April 17, 1928.

1,666,451

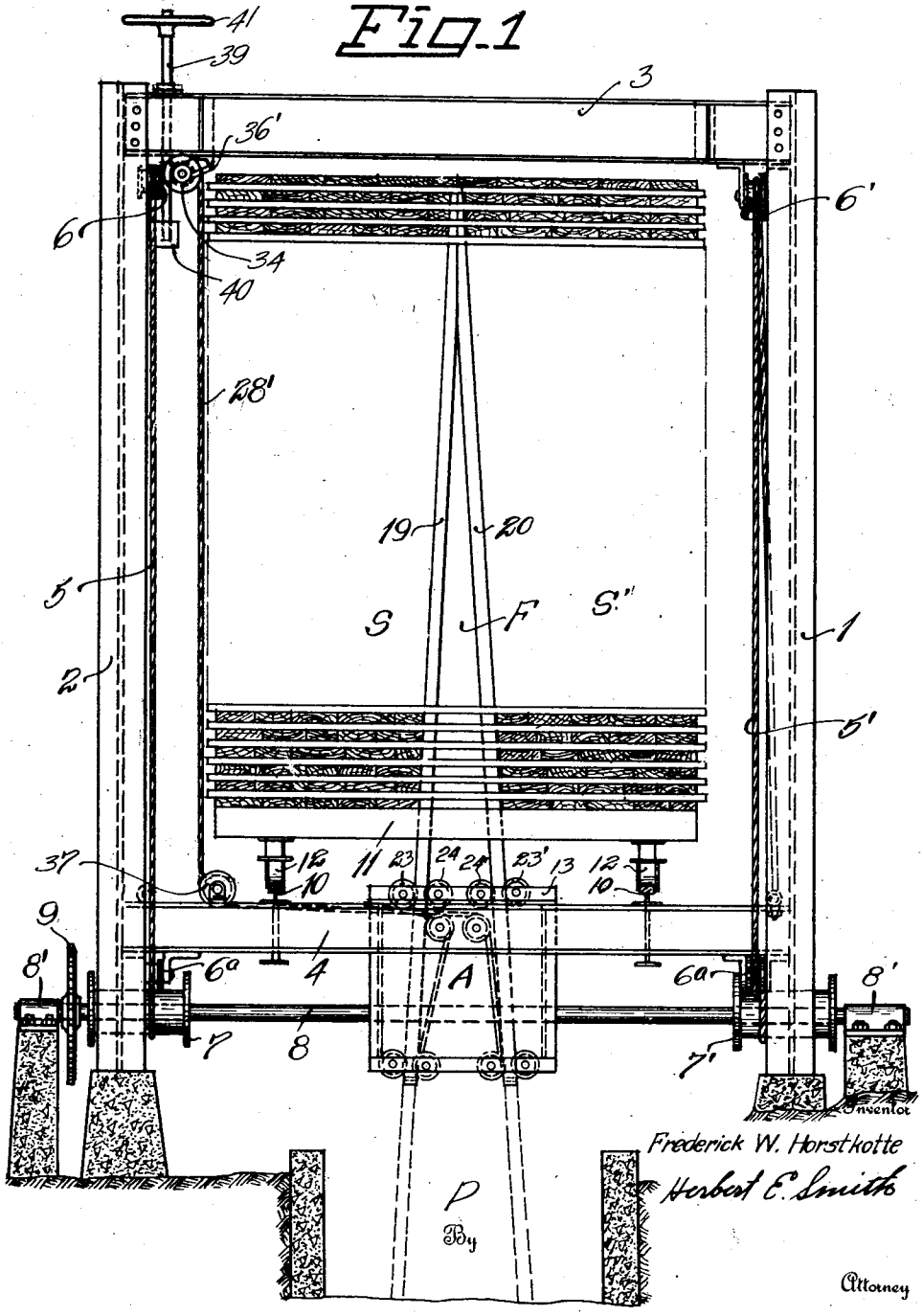
F. W. HORSTKOTTE

STACK SHAPER

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3 Sheets-Sheet 1

Fig. 1



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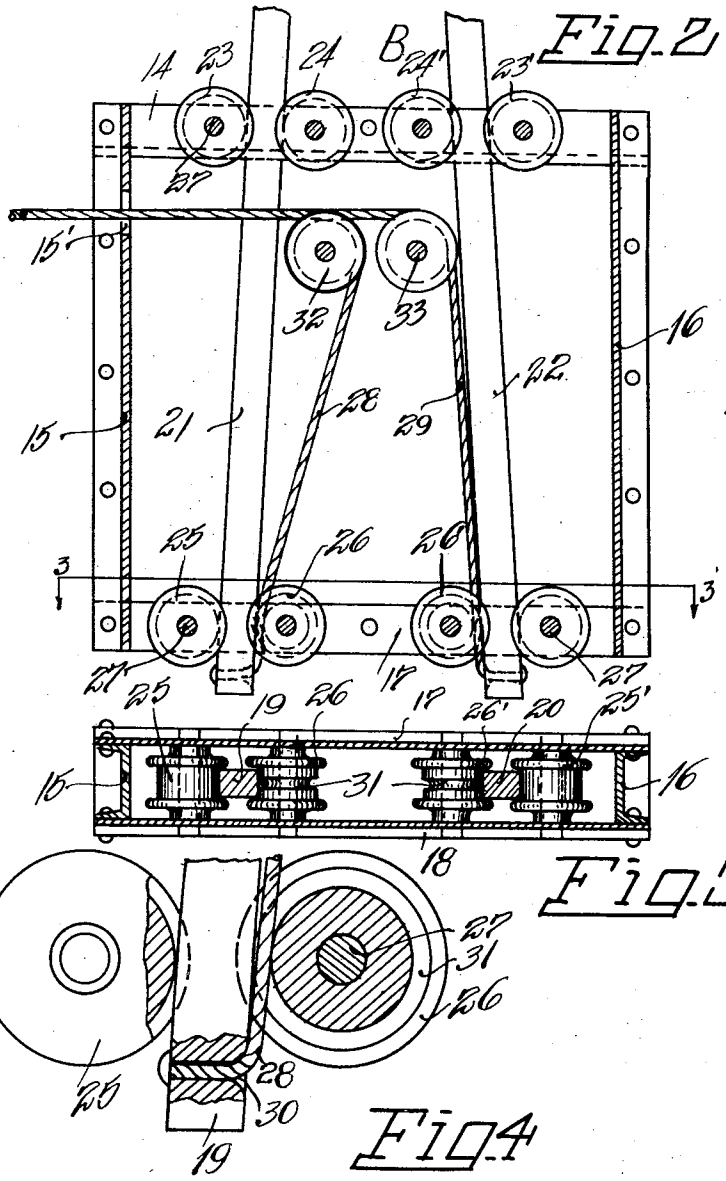


Fig. 2

Fig. 3

