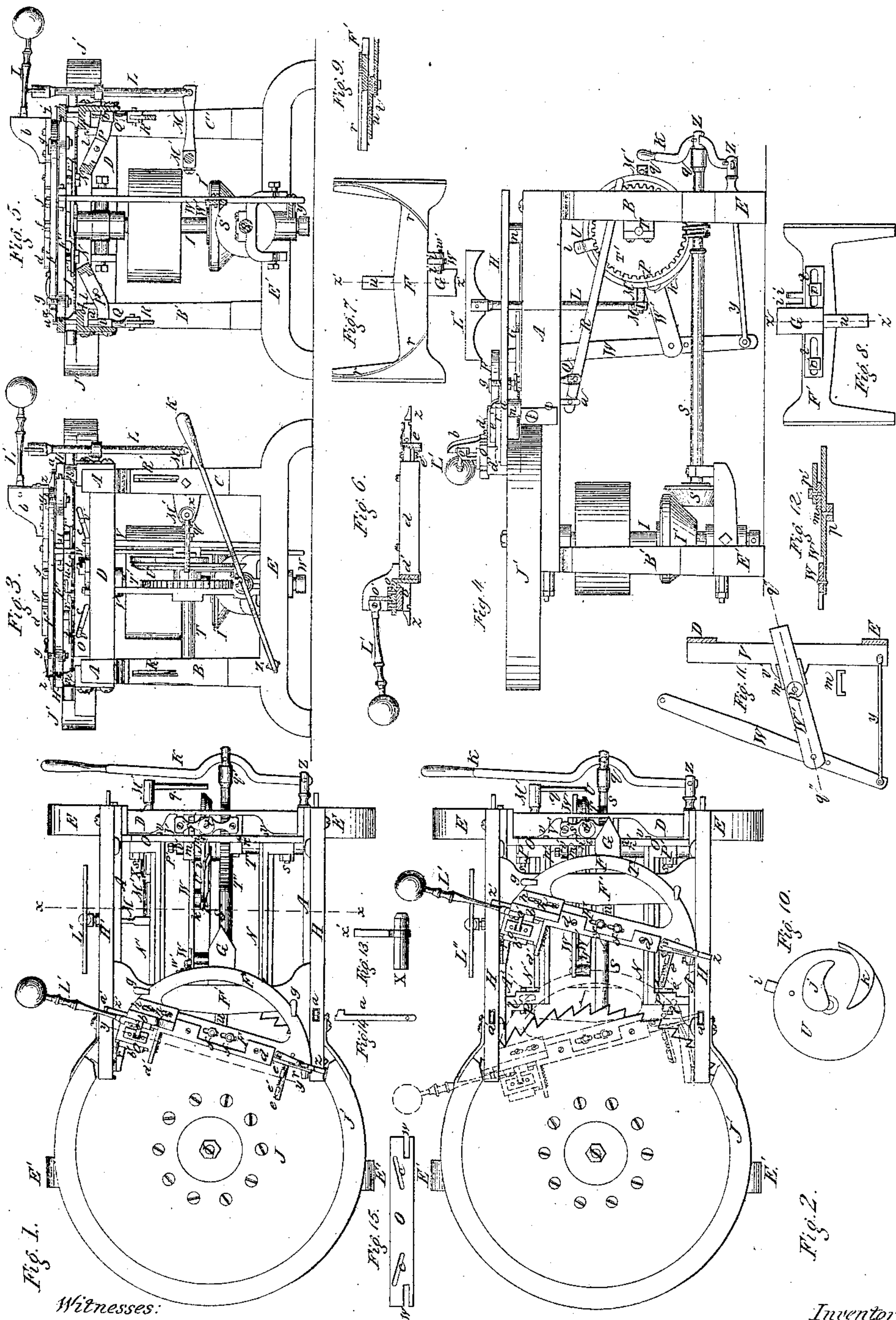


Dyer & Cummings,
Sawing Shingles,

No 27,534,

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Witnesses:
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UNITED STATES PATENT OFFICE.

CALEB M. DYER AND D. M. CUMMINGS, OF ENFIELD, NEW HAMPSHIRE.

SHINGLE-MACHINE.

Specification of Letters Patent No. 27,534, dated March 20, 1860.

