Jan. 23, 1951 W. F. DREW 2,538,747

LUMBER PILE TRANSFERRER

Filed April 29, 1949 2 Sheets-Sheet 1

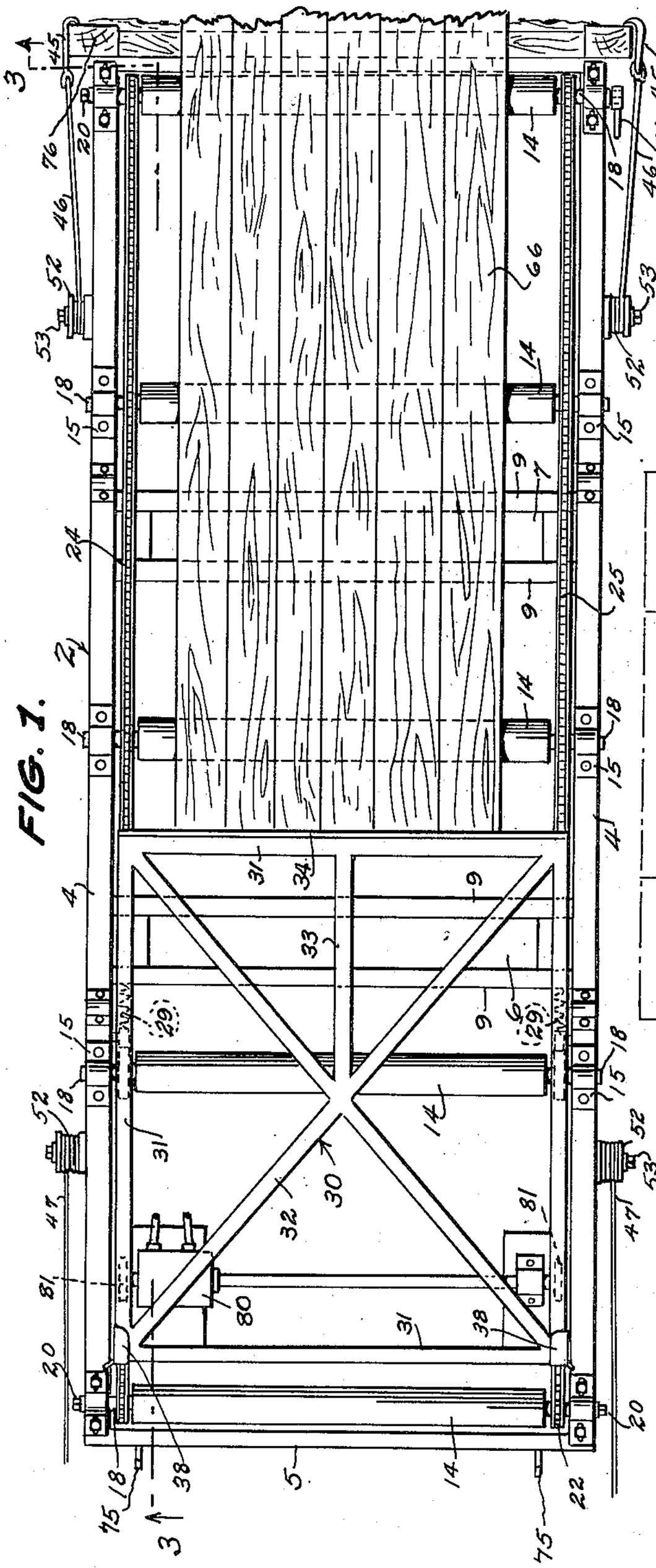

FIG. 1.

