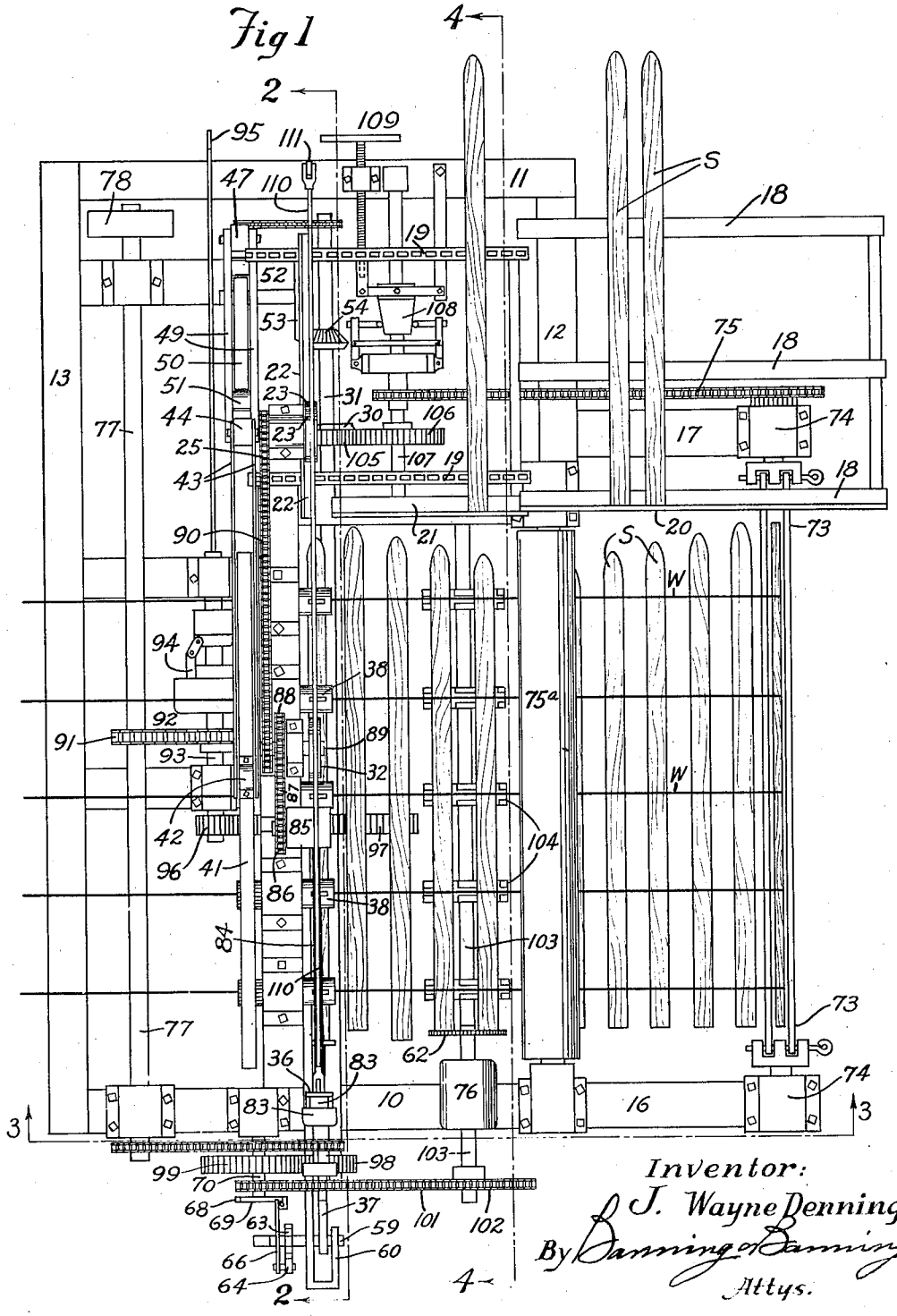
Sept. 9. 1941. J. W. DENNING 2,255,655

PICKET FENCE MAKING MACHINE

Filed Oct. 16, 1940 5 Sheets-Sheet 1

Fig 1



Inventor:
J. Wayne Denning
By Danning & Danning
Attys.

