(No Model.)

G. H. A. HACKSTADT.

SPOKE TENONING MACHINE.

No. 282,515. Patented Aug. 7, 1883.

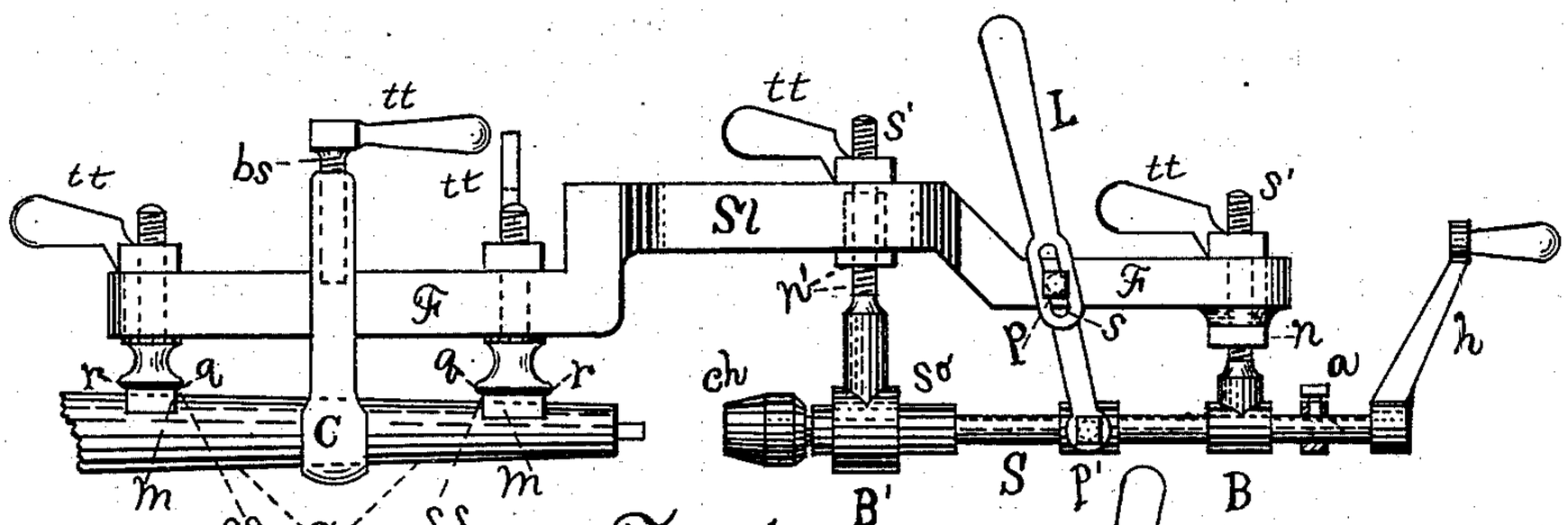

Fig. 1.

