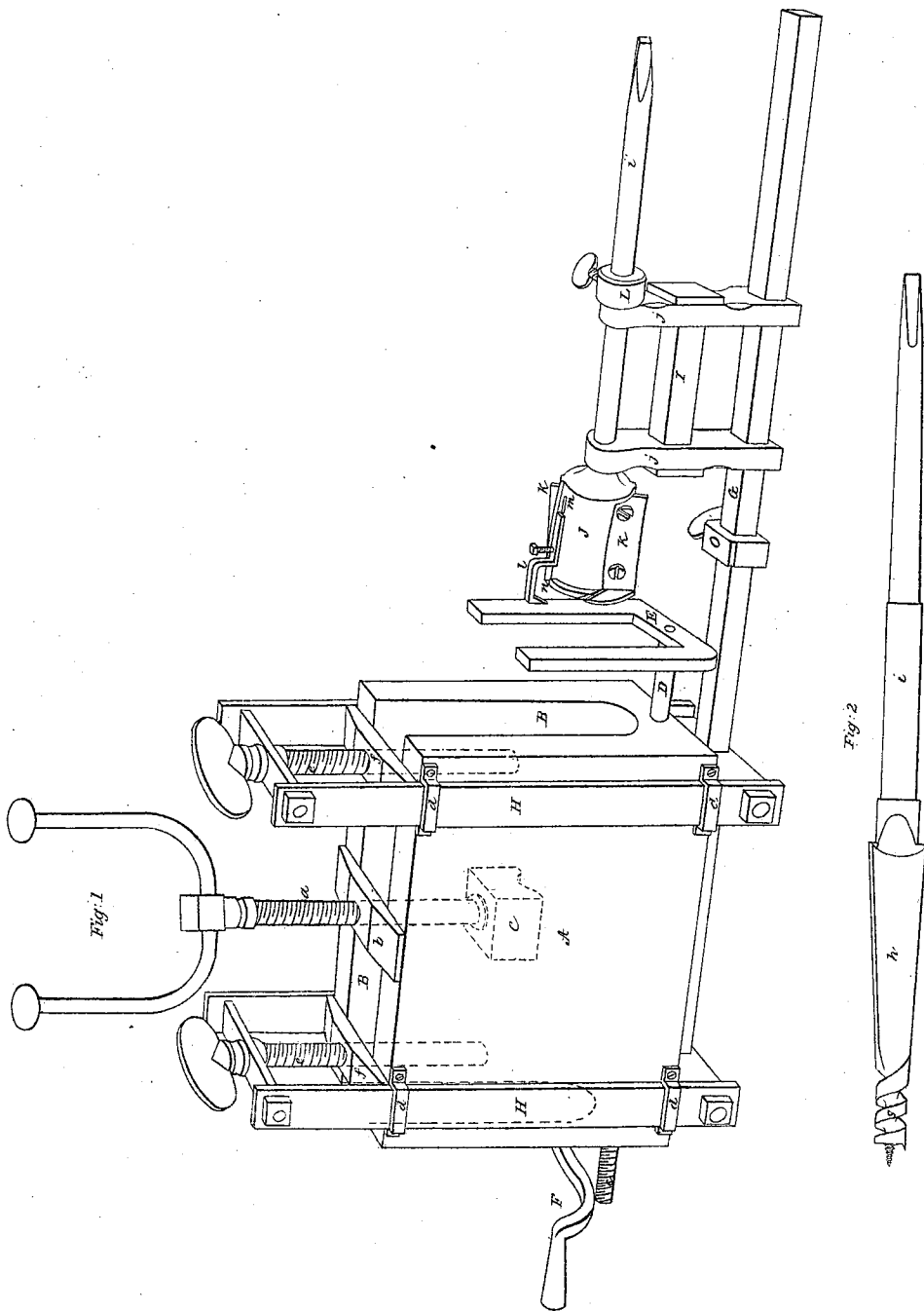


H. Mc Grath,

Tenoning Spokes and Boring Fellies.

IT^o 14,105.

Patented Jan. 15, 1856.



UNITED STATES PATENT OFFICE.

HORATIO McGRATH, OF MEIGS CREEK, OHIO.

BIT FOR BORING FELLIES AND TENONING SPOKES.

Specification of Letters Patent No. 14,105, dated January 15, 1856.

To all whom it may concern:

Be it known that I, HORATIO McGRATH, of Meigs Creek, in the county of Morgan and State of Ohio, have invented certain
5 new and useful Improvements in Machines for Tenoning Spokes and Boring Fellies, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, which forms part
10 of this specification, and in which—

Figure 1 represents a view in perspective of my machine and Fig. 2 is a similar view of a boring bit detached from the machine.

My machine consists of a vise of peculiar
15 construction by which the spoke or the felly is securely held, of a carriage to support the cutting bits sliding upon an adjustable guide bar which can be set to bore the felly or to cut the tenon on the spoke at any re-
20 quired angle, and of an improved tenon cutter and mortising auger.