Sept. 9, 1941. J. W. DENNING 2,255,655

PICKET FENCE MAKING MACHINE

Filed Oct. 16, 1940 5 Sheets-Sheet 2

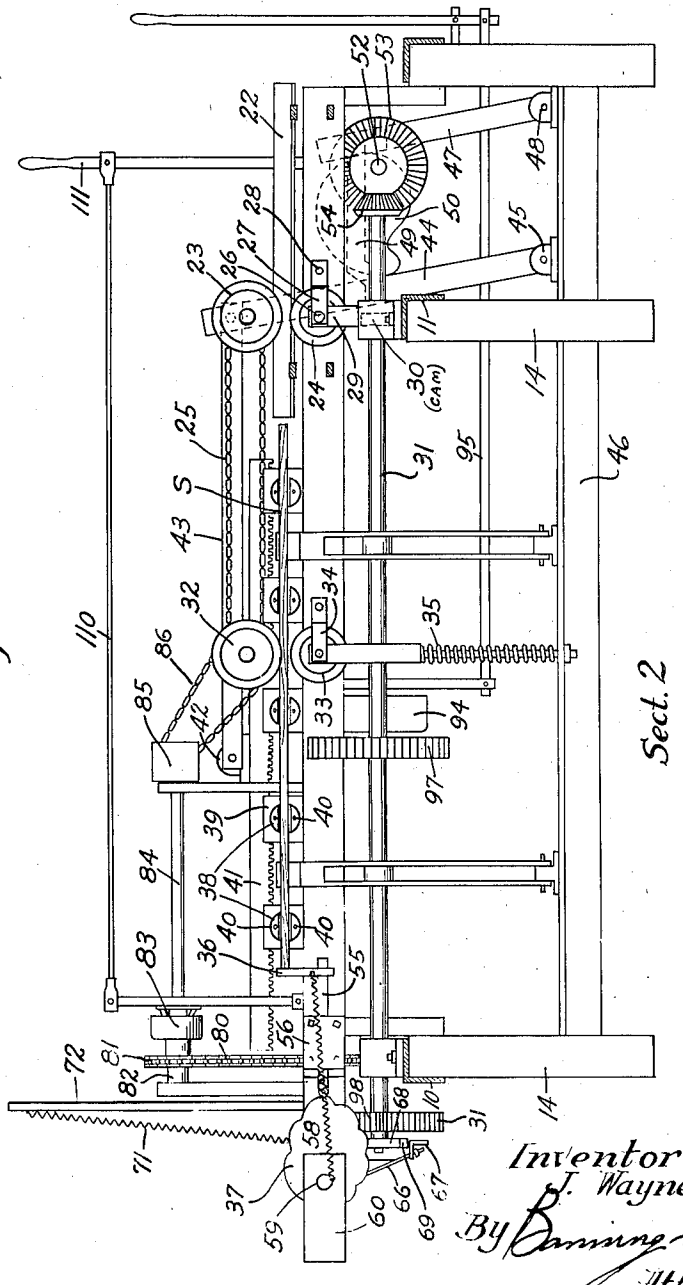


Fig 2.

Sect. 2

Inventor
J. Wayne Denning
By Banning Banning
Attys.

