2 Sheets, Sheet 1.

E. R. Morrison,

Cutting Shingles.

No. 46,129. Patented Jan. 31, 1865.

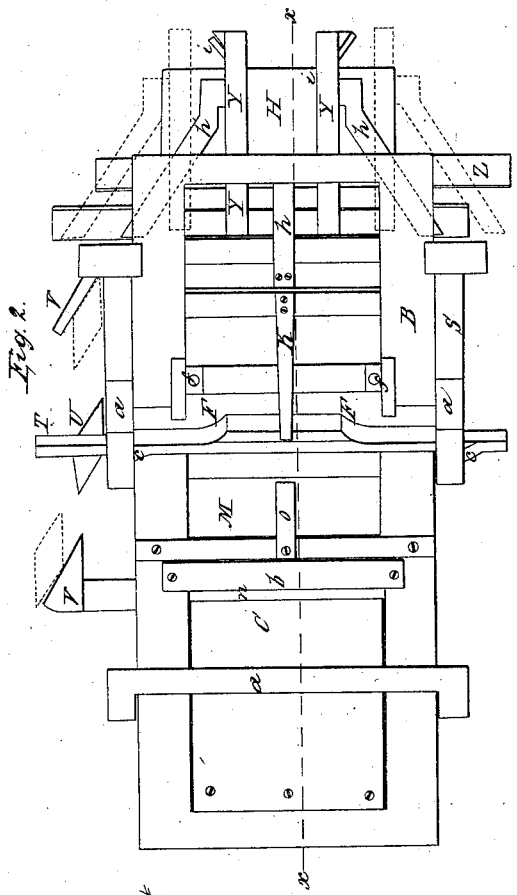

Fig. 2.

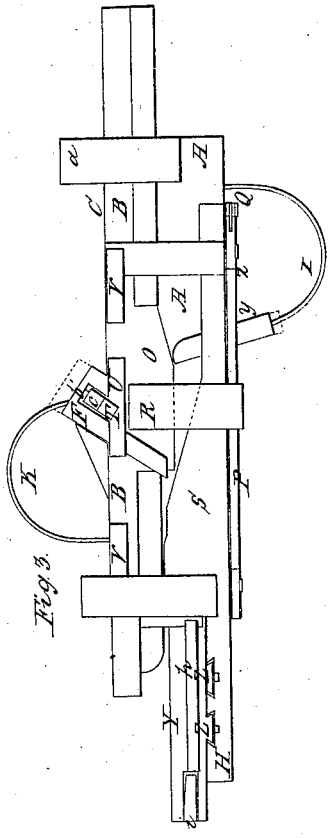

Fig. 3.

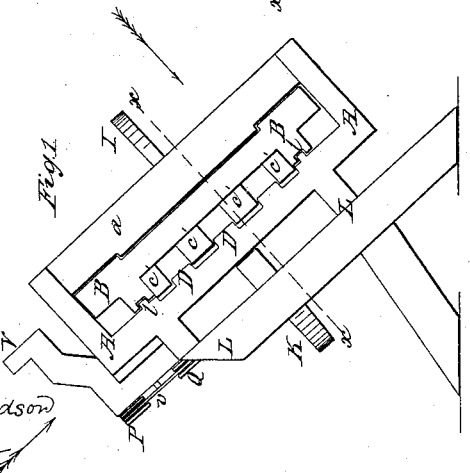

Fig. 1.

