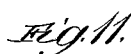


W. H. BENNETT.
TENONING MACHINE.

No. 525,835.

Patented Sept. 11, 1894.



Chas. Gaylord.
Clifford V. White.

William H. Bennett,
By *Deputy* & *Deputy*.
Att'y

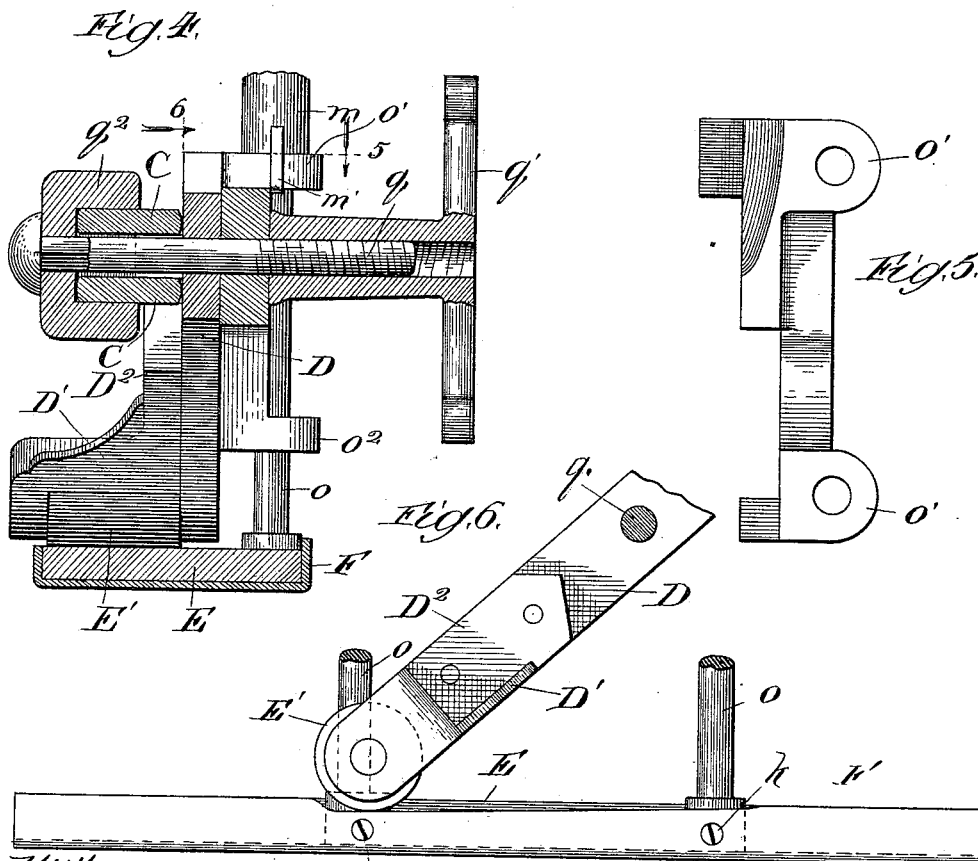
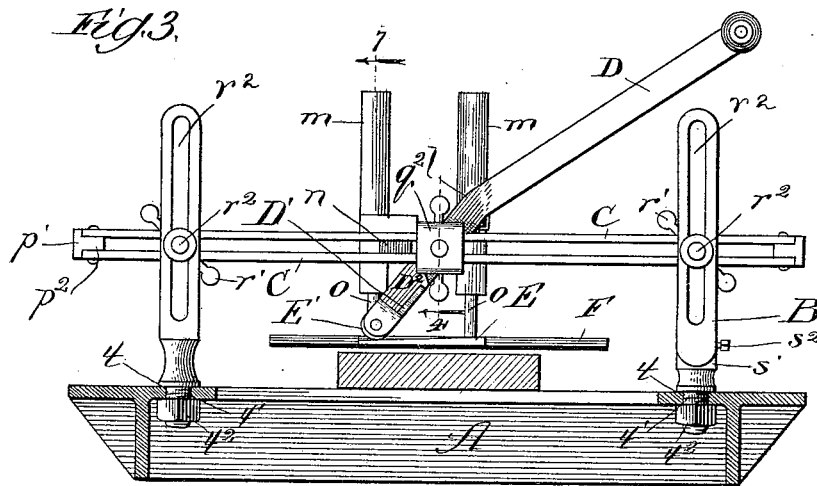
(No Model.)

3 Sheets—Sheet 2.

W. H. BENNETT.
TENONING MACHINE.

No. 525,835.

Patented Sept. 11, 1894.



