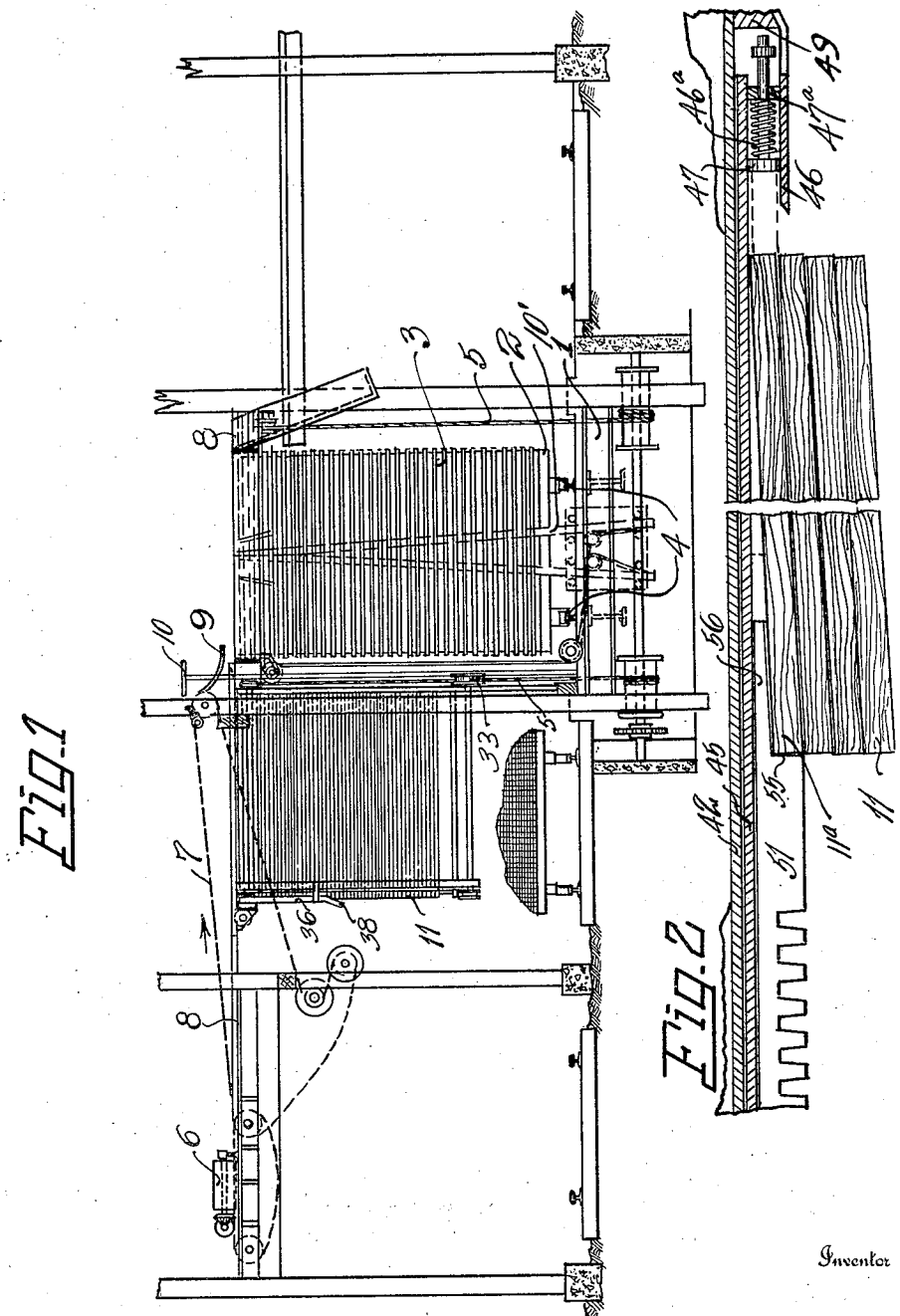
March 19, 1929. F. W. HORSTKOTTE 1,705,570

