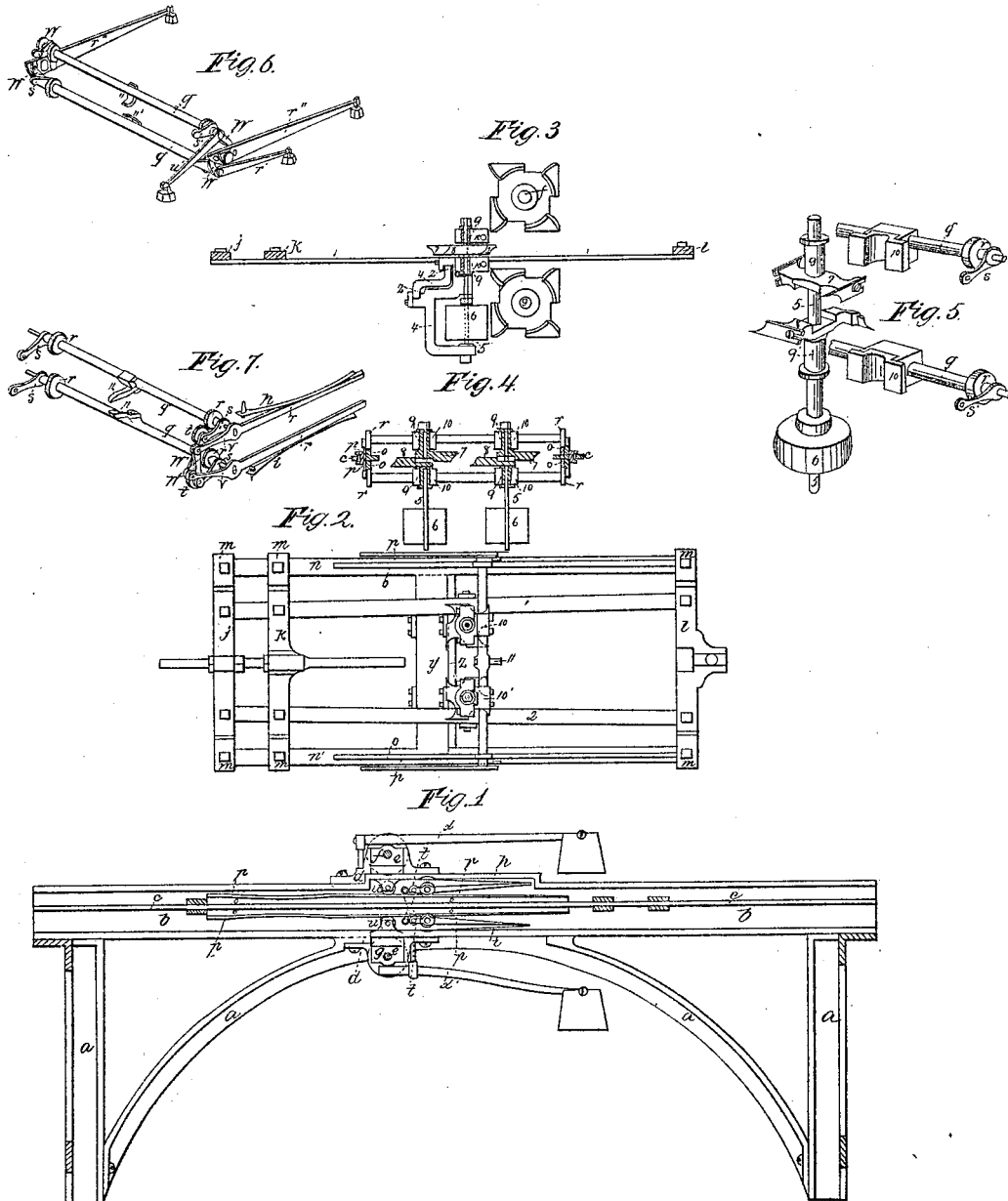


O. Mather,
Spoke Machine.

N^o 7,811.

Patented Dec. 3, 1850.



UNITED STATES PATENT OFFICE.

ORVILLE MATHER, OF CINCINNATI, OHIO.

MACHINE FOR DRESSING SPOKES.

Specification of Letters Patent No. 7,811, dated December 3, 1850.

To all whom it may concern:

Be it known that I, ORVILLE MATHER, of Cincinnati, in the county of Hamilton and State of Ohio, have invented new and useful Improvements in Machinery for the Manufacture of Spokes; and I do hereby declare the following to be a full, clear, and exact description of the nature, construction, and operation of the same, reference being had to the annexed drawings making part of this specification.

