(No Model.)

4 Sheets—Sheet 1.

G. E. COOKE.

SHINGLE SAWING MACHINE.

No. 342,067. Patented May 18, 1886.

Fig. 1.

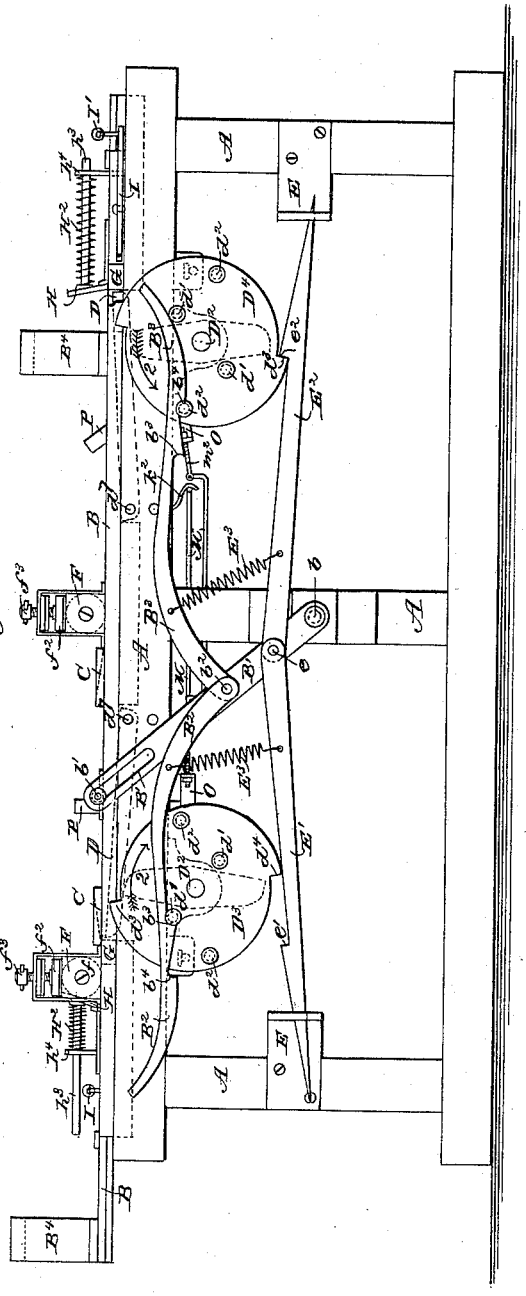
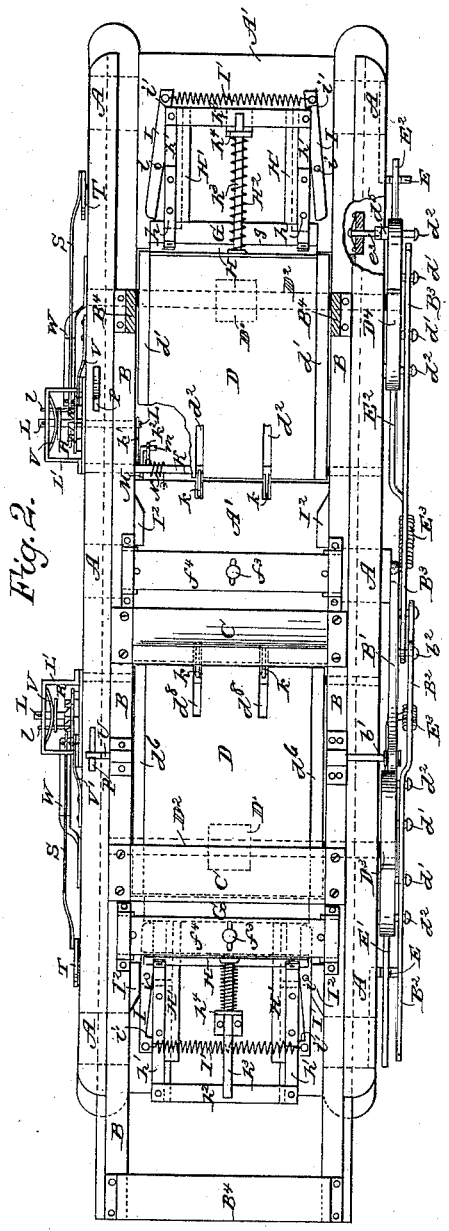


Fig. 2.



WITNESSES:

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C. Sedgwick

INVENTOR:

G. E. Cooke

BY Munn & Co

ATTORNEYS.

(No Model.)

4 Sheets—Sheet 2.

G. E. COOKE.

SHINGLE SAWING MACHINE.

No. 342,067. Patented May 18, 1886.

