J. B. DOUGHERTY.

Hoop-Cutting Machine.

No. 209,962. Patented Nov. 19, 1878.

Fig. 1.

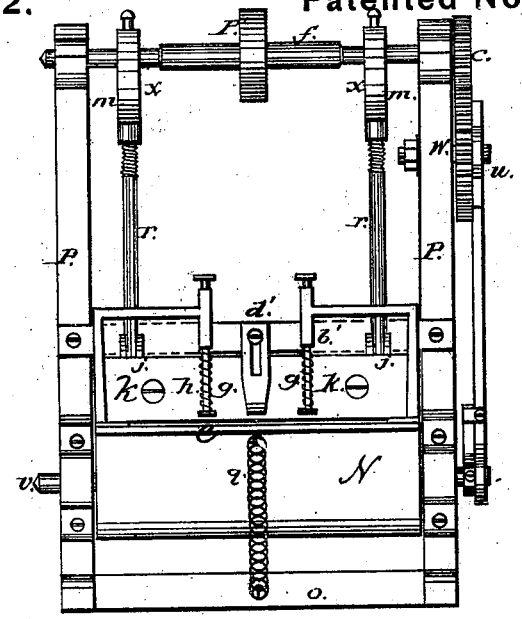
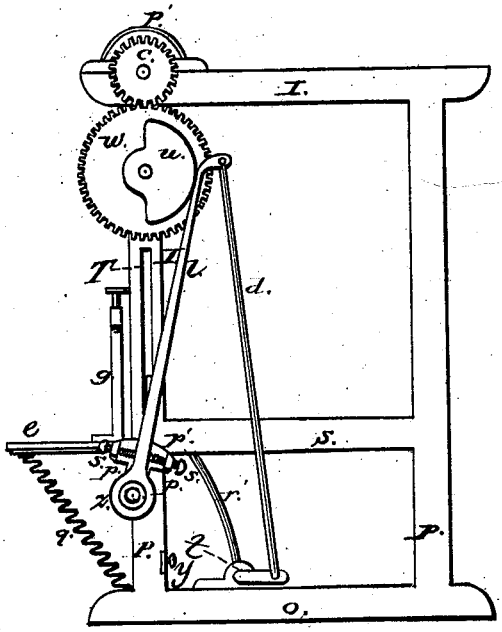


Fig. 2.



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2 Sheets—Sheet 2.

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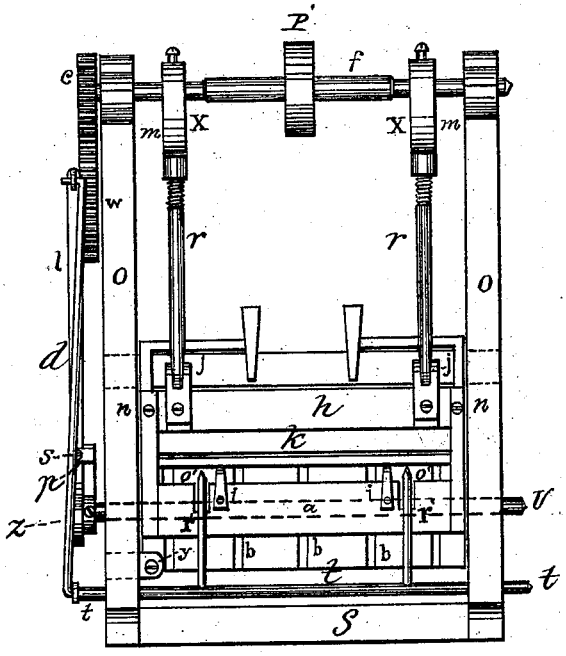
Fig 3



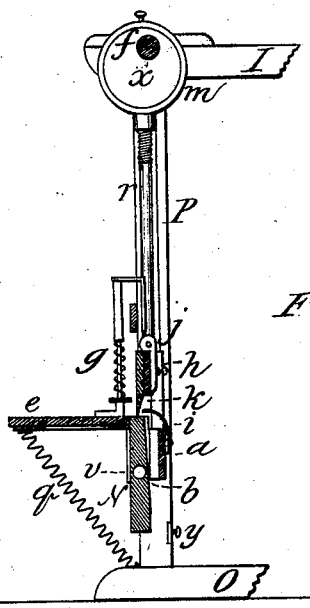


Fig. 4.

WITNESSES:

J. C. Bullock

M. F. O'Dea

INVENTOR.

John B. Dougherty

per B. F. Parsons, atty in fact

UNITED STATES PATENT OFFICE.

