3 Sheets—Sheet 1.

G. W. MAHER.

Machines for Relishing the Rails of Sash, Doors and Blinds.

No. 197,646. **Patented Nov. 27, 1877.**

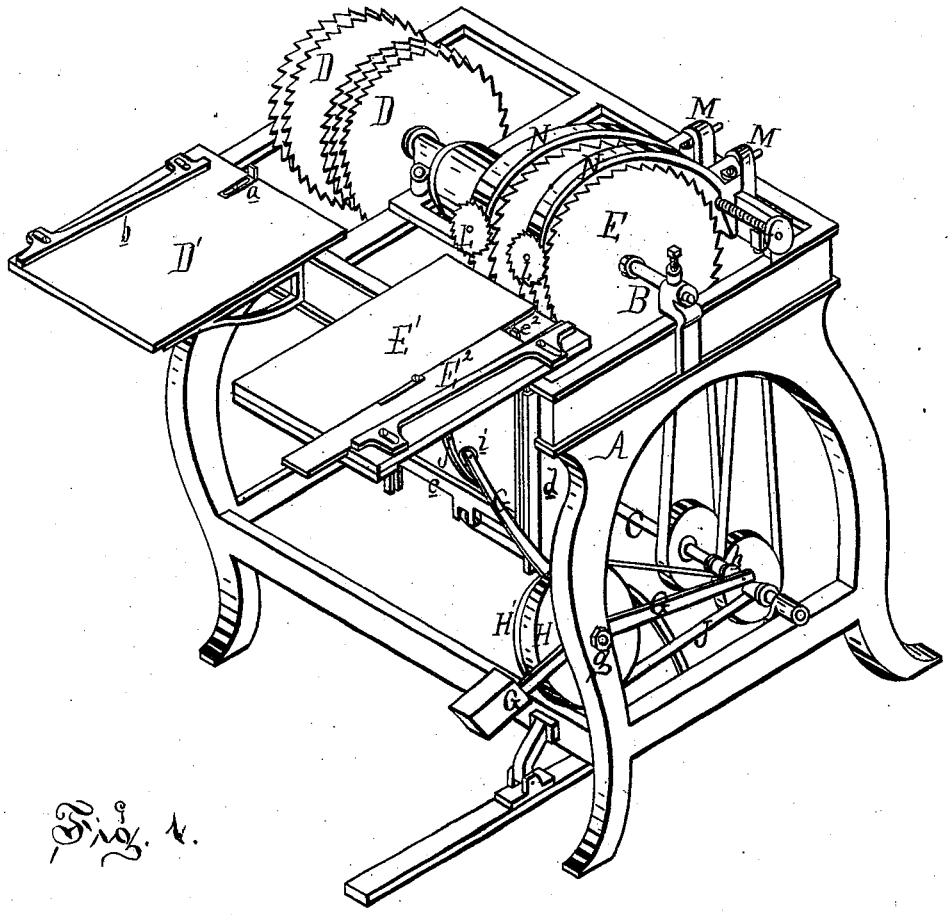


Fig. 1.

Witnesses:
H. L. Aulls
Charles J. Kunk

Inventor:
G. W. Maher
By Atty
Thos. S. Sprague

3 Sheets—Sheet 2.

G. W. MAHER.

Machines for Relishing the Rails of Sash, Doors and Blinds.

No. 197,646. Patented Nov. 27, 1877.