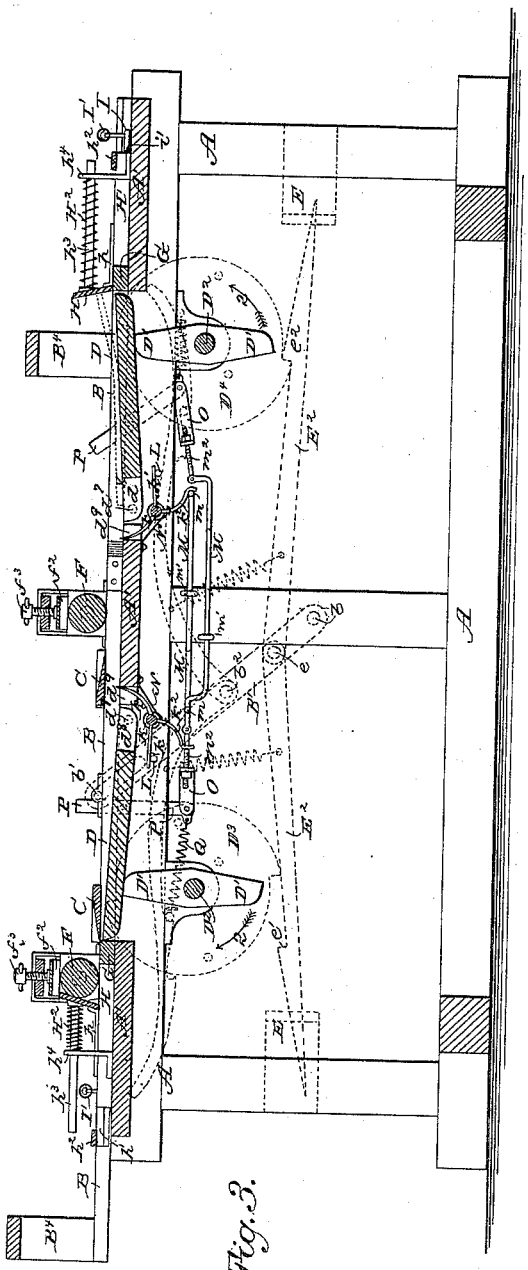

Fig. 3.

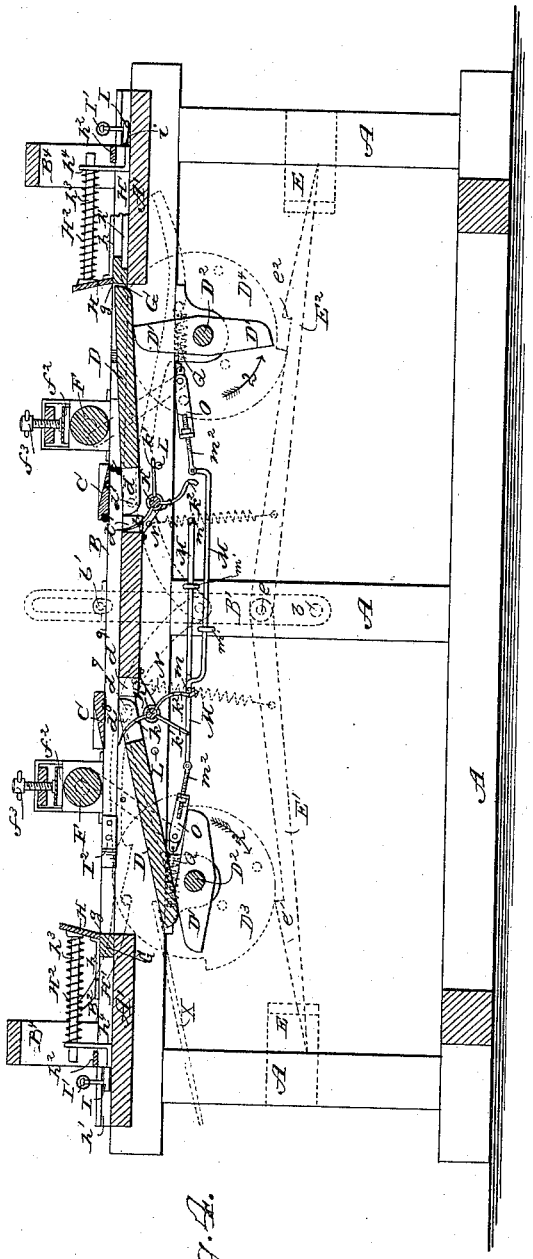

Fig. 4.

WITNESSES:

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(No Model.) 4 Sheets—Sheet 3.

G. E. COOKE.

SHINGLE SAWING MACHINE.

No. 342,067. Patented May 18, 1886.

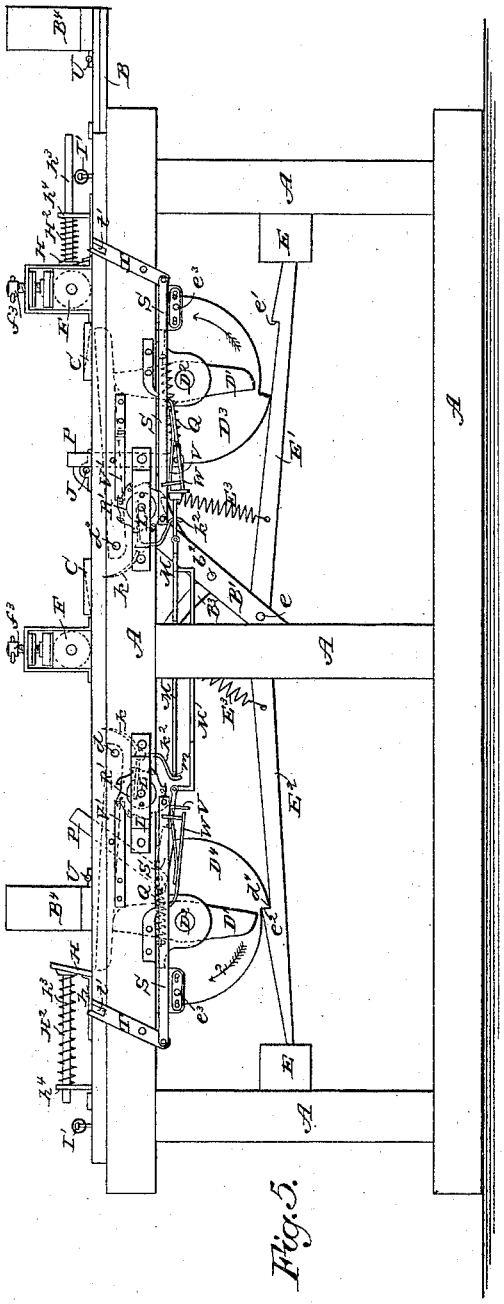

Fig. 5.

