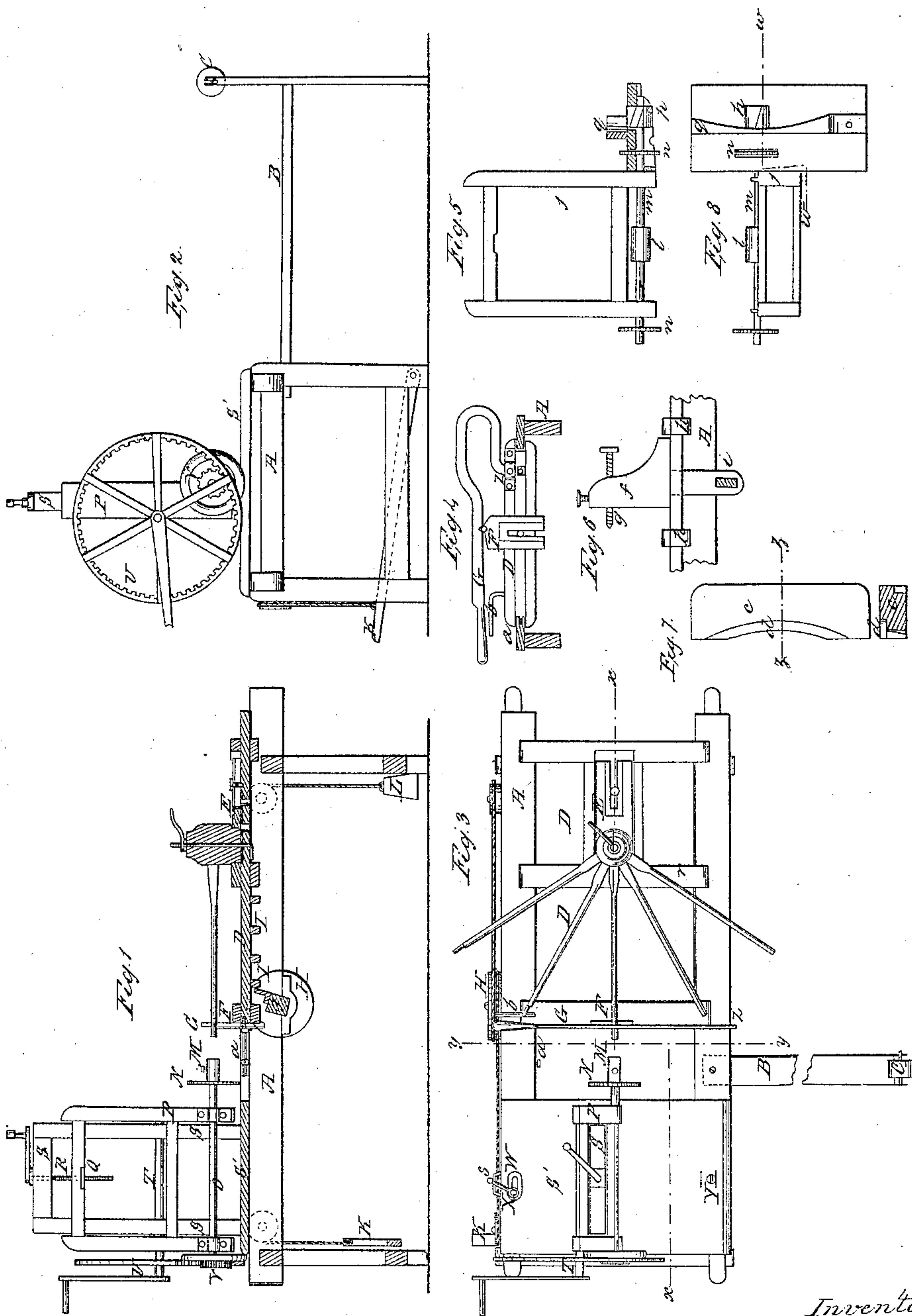


# J. Lefeber, Tenoning Spokes.

N<sup>o</sup> 57,736.

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Witnesses

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# UNITED STATES PATENT OFFICE.

JAMES LEFEBER, OF CAMBRIDGE CITY, INDIANA.

## IMPROVEMENT IN MACHINES FOR TENONING SPOKES.

Specification forming part of Letters Patent No. 57,736, dated September 4, 1866.