Fig. 4

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STACK SHAPER

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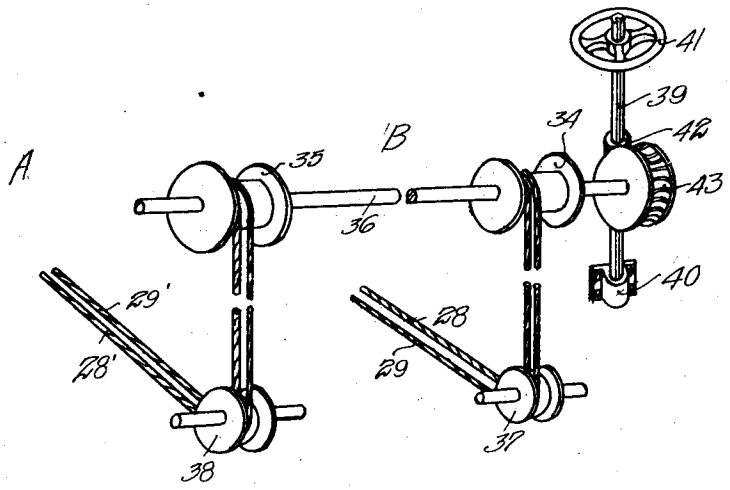


Fig. 5

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Patented Apr. 17, 1928. 1,666,451

UNITED STATES PATENT OFFICE.