Witnesses:
Charles Clifford
Clifford White

Inventor:
William H. Bennett
By *Deputy & Deputy*
Attys

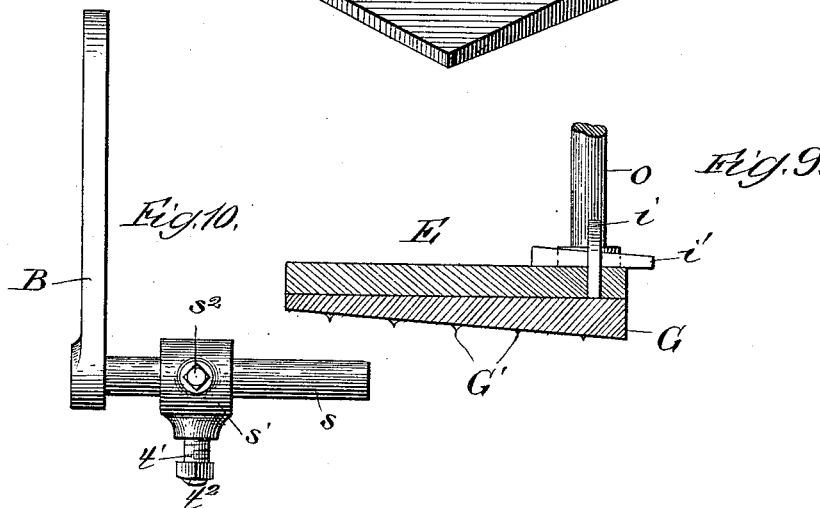
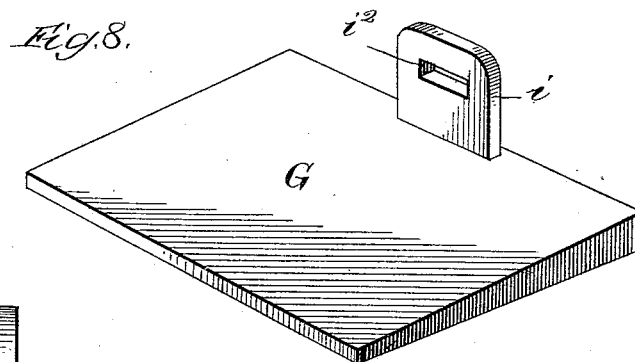
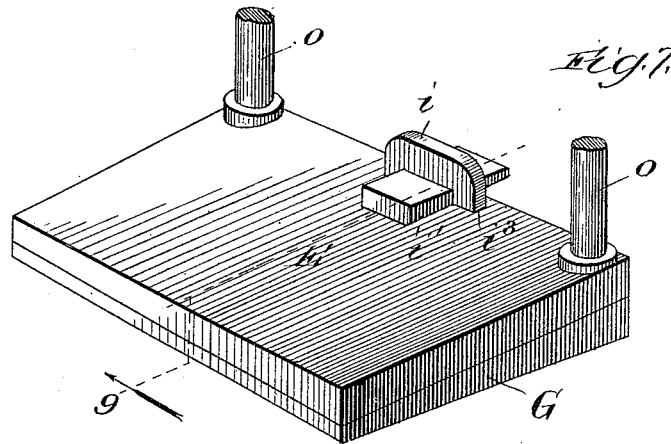
(No Model.)

3 Sheets—Sheet 3.

W. H. BENNETT.
TENONING MACHINE.

No. 525,835.

Patented Sept. 11, 1894.



Witnesses:
Eas. & Gaylord,
Clifford V. White.

Inventor:
William H. Bennett,
By *Dequibus & Associates*
Att'y's.

UNITED STATES PATENT OFFICE.

WILLIAM H. BENNETT, OF CHICAGO, ILLINOIS.

TENONING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 525,835, dated September 11, 1894.

Application filed December 30, 1892. Serial No. 456,811. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. BENNETT, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Tenoning-Machines, of which the following is a specification.

My invention relates to an improvement in tenoning machines, and is in the nature of an improvement upon the invention described in my Letters Patent No. 474,515, granted May 10, 1892. Like the invention therein described, my present invention relates more particularly to the clamp portion of the tenoning machine, the purpose of which is to hold firmly upon the horizontal movable carriage the timber, while the cutting mechanism is forming a tenon thereon.

The object of my present invention is primarily to improve the useful features of my previous construction, and incidentally and furthermore to introduce certain valuable and novel features which render the clamp more efficacious for the purpose to which it is applied.

My invention consists primarily in a clamp comprising an arm carrying the presser plate, and having its pivot in a cross bar made of spring metal or otherwise given a spring-like characteristic, whereby equal pressure is applied to timber varying in thickness.

My invention consists further in a clamp, the presser plate of which carries adjustable, detachable and interchangeable plates, which cause it to bear uniformly against timber presenting different inclination with relation to the carriage.

My invention consists further in the general and specific construction and arrangement of parts, all as hereinafter more fully set forth.