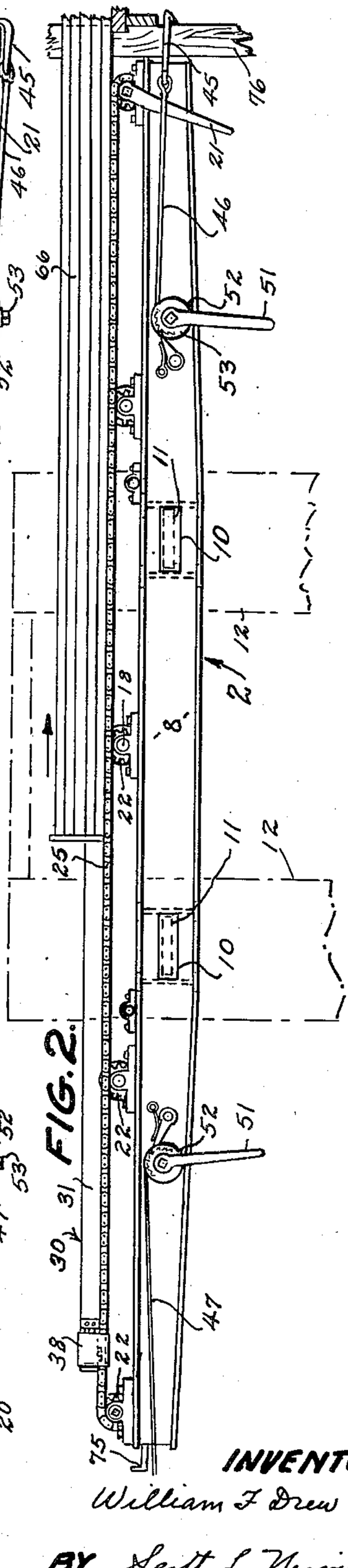

FIG. 2.

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FIG. 3.

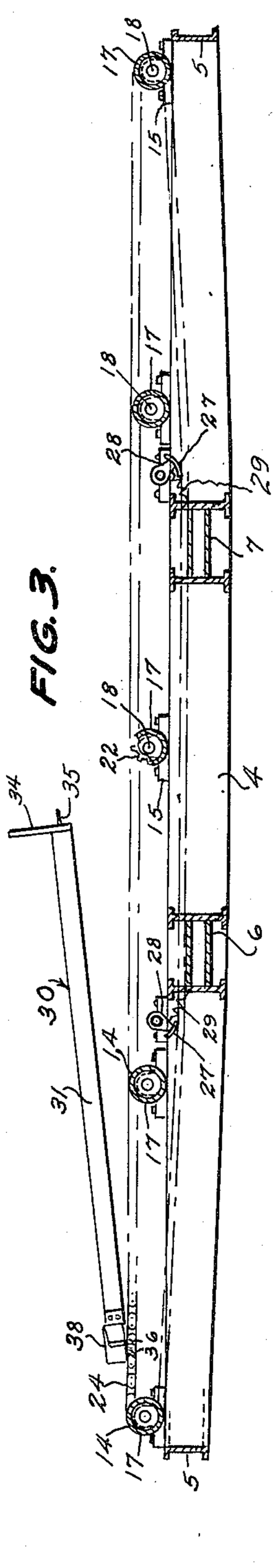

FIG. 9.

