

June 15, 1926.

R. Z. DRAKE

1,588,949

MEANS FOR MOVING AND STORING LUMBER

Filed April 5, 1924

14 Sheets-Sheet 1

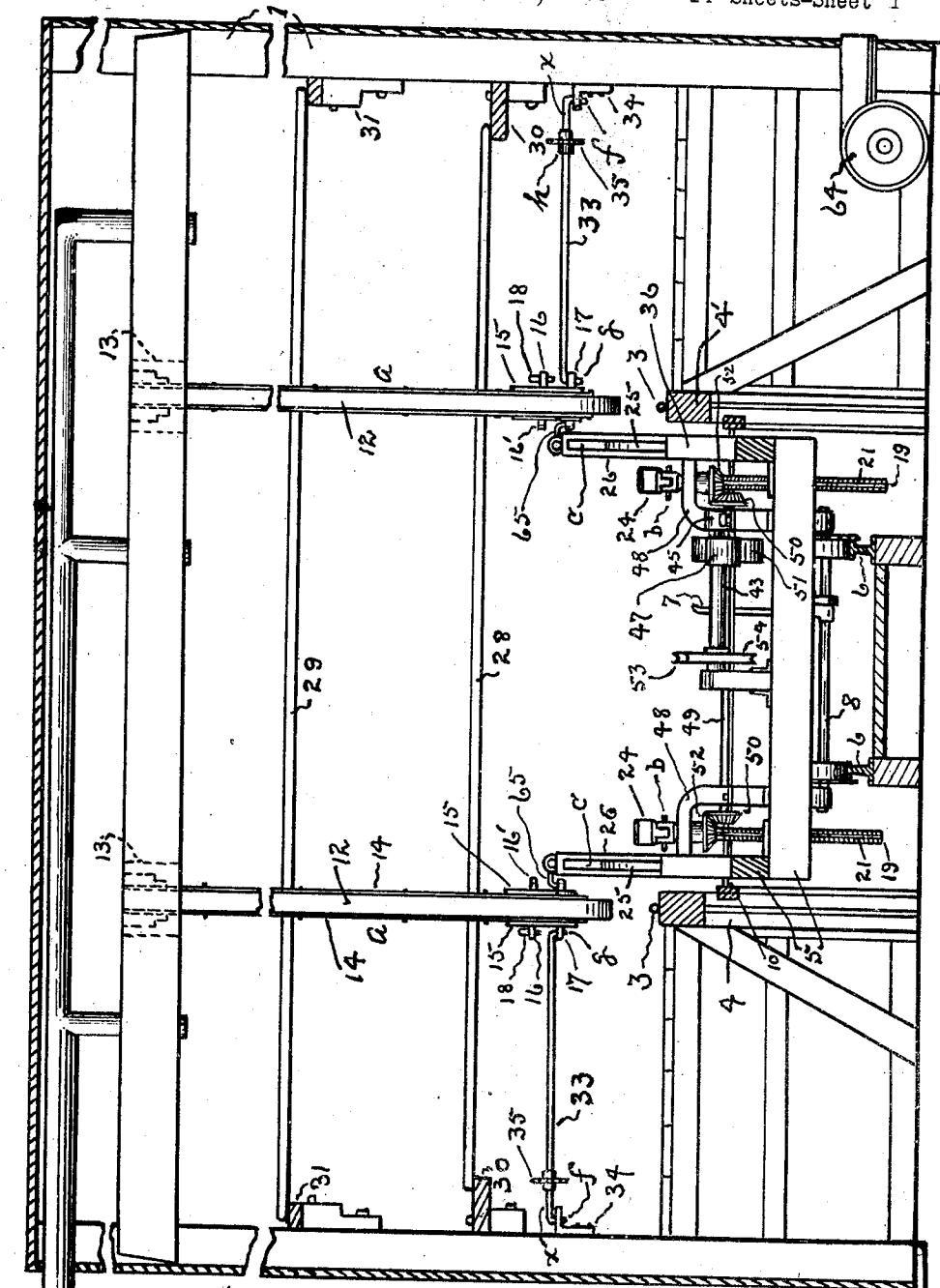


Fig. 1.

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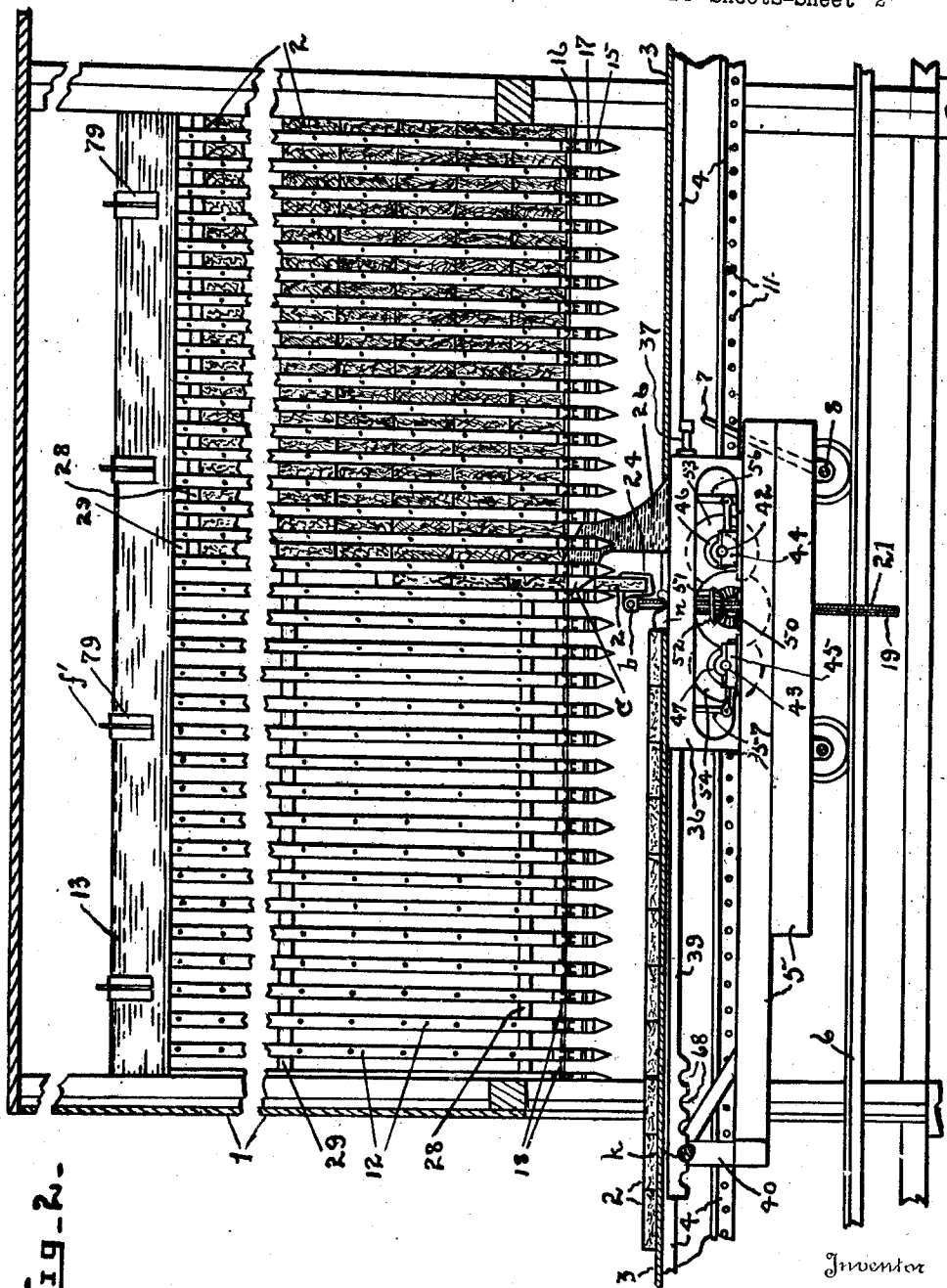
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MEANS FOR MOVING AND STORING LUMBER