FREDERICK W. HORSTKOTTE, OF PORTLAND, OREGON.

STACK SHAPER.

Application filed August 2, 1926. Serial No. 126,613.

My present invention relates to an improved stack shaper for use in piling and arranging lumber and similar material, in order that the lumber of the stack may be treated in a drying kiln, or readily seasoned in other suitable manner by the circulation of air currents.

In the process of drying or seasoning stacked or piled lumber, as in a kiln, according to usual practice, spaces are provided in the stack or pile to permit circulation of air currents for contact with exposed portions of the lumber of the stack. To facilitate the circulation of the air currents, a central, vertical, longitudinally extending main flue is fashioned in the stack or pile, from which flue radiate horizontal spaces which are formed by interposing sticks between the courses or layers of lumber, and the air currents passing upwardly through the main flue of the stack are directed into these laterally extending spaces for drying the lumber.

The stack shaper of my invention is designed to form the central main flue of the stack, and for this purpose is used as a guide in fashioning two longitudinally extending sections of the stack with the flue between them, the flue preferably having a wide bottom, mutually inclined walls, and a closed top.

In the utilization of the stack shaper of my invention, the shaper is carried upon a vertically movable platform which is elevated to initial position for the first layer or course of lumber in the formation of the stack, and then the elevated platform is intermittently lowered as the height of the stack increases, the courses of lumber being manually laid at the same level or altitude, and of course always on the top of the stack.

The base or wide lower end of the flue is formed on the elevated platform by the first layer of boards or lumber that eventually becomes the bottoms of the two stack sections, and the last or top layer of boards forms a closure for the narrow top portion of the flue as well as the top layer of the completed stack.

The shaper includes a pair of spaced shaper frames, (or a greater number may be used if desired) located at predetermined distances apart depending upon the length of the lumber, and each frame carries a pair of mutually inclined guide bars that are relatively movable. Means are provided for spacing apart the upper ends of the mutually inclined guide bars to properly locate the bottom boards of the two sections of the stack in the formation of the flue, and means are provided on the frames for automatically and gradually bringing together opposed bars of the pairs as the elevated platform descends and the height of the stack increases, until the tops of the bars meet at the top of the stack.

The invention consists in certain novel combinations and arrangements of parts 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 in combination with a vertically movable platform and truck of a lumber piling appliance wherein the parts are combined and arranged according to one mode I have thus far devised for the practical application of the principles of my invention.

Figure 1 is a view in elevation of a stacking machine with a completed stack and a flue shaped therein according to my invention.

Figure 2 is an enlarged, detail vertical sectional view of one of the stack shaper frames showing the lower ends of a pair of mutually inclined guide bars and connections.

Figure 3 is a horizontal sectional view at line 3—3 of Figure 2.

Figure 4 is an enlarged detail view partly in section showing the lower end of one of the guide bars and its cable support.

Figure 5 is a compactly arranged perspective view, partly broken away for convenience of illustration showing the operating means for the guide bars.

In Figure 1 which shows the general assembly and arrangement of parts, the flue F is fashioned between the two longitudinally extending sections S and S′ of the stack of lumber, the latter being illustrated as a completed stack, but with parts omitted for convenience of illustration.

The stack is erected within a rectangular main frame comprising corner posts 1 and 2, and cross beams 3 at the top, and the frame is provided with suitable foundations or supports as indicated. A vertically movable platform or horizontally disposed, rectangular frame 4 is suspended within this main frame, and the platform is first elevated to the upper part of the main frame for the purpose of receiving the initial or bottom

layer of the stack. The courses or layers of boards are manually laid by workmen standing at the top of the main frame, always at the same level, and the platform and stack are lowered intermittently as the height of the stack increases, until the stack is completed, at which time the platform and stack appear in the position of Figure 1.

