

J. L. BROWN.  
Spoke Dressing Machine.  
No. 201,592. Patented March 26, 1878.

FIG. 1.

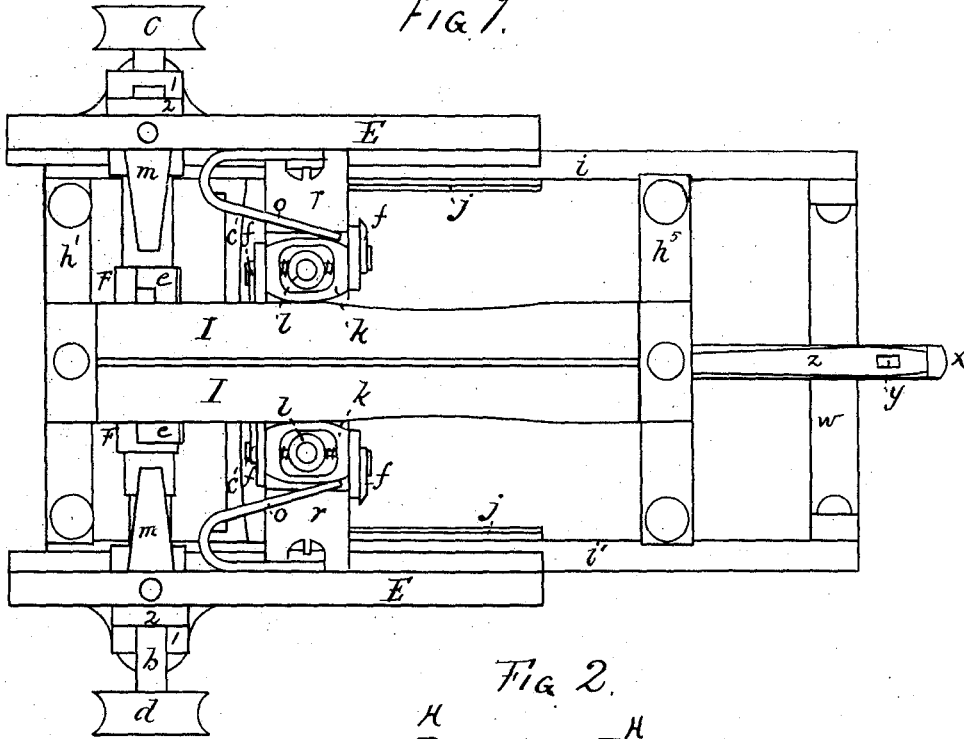
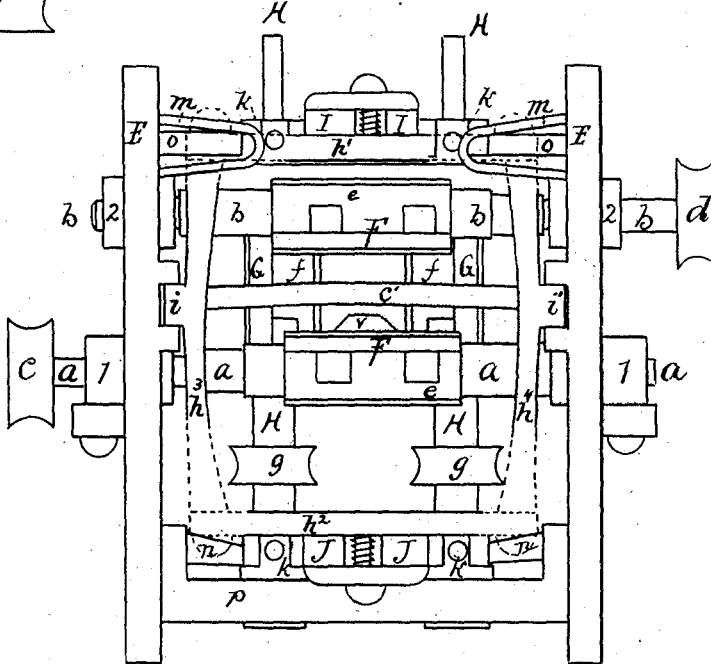


