2 Sheets—Sheet 1.

C. FREIKE.

MACHINES FOR TENONING BLIND-SLATS.

No. 185,312. Patented Dec. 12, 1876.

Fig. 1.

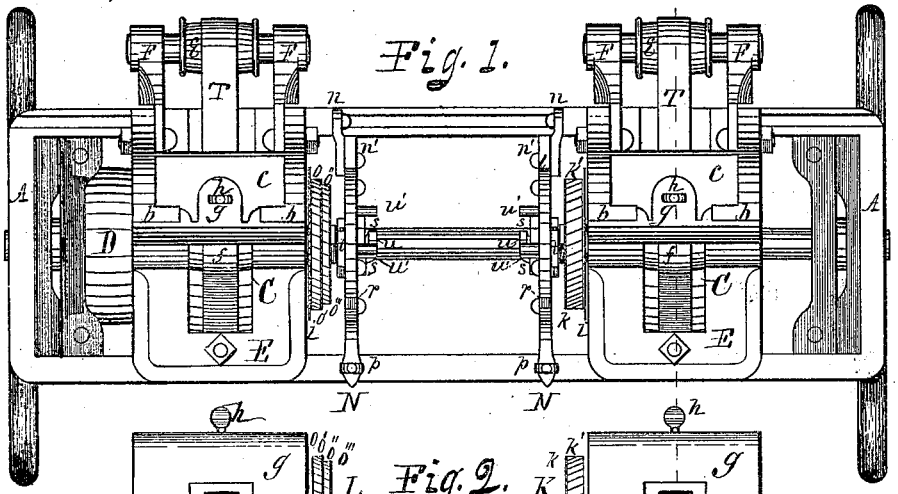
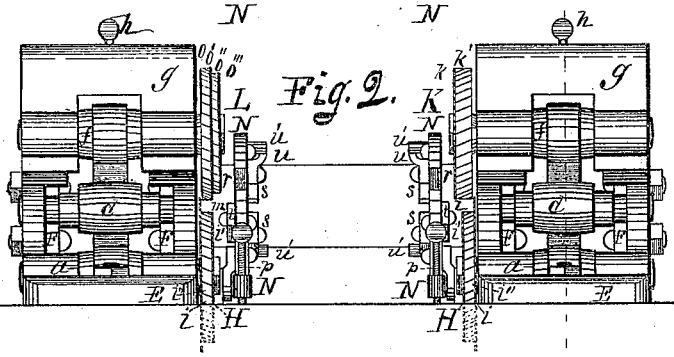


Fig. 2.