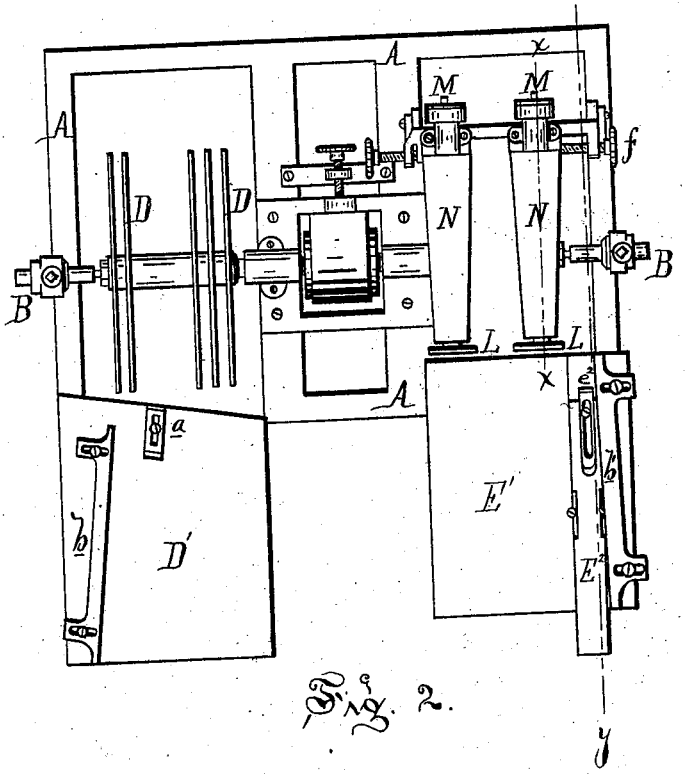


Fig. 2.

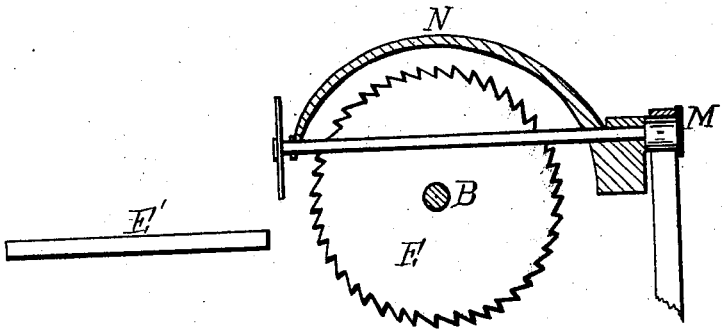


Fig. 3.

Witnesses:
H. L. Mills.
Chas. J. Hunt

Inventor:
G. W. Maher
By Atty
Thos. S. Sprague

G. W. MAHER.

Machines for Relishing the Rails of Sash, Doors and Blinds.

No. 197,646. Patented Nov. 27, 1877.

Fig. 4.

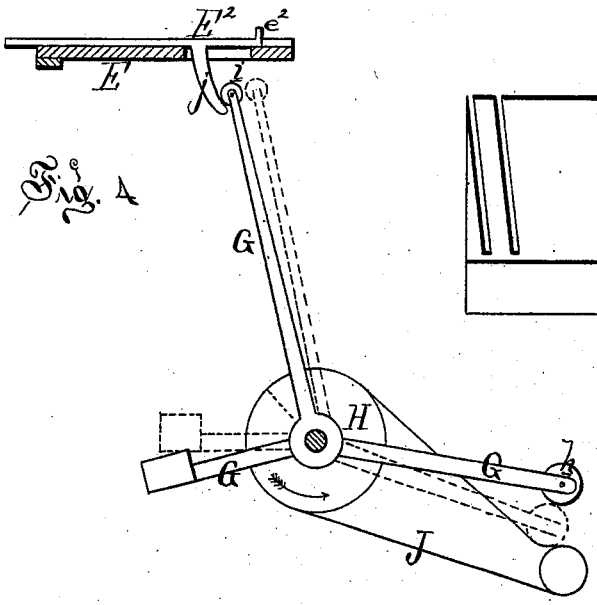


Fig. 6.

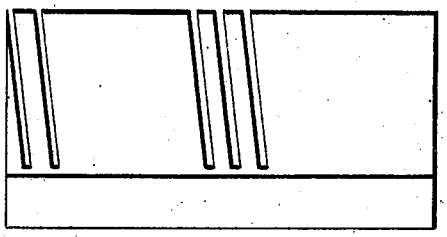


Fig. 5.

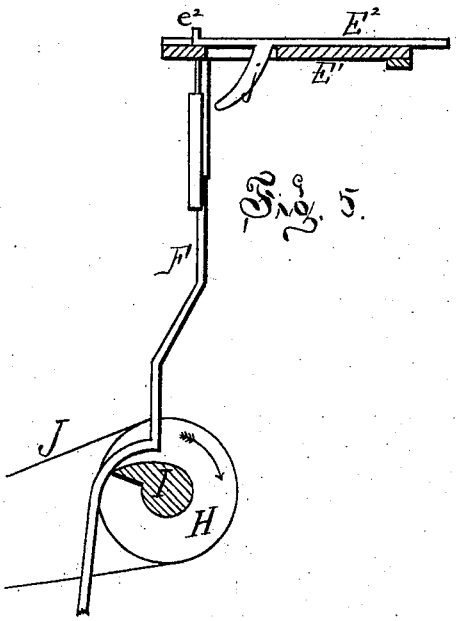


Fig. 7.