STICKER PLACER

Filed Jan. 23, 1928 3 Sheets-Sheet 1



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STICKER PLACER

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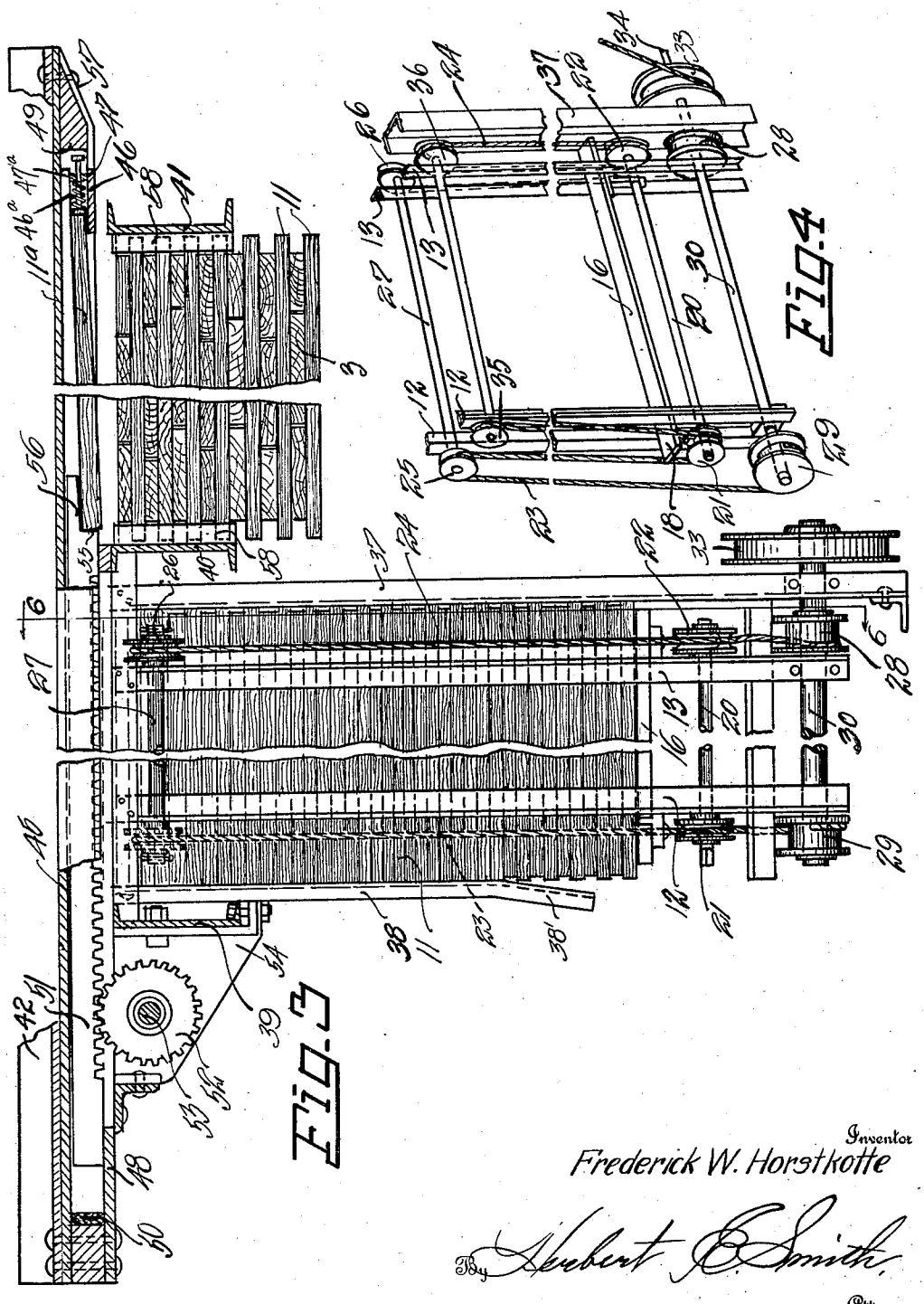