Sept. 9, 1941. J. W. DENNING 2,255,655

PICKET FENCE MAKING MACHINE

Filed Oct. 16, 1940 5 Sheets-Sheet 3

Fig. 8

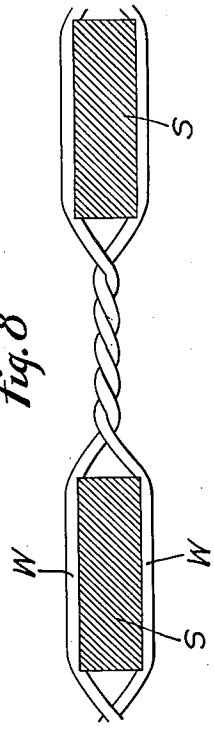
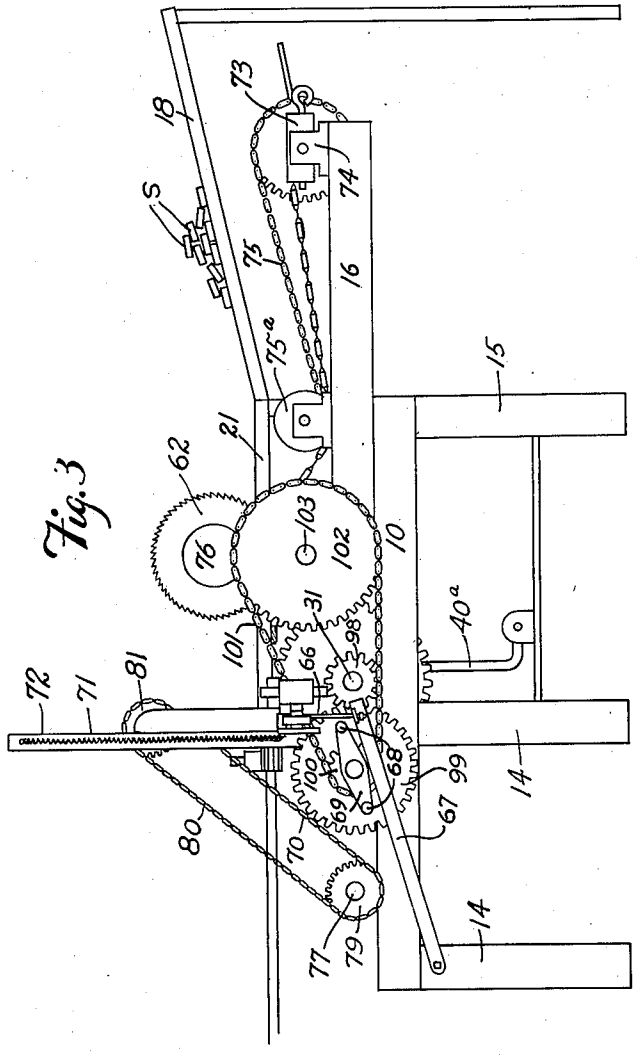


Fig. 3



Inventor:
J. Wayne Denning
By: Deming & Deming
Attys.

Sept. 9, 1941. J. W. DENNING 2,255,655

PICKET FENCE MAKING MACHINE

Filed Oct. 16, 1940 5 Sheets-Sheet 4

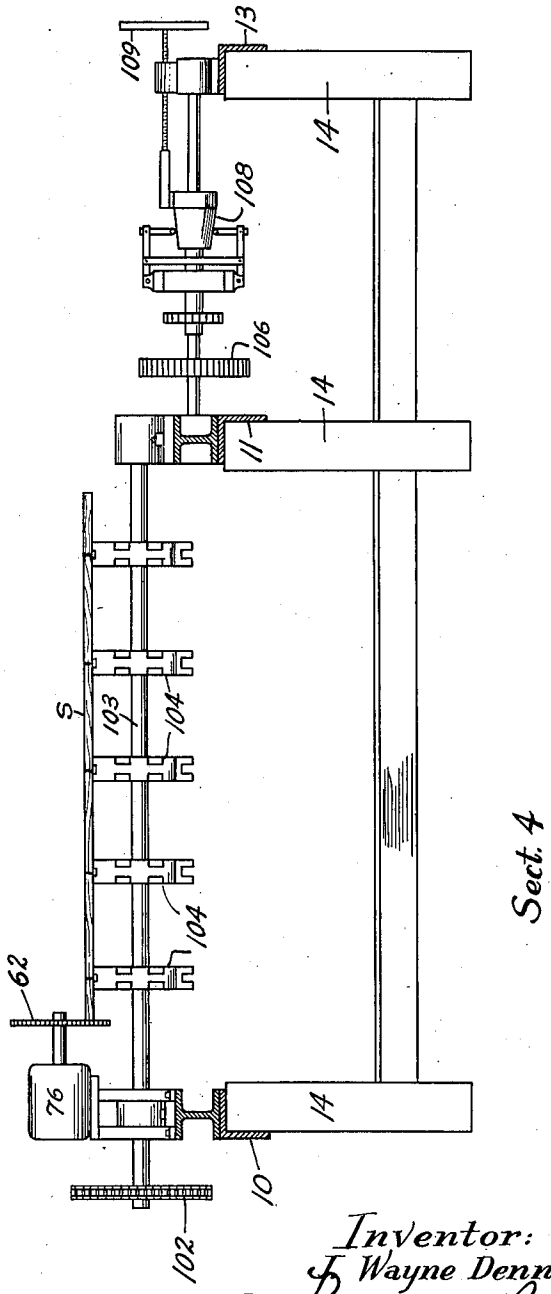


Fig. 4

Sect. 4

Inventor:
J. Wayne Denning
By: Banning & Banning.
Attys.