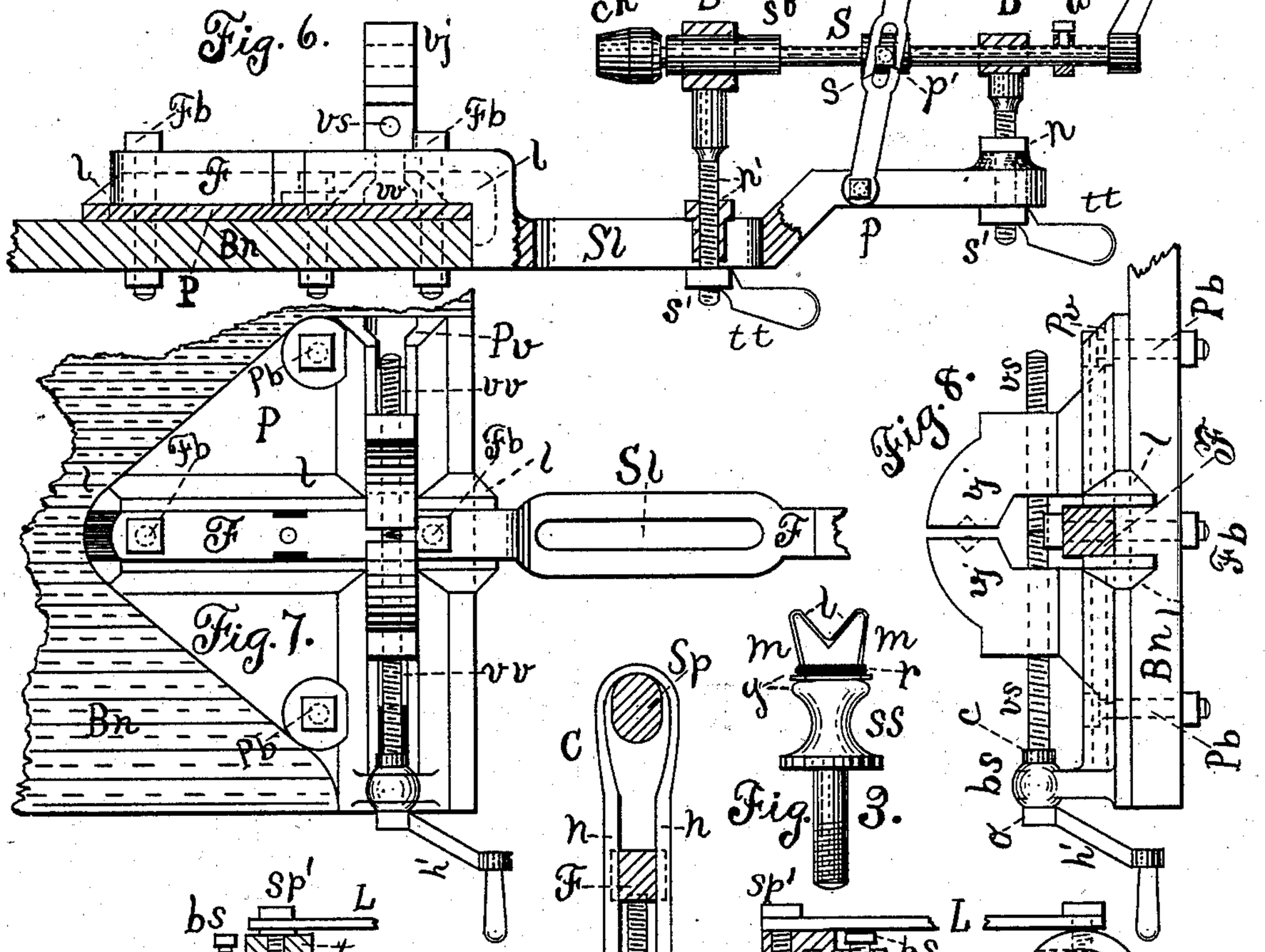

Fig. 6.

Fig. 7.

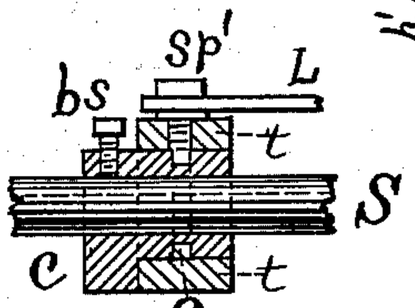

Fig. 4.

Fig. 2.

Fig. 3.

Fig. 5.

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GEORGE HENRY A. HACKSTADT, OF LUDLOW, KENTUCKY.

SPOKE-TENONING MACHINE.

SPECIFICATION forming part of Letters Patent No. 282,515, dated August 7, 1883.

Application filed July 28, 1882. (No model.)

To all whom it may concern:

Be it known that I, GEORGE HENRY A. HACKSTADT, a citizen of the United States, residing at Ludlow, in the county of Kenton and State of Kentucky, have invented a new and useful Spoke-Tenoning Machine, of which the following is a specification.

My invention relates to that class of spoke-tenoning machines which are used in small or repair shops, and which, when being used, are attached to a single spoke of the wheel.