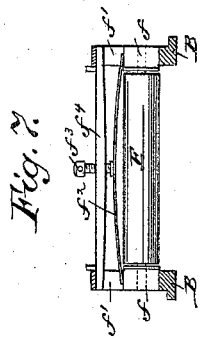

Fig. 7.

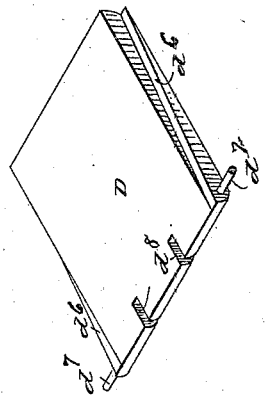

Fig. 8.

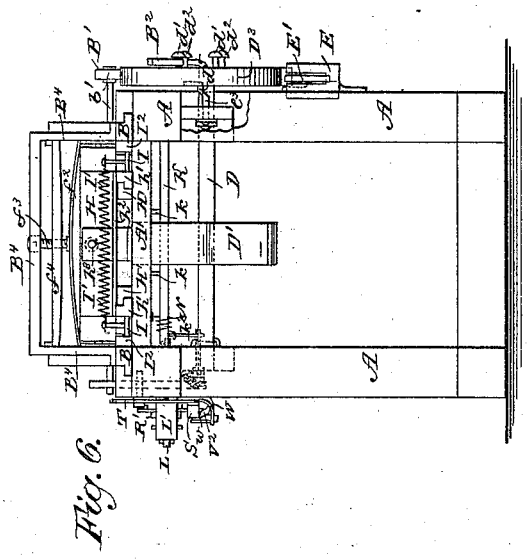

Fig. 6.

WITNESSES:

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(No Model.) 4 Sheets—Sheet 4.

G. E. COOKE.

SHINGLE SAWING MACHINE.

No. 342,067. Patented May 18, 1886.

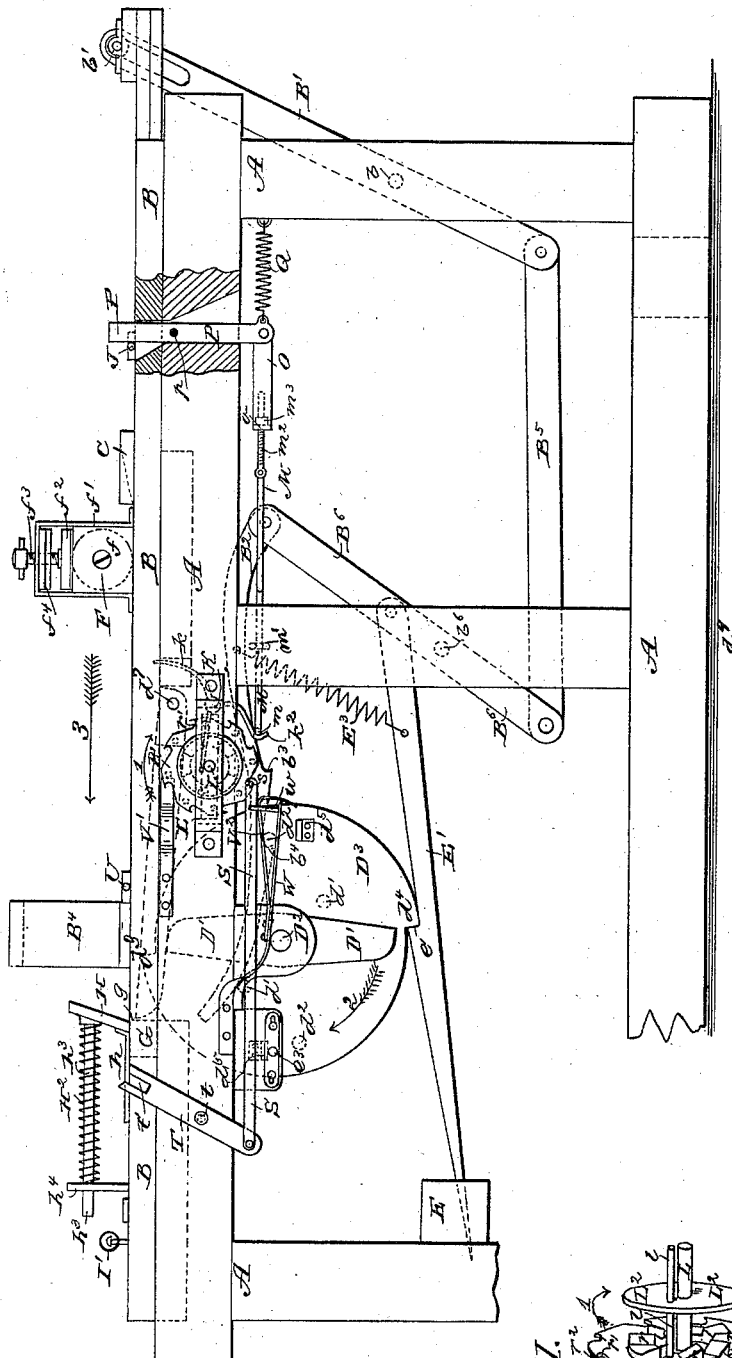

Fig. 9.

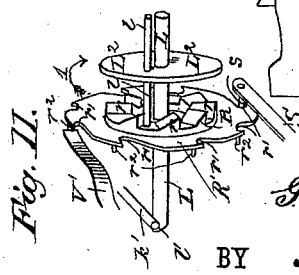

Fig. 11.