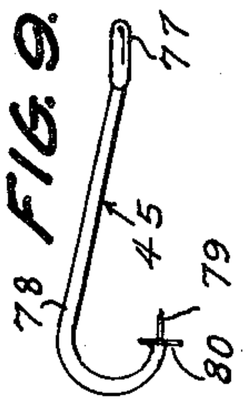

FIG. 4

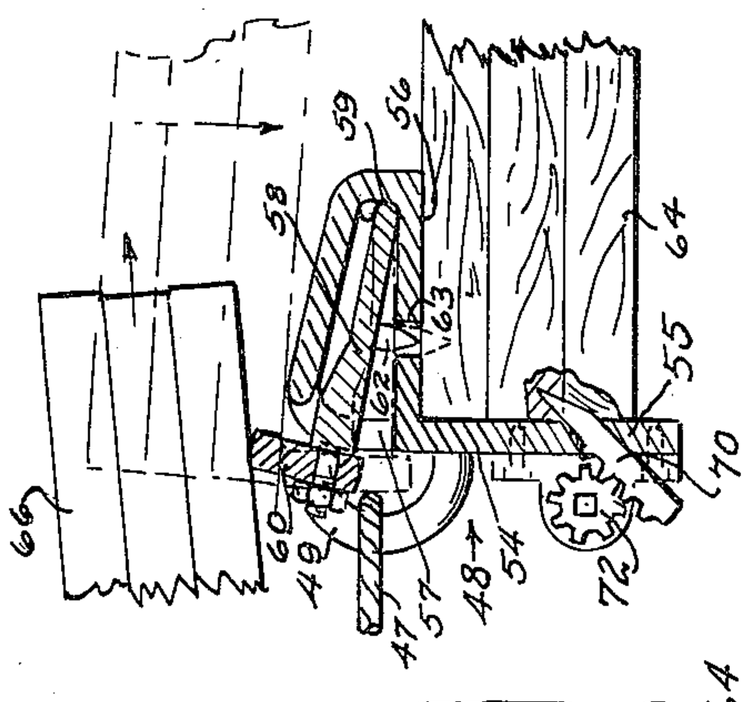

FIG. 5.

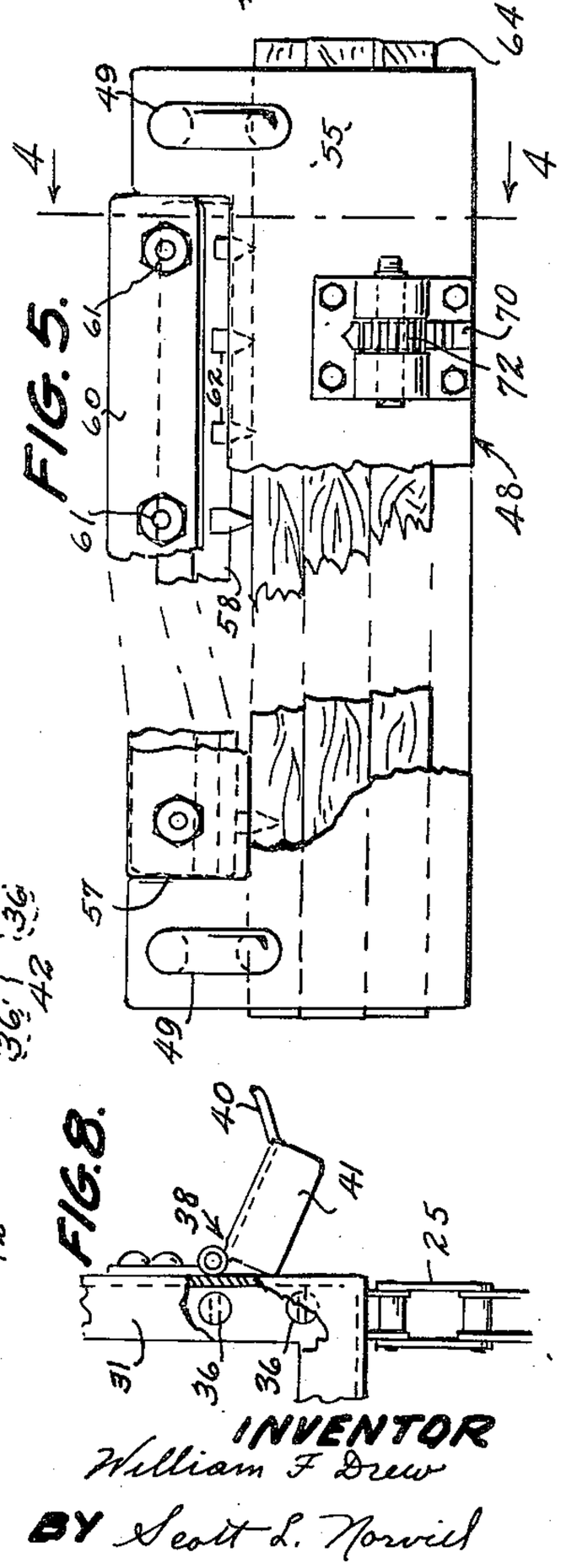

FIG. 6.

