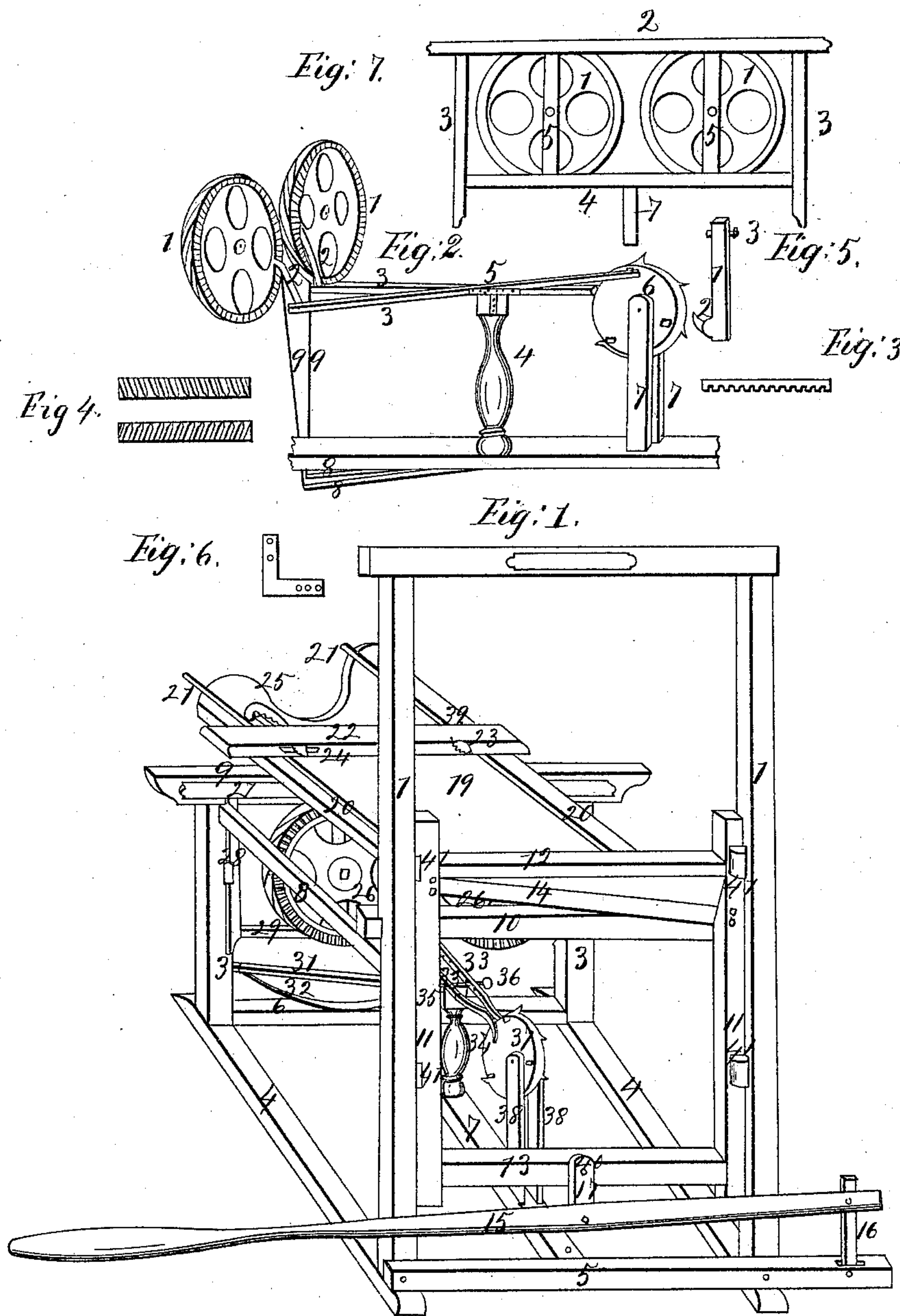


*A. H. Hart,*  
*Cutting Shingles,*  
*No. 2,782,* *Patented Sep. 17, 1842.*





# UNITED STATES PATENT OFFICE.

A. H. HART, OF CHAGRIN FALLS, OHIO.

## MACHINE FOR CUTTING SHINGLES.

Specification of Letters Patent No. 2,782, dated September 17, 1842.