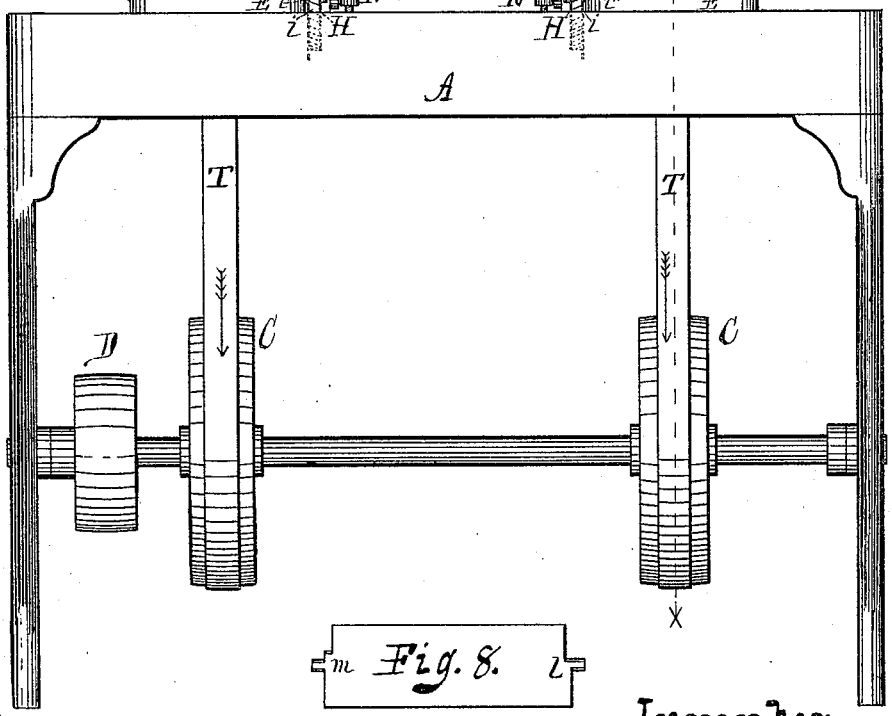


Fig. 8.

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2 Sheets—Sheet 2.

C. FREIKE.

MACHINES FOR TENONING BLIND-SLATS.

No. 185,312. Patented Dec. 12, 1876.

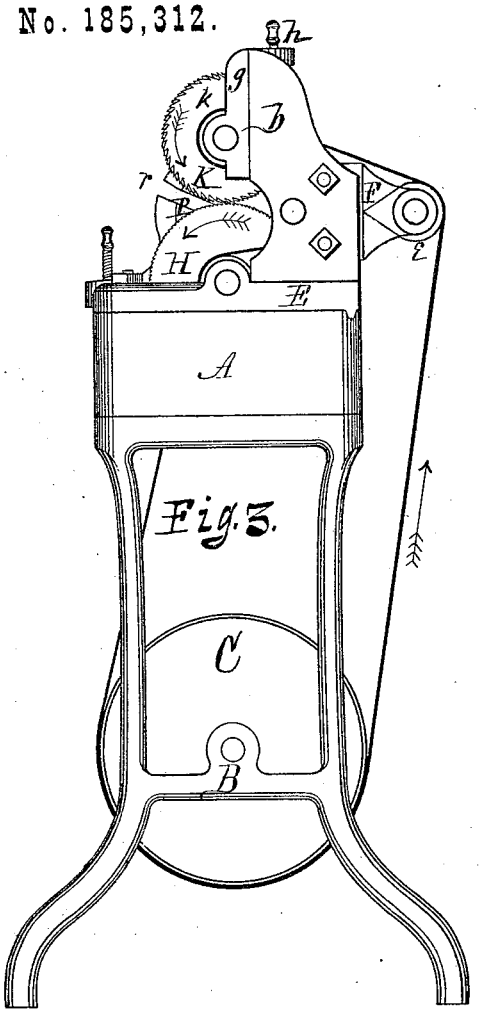


Fig. 3.

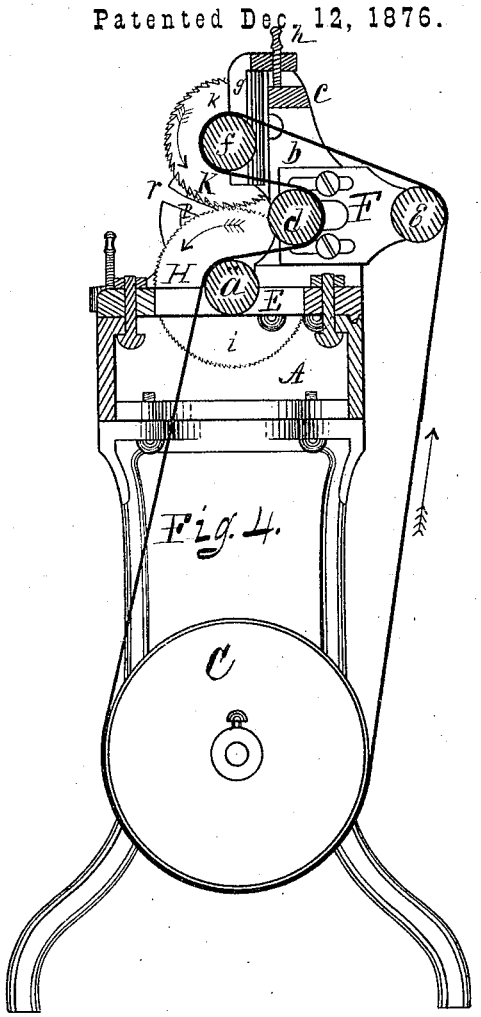


Fig. 4.

