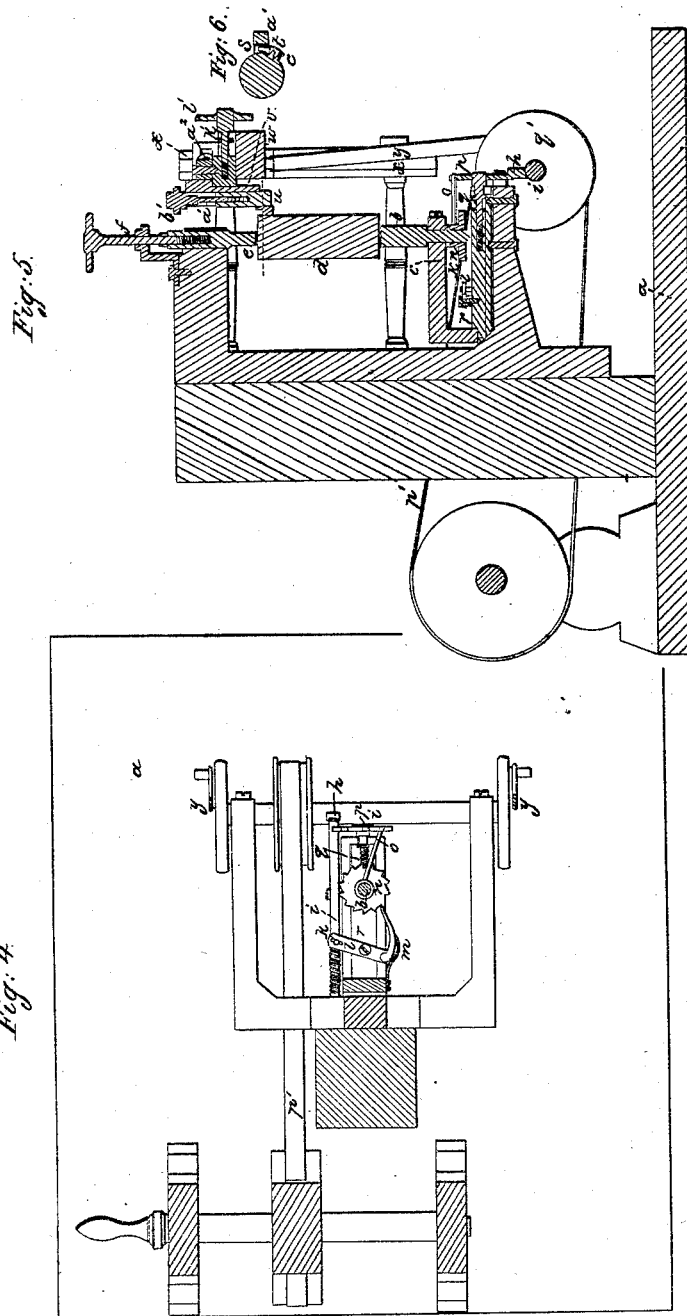


CRUM & LARWILL,
Broom Machine.

2 Sheets—Sheet 2.

No. 6,233.

Patented March 27, 1849.



CRUM & LARWILL.
Broom Machine.

2 Sheets—Sheet 1.

No. 6,233.

Patented March 27, 1849.

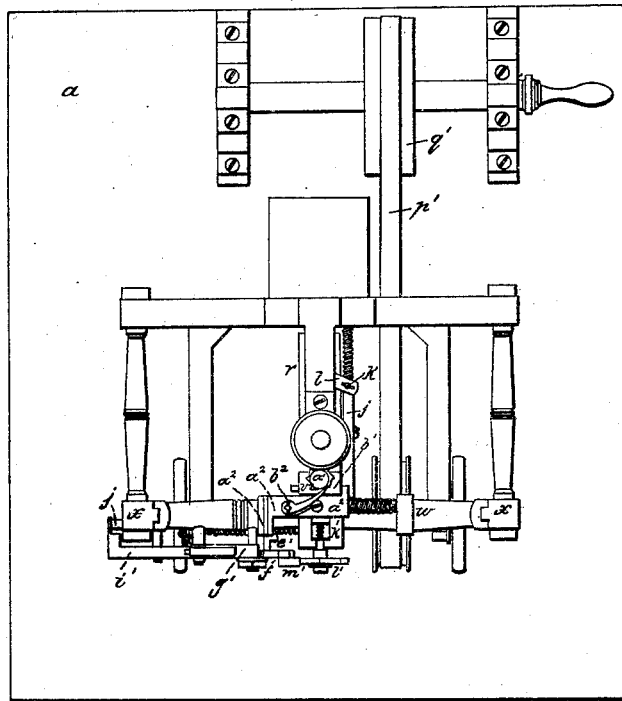


Fig. 1.