In the drawing A is the vise of the machine. It consists of a block of wood in which a deep cavity B is made to receive the
25 spoke; a sliding clamp block C is fitted to this cavity and is operated by a screw *a* which works in a nut formed in a bar *b* crossing the open top of the cavity and secured to the upper surface of the vise block.
30 The head of this screw is furnished with handles by which it is turned to clamp the spoke between the hollow face of the clamp-block and the curved bottom of the cavity.

The vise-block is perforated longitudi-
35 nally beneath the bottom of the cavity and a rod D having a screw cut upon its hinder extremity *c* is passed through it; the front end of this rod is furnished with a forked jaw E between which and the face of the
40 vise block the felly to be bored is clamped by turning a nut upon the hinder extremity of the rod D by means of a crank F or a wrench.

The guide bar G on which the carriage
45 which supports the cutting bits slides extends beneath the center of the vise-block from its hinder extremity forward to a sufficient distance beyond its front extremity to allow of the sliding of the carriage to operate upon the longest spoke or the thickest
50 felly. It is connected with the vise block by two adjustable sliding frames H, H, the one at the front and the other at the hinder extremity of the vise block;
55 these are each composed of two upright

side-pieces sliding in guides *d* secured to the sides of the vise-block. The upper extremities of the side pieces are connected by a cross bar to which a screw *e* is fitted which works in a nut *f* secured to the vise
60 block in such manner that by turning the screw the whole frame may be raised or depressed; the lower extremities of the side pieces are also connected by a cross-bar which is perforated to receive the guide bar,
65 and which is connected with the side pieces in such manner that it can be turned upon its axis to accommodate itself to the varied position of the guide bar; the latter is
70 passed through the lower cross-bar of the front frame and is secured in that of the hinder frame.

A sliding carriage I is mounted upon the guide bar to support the cutting-bits; these
75 are of two descriptions, the one for boring a conical mortise in the felly, and the other for cutting a corresponding conical tenon on the spoke. The former, (see Fig. 2) consist of a single twist cylindrical auger *g* attached to a tapering shell pod *h* secured to a shank
80 *i* which is fitted to turn in holes formed in the uprights *j*, *j*, of the sliding carriage. The cutting edges of the cylindrical auger first entering the wood bore a cylindrical
85 hole which receives a tapering form from the cutting edge of the shell pod *h* as the latter follows the twisted auger. The tenoning bit or hollow auger consists of a cylindrical shell J, with cutting knives, secured to a shank *i'* fitted to turn in the bearings in
90 the uprights of the sliding carriage. This cylindrical shell is flanged at its open end and is fitted with two bent knives *k*, *k*, those cutting edges of the latter which form the conical surface of the tenon are bent spirally
95 in order to shave the tenon with greater facility, and approach each other as they recede from the open end of the auger in order to form a conical tenon. The remaining cutting
100 parts of the knives are bent outward parallel with the flanged face of the cylindrical shell, and cut the shoulder of the tenon while their spiral edges give the proper tapering form. In order to increase the efficiency of the tool thus described, additional cutters *l* are added which, being set
105 by screws in any desired position, precede the face of the shell and reduce the rough spoke while the knives *k*, *k*, finish the tenon. The shanks of the additional knives when
110

not acting are slid back in slots *m* in the cylindrical shell and the cutting edges are received in recesses *n* formed on the flange.

In order to tenon a spoke with the machine thus described, the shank of the bit *J* is fitted to the sliding carriage and a collar *L* is applied to it to prevent it from moving longitudinally in the uprights *j*, *j*. The angle of inclination of the axis of the tenon to be formed is adjusted by altering the position of the frames *H H* by means of their screws *e*, *e*; and the gage collar *O* which limits the movement of the sliding carriage is set to the length of the tenon required. The machine is then clamped upon the spoke, which passes through the cavity of the vise block, by means of the clamp block, care being taken to adjust it to the spoke at the proper distance from the center of the hub of the wheel. Power is then applied to the bit by means of a brace applied to the squared extremity of its shank, and as it is turned and pressed against the projecting end of the spoke, the cutters and knives acting upon it quickly cut the tenon. When the sliding carriage strikes the gage collar the operation is completed, the bit is drawn back, the machine is unclamped from the tenoned spoke, is attached to a new one and the operation is repeated. It will be perceived that by this arrangement of machine,

the tenons of all the spokes of a wheel will be cut exactly of the same size, and with the same disk or inclination to the axle, and as the fellies are all bored by the same tapering bit to the same depth the time and trouble required in fitting each spoke to its felly in the ordinary way is saved, while the work is finished in a more accurate manner.

When the machine is used for boring fellies the latter are clamped between the forked jaw *E* and the face of the vise block, the boring bit (Fig. 2) is then fitted to the sliding carriage and manipulated in the same manner as the tenoning bit.

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

1. The single twist auger with a tapering shell pod for the purpose of boring and tapering a mortise at one operation as herein described.

2. I likewise claim the tenon auger constructed as herein described with its auxiliary adjustable cutter to reduce the superfluous timber and with its finishing bits arranged to cut a tapering tenon with a shoulder at right angles to its axis.

HORATIO McGRATH.

Witnesses:

JAMES H. LUTGEN,
WILLIAM BLEAKNOR.