(No Model.) 4 Sheets—Sheet 1.

W. J. PERKINS.

SHINGLE MACHINE.

No. 569,051. Patented Oct. 6, 1896.

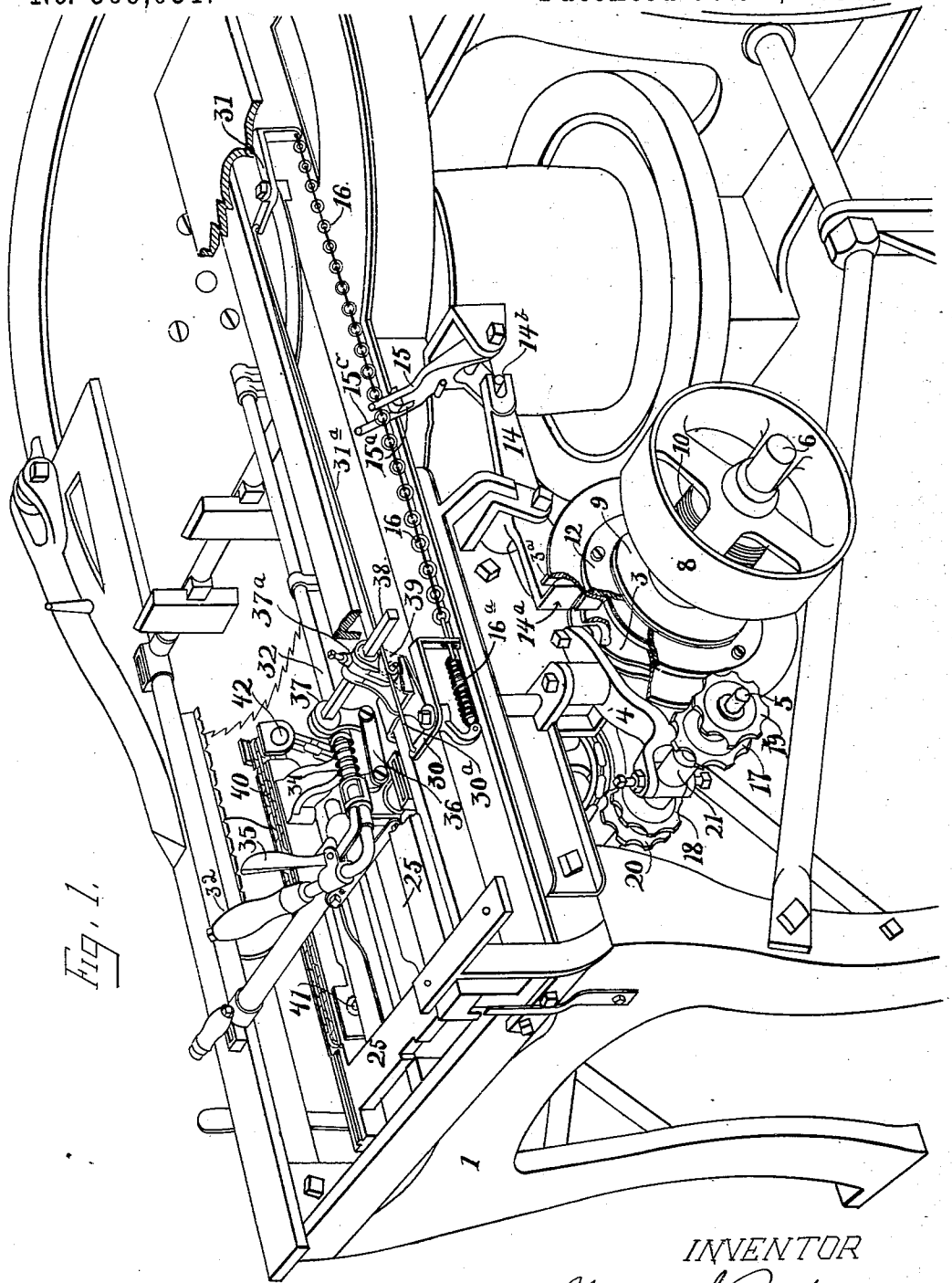

Fig. 1.

