

SPOKE-MAKING MACHINERY.

Our extracts this week from Knight's "Mechanical Dictionary" relate to lathes, planers, and other machines for making spokes. This apparatus, owing to the irregular forms of spokes, is specially constructed for their manufacture, and embodies mechanical devices of exceeding ingenuity. In Fig. 1 is illustrated a

SPOKE LATHE, based on Thomas Blanchard's lathe for irregular forms. The spoke is placed between centers in a lathe head, and is approached to or drawn away from a cutter, in accordance with the shape of a pattern which governs the proximity of the tool to the work. The pattern spoke is in the upper part of the machine, and the guide pieces on each side govern the position of the revolving cutter, which acts upon the material placed between the lower centers.

The lathe shown in Fig. 2 is adapted for turning handles for axes and other implements, as well as spokes. The work, *a*, and pattern, *b*, are fixed between centers and revolved upon a carriage, which is automatically traversed in a longitudinal direction, and at the same time swung by the upright guide, bearing against the pattern, so as to present the work to the action of a set of cutters fixed in the rotary head, *d*; the amount of this swing and consequent penetration of the cutters is dependent upon the shape of the pattern, of which the work is thus caused to present an exact copy. Adjustments are provided for forming several sizes of work from the same pattern.

Fig. 3.

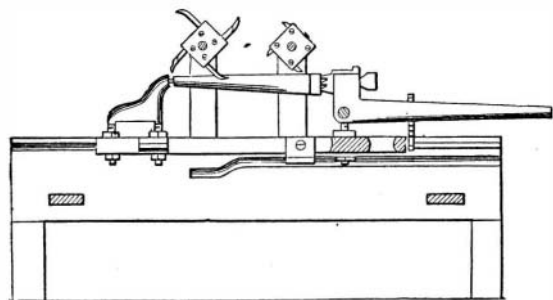
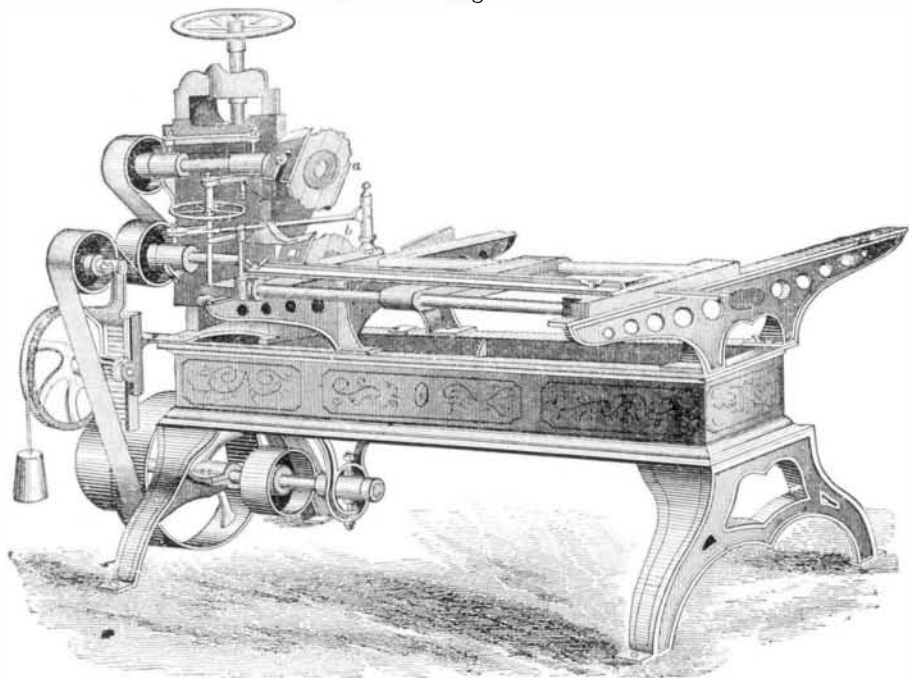


Fig. 3 is a machine for dressing a spoke lengthwise of the stuff, the spoke or the cutter being so moved, the one relatively to the other, that the required shape is produced. In the example, the piece is clamped between the dog in the bent lever and the opposite center; the clamp lever is held in position by a support placed under it and upon the bench. The carriage is reciprocated on the ways, beneath the roughing and the finishing cutter, a guide bar determining the presentation to the cutter, so as to confer the proper shape.