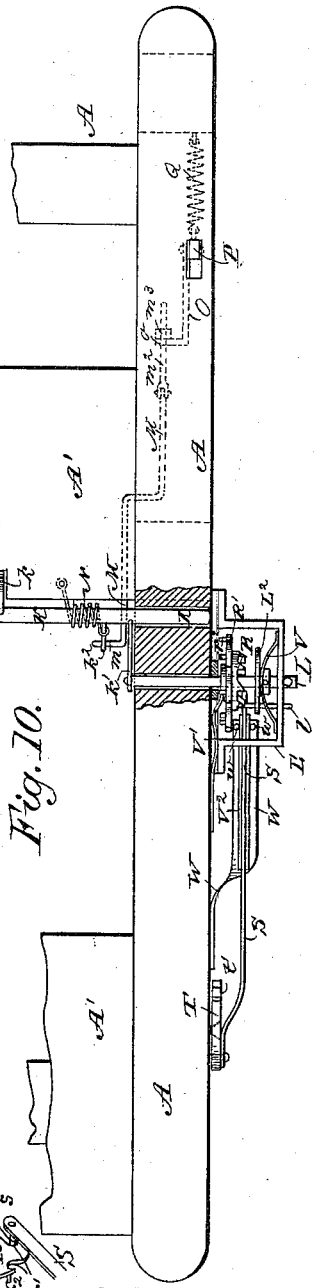

Fig. 10.

WITNESSES:

A. Berger

C. Sedgwick

INVENTOR:

G. E. Cooke

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ATTORNEYS.

UNITED STATES PATENT OFFICE.

GEORGE EDWARD COOKE, OF CLARKSVILLE, TENNESSEE.

SHINGLE-SAWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 342,067, dated May 18, 1886.

Application filed August 14, 1885. Serial No. 174,414. (No model.)

To all whom it may concern:

Be it known that I, GEORGE EDWARD COOKE, of Clarksville, in the county of Montgomery and State of Tennessee, have invented a new and Improved Shingle-Shaving Machine, of which the following is a full, clear, and exact description.

My invention relates to machines more particularly adapted for shaving rived shingles to a finish and with a correct taper from heel to point, and adapted, also, for shaving staves and shaping pieces for wagons, agricultural implements, &c., and the object of the invention is to promote the effectiveness of machines of this character by providing simple efficient means for preventing the shingles or pieces from slipping under the action of the shaving-knife; also means for discharging the shaved shingles or pieces from the machine, and for resetting the discharging devices, and all worked automatically by the reciprocating sash.

The invention consists in certain novel features of construction and combinations of parts of the shaving-machine, all as hereinafter fully described and claimed.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a rear side elevation of my improved shingle-shaving machine arranged in the preferred form as a double-acting machine. Fig. 2 is a plan view thereof, partly broken away and in section. Figs. 3 and 4 are longitudinal vertical sectional elevations of the machine, showing the parts in different operative positions. Fig. 5 is a front side elevation of the machine. Fig. 6 is an end view of the machine. Fig. 7 is a detail cross-sectional elevation showing the presser-roller which presses the shingle to its bed in advance of the knife. Fig. 8 is a perspective view of the shingle-bed. Fig. 9 is a front side view, partly sectional, of a single-acting shingle-shaving machine constructed in accordance with my invention, and with corresponding parts shown in larger size than in the aforesaid views. Fig. 10 is a detail plan view of the single-acting machine, with parts broken away and in section; and Fig. 11 is a detail perspective view of parts of the trip mechanism for actuating the shingle-discharging fingers.

For convenience in description I will more particularly describe the machine as a shingle-shaving machine.

Referring now more particularly to Figs. 1 to 8 of the drawings, the letter A indicates the frame of the machine, in which the sash B is fitted to slide. In this double-acting machine the sash B is fitted with two transversely-ranging knives, C C, set with their cutting-edges reverse ways, or toward opposite ends of the machine, so that two rived shingles or pieces placed one on each of the beds D D of the machine will be shaved to a proper taper or shape at each complete reciprocation or forward and back stroke of the sash, which will be moved in the frame A by any usual or approved mechanism, not necessary to show or describe.

The shingle-beds D are pivoted on pins *d d* to the frame A and in openings of its top, so that the sash B slides over the beds, and the beds are held up to support the shingles as the knives C act on them by means of heavy tappets D′, which are fixed to shafts D^2, journaled in the frame A.

On the shafts D^2 are fixed the disk-wheels D^3 D^4, each of which is provided with two pairs of pins, d' d^2 d' d^2, and also with diametrically-opposite peripheral stop-shoulders d^3 d^4.

To the frame A of the double-acting machine is pivoted at *b* the lower end of a lever, B′, which at its upper end has a pin-and-slot connection, as at *b′*, with the sash B, so that as the sash is reciprocated, the lever B′ will be rocked. As seen best in Figs. 1 and 2, there are pivoted at their inner ends on a pin, b^2, in lever B′, the inner ends of the independently-acting bars B^2 B^3, which extend opposite ways, so that the two hooks b^3 b^4, formed by notches cut in the lower edges of the bars, will successively engage the pins d' d^2 as the lever B′ is rocked to give intermittent half-revolutions to the shaft D^2 and their tappets D′, for raising the shingle-beds D and letting them fall at the proper times, as hereinafter more fully explained.