To all whom it may concern:

Be it known that we, CALEB M. DYER and D. M. CUMMINGS, of Enfield, in the county of Grafton and State of New Hampshire, have invented a new and improved Shingle-Machine; and we do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

Figures 1, and 2, are top views of our improved shingle machine, representing the respective parts thereof in different positions; Fig. 3, is an end elevation of said machine; Fig. 4, a side view of the same; Fig. 5, a section in the line x, x , of Fig. 1; Fig. 6, a section in the line y, y , of Fig. 1; Figs. 7, and 8, top and bottom views of the carriage F' , detached from the machine; Fig. 9, a section in the line z, z , of Figs. 7, and 8; and the remaining figures represent other detached portions of said machine.

The frame which supports the respective parts of our improved shingle machine, is composed of the upright and horizontal pieces which are indicated in the drawings by the letters $A, A', B, B', C, C', D, D', E, E', H, H'$, and V, V' .

The most essential feature of our improved shingle machine, is the arrangement of parts which enables a block of wood to be presented to the teeth of the circular saw in said machine, in such a manner that the cutting action of said saw will be in a direction parallel with the grain of the wood at the butt end of the shingle, and then to be gradually turned upon its axis, as it is carried forward, to such an extent that the saw will be enabled to continue to act nearly in a line parallel to the grain thereof for the entire length of the shingle-block; and by so doing, the surfaces of each of the shingles formed by said process, will be as smooth as if formed by a drawing-knife.

The circular saw J , is firmly and securely combined with the upper end of the vertical shaft I ; and the shaft I , is supported in journal-boxes which are secured to the frame of the machine in any suitable manner.

Projecting tongues on the outer ends of the carriage F' , are received into guiding grooves in the inner edges of the ways H, H' , which ways are elevated a short distance above the side-pieces A, A' , of the frame of

the machine by the blocks n, n , and are securely united thereto by means of screw-bolts, or other suitable devices. The sector-shaped frame F , whose attachments securely hold a block of wood, while it is being operated upon by the saw, rests upon the sector-shaped tongue r , which rises from the upper surface of the carriage F' ; the said tongue r , is received into a groove in the under surface of the said frame (F), and guides the same in its axial movements. The sector-shaped frame F , is prevented from being lifted off from its guiding-tongue r , by the heads of the screws g, g , whose shanks are received into screw-apertures in the carriage F' .

The block of wood to be operated upon, is placed between the heads e , and d' , which project from the face of the frame F , and the weight of said block, before it is seized by the aforesaid teeth of e , and d' , rests upon the movable bearers N, N' . The aforesaid head e , of the frame F , has a series of inwardly projecting teeth at the lower edge thereof, and a couple of springs (more or less) are secured to the face of said head substantially as shown in the drawings; which springs, must be sufficiently powerful to force a block of wood off from the teeth of the head e , whenever the opposite end of the block is relieved from pressure. The head d' , of the frame F , projects from the angular plate d , which is bolted to the chord of the frame F , in such a manner that its position can be varied to suit the various lengths of the blocks of wood to be operated upon. The movable teeth which pass under the head d' , of the frame F , project from the angular-shaped tooth-head o , whose horizontal portion works in a dovetail groove in the offset b' , of the fulcrum-head b , which head is bolted to the right-hand end of the aforesaid sector-shaped frame F , of the block holder, by means of the screw-bolts h, h .

A socket in the upper face of the tooth-head o , receives a vertical projection from the short arm o' , of the weighted lever L' ; which lever is pivoted to the side of the vertical portion of the fulcrum-head b , substantially in the manner shown in the drawings. The weight at the outer end of the lever L' , must be of sufficient gravity to not only drive the teeth of the tooth-head o ,

into the end of the shingle-block, but also to drive forward the said block with sufficient force to overcome the action of the springs e', e' , at the opposite end of the same and bury the teeth of the holding head e , into that end of the said block.

The horizontal bearers N, N' , referred to above, are jointed to the supporting frame of the machine, and also to certain other parts of the machine, in such a manner that the desired automatic movements will be imparted to a shingle-block, after it has been once placed in its proper position upon the said bearers.