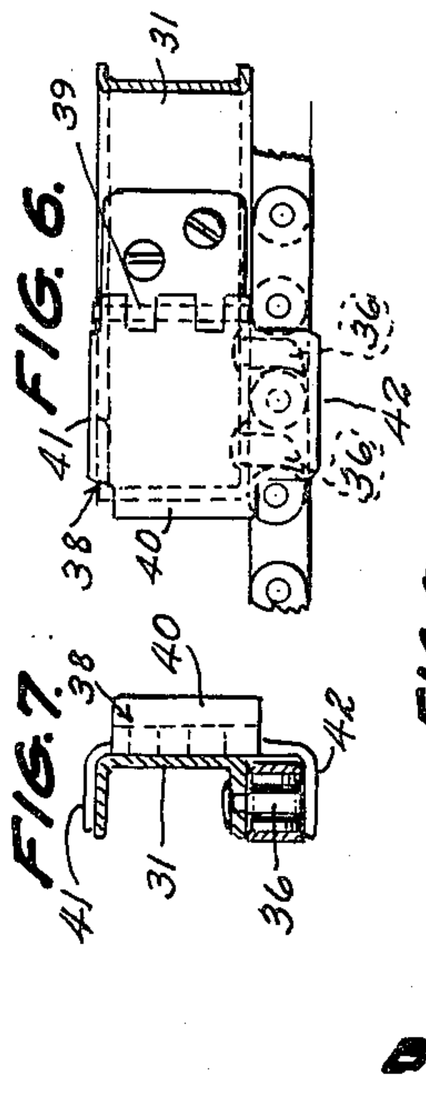

FIG. 7.

FIG. 8.

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LUMBER PILE TRANSFERRER

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Application April 29, 1949, Serial No. 90,325

4 Claims. (Cl. 214—83.36)

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This invention pertains to lumber pile transferors, of a type adapted to handle stacks of lumber, timbers, or the like, and to deposit this material in bins or shelves.

One of the objects of the invention is to provide a rectangular frame for holding a stack of lumber with mechanism for moving the stack toward and from either end into storage bins or shelves and with means cooperative with the hooks of a front end elevating or hoisting truck so that the frame may be raised and moved by the truck, and so that stacks of lumber may be placed on the frame by the forks of the truck;

A second object is to provide a lumber stack or pile transferor with means for forcing a stack of lumber longitudinally into a storage bin, and for temporarily securing the transferor to the framework or other portions of the bin. While supporting on the lifting hooks of a hoisting truck, so that force may be applied to the stack sufficient to push it into the bin, sliding the bottom boards thereof over the bottom of the bin or other lumber already in the bin;

A third object is to provide a rectangular, horizontally extending frame with transverse rollers driven by continuous chains to roll a stack of lumber resting thereon from the end of said frame, and push it a desired distance therefrom, together with bin frame engaging hooks or grappling devices which may be attached to portions of bins, shelves, or lumber already in said bins, whereby said frame will not be pushed away from said bins during the operation.

Other objects will appear hereinafter.

I attain the foregoing objects by means of the construction, devices, and component parts shown in the accompanying drawings, in which—

Figure 1 is a plan view of the device;

Figure 2 is a side elevation thereof;

Figure 3, a longitudinal sectional elevation thereof, taken substantially on line 3—3, Figure 1;

Figure 4, a side elevational section of a lumber grappling clamp drawn on an enlarged scale;

Figure 5, a front elevation of this clamp;

Figure 6, a slide elevation of a portion of the pusher frame, showing chain clasps in closed position;

Figure 7 is an end view of the clasp with the pusher frame and chain sectioned off;

Figure 8 is a plan view of a rear corner portion of the pusher frame showing a chain clasp in open position; and

Figure 9 is a side elevation of a bin hook.

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Similar numerals refer to similar parts in the several views.

The rectangular frame 2 is made of metal parts welded at the joints and consists of two channelled parallel side members 4, and transverse end members 5. On either side of the center there are transverse tubular members 6 and 7 having rectangular sections. Side members 9 of these tubes constitute transverse intermediate frame members. Holes 10 are cut in the webs 8 of the side members 4 to open the ends of these tubes through the sides of the frame. These tubes form sockets which are sized and spaced to receive the lifting hooks 11 indicated by dotted lines, of a front end elevating truck, the elevating tracks of which are indicated by dotted lines 12.