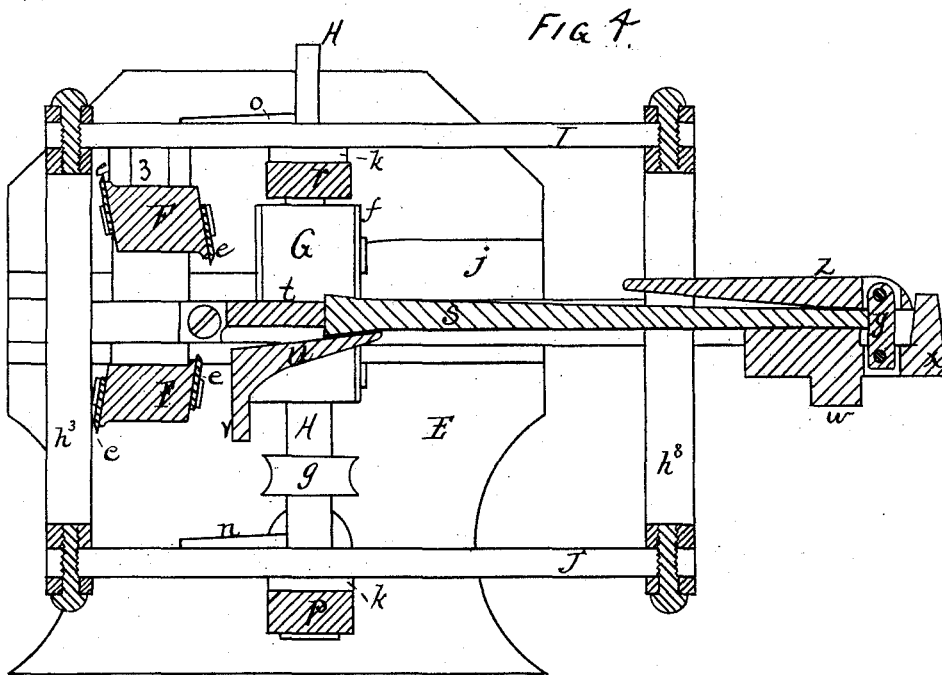
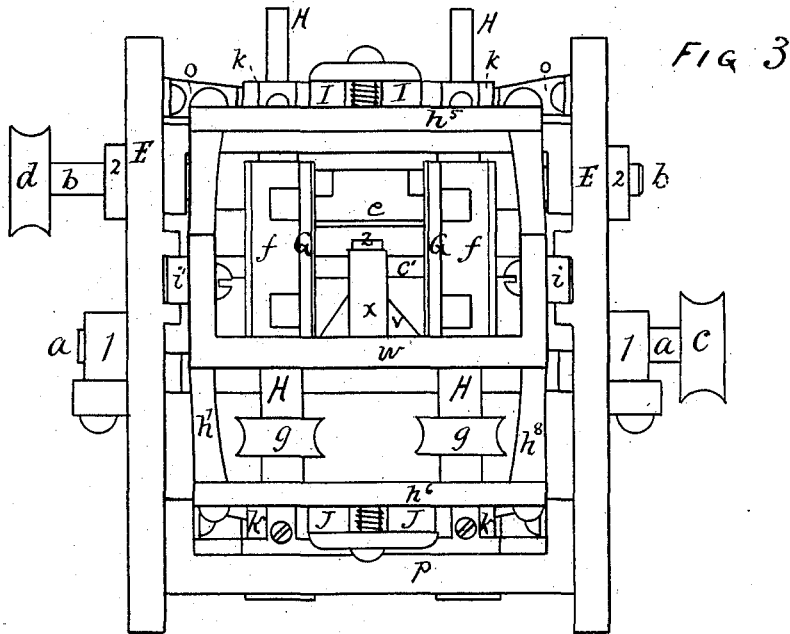
FIG. 2.