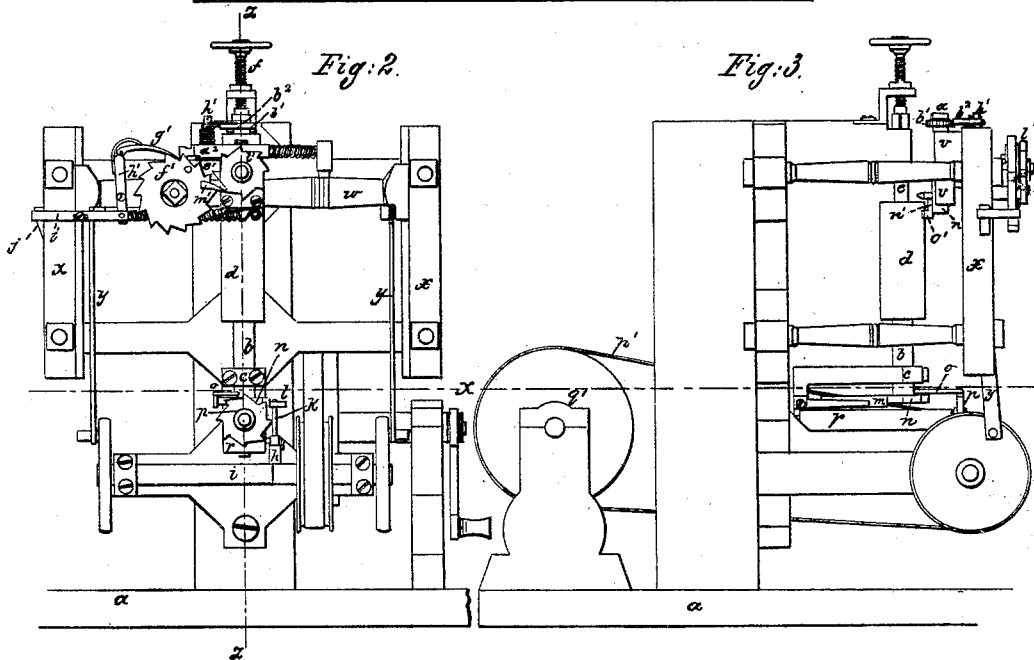


Fig. 2.

Fig. 3.

UNITED STATES PATENT OFFICE.

JOHN CRUM AND ABRAHAM LARWILL, OF RAMAPO, NEW YORK.

IMPROVEMENT IN SPLINT-BROOM MACHINES.

Specification forming part of Letters Patent No. 6,233, dated March 27, 1849.

To all whom it may concern:

Be it known that we, JOHN CRUM and ABRAHAM LARWILL, of Ramapo, in the county of Rockland and State of New York, have invented a new and useful Machine for Making Splint Brooms of Wood, which is applicable to the making of splints of wood for baskets, chair-bottoms, and other purposes; and we do hereby declare that the following is a full, clear, and exact description of the principle or character which distinguishes it from all other things before known, and of the manner of making, constructing, and using the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a plan of the machine; Fig. 2, a front elevation; Fig. 3, an elevation of the left-hand side; Fig. 4, a horizontal section taken at the line X X of Fig. 2, and Fig. 5 a vertical section taken at the line Z Z of Fig. 2.

The same letters indicate like parts in all the figures.

The nature of the first part of our invention consists in cutting a series of splints from the surface of a block of wood with a cutter by a series of reciprocating motions in the direction of the grain of the wood, in combination with an intermittent motion, either of the cutter or the wood, that one splint may be cut after another along the entire surface of the block, the cutter being so formed as to sever each splint from the block on two sides—that is, along the underface and one edge—whether the block from which the splints are to be cut be round, flat, or of any other regular form and whether the splints be cut along the entire length of the block or only a part of the length, as in the making of splint brooms.

The nature of the second part of our invention consists in combining with the cutter that severs the splints from the block one or more cutters having a less range of motion to split each splint along a portion of its length to make the broom of fine splints toward the tip, while they retain their full width toward and at the butt of the broom.