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(No Model.) 4 Sheets—Sheet 2.

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SHINGLE MACHINE.

No. 569,051. Patented Oct. 6, 1896.

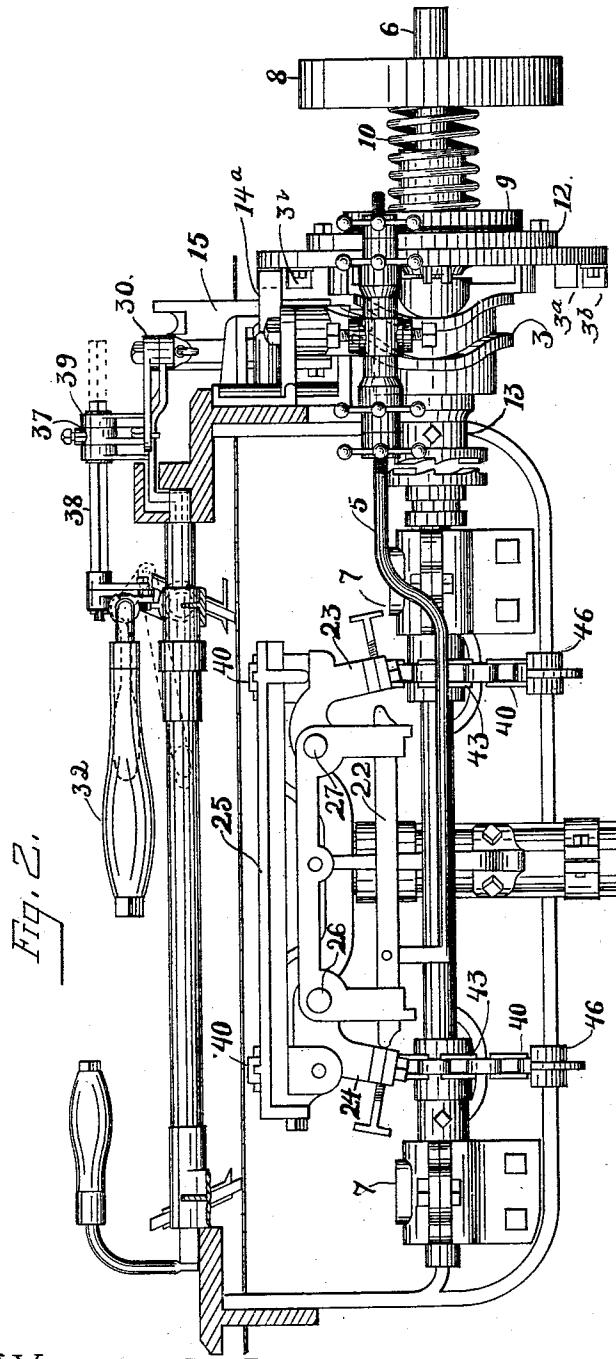

Fig. 2.

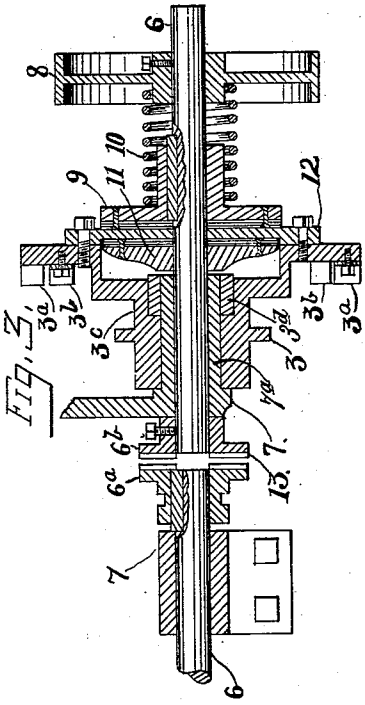

Fig. 3.