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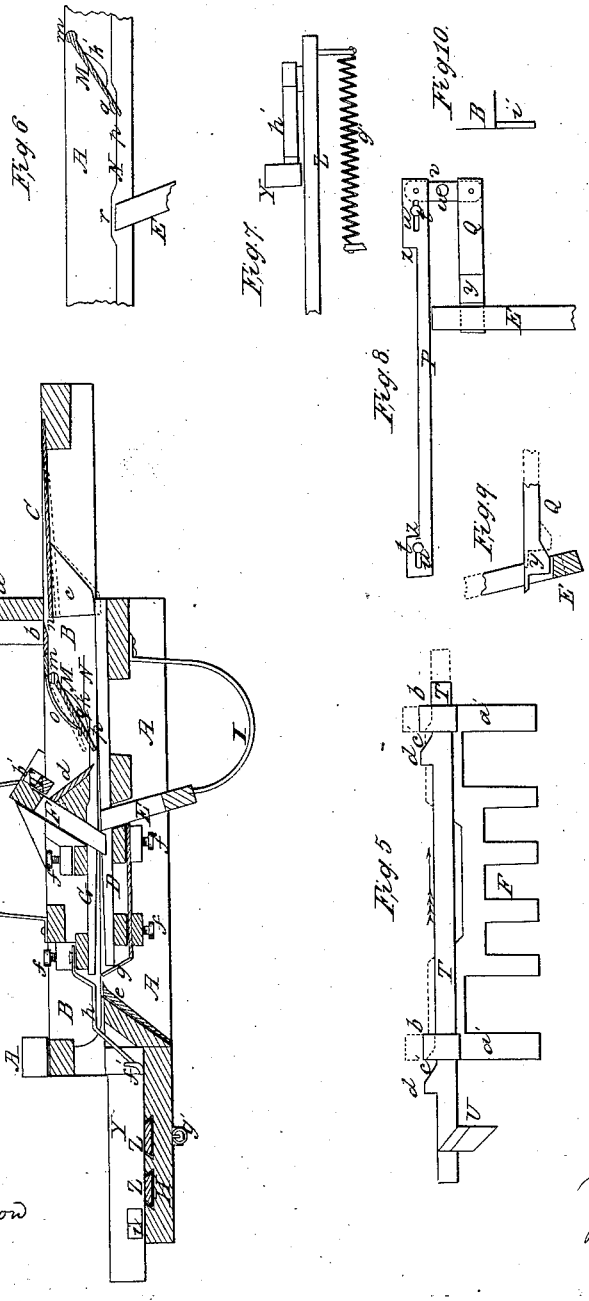

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UNITED STATES PATENT OFFICE.

ENOCH R. MORRISON, OF NEW YORK, N. Y.

IMPROVEMENT IN SHINGLE-MACHINES.

Specification forming part of Letters Patent No. **46,129**, dated January 31, 1865.

To all whom it may concern:

Be it known that I, ENOCH R. MORRISON, of the city, county, and State of New York, have invented certain new and useful Improvements in Shingle-Machines; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification.

Figure 1 is an end elevation of my improved machine; Fig. 2, a plan or front view of the same, looking in the direction indicated by the arrow at the right, in Fig. 1; Fig. 3, a side or edge view, looking in the direction indicated by the arrow at the left in Fig. 1; Fig. 4, a longitudinal vertical section in the plane of line *x x*, Fig. 2; Figs. 5, 6, 7, 8, 9, and 10, views of parts detached.

Like letters of reference indicate corresponding parts in all the figures.

My present arrangement is an improvement on the machine patented to me November 22, 1853. In that divice two frames—one stationary and the other reciprocating—were employed, and the shingle first rived from the bolt, then one side planed, then the next side, and finally the edges jointed, and the shingle discharged perfectly formed.

My invention consists in the improved construction and arrangement of some of the parts by which the action is made more effective.

As represented in the drawings, A is the statianary frame or bed, and B the reciprocating frame, which moves over the first, the length of stroke being that of a shingle or a little more. The bolt from which the shingle is rived is placed upon a table, C, with its end resting against a stop, *a*, beneath which the frame B slides. The back stroke of the frame (as indicated by the arrow at the left in Fig. 2) brings a knife, *b*, in contact with the bolt and rives it. The riven shingle passes down under the knife between the two frames, falling on an inclined bed, D, made up of slats or bars, and projections *c c* on the under side of the table strike its rear end and push it forward (in the forward stroke) till it has cleared its length and fallen back of the teeth of an automaton bar, E, which holds it in place, while the back stroke again brings a knife *d* over its upper surface, shaving or planing it perfectly. The downward inclination of the bed D, on which the shingle rests, produces a corresponding bevel on the planed surface of the shingle. At the end of the back stroke a tooth-bar, F, similar to that before described, rises and catches behind the half-shaved shingle and the forward stroke pushes it forward again, so that its lower surface comes in contact with a stationary knife, *e*, which planes its lower surface. In front of the teeth E a reversely or upwardly inclined bed of slats or bars, G, Fig. 4, is employed, which presents the shingle to the knife *e* at a bevel opposite to that before described, and the effect of these two bevels is to produce the taper in the shingles, as desired. The beds D and G are adjustable to a greater or less degree of inclination by means of screws *f f*, or some equivalent arrangement so as to vary the taper of the shingles. Between the ends of the bed D and knife are situated spring-teeth *g g*, Fig 4, for the purpose of holding the shingles up in the proper position to be cut by the knife and to prevent them from passing under it. After passing the knife *e*, the shingle is caught at the next forward stroke by the head of the spring-rod *k*, or equivalent, and carried forward between the knives *i i* of jointers, which cut the edges and it is then thrown over the platform H perfectly finished and ready for use.

In Figs. 2 and 3 the movable frame is shown partly drawn back in the act of cutting or riving the shingles, and in Fig. 4 it is shown wholly drawn back in the position after the shingle is rived. Springs I and K force the automatic tooth-bars E F into catch behind the shingles. Thus far the arrangement does not differ essentially from that already patented to me before referred to.

