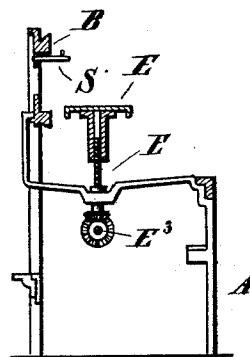
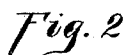


2 Sheets—Sheet 1.

No. 468,096.

Patented Feb. 2, 1892.



Inventor:

Charles H. Fuchs

By *Marsden & Co*
Attys..

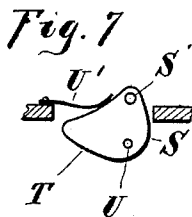
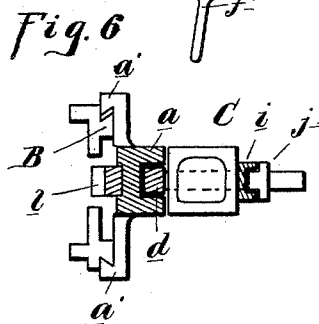
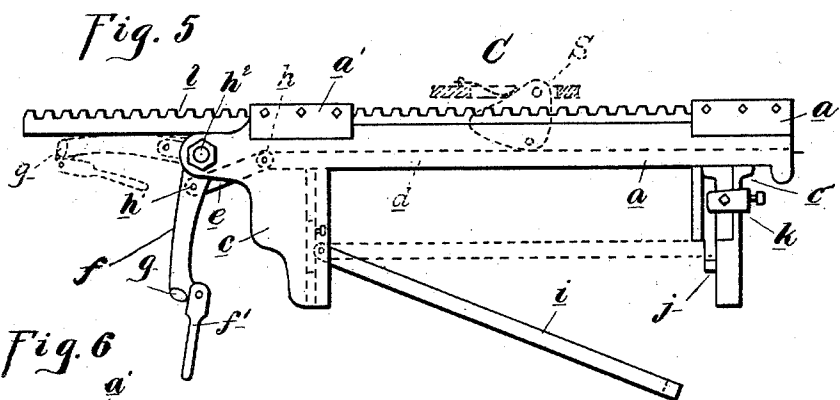
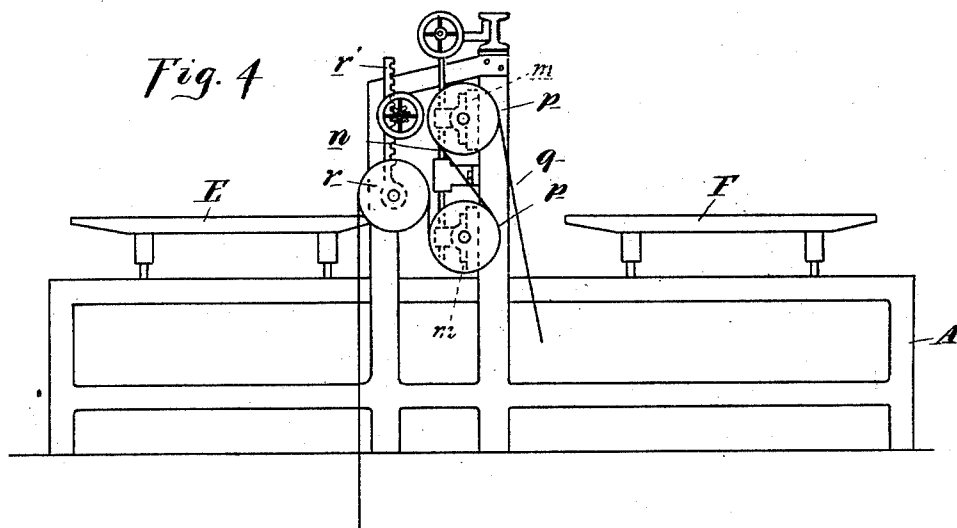
(No Model.)

2 Sheets—Sheet 2.

C. H. FUCHS.
BOX TENONING MACHINE.

No. 468,096.

Patented Feb. 2, 1892.



Witnesses:

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Inventor:

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UNITED STATES PATENT OFFICE.

CHARLES H. FUCHS, OF TIFFIN, OHIO.

BOX-TENONING MACHINE.

SPECIFICATION forming part of Letters Patent No. 468,096, dated February 2, 1892.