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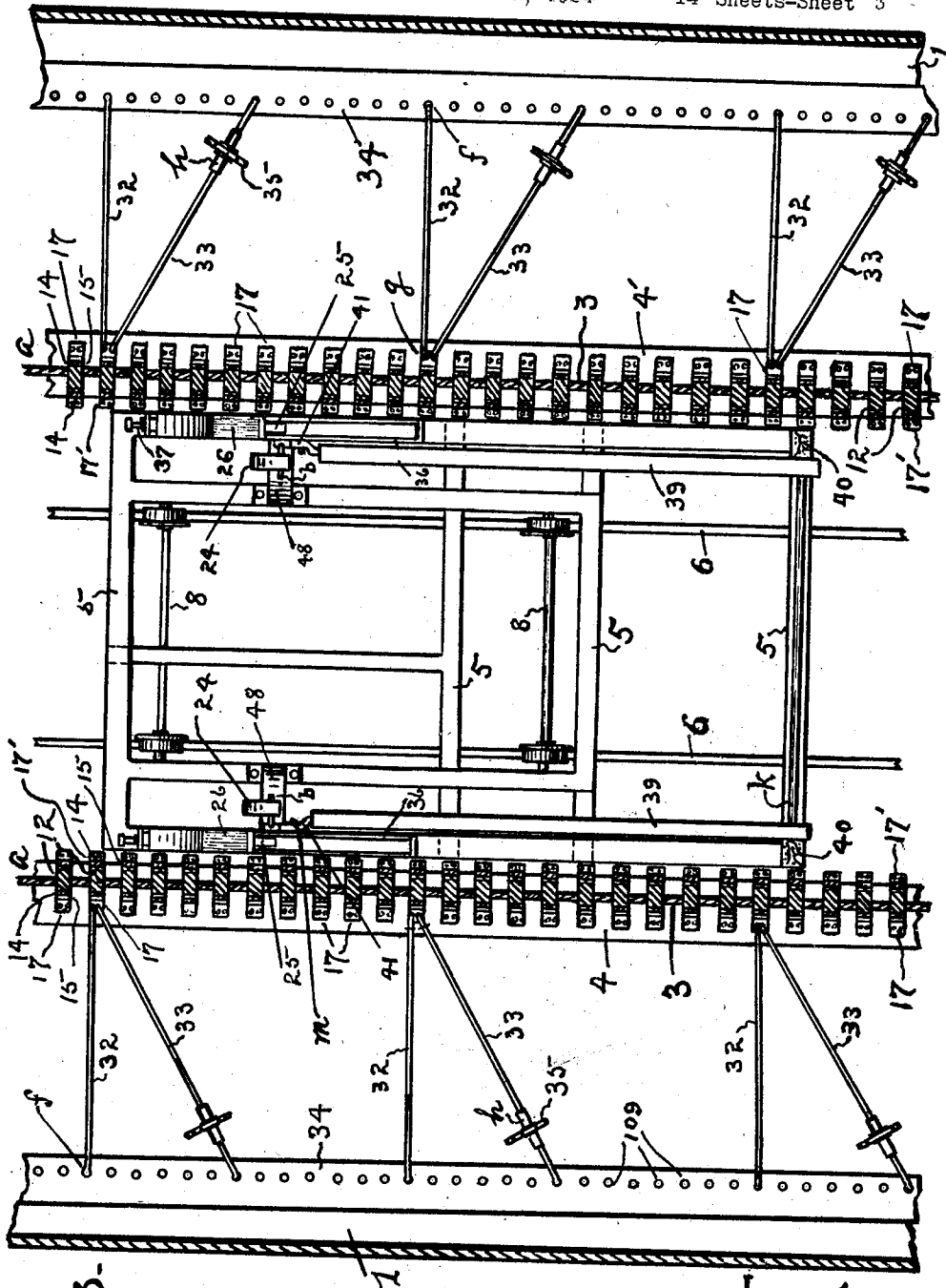


Fig. 3.

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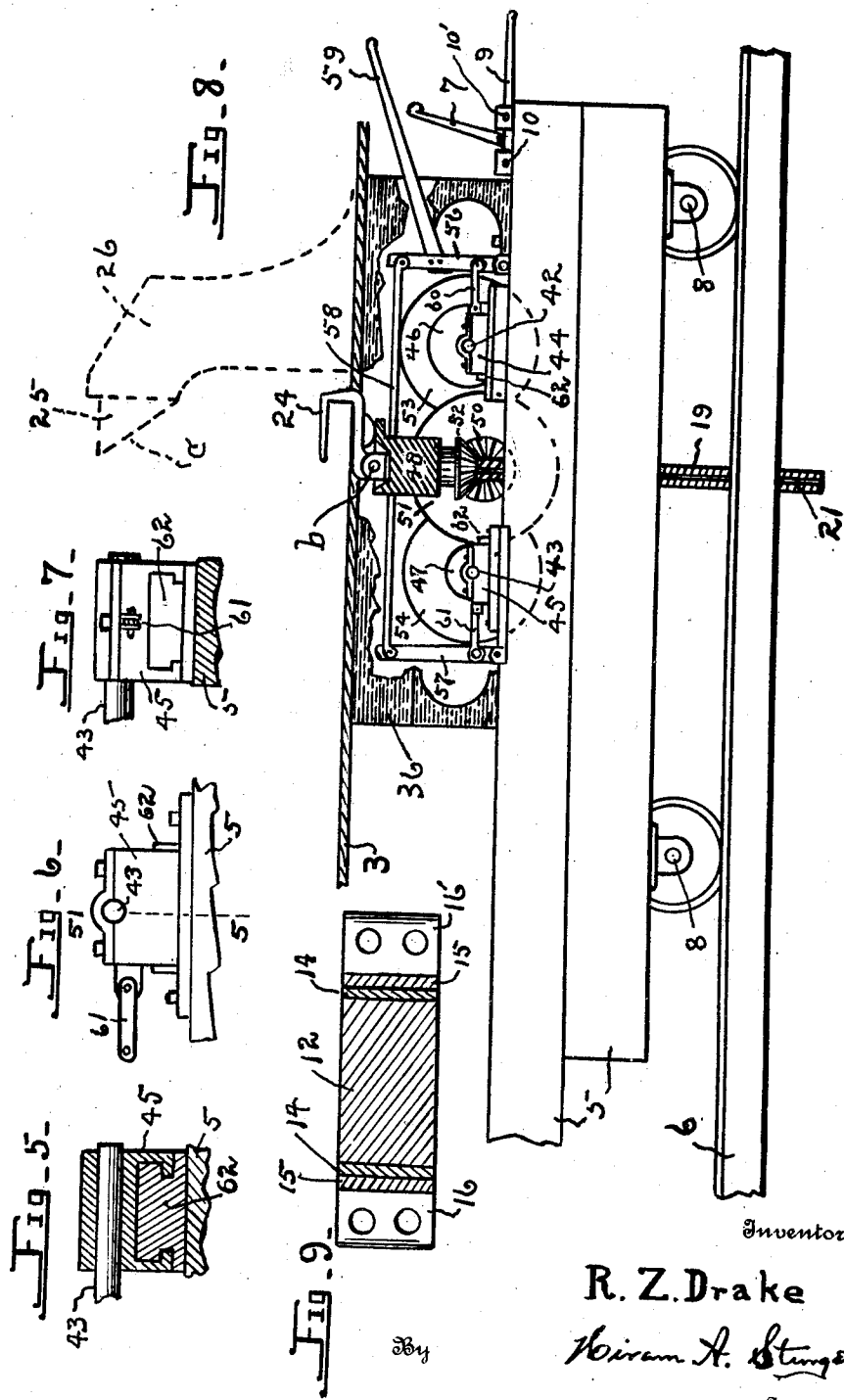
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MEANS FOR MOVING AND STORING LUMBER