WITNESSES.  
Samuel D. Kelley,  
George B. Haskell

INVENTOR.  
Jacob L. Brown  
By Porter & Hutchinson  
Attys

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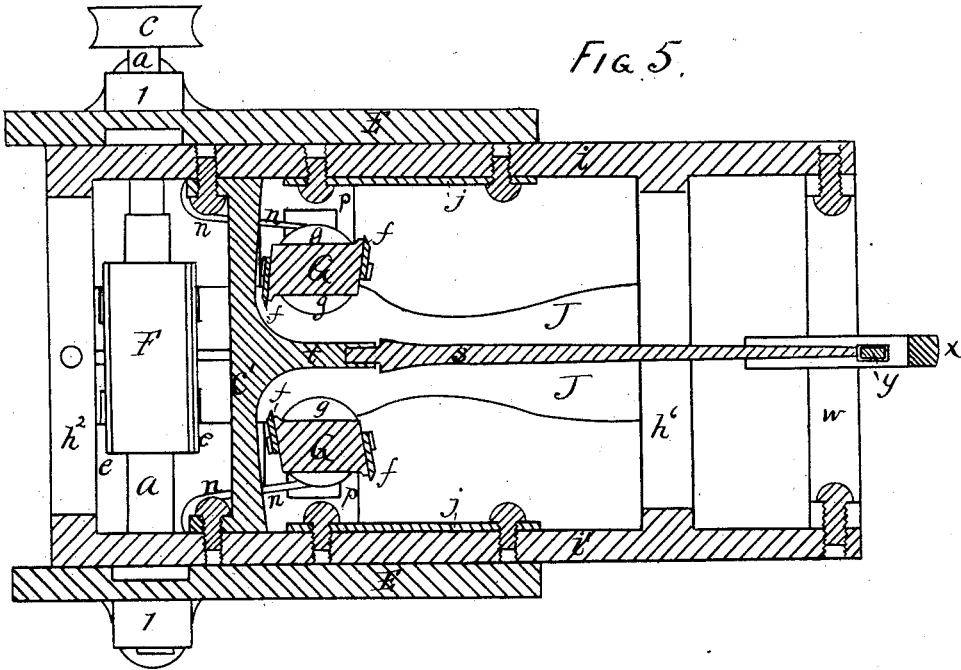


Fig. 5.

Fig. 6.

Fig. 7.

Fig. 8.

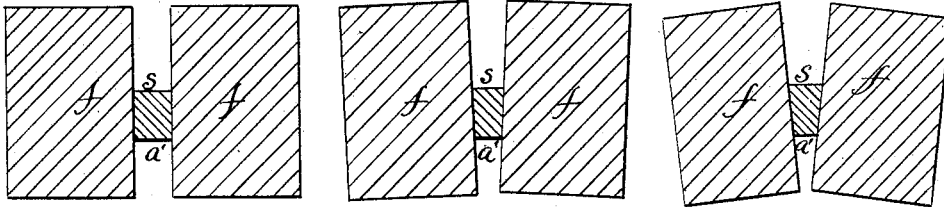


Fig. 9.

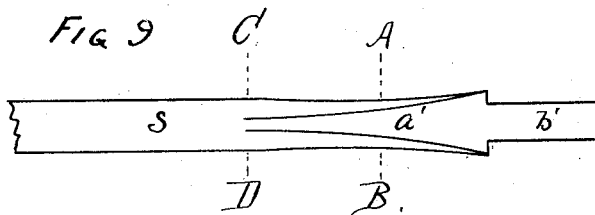
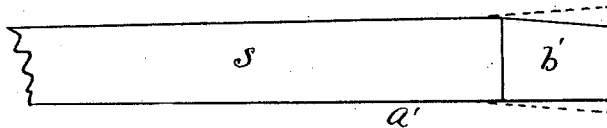


Fig. 10.



WITNESSES:  
 Samuel D. Kelley,  
 George B. Haskell

INVENTOR,  
 Jacob L. Brown  
 By Peter F. Hutchinson  
 Atty

# UNITED STATES PATENT OFFICE.

JACOB L. BROWN, OF AMESBURY, MASSACHUSETTS, ASSIGNOR TO RICHARD F. BRIGGS, OF SAME PLACE.

## IMPROVEMENT IN SPOKE-DRESSING MACHINES.

Specification forming part of Letters Patent No. 201,592, dated March 26, 1878; application filed December 22, 1877.

### *To all whom it may concern:*

Be it known that I, JACOB L. BROWN, of Amesbury, in the county of Essex and State of Massachusetts, have invented a new and useful or Improved Machine for Dressing the Tenons and Forming the Face of Carriage-Spokes, of which invention the following is a specification:

This invention has for its object, first, to reduce the tenon in its width to the exact form it should possess for driving into the mortise in the hub; and, second, to outline or dress the face of the spoke to the exact contour of outline which it should possess, so that each spoke in the set shall be an exact duplicate of every other such spoke.

The invention consists in a machine embodying a pair of horizontal rotary cutters, one of which is automatically adjustable relatively to the other, and both so arranged that as the spoke passes between them the fixed cutter shall cut away the surplus of the tenon-edge at the front of the spoke, while the adjustable cutter cuts away the surplus material of the back of the spoke-tenon, so as to give it the requisite draft or taper for "setting" in the hub.

