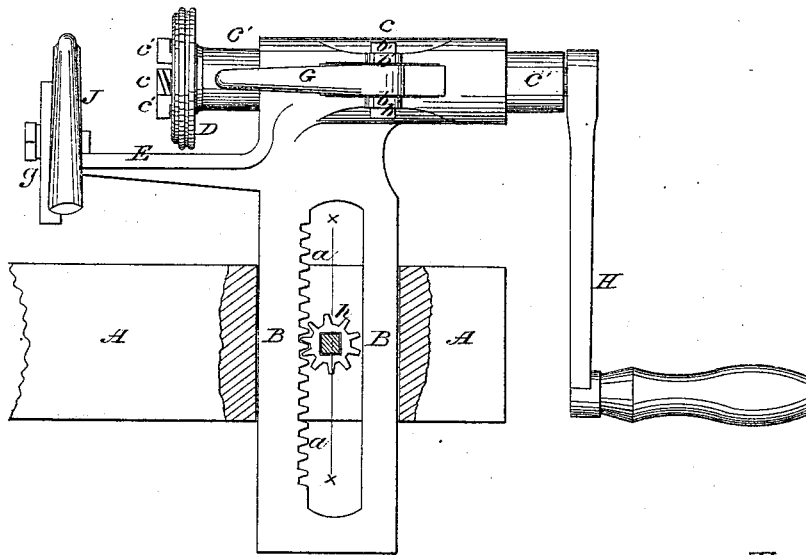


*L. A. Dole,*  
*Tenoning Spokes.*

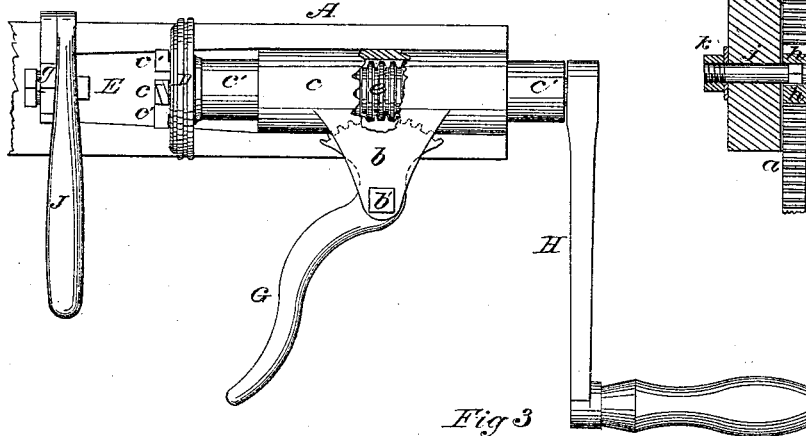
*N<sup>o</sup> 50,768.*

*Patented Oct. 31, 1865.*

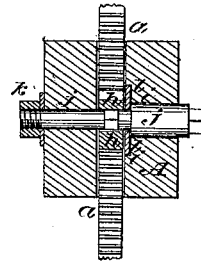
*Fig 1*



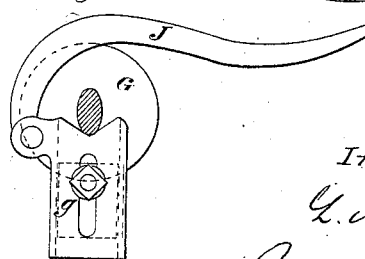
*Fig 2*



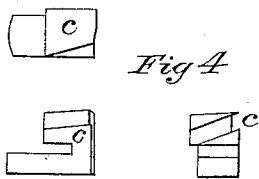
*Fig 5*



*Fig 3*



*Fig 4*



*Witnesses:*

*W. H. B. B. B.*  
*C. H. B. B.*

*Inventor:*

*L. A. Dole*  
*by his Attys*  
*Mason, Smith & Co.*

# UNITED STATES PATENT OFFICE.

L. A. DOLE, OF SALEM, OHIO, ASSIGNOR TO HIMSELF AND ALBERT R. SILVER.

## IMPROVEMENT IN MACHINES FOR TENONING SPOKES.

Specification forming part of Letters Patent No. **50,768**, dated October 31, 1865.

*To all whom it may concern:*

Be it known that I, L. A. DOLE, of Salem, Columbiana county, State of Ohio, have invented a new and Improved Spoke-Tenoning Machine; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is an elevation of the front side of my machine with a portion of its supporting-beam broken away. Fig. 2 is a top view, with a portion of the tubular bearing of the auger-shaft broken away to show the annular rack. Fig. 3 is an end view of the centering and holding device for the spokes. Fig. 4 shows the form of the cutters of the hollow auger. Fig. 5 is a vertical transverse section in the line *x* of Fig. 1.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to a novel machine which is intended for cutting tenons on the ends of spokes to receive the fellies.

The nature of my invention consists in a vertically-adjustable standard which is so constructed that it is adapted for supporting the contrivance for holding and centering the spokes, and also the cutters for forming the tenons on the spokes, said stock or standard being so attached to a supporting-beam or table that it can be elevated or depressed and fixed to operate at any desired point, according to the size of the wheel, as will be hereinafter described.

It also consists in arranging a pressure and feed lever upon the tubular bearing of a longitudinally-movable center-shaft, and connecting the lever to this shaft in such manner that the attendant can move the cutters backward or forward and feed them up to their work during the rotation of said shaft as fast or as slow as he may desire, as will be hereinafter described.