JOHN B. DOUGHERTY, OF ROCHESTER, NEW YORK, ASSIGNOR OF ONE-HALF HIS RIGHT TO JAMES DORSEY, OF SAME PLACE.

IMPROVEMENT IN HOOP-CUTTING MACHINES.

Specification forming part of Letters Patent No. **209,962**, dated November 19, 1878; application filed January 18, 1878.

To all whom it may concern:

Be it known that I, JOHN B. DOUGHERTY, of the city of Rochester, in the county of Monroe and State of New York, have invented new and useful Improvements in Hoop-Cutting Machines, of which the following is a specification, reference being had to the accompanying drawing, in which—

Figure 1 represents a front elevation of the machine embracing my improvements. Fig. 2 represents an end elevation of the same. Fig. 3 represents a rear elevation of the machine, and Fig. 4 a vertical cross-section of the same.

These improvements relate to a machine for cutting beveled splints for barrel-hoops.

On the 23d day of February, 1864, the United States Patent Office granted to me Letters Patent No. 41,688 for a hoop-cutting machine, which was reissued May 18, 1869, No. 3,443, and which machine will not cut the splints uniformly, nor, though it cut the thick, will it cut the thin edges alike. This condition is owing to a want of its adaptation to both a wide and narrow timber-plank in its being worked up into splints. A wide plank, by its own weight, steadies itself against the knife-pressure; but when the same is worked up to a few inches in width, the knife-pressure overbalances the weight of the plank, tilting its outward edge upward, thereby changing the thickness, as it does the bevel, of the splint; and the object of these improvements is mainly to perfect that machine, thereby remedying those difficulties. As, however, different portions of that machine have been changed, it is deemed desirable to describe the entire improved machine in this specification; and it consists, first, in eccentrics applied to a horizontal shaft, which, by vertical rods, operate the sash carrying the knife; second, in a cog-wheel on said shaft gearing into another double its own diameter and affixed to the frame, on the disk of which there is, third, a cam actuating a vertical lever, which extends to a shaft below said knife; fourth, in a regulating mechanism at the foot of said lever, regulating the splint's bevel; and, fifth, in a horizontal rotatory bed, having a leaf forming a part of the same; also, suspended from the rear of the frame carrying the knife is a gage-frame stiffened by ribs; and by a vertical rod are fingers for bearing off one-half of the splints, besides spring and slide detents for securing the plank to the bed, all of which will now be described.

In the drawing is represented a wood frame consisting of sills O O, posts P P, plates I I, and interties S S, to which frame the different parts of the machine are secured.

The eccentrics X X on the shaft *f* revolve within the rims *m*, and by the rods *r* and compass-joints *j* are secured to the sash-frame *h*. Said frame works in the vertical slots T, the same being cut through the front corner-posts, while the knife *k* is firmly bolted to the face of the frame.

The gage-frame *a* is attached to and suspended from the rear of the sash-frame, and is stiffened by the ribs *b*, which ribs serve the purpose, also, of receiving the edge of the timber-plank, while by the set-screws *n* at its back the gage-frame is adjusted for a splint of any desired thickness.

For preventing the splint, when its thin edge is down, from falling under the knife, the curved flat springs *i* are secured to the rear of the gage-frame, bearing off the splints in a sound condition.

The wheel *c* on the end of the shaft *f* gears into the wheel *w*, on the face of which (*w*) is the cam *u*, actuating both the vertical lever *l* and rod *r*. The lower end of said lever *l* is secured on the end of the horizontal shaft *v*, oscillating, by means of the cam, the said shaft, while by the same means the rod *d* vibrates the shaft *t*.

N is the vibratory bed of the machine, hanging edgewise upon the shaft *v*. This shaft passes lengthwise through the center of the bed, imparting to it its vibrating motion, upholds it, and is its axis of oscillation. Even with the top edge of the bed is affixed the leaf *e*, the object of which is to widen out the bed for supporting a wide timber-plank. Said plank is held in place by the spring-detents *g*, which are attached to the top of said leaf, and the slide-detent *d'*, the same being attached to the cross-bar *b'*. At the lower back side of the bed is the set-screw *y*, for regulating the oscillations of the same.

For regulating, by the bed's vibrations, the bevel of the splint, there is affixed on the end of the shaft *v*, and between said lever and corner-post, a regulating mechanism, *z*, consisting of a clamp, *p*, having ears *p'*, through which ears pass set-screws *s*. By turning said set-screws in or out, the lever impinges more or less on said cam, thereby communicating the desired vibration to the bed.