The various contrivances for forming an irregular figure by the process of turning in connection with a pattern, involve too much expense and nicety in their construction, and are too slow in their operation to produce such a common article as carriage spokes with sufficient economy and despatch, besides which, the turning action being more or less across the grain leaves a surface which requires to be finished by sand-paper, and then requires double the paint which suffices for a planed surface. Machines are also in use which plane out an irregular figure by oppositely acting cutters, guided by patterns which travel with the stuff; these are necessarily very limited in their action, owing to the unvarying form of the cutting edges. It is aimed in this invention to combine with the despatch and smoothness of finish of the planing action, a sufficiently near approach, for the purposes of the manufacture of spokes, to the comprehensive capabilities of the pattern turning lathe. This I accomplish by so constructing a planing apparatus, consisting of oppositely acting rotating cutters, that as the latter approach to, or recede from the axis of the stuff, their cutting outline may be modified to suit the varying size and form of the work.

Figure 1, is a longitudinal section through the machine, a short distance from one side, so as to exhibit the inner surface of one of the side stanchions, with the guides and their appurtenances. Fig. 2 is a plan of the carriage or sliding frame. Fig. 3, is a longitudinal section thereof. Fig. 4, is a vertical section through the horizontal cutters. Fig. 5, is a perspective view of one of the horizontal cutters. Fig. 6, is a perspective view of the tongues or shifting mouth-pieces, and their appendages by which they are kept in contact with the stuff, as well as the friction rollers upon their shafts held in position against the guides. Fig. 7, is a

modification of the arrangement shown in Fig. 6, in which the levers are shown as operated by springs, and, by means of connecting links and cranks, acting upon the opposite tongues through the medium of of their shafts.

Similar letters in the different figures have reference to like parts.

(*a, b*) is one of the side stanchions of the frame or stationary portions of the machine; (*b*) being a sill or shear, to which is attached the guide bead (*c*) along which the carriage slides, and which with its fellow support the plummer blocks (*d*), which inclose and allow vertical play to the journal boxes (*e, e*) of the vertical cutter shafts (*f, g*).

The carriage or sliding frame which carries the stuff to be operated on, is constructed as follows. (*j, k, l*) are three cross-heads terminating in clips (*m*) adapted to work along the guide-bead (*c*). (*n, n'*) are two bars which connect the said cross-heads, and each of these bars is furnished with guide beads (*o, o, p, p,*) projecting above and below; the beads (*o, o,*) serve to guide the shafts (*q, q'*) which pass through the upper and lower sections of the stocks of the horizontal cutters, which are by this means drawn apart and closed together, as is hereinafter more particularly described. The shafts (*q, q'*), are furnished with friction rollers (*r, r, r, r,*) adapted to traverse the guide beads (*o, o, o, o,*). The beads (*p, p, p, p,*) as the carriage travels to and fro, elevate or depress the journal boxes (*e, e,*), of the vertical cutter shafts, by the intervention of friction rollers (*u, u, u'*) attached to the said boxes. The ends of the shafts (*q, q'*) pivot within levers (*v, v,*), the tails of which carry weights, which, by a tendency to rotate the shafts (*q, q'*), cause the tongues (*11, 11,*) to impinge with any required force upon the stuff which passes between them. A weighted lever (*v''*) is located between the pair just mentioned and a corresponding one at the opposite side of the machine, and each of these is connected by links (*w, w,*) at different parts of its length to the shafts (*q, q'*), forming a double toggle, and, by causing the shafts to approach each other, keeping the friction rollers (*r*) firmly in position against the guide beads (*o*). The links (*w*) on the shaft (*q, q'*) are entirely independent of the levers (*v'*) adjacent, which have their work