To the levers B′ are pivoted at *e* the oppositely-extending bars E' E^2, which have sup-

port at their outer ends in slots of bracket-plates E, fixed to the frame A, and are provided, respectively, with the hooks or shoulders e' e^2, which are adapted to lock against the lowermost shoulders, d^3 or d^4, of the disk-wheels D^3 D^4 to lock their shafts D^2 and tappets D' against forward movement, and simultaneously with the engagement of these hook-bars E' E^2 with the disk-wheels, as aforesaid, a pin or stud, d^5, on the disk-wheel presses back a spring-pressed pin, e^3, held to the frame A, and passes above said pin, which then springs out and prevents a back movement of the disk-wheel, which thus held against rotation both ways to lock the corresponding tappet, D', in upright position to support the bed D above it against the downward pressure of the knife C as it shaves the shingle or piece held on the bed by the roller F. Springs E^3 are attached at opposite ends to the opposite bars B^2 E' and B^3 E^2, and act to draw the bars B^2 B^3 into engagement with the pairs of pins d' d^2 on the disk-wheels D^3 D^4, and also to engage the shoulders e' e^2 of hook-bars E' E^2 with the peripheral shoulders d^3 d^4 of the disk-wheels. There is a roller, F, mounted in vertically-movable bars f, fitted in brackets f' f', held to the sash B in front or in advance of each of the knives C, a plate-spring at f^2 being pivoted to carry the roller downward with a pressure which may be regulated by a screw, f^3, threaded through the top cross-bar, f^4, above the spring and swiveled to the center of the spring. (See Fig. 7.) The roller F may be pressed downward by spiral springs fitted above the boxes F, if preferred. These presser-rollers F hold the shingles down to the beds D directly in front of the cutting-edges of the knives C, and yield as they advance toward the higher ends of the beds D, which are held by the tappets D' at a proper incline to cause the knives to give a correct taper or shape to the shingles or pieces. (See Figs. 3 and 4.) The presser-rollers thus hold the shingles so that if warped or twisted when laid on the bed they will be pressed flat as they are shaved, and when finished will have a uniform thickness across their entire width at any place from heel to point. The presser-rollers F also coact with the yielding plates or guards H in preventing the forward ends of the shingles from escaping from a thrust or end bearing should the shingles or pieces be warped lengthwise, and as next explained. When the shingle-bed D is held fully up at its free or forward end by the tappets D', its face at said forward end will lie a little below the top of a thrust-block, G, fixed to and across the top A' of the frame A, so that a shingle lying flat at its forward end on the bed D will be pressed by the knife C against the shoulder g of said thrust-block during the entire operation of shaving the shingle, but should the shingle or piece be curled upward when laid on the bed the forward end of the shingle or piece will bear against the guard H, as indicated in dotted lines in Fig. 3, said guard H being inclined backward, so as to overhang the shoulder g of block G to more effectually prevent the forward end of the shingle or piece from slipping up over the guard. The guard H is in plate form, and is connected by strap-irons h h with opposite side pieces, h' h', which themselves are connected by a cross-bar, h^2, at their back or outer ends. The side pieces, h' h', are fitted by tongues to rabbets or grooves in the under sides of guide-bars H' H', fixed to the frame-top A', so that the guard H and its frame h h' h^2 may slide forward and back on the top A'. A spring, H^2, is placed on a bar or rod, h^3, fixed to guard H and supported loosely in a post or bracket-piece, h^4, fixed to the frame-top, the spring being between the guard and said post, so as to throw the guard toward the adjacent bed D, and until the inner ends of the said pieces h' strike the back edge of the thrust-bar G. The inner ends of the pieces h' preferably are extended at their lower parts into under-cuts or notches in the bar G, so as to more effectually resist the tendency of the guard H to rise by the pressure of the shingle or piece on it. At each side of the guard-frame is pivoted at i a lever, I, which has a shoulder at i' adapted to lock behind the frame when the guard H is pressed into normal position by the spring h^3, the lower face portion of the guard then being even with the edge or shoulder of the thrust-block G, against which the forward end of the shingle or piece is pressed by the knife C. A spring, I', connects the outer ends of the levers I I and draws their shoulders i' in behind the guard-frame. This locking action of the opposite levers I I on the frame of the guard prevents the guard from being forced forward by the upturned end of a warped shingle or piece being shaved and which may happen to rest against it. When the sash B has advanced sufficiently to cause the roller F to press this end of the shingle down flat to the bed D, the shingle then will bear against the edge shoulder g of the thrust-bar G, and about at this time trip-blocks I^2 I^2, fixed to opposite side bars of the sash B, will act on the inner ends, i^2, of the opposite levers I I to disengage their shoulders i' from the guard-frame and permit it to be forced back by the contact of the roller F with the guard H as the sash completes its stroke in that direction to carry the knife C clear through the shingle or piece, and as shown at the left-hand end of Figs. 1, 2, and 3. As the roller F recedes on the return-stroke of the sash B, the spring H^2 will force the guard H back to its normal position, and the spring I' will set the shoulders i' of levers I again behind the guard-frame, ready for the next stroke of the sash toward the guard. It will be seen that the guard H, with the roller F, forms an effective means to prevent forward slip of the shingle or piece from the thrust-bar G on the frame; hence the action of the shaving-knife C on every shingle or piece will

be positive, and the shingles or pieces will not stick to the knife and clog the machine. The knife-bed D has inclined rabbets d^6 d^6 at opposite sides, which allow the trip-blocks I^2 to pass along the bed on their way to the levers I, (see Figs. 2 and 8,) and the opposite side bars of the sash B are or may be connected by arching cross-bars or bridge-pieces B^4, which may move over the guard H and its connections as the sash B reciprocates. After the shingle or piece has been shaved the bed D is allowed to swing down on its pivots d^7 by the turning of the tappet D', which had supported it, and, as shown at the left-hand side of Fig. 4, and just as the bed drops the shaved shingle or piece is automatically discharged from the machine by devices next described.