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14 Sheets-Sheet 5



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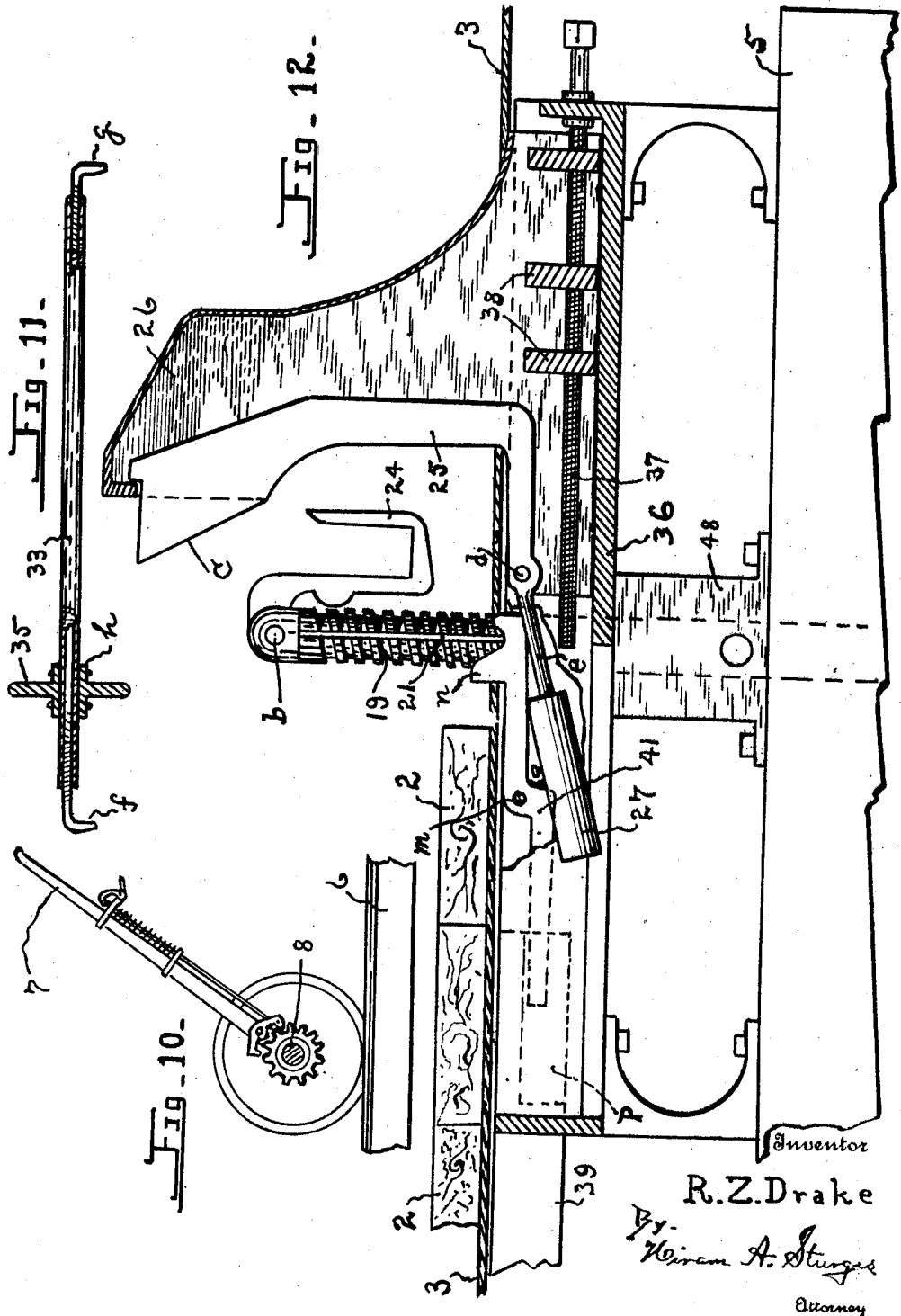
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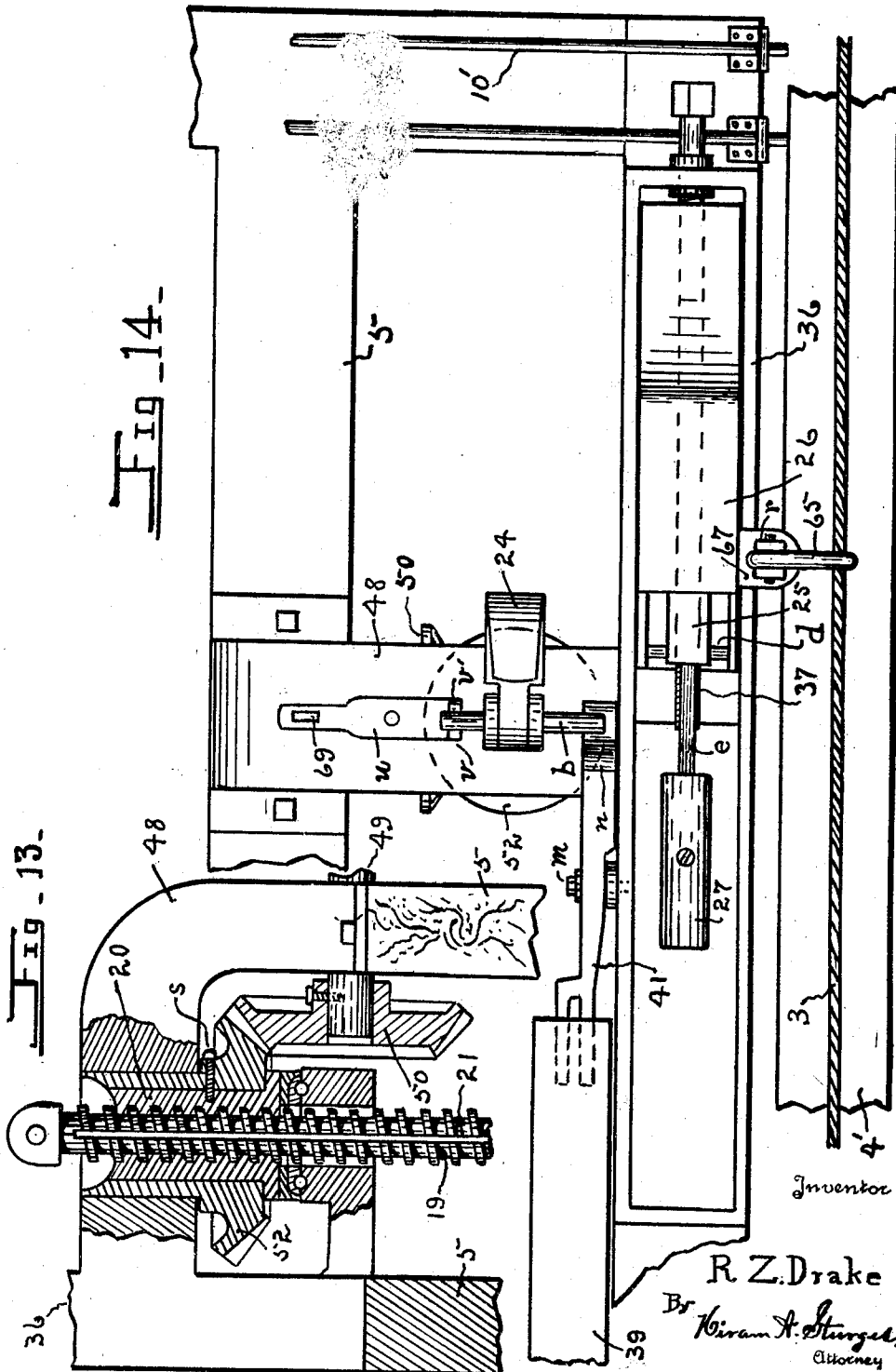
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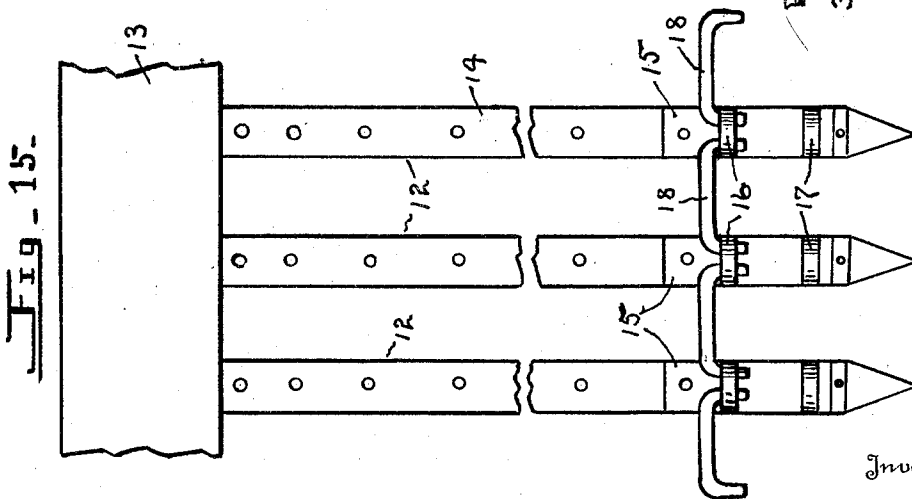
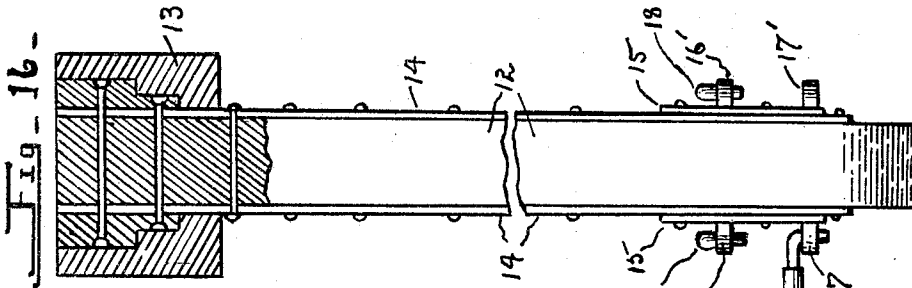
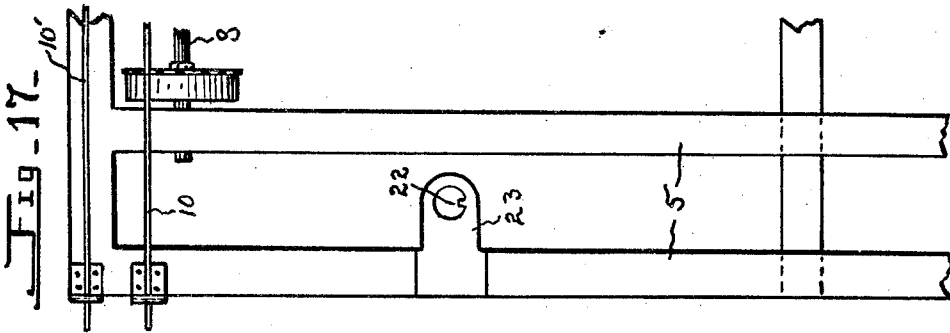
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MEANS FOR MOVING AND STORING LUMBER

