G. N. STEARNS.
Hollow-Auger.

No. 203,384. Patented May 7, 1878.

Fig. 1.

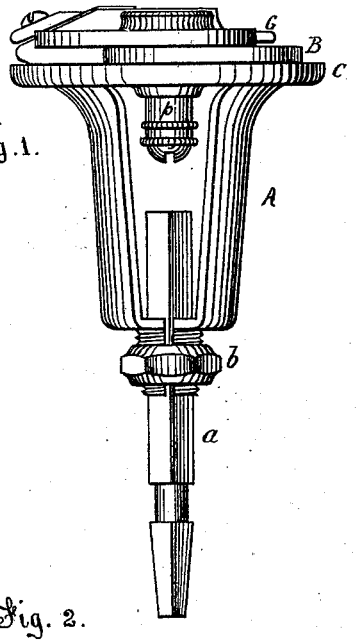


Fig. 4.

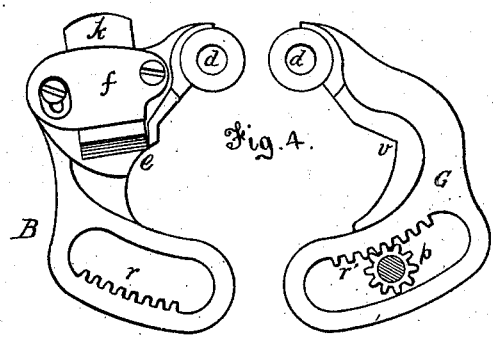


Fig. 2.

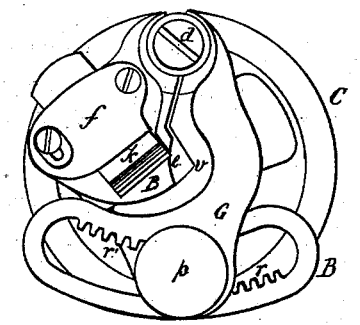
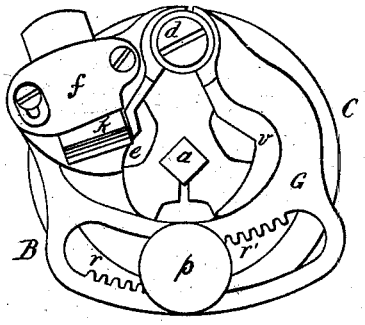


Fig. 3.



Witnesses:

J. F. Greenough

P. B. Wm. Lennan.

Inventor:

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UNITED STATES PATENT OFFICE.

GEORGE N. STEARNS, OF SYRACUSE, NEW YORK.

IMPROVEMENT IN HOLLOW AUGERS.

Specification forming part of Letters Patent No. **203,384**, dated May 7, 1878; application filed June 15, 1876.

To all whom it may concern:

Be it known that I, GEORGE N. STEARNS, of Syracuse, Onondago county, State of New York, have invented certain Improvements in Hollow Augers, of which the following is a specification:

This invention relates to the class of tools termed "adjustable," and is designed for cutting tenons of different sizes and lengths, and to obviate the necessity of using a separate auger for each sized tenon.

My invention consists in providing two jaws, constructed, as hereinafter more specifically set forth, with a joint similar to a rule-joint, which forms a pivot or hinge. The pivoting-pin, passing down through the face-rim of the frame, secures the jaws to the frame, which, together with a peculiarly-shaped **V** in one jaw and a concave projection in the other, forms the adjusting devices for determining the diameter of the tenons to be cut, and also in providing a combined shank for connecting the tool to a bit-stock, and a stock for determining the length of tenon.

The construction is more fully set forth as follows, in which reference is had to the annexed drawing, like letters indicating corresponding parts.

Figure 1 is a side view of the tool; Fig. 2, an end or face view, with the jaws closed; Fig. 3, the same with the jaws expanded. Fig. 4 shows the jaws detached.

The letter A represents the body or frame of the auger, made of metal, preferably of malleable iron or brass, and consisting, as appears in the drawing, of three, more or less, bars, joined at the rear end to a hub, through which the combined shank and stop *a*, having a graduated scale upon one of its flat sides, passes. The hub is conical, and divided into two or more sections by milling or sawing in with a tool prepared for this purpose. It is provided with a binding-nut, *b*, screwed onto it, by means of which it can be firmly affixed to the shank at any desired point of its length. The shank, as will be readily observed, when released, can be set in or out to determine the length of tenon to be cut.