Transverse rollers 14 are journalled at each end in bearing blocks 15 attached to the upper flanges of frame members 4. In the form shown, there are rollers at each end of the frame and three positioned intermediate the ends. Each of the rollers is composed of an outer cylindrical shell 17, and axially positioned stub shafts 18 at each end. The shafts of the end rollers are extended beyond the outer faces of the end bearing blocks and squared at 20 to receive a ratchet wrench 21. At each end of each roller and between the inner face of the bearing blocks and the ends of the cylinders sprockets 22 are keyed to shafts 18. These sprockets are all of the same size and receive endless chains 24 and 25. The upper pass of each of these chains runs above and just within the inner edges of the upper flanges of frame members 4. The lower pass runs just within the webs 8 of these frame members and through holes provided in transverse members 9.

The hold down bolt holes in the bearing blocks of the end rollers may be slotted to allow for permanent adjustment of the tension of chains 24 and 25. Normally the chains are adjusted to run with a slight slack for purposes hereinafter mentioned. Tension of the chains is resiliently controlled by tightening riders 28 pivoted at the top to the top of frame members 4, carrying chain riding shoes 27 on their lower ends and urged to tightening position by springs 29.

Attachable to the top of the upper passes of chains 24 and 25 is a pusher frame indicated generally by numeral 30. This is a square frame composed of angle or channel side and end members 31, and having diagonal bracing 32, a central bracing member 33, and a pusher plate 34 at the front. Barbs 35 are attached to the front

face of plate 34 to prevent plate 34 from displacement after it has engaged the end of a stack of lumber. The lower faces of the side members 31 are made to rest on top of chains 24 and 25.

On the under face and at the rear of the side members are dual link engaging hooks 36 which are shaped and spaced to hook downward into the spaces between the rollers of said chains and extend rearward slightly under the chain rollers. The front end of the pusher frame must be raised slightly as shown in Figure 3 when these hooks are first engaged in the chain. The hooks 36 on the rear frame member 31 are shown in entering position. After the hooks are in place the frame 30 is laid flat on the chains and the hooks are then secured in place by hinged chain clasps 38. These clasps swing on hinges 39 which are secured to the rear portions of the outer faces of frame members 31, and swing from released position as shown in Figure 8, to the enclosed or clasped position as shown in Figures 6 and 7, with their upper flanges 41 bearing on the top of members 31 and their bottom flanges 42 bearing on the underside of the chains 24 and 25 respectively. An angularly outwardly extending tab 40 is provided at the outer end of the clasp to aid in releasing it.

On each side of each end of frame 2 are devices for attaching the frame temporarily to portions of the bin or shelf into or onto which lumber is to be placed. At the right end of frame 2 hooks 45 attached to cables 46 are provided. At the left end of frame 2 cables 47 are provided which are secured to eyes 49 of a lumber grappling clamp 48, shown in Figures 4 and 5.

Cables 46 and 47 are wound up on drums 52 rotatable by wrenches 51 applied to the square ends of shafts 53. These shafts are held against counterrotation by ratchet mechanism contained within drums 52.

The grappling clamp 48 consists of a frame 54 having a vertical front plate 55 and a right angularly outwardly extending horizontal plate 56.

Slot 57 is provided along angular frame structure 54 to receive protruding portions of rocking bar 58 which engages in a bearing channel 59 at the rear of plate 56, while lugs 61 extend forward. At the forward end of these lugs upright press plate 60 is attached by nuts.

Teeth 52 are positioned on the bottom face of bar 58 about midway of its width and are adapted to extend through holes 63 in plate 56 and into lumber 64 on which this plate may be positioned.

When frame 54 is placed over the outer edges of a stack of lumber 64 the press plate 60 is forced upward by reason of the contact of teeth 62 with the surface of the lumber. Press plate may then be forced down by the weight of lumber 66, which is stacked thereon from frame 2. The teeth 62 then bite into the top boards of stack 64 and secure the clamp in place. In Figure 6 the plate 60 to the right of the brake is in raised position, and to the left of the brake in lowered position with the teeth engaging the lumber. The tension of cables 47 keeps the clamp body 54 from being pushed into the bin and the teeth 62 hold the top boards of stack 64 from inward movement as the stack 66 is slid over them.

Where the stack in the bin is high and the friction of forcing the stack 66 inward is great, underspikes 70 may be used. These are slidably operative in front plate 55 so as to extend upwardly and inwardly into boards of a stack of lumber, such as 64, Figures 4 and 5. The movement of this spike is controlled by a ratchet controlled pinion 72 which meshes with rack teeth on the outer portion of the spike. Inward and upward movement of this spike binds the frame 54 onto the topmost boards of the stack.