Across the machine, and about under the pivots d of the shingle-bed D, is journaled a shaft, K, to which are fixed the shingle-discharging fingers k k, which project through or are adapted to slots d^8 d^8 in the bed D and coinciding slots d^9 d^9 in the top A' of frame A. About at a right angle to the fingers k k is fixed to the shaft K an arm, k', which is adapted to be set over a spring-pressed trip-pin, L, fitted to slide laterally in the machine-frame. To the shaft K also is fixed the bent arm k^2, against the hooked extremity of which the bent end m of a push-rod, M, is adapted to act for setting the arm k' over the trip-pin L, and thereby forcing the fingers k k back into the slots d^9 d^9 of the frame A, as shown in Figs. 2 and 3, or, in other words, setting these fingers in position ready to deliver a blow on the back end of the shaved shingle or piece to discharge it from the machine, the force of which blow is determined by the tension of a spring, N, which is coiled around the shaft K and fixed at one end to the bent arm m, and at the other end to the frame A or its top A'. The spring N thus is the prime mover of the discharging-fingers. The push-rod M is supported so as to slide in a suitable guide-eye, m', on the frame, and at its forward end is connected to a bolt end, m^2, which is threaded into the bent end o of a bar, O, and receives a nut, m^3, outside said end o of the bar, which provides for lengthwise adjustment. The other end of the bar O is pivoted to the lower end of a lever, P, which is pivoted at p to the machine-frame, and a spring, Q, attached to lever P and the frame A draws the lever and the push-rod M back after they have been forced forward to set the arm k' over the trip-pin L and out of the way of the arm k^2 of the shaft K as it flies back when the discharging-fingers k are released by withdrawal of the trip-pin L from beneath the arm k', as hereinafter explained. An arm or pin, J, fixed to the sash B is adapted to strike the top of the lever P on the return-stroke of the shaving-knife C, to force the rod M endwise against the arm k^2 on shaft K for setting the arm k' over the trip-pin L. As best seen in Figs. 9, 10, and 11, the trip-pin L is fitted loosely in the frame A and in a bridge piece or bracket, L', fixed to the frame, and on the pin L is fixed a disk or plate, L^2, in which is fixed a pin, l, which acts by its inner end against the face of the teeth r of a circular rack, R, which is fixed to a ratchet-wheel, R', which is placed loosely on the pin L, and has peripheral teeth r', which are engaged by a pin, s, in one end of a connecting-rod, S, which is pivoted at its other end to a lever, T, which is pivoted at t to the frame A, and has at its upper end a slot, t', so arranged that a pin, U, on the sash B may enter the slot for throwing the lever T forward and back for actuating the rod S to impart motion to the ratchet-wheel R' in the direction of arrow 1, and thereby causing each tooth r of rack R to thrust out the pin l, and consequently the trip-pin L, to withdraw its inner end, l', from the arm k' of shaft K to allow the spring N to throw the fingers k forward to discharge the shaved shingle or piece. The pin l projects also from the outer face of the plate L^2 and enters a hole in the bracket L', so as to prevent the trip-pin L from turning axially in its bearings, and thus holding the beveled portion of its inner end, l', downward, so that the arm k' of shaft K will strike said beveled part of pin L and force the pin outward to allow the arm to lodge on top of it to hold the fingers k set back when and after the push-rod M has acted on the arm k^2 of the shaft, as hereinbefore explained. A spring, V, held to the trip-pin L, or it may be to the bracket L', acts between the plate L^2 and the bracket to force the trip-pin L back into position for engaging or supporting the arm k' of shaft K, and a spring, V', held to the frame A at one end acts by its other end against stop-pins r^2 set in the inner face of ratchet-wheel R to prevent back movement of the ratchet.

At W is shown a rigid arm or plate, which is fixed at one end to the frame A, and at its other end carries a pair of pins, w w, which stand one at each side of the connecting-rod S to guide it so its pin s acts properly on the ratchet-wheel R, and a spring, V^2, is fixed at one end to said arm W, and acts by its free end to hold the rod S up to cause its pin s to engage the ratchet-wheel.

The arrangement of operating-levers of the single-acting machine differs somewhat from that shown in the double-acting machine. By referring to Fig. 9 it will be seen that the main lever B', which is connected to the sash B, is pivoted at b a little below its center to the frame A, and its lower end is connected by a rod, B^5, with the lower end of a lever, B^6, which is pivoted at b^6 to the frame A, and the lock-bar E' and lever B^2 are pivoted to the lever B^6 above its pivot b^6 to give the required movement to said lever and lock-bar in operating the tappet-shaft D^2 to lower the shingle-bed D and raise and lock it, as hereinbefore explained.

I will now describe the continuous operation with more special reference to the single-act-