Fig. 4 is a machine for centering a hub, so that it may be bored truly for the spoke mortises. The standard forms a support for the adjustable portions of the apparatus. The

Fig. 7.

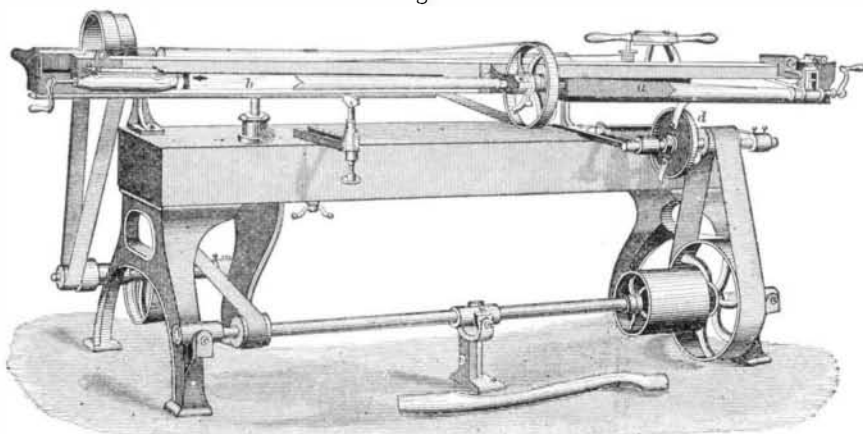


point of the hub rests on a block keyed up by wedges. The butt of the hub rests on a pivoted bar whose carriage is vertically adjustable on the standard by a lever and rod in the rear. The mandrel bolt clamps the pivoted hub rest to a bar on the back of the standard.

Fig. 5 represents a machine for planing the sides of spokes and bringing them to a uniform shape; the edge of the tenon may be tapered at the same operation if desired. The spoke

is placed upon the table, *c*, where it is held against a stop, adjustable to different sized spokes; the table is pushed forward to an amount determined by the previous adjustment of a collar on the stop, bringing the side on the spoke in contact with the cutters on the rapidly rotating cutter head, *b*, which at once dress that side of the spoke and tenon; it is

Fig. 2.



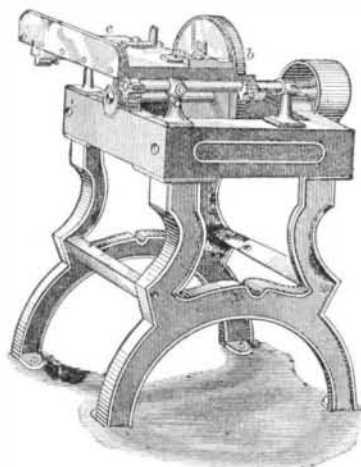
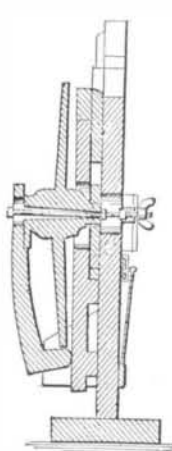
then turned over, and the other side similarly dressed. On drawing the spoke forward and releasing it from the stop, the desired bevel is given to the edge of the tenon by means of the cutters, the particular inclination being determined by an adjustable angle gauge.

SPOKE-TENONING MACHINES

are used for forming the tenons on the outer ends of spokes. In Fig. 6 the hub, having the spokes inserted, is placed on a circular iron plate upon the workbench, and is held fast by

Fig. 4.

Fig. 5.



adjustable clutches upon the head piece, *a*. The whole apparatus is secured to the bench by a screw and nut and lever, *b*. Surrounding the screw is a collar, *c*, and in like manner the bottom plate is surrounded by a collar, *d*. From these collars extend jointed adjustable arms, *e, f*, the middle part of each of which is a right and left hand nut corresponding to screws on the ends of the other joints. These arms carry at their ends the brace guide, *g*, which has vertical adjustment to suit different sized hubs by means of two screws simultaneously operated by a hand wheel, and working in the tubes, *h, h*, which slide in the tubes, *i, i*. In the end of the brace guide is a nut, which is not threaded on its outer

raised or lowered by means of a screw and hand wheel to each, and are adjustable to vary the thickness of the tenon or the depth of the shoulder as required, the carriage always remaining stationary. For spoke tenoning, it is provided with a light adjustable attachment on the carriage for grasping the spoke, and a saw for cutting it off to the proper length, at the same time that the tenon is cut.

Fig. 8 is a SPOKE-THROATING MACHINE.