*To all whom it may concern:*

Be it known that I, ALEXANDER H. HART, of Chagrin Falls, Cuyahoga county, and State of Ohio, have invented a new and useful Machine for Making Shingles; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Plate 1, is a perspective view and plates 2, 3, 4, 5, 6 and 7 sectional representations to be hereafter described.

To enable others to make and use this machine, I proceed to give a description of its construction and use.

Two posts, about  $5\frac{1}{2}$  feet high, (1, 1, Pl. 1,) and about 2 feet apart occupy the front part of the machine, and within these the sash plays that carries the knife. They are connected at the top by a piece of timber of the same size into which they are framed, (2, Pl. 1.) About 16 inches back of these, are 2 shorter posts about 25 inches high from shoulder to shoulder as shown at 3, 3, Pl. 1. These 4 posts are framed into 2 sills which run from the high to the short posts, and on these sills the whole machine rests. They are seen at 4, 4, Pl. 1. They also extend out in front of the high posts far enough to admit a cross sill to rest on the ends. The cross sill may be seen at 5, plate 1, extending transversely from one sill to the other in front of the foot of the high posts. It is boxed a little way into the posts, while the sills are boxed a little way into it. It reaches to the right of the right hand post about 1 foot. The short posts are connected at the bottom by a girt, which I shall call the bottom girt (6, Pl. 1.) This bottom girt is connected with the cross sill by another piece extending from the middle of one to the middle of the other and framed into them. This I shall call the middle bottom piece. It is represented at 7, Plate 1. The short posts at the top are connected with the high posts at the same height, by girts, one of which may be seen at 8, Pl. 1. On the top of the short posts is framed a plate seen at 9, Pl. 1. Just back of the high posts boxed a little way into them, and just above the 2 girts, so that it rests on them, is a beam so wide up and down that the top of it shall be about 1 inch higher than the top of the plate 9. This beam is shown at 10 Pl. 1. The sash plays in front of this, and the

knife at the lowest depression of the sash comes a little down in front of it, so as to clear the shingles from the block.

The sash is composed of 4 pieces framed together in form nearly square. The side pieces are seen at 11, 11. The top piece at 12, and the bottom pin at 13, Plate 1. The top piece is cut beveling from the middle of the front side to the lower edge of the back side, and the lower edge slopes downward from the left to the right, as does also the edge of the knife. The knife is made of a thin steel plate, is bolted firmly at the ends to the inside surface of the side pieces of the sash, and the edge comes about  $2\frac{1}{2}$  inches below the top piece of the sash. The knife sets the whole thickness of it into the sash. Then the shingle when cut is borne away at the upper side by the beveling form of the top piece. The knife is seen at 14 Plate 1. The sash is worked by means of a lever (15, Pl. 1,) the fulcrum of which is an iron bar which rises from the projecting end of the cross sill. The lower end of the iron bar sets into a mortise made nearly through the cross sill and is fastened there by a pin, the mortise being made sufficiently long to permit the bar to turn upon the pin a little to the right and left. The lever is attached to the upper end of the bar by a pin, forming a joint there also. This bar, or fulcrum is shown at 16 Plate 1. The lever is attached to the middle of the bottom piece of the sash as follows: A small iron is fastened to the front face of the bottom piece at the middle, extending from the top a little below the bottom, and through the lower end of this iron passes a bolt that fastens the lever, a nut being screwed on the forward end of this bolt and the other end of it held by a staple driven into the under side of the bottom piece of the sash. The iron at the top is fastened to the bottom piece of the sash by a bolt that runs through the bottom piece and holds a stirrup on the other side to be hereafter described. The iron to which the lever is attached may be seen at 17 Pl. 1; the bolt that fastens the lever to it, and the nut on the end of this bolt at 18 Pl. 1, and the bolt that confines the iron and the stirrup at 40 Pl. 1. The sash may be kept in its place by pins driven into the posts for this purpose as at 41, 41, 41, 41, Pl. 1, or in any other way that best suits the maker.