Application filed March 25, 1891. Serial No. 386,393. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. FUCHS, a citizen of the United States, residing at Tiffin, in the county of Seneca and State of Ohio, have invented certain new and useful Improvements in Box-Tenoning Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to new and useful improvements in tenoning-machines; and it consists in the peculiar construction of the means for clamping the boards to be tenoned and in feeding them to the cutters; further, in the peculiar construction of the feed-tables and the means for adjusting the same; further, in the peculiar construction of the clamping devices for the work, whereby when the work is performed by the cutters the clamps are automatically disconnected, and, further, in the peculiar construction, arrangement, and combination of the various parts, all as more fully hereinafter described.

In the drawings, Figure 1 is a section of my machine on line *x x* in Fig. 2. Fig. 2 is a sectional elevation thereof upon line *y y*, Fig. 1. Fig. 3 is a cross-section through the frame only on line *y y*. Fig. 4 is a side elevation in diagram corresponding to the section of Fig. 1 with some of the parts omitted. Fig. 5 is a detached plan of the feed-slide. Fig. 6 is a cross-section thereof. Fig. 7 is a detail of the deflecting-plate.

A is a suitable supporting-frame, on one side of which is formed the horizontal guides B. Upon these guides the feed-slide C has a horizontal movement, which carries the work between two revolving cutters D. The feed-slide consists of the frame *a*, which is provided with the grooved guides *a'*, which engage with the guides B, and with the stationary clamping-jaws *c* at one end and at the other end a sliding clamping-jaw *c'*. This sliding clamping-jaw is carried by a sliding bar *d*, guided in a longitudinal groove in the body *a* of the feed-slide, and pivotally secured by means of the link *e* to a clamping-lever *f* for increasing the leverage when the material is to be clamped, which has the folding extension-handle *f'* and the upwardly-projecting stud *g*. The pivotal connection *h* *h'* *h''* are so arranged that when the locking-

lever is thrown into the position shown in dotted lines in Fig. 5 the parts will be locked in their adjusted position after the rectangular space between the two clamping-jaws *c c'* is filled with the boards to be operated on by the cutters, the boards being held in position by the clamping-pressure. To lock the boards on the front side, a locking-bar *i* is adjustably hinged to the stationary jaw *c*, and its free end is adapted to be locked upon the movable jaw *c'*. To this end a T-headed keeper *j* is adjustably secured by a stirrup *k* upon the inner face of the jaw *c'*, and the end of the locking-bar *i* is forked to straddle the keeper when the locking-bar is in its closed position. Upon the rear side of the slide is secured a feed-rack *l*, which engages with the feed-pinion *l'*, driven by a feed connection more fully hereinafter described. Below the clamp is a vertically-adjustable table E, which serves as a vertical gage for the boards in the clamp. Any suitable devices—such as the adjusting-screws *E'*, actuated by the hand-wheel *E''* on the shaft *E'''*—may be employed to actuate the feed-screws for adjusting the table. A similar table F, with like adjustments, is arranged upon the other sides of the revolving cutters to receive the work after it has passed through the cutters. The revolving cutters D have knives of suitable description to tenon the boards on the bottom and top in the usual manner as the work is passed through. The shafts on which the cutters are placed are journaled in sliding boxes *m*, secured in suitable vertical guides in the frame and provided with vertical adjusting-screws *n*, actuated from suitable connections through the hand-wheel *o* in the usual manner, whereby the shafts may be adjusted closer together or farther apart, as the size of the work may demand. Each of the cutter-shafts has a pulley *p*, around which the drive-belt *q* passes. *r* is a tightener-pulley, which can be vertically adjusted in any suitable manner, such as shown in the drawings, wherein *r'* is a vertically-sliding frame in which the tightener-pulley is journaled and which, by means of a feed-rack and pinion, can be adjusted vertically.