As shown in Figures 1 and 2, the grappling clamp is attached to the left end of frame 2 by cables 47. These cables are broken off at the left end of the figure, but it is intended that they be extended on and connected to eyes 49 of the grappling clamp 48. The clamp is, therefore, a part of the frame mechanism. When not in use the cables 47 are drawn up and the clamp hung on any convenient part of the frame such as, for example, hooks 75, Figures 1 and 2.

In these same figures hooks 45 are shown in engagement with upright bin frame members 76. This means of securing frame 4 is preferred where stack 66 is to be forced into a bin having secured bottom boards.

Hooks 45 are each made as shown in Figure 9. The eye 77 is for attaching cable 46. The shank 78 is bent to form a semi-circular curve, as shown, which terminates in a barb 79 of relatively small diameter. A pressure or stop disk 80 at the base of the barb limits the penetration of the barb.

When manual operation of the end rollers is undesirable due to the weight of the stack of number mounted on frame 2, the several rollers of the frame may be driven by oil motors 80 positioned adjacent each of the end rollers—and supported within the frame. One motor of this type is shown adjacent the left end roller, Figure 1.

These motors are attached to the roller chains 24 and 25 by sprockets 81. Most industrial hoisting trucks have oil lines supplied with oil under pressure to operate the hoist-jack cylinders. Oil from these lines can therefore be used to operate these roller driving motors. It is obvious that electrically operated motors may be substituted, or power supplied mechanically from a power takeoff from the motor driving means of the hoist.

In use the frame 2, which may be termed a pile transferor frame, is place on the ground and lumber to be stacked in bins, or the like, placed on it lengthwise to form a stack. This may be done by hand, piece by piece, if desired, or a ready prepared stack laid on the frame in one operation. This is most conveniently done by the use of a commercial elevating truck, having forwardly extending lifting hooks. One form of such a truck is known to the trade as a Hyster. In this case the lifting hooks of such a truck, carrying a stack or bundle of lumber, are brought over the frame 2, with the lumber alined with the frame and the stack lowered onto it. Since the hooks are beneath the stack, and are of appreciable thickness, they contact the chains 24 and 25 before the lumber comes in contact with rollers 14. The upper passes of the chains must therefore have resilience to sag sufficiently to accommodate these hooks. This resilience is afforded by the spring actuated tighteners 28. After the stack is positioned on the rollers the truck hooks are withdrawn from beneath the stack and then lowered and inserted into tubes 6 and 7. It is to be understood that these tubes are proportioned and spaced to receive the truck lifting hooks indicated by dotted lines 11, Figure 2.

The frame 2 carrying the stack is then raised and transported to the bin where the stack is to

be stored. In doing this the frame is spotted with the frame and stack in alined position with the sides of the bin, and elevated to be level with its bottom. If the bin frames afford securing means hooks 45 are attached as shown in Figure 1. The stack is then moved to the right into the bin by operation of ratchet wrench 21 which is placed on squared end 20 of shaft 18 of the right end rollers so that the roller is turned clockwise. Chains 24 and 25 cause all the rollers to turn in unison and the stack starts into the bin. After it has moved about half the length of frame 2 there is not sufficient traction on the rollers to overcome the sliding friction of the stack on the bottom of the bin. Pusher frame 30 is then attached to the left end of the chains in the manner previously described, and as the right end roller is further manipulated, pusher plate 34 is brought into engagement with the lower boards of the stack and barbs 35 enter the ends of the boards to hold it in position. Further turning of the end roller then forces the stack entirely from the frame and, as the right end of pusher frame leaves the end of frame 2, continues to push the stack into the bin until the desired position is attained. Meanwhile cables 46 and hooks 45 keep the frame 2, together with the truck hooks supporting it, from being shoved away from the bin. After the stack is positioned, pusher frame 30 is removed, and the empty frame 2 returned to the loading position.

Where stack 66 is to be placed on loose boards, or the like, grappling clamp 48 is attached to these boards as above explained, after the truck has spotted the frame 2 so that delivery is made from the left end.