The table for the block to rest on to be cut, is constructed thus. Take a board,  $1\frac{1}{2}$



in. thick, mortise one end into the back of the beam, the upper surface coinciding with the upper surface of the beam, the other end of the board lying over on the plate, screwed onto it, and the plate being boxed about  $\frac{1}{8}$  of an inch into the board. This board must be  $11\frac{3}{4}$  inches wide. On the sides of the board,  $1\frac{1}{4}$  inches from it are two strips, (or side pieces,) of the same thickness, and length as the board and fastened to the beam and plate in the same manner as the board. The board is represented at 19, pl. 1, and the side strip at 20, 20, pl. 1.

That part of the machine which I have thus far described, I do not claim as original, and have only described it as it is connected with the feeding part of the machine, which is new, for which I desire a patent and which I am now about to describe.

I construct a carriage to move from the block to be cut, as follows. Two slides are made to fit the spaces left between the board and the side strips; the sides being 1 in. thick, rabbeted on the upper edges leaving the lower edges to fit grooves made for the purpose in the board and side strips, and making the upper surface of the slides coincide with that of the board and side strips. See the slides at 21, 21, pl. 1. On the bottom of each slide is screwed a rack, of the same length as the slide, the teeth of which run obliquely across it, those on the left rack inclining backward from the right to the left edge of the rack, and those on the right hand rack inclining backward from the left to the right edge of the rack. The teeth on each rack, are pointed on the ends that are directed toward the other rack, in manner as represented at plate 4, where the 2 racks may be seen in the position which they occupy in respect to each other. A side view of one of the racks is seen at pl. 3. The center of the slides are just 13 inches apart, being directly over the center of the two screw wheels that move them. A head-block is attached to these slides lying a little way over the forward end of them, and extending in length a little beyond the outer edge of the side strips. It may be seen at 22, pl. 1. It is fastened to the slides by means of 2 irons in the shape of an L, or carpenter's square, the 2 arms being of equal length, (pl. 6,) one arm being riveted firmly to the side on the top, and the other extending toward the end of the head block and screwed to the under side of it by a single screw for each L, the screw being near the end, and 2 holes being left, so that by moving the screw from one hole to the other, *i. e.*, to a greater or less distance from the end of the L, more or less difference may be made in the thickness of the 2 ends of the shingles. The L's turn on the screws so

that the head-block may turn without cramping the sides. The L's are sunk into the head block the thickness of them.

In the front of the head-block, near one end, is a stationary dog, which holds one end of the shingle block; near the other end a movable dog passes through a mortise from the front to the back side of the head-block running back about 6 inches and turns upon a pin that passes down through it; the mortise being made sufficiently long for the dog to turn to the right and left. When this dog is driven into the shingle block, it is held in its place by a catch, screwed on the back side of the head block, having notches on the under side, so that by turning it over onto the dog, the notches catching onto it hold it in its place. The stationary dog is seen in front of the head-block at 23, the movable one at 24, and the catch at 25, pl. 1. There is a pin in the top of each side strip of the table, just over the forward edge of the plate, to stop the carriage when it is moved backward. One of these seen at 39, pl. 1.