ing machine, as follows: In the positions of the parts shown in Fig. 9 the sash B is quite at the extreme limit of the back-stroke, and the pin or arm J is acting on lever P to force rod M forward to set the arm k on shaft K over the trip-pin L and throw the fingers k back onto the pin L, and the outer hook or notch, b^4, of bar B^2 has just drawn the wheel D^3 around in direction of arrow 2 to move shaft D^2 for lifting the shingle-bed D to its highest position by the tappet D', at which time the shoulder e' of bar E' had met the shoulder d^4 of wheel D^3, and one stop, d^5, on said wheel had lodged on the spring stop-pin e^3 to double-lock the tappet, so it firmly supports the bed D, as hereinbefore described, and the pin U on the sash had passed by the lever T after having moved it to the position shown for tripping the fingers k into action for discharging the last shaved shingle or piece. The next shingle or piece to be shaved now is laid on the bed D with its forward end abutting the thrust-block G or guard H, and as the sash B moves forward in direction of arrow 3 to carry the knife C through the shingle or piece the pin J will leave the lever P and allow the spring Q to draw back the rod M from the arm k^2 of shaft K, and the lever B^6 will throw the bar B^2 forward, so that its inner notch engages the opposite pin, d', on wheel D^3, ready for the next return or back stroke of the sash, and the shoulder e' of bar E' will be moved forward away from the shoulder d^4 of wheel D^3 to allow the wheel to be turned in direction of arrow 2 at the proper time. As the knife C passes through the shingle or piece, the roller F and guard H coact, while the guard is pushed forward, as hereinbefore fully described, to prevent slip of the shingle or piece, and the pin U engages the slot t' of lever T to rock the lever and throw back the rod S and set its pin or tooth s into the next notch or tooth, r', of the ratchet-wheel R', and after the knife C has completed its cut through the shingle and the motion of the shaft is reversed the guard H will follow the roller F backward to the edge of the thrust-block G, and the bar B^2 will draw on the pins d' d^2 successively by its notches b^3 b^4 to turn the wheel D^3 in direction of arrow 2, and thereby turn the tappets D', to allow the shingle-bed D to fall, as at the left-hand end of Fig. 4, and during this falling movement of the bed the pin U on sash B will again engage the lever T, to throw its upper end backward to the position shown in Fig. 9, and thereby carry the rod S forward to turn the ratchet-wheel R in direction of arrow 1 the distance of one of its teeth r' and r, and thereby force the trip-pin L outward, to withdraw it from the arm k' of shaft K and allow the spring N to throw the fingers k backward and strike the back end of the shaved shingle or piece lying on the lower bed, D, and discharge it from the machine, as indicated at X in dotted lines in Fig. 4. As the back-stroke of the sash B is about half completed, the tappet D' will again begin to assume an upright position with its other end upward, and as it fully raises the shingle-bed D the wheel D^3 will again be doubly locked by the stops e^3 d^5 and shoulders d^3 e', to hold the bed D in place, and as the sash completes its back-stroke the pin J on it will again push back the lever P to thrust the rod M forward against the arm k^2 of shaft K for setting the arm k' over the trip-pin L, and all is ready for the next forward stroke of the sash to shave the next shingle or piece laid on the bed D.

In the double-acting machine shown, the one trip-pin J on sash B acts on both the setting-levers P P of the discharging-fingers k at opposite ends of the machine, and the sash has a pin, U, at or near each end, which, at the extremes of the strokes of the sash each way act on the levers T to trip the shingle-discharging fingers k into action at each end of the machine as the beds D fall when their respective tappets D' are turned to horizontal positions, it being understood that one shingle or piece is being shaved at one end of the machine while another shingle or piece is being discharged at the other end of the machine, a shingle or piece being shaved and discharged at each half-stroke of the sash. The one lever B' actuates the opposite pairs of bars B^2 E' B^3 E^2 with like effect on the disk-wheels D^3 D^4 and their respective tappets, as hereinbefore described for the single-acting machine, and, if desired, the lever B' may be extended upward at one end of the double-acting machine to connect with the sash, as shown in the single-acting machine, Fig. 9, and in which case the lever B' in Fig. 1 will not be connected with the sash, as therein shown, and the second pair of operating-bars, E^2 B^3, will be connected between their operating-lever and the lever B', which connects with the end of the sash, as will readily be understood.

It will be seen that all the operations of the machine are automatic and positive, and that the working capacity of the machine is limited only by the expertness of the attendants who feed the rived shingles or pieces to it.

A spring pressed or yielding bar may be mounted across the sash B as a substitute for and mechanical equivalent of the roller F; but the roller is preferred, as it will operate to hold the shingles to the bed D with less friction than would the bar.

It is evident that two or more of the tappets D' may be fixed to the shaft D^2 under each of the shingle-beds D to support the beds, and the setting and tripping mechanism of the discharging-fingers k may be arranged for one bed D of the double-acting machine at one side of the machine-frame and for the other bed D at the other side of the frame, and the trip-pins on the sash will be correspondingly arranged to throw the levers P to trip the discharging-fingers, substantially as above described, and the frame of the double-acting machine may

be lengthened, so that the ends of the sash will not run past the ends of the frame, as in Figs. 1 and 5, when the machine is operated.

As before stated, the machine is adapted not only for shaving shingles, but is adapted also for shaving staves and for shaping pieces for use in building wagons, agricultural implements, and in other work.

It is obvious that the mechanism for setting the arm k' of the shaft K over the trip-pin L, and for tripping the arm from said pin may vary in its details from that herein shown and described, as other means may be devised for securing these results by or from the action of the reciprocating sash.

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

1. In shingle-shaving machines, the combination of the pivoted shingle-bed D, a tappet, D′, fixed to a shaft, D^2, a disk-wheel, D^3, fast on shaft D^2, and provided with pairs of pins, d' d^2, a bar, B^2, having notches or hooks b^3 b^4, adapted to engage the pins d' d^2, and operating-levers, substantially as described, connecting the bar B^2 to the sliding sash B, substantially as herein set forth.

2. In shingle-shaving machines, the combination of the pivoted shingle-bed D, a tappet, D′, fixed to shaft D^2, a disk-wheel, D^3, on shaft D^2, and provided with pairs of pins d' d^2 and stop-shoulders, as at d^3 d^4, a bar, B^2, having hooks b^3 b^4, adapted to engage the pins d' d^2, a bar, E, having a shoulder, e', adapted to the stop-shoulders d^3 d^4, and operating-levers, substantially as described, connecting the bars B^2 E′ to the sliding sash B, substantially as herein set forth.

3. In shingle-shaving machines, the combination of the pivoted shingle-bed D, a tappet, D′, fixed to shaft D^2, a disk-wheel, D^3, on shaft D^2, and provided with pairs of pins d' d^2, a bar, B^2, having hooks b^3 b^4, adapted to engage the pins d' d^2, operating-levers, substantially as described, connecting the bar B^2 to the sliding sash B, studs d^5 on wheel D^3, and a spring-pressed pin, e^3, on the frame A, with which pin the studs d^5 are adapted to lock, substantially as herein set forth.