Instead of placing the frames A B in a horizontal or level position or a vertical one, I place them in the angular or inclined position indicated in Fig. 1—that is, with one side lower than the other, and supported by a suitable standard, L, at each end; and in order to keep the frames in place in this position, I join them by a tongue and groove, *l*, Fig. 1, or an equivalent device. This inclined position is particularly adapted to this arrangement of the frames, and accomplishes an effect that would not be accomplished in other

machines—viz., it allows the shavings to pass off easily and without the necessity of removing them by hand.

In ordinary machines the working parts were so disconnected, and therefore so much open space is left that the shavings can escape directly through; but in this device the parts are so compact that were the frames level the passage of the shavings would be cut off, and they would constantly clog the machine and have to be removed by hand. The incline of the frames causes them to fall off as they are formed, and therefore no attention need be given to the matter. This position is also the best to enable the shingle-bolt to be handled easily. It is only necessary for the hand to merely hold against it to keep it in place on the table C; whereas, were the table to stand vertically instead of inclined, the whole weight of the bolt must be sustained. The tongue and groove *l* keep the frames A B in position at all times and save the necessity of outside guides or clamps, which would be in the way of the operating parts.

In my former machine the table C was hinged at the outer end, and a spring was employed under it at the inner end to produce elasticity and to keep it in place under the bolt. Instead of this arrangement, I now make the table C of a spring-plate, secured rigidly at the outer end, as shown clearly in Figs. 2 and 4. A throat, *n*, is left between the end of the table and the knife *b* of sufficient size to allow the rived shingle to pass through. This arrangement of the table is much more effective than the old, from the fact that its whole length is elastic, whereas in the old the elasticity was only produced by a spring beneath at one end. This elasticity is necessary in order that the shingle may rive with the grain of the wood, which is frequently irregular or "curled," and therefore the cut must be correspondingly thicker or thinner. This is accomplished by a greater or less degree of depression of the table under the bolt. Were it not for this elasticity the riving-knife must give way, or the other parts would become displaced.

At a suitable position in the movable frame B, between the knives *b* and *d*, is situated a pressure-plate, M, pivoted at *m* in such a manner that its lower end may adjust as indicated by the red lines, Fig. 4. This plate is made elastic by a spring, *o*, resting on its top. One end of the plate is provided with a projection, *q*, that rests and runs on a way, N, Figs. 4 and 6. This way has an elevation, *r*, at the position where it passes the teeth E, so that it will rise over them; but in the rear of this the depression *p* lowers it again, so that as the end of the riven shingle falls on the bed D the pressure-plate will be drawn over it, and bear it down in such a manner as not only to cause it to clear from the knife *b*, but also hold it down as it is carried onward in the machine to be planed. The employment of the way N renders the action of the pressure-plate automatic, so that it will rise and fall exactly at the right time. In some cases the shingle may be too short to allow the end of the pressure-plate to bear on it. To obviate any difficulty from this source I employ projections *k' k'* on the under side of the pressure-plate, which will rest on the shingle at all times.

As the knife *d* approaches the end of the shingle in the back stroke it is necessary that the teeth E should fall or be depressed, as indicated by red lines, Fig. 3, so as not only to allow the knife to pass over it, but also to enable the other set of teeth, F, to catch the end of the shingle and drive it forward for planing its opposite surface. This is accomplished by an inclined cam, *o*, Fig. 3, of the sliding frame striking the outer arm, *s*, of the tooth-bar at the proper moment. When thus depressed it is also necessary it should stay so till the next forward stroke of the frame has been accomplished, in order that the succeeding shingle may be driven over the teeth E to supply the place of the former. To accomplish this retention of the teeth, I secure a gage-slide, P, Figs. 1, 3, 8, and 9, at the proper position under the stationary frame, held in place by means of screws *t t*, or equivalent, passing through the gage-slots *u u*. To one end of this slide is jointed a lever, *v*, turning on a pivot, *w*, the opposite end of the lever being similarly jointed to a bar, Q, having a cam or wedge, *y*, at its opposite end, that stands in such position relatively with the tooth-bar E as that, when driven forward, the cam will hold said tooth-bar down as it is depressed, or when drawn back it will release it and allow the teeth to rise. This arrangement is shown most clearly in Fig. 9. The gage-slide P is provided with shoulders *z z*, or equivalent, at opposite ends, against which strikes a projection R, Fig. 3, of the movable frame at each reciprocation, thus moving the gage-slide, and consequently the cam *y* at the end of each stroke, and therefore holding down and releasing the tooth-bar at those moments.

