinging or vibratory. Another is sliding, and is at right angles to the vibratory motion, and another, which is rotary. The sliding motion is for the purpose of carrying the cutters along the surface of the rough material. The vibratory motion is for the purpose of causing them to follow the form of the model, and the rotary motion is for the purpose of producing the cutting action.

The frame is constructed by first placing a bed upon shears or slide-rods secured at each end of the frame, as seen at *i i*, grooves being cut in each end of the bed to keep it firmly in position while it is permitted to slide along the shears *i i*. Two standards, *k k*, arise from near each end of the bed, a slit being cut through them to receive and guide the vibrating cutter-beam *l*. The beam *l* is suspended

by rods to the ends of a horizontal beam resting upon the uprights *k k*.

The cutter-wheels are seen at *m m'*, and consist of a series of steel bows, sharpened on their edges and riveted or screwed around the circumference of circular metal disks. These are suspended on a shaft in a saddle attached at each end to the beam *l*. The cutting-wheels must be hung on a line with each other.

A space is cut in the lower face of the beam *l* to insert the "governor" or friction-point *n*. Its position is such as to bear always upon the surface of the pattern, which is suspended on the centers *f c*. The surface of the governor is always kept upon the model or pattern by means of the weight seen in the figure; or a spring or other like power may be used instead, which will yield to the vibrations of the beam.

Between the two posts *k k* upon the bed of the frame there is a fixture for connecting the frame with the screw, in order to get the sliding motion upon the shears *i i*. This consists of a jointed gripper, *o o*, which has on each half of its jaws a female screw cut to match the thread upon the male screw of the feeder attached to the bevel-wheel *h*. Opening the jaws disconnects the frame from *h;* closing connects them. It is usual to draw the cutter-frame back to starting-place by hand when ready to introduce new pieces to be turned; but this is not necessary. In order, however, to reverse the motion by the screw and grippers so as to accomplish this, an additional bevel-pinion wheel must be set upon the driving-shaft on the opposite side of *h*, the disengagement of the first bevel-pinion and the engagement of the second effecting the operation. The cutter-wheels are driven by belts running from drums beneath the frame to pulleys upon their shafts, as represented. Other suitable gearing drives the shaft *d*, as shown in the drawings.

The operation is as follows: If the machine is set to turn lasts, a finished one for a model is placed between the centers *f c*, so that it will receive the action of the governor *n*. A piece of wood, chopped out roughly to the right dimensions, is next inserted between the centers *g g'*. A second like piece is fixed in the centers *e c'''*. As the machine is represented in the drawings, the gearing is set for turning a pair of lasts from one pattern or model—that is, a right and left last. One piece of the rough material must be put in the centers in the same position as the model; but the piece for the opposite or left last (the model being a right last) must be placed in the centers, so that its bottom will be turned up, as seen in the center *e*, when the bottom of the model is turned down, as seen in *e*, and it will rotate also in a contrary direction from the pattern. The cutter-frame *l* having been drawn forward to the movable bar *b* and the grippers *o o* adjusted upon the feeding-screw, the cutting commences, the cutters advancing first upon the toes of the lasts and forming them, the model-last and the rough materials all revolving in the order previously described. As the unequal faces of the model are brought in contact with the governor *n*, the beam *l* is made to vibrate back and forth in accordance therewith, the face of the governor always pressing upon the surface of the model by reason of the weight attached to the beam *l*. As the inequalities of the model are passed over by the governor, the cutters are made to recede or advance upon the rough material, thereby cutting away the stuff to produce depression on its surface, or receding and leaving elevations in exact accordance with those elevations and depressions upon the model. The frame is meanwhile slowly passing along toward the beam *a*, thus insuring the passage of the governor and cutters over the whole materials. Once going over produces the work finished, and the pieces may be then removed and other rough material introduced, as before.

It will readily be seen that from the construction of my machine, and by means of the numerous independent centers, and the position and arrangement of the cutter-wheel frame, my invention may be extended with facility, so as to embrace and operate upon a great variety of objects and shapes at once, and thus produce a large amount of work. In the machine as shown in the drawings hereunto annexed it will be readily seen that the cutters can be made to operate on both sides of the wheel or disk upon which they are fastened by introducing more centers in the frame and gearing on the shaft. The frame may also be elongated, so as to lengthen the beam *l* and add a greater number of cutter-wheels, so as to turn from one model a great number of pairs of lasts within the time required to turn one. The shaft *d* may also be lengthened and carried to any desirable extent, so as to introduce between the parallel beams *a* and *b* a number of cutter-wheel frames and centers, so as to turn by one operation lasts, spokes, and gun-stocks, and all shapes capable of being wrought by the machine.

Instead of hanging the vibrating beam *l*, I contemplate causing it to slide on friction-rollers centered in the slots in the upright posts *k k*. I also can vary the operation by substituting for the vibratory beam *l* a lever, as seen in Fig. 4. This is hung centrally upon the foundation-plate of the cutter-frame, the model acting on one end to make the vibrations, while the cutter-wheel is set upon the opposite one, as represented. This mode enables me to make but one copy of the model at a time, and is therefore unequal to the vibrating beam before described.

In my machine I can also, without any alteration whatever, introduce long or short things to be turned, so as to embrace a very extended range of objects, as I can remove the distance between my independent centers to an indefinite extent, and can cause my cutters to pass readily over such space. Thus I can one min-

ute adjust it to the length of a last, and the next introduce and turn instead thereof gun-stocks, or spokes for carriage-wheels, and in all these diversities of spaces between the turning-centers keep those centers firm in their bearings.

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

The herein-described arrangement and combination of the vibrating beam and cutter-wheels with the revolving centers, so as to produce at one time and from one pattern a right and left last, or a series of right and left lasts, or work of like character, substantially in the manner set forth herein.

SAMUEL HUNTINGTON.

Witnesses:

JOSEPH P. PIRSSON,

J. L. KINGSLEY.