- to perform in keeping the tongue against the stuff, and the levers (v'') perform their work unaffected by the rotation of the shafts (q, q'). The heads (s') on the extremities of the small cranks on the shaft (q, q') are by contact with the beads (p) to prevent the tongues from too near an approach when the stuff or spoke is removed.
- 10 Extending from one stanchion to the other is a rail (y) which being furnished with guide beads (z, z) affords support and lateral play to the sliding carriages ($4, 4$), into which the stocks or journal boxes ($10'$) of the lower sections ($8, 8$) of the horizontal cutter heads are dovetailed; these dovetail joints allow the lower cutter stocks ($10', 10'$) to rise and fall with the vertical motion of the lower shaft (q'), the stock carrying with it the cutter head (8) by the intervention of the collar ($9'$) which is embraced by the stock ($10'$). The upper sections ($7, 7$) of the horizontal cutter heads rise and fall upon the vertical shaft (5) by means of collars ($9, 9$) which are embraced by the stocks or boxes ($10, 10$), which rise and fall with the vertical motion of the upper shaft (q) which passes through them.
- 30 ($1, 2$) are shear-bars whose divergence from the axis of the spoke corresponds with its taper, these being grasped by the carriages ($4, 4$) the latter are caused to approach and recede in accordance with the bars. The rail (y) limits the motions of the cutter carriages to these advancing and receding motions at right angles to the track of the carriage in which the spoke is chucked.
- 40 The sides of the spoke formed by the horizontal cutters are a nearly regular taper from the hub end to the felly end, but the outlines of the more flattened sides formed by the vertical are irregular. The separation of the horizontal cutters enables them to meet this increase in the size of the spoke, still preserving to the requisite degree the roundness of form.
- 50 The shafts (5) of each pair of horizontal cutters are pivoted within the carriages ($4, 4$) which traverse transversely on the rail or shears (y).
- ($6, 6$) are the pulleys by which these shafts ($5, 5$) are rotated.
- 55 ($7, 8$) are two sectional cutter heads counter-lapped to each other and each bearing a pair of oppositely situated bits, the cutting edges of the upper bits ($7, 7$) being shaped to form the upper half of the portion of the spoke assigned to the lateral or horizontal cutters, and the lower bits ($8, 8$) being formed to produce the lower portion thereof. The cutting edges on their receding or continuous portions are produced so as to overlap each other's cuts, so as to leave no uncut portion at the middle when the heads are drawn apart. Each horizontal cutter head is furnished with bushes or collars ($9, 9'$) which journal within stocks or boxes ($10, 10'$) which are traversed by the shafts (q, q') which rise and fall, through the action of the guide beads (o, o, o, o) upon the friction rollers (r, r, r, r) on the shafts (q, q'). So that, as the vertical cutter heads retreat from the axis of the spoke, the upper and lower sections of the horizontal cutter heads retreat with them, and being, by the shears ($1, 2$) drawn apart at the same time laterally from the spoke, any preconceived change of size and figure may be formed.
- The bits on the vertical cutters are hollowed to suit the pattern, and may be made to open out like the horizontal ones, but this is unnecessary in the manufacture of spokes.
- (x, x) are weighted levers, which, by pressing against the journal boxes (e, e) limit their play to so much as is due to the guide bead (p, p, p, p) and keep them steadily up to their work.
- ($11, 11$) are tongues projecting from the midlength of the shafts (q, q') and made to grasp the spoke between them and hold it steady for the action of the cutters, by their connection as before explained with the weighted levers (r, r, r, r) which act independently of the rise and fall of the shafts (q, q') as the friction rollers (r, r, r, r) are loose.
- A modification of the arrangement by which the tongues are operated and the friction rollers (r, r, r, r) kept in contact with the guide beads (o) upon which they traverse, is shown in Fig. 7, where the equivalents of the levers (v') are shown at (v); these being extended beyond their fulcrum are jointed to links (w') which connect with cranks (s) on the shafts (q) or (q') as the case may be on their opposite sides of the guide; thus the parts serving to keep the tongues to their places on the stuff, and the rollers (r) upon the guides, are mutually sustaining; the shafts (q, q') forming (when the rollers (r) are in contact with the guides) fulcrum for the lever by which the tongue is kept to its work through the medium of its shaft, cranks and connecting links (w'); and the tongues (11) when up to their bearings forming a point of resistance from which the pressure is placed upon the shaft on which the rollers (r) run. The springs (h, i) serve by suitable pressure upon the levers to keep all at the requisite degree of tension and pressure. The loose rollers (t, t) which are paired on each side prevent too near an approach of the tongues when the stuff is removed as they in the absence of the spoke, come in contact with the bead or guide (p, p).
- Having thus fully described the nature

operation and construction of my improvements in machinery for making spokes, what I claim therein as new and desire to secure by Letters Patent is—

- 5 1. Constructing a cylindrically rotating cutter head, with a separating joint athwart its middle, and in the plane of its rotation, so arranged as that by the mutual advance or recession (in the direction of their axis of
10 rotation) of the respective sections of the cutter heads, as they traverse the length of the stuff, the cutting edges are adapted to impart the varying outline and form required for the work.

2. The shafts (g), and weighted levers (r' , 15
 r''), in combination with the levers (r''' ,
 r''''), and the links (w, w), or their equivalents for sustaining in position the tongues (11) upon the spoke, and the rollers (r) 20
upon the guides and rendering them self adjustable under all the circumstances which can effect them.

In testimony whereof, I have hereunto set my hand before two subscribing witnesses.

ORVILLE MATHER.

Witnesses:

EDWARD H. KNIGHT,
GEO. H. KNIGHT.