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14 Sheets-Sheet 8



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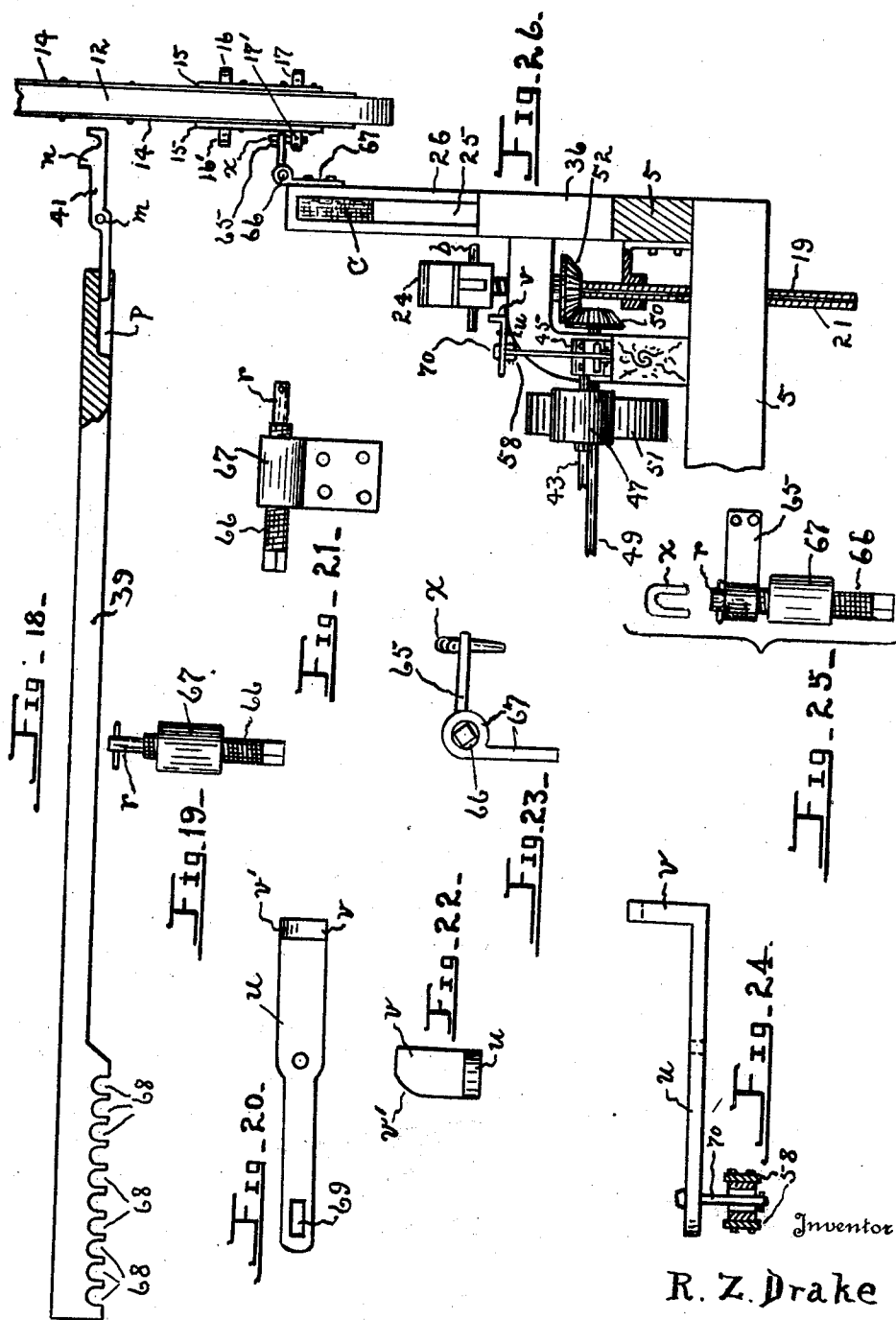
R. Z. DRAKE

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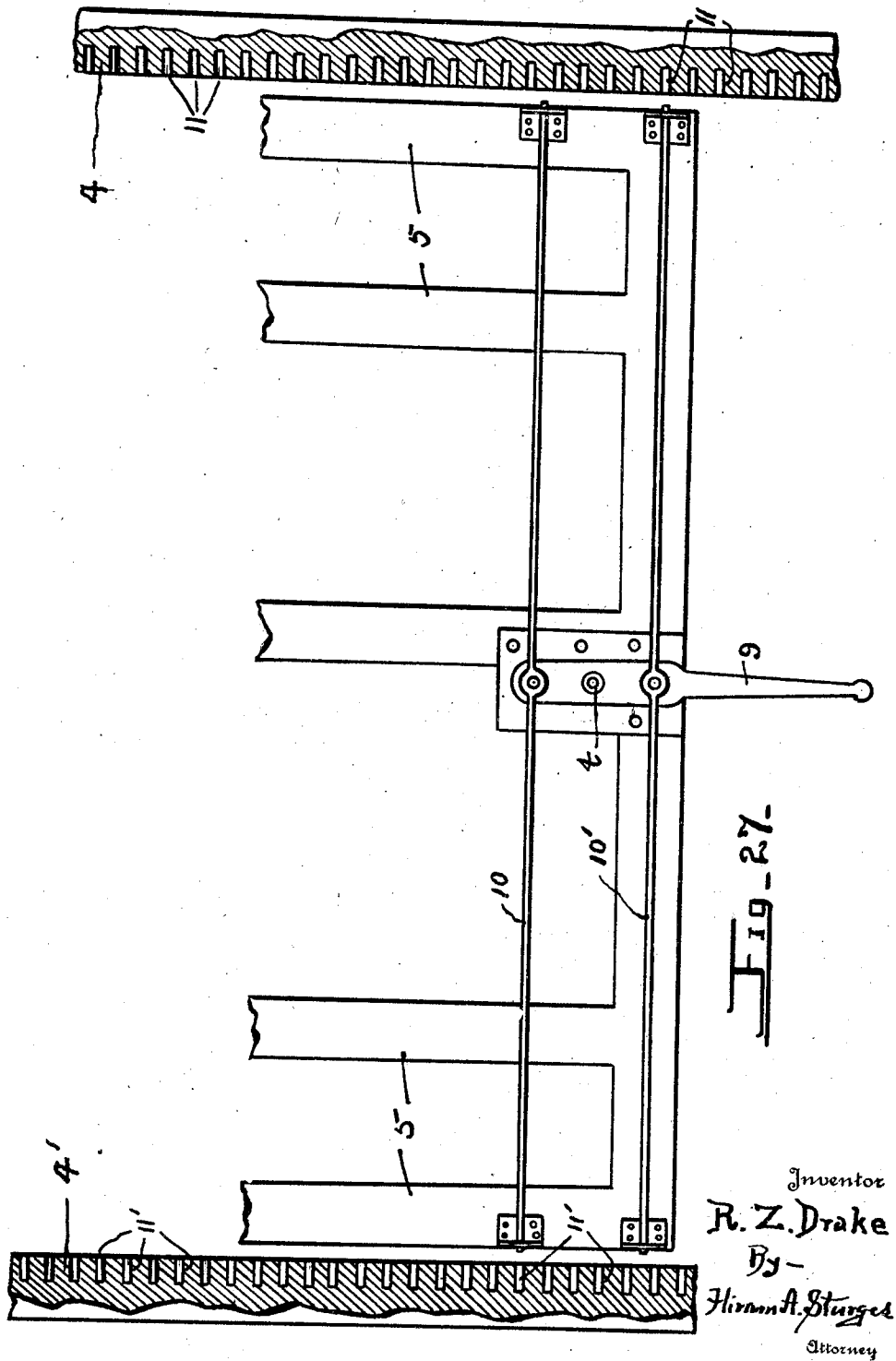
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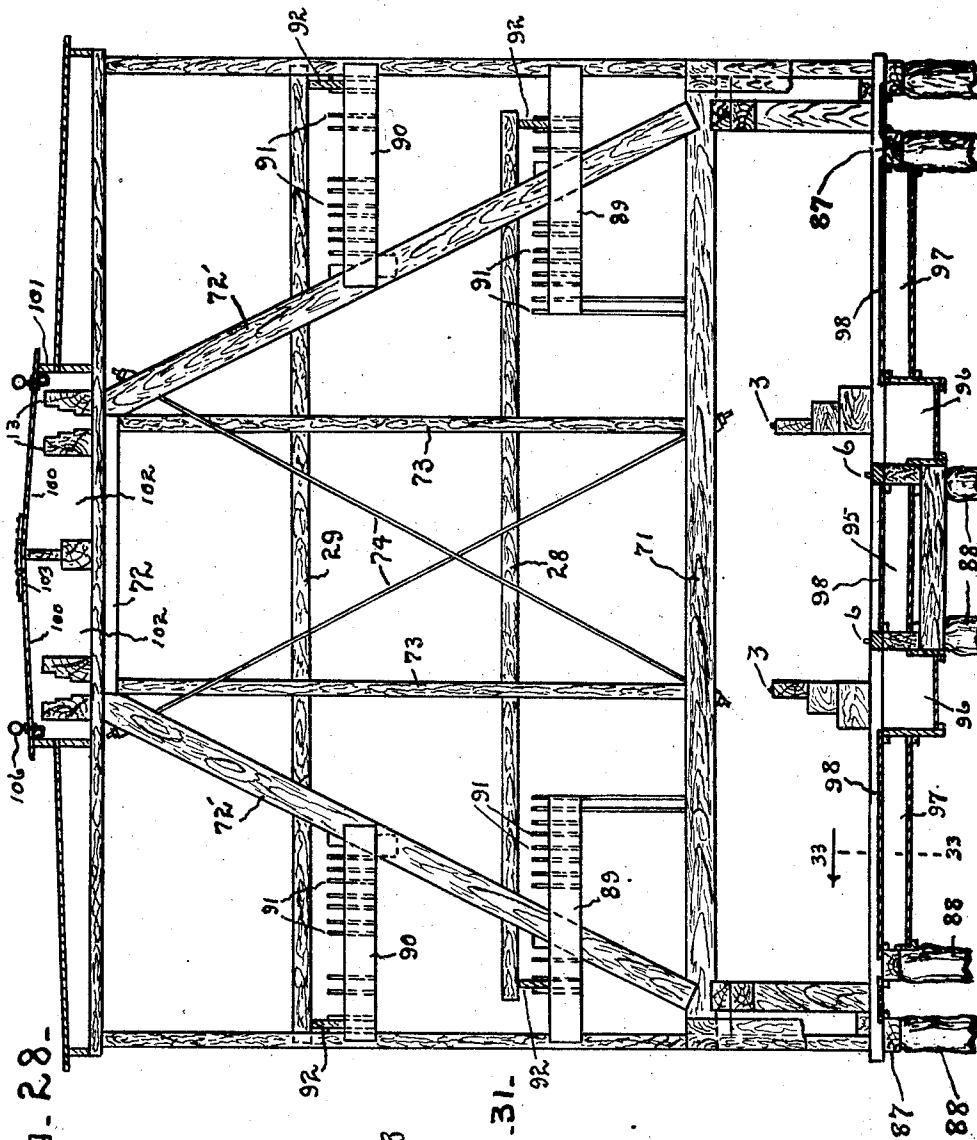