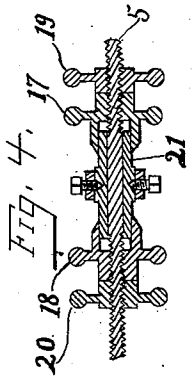

Fig. 4.

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4 Sheets—Sheet 3.

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Fig. 5.

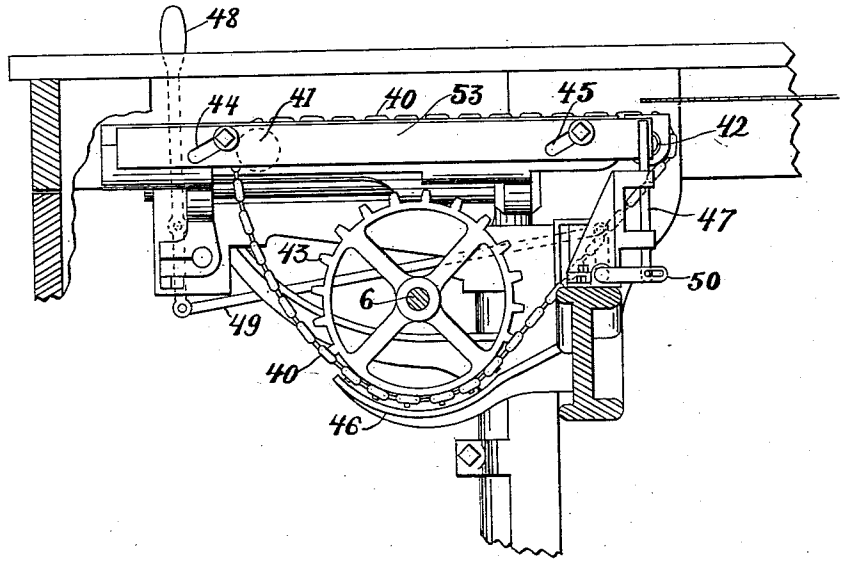
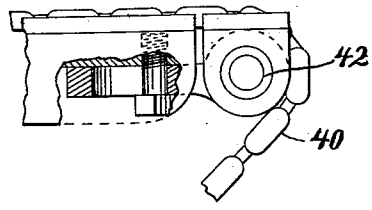


Fig. 6.



WITNESSES

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(No Model.) 4 Sheets—Sheet 4.

W. J. PERKINS.

SHINGLE MACHINE.

No. 569,051. Patented Oct. 6, 1896.

Fig. 7.

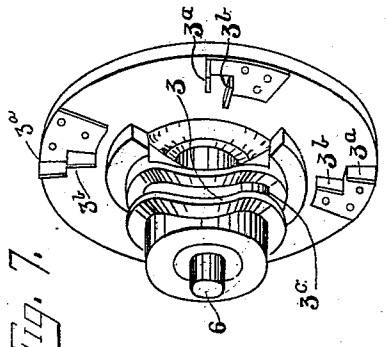

Fig. 8.

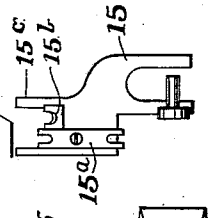

Fig. 9.

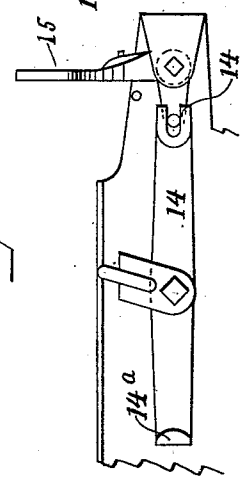

Fig. 11.