Fig. 3

Fig. 4

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Fig. 7

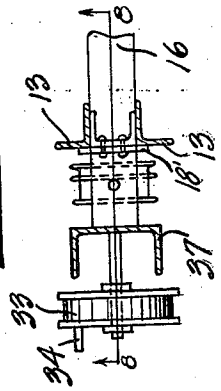


Fig. 8

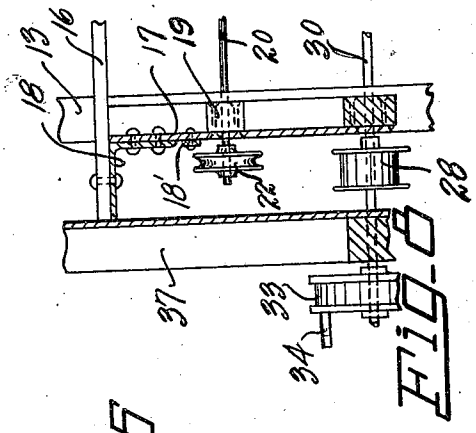


Fig. 6

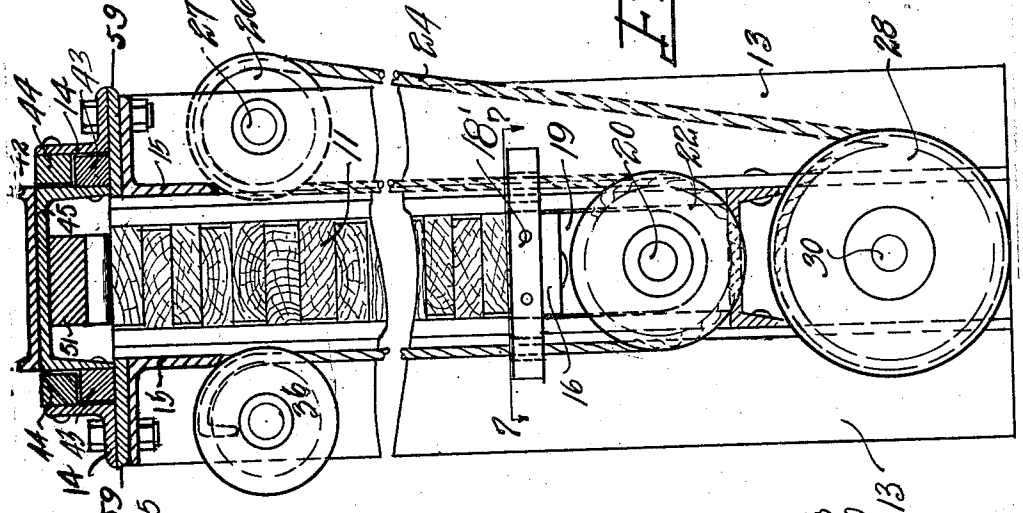
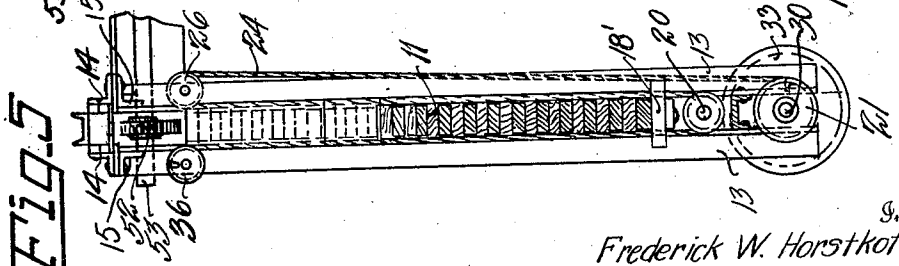


Fig. 5



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UNITED STATES PATENT OFFICE.

FREDERICK W. HORSTKOTTE, OF PORTLAND, OREGON.

STICKER PLACER.

Application filed January 23, 1928. Serial No. 248,780.