Arms P, P , and P', P' , project laterally from the ends of the bearers N, N' , as shown in Figs. 2, and 5; the curved arms P, P , which project from the after ends of said bearers, being about double the length of the straight arms P', P' , which project from the front ends of the same. The pivot pins which pass through apertures formed in the central portion of each of the said arms P, P , are received into apertures in the ears l, l , which project inwardly from opposite sides A, A' , of the frame of the machine. The pivot pins s, s , which project rearwardly from the front portion D , of the supporting frame, first pass through the horizontal slits w, w , in the sliding plate O , (see Fig. 15,) and then through apertures in the arms P', P' , of the bearers N, N' . The pivot pins v, v , which project from the front ends of the bearers N, N' , pass into the oblique slots c, c , in the said sliding plate O . Stop-plates a, a , (whose shape is shown by Fig. 14,) pass vertically through guiding apertures in the ways H, H' , and in the sides A, A' , of the frame of the machine, in the positions shown in Fig. 4. The lower ends of said stop-plates are jointed to the after ends of the levers R, R' , whose forward ends are received into elongated vertical slots in the posts B, C , of the frame of the machine. Near to the after ends of the aforesaid levers R, R' , a jointed connection is effected between the said levers and the outer ends of the arms P, P , of the bearers N, N' , by means of the vertically descending bridle-pieces Q, Q' ; the object of which connection will be hereinafter fully explained.

The pointed flat-plate G , its tongue u , and the doubly slotted plate t , which are rigidly combined with each other, and whose shape is clearly shown in the drawings, are connected to the under side of the carriage F' , by means of the screw bolts r', r' , in such a manner that free lateral movements can be imparted to the said connected plates. The tongue u , of the aforesaid plate G , passes between the descending lower ends of the two bolts f, f , whose heads are secured in slots in the straight side of the sector-shaped frame F , of the block-holder, by means of screw-nuts. It will therefore be perceived that

the shifting of the block-holder F , from the position shown in Fig. 1, to the position indicated by the red ink outline of said block-holder in Fig. 2, will cause the aforesaid bolts f, f , to impart a considerable degree of lateral movement to the said plate G . At about equal distances from the center of the upper edge of the sliding plate O , small vertical rollers n', n' , are connected thereto by means of set-screws, the distance between the said rollers being a little greater than the width of the plate G .

The interior uprights V, V' , in the front ends of the frame of the machine, and which are securely united to the transverse end pieces D, E , of said frame, serve various purposes in connection with the parts of our improved shingle machine, which are yet to be described. The head of the vibrating plate Y , is received between the lower ends of the said uprights, and is jointed thereto, (or to the cross-piece E ,) in any suitable manner: the vibrating end of the plate Y , is jointed to the lower end of the lever W , whose upper end is jointed to the carriage F' , by means of the ears z', z' , and the joint-pin w' ,—or by any other suitable means. A short grooved head m , is pivoted to the offset v' , of the upright V' , by means of the pin p' (Figs. 1 and 2,) which head receives into its guiding groove the oblong plate W , whose after end is jointed to the lever W .

The roller p , which works freely upon a projecting pivot from the side of the oblong plate W , is alternately operated upon by the cams j, k , on the face of the wheel U ; the cam j , imparting a forward movement to the carriage F' , through the medium of the oblong plate W , and the lever W ; and the cam k , imparting a reverse movement to said carriage, by the same means. The shape of the said cams j , and k , by which they are enabled to exert a pressing and a drawing action upon the roller p , is clearly represented by Fig. 10. The aforesaid wheel U , is securely united to the extreme inner end of the shaft T , whose journal-boxes are combined with the uprights B, V , of the frame of the machine.

The toothed-wheel T' , on the shaft T , gears into the threads of the endless screw-block l' , on the shaft S ;—and motion is communicated from the saw-shaft I , to the shaft S , through the medium of a broad faced beveled friction-wheel I' , on the former, acting against the periphery of a narrower faced friction-wheel S' , on the latter, as shown in Fig. 4.

The shaft S , has elongated journals, which enable it to be freely moved, in a longitudinal direction, through its journal-boxes, and also through the screw-block l' , to any desired extent. The hand-lever K , which is pivoted to the sleeve q' , on the outer end of the shaft S , and whose fulcrum end is piv-