Sept. 9, 1941. J. W. DENNING 2,255,655

PICKET FENCE MAKING MACHINE

Filed Oct. 16, 1940 5 Sheets-Sheet 5

Fig. 5

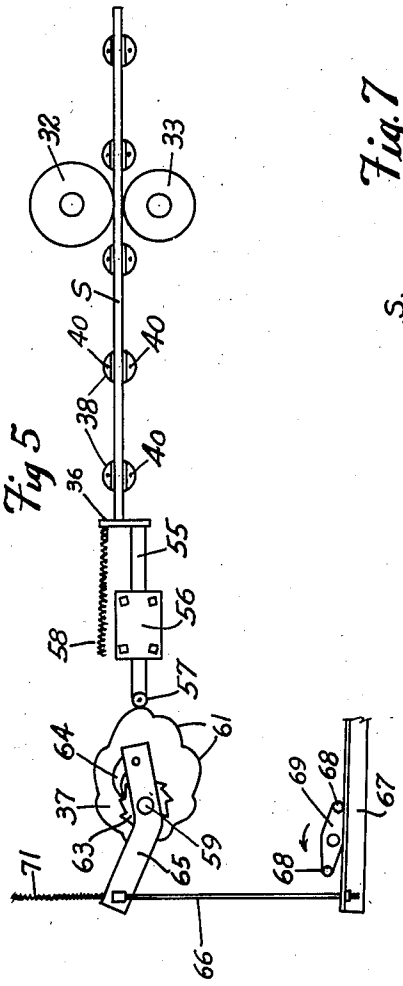


Fig. 7

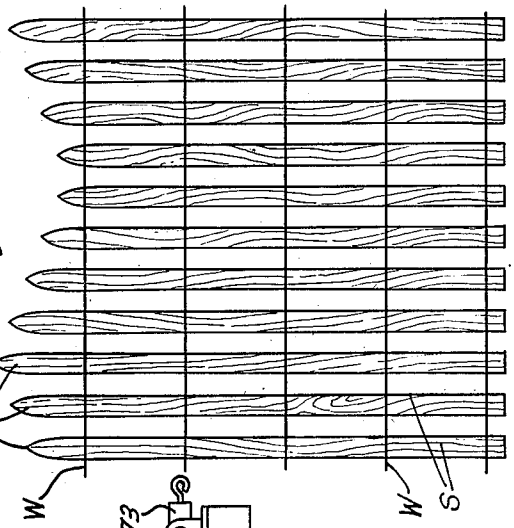
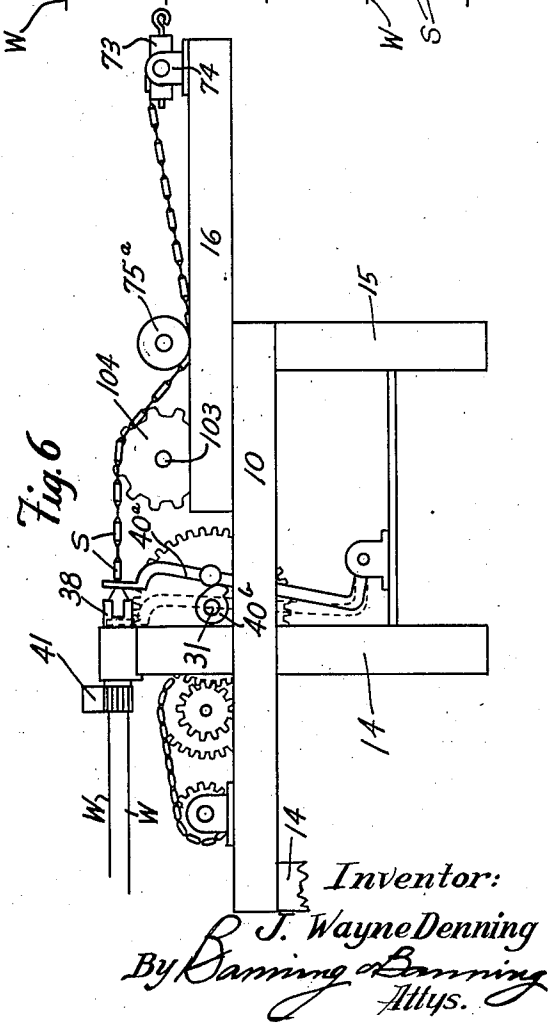


Fig. 6



Inventor:
J. Wayne Denning
By Banning & Banning
Attys.