In the drawings—Figure 1 is a view in elevation, partly sectional, of my improved clamp applied to a carriage. Fig. 2 is a similar view showing the clamp in position to press a timber upon the carriage, and showing how the cross bar yields to allow for the increased thickness of the timber. Fig. 3 is a rear elevation of my improved clamp. Fig. 4 is a cross section taken on the line 4 of Fig. 3. Fig. 5 is a plan view of a detail taken on the line 5 of Fig. 4. Fig. 6 is a view in elevation,

partly in section, of the lower end of the pressing lever, and of the presser plate, taken on the line 6 of Fig. 4. Fig. 7 is a perspective view of the presser plate, showing the separable plate attached thereto. Fig. 8 is a perspective view of one form of separable plate. Fig. 9 is a cross section on the line 9 of Fig. 7. Fig. 10 is a view in elevation of a detail relating to the means for supporting one end of the cross bar upon the carriage. Fig. 11 is a perspective view, partly broken away, of another form of separable presser plate.

All sectional views herein described are to be taken as indicated by the arrows in the respective figures.

A represents the traveling carriage as shown in my said former patent to which the clamp is held by longitudinally slotted standards B. For the purpose of joining the standards B to the carriage the latter is provided with the hole t , and the standard is provided with the screw threaded extension t' and nut t^2 . In the main the connection between the standards B and the carriage A is the same as that shown in my before-mentioned patent; but in order that the clamp may be adjustable with relation to the cutting side of the carriage, I prefer to mount one of the standards B upon a slide bar s , received in a collar s' , which is secured to the carriage by a screw thread and bolt $t' t^2$. The relation of the slide bar s and collar s' is adjustable, and they are held in their adjusted positions by a set screw s^2 . These details are shown more particularly in Fig. 10. By reason of the adjustability of the standard upon the carriage, the clamp which is carried thereby may be brought nearer to or farther from the edge, to grip the timber nearer to or farther from the path of the knives. The slotted standards carry the cross bar C, the connection of which with the standards is through the medium of a threaded stem having nuts or heads on opposite ends, one of which is preferably in the form of a handle, and has a screw-threaded connection therewith, which stem passes through the slot in the standard and the slot in the cross bar. The structure is shown in the figures where r represents the threaded stem, r' the handle, and r^2 the slot. The connection is therefore capable of adjustment vertically and longitudinally.

The cross bar C, which in my previous structure is shown as made of a single metal plate having a central longitudinal slot, is in my present structure made of two spring bars, affording between them the longitudinal aperture p , and held together at their opposite ends by cast metal plugs p' . These plugs are in the form of a T-casting, the stem p^2 of which is perforated to receive a bolt which holds thereto the two members of the cross-bar. The shoulders afforded in the cross part of the plug serve to maintain the parallel relation of the spring bars under all conditions. Because of these functions the plug p' is a useful feature of my structure. The clamp proper comprises a lever D, which has a pivot as shown at q in the slot p of the cross-bar, the pivot being adjustable by being formed as a screw threaded stem controlled by a handle q' . I prefer, however, as the bars constituting the cross bar C are intended to be movable against their spring resistance, to provide the head of the stem q in the form of a clip q^2 , which receives within it the lateral edges of the bars and prevents their separation. These bars are prevented from approaching each other too closely by the stem q . The structure herein described is shown in Fig. 4.

The lever carries at its lower end a roller D', which bears against the presser plate E, as in the case of my previous structure. To provide a bearing for the roller E' the angle plate D² is secured to the lower extremity of the lever, the lower end of the angle plate serving as a bearing for the shaft of the roller. The presser plate E is held in a normally elevated position by rods o , passing through collars $o' o^2$, formed on the plate o^3 , which is held to the cross-bar by the screw-threaded stem q before mentioned, and the entering stud n cast upon the plate o^3 . Beyond the collar the rods o are provided with springs n' , the tension of which is such as normally to hold the presser plate in an elevated position. In the use of this machine it is found that sawdust and other objectionable matter gets into the coils of the spring, interfering with its operation. To prevent this I provide the hoods m , which at their lower ends have the soft metal ears m' , which hoods are cylindrical in shape and fit over each spring n' to be held in position by folding the ears m' about the upper collar o' . This provision prevents the access of dust to the springs.

The action of the lever D is as follows: Elevation of the free end to a position approaching a vertical line above the presser plate, forces the presser plate downward upon the timber, and holds it firmly while the carriage is being advanced to the tenoning knives. In order to facilitate the movement of the traveling carriage A, the lever D is made with a crook or crank, as shown at l in the figures, whereby the upper end of the lever, when it is changed from the vertical to release the presser plate, approaches more nearly to a

line parallel with the line of travel of the carriage; hence when the return motion of the carriage is produced by drawing upon the lever D the line of draft is more nearly parallel with the line of movement, and buckling of the carriage upon its track is prevented. Where the lever projects more nearly in a vertical line with relation to the carriage this tendency to bind is quite prominent, so that the movement of the carriage is frequently performed by grasping its frame with the hand, which is in itself dangerous.