oted to the projection Z, is employed by us for imparting the required longitudinal movement to the said shaft. The beveled friction-wheel I', on the saw-shaft I, is combined therewith in such a manner that while it is compelled to rotate with said shaft, it can be freely moved longitudinally upon the same. The weight of the friction-wheel I', must be such as will cause it to act with the required degree of force against the periphery of the friction-wheel S', unless it should be preferred to combine a spring with the saw-shaft in such a manner that it would exert the required degree of downward pressure upon the said friction-wheel. It will therefore be perceived that by exerting the requisite degree of force upon the lever K, the shaft S, can be pressed inward to such an extent that its friction-wheel S', will elevate the friction-wheel I', on the saw-shaft, as it is forced under it, until only the inner half of the periphery of the latter wheel will act upon the periphery of the former, and thus produce a slower motion of the shaft S, than when the friction-wheel S', is operated upon by the outer portion of the driving friction-wheel I'. Therefore, the operator of this machine can at pleasure vary the number of forward and backward movements of the carriage F, to suit the description of the wood which the machine may at the time be operating upon; or he may instantly throw the said carriage out of connection with the saw-shaft, in case there should be any occasion to do so. The hood J', which protects the exposed portion of the saw-teeth, is hinged to the sides A, A', of the frame of the machine in the manner represented in Fig. 4. It can therefore be readily turned upward clear of the saw, or be detached from the machine by removing a couple of screws.

In the accompanying drawings, Figs. 1, 3, 4, and 5, represent the sector-shaped frame F, and the parts of the machine which are connected therewith, in the respective positions that they attain at the moment that the saw cuts the last fibers in the severing of a shingle from the shingle-block, that may be placed within the heads of the said block-holding frame. At which moment the outer extremity of the cam k, passes beyond the roller p, and commences its drawing action upon the plate W', which produces the backward movement of the carriage F, that terminates at the position shown in Fig. 2.

When the forward movement of the block-holder F, carries it to the position shown in Fig. 1, the shingle which will be formed during the said movement, will be thickest at that end of the shingle-block which will be held by the head d'; for the reason that during the said movement, the position of the upper surface of the bearer N', is necessarily lower than that of the saw-plate J, a

distance equal to the required thickness of the butt ends of the shingles to be formed in the machine; and when the forward movement of the block-holder (F,) carries it to the position shown in Fig. 4, and also as shown by the red ink outline in Fig. 2, the thick end of the shingle, which will be formed during the said forward movement, will be at the left hand end of the shingle-block, or the end thereof which will be held by the head e, of said block-holder.

It will be perceived by reference to the drawings, that when the block-holder is in the position shown in Fig. 1, the plate G, on the under side of the same, is thrown to the left of the center of the machine, or nearer to the bearer N, than to the bearer N', and consequently, the rearward movement of the carriage, while the block-holder is in the aforesaid position, will cause the plate G, to bear against the left-hand roller, or pin, n', of the sliding-plate O, and carry the said plate longitudinally toward the left hand side A, of the frame of the machine a certain required distance: which movement of the plate O, (in consequence of the pivots v, v, from the front ends of the bearers N, N', being received into the oblique slots c, c, in the said plate,) will elevate the upper surface of the bearer N', nearly to the level of the saw, and will depress the upper surface of the bearer N, below the level of the saw, a distance just equal to that of the required thickness of the butt ends of the shingles to be formed in the machine. The aforesaid elevation of the bearer N', will depress the outer end of its arm P, and also the after end of the lever R', with which the said arm is connected; and by so doing, it will draw down the stop-plate a', a sufficient distance to sink the upper end thereof entirely below the upper face of the way H': The aforesaid depression of the bearer N, will elevate the outer end of its arm P, and also the inner end of the lever R; that is connected therewith; which movements will throw the upper end of the stop-plate a, the proper distance above the way H.

A shingle-block of the proper length having been placed between the heads d', and e, of the block-holder, with its weight resting upon the bearers N, N', the weight of the outer end of the lever L', must then be able to bury the teeth of the holder-head e, and of the tooth-head o, in the ends of said shingle-block, and securely hold the same during the time that it will be operated upon by the saw. The apparatus for lifting the weighted lever L', at the proper moment, during the reverse movement of the carriage F', for the purpose of allowing the shingle-block to replace itself upon the bearers N, N', after a shingle has been formed, is constructed and operated in the following manner; viz:—A sleeve X, whose lateral arm x',

is bolted to the upright B, of the frame of the machine, carries a horizontal roller M', whose outer end projects a little beyond the frame of the machine, and carries the short lateral arm *q*, while the inner end of said roller is firmly united to the transverse arm M. The outer end of the said arm M, is jointed to the vertical shaft L, which works in a guiding loop connected to the side A', of the frame of the machine, and which is surmounted by a horizontal lifting head L'. At the proper moment for lifting the weighted lever L', upon the lifting head L' the arm *z*, which projects from the periphery of the cam-wheel U, strikes against the arm *q*, of the roller M', during its downward movement, and carries the said arm with it a sufficient distance to impart the requisite degree of vertical movement to shaft L, of the lifting head L', through the medium of the lever M, and then allows the same to fall again to its normal position.