Patented Sept. 9, 1941 2,255,655

UNITED STATES PATENT OFFICE

2,255,655

PICKET FENCE MAKING MACHINE

J. Wayne Denning, Joliet, Ill.

Application October 16, 1940, Serial No. 361,362

11 Claims. (Cl. 140—26)

The machine of the present invention is designed for the making of picket fencing of the character which provides an irregular or undulatory contour along the upper edge of the fencing and in which wooden slats are employed as pickets secured in place by the twisting of longitudinal strand wires. In fencing of this character, in order to present an attractive appearance, it is customary to employ picket slats of progressively varying length, so that the upper edge will present a recurrent wave-like contour, with the lower edges standing in alignment; and the object of the present invention is to produce such a fence by the employment of picket slats which are initially of uniform length and which are fed laterally in uniform sequence to the wire twisters, but which at this point are variably fed lengthwise before the twisting or tying operation so that an undulatory effect will be initially produced at each edge of the fence, with the provision, however, for thereafter cutting the unevenly spaced slats uniformly along the lower edge, so that the completed fence will display an undulatory contour only along the upper edge.

Further objects and details will appear from the description of the invention in conjunction with the accompanying drawings, wherein—

Figure 1 is a plan view of the machine as a whole, showing the feeding progression from left to right with the takeup reel for the completed fence at the right side of the figure;

Fig. 2 is a sectional elevation taken on line 2—2 of Fig. 1 looking in the direction of the arrows;

Fig. 3 is an end elevation of the machine taken from the near side of the machine as illustrated in Fig. 1;

Fig. 4 is a cross sectional elevation taken on line 4—4 of Fig. 1;

Fig. 5 is a detail of the slat feeding and variable stop mechanism for regulating the position of the slats;

Fig. 6 is an end view showing the fence feeding mechanism and the twisters, with the driving mechanism removed for clarity of illustration;

Fig. 7 is a section of the completed fence; and

Fig. 8 is an enlarged detail of two of the slats with the connecting strand wires.

The machine as a whole is mounted upon a frame comprising end rails 10 and 11 and cross rails 12 and 13, giving to the frame a generally rectangular formation. The frame is mounted upon legs or standards 14 and 15, and in order to support the fence reel and associated parts, supplemental rails 16 and 17 are provided which project to the right of Fig. 1. Above the rails 17 is located an inclined chute consisting of three spaced rails 18 which serve as a support for a plurality of slats S, which are fed downwardly along the chute and on to the surface of endless feed chains 19—19.

The butt ends of the slats, as they are moved down the chute, are brought into contact with a stop bar 20 which evenly aligns the slats, and the stop bar 20 is supplemented by a stop bar 21 so that the slats will be carried to the left of Fig. 1 until their lateral progress is arrested by a stop flange 22. At the point of arrest the butt end of the slat will occupy a position between upper and lower feed rolls 23 and 24, the upper roll 23 being constantly driven by a sprocket chain 25. The lower roll 24 (Fig. 2) is a presser roll which is carried by a stub shaft 26 journalled within a forked bracket 27 which is pivoted at 28 to permit the presser roll to be elevated toward the constantly driven upper feed roll 23. The ends of the shaft 26 are also engaged by the arms of a lower forked bracket 29 which rests upon and is actuated by a cam 30 carried by a shaft 31 which extends transversely of the machine and is driven by connections presently to be described.

With each elevation of the presser roll 24, a slat will be lifted into frictional contact with the upper feed roll 23 and moved inwardly, or to the left in Fig. 2, until its butt end comes within the bite of upper and lower secondary feed rolls 32 and 33, the upper roll being positively driven, and the lower roll being mounted within a pivoted yoke bracket 34 which is urged upwardly by the thrust spring 35 which imparts sufficient friction to the slat to insure the endwise feeding thereof until the butt end is brought into contact with a stop 36 which is variably positioned by the action of a template cam 37 in such a way as to impart the undulatory contour desired in the completed fence. The cam and associated mechanism will be hereinafter described in detail.

During the progress of the slat toward its stopped position, it passes through the jaws of a plurality of twisters 38, each of which is mounted within a head block 39 and provided with wire apertures 40 for the feeding forward of the duplicate wires W W which, with each operation of the twisters, are twisted together in the manner illustrated in Fig. 8. The twisters coact with oscillating stripper bars 40a pivoted at their lower ends

and adapted to be moved from the dotted line position shown in Fig. 6 to the full line position in crowding forward a slat after the twist has occurred on the forward side, and adapted to maintain this position during the formation of the succeeding twist to restore to the dotted line position in advance of the arrival of the next slat. The stripper bars are actuated by cams 40b mounted on the shaft 31 so that their return action is properly timed with relation to the action of the twisters. This is a conventional method of fabricating slat fences, so that it is not deemed necessary to describe the twisters and associated parts in further detail.