Fig. 5.

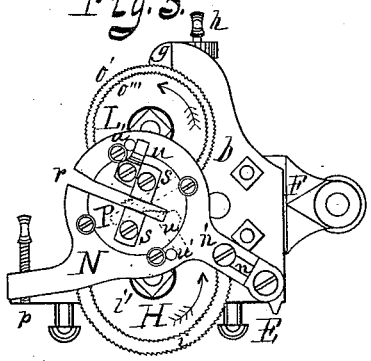


Fig. 6.

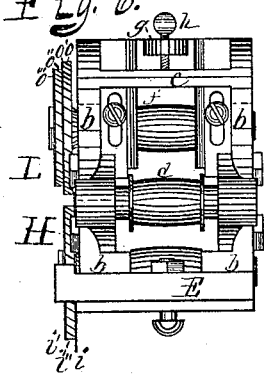
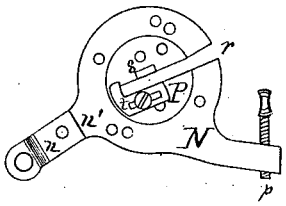


Fig. 7.



Attest.
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E. J. Behel

Inventor.
Charles Freike,
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UNITED STATES PATENT OFFICE.

CHARLES FREIKE, OF CHICAGO, ILLINOIS, ASSIGNOR TO WILBUR F. BEHEL, OF SAME PLACE.

IMPROVEMENT IN MACHINES FOR TENONING BLIND-SLATS.

Specification forming part of Letters Patent No. **185,312**, dated December 12, 1876; application filed June 20, 1876.

To all whom it may concern:

Be it known that I, CHARLES FREIKE, of the city of Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Blind-Slat-Tenoning Machines, which improvements are fully set forth in the following specification, reference being had to the accompanying drawings.

The object of my invention is to provide a machine to tenon window-blind slats having one long and one short side, and to be employed in the manufacture of blinds having frames with rabbeted inner edges, and in which the shoulders, or a portion of the shoulders, on opposite sides of the tenons are not in the same transverse plane, the sides differing in length at each end about equal to the depth of the rabbet on the inner edges of the blind-frame.

To this end I have devised and constructed the machine represented in the accompanying drawings, in which—

Figure 1 is a plan view of my improved blind-slat-tenoning machine; Fig. 2, a front side elevation; Fig. 3, an end elevation. Fig. 4 is a transverse vertical section. Fig. 5 is an end elevation of one of the cutting-head frames removed from the main frame, and Fig. 6 is a rear elevation of the same. Fig. 7 is a side view of the oscillating centering-disk and disk-frame removed from Fig. 6. Fig. 8 is a side view of a tenoned slat.

In the drawings, A represents the main supporting-frame, which is of rectangular form, mounted on suitable supporting-legs at each end, which are firmly bolted to the frame. B B are end cross-bars connecting the supporting-legs near their lower ends, and furnishing bearings in which is journaled the horizontal lengthwise counter-shaft, on which are mounted driving-pulleys C, held thereon in an adjustable manner by means of set-screws, so as to be readily adjusted in line with the pulleys on the saw-arbors in the cutting-head frames, mounted on the main frame. D is a pulley mounted on the counter-shaft to receive the driving-belt which connects the machine with the prime mover to impart motion to the machine. E E are bed-plates of the cutter-head frames, fitted to the upper surface of the main frame to slide lengthwise thereon in grooved ways, and, when adjusted, are fixed in place by suitable screw-bolts, which pass upward through the bed-plates in such a manner that the heads of the bolts will engage the inward-projecting flanges on the inside of the upper edges of the sides of the main frame. These bed-plates furnish bearings for the arbors of the lower cutting-heads, and are provided with central openings to admit the belts from the driving-pulleys C to pass over pulleys *a* on the arbors of the lower cutting-heads. A portion the cutter-head frames, consisting of ends *b*, connected by transverse bars *c*, are mounted on the rear portions of the bed-plates E, to which they are secured by suitable screw-bolts. These frames furnish journal-bearings for the idle pulleys *d*, which are placed rearward of the cutting-head arbors, to change the direction of the belts, and to admit the slats centrally to the cutting-heads. F are bearings in which revolve the journals of idle pulleys *e*. These bearings, at their inner ends, are of plate form, slotted lengthwise, and are secured in place on the inside of the end portions *b* of the cutter-head frame in such a manner as to be adjusted transversely of the main frame by means of screw-bolts passing through the slots and end portions of the frame.

