O. T. WILLIAMS.

Shingle-Machine.

No. 162,988. Patented May 4, 1875.

Fig. 1.

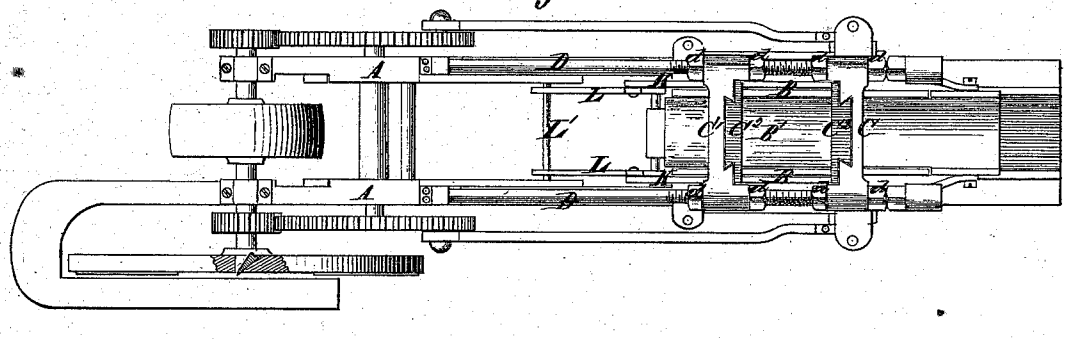


Fig. 2.

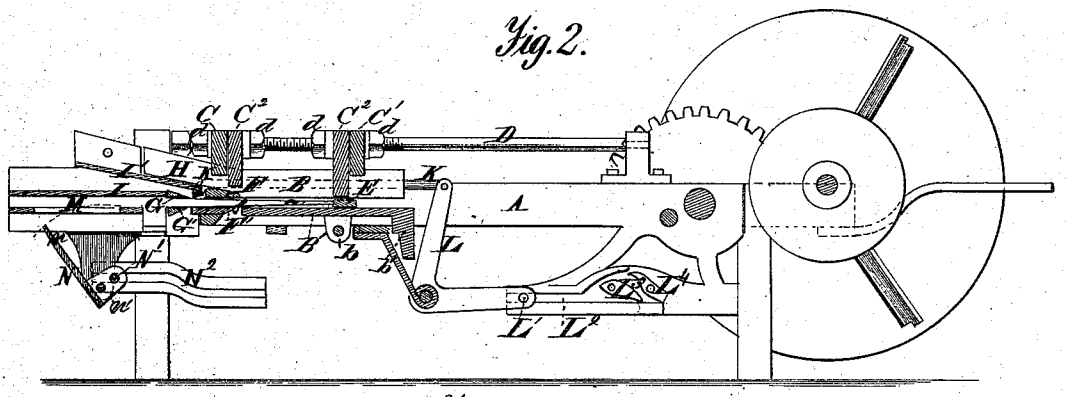


Fig. 4.

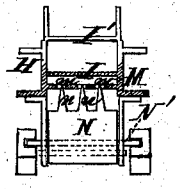


Fig. 3.

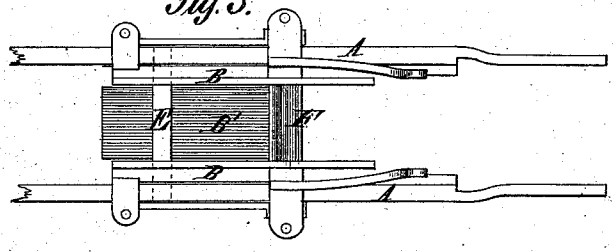


Fig. 5.

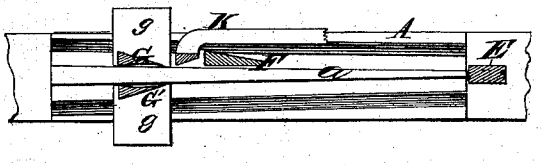


Fig. 6.

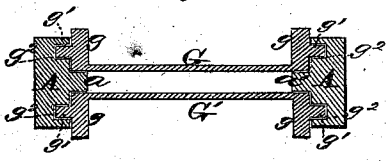
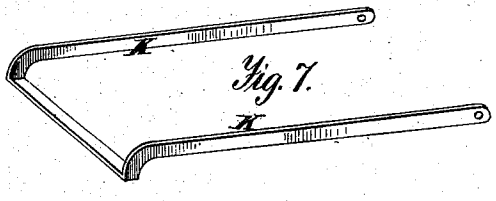


Fig. 7.