*To all whom it may concern:*

Be it known that I, JAMES LEFEBER, of Cambridge City, Wayne county, and State of Indiana, have invented a new and useful Improvement in Machines for Boring and Tenoning; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a longitudinal section of the frame of my machine in vertical planes on the bent line *x* in Fig. 3. Fig. 2 is an end view, looking toward the crank. Fig. 3 is a plan. Fig. 4 is a cross-section, on the line *y* of Fig. 3, the lower part of the frame of the machine being removed from the view. Fig. 5 is a detailed side view of a detachable power-frame, J. Fig. 6 is a detailed view of the detachable head-blocks *f*. Fig. 7 is a detailed view of the head-block. Fig. 8 is a plan of the detachable power-frame.

Similar letters of reference indicate like parts.

This invention consists in a combined boring and tenoning machine, adapted especially for the manufacture of wheels of carriages and other vehicles. It is also calculated for finishing or completing the wheel thereon, so that it need not be removed until it is finished. The felloes can be doweled thereon by placing a doweeling-table on the machine.

A designates the frame of the machine. A supplementary frame, B, hinged to its side, as seen in Figs. 2 and 3, carries a pulley, C, whose object is to carry the usual sand-belt for polishing and dressing the work. When the said belt (which is not shown in this application) is not being used, the frame B is swung around against the main frame, and when it is in use it is brought out at right angles with the main frame, so that a belt from its pulley C may be run over a pulley on a mandrel or shaft, which may occupy the place of the mandrel O, Fig. 1.

The right-hand end of the main frame is open on top, and its sides form ways which support the sliding carriage D that carries the wheel to be made. The hub of the wheel is locked to the carriage D by means of an an-

gle-iron whose upper part goes through the hub and is secured by a nut and washer. The hub is also clamped by a sliding block, E, which is fitted to move lengthwise of the carriage D, and which can be secured by a set-screw.

The block E serves to hold the hub firmly against the cross-piece *r* of the carriage and, by being movable, allows hubs of different sizes to be secured on the carriage.

The spokes of the wheel, when tenons are being formed on their ends, and when they are being sawed to the right length, lie on a rest, F, which is made adjustable in height, as seen in Fig. 4, being held by a set-screw in or against the front end of the carriage.

The transverse lever G is pivoted at Z on one side at the front of the carriage in line with the rest, being adjustable in height, as seen in Fig. 4. This lever extends across the carriage and is brought down upon the spoke above the rest F, both the lever and the rest having indentations made in them, which receive the upper and lower sides of the spoke, and being thereby enabled to hold it firmly. When the lever is brought down on the spoke the hold-fast *b* is turned over it and held there until the tenon is made.

The carriage D is brought up to the hollow auger by means of a cog on a transverse shaft, J, which extends beneath the carriage, and whose ends are sustained in the sides of the frame A, one of its ends having a double-grooved pulley, H, fixed on it. The cog of the shaft engages the teeth of a ratchet, I, made on the under side of the carriage, and by means of the revolution of the shaft causes the carriage to advance or recede on the frame, the revolution of the shaft in one direction being effected by the treadle K, a cord or chain from which goes round the pulley H, and in the other, in order to restore the shaft to its previous position, by a weight, L, a cord from which also goes around the pulley, but in the contrary direction to that from the treadle.

The saw for cutting off the spokes to a proper length, and the chuck for holding the hollow auger, are supported and operated in the left-hand end of the frame A in a movable frame, P, which is moved vertically to suit the work by means of a screw, K, in the top



of the stationary frame S, working through the plate or nut Q in the top of the movable frame P.

The stationary frame S stands on a platform, S', which is fastened to the main frame by a set-screw, Y, on one side, and on the other side by a screw-bolt, X, which passes up from the main frame through a slot, W, in the platform S', and receives a nut, s.

It will be observed from this construction that the platform S' can be swung on the main frame around the set-screw Y, as a pivot, and that its frame S and the movable frame P, which the latter carries, can thereby be set in angular directions with regard to the main frame.

The frame S and platform S' can be removed from the main frame at pleasure and another frame fastened in its place.

The movable frame P is so made as to enable the work of sawing and tenoning to be done by hand, a crank-wheel, U, and shaft T being placed on it, such crank-wheel having cogs on its inner circumference, which engage a gear-wheel, V, formed on the end of a shaft, O, which is also carried in the frame P. The shaft O extends toward the right beyond the end of frame P, and carries a circular saw, N, and also a chuck, M, which receives a hollow auger for making the tenons on the spokes.