It also consists in a pair of vertical rotary cutters, the boxes in which both the upper and lower ends of the arbors of said cutters are journaled, being laterally adjustable, so that said cutters may be moved apart or toward each other, either in parallel lines, or may be wider apart at bottom or top, as may be desired, when trimming and outlining the face of the spoke, which is the result effected by these cutters.

It further consists in a frame arranged to be reciprocated horizontally in fixed ways transversely to the axial line of the cutters, said frame having affixed to it adjustable shaping-guides, which vertically adjust the upper horizontal cutter, so that it cuts the back edge of the spoke-tenon at the required angle or taper, as before specified. Said frame also carries upper and lower shaping bars or guides, which respectively and independently adjust the upper and lower ends of the arbors of the vertical cutters, and thereby determine the outline and form of the spoke-

face cut by said cutters, as before stated, such frame being also provided with devices for centering and holding the spokes in position when being operated on by the cutters, as before stated.

In the drawings, Figure 1 is a top or plan view of the machine. Fig. 2 is an end view as taken at the left of Figs. 1, 4, and 5. Fig. 3 is an end view as taken at the right of said Figs. 1, 4, and 5. Fig. 4 is a longitudinal vertical section as taken through the axial line of the spoke when in position to be acted upon in and by the machine. Fig. 5 is a horizontal section taken through the machine in the axial line of the spoke when in position to be acted on. Fig. 6 is an enlarged section, showing the spoke near its tenon-shoulder in transverse section, and the vertical cutters in longitudinal section. Fig. 7 is a section similar to Fig. 6, but taken on line A B, Fig. 9. Fig. 8 is a section similar to Fig. 6, but taken on line C D, Fig. 9. Fig. 9 is a front view of a portion of a spoke, and showing the face thereof. Fig. 10 is a side view of the same portion of a spoke.

In these figures, E E represent the side frames, which are preferably formed of cast-iron, and in such form as will subserve the purpose of securing and sustaining the other constituent parts in their proper positions. *a* is the arbor of the lower horizontal cutter. This arbor is journaled in boxes 1 1, which are secured in side frames E, as shown. *b b* represent the arbor of the upper horizontal cutter. This arbor is journaled in boxes 2 2, also secured in frames E. These arbors are respectively rotated by a belt acting on the pulleys *c d*, secured upon the shafts, as shown. F F are the respective cutter-heads of arbors *a b*, and the cutters *eee e* are secured on these heads in the usual manner, as shown. The boxes 2 2 of the upper arbor are provided with vertical adjustment, (by means to be described,) and the space 3 (shown in Fig. 4) indicates a passage in frames E for such movement of these boxes. H H are two vertical arbors, which are rotated by means of belts acting on pulleys *g g*, respectively secured on these arbors. The heads G G, respectively secured upon or formed with these arbors, are

provided with cutters *ffff*, as shown. Both the upper and lower ends of these cutters or arbors are journaled in boxes *ll*, which are pivoted in laterally-sliding holders *k k*, as shown in Fig. 1, these holders being arranged to slide in longitudinal passages in the bars *p r*, in the former of which the lower and in the latter the upper holders slide when they are so laterally adjusted by the means to be described. *h<sup>1</sup> h<sup>2</sup> h<sup>3</sup> h<sup>4</sup>* constitute the end of the said sliding frame, as shown in Fig. 2. *h<sup>5</sup> h<sup>6</sup> h<sup>7</sup> h<sup>8</sup>* constitute the opposite end of said frame, as shown in Fig. 3. To the vertical members of these ends, on each side, is connected one of the guide-bars *i* and *i'*, which slide between ways upon frames *E E*, plainly shown in said Figs. 2 and 3.

To the top members *h<sup>1</sup>* and *h<sup>5</sup>* of these ends are secured the shaping-bars *I I*, the outer edges of which are in contact with the sliding holders *k k*, in which the upper boxes of the vertical arbors *H* are pivoted. To the lower members *h<sup>2</sup>* and *h<sup>6</sup>* of said ends are secured the shaping-bars *J J*, which act between the lower holders *k k* of the vertical shafts in the same manner as the bars *I I* act upon the upper holders. Two bow-springs, *n n*, acting at one of their ends against the lower holders *k k*, serve to keep them in contact with bars *J J*, while similar springs *o o* serve to keep the upper holders in contact with bars *I I* as the same are slid backward and forward by the sliding frame.