For moving the carriage forward, two cast iron screw-wheels are employed, each 12 inches in diameter, including the threads on the edge, a rim, of which there are 6 on each wheel; the threads running obliquely across the rim, commencing, on the right wheel, at the inner face of the wheel, and running toward the right terminate at the outer or back face; and, on the left wheel, commencing at the inner face, and running toward the left, terminate at the outer face. The threads are square threads about  $\frac{3}{8}$  of an in. in size pointed at the ends, each one terminating just after the next commences. The object of pointing the teeth of the rack and the threads of the wheels is that they may not catch against each other when the wheels are thrown into gear while in motion. Around the inner, or front face of the wheels, near the edge is a rim, in which teeth are made, somewhat resembling the teeth of a saw, the square edge, turning downward on the left of the right wheel, and contrariwise on the other wheel. Both wheels are shown at 26, 26, pl. 1, and both at 1, 1, pl. 2, as well as a back view of both as placed in the perpendicular carriage at 1, 1, pl. 7.

For the purpose of ungearing the wheels, or lowering them away from the racks, they are attached to the perpendicular carriage just mentioned, the construction of which is as follows: A top piece lies just forward of the plate that rests on the top of the short posts. It lies transversely across the girts extending each way a little beyond them. Into the under side of this top piece, just within the girts are framed 2 end pieces, and a bottom piece joins the two lower ends of these. Then, between



these end pieces, are two posts, joining the top and bottom pieces. The centers of these posts are just 13 inches apart, and the shafts of the screw wheels pass through the middle of these posts, so that the wheels turn directly in front of this perpendicular carriage. From the center of the bottom piece, passes downward through a hole made for the purpose in the back end of the middle bottom piece of the machine, a post, so that it works up and down in this hole. Then, to move this carriage, a lever is attached to it, the fulcrum end being fastened by a pin on which it turns, to a short post rising from the bottom girt, a little one side of the middle. A pin then unites it to the last described post, which the other end works up and down in a long mortise cut in the side of one of the short posts at the bottom, or, just about the bottom girt. A steel spring has one end screwed on the top of the bottom girt, directly at the middle, and curving around upward, at the other end holds the end of the lever up near the top of the mortise. When the upper carriage is to be drawn back for the reception of a new block, ungear the wheels, by pressing down with the foot upon the end of the lever. The top piece of the perpendicular carriage is seen at 27, pl. 1, and 2, pl. 7. One of the end pieces at 28 pl. 1, and both at 3, 3, pl. 7, the bottom piece at 29, pl. 1, and 4, pl. 7, and the 2 posts in which the wheels are placed, at 5, 5, pl. 7. The post to which the lever is attached at 7, pl. 7, the lever at 31, and the spring at 32 pl. 1.

The wheels are turned by means of two dogs which work alternately upward; the right hand one striking the teeth of the right wheel turns it upward toward the right; then the left hand one striking the teeth of the left wheel, turns that upward toward the left. The dogs are represented at 2, 2, pl. 2. They are of cast iron, sharpened nearly to an edge at the upper end and bending a little backward so as readily to strike into the teeth of the wheels. They are so placed as to strike the wheels upward, on the sides that are turned toward each other. The lower ends of the dogs are united to two cast iron levers, each about  $8\frac{1}{2}$  inches long, lying nearly horizontally, though inclining a little downward on the back end when they are united to the dogs, by rivets so as to turn freely on them. The levers are shown at 33, 33 pl. 1, and at 3, 3 pl. 2. They are supported at the fulcrum in the middle by an in. pin, which runs through them both, and confines them to two irons, shaped like a T, one fastened on the right, and the other on the left of a wooden pillar, one foot high, which sets into the middle bottom piece, a little back of the center. The bottom part of the T

is riveted firmly to the pillar, while the top part rises above the pillar, the levers being on the inside, and setting each into a notch cut in the top part of the pillar for the purpose. The T has several holes lying along the length of the top part, in a horizontal line; the holes being also made through the lever so that the pin may be moved from one to another, thus varying the place of the fulcrum; and, by this means, varying the thickness of the shingles.