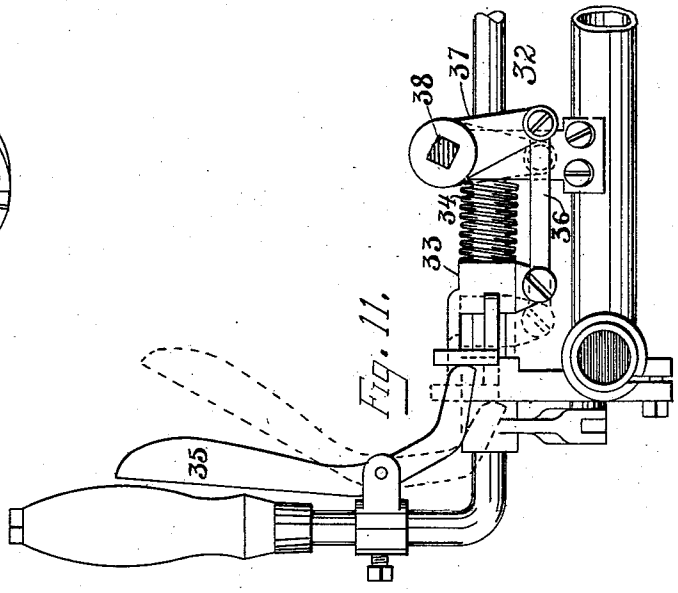

Fig. 10.

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UNITED STATES PATENT OFFICE.

WILLIS J. PERKINS, OF GRAND RAPIDS, MICHIGAN.

SHINGLE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 569,051, dated October 6, 1896.

Application filed April 3, 1894. Serial No. 506,198. (No model.)

To all whom it may concern:

Be it known that I, WILLIS J. PERKINS, a citizen of the United States, residing at the city of Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Shingle-Machines, of which the following is a specification.

This invention relates to shingle-sawing machines, and more particularly to that class of shingle-machines commonly called "hand machines," in which the bolt-carriage is moved backward and forward by the operator.

The invention refers to the mechanism for shifting or tilting the tilt-table and the mechanism for feeding or propelling of the bolt to and over the saw in order to saw or cut the shingles from the bolt; and the objects of my invention are, first, to tilt or shift the tilt-table with the least possible expenditure of force on the part of the operator and with the least possible predetermined movement of the carriage; second, to retain the tilt-table in any required position at the will of the operator; third, to assist the operator in feeding the shingle-bolt to the saw; fourth, to prevent the bolt from coming in engagement with the saw at the will of the operator. These objects I accomplish by means of the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view showing an end, side, and top of a shingle-machine containing my improvements. Fig. 2 is an end elevation with a part of the framework removed in order to show the automatic tilt and adjunctive parts. Fig. 3 is a longitudinal sectional view of the tilt, cam, and adjunctive parts. Fig. 4 is a longitudinal section through the center of the shaft bearing the point-controlling hand-nuts. Fig. 5 is a side elevation of a part of the machine with tilting mechanism omitted in order to show more clearly the mechanical shingle-bolt-feeding mechanism; Fig. 6, detail view of feed-chain take-up; Fig. 7, detail view of tilting-cam; Fig. 8, front elevation of tilting dog-arm; Fig. 9, side elevation of dog-arm and escapement-bar; Fig. 10, plan view of mechanism connecting trip-lever on dog-handle and tilting-chain; Fig. 11, elevation of dog-handle connections with tilt-chain support removed.

Similar letters refer to similar parts throughout the several views.

The general construction of this class of machines consists of a saw suitably supported and driven, a reciprocating carriage provided with dogs for grasping and holding the shingle-bolt, a support for sustaining the reciprocating carriage, and a tilt-table outside of the carriage for determining and controlling the thickness of the shingles severed from the block.

Ordinarily the inclination of the upper surface of the tilt-table in relation to the plane of the saw is made for every shingle separated from the block, the change being preferably made immediately after the shingle has been severed and before the bolt again rests on the tilt-table. Frequently, on account of an imperfection in the shingle-bolt, it becomes desirable to have the tilt-table remain in its adjusted position while several shingles are severed therefrom. The method of shifting the tilt-table, hereinafter described, is an improvement upon my patent dated March 1, 1892, Serial No. 469,976. In previous methods known to me employed to secure this result automatically on a hand-feed machine the power to produce the same is derived entirely from the carriage, which engages with the shifting device and the tilt, the force of power required emanating directly from the sawyer, producing a jerking or jarring strain upon him of an intensity proportionate to the perfectness or crudeness of the mechanism employed.