It will be observed that the outer edges of the two bars *J* are formed alike, and with an irregularly-curved outline, and the same is true of bars *I*; but the two pairs are unlike in their curve; hence, as the frame is slid back and forth, the vertical cutters will not only be varied in their distance apart, but while they will be parallel at starting, they will be oblique to each other in varying degrees as the frame advances, in order to give to the spoke-face the form to be described.

In Figs. 4 and 5, *t* represents a short arm, supported by bar *c'*, which is connected with the sliding frame, as shown in Fig. 5. This arm receives the spoke-tenon *b<sup>1</sup>* in a recess fitted to hold it firmly while being dressed by the cutters. *u* is the adjusting-finger, which is supported by the transverse bar *v*, secured to sides *E*, and is so adjusted vertically that when the face *a'* of the spoke rests upon it, (as the spoke is seated in the holder *t*), it (the spoke) shall be in the proper position relatively to the lower horizontal cutter, so that said cutter shall dress the edge of the tenon to an exact prolongation of such face-line of the spoke. When the tenon of the spoke is thus seated in arm *t*, the opposite or top end of the spoke is laid in a holding-block formed or secured upon transverse bar *w*, as shown, and the spoke is held firmly in position by brake *z*, which is pivoted to the link *y*, pivoted in a projection of bar *w*. The rear end of this brake bears against a rigid projection, *x*, which thereby prevents end motion of the spoke

when being acted upon by the cutters, and by this means the otherwise necessary direct end support of the spoke when being dressed is avoided, as the brake is held in position by the projection *x*, and thereby prevents end motion of the spoke.

The upper horizontal cutter is adjusted automatically to cut the back edge of the tenon by the guides *j j*, which are secured to the side bars *i i'* of the traveling frame, so that they pass under the shaft or boxes of this cutter coincident with the cutting action upon the tenon, and thereby cause the cutter to impart to the tenon a taper corresponding to the upper edges of such slides.

It may be proper to observe that the "spoke-lathe," in which the spokes are first formed, does not and cannot finish either the edges of the tenon or the face of the spoke to the exact form required, the surplus material of the tenon being shown by the dotted lines in Fig. 10, and the contour of the finished "face" being shown in Figs. 6 to 10.

By the proper forms of bars *I J* the vertical cutters are parallel with each other when the spoke enters between them, and therefore the body of the spoke at the shoulder will be cut in parallel lines, as shown in Fig. 6; but by the relative curves of the upper and lower shaping-bars the lower ends of these cutters will approach each other more rapidly than the upper ends, or while the lower ends thus approach the upper ends may recede from each other, and hence the face of the spoke can and will be cut in both a curved and constantly-converging direction, as shown in Fig. 9, and the body of the spoke may be, as shown, diminished from the shoulder upward for a short distance, in order to give it that appearance of lightness which is desirable.

By varying the configuration of the shaping-bars, any desired curve of face may be imparted to the spoke, and by reason of the independent action of both the upper and lower ends of the vertical arbors any desired curves of a simple or compound nature may be cut, either in connection with or independent of the horizontal cutters.

The spoke-carrying frame may be moved back and forth, either by hand or by a rack and pinion operated by a crank on the pinion-shaft, or by any other means operated by hand or power.

I claim as my invention—

1. In combination with the fixed and vertically-adjustable parallel rotary cutters, the carrying-frame, as provided with the forked spoke-tenon holder *t*, the brake *z*, and the shaping-guides *j j*, for adjusting the upper roller to the required form of the spoke-tenon, substantially as described and shown.

2. In combination with the spoke-carrying frame provided with its adjusting-bars *I J*, the laterally-adjustable vertical cutters, substantially as described and shown.

3. In combination with suitable adjusting devices, constructed substantially as described,

two rotary cutters, each provided with and susceptible of adjustment at either end independent of the other end of such cutter-bar, or of the other cutter, substantially as described and shown.

4. In a spoke-dressing machine, and in combination with the spoke-carrying frame, the forked spoke-tenon holder *t* and the vertically-adjusting finger *w*, substantially as described and shown.

5. The combination of the fixed and adjustable horizontal cutters, the independently-adjustable vertical cutters, and the spoke-carrying frame provided with the adjusting-guides I I and J J, substantially as described and shown.

JACOB L. BROWN.

Witnesses:

GEORGE H. BRIGGS,  
JOSEPH T. CLARKSON.