My present invention relates to an improved sticker placer which while adapted for general use in stacking or piling lumber is particularly applicable for forming lumber in piles for open air curing and for stacking the lumber upon cars or trucks to be conveyed to kilns for drying. In both instances where the stacked or piled lumber is to be cured or dried it is necessary in the formation of the pile or stack to provide vent spaces, as between the courses of lumber in the stack, for the circulation of air in contact with the upper and lower sides of the lumber. To provide these spaces, a number of sticks of a length slightly longer than the width of the stack or pile are deposited transversely of the pile upon each course as it is manually laid.

My invention contemplates the use of mechanical means automatically operated for actuating a series of stick feeding mechanisms and conveyors for depositing the sticks in their several places upon the top course of the lumber as the stack is formed. The plurality of stick feeding and conveying mechanisms for depositing the sticks upon the successive courses as they are laid vary in number with the length of the lumber and two, four, six or other suitable number of these mechanisms are employed. The stick feeding mechanism includes a manually controlled and automatically operating elevator, operating in conjunction with a hopper, to bring the uppermost stick of a stack into position for an overhead, horizontally operating stick-conveyor which intermittently reciprocates and transfers the topmost stick from its stack and deposits it upon the topmost course of lumber on the lumber stack adjacent thereto.

The invention consists in certain novel combinations and arrangements of parts for accomplishing the above operations as will hereinafter be more fully described and claimed.

In the accompanying drawings I have illustrated one complete example of the physical embodiment of my invention wherein the parts are combined and arranged according to the best mode I have thus far devised for the practical application of the principles of my invention.

Figure 1 is a view in elevation showing a lumber piling or sticking machine equipped with the mechanism of my invention, the stick-conveyor being shown in retracted position.

Figure 2 is an enlarged, detail, longitudinal vertical sectional view of the stick-conveyor and stick-carrier therein, showing the latter in position to engage and move a stick.

Figure 3 is a detail elevation with parts in section showing the hopper with the stick-elevator, and the stick-conveyor and carrier with a stick ready to be dropped upon the lumber stack.

Figure 4 is a detail perspective view showing the operating cables and sheaves for the elevator.

Figure 5 is an edge view of the feed hopper with sticks stacked therein, the side frame being omitted for convenience of illustration.

Figure 6 is an enlarged, transverse sectional view at line 6—6 of Figure 3 and partly broken away showing the relation of the feed hopper and elevator to the stick-conveyor and carrier.

Figure 7 is a detail sectional view at line 7—7 of Figure 6.

Figure 8 is a sectional view at line 8—8 of Figure 7.

In order that the general arrangement and relation of parts may readily be understood attention is first directed to Figure 1 of the drawings where a lumber stacking or piling apparatus is illustrated as employing a vertically movable platform 1 supports the kiln car or truck 2 upon which the lumber stack 3 is erected. The kiln truck or car rests upon rails or tracks 4 of the platform 1 and the stack of lumber on the truck is conveyed by means of the truck and rails to the kiln or other suitable place. In piling the lumber on the truck, the latter is first elevated by means of hoisting cables 5 and suitable operating mechanism therefor to the desired height, and the elevated platform which supports the truck is intermittently lowered as the stack increases in height by the addition of successive courses of lumber and alternately arranged series of spacing sticks.

The lumber is supplied to the stacking plant over conveyor rollers 6 and manually shifted therefrom to endless conveyor belts or chains 7, the working flights of which convey the successive pieces of lumber to the right, over the supporting frame or structure 8. At the discharge ends of the endless conveyors the lumber slides down inclined chutes 9, and men standing on the upper deck

or platform of the frame 8 pick up the pieces as they slide down the chute and deposit them in courses on the sticks deposited on top of the lumber stack. The pilers lay the successive pieces of lumber in courses to form the stack, and when the elevator 1 and its car or truck 2 are loaded the truck will have been lowered to position in Figure 1 to be run over the rails to the kiln. A hand wheel 10 is indicated for controlling the descent of the chimney guides 10′ through suitable lowering mechanism.

As each course is laid on the stack a plurality (two, four, six, or other suitable number) of spacing sticks 11 are mechanically and automatically placed in spaced relationship transversely of the lumber stack, preferably with their ends projecting slightly beyond the front and rear sides of the stack, as seen in Figures 1 and 3.