The object of my invention is to improve such a spoke-tenoning machine so that it will be better adapted to the wants of the wheelwright, by enabling him to use not only the various sized hollow augers which may be sold along with this machine, but also any hollow augers which he may already have or prefer which are or can be used in spoke-tenoning machines; also, by so constructing this spoke-tenoning machine and a bench-vise relative to each other that the tenoning-machine, when combined with and attached to said vise, may furnish the wheelwright with a machine which may serve various other purposes for which additional machines might be required—as, for instance, drilling, boring, cutting threads, tapping, &c.; and since the said spoke-tenoning machine and the vise may be used for their separate purposes at the same time such a combined tool would be very desirable in small or repair shops.

In the drawings, Figure 1 shows my spoke-tenoning machine in position attached to a spoke, as when it is used for tenoning spokes. Fig. 2 shows the clamp C, used for securing the device to a spoke. Fig. 3 shows an end view of one of the spoke-standards *ss*. Figs. 4 and 5 show two different methods of attaching the hand feed-lever L to the hollow auger-shaft S. Fig. 6 shows the spoke-tenoning machine attached to the bench-vise as it is to be when to be used for such additional purposes as mentioned. Fig. 7 shows a plan of the bench-vise and a part of the spoke-tenoning machine as attached thereto. Fig. 8 shows an end view of the vise and a section of the frame F. Figs. 6, 7, and 8 show how the said devices are attached to each other and to the bench.

In Fig. 1, F is the main supporting-frame of the machine. One end of frame F carries two standards, *ss ss*, which are attached thereto by means of nuts, and which have bearings at their ends for a spoke, S*p*. The holes in frame F for said standards are not tapped, since, if they were, the threads would be injured in bolting the frame to the bench-vise, and hence threads are not cut on that part of the standards *ss ss* which is within frame F. By referring to Fig. 3 also it can be seen that the bearing ends *m* of said standards have V-shaped bearing-surfaces for the spokes, and sides tapered from the extremities of a standard inward to an abrupt shoulder, *q*. Said metal V-bearings may be placed in contact with the spoke; or, as I think better, pieces of leather or rubber can be pressed over and into these V-bearings and lapped down upon the sloped sides *m*, and secured by means of bands or rings *r*, driven down over the leather or rubber to a tight position adjacent the abrupt shoulder *q*, and hence present a bearing-surface to the spoke that will not abrade or disfigure it. I may also make a groove around two or all of the sides of a standard adjacent shoulder, *q*, and beneath the ring *r*, so that the leather, which is soaked before putting in place, or the rubber, may be pressed into said groove and may be more securely held in position. Leather or rubber may be put around and be sewed or otherwise attached to clamp C for the same purpose. The standards *ss ss* can be adjusted vertically by means of washers and tail-nuts *tt tt*. Intermediate between said spoke-standards the sides of frame F are provided with rectangular gaps for the reception of the branches *n n* of a clamp, C, which, in connection with the spoke-standards *ss ss*, serves to bind the frame F to the spoke, and said branches, after straddling F, unite above it in a boss, *cn*, which is tapped, and forms a nut for a binding-screw, *bs*, provided with a tail-nut, *tt*, which is used for tightening or loosening the clamp when the machine is attached to or loosened from a spoke. To the other end of frame F are attached adjustable standards provided with bearings B B′ for the hollow auger-shaft S. Said shaft is cylindrical, and the shank of a hollow auger or a socket-piece, *so*, for an auger or for a chuck, as *ch*, may be attached to its inner end, as indicated, and a journal be provided upon such auger-shank, socket-piece, or chuck such as will fit in the