The third part of our invention relates to the method of making splint brooms; and it consists in so moving the block of wood or the cutter, or both, toward one another in such way as to make the splints thicker at the butt than at the point, and also in giving to the

cutter-stock or the block an intermittent motion in the direction of the axis of the block at the end of each series of cuts, that the splints cut on the block may be shorter as they approach the center of the block.

In the accompanying drawings, which represent our invention as applied to the making of brooms, *a* represents a frame properly adapted to the purpose, but which may be varied at pleasure, and *b* a vertical spindle or mandrel running in a box *c* and on a step below, to the upper end of which is fitted the block of wood *d* to be formed in a broom, which is centered and held in place by a sliding center *e* and screw *f* in manner similar to a lathe. The mandrel receives an intermittent rotary motion to turn the log the distance required for a splint at the end of each cut—that is, at the end of each return motion of the cutter—by a spur *h* on the crank-shaft *i*, which at every rotation of the said shaft pushes back a slide *j*, provided with a pin *k*, that lies in a slot in the arm of the lever *l* of a dog or hand *m*, that acts on the teeth of a spur-wheel *n* on the mandrel, so that at each rotation of the crank-shaft the mandrel is rotated the distance due to the motion given to the slide by the spur; and at the end of each entire revolution of the mandrel the axis of the mandrel must be moved toward the cutter a distance equal to the thickness of the splints intended to be cut, which is effected by an arm *o* on the mandrel, which at every revolution strikes one tooth of a wheel *p* and turns it through the distance of one tooth; and this wheel is on a screw *q*, that has its bearings in the frame and is tapped in an auxiliary frame *r*, that carries the box *c* in which the mandrel is mounted. In this way the mandrel is at the end of each series of cuts moved by an intermittent motion toward the plane of motion of the cutter as the splints are cut nearer and nearer the center of the block. The latter of these is the plan adopted in this machine.

The cutter *s*, made with a thin projecting lip *t*, is attached to or made part of a block attached to a slide *u*, that slides vertically in a recess in a horizontal slide *v*, the said horizontal slide being adapted to a groove in a cross-head *w*, similar to the cross-head of a steam-engine, which works on vertical ways *x x* by means of two connecting-rods *y y*, that take hold of cranks on the ends of the crank-

shaft before mentioned, so that at every rotation of the said crank-shaft the cutter receives a reciprocating motion up and down to cut a splint from the block. The block to which the cutter is attached is made to slide vertically by a vertical screw a' , tapped into the slide and having its bearings in the arm of the horizontal slide, and the upper end of the said screw is provided with a toothed wheel b' , which is turned at stated periods by a spur e' on a toothed wheel f' , which acts on a spring-slide a^2 , provided with a spring hand or pawl b^2 , that takes into the teeth of the wheel b' . The said wheel f' is turned the distance of one cog at each rotation of the crank-shaft by a dog or hand g' , the lever h' of which is jointed to a spring-slide i' , that is forced back at the end of the upward motion of the cross-head by passing up an inclined plane j' on the frame. This arrangement of parts is for the purpose of gradually elevating the cutter that every series of splints may be cut of less length as they approach the center of the block, that the core of the block to which all the splints remain attached may be of a conical form; or, in other words, to make every series of cuts (one series extends entirely around the block) of less length as they approach the center. For this purpose the number of cogs on the wheel f' should be equal to the number of cuts constituting a series, that the cutter may be elevated only at the end of each series. The cutter must be moved toward the axis of the block at the end of each series of cuts to feed or present the wood for another series, and this is done by means of the horizontal slide in which the cutter-slide works, the said horizontal slide being adapted to receive the threads of a screw k' , that has its bearings in the cross-head and provided with a toothed wheel l' , the cogs of which are acted upon to turn the screw and move the cutter forward by another spur m' on the front face of the toothed wheel f' , so that the cutter is moved toward the block at the same time that it is elevated; but it has been stated that the lower end of the block is moved toward the cutter at the end of each series of cuts, and that the cutter is also moved toward the block. The object of this is to make the splint thicker toward the butt than at the point, for it will be obvious that the motion of the cutter alone toward the block would make the splints of equal thickness from end to end; but if at the same time one end of the block be also moved toward the cutter then the splints at that end will be thicker than at the other, and the difference of this thickness will depend on the extent of the relative motions of the cutter and block of wood toward each other.