By this arrangement the pulleys *e* serve the double purpose of changing the direction of the belts and of tightening pulleys. The arbors of the upper cutting-heads, on which are mounted the pulleys *f*, have their journal-bearings in vertical slides *g*, fitted to guide-ways on the front edges of the ends *b* of the cutter-head frames, which are provided with inner projecting flanges, slotted vertically, through which the screws are passed that hold the slides in place on the frame, and by means of which, in connection with the adjusting-screws *h*, the cutting-heads can be adjusted to or from the lower fixed cutting-head by raising or lowering the vertical slides *g*, to produce tenons of proper size, or of different sizes, as may be required in the manufacture of blinds.

The cutting-heads (represented at H) are each composed of a cut-off saw of disk form, as at *i*, of sufficient diameter to cut off the

slat from the slat-strip to proper length, and a disk-saw, *i'*, of sufficient diameter to cut the shoulder on the long side of the slat, and an intermediate saw, *i''*, of about the same diameter as *i'*, fitted with spiral chisel-edged teeth, and of a thickness which, added to *i'*, will about equal the length of the tenon on the long side of the slat. These saws are mounted on their respective arbors by first placing the large saw *i* on the arbor, then the thick saw *i''*, and, last, the shouldering-saw *i'*.

The cutting-head (represented at K) is composed of a shouldering disk-saw, *k*, and a chisel-edged spiral-toothed saw, *k'*, of about the same diameter as the shouldering disk-saw *k*, and of a thickness which, when added to the shouldering-saw *k*, will overreach the cutting-head H a distance equal to the difference between the length of the tenon on the long and short sides of the slat, which difference will be about equal to the depth of the rabbet on the inner edge of the blind-frame. This cutting-head, in connection with the cutting-head H, is employed to tenon slats having the shoulders on opposite sides of the tenons cut to the tenons on different transverse planes, as seen at *l*, Figs. 2 and 8, and are designed to be employed in the manufacture of blinds, when the blind-frame is bored for the reception of the slat-tenons, close to the raised portion of the rabbet.

The cutting-head represented at L is composed, in part, of saws *o* and *o'*, substantially the same as the saws *i* and *i'* at H, and are placed on the arbors in the same plane as those saws, so as to cut the shoulders on both sides of the tenons on the same transverse plane, and are also composed, in part, of saws *o''* and *o'''*, of substantially the same general construction as the saws *o* and *o'*, but of less diameter, and are designed to be employed in connection with the cutting-heads H in the manufacture of blinds, where the blind-frame is rabbeted on its inner edges, and is bored for the reception of the slat-tenons some considerable distance from the raised portion of the rabbet, which distance will be about equal to half the difference between the diameter of the saws *o o'* and *o'' o'''*. The slats when tenoned are represented at *m*, Figs. 2 and 8.

In the drawings I have represented the cutting-heads K and L adapted to cut the tenons, as represented at *l'* and *m*, Figs. 2 and 8, and where either form is selected it will be necessary to employ two cutting-heads of the proper form to cut the form selected on both ends of the slats, and these heads may be employed on either the upper or lower arbors.

By omitting the cutters *o''* and *o'''*, (shown at L,) and employing the cutters *o* and *o'*, in connection with the cutting-heads H, this machine may be employed in the manufacture of blinds in which the slats are shouldered on both sides of the tenons on the same transverse plane, and which are used in the manufacture of blinds having frames with square inner edges, such as are now in common use.