The vertically movable platform 4 is suspended from the upper portion of the fixed main frame by suspending cables 5 and 5′ that pass around the upper guide pulleys 6, 6′ and lower pulley 6ª, the former on the main frame and the latter on the platform, and from the top portion of the main frame the cables pass downwardly to and around drums 7 and 7′ on the shaft 8, journaled in bearings 8′ below the platform. The drum shaft is provided with a gear wheel 9 for the transmission of power applied from a suitable source in winding the drums to elevate the platform, and control mechanism is employed for releasing the cables to intermittently permit lowering of the elevated platform as the height of the stack increases.

On its upper surface the platform is provided with track rails as 10 for supporting a truck 11 having wheels 12. The empty truck is run onto the platform-rails, the platform and truck are elevated, the stack erected on the truck, and when the stack is completed and the loaded truck has descended with the platform to position of Figure 1, the truck with its load or stack is rolled off the platform, and conveyed to the kiln or other destination.

The number of units of the stack shaper employed depends upon the length of the lumber to be stacked. In this exemplification of the invention I have illustrated two units A and B, spaced a suitable distance apart and carried by the vertically movable platform 4. As the units are of substantially the same construction, a description of one will suffice for both.

Each unit includes a shaper frame of rectangular shape and supported in upright position on the platform 4, transversely of the stack, and located at the longitudinal center of the platform, truck, and main frame, below the truck and with a major portion of the shaper-frame below the platform. The shaper-frame is made up of a pair of parallel, spaced angle irons 13 and 14, (Figs. 1 and 2) bolted to the top of the platform 4, and the ends of the frame are formed by spaced, upright channel plates 15 and 16, at the lower ends of which are secured the bottom bars 17 and 18 parallel with the upper bars or plates and also formed of angle irons. These parts are bolted or riveted together to form a rigid structure, and this rigid structure or frame is rigidly bolted or otherwise secured to the platform 4.

In the two units A and B and carried by the shaper frames are arranged pairs of mutually inclined, upright bars designated 19 and 20, and 21, 22, each pair of bars being relatively movable with relation to its shaper frame, and both pairs of bars are connected to move simultaneously in vertical planes.

The pairs of bars are retained and guided in their frames by means of grooved rollers arranged in pairs as 23 and 24, and 23′ and 24′ at the upper end of the frame, and complementary pairs of guide rollers 25 and 26 and 25′ and 26′ at the lower end of the frame. The rollers are disposed in vertical planes and are journaled on horizontal shafts 27 having bearings in the frame. It will be noted in Figure 2 that the pairs of lower guide rollers are spaced wider apart than the pairs of upper guide rollers, thus giving to the complementary guide bars a mutual inclination, and this arrangement of the rollers also provided for a drawing-together movement of the mutually inclined bars as the platform descends while the bars remain at a stationary height in the stack.

The mutually inclined guide bars slant toward each other at all times, but their upper complementary ends are initially spaced apart as guides for the first layers of the stack sections, and thereafter are gradually and automatically brought together by action of the frictional rollers as the latter travel down the opposite sides of the bars, until the upper ends of the bars are brought together at the top of the completed stack, as indicated in Figure 1.

The pairs of bars 19—20 and 21—22 are suspended on cables 28 and 29 and 28′ and 29′ respectively, each cable being anchored as at 30 to the lower ends of a beam, and the guide rollers 26 and 26′ at the bottom of the frame are fashioned with central, annular grooves 31 countersunk in the grooved peripheries of the rollers, to accommodate the cables as they pass up alongside the inner faces of the bars, between the bars and the rollers.

As best seen in Figure 2 the cables pass up and over guide pulleys 32 and 33 journaled on the shaper frame, and then pass out of the frame through a slot as 15′ in the end plate 15, to a pair of drums 34 and 35 on the drum shaft 36, which latter shaft is provided with journal bearings 36′ located at the upper part of the main frame of the stacking machine. Guide pulleys 37 and 38 are also provided on the platform 4 for the cables for properly guiding them around the underside of the truck and up alongside the stack.