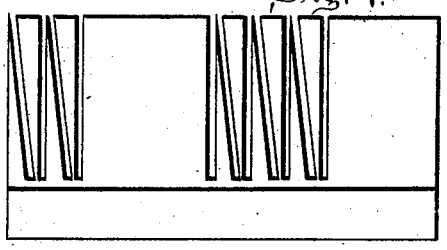
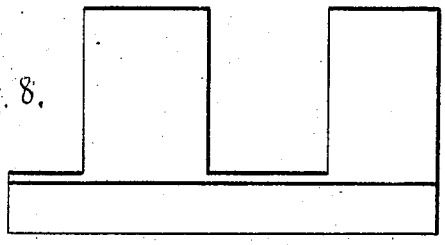


Fig. 8.



Witnesses:
H. L. Mills
Chas. J. Kinsch

Inventor:
G. W. Maher
By Atty
Thos. S. Sprague

UNITED STATES PATENT OFFICE.

GEORGE W. MAHER, OF ALBION, MICHIGAN.

IMPROVEMENT IN MACHINES FOR RELISHING THE RAILS OF SASH, DOORS, AND BLINDS.

Specification forming part of Letters Patent No. **197,646**, dated November 27, 1877; application filed July 19, 1877.

To all whom it may concern:

Be it known that I, GEORGE W. MAHER, of Albion, in the county of Calhoun and State of Michigan, have invented an Improvement in Relishing-Machines, of which the following is a specification:

The nature of my invention relates to an improvement in machines for relishing the rails of sash, doors, and blinds, and cutting the necessary wedges from the waste timber at the time the complete tenon is made; and its object is to obviate the necessity of handling the rail at each successive step in the process. This has been partially accomplished by a machine having two gangs of three circular saws each mounted on an arbor, and two saw-tables, one opposite each gang. With one gang (and with its table-gage set to an angle with the arbor) the wedge-slots could be cut, but only one of them up to the shoulder, so as to make a full-length wedge, while with the other gang the wedges would be ripped off and the parallel sides of the tenon formed, the bases of the wedges being subsequently cut off by two small overhead circular saws, whose arbors are at right angles with the main arbor. These small arbors overhung their outer bearings, and would not run steady, while the wedges and slivers would be frequently projected violently toward the attendant, to his great discomfort and danger.

My improvements upon such a machine consist, first, in placing a double gang of circular saws upon one end of the arbor, and graduating them in diameter, so that, when the end of a rail is fed angularly up to them, they will slot it up to the shoulder; secondly, in an arm extending from the back over to the front of a double gang at the other end of the main arbor, (which gangs split the wedges and form the tenon,) to support the front end of the arbor of the saw which cuts off the wedges, while it also serves as a guard for preventing the gang-saws from throwing wedges or slivers toward the operator; thirdly, in suitable devices for automatically throwing the cut-off saws into operation and raising the table, so as to bring the rail into contact with said saws.

Figure 1, Sheet 1, is a perspective view of the machine. Fig. 2, Sheet 2, is a plan or top view. Fig. 3 is a longitudinal section of an arm and guard at *x x*. Fig. 4, Sheet 3, is a vertical section at *y y*, showing in side elevation the mechanism for throwing the cut-off saws into operation. Fig. 5 is a sectional elevation of the other side of the counter-drum, showing the manner of raising the saw-table automatically by a cam on said drum. Fig. 6 is a plan of a rail end diagonally slotted. Fig. 7 is a view of it longitudinally slotted. Fig. 8 is a plan of the same, showing the wedges cut off and the tenons completed.