Fig. 28-

Fig. 29-

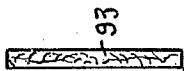
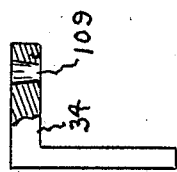


Fig. 31-

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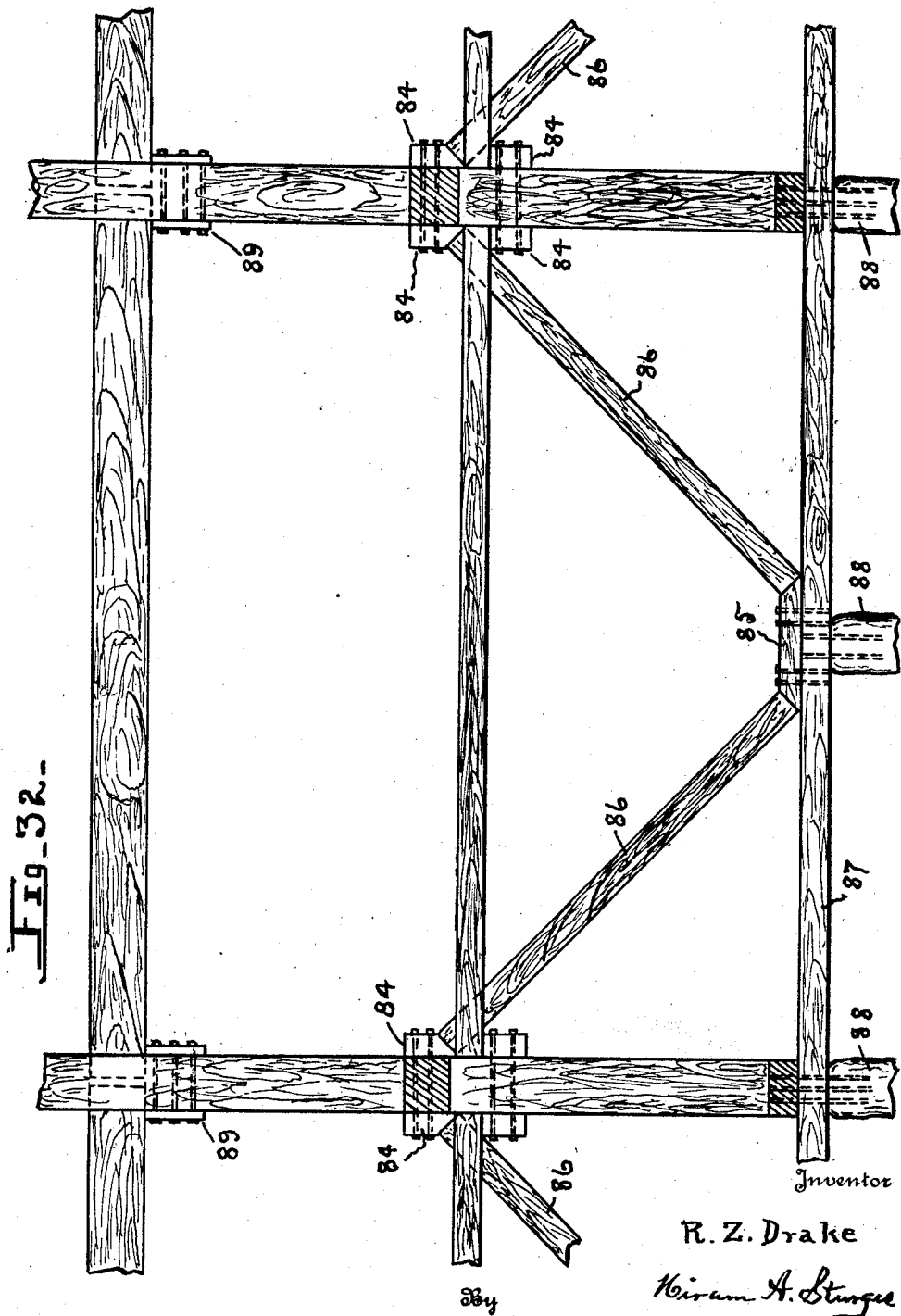
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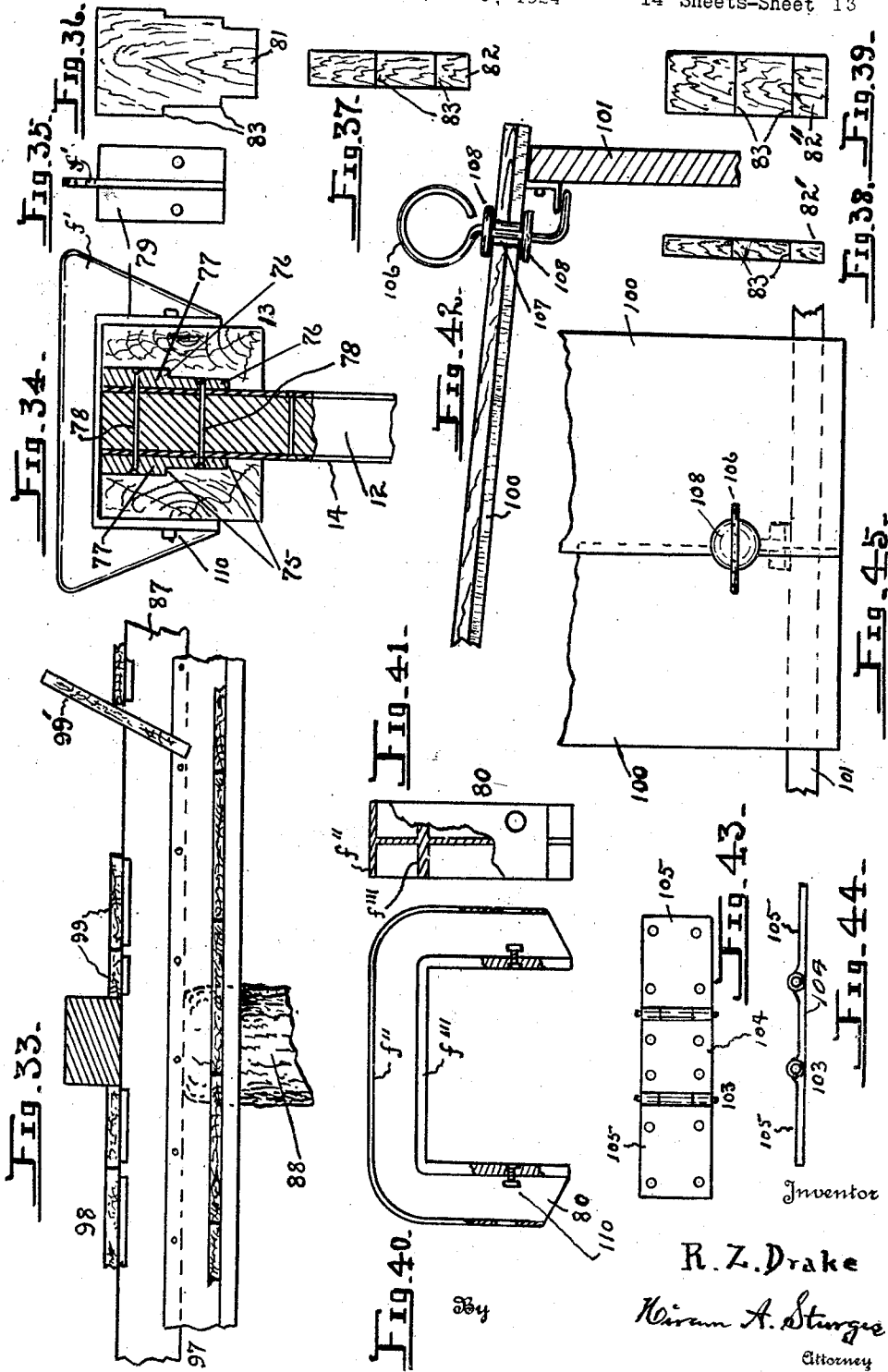
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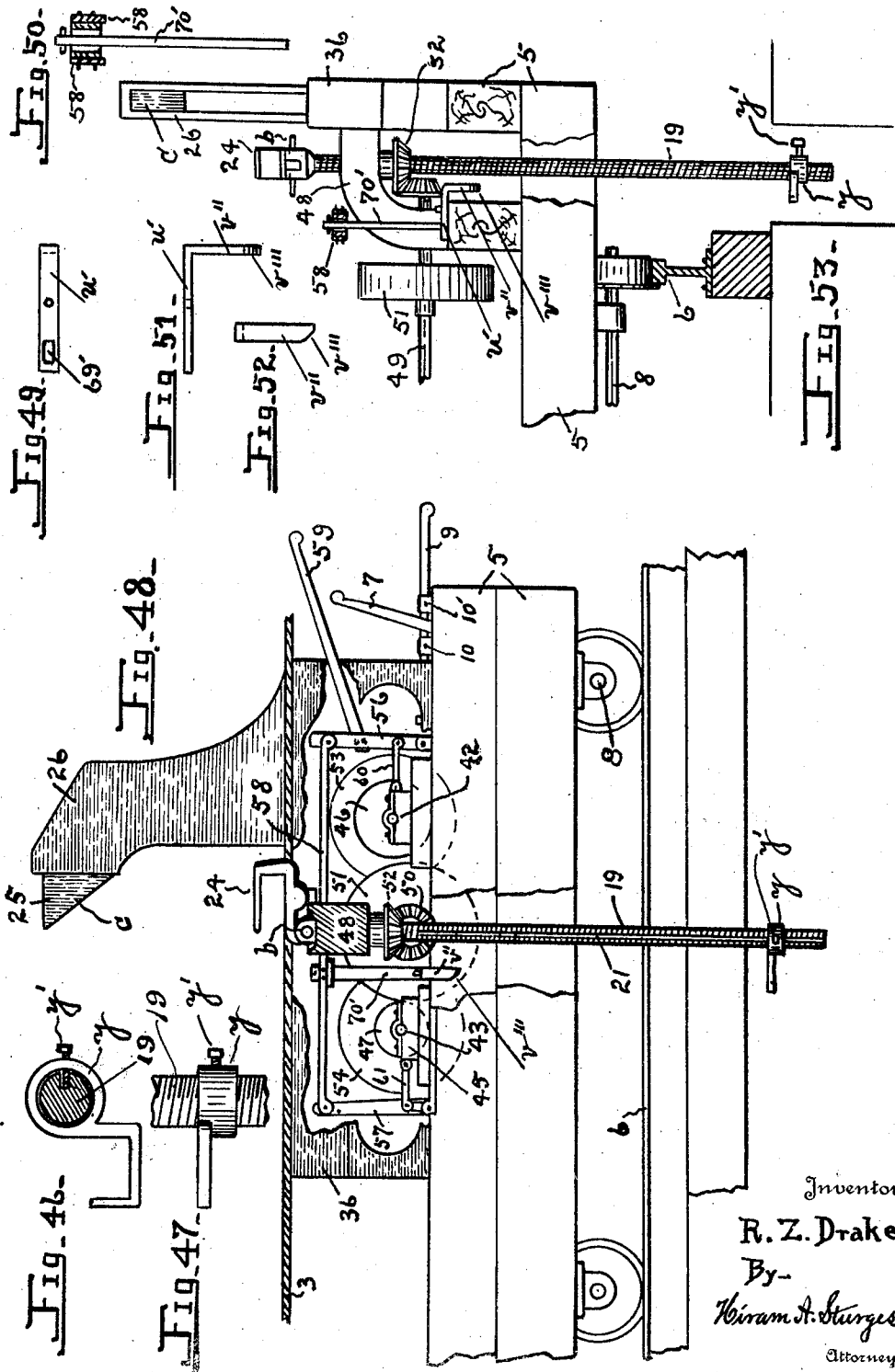
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MEANS FOR MOVING AND STORING LUMBER