These sticks are of uniform length and as they are located between upper and lower courses of the stack they provide horizontally extending spaces between the course for circulation of air in curing or drying the lumber.

The number of sticks provided for a stack varies with the length of the lumber and according to the number of stick-feeding and co-operating stick conveying mechanisms required for a stack also varies. The plurality of stick-feeding and stick-conveying devices are of similar construction and operation and a description of one will suffice for others.

Each stick feeding appliance includes the upright hopper and its vertically movable elevator and co-operates with an over-head, horizontally disposed combined conveyor and carrier which removes the top stick 11ª from the stick-stack of the hopper and places it upon the top course of the lumber stack 3.

The hopper includes opposed pairs of upright angle plates 12, 12, and 13, 13, spaced apart and supported from above on the overhead frame 8 of the machine in connection with spaced angle plates 14 that guide the stick conveyor and angle brackets 15 as shown in Figure 6. The hopper is thus formed as a rigid, open frame in which the stick elevator 16 is designed to vertically reciprocate, and elevate a stack of sticks 11. The stationary hopper is located adjacent the lumber stack and the elevator includes a bottom plate 16 which forms the bottom of the stacks of sticks. The elevator is guided at its ends by the angle irons 12, 12, and 13, 13, and upright channel plates 37 and 38 of the frame of the hopper. At the underside of the bottom plate 16 and near its ends are attached vertical flanged side plates 17 by means of angle irons 18 and bolts or rivets, and the flanges of the side plates, which flanged side plates slide between the angle plates 12 and 13 to hold the elevator from wobbling. Cross straps 18′ on the side plates prevent longitudinal displacement of the elevator and thus assist in guiding its vertical movement.

Bearing blocks 19 are secured to the two side plates, and a horizontally disposed shaft 20 is journaled parallel with the sticks in the hopper and below the elevator.

On the ends of this shaft, exterior of the hopper, are mounted winding pulleys 21 and 22 and a pair of housing cables 23 and 24 are passed around these pulleys and up over a pair of guide pulleys 25 and 26 on the shaft 27.

From these upper guide pulleys, the cables pass downwardly and are attached to the respective housing pulleys 28 and 29 mounted on an operating shaft 30, which shaft is journaled in bearings of the hopper frame and extends longitudinally throughout the length of the lumber stacker for operating all of the stick elevators in use.

The shaft 30 is turned and controlled to lift and lower the elevator through the action of a power driven operating drum 33 on the shaft, or the shaft may be manually turned by power applied to the handle 34 on the pulley 33.

The other ends of the cable are attached to pulleys 35 and 36 and it will be apparent that as the winding pulleys 28 and 29 are properly turned the elevator will be bodily raised, and the uniform operation of the cables permits the stack of sticks to be lifted as required, and the empty elevator to be lowered for a fresh supply of sticks when the stack is exhausted.

The sticks are placed in the hopper on the elevator when the latter is in lowermost position and as the sticks are elevated they are guided at their ends by the stationary end plates 38 and 37 in the form of upright channel plates, the latter plate resting upon a suitable support and affording an additional support for the rigid hopper frame. The guide plate 38 at its lower end terminates in an elevated outwardly flaring guide flange 38′ against which the sticks at one end contact and are guided into alinement in the hopper as the elevator ascends with an intermittent motion.

At the top of the feed hopper a horizontal channel beam 39 is supported in the frame 8 and extends transversely of the sticks in the hopper, and spaced channel beams 40 and 41 parallel with the lumber stack are also supported from the frame 8 between which latter beams the stack 3 is erected.

As the elevator lifts the sticks 11 of the stack the top stick 11ª of the stack is removed therefrom and deposited upon the top course of the lumber stack as indicated in Figure 3. For this purpose I utilize a reciprocating conveyor disposed over the feed hopper; adapted to be projected from the position in Figure 1 to that of Figure 3 longitudinally

of the sticks in the hopper; to deposit the sticks 11ª; and to be returned to retracted position of Figure 1.