In the drawing, A represents the frame of the machine, having the arbor B journaled longitudinally at the top, and which is driven from a counter-shaft, C, below. On the arbor, near the left-hand end, is mounted a gang of saws, D, arranged in two groups—one of two and one of three saws—of gradually-increasing diameter. In front of these a table, D′, slides on ways, and is provided with a stop, *a*, at the front edge, and an adjustable gage, *b*, at the left side. A stop under the table arrests the forward motion of the latter. The saws are longitudinally adjustable in both groups on the arbor. The gage is adjusted into such an angle with the saws as to give the required bevel to the wedges, after which the rail is placed on the table against the gage and stop, and run into the saws until the table is arrested by the under stop cutting the diagonal slots in the tenon end of said rail, as seen in Fig. 6.

At the other end of the arbor another gang of saws, E, is mounted in two groups of two and four saws, respectively, in front of which a saw-table, E^1, has a vertical movement with a supporting-gate, *c*, in guides *d* at the front of the frame A. This table may be raised by a treadle connected with the bottom of the gate *c* through a curved rod, F; but I prefer to omit the treadle and raise the table automatically. On the right side of the table is an adjustable gage, *b′*, and next to it there is a slide, E^2, dovetailed flush into the table-top with an adjustable stop, *e*, at its front end.

The saws E are adjustable on the arbor to the size and relative position of the tenons to be formed, which is done by placing the diagonally-slotted rail end seen in Fig. 6 upon the table against the gage *b′*, and pushing forward the rail into the saws, which rip each of the

diagonal tongues into two wedges and form the parallel sides of the tenons, all the cuts extending to the rail-shoulder. The inner ends of the wedges are then cut off by two cross-cut circular saws close to the shoulder.

The cut-off saws L L are each mounted on the front end of an arbor, M, at right angles with the arbor B, and above it. One arbor is to the left of the saws E, and the other passes between the group of four, and both are journaled through the ends of segment-arms N, the rear end of each being firmly bolted to a head-block in the frame behind the saws. The arbors M are driven by quarter-turn belts from the counter-shaft C.

The arms N are longitudinally adjustable on the head-block by means of the screws *f f*. The arms pass over the tops of the saws, and serve as guards to prevent the saws from throwing wedges or slivers into the face of the operator. They are also ribbed on the under side to stiffen them, and afford a bearing for the outer ends of the arbors M, that will cause them to run true and steady at all times. By raising the table E^1 the bases of the wedges will be cut away from the shoulder.

As hereinbefore mentioned, this table can be raised by a treadle; but I prefer to do it automatically. To this end I fasten a stud, *g*, to the right front leg of the machine, and on which I sleeve at its angle a bell-crank lever, G, and journal also on said stud a pulley, H, with a guard-disk, H′, outside of it, with a cam or wiper, I, between them. A belt, J, is hung loosely around the pulley H and one on the counter-shaft. A tightener-pulley, *h*, is journaled on a stud projecting from the foot of the lever, so as to overhang the belt. Another roller, *i*, at the top of the lever, projects into the path of a thumb, *j*, pendent from the slide E^2, so that when the said slide is pushed forward by the end of the rail the tightener-pulley *h* will take up the slack of the belt J, and through it rotate the pulley H and its cam I, which, passing under a bend in the rod F, raises the gate *c* and the superposed table E^1, thereby bringing the work into contact with the cut-off saws. It will then be seen that the operator has but to handle the rail twice—once to cut the diagonal slots, and once to cut the longitudinal slots—the rest of the process being done automatically, including the making and the cutting off of the wedges.

What I claim as my invention is—

1. In a relishing-machine, the combination of two gangs of circular saws upon the same arbor, the saws in each gang regularly increasing in size, a table for each gang of saws, one table provided with guides, and adapted to present the rail diagonally to its proper gang of saws, the other table adjustable vertically, and adapted to present the rail in a right line to its proper gang of saws, and cut-off saws, all arranged upon one table, substantially as described and shown.

2. In a relishing-machine, substantially as described, the arms N, forming guards for the saws, in combination with the head-block and arbors M, substantially as and for the purpose set forth.

3. The combination, with the table E^1, of the slide E^2, thumb *j*, lever G, pulley H, cam I, belt J, tightener-pulley *h*, and rod F, for automatically raising the table E^1, substantially as described.

GEORGE W. MAHER.

Witnesses:

H. F. EBERTS,

H. S. SPRAGUE.