The drum shaft 36, which through the instrumentality of its cables, is used to elevate the guide bars from the pit P in Figure 1. and retain the bars in stationary elevated position, is manually controlled by a work-

man standing at the top of the main frame of the stacking machine, through the manipulation of a hand wheel on the vertical control shaft 39, journaled in a bottom bearing 40 on the main frame. The hand wheel 41 is readily accessible at all times to the workman, and a worm screw is provided on the shaft for co-action with a worm wheel 43 on the drum shaft 36.

The platform, truck with its stack, and shaper frames are gradually lowered as the height of the stack increases, but the elevated guide bars remain stationary as to the vertical movement of these parts, as the worm and gear wheel remain at all times in mesh.

When the empty truck is elevated with the platform and shaper frames, the guide bars are also elevated, but as their upper ends attain a height located at a point slightly above the pairs of rollers 23—24 and 23′—24′, it will be apparent that their upper ends are spaced apart as indicated at the broken ends in Figure 2. Then as the rollers ride down alongside the bars, by their frictional engagement therewith, the rollers draw the bars, as 19 and 20, together to the position indicated in Figure 1.

The layers of lumber are laid on the two stack sections S and S′ the inner edges of the adjoining inner boards being placed in contact with the complementary pairs of guide bars, and then each layer or course is completed by successively laying the boards outwardly from the center of the stack and its flue.

After the stack has been completed as in Figure 1, the elevated set of guide bars is lowered, by manipulation of the hand wheel 41, into the pit P, the upper ends of the bars being lowered beneath the truck 11, and the loaded truck is then run off the platform rails and replaced with an empty truck. The platform, shaper frames and empty truck are again elevated, as are also the guide bars, and another stack is erected.

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

1. In a stack shaper the combination with a main frame, a vertically movable platform, and supporting means whereby the platform may successively be suspended at lower levels, of a pair of upright guide bars carried by the platform, and means on the main frame for retaining the guide bars in elevated position as the platform descends.

2. In a stack shaper the combination with a main frame, a vertically movable platform, and supporting means whereby the platform may successively be lowered to different levels as the height of the stack increases, of a pair of relatively movable, spaced guide bars, means for retaining the guide bars in elevated position as the platform descends, and means for relatively moving the guide bars with the descent of the platform.

3. In a stack shaper the combination with a main frame, a vertically movable platform, and supporting means whereby the platform may successively be suspended at lower levels, of a pair of upright, mutually inclined guide bars, means for retaining the guide bars in elevated position, and means carried by the platform for drawing together the mutually inclined guide bars as the platform descends.

4. In a stack shaper, the combination with a main frame, a vertically movable platform and a shaper frame thereon, of a pair of spaced, mutually inclined guide bars carried by the shaper frame, means supported from the main frame for retaining the guide bars in elevated position, and means on the shaper frame for drawing together the guide bars as the platform descends.

5. In a stack shaper, the combination, with a main frame, an elevated platform and means for supporting said platform at successively lower levels, of spaced shaper frames carried by the platform, pairs of spaced, relatively movable mutually inclined guide bars carried by the shaper frames, means on the main frame for retaining said guide bars in elevated position as the platform descends, and means on the shaper frames for drawing together the bars of each pair actuated by the descending movement of the platform.

6. In a stack shaper, the combination with a main frame, an elevated platform and means for supporting said platform at successively lower levels, of a shaper frame rigid with the platform, guide bars carried by the shaper frame, and means for elevating the guide bars and retaining the latter in elevated position as the platform descends.

7. In a stack shaper, the combination with a main frame, an elevated platform and means for supporting the platform at successively lower levels, of a shaper frame rigid with the platform, mutually inclined guide bars carried by the shaper frame, winding mechanism on the main frame and cables from said mechanism to the guide bars for elevating the guide bars and retaining them in elevated position as the platform descends, and means for drawing together the bars as the platform descends.

8. In a stack shaper, the combination with a main frame, an elevated platform and a shaper frame carried thereby, of a pair of spaced mutually inclined guide bars and guide rollers therefor on the shaper frame, a winding mechanism on the main frame and cables therefrom to the bars whereby the latter are retained in elevated position as the platform descends.

In testimony whereof I affix my signature.

F. W. HORSTKOTTE.