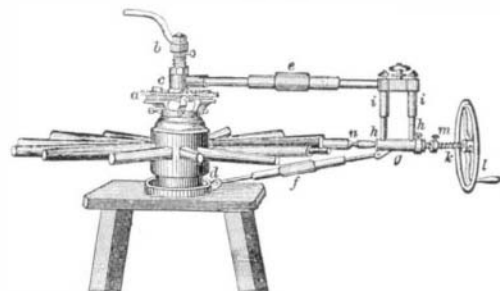
The throat of a spoke is the portion of diminished thickness a short distance from the hub, to give a certain degree of flexibility to the spoke. See the lower figure in the illustration, where it is purposely slightly exaggerated to show it the more clearly.

The machine is intended for shaping and smoothing the throats or necks of spokes, preparatory to insertion in the hubs. It has an iron frame. The cutter head revolves on a steel shaft, running in self-oiling boxes, and can be so constructed as to make the throat of any desired shape. The frame upon which the spoke to be throated rests is hinged on a slide bar which passes back and forth over a guide, which, in connection with the knives on the cutter head, regulates the shape of the throat. The spoke is placed under a lever, and held firmly while passing back and forth; ordinary spokes can be throated on both sides by simply changing the guard, which is accomplished by the hand lever on the end of the machine. A

SPOKING MACHINE

is represented in Fig. 9, and is used for setting spokes in the hub with a uniform dish. It has a fixed standard, A, and

Fig. 6.



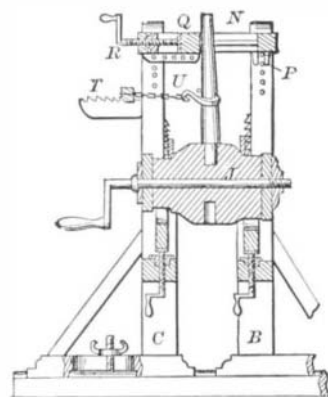
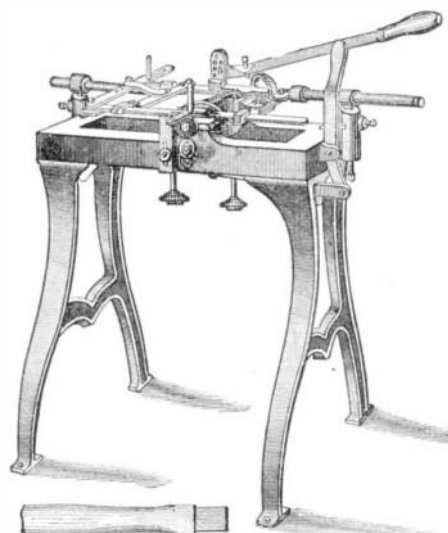
a movable standard, C, carrying pillow blocks adjustable as to height by means of screws, and a head, N, which may, to vary its elevation, be hinged in either one of a series of notches, P. The hub is laid with its ends resting in the pillow blocks, and clamped by the rod, J, which works into a nut; and the spoke is adjusted to the required dish, and firmly held, while being driven, by means of a gage block, Q, operated by a cranked screw, R; while a hook and chain, U, attached to a bevel-edged lever engaging one of the notches in the rack T, hold it to the gage, and prevents its moving too far in the opposite direction. Each spoke is successively driven and the wheel removed, the head, N being turned on its hinge.

Damp Walls.

The walls of a building are liable to be charged with moisture, 1, by wet rising in them from the damp earth; 2, by

Fig. 8.

Fig. 9.



side, and turns freely in the guide unless held by a set screw; when this is made fast, the screw shaft, *k*, feeds in either direction, according as the hand wheel, *l*, is turned to the right or left. The depth of tenon is gaged by a collar, *m*, adjustable at any point on this shaft. The tenons are formed by a hollow auger held by the brace, *n*, the apparatus being rotated around the fixed hub as a center.

The machine shown in Fig. 7 is adapted for tenoning cabinet work as well as spokes. The two cutter heads, *a, b*, are

rain falling upon the exterior of the walls; 3, by water from the roofs or leaking gutters soaking into the tops of the walls. Of these evils, the first may be prevented by the construction of dry areas or air drains, and by the introduction of damp-proof courses; the second, by impervious outer coatings or by the use of hollow walls; and the third, by the use of projecting eaves with proper gutters, or, where parapet walls are used, by an upper damp course.—Notes on Building Construction