To the slide of the cutter is attached an arm n' , (see also horizontal section, Fig. 6,) that carries slitting-cutters o' , which cut into the surface of the wood radially to a depth equal to the thickness of a splint, so that when a splint is severed from the block by the main

cutter, the wood having been previously split by these cutters o' , each splint will be divided into several, the number depending on the number of cutters o' , and as these are above the main cutter of course the main splints will only be slit along a portion of their length, thus retaining all the strength and stiffness required near the butt, while the tips are made as fine as may be desired, and the length of the slit part may be varied at pleasure by varying the distance between the slitting and the main cutter.

The machine is operated by a belt p' from some first mover passing around the pulley q' on the crank-shaft, from which all the motions are derived.

We wish it to be distinctly understood that we do not limit ourselves to the application of the leading parts of our invention in the form above described, but claim the privilege of varying these to any extent desired so long as we retain the principle of our invention or any essential part thereof, and therefore we will exemplify how these may be varied. As, for instance, the leading part of our invention may be applied to the cutting of splints for various purposes other than brooms from a flat block instead of a round one by placing it on a carriage instead of a mandrel, the carriage being made to move by an intermittent motion to feed the block to the cutter for the cutting of each splint in succession and at the end of each series of cuts by a motion at right angles moved toward the cutter to present it for a new series of cuts; or, instead of moving the block, the cutter can receive three motions, one continuous and reciprocating in the direction of the grain of the wood, and another intermittent to present the cutter to the wood for each successive cut, and a third toward the face of the block at the end of each series of cuts to prepare for a new series.

When the machine is applied to the making of splints for purposes other than brooms, they may, if desired, be severed entirely from the block, and whether the principle of our invention be applied to the making of splint brooms or splints for other purposes the splints can be cut from a round or flat block at pleasure; but if for brooms they should be cut on a round block to avoid the necessity of attaching them to a central core or block, which may, however, be done.

The minor parts of our invention, as above described in the machine for making brooms, may be variously modified without changing the principle or mode of operation thereof—as, for instance, instead of rotating the block by an intermittent motion for each cut the cutter can be attached to a circular gate surrounding the block and made to travel thereon around the block by an intermittent motion, in which event it will be necessary to move the cutter at the end of each circuit toward the axis of the block for each new series of cuts.

Instead of moving the cutter in the direc-

tion of the grain of the wood to sever the splints, the block may be moved for this purpose; and instead of moving one end of the block toward the cutter and the cutter toward the block to make the splints thicker at the butt than at the point, this may be done by moving both ends of the block, one end more than the other, and to effect this the apparatus described above for moving one end can be applied at the other end in the same way, the motions at the two ends being so regulated in extent as to make the difference required in the thickness of the splints; or the same end may be attained by giving an alternate motion to the block, first moving one end and then the other, and giving two cutting motions of the cutter for each intermittent rotary motion of the block, so that the cut which is made after the upper end of the block is moved toward the cutter shall cut off a wedge-formed splint or shaving that the next cut after the lower end of the block has been moved shall form a splint on the block thicker at the butt than point. By this modification, however, it will be seen that one-half of the cuts are lost, although it presents the advantage of making all the splints parallel with the axis of the block, while in the other examples those cut from the inside of the block will be slightly diagonal thereto. For the purpose of making the splints shorter toward the center of the block than at the periphery, instead of moving the cutter upward the same end may be attained by moving the block down, but we deem the mode above described the best.

Having thus pointed out the nature of our

invention, the best mode of constructing and using the same, and the various modes in which the principle or character of our invention can be applied, we declare that what we claim as our invention, and desire to secure by Letters Patent, is—

1. Cutting a series of splints on or from the surface of a block of wood with a cutter by a series of cuts in the direction (or nearly so) of the grain of the wood, substantially as described, in combination with a series of intermittent motions, that the splints may be cut in succession, one after another, along the entire surface of the block, substantially as described.

2. Combining with the cutter that forms the splints on the block one or more slitting-cutters placed at the required distance from the main cutter, substantially as described, that each splint may be divided into two or more parts toward the point, as described.

3. The method of forming the splints thicker at the butt than at the point, substantially as described, by moving the block of wood toward the cutter or the block and cutter toward each other, substantially as described.

4. The method of making the splints on the block shorter as they approach the center of the block by changing the position of the block or the cutter or the range of motion of the cutter, substantially as described.

JOHN CRUM.
ABRAHAM LARWILL.

Witnesses:

HARMEN GOETSCHUIS,
JOHN HENRY GOETSCHUIS.