I am aware that a shank and stop combined in one piece is not new, as I now have a patent on this device; but the combination of the divided tapering hub and binding-screw with the shank is new, and an important feature of my invention.

On the front or cutter-head end of the frame or body the bars terminate in a circular ring of metal, its upper rim forming the bearing or face rim, upon which the pivoted jaws are operated, as mentioned before. At two points opposite to each other on the face-rim, and upon its lower side, two bosses are cast on. These are perforated, so as to allow the pivoting-pin *d*, Fig. 2, to pass through the jaws and rim, and it is securely held in place by a nut. The pinion P is also provided with a bolt, having a thread on its lower end. This pinion works in a rack, *r r'*, and its bolt projects down through the perforation in the face-rim and boss, and is set as required by the set-nut. The jaw B is provided with a cutter, *k*, which is held in place and operated by a pivoted strap or cap, *f*, at or below the foot of the cutter *k*. The jaw has a concave projection, which forms a bearing for the jaw upon the timber of the spoke as it is cut away, aiding materially in centering and steadying the tool while cutting. The opposite or guide jaw is provided with a **V**-shaped indenture of peculiar form, as shown at Fig. 2, its office being to center the work properly. Many experiments on shaping this indenture led me to adopt this as the only shape of the guide-jaw which would conform perfectly to the peripheries of the various tenons of different diameters in the scope of adjustment. Both jaws are provided with the segments *r r'*, Figs. 2 and 3, the segment of the guide-jaw overlapping that of the cutter-carrying jaw. These segments are provided on opposite sides with a rack, the teeth of which are so graduated as to allow the pinion to gear into both. This I found necessary, in order to make the tool center perfectly in each size. The pinion P is located opposite the pivot *d*, and gears into both racks on opposite sides, so that by turning it the jaws are expanded or contracted to any desired degree on each side of the center equally, so as to be at all times centered on the axis of revolution. They are firmly held at any desired size by a bolt on the pinion-axis that passes through

the rim and boss of the frame, its lower end being provided with a thread, upon which a set-nut operates as a securing device.

The pinion P being permanently secured at a true center, in combination with the graduated segmental racks, forms a centering device that is both positive and, in a measure, automatic in its operation.

It will be observed that, in consequence of the segment of the guide-jaw overlapping that of the cutter-carrying jaw, it is brought nearer to the axis upon which the pinion revolves, and therefore when the pinion is turned its cogs engage the rack of the guide-jaw, moving it with greater rapidity than the cutter-carrying jaw, which, by reason of the overlap, is farther from the center of the axis of the pinion. The necessity for this will be obvious on examining Figs. 2 and 3. As the peculiar shapes of the indenture in the guide-jaw and projection in the cutter-carrying jaw, if both moved alike, would bring the cutting center of the auger on different sides of the axial center of the body and shank, and render the tool unsteady in use, the weight of metal in the jaws is distributed so as to balance when placed in a bit-stock or lathe for use. The tool is strong, compact, and durable.

Having thus fully described my invention, I claim—

1. The jaws B G pivoted at a point, *d*, in combination with each other, and the cutter-head of a hollow auger, substantially as and for the purposes specified.

2. In combination with two jaws, pivoted at any point *d* on the cutter-head, of a hollow auger, the segments *r r'* provided with racks having graduated teeth, and pinion P, operating to center the jaws automatically at any degree of adjustment, and for the simultaneous opening and closing of the jaws, as herein set forth and specified.

3. The pinion P, provided with an axial pin passing through a boss on the frame of the cutter-head of a hollow auger, gearing into the segmental rack *r r'* of the expanding and contracting jaws, in combination therewith, and the auger-frame A, as herein set forth, and for the purposes specified.

4. The projection *c* and recess or indenture V in the jaws, substantially as and for the purposes specified.

5. The adjusting divided hub and binding-screw, in combination with each other, and the combined gaging-shank and stop *a*, substantially as specified.

In witness whereof I have hereto set my hand.

GEO. N. STEARNS.

In presence of—

P. B. McLENNAN,

J. J. GREENOUGH.