In my improved device the strain and labor on the sawyer are reduced to a minimum, and the greater part of the power required to operate the moving parts is derived from the belt or other connection from the power which operates the saw, thereby lessening the labor of the operator and enabling him to work more efficiently and more rapidly, increasing the output of shingles with less expenditure of physical exertion.

Any suitable form of tilting mechanism can be used. In the illustration, however, the mechanism shown and described is substantially the same as that shown and described

in my patent above referred to; but I do not confine myself to such form.

The following-described mechanism may be applied to varying forms of tilting machinery.

1 is the machine-frame.

25 is the tilting table, which tilting table may be of any suitable form; but I have shown substantially the tilt described in my patent above referred to. It may be constructed so as to include any suitable form or thickness of butt or point controlling mechanism.

3 is a cam and escapement wheel suitably supported.

4 is a pivotal arm extending from the cam 3 to the tilt-shifting arm 5.

6 is a revolving shaft suitably supported in bearings 7.

8 is a pulley from which connection may lead to any suitable driving power. A gear or any well-known equivalent may be substituted for the pulley 8.

The face of the friction flange or sleeve 9 on the shaft 6 engages with the corresponding surface on cam 3. Sleeve 9 turns with the shaft 6 and has longitudinal movement thereon. A spring 10, (shown in the drawings as a coil-spring,) which bears against the sleeve 9, maintains a constant friction pressure between sleeve 9 and the cam 3. This pressure is sufficient to rotate the cam and operate the tilt when not restrained, as hereinafter described. A collar 11 is attached to the shaft 6, or it may be made integral therewith. A second collar or flange 12 is attached to cam 3, or it may be made integral therewith. This combination of collars and friction pressure attach the same to the shaft 6 and prevent any balancing or offsetting of the friction resistance on other parts of the mechanism, and also prevent any longitudinal motion of shaft 6.

3^a and 3^b are stops on an inner and outer circle located on a projecting flange on cam 3. They are preferably integral with or attached to the cam 3 or parts connecting therewith. The contact-face of 3^b is set back of 3^a a distance proportionate to the thickness of the lug 14^a. A circular groove 3^c is formed on cam 3. The groove may be of any pitch or outline that will adapt it to suitably actuate the tilting mechanism. Cam 3 is preferably mounted on a sleeve 7^a, that encircles shaft 6, preventing unnecessary friction therewith.

3^d is a collar attached to sleeve 7^a and retains cam 3 in its predetermined longitudinal position with shaft 6.

14 is a pivotal arm having a lug 14^a on one end and the slot connection 14^b with a second pivoted arm 15 at the opposite end. The cord, chain, or other equivalent device 16 is attached to suitable supports on a shingle-bolt-holding carriage, preferably located adjacent to opposite corners of the carriage on the movable-dog end of the carriage. Arm 15 has an engaging surface or dog, as 15^a, proportioned to the size and form of the flexible connection. 15^a may be provided with a slot in order to facilitate its adjustment. 15^b has a straight surface free from abutting or engaging projections or slots.

15^c is a bar or guard to retain or confine the flexible connection or chain. The backward movement of the carriage will leave the arm 15 inclined away from the saw, (see Figs. 1 and 2,) the lug 14^a engaging with the stop 3^a. In the backward movement of the carriage the chain, cord, or flexible connection is drawn by the inclination of the arm 15 to the bottom of the slot or engaging surface 15^a, engaging with said arm and carrying it along as the arm 15 passes over its pivotal center. The action of the angle of inclination to the path of continuous movement of the chain or cord is to release its engagement with the arm 15, and it then slides idly along, offering practically no resistance to the friction of the carriage movement. The movement of the arm 15 from right to left raises the lug 14^a, severing the connection with stops 3^b, releasing the cam 3. The friction tension-sleeve 9, acting on cam 3, now revolves it until stop 3^a engages with lug 14^a. The forward movement of the carriage in a similar way lowers the lug 14^a from stop 3^a, when the friction acts to force and maintain engagement between stop 3^b and lug 14^a.