bearing B′, and when required different-sized bearings B′, having standards with screws *s′*, may be used. A collar-stop, *a*, serves to regulate the length of tenon cut. To the shaft there is attached a handle, *h*. The shaft-standard at the end of frame F is adjustable in the direction of its length only, and is secured in position by a nut, *n*, below frame F, and by a tail-nut, *tt*, above it. The middle portion of frame F is bent, as shown, and has a longitudinal slot, S*l*, in which a thimble-nut, *n′*, projects and along which it can be adjusted, and through said nut *n′* passes the screw *s′* of the standard-supporting bearing B′, and by means of this nut *n′* and the tail-nut *tt* said standard is secured to frame F. By means of slot S*l*, the thimble *h′*, and tail-nut *tt* bearing B′ may not only be adjusted in the direction of the length of its standard, but also in the direction of the length of frame F. A hand-lever, L, is attached at one end by a screw-pin, *p′*, to a collar on shaft S, and has a longitudinal slot, *s*, for a fulcrum-pin, *p*, which is screwed into frame F, and I may place slot *s* at the end of lever L instead of at the middle, as shown. One method of attaching lever L to shaft S, so as not to interfere with the rotation of said shaft, is shown in Fig. 4, and another in Fig. 5.

In Fig. 4 a sleeve having a collar, *c*, is attached at any desirable point on the shaft by means of the binding-screw *bs*. This sleeve has a groove, *g*, cut around it, and a thimble which fits on this sleeve has a screw-pin, *p′*, which passes through it and into the groove *g* of the sleeve, and the other end of which serves as a pin, to which is attached the end of the lever L. In Fig. 5 a sleeve, S*l*, is similarly attached to shaft S by means of binding-screw *bs*. This sleeve has a groove, *g*, around it, and a second sleeve, *sv*, is slotted from the side, so that when sleeve *sl* is inserted sidewise into sleeve *sv* and shaft S is passed through both, the partial circular inward projection of *sv* being then within groove *g* of *sl*, said projection will prevent an endwise movement of *sv*, while sleeve *sl* and shaft S will be free to rotate within it. The lever L is then attached to sleeve *sv* by means of a screw-pin, *p′*.

Now, when it is desired to attach the machine just described to a bench-vise, the spoke-standards *ss ss* are removed and the machine is turned bottom side up, as shown in Fig. 6, and if desired pins *p* and *p′* may be loosened and the lever L turned end for end, so as to be more convenient to use. It is preferable to fasten the vise to the right end and corner of the bench, so that the machine may project from the work-bench in the direction of its length, as shown in Figs. 6, 7, and 8.

The bench-plate P, which is secured to bench B*n* by bolts P*b*, is so made that the fastening end of frame F fits upon said plate and between lugs *l l l* thereof, and can be firmly secured in place by means of two bolts, F*b*, which pass through the same holes in said frame that the spoke-standards formerly did, and through the vise-plate and bench, and consequently secure the whole device firmly to the bench.

The vise-jaws *vj* have V-bearing bases which slide in V-grooves formed by the lugs P*v* P*v* of the vise-plate, and at right angles to the center line of shaft S, and a boss, *bs*, is cast to the vise-plate in the line of said grooves, in which rotates a right and left screw, *vs*, which passes through the vise-jaws and serves, when rotated by means of handle *h′*, to open or close the vise. The screw is prevented from moving endwise by means of collar *c* and handle-boss *o*. The faces of the jaws may be parallel vertically, and may be continuous, or may have angular or other shaped notches cut in them, as indicated by the dotted lines; or special known clamping devices may be placed upon and between the jaws for holding round or other shaped work.

The frame F is inserted endwise and beneath vise-screw *vs* into its position, and by giving it a wedging fit it may be driven tightly into position, so as to make the whole device more rigid. In fact, it could in a great measure be secured in position by making it and the groove through which it is driven dove-tailed in cross-section, so that for some purposes where this arrangement of the machine might be required for but a short time it would not be necessary to more securely fasten the frame by means of bolts, as P*b*.

Provision may be made for the adjustment of collar *c* and the boss of handle *h′* on end of vise-screw *sv*, so that the vise-jaws may come together at the center line of shaft S; also, common nuts may, of course, be used instead of tail-nuts *tt*.