It also consists in an adjustable spoke-centering device, which can be adjusted for spokes of different sizes, in conjunction with a lever for holding the spokes in place during the operation of the cutters in forming the tenons, as will be hereinafter described.

To enable others skilled in the art to understand my invention, I will describe its construction and operation.

In the accompanying drawings, *A* represents the beam to which my improved tenon-cutter is attached. This beam should be of sufficient length to support the wheels the spokes of which are to be tenoned, and the wheels may be applied to a vertical pin which will pass through their hubs and admit of their being rotated so as to bring the ends of the spokes in front of the tenon-cutter. Instead of a single beam or trestle the machine which I am about to describe may be secured to a common table or work-bench.

*B* represents a vertical standard, which has a vertical slot through it, on one edge of which a rack, *a*, is formed, which is adapted to receive a pinion, *b*, for elevating or depressing the machine, as will be hereinafter described. This slotted standard *B* carries on its upper end a horizontal tubular bearing, *C*, for the mandrel *C'* of the hollow chuck-head *D*, which bearing has a slot through its front side, on each side of which projects a lug, *b*, for supporting and holding in place a pressure-feed lever, which will be hereinafter described.

*E* represents an arm which projects from one edge of the standard *B* a suitable distance to receive the holding and centering devices for the ends of the spokes. This arm is arranged a sufficient distance below the axis of the tubular bearing *C* to admit the chuck-head *D* to turn freely over it, and it may be cast with the standard *B* and its tubular bearing, or it can be cast separately and afterward bolted in its proper position. The object of securing the arm *E* rigidly to the standard *B* is that this arm may be adjusted with the standard and cutters, thus avoiding the necessity of providing for separate adjustments by constructing the frame of the machine in two parts.

The chuck-head *B* has a central opening through it for the admission of the tenons, and around this hole are arranged the angular cutters *c c* and the guide-blocks *c' c'*, which may be adjusted for cutting tenons of different diameters. This chuck is screwed on one end of a mandrel, *C'*, which is allowed to have a free endwise movement in its tubular bearing *C*, and which has a number of annular grooves formed in its surface at regular distances apart. These grooves leave what I denominate an "annular rack," *e*, Fig. 2, which receives the teeth of a

segment that is formed on the end of a curved lever, G. This lever is pivoted at *b'*, between the lugs *b*, and vibrates in a horizontal plane.

Its outer end is moved backward and forward during the operation of the machine, for the purpose of feeding the cutters up to their work and then withdrawing them again. On the opposite end of the mandrel *C'* to the chuck a hand-crank, H, is secured, by means of which the mandrel can be rotated while it is being moved up to its work. To the vertical end of the horizontal supporting-arm E a centering-plate, *g*, is secured by means of a bolt and binding-nut, the former of which passes through a vertical slot in said plate, as shown in Fig. 3, for the purpose of admitting of the adjustment of the plate for spokes of different sizes. An angular notch, *g'*, is cut in the plate *g*, which will always bring the spoke exactly in the center of the tenon-cutter or chuck-head D, if this plate *g* is properly adjusted with respect thereto. On the back edge of the notched centering-plate *g* a pressure-lever, J, is pivoted, which is curved in such manner that by bringing it over the spoke upon the notched end of plate *g* and pressing it down this spoke will be forced down in its place and held firmly during the operation of forming the tenon. Then, upon throwing up this lever J, another spoke can be adjusted in its place. The standard B passes through a vertical opening which is made through the beam A, and it is adjusted by means of a pinion-wheel, *h*, on a transverse rod, *j*, as shown in Figs. 1 and 5. That portion of the rod *j* which receives the pinion *h* is square and enters a corresponding square opening through the pinion, so that by turning this rod its pinion will act upon the rack *a* and move the standard, together with its arm E and attachments. The machine is secured rigidly to the beam A after it has been adjusted by means of a nut, *k*, which will cause a shoulder, *i*, on the rod *j* to force a plate, *l*, against the pinion *h*, and thus

prevent this pinion from turning. By loosening the nut *k*, and thus relieving the pinion *h* the rod *j* can be rotated and the machine elevated or depressed.

If it is desirable to adapt the machine for boring fellies, it is only necessary to remove the hollow auger-chuck D, and substitute for it an auger-bit which may have a square shank, care being taken that it run perfectly true.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. Constructing the cutter or boring shaft *C'* with a circular rack, *e*, and arranging the toothed feed-lever G to gear with the said rack, substantially in the manner and for the purpose herein described.

2. The arrangement of the arm E on the vertically-adjustable standard B, said standard serving to adjust and support the cutter or boring shaft *C'*, and said arm being adapted for sustaining the holding and centering devices for the spoke in front of the cutter or borer, substantially as herein described.

3. The construction of the adjustable centering-plate *g*, with a notch in its upper end to receive the spokes, in combination with the pressure-lever J, said parts being arranged in front of a rotary tenon-cutter, substantially as described.

4. The arrangement of the rod *j*, having a shoulder, *i*, formed on it, the binding-plate *l*, and nut *k*, in combination with the rack *a* and pinion *h*, in the manner and for the purpose herein described.

5. The construction of the frame of a spoke-tenoning machine with a slotted standard, B, a slotted tubular bearing, C, and an arm, E, substantially as described.

L. A. DOLE.

Witnesses:

WM. H. GARRIGUES,  
EDWARD W. FAUCETT.