Witnesses.

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UNITED STATES PATENT OFFICE.

ORRILLIUS T. WILLIAMS, OF SMITHLAND, KENTUCKY, ASSIGNOR TO GORDON C. WILLIAMS, WILEY B. WILLIAMS, AND NORA M. WILLIAMS.

IMPROVEMENT IN SHINGLE-MACHINES.

Specification forming part of Letters Patent No. **162,988**, dated May 4, 1875; application filed February 20, 1874.

To all whom it may concern:

Be it known that I, ORRILLIUS T. WILLIAMS, of Smithland, in the county of Livingston and State of Kentucky, have invented certain Improvements in Shingle-Machines, of which the following is a specification:

The nature of my invention consists mainly in the employment of a reciprocating carriage carrying a fixed frow and knife for shaving and splitting a board of even thickness from a stick of timber, and a pair of knives which are moved toward and from each other as the carriage moves to and fro, and shape the board taken off by the frow and first knife into a shingle of proper tapering form. My invention further consists of certain hereinafter fully explained automatic mechanism for the proper discharge of the shingles and the shavings.

In the annexed drawing, Figure 1 is a plan view of my improved shingle-machine. Fig. 2 is a vertical longitudinal section of the same. Fig. 3 is a plan view of a portion of the carriage and the shears upon which the said carriage travels, exhibiting the stationary or fixed cross-bar that holds the board being split from the stick of wood. Fig. 4 is a transverse vertical section through the receiver of the carriage, exhibiting the throwing device. Fig. 5 is a longitudinal vertical section through the tapering knives, frow, and push-bar, showing the inner side of one of the shears having the converging way, there being two used in the machine to form the pattern. Fig. 6 is a vertical transverse section of the tapering knives and the shears. Fig. 7 is a perspective view of the push-bar, detached from the machine.

The same letters of reference are used in all the figures in the designation of identical parts.

The several working parts of the machine are mounted on a suitable frame-work, combining, in its construction, the shears A, upon which the carriage B moves, being reciprocated through the medium of crank and connecting-rods driven by gearing, in the manner clearly shown. The sticks or blocks of timber to be worked up into shingles are placed between the slides C^2 of the adjustable cross-heads C and C^1, which are supported in an elevated position over the carriage by fixed parallel and horizontally-arranged rods D. The cross-heads, after proper adjustment with reference to the length of the sticks of timber, are held in place rigidly by nuts *d* on the screw-threaded portions of the rods D. The sticks of timber feed down by their own gravity, being arrested by the bottom plates B′ of the carriage, and the adjustment of the cross-head C should be such that the end of the stick abutting on its slide C^2 will be in line with the forward edge of the fixed cross-bar E, which extends from one shear to the other across the bottom plate of the carriage, and toward which the knives travel in splitting and shaving the shingles. This cross-bar E thus forms an abutment, giving the proper end support to the stick directly in line with the path of the knives and the frow, which frow and one of the said knives pass beyond it, above and below, respectively, while the two remaining knives bring up against its edge. The frow F and the knife F^1, placed below and parallel therewith, are fixed to the carriage, the frow—which merely splits a board from the under side of the stick—being arranged slightly in advance of the said knife, which has a sharp edge to take a shaving or the unevenness from the bottom of the stick.

To permit the discharge or escape of the shaving thus cut through between this knife and the bottom plate of the carriage, a transverse space or opening, *f*, is provided at this juncture. The said bottom plate of the carriage is hung on a hinge, *b*, so arranged with reference to the fixed cross-bar E, that at the full return-stroke of the carriage the hinge will, in practice, be back of the cross-bar. The object of hinging the said bottom plate is to enable it to tilt or yield downwardly, for the purpose hereinafter explained. The bottom plate of the carriage is caused to yield or tilt downwardly by the action of the frow F upon the board being split from the block or stick of wood, to permit the latter to pass below and be cut by the knife F′, and also to enlarge the space or opening between such knife and bottom plate, to make room for the

exit of any extra thickness of shaving or unevenness of surface that may be cut from the stick or block of wood. The said bottom plate is returned to its horizontal position by means of a weight, b', in which position it is held sufficiently long to properly support the stick or block of timber before the frow and knife begin to operate upon it at each forward movement. After that the stick is held by the action of the frow and knives pressing it forcibly against the cross-bar E, so that the bottom plate can then be tilted, as stated, without detriment to the operation of the machine.