4. In shingle-shaving machines, the combination of the pivoted shingle-bed D, a tappet, D′, fixed to shaft D^2, a disk-wheel, D^3, on shaft D^2, and provided with pairs of pins d' d^2, and stop-shoulders, as at d^3 d^4, a bar, B^2, having hooks b^3 b^4, adapted to engage the pins d' d^2, studs d^5, on wheel D^3, and a spring-pressed pin, e^3, on the frame A, with which pin the studs d^5 are adapted to lock, a bar, E′, having a shoulder, e', adapted to the stop-shoulders d^3 d^4, and operating-levers connecting the bars B^2 E′ to the sliding sash B, substantially as described, whereby the shingle-bed D will be lowered and raised and the wheel D^3 will be locked against rotation in either direction to hold the bed D in raised position, substantially as herein set forth.

5. In shingle-shaving machines, the combination, with the knife-carrying sash and a shingle-holding bed, of a thrust-block, as at G, and a guard rising from the front edge of the thrust-block to prevent forward slip of warped shingles under the pressure of the knife, substantially as herein set forth.

6. In shingle-shaving machines, the combination, with the knife-carrying sash and a shingle-holding bed, of a thrust-block, as at G, and a guard, as at H, standing normally in line with the front edge of the thrust-block, and said guard being adapted to yield backward, substantially as and for the purposes herein set forth.

7. In shingle-shaving machines, the combination, with the sash B, its knife C, a presser-roller, F, mounted on the sash in advance of the knife, and a shingle-bed, as at D, of a guard, as at H, held above the thrust-block G, and so as to yield to the advance of the presser-roller, substantially as herein set forth.

8. In shingle-shaving machines, the combination, with the sash B, its knife C, a presser-roller, F, on the sash in advance of the knife, and a shingle-bed, as at D, of the guard H, fitted to the machine-frame, so as to yield to the advance of the presser-roller, a device locking the guard in normal position in line with the thrust-block G on the frame, substantially as described, and a device, substantially as specified, fitted to the sash B, so as to trip the locking devices of the guard to allow the guard to yield to the roller F, substantially as herein set forth.

9. In shingle-shaving machines, the combination, with the sash B, its knife C, a presser-roller, F, mounted on the sash in advance of the knife, and a shingle-bed, as at D, of the guard H, fitted to slide on the machine-frame, a spring pressing the guard normally into line with the thrust-block G on the frame-levers I I, pivoted to the frame and normally locking behind guard H, and trip-blocks I^2 on the sash acting to release the guard, substantially as herein set forth.

10. In shingle-machines, the combination, with the frame A, the pivoted shingle-bed D, and the sliding sash B, of a shaft, K, having fingers k and an arm, k', a spring-pressed trip-pin, L, fitted in frame A, and on which the arm k' is adapted to be set, and a spring, N, acting to thrust the fingers k forward when pin L is withdrawn by devices operated by or from the sash B after the shingle-bed falls, substantially as herein set forth.

11. In shingle-machines, the combination, with the frame A, the pivoted shingle-bed D, and the sliding sash B, of a shaft, K, having fingers k and an arm, k', a spring-pressed trip-pin, L, fitted in frame A, and on which the arm k' is adapted to be set, a spring, N, acting to thrust the fingers k forward when pin L is withdrawn, a lever, T, pivoted on frame A, a pin, U, on the sash B, and adapted to operate lever T, and devices, substantially as described,

operated by lever T, and acting to withdraw the trip-pin L as the shingle-bed falls, substantially as herein set forth.

12. In shingle-machines, the combination, with the frame A, the pivoted shingle-bed D, and the sliding sash B, of a shaft, K, having fingers *k* and an arm, *k'*, a spring-pressed trip-pin, L, fitted in frame A, and on which the arm *k'* is adapted to be set, a spring, N, acting to thrust the fingers *k* forward when pin L is withdrawn, a lever, T, pivoted on frame A, a pin, U, on sash B, adapted to operate lever T, a rod, S, connected to lever T, and provided with a pin, *s*, a ratchet-wheel, R', loose on trip-pin L, and provided with teeth *r r'*, a pin, *l*, held to a plate, L^2, carried by trip-pin L, and adapted to the teeth *r* of wheel R', and said pin *s* adapted to the teeth *r'* of said wheel, studs r^2 on wheel R', and springs V V' V^2, substantially as herein set forth.

13. In shingle-machines, the combination, with the frame A, the sliding sash B, the shaft K, carrying fingers *k* and arms *k' k²*, and the trip-pin L, of a push-arm operated by or from the sash B, and acting on the arm *k'* of shaft K, to set the fingers *k* back, substantially as herein set forth.

14. In shingle-machines, the combination, with the frame A, the sliding sash B, the shaft K, carrying fingers *k* and arms *k' k²*, and the trip-pin L, of a rod, M, adapted to push on arm *k²*, a lever, P, connected to rod M, and a pin, J, on sash B, adapted to operate the lever P and rod M, to set the arm *k'* on the trip-pin L, to set the fingers *k* back, substantially as herein set forth.

15. In shingle-machines, the combination, with the frame A, the sliding sash B, the lever P, pivoted to the frame and adapted to be rocked by a pin on the sash, and a push-rod, M, guided on the frame and connected to the lever P, and adapted to be operated thereby for setting back the shingle-discharging fingers *k*, of a spring, as at Q, acting to draw back the rod M after it sets the fingers *k*, substantially as herein set forth.

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Witnesses:
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