In order to use the saw after the tenons are formed, the frame P is raised by means of the screw K, so as to bring the auger-chuck M high enough to allow the spokes that are to be sawed off to pass beneath it, when the carriage D is moved forward and the spokes are brought before the saw N.

The extent of motion allowed to the carriage is governed by a sliding stop, a, that slides on a rod set in a recess in one of the inner sides of the frame A, and which is so set as to arrest the forward motion of the carriage at any desired point. When the carriage is brought forward in order to saw off the ends of the spokes, the stop a is moved forward on its rod as far as it will go, so as to let the carriage move the right distance to bring the spoke opposite the saw. The nut s is then turned loose and the platform S' is swung on its pivot Y toward the right, (observing Fig. 3,) so as to bring the saw N to a diagonal position, where its front edge will be nearer the center of the hub than the center of the saw will be, whence it will result that the end of the spoke will be cut off at an angle and will be able, when the wheel is turned on its carriage, to pass the side of the saw and enable the operator to bring a fresh spoke against the saw. After the spokes are cut off to the proper length the carriage D is run back and the frame P is lowered until the auger-chuck is brought in the same plane with the center or axis of the spoke which is before it. The stop a is then moved to suit the length of the tenon to be made on the spokes, and the front of the carriage D is brought up to the stop, so that all the spokes may have tenons of the

same length. When the spokes have all received their tenons the carriage D is run still farther back to enable the operator to place the felly-carriage c on the ways of frame A in front of wheel-carriage D. This felly-carriage is shown in Fig. 7, both in plan and in cross-section. It is curved and rabbeted to enable it to receive a felly and hold it while being mortised to receive the spokes.

The frame J (shown in Fig. 5) is provided with a pulley, so that power from a belt can be applied to drive the shaft m, which shaft carries two saws, n n, at opposite ends of the frame, and also a rotary planer, p, working through a platform provided with a curved guide, g, suitable for guiding the fellies when they are planed or dressed. This frame J can be placed over the stationary frame S by first taking off the hand-power frame P, in order to which the screw K is first withdrawn; then the nut Q is removed from the top bars of frame P, when the latter frame can be lifted off the frame S and set aside, and the power-frame J put in its place. The frames P and J have double sides, so as to inclose the frame S when they are applied to the machine.

When it is desired to use a sand-belt, the supplementary frame B is swung out to the position seen in Figs. 2 and 3, and (the frame P being then on the machine) a pulley (not shown) is placed on the shaft O in place of the chuck N, and a sand-belt can be placed on pulley C and a pulley substituted in place of the chuck M.

I have also provided a head-block, f, for turning, which may also be applied to the frame A. This head-block is seen in Fig. 6. It has jaws h h on each side, to enable it to take hold of and slide on the ways of frame A, and is secured to the frame in any desired position by means of a key, i, which locks the foot of the head-block beneath the under side of the frame in a manner well known to mechanics. By placing the head-block in the frame and using the hand-power frame that carries the chuck M, I am enabled to do all kinds of drilling commonly done in smith-shops. The head-block is also used in turning, in connection with the chuck, the frame P being raised to the level of the center-pin, g, of the head-block, by means of the screw K.

The saw n, next to the planer p, is for sawing the fellies to the desired thickness. The chuck M holds the saw N firm on its mandrel or shaft, and said chuck is suited to receive all the other chucks and augers which are usually employed in shops for which this machine is intended. In operating the machine, when the frame P is placed thereon, the workman places his left hand on lever G and his left foot on treadle K and the right hand on the crank seen in Fig. 1.

The top or table of the frame of the machine may, if desired, be made adjustable vertically, so that it may be raised or lowered to suit different kinds of work.

The guide g on frame J may be straight in-



stead of curved, and other suitable forms may be used to suit the kind of work to be done—as, for instance, planing straight stuff, edging stuff, sawing to a thickness, rabbeting, plowing, and all kinds of work commonly done in wagon and carpenter shops.

The backward movement of the wheel-carriage may be limited by a stop similar to the stop which limits its forward movement.

What I claim as new, and desire to secure by Letters Patent, is—

1. Supporting the gear-frames P or J upon the movable frame S, and providing for their vertical adjustment thereon, substantially as described.

2. In combination, the movable frame S, the gear-frame P, and the carriage D, substantially as described.

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Witnesses:

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