It will be noted that the cam revolves the distance from 3^b to 3^a at a single impulse when the carriage is on a backward movement or is moved away from the saw, the forward movement of the carriage allowing the cam to revolve from 3^a to 3^b a short distance only, and the cam-face at that section being made straight to prevent any shift or change of the tilt. This forms a convenient escapement mechanism for the required purpose, but other escapement mechanism may be used.

The direct connection to the tilt-table (rod 5) has imparted to it a reciprocating motion by the cam rotation. Rod 5 is screw-threaded on the outer end. (See Fig. 4.) Having screw-threaded engagement therewith are the hand-nuts 17 and 18 with their corresponding jam-nuts 19 and 20. A sleeve 21 fits loosely over rod 5 and is preferably fitted into caps or nuts 17 and 18, thereby excluding fine dust from the contact-set of 17 and 21 and 18 and 21. Sleeve 21 is suitably attached to the arm 4. The opposite end of rod 5 is pivoted to reciprocating-point screw-bar 22. The shingle-bolt-supporting table 25 rests on two hinged supports 23 and 24. These supports are journaled on two rods 26 and 27, which are seated on the main frame of the tilt-table proper. The rod 5 has a limited amount of motion by means of cam 3. This motion is preferably in excess of that required to actuate the tilt-table. The latitude given to rod 5 before its travel acts on table 25 is gaged by the hand-nuts 17 and 18, and the

thickness of the shingle-points are, therefore, gaged accordingly. A sleeve 33 encircles the dog-rod 32 and has a free longitudinal movement thereon. Spring 34 bears against the sleeve 33 on one end and engages with the collar attached to the rod 32 on its opposite end. The lever 35 is centrally pivoted to the rod 32 and bears against the sleeve 33. A link 36 is pivoted at one end to the sleeve 33 and at the opposite end to an arm 37 on square shaft 38. The square shaft 38 passes through arm 37^a, which is suitably journaled on lug 39, supported from the carriage. The opposite end of 37^a is attached to the connecting-rods 30^a and 31^a, which complete the engagement between the arm 37^a and the bell-cranks 30 and 31. Shaft 38 passes through arm 37^a, having longitudinal sliding motion therein.

The cord, chain, or other equivalent device 16 is shown connected to the carriage by means of the bell-cranks 30 and 31. The chain is connected to a spring 16^a, which holds the chain under tension for the purpose of providing a yielding strain in case of a quick action on the escapement-arm 15 and causes the chain to assume its normal position after having been thrown out of engagement with arm 15. Bell-cranks 30 and 31 are suitably supported from the carriage-frame.

32 is a rod or connection to which the dog-operating mechanism is attached and is substantially the same as in my previous patent above referred to. The dog-rod travels with the dog and varies in its distance from the bell-cranks 30 and 31, the rod 38 sliding through the square opening in the arm 37^a. The flexible feed is composed, preferably, of two chains 40. Each chain passes over rollers 41 and 42 and engages with chain-wheel 43, substantially as shown in Fig. 5. The upper surfaces of these chains are in the same plane and project a short distance above the shingle-bolt ways 53, so as to support or partially support the shingle-bolt, and the distance of this upward projection may be adjusted by sliding the bar 53 horizontally, or by any other suitable means.

44 and 45 are incline slots receiving the bolts which support the bar 53.

The operation of this part of my invention is as follows: The shingle-bolt is placed in the shingle-bolt-holding carriage, resting upon the upper surfaces of the chain 40, which chains are supported upon a plane surface of the tilt-table 25. The bolt-supporting surfaces of the chains have a continuous movement toward the saw and carry or tend to carry the bolt in that direction. I prefer to so adjust the chain that it will require little or no effort on the part of the sawyer either to propel the bolt to the saw or to check the movement of the bolt, allowing the chains to run idly beneath it.