The pillar is represented at 34 pl. 1, and at 4, pl. 2. The T's at 35, pl. 1, and at 5, pl. 2; and the pin at 36, pl. 1. The levers are moved by a wheel that I shall call the tooth wheel; of cast iron,  $\frac{3}{4}$  in. thick, and 5 in. in diameter, including teeth which are about  $\frac{1}{2}$  inch. There are 6 teeth, at equal distances apart, running square across the edge or rim of the wheel.

The teeth in shape somewhat resemble saw-teeth, being square down toward the center of the wheel on one side, and slantwise on the other. This wheel is in such position that the edge of it moves between the forward ends of the cast-iron levers, these ends inclining toward each other, so as just to touch the sides of the wheel. On the sides of the wheel near the edge, are 6 pins, 3 on each side, directly against the teeth, so adjusted that the three on one side stand one against every other tooth, and the three on the other side against the intermediate teeth. Being thus arranged, at one elevation of the main lever, by which the machine is worked, a pin on one side strikes one of the cast iron levers and at the next elevation, a pin on the other side strikes the other lever, and as the wheel turns the end of the lever slips down past the pin. The shaft of this tooth wheel is set in 2 standards, one on each side of the wheel, which are mortised into the middle bottom piece. The tooth-wheel may be seen at 37 pl. 1, and at 6 pl. 2. The standards at 38, 38, pl. 1, and 7, 7, plate 2.

To turn the tooth wheel a stirrup is fastened to the bottom piece of the sash, on the inside at the middle, setting a little into it and extending a little below it, having a foot, or dog, fastened to the bottom part, by a rivet on which it turns upward, but being square at the lower corner so as not to turn downward below a horizontal position. This foot comes to an edge at the toe, slanting thence to the heel on the under side. The stirrup is confined by the same bolt that fastens the iron on the front side of the sash to which the lever is attached. The stirrup can be raised or lowered at pleasure, as may be necessary. A side view of the stirrup may be seen at 1, pl. 5, the foot at 2, and the bolt at 3, pl. 5, all nearly in the position which they occupy in reference to the tooth wheel at 6, pl. 2. Now, when the sash is raised by the main lever, the toe of this



foot strikes one of the teeth of the tooth-wheel and turns the wheel backward. Then, when the lever is depressed, the foot by turning upward on the rivet, passes down 5 below the next tooth, and so on. This motion of the tooth wheel communicates a motion alternately to the two metallic levers which are connected with the dogs that move the screw wheels, and thus the carriage that 10 carries forward the shingle block is borne forward, first shoving one end of the block the farthest and then the other, alternately. This takes the thickest end of the shingle first from one end of the block and then 15 from the other and so on.

As soon as one of the metallic levers has passed the pin that moves it, it is instantly drawn back to its former position by a steel spring joined by a cord or wire to the dog 20 that is connected with that lever, the cord or wire passing down from the dog through a hole in the forward part of the middle bottom piece, to the end of the spring. There is one spring for each dog, fastened firmly at 25 one end to the under side of the middle bottom piece at the middle, while the other end,

to which the cord or wire is attached, curves downward and is directly under the dog, which, together with its lever, it is intended to pull back to its place. The springs are of 30 sufficient strength, suddenly to bring back the levers when they have passed the pins of the tooth wheel. They may be seen at 8, 8, and the cords at 9, 9, pl. 2.

In order to prepare the shingle block for 35 cutting with this machine, let the block be seamed as in the ordinary machine for cutting shingles.

What I claim as my invention and desire to secure by Letters Patent, is: 40

The combination of the lever, stirrup and foot, tooth wheel, metallic levers and upper and lower carriages for the purpose of feeding the machine in the manner described. 45 The construction of these parts or the combination of the screw wheels and racks, the tooth wheel and foot, or of any other parts separately, is not claimed.

A. H. HART.

Witnesses:

L. D. WILLIAMS,  
SEVENUS BURNET.