For use in certain classes of tenoning, the presser plate E in the form shown in my previous patent, is perfectly satisfactory; but I have found that advantages arise if means be provided for changing the dimension of the plate, as well as for changing the pitch of its face or bearing surface. Where the timber to be tenoned has a taper, it is found that if the bearing surface of the presser plate be straight, the unequal resistance thereto, when forced downward by the lever D, results in a fracture; and it is found also that the direction of the taper is sometimes from left to right, and sometimes from right to left. In order to provide for the first of these requirements, I supply the elongated flange plate F of a width to embrace the presser plate E, and adapted to be held thereto by screws if desired, as shown at k Fig. 1, or, and more particularly when a wedge-shaped additional plate G is employed, by the slotted ear i and wedge i' , presently described. When the plate F is used alone, and whether it is held to the presser plate E by screws or by the slot and wedge, it serves to elongate the bearing face of the presser, and thus give to it a better clamping action upon the material. To provide for clamping tapered bodies such as wagon poles or stakes, I supply wedge shaped plates G, thicker at one edge than at the other, and by preference with one or several downward projecting spurs G'. The plate G is provided toward one edge with the ear i , having the slot i^2 , which ear passes through a slot i^3 formed in the presser plate E, and the slot i^2 receives the wedge pin i' , previously mentioned, as fully illustrated in the figures. In Fig. 8 the ear i is shown at the thicker edge of the plate G, while in Fig. 11 it is shown at the thinner edge of this plate. In this way provision is made for the different direction of inclination between wagon poles for instance, on the one hand, and wagon stakes for instance, on the other. It is quite obvious that plates G, of any desired inclination of the lower or bearing surface, may be interchangeably employed on the same device, and it is contemplated that a single machine will be supplied with a number of interchangeable plates F G, suitable to the requirements of the factory employing it.

The operation of the clamp is as follows: The timber being placed upon the carriage under the presser plate E, which as described may or may not have a supplemental plate F

or G secured thereto, the lever D is thrown over from the position shown in Fig. 1 to the position shown in Fig. 2, whereby the timber is firmly clamped on the carriage, and if the thickness of material is exactly that to which the height of the cross bar *c* is adjusted through the medium of the screw threaded pins *r*, no variation occurs in the cross bar C. Should the thickness of material be slightly in excess of that provided for in the adjustment of the cross bar, the latter will yield against the resistance of its own resiliency, so that the clamp is enabled to operate without requiring re-adjustment of the set screw connection with the standards B.

Through the medium of the slide bar *s*, the position of one of the standards B with relation to the carriage, or more particularly with relation to the cutting knives of the tenoning machine, may be changed to satisfy all requirements. The other standard is usually so near the edge of the carriage that nothing is gained by making it adjustable with relation thereto; but it is quite within my invention to make this standard adjustable as well as the other, and in the same or equivalent manner.

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

1. In a clamping device of the character described, the cross-bar comprising parallel spring bars, held at their ends and joined substantially to maintain their relation to each other, said bars supporting the clamp, and affording a yielding retaining device therefor, in combination with the clamp having adjusting means playing in the space between the spring-bars, as set forth.

2. In a clamping device of the character described, the clamp-carrying cross-bar C, com-

prising spring bars held together at their ends by T-plugs *p'*, in combination with the clamp having adjusting means playing in the space between the spring-bars, substantially as described.

3. In a clamping device of the nature described, in combination with the movable carriage, the clamp operating and carriage moving lever having the crook or bend at a point adjacent to the clamp-carrying bar, substantially as described and for the purpose set forth.

4. In a clamping device of the character described, in combination with the presser plate, the rods *o* and their springs *n'*, and the closed removable hoods *m*, as and for the purpose described.

5. In a clamping device of the nature described, in combination with the carriage the support for the clamp carrying mechanism, comprising a collar *s'* and a slide rod *s*, secured respectively to the carriage at one side thereof and to the clamping mechanism at one end thereof, and moving one with relation to the other, substantially as and for the purpose described.

6. In a clamping device of the nature described, in combination with the clamp-carrying cross-bar, comprising parallel spring bars held together at their ends, the clamp thereon and the lever, the lever pivot comprising a stem having a handle, and passing between the bars, and a clip forming the head of the stem and embracing the bars respectively, whereby their separation at a central point is prevented, substantially as described.

WILLIAM H. BENNETT.

In presence of—

W. N. WILLIAMS,

H. J. FROST.