The chains resting upon the tilt-tables are respectively raised and lowered as the table is tilted, which has the effect to tighten or loosen each chain alternately upon its chain-wheel 43. To retain the chain always in position to be operated by its chain-wheel, I provide a guard 46. This prevents the chain from moving out of operative connection with the chain-wheel. In order to prevent the chain from moving the bolt upon the saw, I provide a stop 47, one on each side, which stops may be lifted above the surface of the tilt-table by means of the pivoted handle 48, connecting-rods 49, and bell-cranks 50, which actuate the stops 47, so as to intercept and check the shingle-bolt in its forward movement toward the saw.

In case it becomes desirable for any reason to dispense with the chain-feed its operating mechanism is disconnected. The shaft 6 is made in two parts connected by means of two clutches 6^a and 6^b with face lugs or projections, the clutch 6^a having a longitudinal or sliding motion on the shaft, occurring midway between the clutch connections.

It is within the spirit of my invention, and I desire to cover the novel features of my invention, whether used as a whole or in part.

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

1. In a shingle-machine, the combination with an intermittently-rotating tilt-actuating cam, an escapement and a shingle-carriage adapted to actuate said escapement, substantially as described.

2. In a shingle-machine, the combination with an intermittent escapement movement, the beats of which are determined by carriage travel, of a tilt-actuating cam operated through said movement, and suitable power for operating the same.

3. In a shingle-machine, the combination with an intermittently-rotating tilt-actuating cam, of an escapement partially actuated by carriage movement.

4. In a shingle-machine, the combination with a reciprocating carriage, an escapement outside of said carriage, an arm connected to said escapement, surfaces on said carriage that shift the said arm to correspond to the carriage movement, and a tilt-table operated by the said escapement, substantially as described.

5. In a shingle-machine, the combination with a movable carriage, of an intermittently-moving tilting mechanism adapted to convey intermittent movement to the tilt-table, a tilt-table, an escapement mechanism, and suitable mechanism for automatically releasing said escapement mechanism from the operation of the carriage when said carriage is shifted, substantially as described.

6. In a shingle-machine, the combination with a rotating tilt-actuating cam and a plurality of stops having a synchronism of movement therewith, a trip or abutting surface, and a movable carriage adapted to come in contact with the said trip or abutting surface

and to actuate the same, substantially as described.

7. In a shingle-machine, the combination with a movable carriage, of a release or escapement device, a train of mechanism, a suitable power for operating said train of mechanism, and a tilting-block-regulating table, substantially as described.

8. In a shingle-machine, the combination with a reciprocating carriage, a tilting-table, a train of operative mechanism connected thereto, and an escapement device for controlling said train of mechanism.

9. In a shingle-machine, the combination of a yielding device having an operative engagement in normal position with an escaping device, an escaping device substantially as described, and suitable mechanism for shifting said yielding device into inoperative adjustment with said escapement, substantially as described.

10. In a shingle-machine, the combination of a reciprocating carriage adapted to support a shingle-bolt, a saw, a moving supporting-surface beneath the shingle-bolt for supporting in whole or in part the shingle-bolt, and adapted to propel or assist in propelling the shingle-bolt toward the saw.

11. In combination with a movable carriage, of a tilt-table and a movable bolt-supporting feed and suitable mechanism for giving a forward movement of said bolt-supporting feed toward the saw.

12. A movable bolt-supporting feed, in combination with a tilt-table, upon which said feed is supported, and suitable mechanism for operating said feed, substantially as described.

13. The combination with a carriage, of a movable flexible feed, a tilt-table supporting said flexible feed, and suitable mechanism for operating said feed.

14. The combination of a movable feed, a tilt-table supporting said feed, suitable mechanism for giving the forward movement to said feed, and a stop for arresting the movement of the shingle-bolt supported on said feed, substantially as described.

15. The combination with a flexible bolt-feed, a tilt-table supporting said feed, chain-wheels engaging with said feed, and suitable mechanism for giving the required movement to the feed, substantially as described.

In witness whereof I have hereunto set my hand and seal in the presence of two witnesses.

WILLIS J. PERKINS. [L. S.]

Witnesses:
M. LOUISE WRIGHT,
CHRISTOPHER HONDELINK.