I employed a patent expert to examine the state of the art, and find that various devices have been invented and patented embodying certain features found in my improved spoke-tenoning machine. Said features are embodied in a patent for spoke-tenoning machines, granted to John McCune, June 26, 1847; for spoke-tenoning machines, to R. W. Eaton, February 26, 1878, No. 200,649; for spoke-tenoning machines, to T. Connor, February 10, 1880, No. 224,393, and for spoke-tenoning machines, to C. B. Holmes, April 25, 1882, No. 256,897; for a boring and tenoning machine, No. 12,776, granted May 1, 1855; for a machine for tenoning spokes, to J. G. Peace, February 1, 1876, No. 173,052; for spokes and fellies, machine for tenoning and boring, to E. Goss, August 21, 1877, No. 194,300; a spoke-tenoning and felly-boring machine, to H. S. Barnes and J. I. Miller, February 26, 1878, No. 200,598. I therefore disclaim any individual part of or any combination found in any of said patents, for I find "certain combinations existing up to certain points" in said patents as the combination of a supporting-frame with two standards, provided with bearings for a hollow auger-shaft,

which is rotated by means of a handle, and where said standards are adjustable in the direction of their lengths; but

What I do claim as new, and desire to secure by Letters Patent in a spoke-tenoning machine, is—

1. As a means of adjusting the bearing B′ of the hollow auger-shaft, not only in the direction of the length of the standard of bearing B′, but also in the direction of the length of the hollow auger-shaft S, the device consisting of the threaded standard *s′*, slot-nut *n′*, and nut *tt*, in combination with the slotted frame F, substantially as set forth.

2. The removable standards *ss ss*, each being provided with a V-bearing for the spoke, and having the construction shown and described for the use of a leather or rubber bearing-cover, and provided with such cover, in combination with a suitable frame, F, provided with a clamp, C, whose branches *n n* slide in grooves of frame F, all substantially as described.

3. The clamp C, having the two branches *n n* so constructed as to slide in grooves in the sides of frame F, in combination with removable standards and the spoke end of the frame of the spoke-tenoning machine.

4. The spoke-tenoning-machine frame having its bearing-sides shaped to fit into a groove provided for it in the base-plate of a bench-vise, and having the construction suitable for the attachments of the spoke end, substantially as described, in combination with the bench-vise having a groove between the lugs of the base-plate, and provided with holes corresponding to those in the spoke end of frame F for bolts, as F*b*.

5. The combination of a bench-vise having a groove in its base-plate for holding the spoke end of a spoke-tenoning-machine frame, and having the bases of the vise-jaws and the parts connected therewith so constructed as to permit the spoke end of the frame of the tenoning-machine to pass under the vise-jaws and into the said groove, and having holes in the base-plate for bolts, as F*b*, in combination with the frame of the spoke-tenoning machine, all substantially as set forth.

6. The combination, with the frame F, of a spoke-tenoning machine having a longitudinal slot, S*l*, and provided with a standard and bearing, B, constructed substantially as set forth, and a second bearing, B′, of a device consisting of the threaded standard of bearing B′, the slot-nut *n′*, and nut *tt*, the latter device being intended as a means of adjusting the bearing B′, as set forth, and the bearings B and B′ being provided for the shaft of a hollow auger or cutter, all substantially as set forth.

7. The combination, in a spoke-tenoning machine having bearings B and B′ for the shaft of a hollow auger or cutter and an adjusting device for the bearing B′, consisting, essentially, of the threaded standard, the slot-nut *n′*, and the nut *tt*, of the slotted lever L, with the frame F, and by means of the sleeve and the parts connected therewith on the shaft of the hollow auger, with the said shaft, as set forth.

8. The combination, with the frame F of a spoke-tenoning machine having the construction substantially as shown and described, for attaching to it the standards for the bearings of a hollow auger-shaft, and the standards and clamp for securing the machine to a spoke, of the device for supporting and guiding the shaft of a hollow auger or cutter, and consisting of the combination of the bearings B and B′ with their standards and means of adjustment, as set forth, and the slotted lever L, and of the removable standards and clamp C, for attaching the machine to a spoke, and having the construction substantially as set forth.

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