The twisters composing the entire group are rotated in unison by a rack bar 41, first in one direction and then in the other, which rack bar is provided with a lug 42 to which are pivoted link arms 43 which at the right hand end (Fig. 2) are pivoted to the upper end of an oscillating lever 44, which in turn is pivoted at its lower end to a bracket 45 carried by a lower rail 46 which constitutes a part of the frame.

The lever 44 cooperates with a companion oscillating lever 47 similarly pivoted at its lower end to a bracket 48, and the two oscillating levers are connected by a yoke bar 49 which is slotted to receive a constant diameter cam 50 which when rotated serves to oscillate the levers 44 and 47 in unison, which oscillation is permitted by the pivoting of the ends of the slotted yoke to the levers, rollers 51 being provided for the contact of the cam and to reduce friction (Fig. 1).

The cam 50 is mounted upon a shaft 52 carrying a bevel faced gear 53 meshing with a bevel pinion 54 carried by the shaft 31, which arrangement actuates the twisters in timed relation to the infeeding of the slats so that, after a slat is properly positioned, the twisters will be rotated in one direction to apply a twist to the fence fabric, and, after said slat has been drawn back as a part of the completed fence, will apply the next twist to the next succeeding slat in the opposite direction.

The stop 36 is carried by a thrust rod 55 (Figs. 2 and 5) which is slidably mounted within guide plates 56 and carries a roller 57 at its rear end, which is held in contact with the edge of the template cam 37 by the tension of a spring 58. The template cam is eccentrically keyed to a stub shaft 59 journalled within a bifurcated bracket 60 (Fig. 1), and the edge of the cam is provided with a series of undulations 61 so configured as to move the stop 36 in varying degree and in conformity with the design or pattern to be imparted to the upper edge of the fence, so that, with a complete rotation of the cam, a unit of the recurrent pattern will be imparted to the picket slats, which at this stage will also be unevenly positioned at their butt ends in preparation for the subsequent cutting, which is performed by a rotating saw 62 in a manner to be presently described.

The template cam 37 is actuated by a ratchet 63 rigidly secured to the shaft 59, which ratchet is engaged by a dog 64 carried by a lever 65 pivoted upon the shaft 59 and having its outer end connected by a link rod 66, the lower end of which is engaged by a rocking bar 67 pivoted at its opposite end to the frame, and actuated by rollers 68 at the opposite ends of a rotating arm 69 carried by a shaft 70 suitably driven in a manner to be described. In Fig. 5, the position of the rocking bar 67 and rotating arm 69 with relation to the cam 37 has been shifted through 90° for clarity of illustration.

The ratchet lever 65 is drawn upwardly by the tension of a spring 71 secured to a post 72, so that after each advance of the dog 64 under the pull of the link rod 66, the dog will be restored to position to engage the next tooth of the ratchet

The completed fence is wound forwardly upon a reel 73, the heads of which are mounted within journal boxes 74 on the frame rails 16 and 17, and the reel is rotated by a sprocket chain 75 driven in a manner to be presently described. The completed fencing passes under an elevated idle roll 75a located between the twisters and the reel.

The rotary saw 62 is carried by the shaft of a motor 76 mounted upon the frame rail 10 and in position to evenly trim away the surplus material of the slats at their butt ends so as to produce a fence of the desired character so that the butt ends will be trimmed in varying degree as the fence advances to the saw.

The main drive for the machine is from a drive shaft 77 suitably driven by a pulley 78 or the like, and said shaft at its opposite end drives a sprocket 79 carrying a sprocket chain 80 which drives an upper sprocket wheel 81 mounted on a shaft 82 carrying a clutch 83 for clutch engagement with a shaft 84 which, through gearing in a gear box 85, drives a sprocket chain 86 running over a sprocket wheel 88 on a shaft 89 which carries the secondary feed roll 32. The same shaft mounts a sprocket chain 90 which drives the upper feed roll 23.

The main drive shaft has mounted thereon a sprocket 91 carrying a sprocket chain 92 which drives a shaft 93 through the medium of a clutch 94 operated by a hand lever 95. The shaft 93 carries a pinion 96 which meshes with a gear 97 on the shaft 31, so that power imparted to said shaft will operate the cam which controls the movement of the pressure roll 24 and will also impart movement to the cam shaft 52 which controls the action of the twisters in timed relation to the feeding of the slats.