Motion is communicated to the feed-slide by the drive-pulley *s*, which has two beveled drive-pinions *t* loosely secured upon a shaft,

with a sliding clutch *u* arranged between the two and connected to a hand-lever *v*, whereby either one may be thrown into gear or both may be thrown out of gear, if desired. These feed-pinions are adapted to be engaged with a bevel-wheel *w* upon the shaft of the feed-pinion by means of the lever *v*. The attendant thus can throw either feed-pinion into gear, thereby communicating motion to the feed-slide in either direction or holding it stationary by throwing both pinions out of gear with the clutch. The drive-wheel *s* is preferably connected to its shaft with an automatic make-and-break connection, which in case of accident will disconnect it from the shaft. The particular devices shown in the drawings consist of the toothed clutch *y*, which is feathered upon the shaft and which is held normally in engagement with the wheel *s* by the tension of a spring *z*, of suitable tension, so that when the strain in the drive mechanism becomes too great it will yield and throw the drive-pulley *s* out of gear.

In practice the feed-slide is charged with the boards in the position shown in Fig. 1, the boards being placed by the attendant to a necessary number to fill the space between the two jaws and allow of tightening them up by throwing the lever *f* into the position shown in dotted lines in Fig. 5. It will be observed that the bar *i* must first be closed against the boards before clamping, so as to engage the front end of the lever upon the keeper.

The adjustment of the table *E* is such that the boards will be pressed by the clamp about the longitudinal center, and the revolving cutters will be so adjusted that one cuts into the bottom and the other into the top of the boards, respectively, while passing through, the cut being made of sufficient depth to form the tenons.

It will be seen that the machine can be adapted for boards of any size within the range of its adjustments. After the boards are clamped the attendant, by means of the lever *v*, throws the feed into gear and the boards pass between the cutters. The deflecting-plate *S*, pivoted upon the pin *S'*, is arranged with its curved or inclined face *T* in the path of the stud *g*, so that when the stud strikes against the plate the lever *f* is automatically thrown into the position to open the clamps. The plate *S* during this movement is free to turn on its pivot until the stop *U* strikes against a portion of the frame. As soon as the stud *g* has passed, the lever being thrown to its unlocked position, a spring *U'* returns the plate *S* to its initial position, the whole being for the purpose of preventing a sudden shock in opening the lever. After the attendant has removed the boards the slide may be returned to its original position by the drive mechanism ready for another operation.

The function of the table *F* is primarily to prevent the finished work from dropping out of the clamp after the latter is unlocked; but

if adjusted to the height of the table *E* it will also form a support while the boards are operated upon, while the table *E* is for the purpose of adjusting the boards all to a common height within the clamp.

The necessary adjustments are provided throughout the machine to adapt it for different sizes of work.

What I claim as my invention is—

1. In a tenoning-machine, the combination of a vertically-adjustable feed-table, a clamp adapted to clamp the work centrally, tenoning-cutters above and below the feed-table, feed devices for the clamp, and an independent vertically-adjustable table adapted to receive the finished work, substantially as described.

2. In a tenoning-machine, the combination of a vertically-adjustable feed-table, a clamp adapted to clamp the work centrally, tenoning-cutters above and below the feed-table, feed devices for the clamp, an independent vertically-adjustable table adapted to receive the finished work, and means for automatically releasing said clamp in its forward movement, substantially as described.

3. In a tenoning-machine, the combination, with the cutters arranged above and below the work upon horizontal shafts, of vertically-adjustable boxes in which said horizontal shafts are journaled, means for simultaneously adjusting said boxes vertically, a work-supporting table secured at one side of said cutters, a work-receiving table secured at the other side of said cutters, and means for independently vertically adjusting said tables, substantially as described.

4. In a tenoning-machine, the combination, with the frame *a*, slidably engaging at one side with the guides *B*, of the jaws *c c'*, secured thereto and overhanging the work-supporting table *E*, and the bar *i*, pivotally secured to the jaw *c* and detachably secured to the jaw *c'*, substantially as described.

5. In a tenoning-machine, the clamp having a locking-lever, feed mechanism for said clamp, and an automatic unlocking device consisting of a pivoted spring-pressed cam for said clamp, substantially as described.

6. In a tenoning-machine, the frame *a*, clamps *c c'*, locking-lever *f*, and the pivoted cam-plate *S*, adapted to strike the lever *f* during its forward movement and unlock the clamp, substantially as described.

7. In a tenoning-machine, a locking-lever, clamps, one of which is moved by the lever, and an automatic unlocking device for said lever, consisting of the stud *g*, the pivoted plate *S*, stop *U*, and spring *U'*, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES H. FUCHS.

Witnesses:

N. L. BREWER,
H. D. MILLER.