The shaping-knives G G′, which are provided at their ends with right-angular plates or bars $g\ g$, having projections or lugs $g^1\ g^1$ fitting or entering grooves or channels g^2 in the inner sides of the shears, are guided in their movements by ways $a\ a'$, they being brought in contact therewith, and the grooves $g^2\ g^2$, in which they travel, made to conform in shape to that of the said ways, which may be converging, curved, or parallel, or of other shape to form the pattern for the article to be made.

The pattern, in practice, is permanently fastened to the inner sides of the shears, and is made of steel. These knives are slightly concaved and are arranged, in rear of the frow F and knife F′, between the carriage B and the receiver H, by which they, the said knives, are confined in place, so that they will be prevented from having independent longitudinal motion. The shaving cut by the lower shaping-knife is discharged by its own gravity underneath the machine. The shaving cut by the upper shaping-knife passes over said knife onto the plate I, underneath the covering-plate I′ of the receiver H, and is properly cleared from the knife during the return of the carriage and receiver by a push-bar, K, which is attached thereto, but has imparted to it a limited independent reciprocating motion, during each return stroke. It has the form of a yoke, and, when at rest, its cross-bar extends across the carriage just in advance of the upper shaping-knife. As this cuts off the shaving, at which time the carriage has completed its forward stroke, the said cross-bar drops slightly, it being free to move to a limited extent up and down, so as to bring it directly opposite, the butt end of the shaving being thus cut. The arms or rods of this push-bar are respectively pivoted to the vertical arms of the bell-cranks L, fulcrumed on the carriage. The ends of the horizontal arms of these bell-cranks are connected by a rod, L^1, the projecting ends of which extend into and travel in ways or grooves L^2 in the frame. During the forward stroke of the carriage the rod L^1 moves along horizontally, passing, near the end of the stroke, under and beyond the automatic switches L^3, which, as the rod escapes from under them, are thrown down by the inclines L^4.

On the return stroke of the carriage and its adjuncts, the ends of the rod L^1 are forced to travel over the curved back of the switches, whereby the bell-cranks are operated, so as to give a limited reciprocation to the yoke, which, in turn, strikes the end of the shaving and pushes it back off of the knife, and then returns to its original position. These shavings pass out over the end of the receiver. The shingles are received in the gutter M of the receiver, from which they are discharged by means of an oscillating fork, N, the prongs n of which play through slots m in the gutter. The fork is pivoted to downwardly-projecting arms of the receiver H, and carries in angular ears n' a rod, N′, the projecting ends of which travel in cam-grooves N^2 in the rear standards of the frame, through which means the fork is oscillated at the proper times, during which movement the prongs n rise through the gutter and take hold of the shingle therein. As the shaping-knives cut close up to the fixed cross-bar E it is advisable to cover or furnish the edge of the latter with soft metal, so that the knives may not be dulled in case a contact results. The plate I′ has an inclination equal to that of the upper surface of the splitting-frow F, of which it is a continuation and with which it is flush. It passes between the board being split by the frow F and the main body of the stick of timber, and by bearing the latter up, by reason of its inclination, facilitates the action of the splitting-frow.

Although I have stated that this machine is for forming tapering or convergent shaped articles of wood, as shingles, still it can be used in forming curved and parallel or other desired shaped surfaces, such as barrel heads and staves and the like, by substituting in lieu of the ways shown those of the required shape.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The fixed frow F and knife F′, in combination with the shaping-knives G G′, which, besides their traversing motion, move toward and from each other, substantially as and for the purpose set forth.

2. The fixed frow F and knife F^1 and shaping-knives G and G′, in combination with the fixed immovable cross-bar E, armed with soft metal, substantially as specified.

3. The knife F′, in combination with the tilting or yielding bottom plate B′ of the carriage, substantially as specified.

4. The shaping-knife G, in combination with the push-bar K, substantially as specified.

5. The combination of the push-bar K, bell-cranks L, fulcrumed on carriage B, connecting-rod L^1, grooves L^2, and automatic switches L^3, substantially as specified.

6. The receiver H, provided with a gutter, M, for the reception of the shingles and plate I, over which the top shaving passes, substantially as specified.

7. The combination of the fork N *n n' n'*, rod N', reciprocating receiver H, and cam-grooves N^2, substantially as specified.

8. The combination of the adjustable cross-heads C C', carriage B, and cross-bar E, substantially as specified.

In testimony whereof I have hereunto signed my name in presence of two subscribing witnesses.

O. T. WILLIAMS.

Witnesses:
JOS. R. EDSON,
J. W. MISTER.