The curved fingers *r'*, attached to the horizontal shaft *t*, are vibrated by the rod *d*, the same being actuated by the said cam *u*. Said fingers, after bearing off the splints, on returning, fall into the slots *o'* in the top edge of the frame *a*.

The spring *q*, extending from the sill O to the under side of the leaf *e*, aids in giving prompt action to the bed.

The pulley P' on the shaft *f* receives the driving-power, communicating the same to all parts of the machine.

The operation of the invention is as follows: The timber-plank, of any desired thickness, is first softened by steaming to prevent cracks in the operation of cutting, then secured by the detents *g* and *d* to the bed N, and then power applied to the pulley P'. The knife, now receiving through the eccentrics *x* and rods *r* a vertically-reciprocal movement, communicates motion to the cog-wheels *c w* and cam *u*. This motion, while acting through the lever *l* and shaft *v*, operates the other parts as follows:

The diameter of wheel *w* being twice that of *c*, two splints are severed to one revolution of *w*, and the periphery of cam *u* being equidistant from the center of wheel *w*, the lever, acting through shaft *v*, communicates to said shaft a rotary action, whereby the outward edge of the leaf *e* is oscillated above or below a level. The extent of these oscillations is regulated by the set-screws *s*, through the ears *p* of the clamp *p'*, and a rotary motion given to the bed N, thereby imparting first a square, then a beveled cut, or both square or both beveled cuts, to the knife; in either of which movements, owing to the rotatory action of the bed, it does not receive the cuts of the knife successively in the same place, whereas in the first machine one cut is beveled, the next square, and the bed receives the knife successively in the same place, thereby requiring oft renewals of the bed. The gage-frame *a*, by the set-screws *n* at its rear, is adjusted for a splint of any desired thickness. If the thin edge of the splint is down, it is supported in an upright position until borne off by the curved flat springs *i*.

In the operation of severing the splints from the plank, if the timber has not been steamed, there is a tendency to form small cracks in the side facing the knife, while the opposite side is left sound. But after the splint is made into a hoop, as the cracks are with the grain of the wood, they do not impair its strength; still it is desirable to conceal them. To do this, provision is made in making the hoop to put the cracked face to the barrel, in the following manner: As the thick edge of the hoop is toward the end of the barrel, and the hoop-lock made by machinery, in passing the end of the splint into the lock-cutting machine, to have the cracked faces to the barrel and thick edges toward the end of the same, the said faces must all face one way. But the splints are made with one half of the same having thick edges up, the other half with the thin edge up, and by turning all thick edges up, as necessary, to have them all toward the end of the barrel, and cracked sides face inward, it is found that one-half of the splints face the wrong way, and have to be reversed, and where they all fall, as cut, into one promiscuous pile, it causes loss of time to assort and reverse them. To remedy this difficulty, the fingers *r*, connected and operated as described, were devised. Two splints being severed at one operation of the fingers, and the fingers bearing off and depositing in a pile by itself the one having the thick edge up, the one with the thin edge up is cut when the fingers are from the knife, and dropped in a pile by themselves between the fingers and knife, thus being ready for use without assorting.

The advantages of the invention are the following: A splint from either a wide or narrow plank is furnished of any bevel or thickness. All thick or thin edges are uniform. Only half of the knife's strokes come in the same place on the bed, thereby saving frequent renewals of the same. The splints as cut from the plank are separated and deposited in different piles, which saves assorting by hand.

Having described my improvement in hoop-cutting machines, what I claim as my invention, and for which I ask for Letters Patent, is—

1. The combination of the oscillating bed N, upheld by the shaft *v*, having the leaf *e*, with the mechanism *z*, consisting of clamp *p*, ears *p'*, and set-screws *s*, as and for the purposes described.

2. The regulating mechanism *z*, consisting of the clamp *p*, ears *p'*, and set-screws *s*, affixed to the lever *l* and shaft *v*, by which the oscillations of the bed are adjusted, as and for the purposes described.

3. The rod *d*, affixed to the lever *l* and shaft *t*, the fingers *r'*, slots *o'*, and curved flat springs *i*, preventing the severed splints from falling under the knife, as and for the purposes described.

4. The combination of the slide *d'* and springs *g* with the bed N, shaft *v*, and leaf *e*, as and for the purposes described.

In testimony whereof I have hereto subscribed my name this 15th day of January, 1878.

JOHN B. DOUGHERTY.

Witnesses:

JAMES DORSEY,

B. F. PARSONS.