The stick-conveyor comprises a reciprocable slide frame adapted to be projected at intervals over the top of the lumber stack, which frame forms a housing for a relatively movable stick-carrier or shuttle member that moves bodily with the conveyor, and means are employed whereby the stick-carrier and the housing or slide frame are projected simultaneously to operative position; the stick-carrier is given a reverse movement independently of the slide frame to deposit the stick upon the lumber stack; and then the carrier and its slide frame are simultaneously returned to normal or retracted position.

The reciprocable conveyor or slide frame is made up of a pair of channel beams 42, and 45, fastened together back to back, having attached at its lower outer edges guide bars 43 which slide beneath complementary stationary guide bars 44 bolted at the inner sides of the pair of angle iron beams 14 which are rigid with the frame 8 of the machine. The slide frame is supported to slide on the upper horizontal faces of the spaced plates 59 between the angle plates 14 and 15 above the top of the stick-hopper.

At its front end the housing or slide frame is provided with a rigid cross plate 46 located at its lower side, and the stick-carrier has a resilient plunger head 47 slidable in cross head 47ª thereon, and provided with a spring 46ª while at the rear end of the housing a cross plate 48 is bolted to its underside for supporting the rear end of the relatively movable stick-carrier. A forward bumper 49 is located in the slide frame to receive impact from the plunger head 47 of the stick-carrier, and a rear bumper or cushion 50 is provided in the housing for the rear end of the stick-carrier.

Within the channel beam 45 of the carrier is a fixed longitudinally extending rack bar 51 movable with the carrier and provided with rack teeth on the lower face of its rear portion for co-action with a reversible pinion 52 mounted on the shaft 53 in a bearing bracket 54 suspended from the main frame 8.

The shaft 53 is a line shaft extending the full length of the stacking machine and has mounted thereon a number of pinions 52 corresponding to the number of stick-conveyors used in the stacking machine, and is suitably operated in such manner that it may with facility be driven forwardly and reversely to operate the reciprocable stick-conveyor and its stick-carrier.

The rack bar 51 forming a rigid part of the stick-carrier is shorter in length than its channel beam 45 and terminates at its forward end with an abrupt shoulder 55 and a fork 56, the latter having a lower inclined face as best seen in Figure 2, adapted to slide over the end of the stick 11ª, and the shoulder adapted to abut against the end of the stick.

At its front end the slide frame or housing of the stick conveyor is fashioned with a beveled face 57 on its lower side to guide the housing and permit it to ride or glide over the lumber stack or its supporting frame.

On the out-stroke of the conveyor, under action of the pinion and rack bar, the stick-carrier is pushed to the right in Figures 2 and 3 causing the shoulder 55 to abut against the end of the stick 11ª and the stick is then pushed from its stack, in inclined position as shown in Figure 2, causing the front end of the stick to enter the pocket formed in the front of the housing or slide frame by the cross plate 46 as indicated by dotted lines in Figure 2 and by full lines in Figure 3. Continued movement of the rack bar, through the instrumentality of stick 11ª, moves the carrier-head 47 into contact with the cushion 49 of the slide frame, and the latter then partakes of the further movement of the carrier and is projected to position of Figure 3 over the lumber stack. In this location of the stick-conveyor, the stick 11ª is retained by the shoulder 55 of the carrier and the cross plate 46 of the slide frame in an inclined position above the lumber stack with its forward end projecting slightly beyond the lumber stack.

The return movement of the carrier caused by the reversal of the rotary movement of the pinion now slides the carrier to the left relatively to the now stationary slide frame, and the shoulder 55 is withdrawn from contact with the end of the stick 11ª, leaving the latter supported in inclined position by the plate 46. As the carrier moves to the left the head 47 strikes the right end of the stick, pushing said end from its supporting plate, and releasing the stick so that it is free to drop into place on the top course of lumber of the stack. The stick in its inclined position contacts at its left end with the beam 40 and falls to the stack between pairs of spaced side plates 58 attached at the inner sides of the beams 40 and 41, which guide the fall of the stick. In this position the ends of the stick project from the sides of the stack, and the vertically alined series of stick-ends pass downwardly between the guide plates 58 as the stack descends.