N are disk-frames, composed of parts *n* and *n'*, fitted to each other by a sliding grooved connection, as represented in the drawings, for the purpose of adjustment, and are held in adjusted position by suitable clamping-screws. These disk-frames are pivoted to the rear inner corners of the bed-plates E, and overspan the main frame with the adjusting-screws *p* resting on the front portion of the main frame, and the center of the disk-frame rising to the center between the cutting-heads. The disk-frames are provided with central openings, grooved to receive the grooved centering-disks P in such a manner that their surfaces are about even, and are held in place in the frames in such a manner as to freely oscillate, by means of screws inserted in the frame with their heads overlapping the joint formed between the disk and the frame.

The disk-frames, and also the disks, are slotted, as represented at *r*, for the purpose of receiving the slat, to hold it in position to be operated upon by the cutting-heads, to cut it in proper lengths, and form the tenons on its ends. For the purpose of adjusting the slots *r* to the thickness of the slats, radial adjustable slides *s* are provided, secured to the disks in an adjustable manner by means of suitable clamping-screws passing through the slotted slides *s*, and entering the disks. These disks are also provided with adjustable centering-slides *t*, held in place and made adjustable on the disk by means of suitable clamping-screws passing through their slotted arms and entering the disk, and are employed for the purpose of properly centering the slat in the disks in the direction of its width. *u* are stop-arms secured to the disks, and come in contact with studs *u'* fixed in the disk-frame at proper points, to limit the oscillatory movements of the disks, which, in ordinary work, will be found sufficient at about one-third of a revolution, and should not exceed a half revolution. T are endless driving-belts on pulleys, from which they pass upward on the rear side of the machine, over the idle pulleys *e*, thence over pulleys *f* on the arbor of the upper cutting-heads, thence round the idle pulleys *d*, thence over pulleys *a* on the arbor of the lower cutting-heads; thence under pulleys C, driving the cutting-heads H K and H L in pairs in the same direction, as indicated by the arrows, by means of one belt, to each pair of cutting-heads.

In operating the machine, the cutting-heads being in motion, the attendant inserts the blind-slat strip, previously prepared, through the slots in the disk-frames into the centering-disks, and turns the strip, causing the centering-disks to move forward through the space limited by the stop, which is sufficient to produce round tenons on the ends of the slats, which are also cut in proper lengths, and having shoulders on opposite sides of the tenons, produced by the action of the rotary cutters during the forward movement of the centering-disks, which are then turned back to their

starting-points, having performed a limited oscillatory movement, and at which point the finished slat is withdrawn, and the machine is ready for a second operation.

In the drawings and foregoing description I have represented the slides *g* constructed to move in a vertical plane, but do not wish to confine myself to this particular construction, as it is evident that a better mechanical construction would be to construct the slides *g* to move at right angles to the slots in the centering-disks when the disks are in position to receive the slat-strip, so that the center of disks, and, consequently, the center of the tenon of the slats, would be in the center between the cutting-heads on a line connecting their centers. I have also represented the idle pulley *d* as having its bearings in the ends of the cutting-head frame, instead of which the idle pulleys *d* and *e* may have their bearings in a suitable frame, fitted to slide in the cutting-head frame, made adjustable and held therein in substantially the same manner as the sliding bearings F are fitted and held in the cutter-head frame, in which instance the idle pulleys *d* and *e* would both serve the double purpose of changing the direction of the belts and as tightening-pulleys.

I claim as my invention—

1. The oscillating centering-disks P, in combination with the disk-frame fitted with stops *u* and *u'*, to limit its oscillations, substantially as shown and described.

2. The disk-frame N, filled with slotted centering-disks, to center and hold the slats, and stops *u* and *u'*, to limit the rotary movement of the disks, in combination with the rotary cutting-heads, to cut the shoulders and form the tenons when the slats are oscillated within the range of the cutters in the cutter-heads, substantially as and for the purpose described.

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Witnesses:

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S. R. FRIZIER, Jr.