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14 Sheets-Sheet 14



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UNITED STATES PATENT OFFICE.

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MEANS FOR MOVING AND STORING LUMBER.

Application filed April 5, 1924, Serial No. 704,458.

This invention relates to means for moving lumber and storing it in a seasoning house in such a manner that, without becoming warped, it will become seasoned more quickly than ordinarily. The invention is particularly of advantage in instances where planks, boards, joists and other kinds of lumber containing an excessive amount of moisture is required to be seasoned. It broadly includes a plurality of vertical hangers or bars arranged in sections adjacent to each other in a seasoning house, a vehicle or car on a track provided with hoisting mechanism including screws or carrier-bars having hooks or shoes for receiving the lumber and being vertically movable for disposing it between the hanger-bars of the adjacently disposed sections, and thereby providing vertical passages for a movement of air for facilitating seasoning, a horizontal lumber-carrier being provided and preferably consisting of a pair of movable ropes or cables for conducting said lumber into the seasoning house for delivery to the vertically movable carrier-bars or screws of the hoisting mechanism.

In order that the lumber may be speedily moved and stored with a minimum amount of manual labor and that decreased weight and the proper color may be had, and that bending, warping, checking or cracking of the lumber may be prevented while seasoning is progressing, and that the lumber, when seasoned, may have a greater strength than usual, I provide certain specific features found to be of great advantage, one being an automatically operative latch mounted in a casing and adapted to sustain the weight of the lumber between the sections while the carrier-bars move additional lumber upwardly; also adjustable locking means for connecting the hanger-bars of a section in stationary relation with the casings of the latches for preventing vibration; also means for reinforcing each hanger-bar so that it will remain rigid and will resist transverse stresses; also it specifically includes horizontal, vertically movable spreader-strips and tie-bars for preventing vibration and maintaining the hanger-bars of the several sections in uniformly spaced relation; and includes longitudinally adjustable skid-plates automatically operative for elevating or releasing the sawed lumber from the horizontal carrier while the screws

or carrier-bars receive planks, boards or joists to be elevated. The invention also includes a pair of stop-members or dogs for disposing the moving lumber at right-angles to the horizontal carrier, and permitting one or more plank to be disposed, closely adjacent to the screws or carrier-bars, ready to be elevated. Another specific object includes means automatically operative to terminate any further downward movement of the screws or carrier-bar after their shoes or hooks are disposed in a position ready to receive a plank or planks to be elevated.

With the foregoing objects in view and others to be mentioned hereinafter, the invention presents a novel and useful construction, combination and arrangement of parts, as described herein and claimed, and illustrated in the accompanying drawings, it being understood that changes in form, size, proportion and minor details may be made, said changes being determined by the scope of the invention as claimed.

In the drawings which illustrate one embodiment of the invention, Fig. 1 is a view showing a part of a seasoning house in transverse section, together with lumber hoisting mechanism, also showing the reinforced hanger-bars of a section, a pair of horizontal spreader-strips, and adjusting-rods. Fig. 2 is a view of parts taken at right-angles to the view shown in Fig. 1, lumber being shown in loaded position between some of the sections. Fig. 3 is a broken away, plan view showing the seasoning house and hanger-bars in section and showing the horizontally movable carrier, the car frame and skid-plates. Fig. 4 is a plan view of the hoisting mechanism and the car frame. Figs. 5, 6 and 7 are detail views relating to Fig. 8. Fig. 5 is a sectional view on line 5-5 of Fig. 6. Fig. 6 is a side view of a box providing bearings for the shaft of one of the transversely movable friction rollers. Fig. 7 is an end view of the box shown in Fig. 6. Fig. 8 is a broken away side view of the car. Fig. 9 is an enlarged view in transverse section through a hanger-bar and its brackets.

Fig. 10 is a side view of a hand-lever for moving the car. Fig. 11 is a view, partly in section, of an adjusting-rod. Fig. 12 is a side view, partly in section, showing an automatically operative latch and its housing, also illustrating relative positions of a vertically movable carrier-bar or screw and

one of the dogs. Fig. 13 is a view, partly in section, to illustrate the mounting of a screw or carrier-bar. Fig. 14 is a plan view of the parts shown in Fig. 12. Fig. 15 is a detail illustrating reinforced hanger-bars and their tie-bars. Fig. 16 is a view of a hanger-bar taken at right-angles to a hanger-bar shown in Fig. 15. Fig. 17 is a detail relating to Fig. 4, to show a lug for engaging in a slot of a screw or carrier-bar.

Fig. 18 is a view, partly in section, showing the side of a skid and a dog. Fig. 19 is a plan view of a bracket or holder for the adjustable bolt of an apertured coupling-plate shown in Fig. 23. Fig. 20 is a plan view of a rock-bar or stop-member. Fig. 21 is a side view of the holder shown in Fig. 19. Fig. 22 is an end view of the rock-bar shown in Fig. 20. Fig. 23 is a side view of an apertured coupling-plate, its staple and its bolt. Fig. 24 is a side view of the rock-bar shown in Fig. 20, a connecting-bolt being shown engaging in a block which is secured to a pair of links. Fig. 25 is a plan view of the apertured coupling-plate and staple shown in Fig. 26. Fig. 26 is a broken away detail to illustrate relative positions of the rock-bar shown in Fig. 24 and the apertured coupling-plate shown in Fig. 23. Fig. 27 is a plan view, partly in section, to clearly illustrate the arrangement of apertures in the parallel cable-supports for receiving the pawl-rods of the car frame.