It will be noticed that the cam *y* is merely for the purpose of holding down the tooth-bar after it has been depressed by the cam O, and not for operating it. This device is most effective in accomplishing the result desired, holding the teeth E down during the whole forward stroke, then releasing them behind the end of the shingle. It is also necessary that the tooth-bar F should fall at the commencement of the forward stroke, to force the half-planed shingle forward against the knife *e*, and that, in the back or reverse stroke, it should be kept in a raised position the whole distance. The tooth-bar being already depressed, nearly, at the end of the forward stroke, its outer projection, *a'*, strikes on an inclined cam or wedge, S, of the stationary frame, Fig. 3, and raises it in such a manner that not only will it clear over the knife *e*,

Fig. 4, but also in the reverse stroke it will pass over the succeeding shingle moved up by the teeth E. In order to retain the tooth-bar F in this raised position, I make slots or motises b' b', Fig. 3, in the head of its two opposite ends, and in these slots rests and slides a bar, T, Fig. 5, having cams composed of inclined sides c' c' and square tops d' d'. By sliding this bar forward, as indicated by the red lines, Fig. 5, when the tooth-bar is raised, the cams fit under the mortises and hold there, retaining the tooth-bar in its raised position.

In order to operate the bar T automatically, I secure to it on one side a diamond or equivalently shaped block, U, which at the opposite strokes of the frame strikes alternately-inclined cams V V, Fig. 2, situated at suitable distances respectively from the side of the frame, to produce the desired end motion of the bar T. By this means the teeth F are allowed to fall at the commencement of the forward stroke to push forward the shingle, but are retained in a raised position during the back stroke to pass over the succeeding shingle.

As the shingle is forced forward over the knife e with both sides planed, it falls on the platform H, and at the commencement of the next forward stroke a head, f, secured to the spring-shank h', attached to the movable frame, strikes its end and forces it forward between the knives i i, which joint its edges. In my old machine one of the knives was stationary, while the other was secured to an expanding jointer or frame, that adapted itself to the width of the shingle. The difficulty with this device was that the jointers did not adjust themselves readily centrally with the shingle—that is, if the shingle was narrow the jointing must be done on one side of the center, and consequently in passing from the planing-knives the shingle must diverge from a straight line. Thus the shingles could not be run through very rapidly without breaking, splitting, or slivering them. In my present arrangement I attach the knives respectively to jointing-bars Y Y, situated on each side the center of passage of the shingle, and sliding or adjusting laterally, to adapt them to the width of the shingle. These bars are attached to guides Z Z, sliding flush in the platform, or in some equivalent manner. The upper jointer will slide or adjust itself to the edge of the shingle, owing to the inclination of the frame, but it is necessary to attach a spring, g', or equivalent, to the lower jointer, and connect the same with the frame in some suitable manner, as shown in Fig. 7, in order to produce necessary reaction. If desired, a spring may also be connected with the upper jointer. On the outside of each of the jointers Y is secured an inclined arm, h', forming an angle, as clearly shown in Fig. 2. When the sliding frame moves forward, projections i i, Figs. 3 and 10, secured to it at a suitable position, strike on the inside of the arms h' and expand them, so as to entirely free the shingle and allow it to fall off from the platform perfectly formed. The projections i' do not strike the arms h' till the shingle is entirely jointed, when they strike and open the jointers fully for the reception of the next shingle. The effect is thus accomplished by the regular intermittent motion of the sliding frame and a shingle discharged at each reverse stroke.

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

1. Forming the table C of a spring-plate in such a manner as to furnish an elastic surface its whole length, the same being provided with the projections c c, and operating, in combination with the riving-knife b, substantially in the manner and for the purpose herein set forth.

2. The pressure-plate M, made elastic by the spring o, in combination with the way N and tooth-bar E, in such a manner that said plate will rise over the bar, but produce a pressure on the shingle in the rear, substantially as specified.

3. The projections k' on the under side of the pressure-plate M, which force the riven shingle to the bed-plate if too short to be borne upon by the extreme end of the pressure-plate M, the whole arranged as herein set forth.

4. The arrangement of the gage-slide, P, lever v, and cam-bar Q, in combination with the tooth-bar E, projection R, and cam O to retain and release the said tooth-bar, in the manner substantially as herein specified.

5. The arrangement of the bar T, provided with the cams c' c' and block U, in combination with the tooth-bar F and the cams V V, for retaining and releasing the said tooth-bar, substantially as herein set forth.

6. The combination and arrangement of the jointers Y, arms h h', guides Z, and spring or springs g', in such a manner that said jointers act centrally on the shingles, substantially as herein set forth.

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

ENOCH R. MORRISON.

Witnesses:
R. F. OSGOOD,
JAY HYATT.