After depositing the stick upon the top course of the stack of lumber, the stick-conveyor with its carrier continues to move to the left in Figure 3 until the slide frame is withdrawn from above the lumber stack. Another course of lumber is then manually laid on the sticks thus deposited and the lumber stack is lowered accordingly, while the elevator for the stack of sticks is correspondingly lifted. When the lumber stack is completed its supporting car is wheeled away to the kiln and an empty car takes its

place, and when the stick-stack in the hopper is exhausted its elevator is lowered and the hopper refilled ready to be used for supplying additional sticks to the conveyor and carrier.

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

1. The combination with a lumber piler including a stick-hopper, of a reciprocable conveyor and a relatively movable stick-carrier supported therein for transferring successive sticks from the hopper to a stack of lumber.

2. The combination with vertically movable stick-feeding mechanism, of an overhead horizontally disposed reciprocable stick-conveyor and actuating means therefor, and a relatively movable stick-carrier supported within the conveyor for co-action therewith in transferring a stick from the feeding mechanism.

3. The combination in a lumber piler with a lumber-stack supporting means and means for lowering said means and stack, of a stick-hopper and an elevator for sticks within the hopper, and mechanically operated means for transferring successive sticks from the hopper to a lumber stack.

4. The combination with a stack-supporting platform and means for intermittently lowering the platform as the height of the stack increases, of a stick-feeding elevator and lifting means therefor, a stick-conveyor reciprocable transversely of the platform, and a stick-carrier mounted within the conveyor for co-action therewith in transferring a stick from the elevator to the lumber stack on the platform.

5. The combination with a lumber piler and it supporting frame, of a slide-frame and means for reciprocating it, a relatively movable stick-carrier supported in the slide frame and bodily movable therewith, and co-acting means on the slide frame and carrier for picking up a stick and releasing said stick for the purpose described.

6. In a lumber piler the combination with a supporting frame, of a reciprocable slide-frame, a relatively movable stick-carrier supported within the slide frame, means for actuating the carrier, and co-acting means on the carrier and frame for picking up a stick and releasing said stick for the purpose described.

7. The combination with a supporting guide-frame and a reciprocable slide-frame guided thereby, of a relatively reciprocable carrier carried by the slide-frame, means for imparting an initial movement to the carrier, co-acting means on the carrier and slide frame for picking up a stick, and means for imparting a return movement to the carrier in advance of the movement of the slide frame for releasing the stick.

8. The combination with a reciprocable stick-conveyor, of a relatively reciprocable carrier carried by the conveyor, means for imparting an initial movement to the carrier and co-acting means on the carrier and conveyor for picking up a stick and imparting the movement of the carrier to the conveyor, means for imparting an initial reverse movement to the carrier to release the stick, and means for imparting the reverse movement of the carrier to the conveyor.

9. The combination with an open-bottom slide frame having front and rear cross plates at its underside, of a carrier reciprocable within the slide-frame and supported on said plates, means for actuating the carrier and imparting an initial movement thereto to pick up a stick, co-acting means on the carrier and frame for bodily moving said members to convey the stick, and means for releasing the stick upon a reverse initial movement of the carrier with relation to the frame.

10. The combination with an open-bottom slide frame having spaced bottom-plates, of a relatively reciprocable carrier supported on said plates and adapted to contact at alternate ends with said frame, and means for actuating the carrier.

11. The combination with an open bottom slide frame having spaced bottom plates, of a relatively reciprocable carrier supported on said plates and a rack bar on the carrier, and a reversible pinion for co-action with said rack bar, whereby an initial reciprocal movement is imparted to the carrier in advance of subsequent movement of the frame.

12. The combination with an open bottom slide frame having spaced bottom plates, of a relatively reciprocable carrier supported on said plates and adapted to contact at alternate ends with the frame, a rack bar fixed to the carrier with one of its ends terminating in spaced relation to one of said plates, and a reversible pinion for co-action with said rack bar.

In testimony whereof I affix my signature.

FREDERICK W. HORSTKOTTE.