Fig. 28 illustrates a truss and air ducts for the seasoning house, being an end view. Fig. 29 shows a bracket having an aperture of inverted cone-shape. Figs. 30 and 31 are end views of spreader-strips. Fig. 32 is a broken away side view, on an enlarged scale, showing a part of the wall frame for the seasoning house. Fig. 33 is an enlarged detail, being a section on line 33—33 of Fig. 28. Fig. 34 shows a girder-clamp and its mounting. Fig. 35 is an end view of the clamp shown in Fig. 34. Fig. 36 is a side view of a spacer-block. Figs. 37, 38 and 39 are edge-wise views illustrating spacer-blocks differing in thickness. Fig. 40 shows a modified form for a girder-clamp. Fig. 41 is an end view, partly in section, of the clamp shown in Fig. 40. Fig. 42 is a detail showing the use of a hand-hold or door-latch. Fig. 43 is a plan view and Fig. 44 is a side view of a double-leaf hinge. Fig. 45 is a plan view of the door-latch and part of a door.

Fig. 46 is a plan view of a set-ring, a carrier-bar or screw being shown in transverse section. Fig. 47 is a side view of the set-ring shown in Fig. 46. Fig. 48 is a broken away side view of a car frame showing parts thereon for terminating an upward sliding movement for the carrier-bars or screws. Figs. 49, 50, 51 and 52 are detail views relating to Figs. 48 and 53. Fig. 49 is a plan view of a rock-lever. Fig. 50 shows an up-

right actuating-bolt secured to a pair of links, the latter being in section. Fig. 51 is a side view of the rock-lever shown in Fig. 49, and Fig. 52 is an end view of the same. Fig. 53 is a broken away end view of the car frame showing parts thereon for terminating an upward movement for the carrier-bars or screws.

As a matter of convenience, the sawed lumber to be mentioned herein is shown and described as planks, but by changing the proportions of some of the parts, other kinds of lumber may be moved and stored.

Referring now to the drawings for a more particular description, numeral 1 indicates a seasoning house for sawed lumber, the planks 2 being conducted therein upon a carrier designated herein as cables 3, movable upon parallel carrier-supports 4 and 4', said cables being moved by any suitable means. At 5 is indicated the frame of a car adapted to be moved on a track 6 by means of a hand-lever 7 which is mounted on a car-axle 8; and by means of a hand-lever 9 the car may be maintained in stationary relation with the supports 4 and 4', the respective ends of a pawl-rod 10 being adapted to engage in apertures 11 and 11' in alternation, and the respective ends of a pawl-rod 10' also being adapted to engage in apertures 11 and 11' in alternation, these apertures being formed in these respective supports at longitudinal intervals thereof, the apertures 11 (Fig. 27) being disposed in planes midway between apertures 11'.

Numerals 12 indicate upright hanger-bars which are secured at their upper ends to a pair of parallel girders 13 disposed in the upper part of the seasoning house, said bars having a suitable length and, preferably, being formed convergent at their lower ends to permit sawed lumber to be readily conducted upwardly therebetween, and being reinforced at two opposed sides by metallic strips 14, said strips 14 for each hanger-bar, near its lower end, having opposed brackets 15 provided with apertured projections 16, 16', 17 and 17', the result, on account of the reinforcement mentioned being that these bars will resist bending and will sustain stresses directed thereto.

The hanger-bars 12 may have any suitable mounting in the girders 13 adequate for supporting the weight of the lumber, and are disposed at multiple distances apart, depending upon the thickness of the lumber to be stored between the sections *a* (Figs. 1, 3,) of said hanger-bars, said sections *a* being disposed approximately at right-angles to the movable cables 3. While I have shown and prefer only two of these hanger-bars for a section *a*, a greater number may be employed if desired.

Numerals 18 indicate tie-bars of approximately inverted U-shape, adapted to engage

in the apertures of the projections 16 and 16' of the hanger-bars of two adjacent sections *a* for maintaining the lower ends of the hanger-bars of said sections in uniformly spaced relation.

On account of the construction described it will be understood that when planks are disposed between the sections *a* the sides of the planks will co-operate to form vertical passageways, each passageway having a width corresponding to the thickness of a hanger-bar, so that air may move therethrough for absorbing moisture to advantage.

The sawed planks are moved upwardly from the cables 3 and are disposed between the hanger-bars of two adjacent sections *a* by means of a pair of carrier-bars or reversely threaded screws 19 which do not rotate, but are adapted to have vertical, sliding movements on the car by means of a pair of interiorly-threaded sleeves 20 (Fig. 13), each bar 19 being provided, longitudinally, with a slot 21 for receiving a lug 22 formed in a plate 23, as best shown in Fig. 17 of the drawings, each bars 19 at its upper end being provided with a shoe or hook 24 adapted to receive a plank and to have swinging movements from a pivot-pin *b*.

Numerals 25 indicate a pair of latch-bars, each being disposed in a casing 26 and having an upwardly divergent bearing-face *c* projecting outwardly of the casing, as best shown in Figs. 12 and 14, said latch-bars being normally swung outwardly and maintained in a vertical plane between two adjacently disposed sections *a* by any suitable means, the means herein shown being weights 27 adjustably mounted on the arms *e* of said latch-bars; and in the operation of loading, the car is first maintained stationary by use of the pawl-rods 10 and 10', and the hooks or shoes 24 being disposed in the horizontal plane of the cables and the planks thereon, the two pairs of tie-bars 18, above the hooks, are then removed, and a plank is moved by said cable into engagement with said hooks.

The carrier-bars will then conduct the plank upwardly, the hooks and plank, on moving upwardly, being swung rearwardly by action of gravity, said plank then being conducted above the latch-bars, and during its upward movement engaging the parts *c*, and thereby causing the latch-bars to swing inwardly of the casing, and it will then be understood that when the carrier-bars move downwardly the plank will remain above the latch-bars and will be supported by them, said latch-bars being swung outwardly of the casing 26 by operation of the weights 27 as soon as the plank has been conducted to a point above said latch-bars; and thereafter a second plank may be elevated, its upper edge engaging the lower edge of the first named plank; and the operation as de-

scribed may continue until the loading of the planks between two adjacent sections *a* has been completed, at which time the two pairs of tie-bars 18, which had been removed, are again mounted in the apertured projections 16 and 16', the carrier-bars, of course, operating to sustain the weight of the load until the tie-bars have connected said members 16 and 16'.

The car is then moved a limited distance on the track by use of the hand-lever 7, and is again disposed stationary by use of the hand-lever 9 for moving the pawl-rods 10 and 10', and the operation may continue for loading other sections.

It will be understood that the transverse stresses directed to the hanger-bars will be very great, and therefore spreader-strips 28 and 29 are employed, and are disposed between the hanger-bars of the several sections *a*, the width of said strips corresponding to the thickness of the lumber which is stored between any sections *a*, the end-portions of said strips 28 being disposed upon stationary ledges or wall-supports 30, and the end-portions of the strips 29 being supported above the supports 30 upon stationary ledges or supports 31, as best shown in Fig. 1 of the drawings, and it is obvious that the use of the strips 28 and 29 tend to maintain the hanger-bars of the several sections *a* equi-distant from each other.

In the operation of loading, when the planks are conducted upwardly in succession between a pair of the sections *a*, the uppermost plank will first engage a spreader-strip 28, and said strip will be moved upwardly during said loading until it engages the strip 29, and when the loading between said pair of adjacent sections *a* has been completed, both of said spreader-strips will be disposed in contacting relation with each other at or near the top of the seasoning house; and it will be seen that when the planks between any two adjacent sections *a* are unloaded by permitting the planks to slide downwardly between said sections, the spreader-strips will be returned by reason of their own weight to their respective supports or ledges, inasmuch as said strips 28 have a lesser length than either the length of strips 29 or a lesser length than the distance between the two ledges 31, and the distance between the supports 31 being greater than the distance between the said supports 30, they will, as stated, then return to their respective ledges.

It will be appreciated that the use of the tie-bars and spreader-strips are important so that seasoning may be practically uniform and that warping or bending of the lumber, while becoming seasoned may be avoided, and it will be understood that the hanger-bars of the sections *a* in all parts of the seasoning-house should be maintained in

some fixed relation with each other whether loaded or empty; also it will be noted that the two pairs of tie-bars 18 which connect the hanger-bars of a pair of adjacent sections *a* must be removed before lumber is moved upwardly therebetween, in the operation of loading, and therefore the adjusting-rods 32 and 33, best shown in Figs. 3 and 11, are employed and arranged in pairs, each having a hook *f* for engaging in an apertured ledge 34, and having a hook *g* for engaging in an aperture of a projection 17.