A block of wood having been placed within the block-holder F, while it is in the position represented in Fig. 2, the operation of our improved shingle machine will be as follows: viz:—the advancing movement of the carriage will first bring the left hand end of the face of the shingle-block in contact with the teeth of the saw, and it will be observed that the direction of the grain of the wood at that end of the shingle-block will be tangential to the periphery of the saw, and will continue so as the carriage advances, until the saw has cut entirely through that end of the block; and at that moment, the projecting arm *z*, from the left hand end of the block-holder, will strike against the upwardly projecting end of the stop-plate *a*, and arrest the forward movement of that end of the same; and thereby cause the continued forward movement of the carriage, to gradually turn the block-holder upon its axis around to the position represented by the red ink outline of said block-holder, in Fig. 2. The aforesaid peculiar movements of the said block-holder, causes the cut of the saw to be in the direction of the grain of the wood, from one end of the shingle-block to the other, and consequently, the shingles formed in our improved shingle machine are nearly as smooth as if their surfaces had been finished with a plane. The reverse movement of the carriage F', after a shingle has been formed in the aforesaid manner, will first detach the shingle-block from the teeth of the block-holder, and then re-set them again in the before described manner; and then the plate G, will, by its action upon the sliding plate O, shift the positions of the bearers N, and N', depressing the former and elevating the latter, and also by the same movements, depressing the stop-plate *a*, and elevating the stop-plate *a'*; thereby putting the shingle-block, as well

as the respective movements of the machine, in the proper position for the next forward movement of the carriage F', in which the position of the shingle-block will be such as to cause the right-hand end of the face thereof to be first acted upon by the teeth of the saw, and in a direction parallel with the grain of the wood; and after being cut through by the saw, or nearly so, that end of the shingle-block will be arrested in its forward movement by the arm *z*', and the stop-plate *a'*,—when the continued forward movement of the carriage F', will carry the block-holder around upon its axis to the position shown in Fig. 1; and so onward in regular succession; first cutting the butt end of a shingle from one end of a block and then from the opposite end of the same, automatically, and the cut of the saw being invariably in the direction of the grain of the wood, or nearly so, substantially as set forth.

1. What we claim as our invention and desire to secure by Letters Patent in the production of sawed shingles, is, first, bringing one corner of a block of wood in contact with the teeth of a circular saw, and then imparting such a character of feeding movement to the said block as will enable the saw to cut its way through to the diagonal corner of the same, and in such a manner that the kerf lines on the main portion of one side of each shingle thus formed, will be nearly parallel with the grain of the wood, all substantially as herein set forth.

2. We also claim the combination of the carriage F', and the block-holder F, with each other and with the laterally movable plate G, the longitudinally movable plate O, the bearers N, N', and the stop-plates *a*, *a'*, substantially in the manner and for the purpose herein set forth.

3. We also claim the undogging of the shingle-block at the proper moment of time and then dogging it again in a different position within the block-holder in the manner herein set forth.

4. We also claim our improved method of imparting the forward and rearward movements to the carriage F', viz; by means of the cams *j*, *k*, on the face of the cam-wheel U, which operate through the medium of the reciprocating sliding plate W', the vibrating lever W, and the auxiliary devices which are combined with the said parts substantially in the manner herein set forth.

5. We also claim the peculiar arrangement of the parts, for transmitting different degrees of motion from the saw-shaft I, to the horizontal shaft S; viz; the broad bevel-faced friction-wheel I', on the saw-shaft, being secured thereto in such a manner that it is compelled to rotate therewith at the same time that it can be moved up and down the same, while the narrower bevel-faced

friction-wheel S', is rigidly secured to the inner end of the shaft S, and the journals of said shaft are of such a length that it can be moved lengthwise to any desired extent, 5 by means of the hand-lever K, or the equivalent thereof, substantially in the manner herein set forth.

The above specification of our improved

shingle machine signed and witnessed this twenty second day of December 1839.

CALEB M. DYER.
D. M. CUMMINGS.

Witnesses:

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