Obviously the hooks or clamp may be attached to either end of the frame as desired. Also motor mechanism 80 may be employed instead of wrench 21.

While I have explained the preferred use of this stacker as applied to lumber, it is obvious that the device has many other uses. For example boxes, or irregularly shaped objects may be placed on pallets, and these pallets placed on the frame 2, and then shoved one by one, or as a group into bins or onto storage shelves. Other uses, and many modifications of the parts shown may be suggested to those familiar with the art, and therefore, I wish to be limited only by the following claims.

I claim:

1. A lumber pile transferor comprising, in combination, a frame including parallel longitudinal side members, transverse end members, and transverse intermediate members consisting of rectangular tubes sized and arranged to form transverse sockets adapted to receive the lifting hooks of a hoisting truck; transverse rollers having end shafts journalled in bearing blocks on the upper portions of said frame side members including end rollers adjacent the ends of said frame and intermediately positioned rollers; sprockets positioned at the ends of said rollers; endless roller chains running over the sprockets at each end of said rollers, whereby all rollers rotate in unison; said chains having upper passes and lower passes; resiliently operative chain idlers bearing on each of said chains; means for turning said end rollers including ratchet wrenches applicable to the shafts of said end rollers; a pusher frame removably attached to the upper passes of said chains by link engaging hooks and chain clasps at its rear end and having a barbed pusher plate at its forward end; and

engaging hooks supported on cables running over ratchet drums attached to each frame side member adjacent its end, whereby said frame may be secured to stationary objects and held against longitudinal displacement.

2. In a lumber pile transferor having a rectangular frame, rollers operative transversely thereon, having end sprockets, roller chains running over said sprockets, and a pusher frame operative on said chains, the combination therewith of mechanism for attaching said pusher frame to said chains, including hooks positioned on the bottom of said frame, alined with said chains, and spaced to engage between the rollers of said chains, said hooks having prongs extending rearward under said rollers, together with chain clasps hinged to the sides of said frame to swing toward and away therefrom and having U-shaped clasps with top plates adapted to engage over the top of said frame above said hooks, and bottom plates adapted to engage under said chain below said hooks.

3. In a lumber pile transferor having a rectangular transferor frame, lumber supporting rollers transversely journalled and operative thereon, sprockets at each end of each roller, roller chains running over and under said sprockets whereby said rollers turn in unison, means for rotating said rollers, and a pusher frame removably attached to the portion of the chain running above said sprockets at its end opposite to its direction of movement, the combination therewith of mechanism for attaching said pile transferor frame to a fixed object onto which lumber is to be transferred including ratchet drums attached to each side of said frame near one end thereof having squared shafts adapted to receive ratchet wrenches, cables wound on said drums and extendable beyond the end of said frame and hooks attached to the outer ends of said cables having barbs at their curved ends backed by stop disks.

4. In a lumber pile transferor having a rectangular pile transferor frame, lumber supporting rollers transversely journalled and operative thereon, sprockets at each end of each roller, roller chains running over and under said sprockets whereby said rollers turn in unison, means for rotating said rollers, and a pusher frame removably attached to the portion of the chain running above said sprockets at its end opposite to its direction of movement, the combination therewith of mechanism for attaching said transferor frame to a fixed object to which lumber is to be transferred including ratchet drums attached to each side of said frame near one end thereof having squared shafts adapted to receive ratchet wrenches, cables wound on said drums and extendable beyond the end of said frame and a grappling clamp secured to their outer ends including an angular transversely extending body having a vertical front plate and a horizontal top plate adapted to fit over the adjacent top edge of a stack of lumber on which a stack is to be slidably transferred from said frame, a rocking plate hingedly attached to the rear of said top plate having teeth on its under face adapted to engage the top members of said stack on which lumber is to be slidably transferred, and a transversely extending press plate attached to the front edge of said rocking bar and positioned to be contacted and pressed downward by lumber longitudinally from the end of said transfer or frame onto the stack of lumber on which said clamp is positioned, whereby said

rocking bar teeth are forced into top members of said stack, together with angularly upward and inwardly extensible spikes attached to said frame front plate adapted to secure said frame onto said lumber stack.

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