The shaft 70 is driven through gears 98 and 99, the former of which is mounted upon the shaft 31, and rotation from the shaft 70 is imparted through a sprocket wheel 100 and sprocket chain 101 to a sprocket wheel 102 mounted upon a shaft 103 which carries a group of star wheels 104 (Fig. 4) which assist in feeding the completed fence toward the right in Fig. 1.

The power for operating the takeup reel 73 is derived from the shaft 31 through gears 105 and 106, which latter is mounted on a shaft 107 and through the sprocket chain 75, the speed of which may be regulated by a suitable clutch 108 to compensate for the increase in the diameter of the fence roll as the work progresses. The action of the clutch is regulated by a hand wheel 109 and the clutch 83 is operated by a draw rod 110 connecting with a hand lever 111.

Operation

In operation, the supply of picket slats is laid upon the inclined chute at the right of the machine, with their butt ends evenly stacked against the stop bar 20, and the operator moves the slats forwardly to the left one at a time until they are caught by the endless feed chains 19 and moved into position between the upper and lower feed rolls 23 and 24.

At timed intervals, the lower presser roll will be elevated to lift the positioned slat into contact with the constantly rotating upper roll 23,

so that the slat will be fed endwise across the machine until it is engaged by the constantly rotating secondary feed rolls **32** and **33** which exert the necessary friction to continue the feeding of the slat until its butt end engages the stop **36**, which will momentarily occupy a position conformable to the undulating edge of the template cam **37**. When so stopped and moved forward by the stripper bars, the twisters will be actuated to impart the necessary twist to the strand wires, and thereafter the newly positioned slat will be drawn back with the completed fence and away from the twisters to afford clearance for the arrival of the next succeeding slat. During this interval, the stop **36** will be repositioned in conformity with the configuration of the template cam, so that each succeeding slat will occupy a different position with respect to the twisters until an upper edge pattern conformable to the template cam has been imparted to the fence fabric. As the completed fence advances, the butt ends of the slats will encounter the constantly rotating saw and the surplus material trimmed away, so that the lower edge of the fence will present an even appearance when the fence arrives at the point where it is wound upon the takeup reel. Any desired configuration can be given to the upper edge of the fence by the mere substitution of template cams which are properly configured to attain that result.

The machine as a whole is one in which the operations involved in the proper spacing of the slats are entirely automatic, so that it is only necessary for the operator to deliver the slats to the feeding mechanisms with a sufficient frequency to provide for the infeeding of the successive slats at the proper intervals, after which the operations continue without interruption until the completed fence is delivered to the takeup reel.

Although the invention has been described with particularity as to detail, it is not the intention, unless otherwise indicated in the claims, to limit the invention to the precise form shown, since the principle involved in the use of a template for regulating the stopped position of the succeeding slats may find embodiment in machines which are variously constructed to provide for the feeding of the slats and the securing of the strand wires in the formation of the completed fence fabric.

I claim:

1. In a machine for fabricating fencing consisting of spaced slats and longitudinal strand wires engaging the slats, the combination of means for engaging the strand wires with tne slats, means permitting lateral advancement of slats of uniform length singly to the wire engaging means, a stop for positioning one end of each slat in the intended relation longitudinally with respect to the wire engaging means, a patterned template member for variably changing the position of said stop to adjust the ends of succeeding slats in conformity with the intended pattern, and means for operating the wire engaging means and the template member in timed relation to one another to impart a variable contour to the upper end of the completed fence.

2. In a machine for fabricating fencing consisting of spaced slats and longitudinal strand wires engaging the slats, the combination of means for engaging the strand wires with the slats, means permitting lateral advancement of slats of uniform length singly to the wire engaging means, a stop for positioning one end of each slat in the intended relation longitudinally with respect to the wire engaging means, a patterned template member for variably changing the position of said stop to adjust the ends of succeeding slats in conformity with the intended pattern, means for operating the wire engaging means and the template member in timed relation to one another to impart a variable contour to the upper end of the completed fence, and a cutter for cutting off the butt ends of the slats in straight alignment after the fence has been fabricated.

3. In a machine for fabricating fencing consisting of spaced slats and longitudinal strand wires engaging the slats, the combination of means for engaging the strand wires with the slats, means permitting lateral advancement of slats of uniform length singly to the wire engaging means, a stop for positioning one end of each slat in the intended relation longitudinally with respect to the wire engaging means, a rotatable template cam having its edge configured to impart variable stopping positions to the stop member to adjust the ends of succeeding slats in conformity with the intended pattern, and means for operating the wire engaging means and the template member in timed relation to one another to impart a variable contour to the upper end of the completed fence.

4. In a machine for fabricating fencing consisting of spaced slats and longitudinal strand wires engaging the slats, the combination of means for engaging the strand wires with the slats, means permitting lateral advancement of slats of uniform length singly to the wire engaging means, a stop for positioning one end of each slat in the intended relation longitudinally with respect to the wire engaging means, a rotatable template cam having its edge configured to impart variable stopping positions to the stop member to adjust the ends of succeeding slats in conformity with the intended pattern, means for operating the wire engaging means and the rotatable template cam in timed relation to one another to impart a variable contour to the upper end of the completed fence, and a cutter for cutting off the butt ends of the slats in straight alignment after the fence has been fabricated.

5. In a machine for fabricating fencing consisting of spaced slats and longitudinal strand wires engaging the slats, the combination of a plurality of twisters for intermeshing the slats within the strand wires, means for laterally advancing the slats singly to the twisters, means for imparting endwise movements to the slats with respect to the twisters, means for regulating the endwise movement of succeeding slats to impart a variable contour to the ends of the line of slats in advance of the twisting operation, and means for actuating the several mechanisms in timed relation to one another to produce a fence having an irregular contour along its upper edge.

6. In a machine for fabricating fencing consisting of spaced slats and longitudinal strand wires engaging the slats, the combination of a plurality of twisters for intermeshing the slats within the strand wires, means for laterally advancing the slats singly to the twisters, means for imparting endwise movements to the slats with respect to the twisters, means for regulating the endwise movement of succeeding slats to impart a variable contour to the ends of the line of slats in advance of the twisting operation, means for actuating the several mechanisms in timed relation to one another to produce a fence having an irregular contour along its upper edge, and a cutter for cutting off the butt ends of

the slats in straight alignment after the fence has been fabricated.

7. In a machine for fabricating fencing consisting of spaced slats and longitudinal strand wires engaging the slats, the combination of a plurality of twisters for applying the strand wires to the slats, means for laterally delivering the slats singly to a position in alignment with the twisters, feeding means for advancing the slats endwise through the twisters, a member for variably regulating the extent of said endwise movement imparted to succeeding slats conformable to the pattern to be imparted to the upper edge of the fence, means for actuating the slat feeding means, the twisters and the regulating means in timed relation to one another, and means for withdrawing the completed fence away from the twisters.

8. In a machine for fabricating fencing consisting of spaced slats and longitudinal strand wires engaging the slats, the combination of a plurality of twisters for applying the strand wires to the slats, means for laterally delivering the slats singly to a position in alignment with the twisters, feeding means for advancing the slats endwise through the twisters, a member for variably regulating the extent of said endwise movement imparted to succeeding slats conformable to the pattern to be imparted to the upper edge of the fence, means for actuating the slat feeding means, the twisters and the regulating means in timed relation to one another, means for withdrawing the completed fence away from the twisters, and a rotary saw located in the line of advance of the butt ends of the slats and in position to evenly trim the butt ends.

9. In a machine for fabricating fencing consisting of spaced slats and longitudinal strand wires engaging the slats, the combination of a plurality of twisters, feeding means for the endwise delivery of slats of equal length successively to the twisters, means for variably regulating the extent of said endwise feeding of the slats in conformity with the pattern to be imparted to the upper edge of the fence, and means for actuating said feeding means, said twisters and said regulating means in timed relation to one another.

10. In a machine for fabricating fencing consisting of spaced slats and longitudinal strand wires engaging the slats, the combination of a plurality of twisters, feeding means for the endwise delivery of slats of equal length successively to the twisters, means for variably regulating the extent of said endwise feeding of the slats in conformity with the pattern to be imparted to the upper edge of the fence, means for actuating said feeding means, said twisters and said regulating means in timed relation to one another, and a rotary cutter positioned to trim the butt ends of the slats in even alignment after the slats have been engaged by the strand wires.

11. In a machine for fabricating fencing consisting of spaced slats and longitudinal strand wires engaging the slats, the combination of means for engaging the strand wires with the slats, feeding means for the endwise delivery of slats of equal length successively to the wire engaging means, means for variably regulating the extent of said endwise feeding of the slats in conformity with the pattern to be imparted to the upper edge of the fence, and means for actuating said feeding means, said wire engaging means and said regulating means in timed relation to one another.

J. WAYNE DENNING.