The rods 32 are preferably disposed at right-angles to the cables 3, and the rods 33 are disposed in angular relation to the rods 32 so that adjustments may be made for either preventing or causing any desired movement of the hanger-bars, either transversely or longitudinally of the seasoning house, each rod 33 and 32, as best shown in Fig. 11, preferably being of tubular construction and having inner end-portions reversely threaded for receiving the hooks *f* and *g* which also are threaded to correspond to the threaded, inner end-portions of rods 32 and 33. It will be understood that if the rods are rotated in one direction while mounted in operative positions the distance between their respective hooks *f* and *g* will be decreased, and that if rotated in a reverse direction the distance between said hooks will be increased; and by reason of this construction it will be noted that several movements may be effected for the hanger-bars, for instance, both rods 32 and 33 may be rotated in the same direction for increasing the distance between their respective hooks *f* and *g*; and both may be rotated in a direction reverse to the direction last named for decreasing the distance between their respective hooks; also the rod 32 of a pair may be rotated in a direction to increase the distance between its terminal hooks, the rod 33 of the same pair being rotated in a direction for decreasing the distance between its terminal hooks; and the rod 32 of a pair may be rotated in a direction for decreasing the distance between its hooks, the rod 33 being rotated for increasing the distance between its terminal hooks. Said hooks 32 and 33, when used in pairs, as shown in Fig. 3 of the drawings, permit adjustments to be made, as above outlined, for maintaining the hanger-bars of the sections *a* in stationary relation relative to each other, and for preventing or causing a swinging movement of one hanger-bar of a section relative to another. The wheel 35, best shown in Fig. 11 is mounted in stationary relation upon either rod 32 or 33, as a matter of convenience, for rotating said rods in either direction.

By referring to Figs. 12 and 14 of the drawings it will be seen that the casings 26, together with their latch-bars 25, may be

adjusted longitudinally of the car frame 5, one object in view being to dispose the outwardly projecting parts of the latch-bars in such positions that they may be engaged by the moving planks, and may sustain the weight of the planks when elevated and while the carrier-bars 19 are moving downwardly.

Each casing 26 is adapted to have a sliding movement in a box or housing 36 which is stationary with the frame 5, each casing being moved by means of a screw 37 which is threaded in the blocks 38 of the casing, said screw being rotated by any suitable means for this purpose.

On account of the construction as described, lumber may be moved and stored rapidly, each vertical reciprocation of the screws 19 requiring but a few seconds of time, the cables 3 having a continuous movement during operation for conducting the planks to the hooks.

Means are provided for preventing any movement, for a short interval, of certain planks on the cables, said means being operative just before a plank to be elevated enters the hooks 24, and operating, automatically, to elevate and thereby release the said certain planks from the cables, the object in view being to prevent a contact of any plank with the plank which has entered the hooks 24 and to prevent a contact of any plank with the screws or carrier-bars 19.

The means last mentioned for a stop-movement of planks consist, in part, of a pair of skid-plates 39 having a mounting at one of their ends to permit them to swing upon a rod *k* engaging in posts 40 of the frame 5, the opposite ends of these skids being disposed adjacent to the screws 19. Numerals 41 indicate a pair of rock-levers or dogs, each having a suitable pivotal mounting *m* and provided with a catch or stop-member *n* and having one of its ends engaging in a recess *p* (Fig. 18), said recesses *p* being formed in the skid-plates 39, the opposite end of each dog being disposed in the vertical plane of a pivot-pin *b* of a screw 19; and during operation, when the screws 19 move downwardly the pins *b* will engage the dogs to cause coincident, swinging movements thereof, the skid-plates 39 being swung upwardly for disengaging the planks from the cables 3, and thereby preventing the planks thereon from engaging or interfering with the screws or with the plank which, at that time, has been or is about to be received by the hooks 24, ready to be elevated. It will be understood, of course, that more than one plank may enter the hooks 24 and may be elevated by the upward movement of the screws or carrier-bars, depending upon their width, the proportions for the hooks being such that a plank of considerable width or a plurality

of planks of limited width may enter said hooks. By referring to Figs. 12, 14 and 18 it will be seen that the ends of the skid-plates, at the will of an operator, may be disposed a sufficient distance from the screws to permit a single plank or such number of planks as may be desired, to engage and be moved by the cables into the hooks 24.

The pivot-pins *b*, by the downward movement of the screws, are moved into engagement with the dogs, and it will be understood that said foremost plank or planks, after being moved into the hooks 24, or a plurality of planks of limited width entering said hooks by the moving cables 3, will be conducted upwardly by the upward sliding movements of the screws 19, and that the upward movements of said screws permit a reverse swinging movement of the dogs and the skid-plates. The stop-member *n* operates to prevent a further movement of the planks toward the screws until the latter slide downwardly for another engagement of the pivot-pins *b* with the dogs, the operation as described for a control of the movements of the lumber being automatic in all respects, the pivot-pins *b* causing the dogs to swing in one direction, and the weight of the skids and lumber thereon causing the dogs to swing in a reverse direction.

In order that vertical reciprocation of the screws 19 may be provided, mechanism is used consisting, in part, of a pair of driven shafts 42 and 43, adapted to be rotated in reverse directions, these shafts having bearings for their inner ends upon the car frame, the outer end of the shaft 42 having bearings in a box 44 adapted to be moved, and the outer end of the shaft 43 having bearings in a movable box 45. At 46 is indicated a friction roller which is mounted on the shaft 42, and a friction roller 47 is mounted on the shaft 43.

On the car frame is a sleeve-supporting yoke 48 of approximately inverted U-shape, each yoke being suitably secured to the car frame and having a part disposed in a plane between the shafts 42 and 43. At 49 is indicated an idler shaft having bearings for its ends in the yokes and provided with a pair of miter gear wheels 50, and a friction roller 51, the latter being disposed between the friction rollers 46 and 47.

Numerals 52 indicate a pair of miter gears, each being mounted upon a sleeve 20 and having bearings in a yoke 48 and engaging a miter gear wheel 50, and each miter gear wheel 52 is secured to a sleeve 20 by any suitable means, as by a key *s* (Fig. 13), and it will be understood that when the idler shaft 49 is rotated in one direction, the interiorly threaded sleeves 20 will be rotated for elevating the screws 19, any

rotatable movement of the screws being prevented by the lugs 22 which engage in the slots 21 thereof, a rotation in a reverse direction of the idler shaft causing downward sliding movements of the screws.

At 53 and 54 are indicated pulleys which are mounted upon the respective shafts 42 and 43, and by use of a cable 55, movable by any suitable means, these shafts and the friction rollers thereon may rotate in reverse directions, said cable, as shown in Fig. 4, engaging the upper part of one and the lower part of the other pulley mentioned.

Any suitable means may be provided for causing limited, coincident transverse movements, horizontally, of the shafts 42 and 43 to cause one of the rollers 46 or 47 to engage the friction roller 51, the means herein shown consisting, in part, of a pair of upright rock-levers 56 and 57 having pivotal connections for their lower ends upon the frame 5, their upper ends being pivotally connected by links 58, said levers being adapted to have coincident swinging movements in the same direction by use of a hand-lever 59. At 60 (Fig. 8) is indicated a link pivotally connecting the lever 56 with the box 44; and a link 61 (Fig. 8) pivotally connects the lever 57 with the box 45, each box being slidingly mounted on a core 62 (Figs. 5, 7) which is stationary with the frame 5, and it will be understood that a limited movement of the hand-lever 59 in a downward direction will cause engagement of the friction roller 47 of the shaft 43 with the friction roller 51 of the idler shaft 49 for rotating said shaft 49 in one direction, the friction roller 46 being disengaged coincidentally from the friction roller 51; and it is obvious that the idler shaft may be rotated in a reverse direction by use of said hand-lever 59 since an upward movement of said hand-lever will cause engagement of the roller 46 with roller 51, the roller 47 being moved out of engagement with said roller 51.

Numerals 63 indicates an intake or discharge-port for air, and at 64 is indicated a fan for causing a circulation of air which may move in the vertical passageways between the sections *a* for absorbing moisture from the lumber.

It will be noted that a single operator, by use of the hand-levers 7, 9, and 59 may perform practically all of the work necessary for the movement and storage of lumber placed on the cables 3, other operations, for the most part being automatic, it being understood that two pairs of tie-bars 18 must be removed which connect the hanger-bars of two adjacent sections *a* to permit the lumber to be elevated therebetween, said tie-bars, of course, being required to be replaced, manually, after the lumber has been elevated or stored between said sections, the

rods 32 and 33 requiring practically no attention after they have been adjusted.

In some instances it is desirable to secure the casings 26 to the hanger-bars of a section *a* adjacent to said casings, especially when unusually large or heavy lumber is to be stored, and any suitable means may be provided for this purpose, the means herein described and best shown in Figs. 19, 21, 23, 25 and 26 of the drawings, consisting of apertured coupling-plates 65 and staples *x*, said staples being adapted to engage in the apertures of said plates and in the apertures of the projections of brackets 15 of the hanger-bars, each plate being mounted pivotally on a terminal part *r* of a screw-bolt 66, the latter being threaded in a holder 67 adapted to be secured to a casing 26; and by rotating the bolts 66, the apertured plates may be caused to advance or retreat for suitable engagement of the staples *x* in the apertures of the plates and in said apertured projections of the brackets 15. In this connection it should be stated that the projections at the opposed sides of the hanger-bars are similar, respectively considered, this being a matter of convenience when assembling the parts in a seasoning house.

By referring to Figs. 2 and 18 of the drawings it will be seen that the skid-plates 39 are provided at one of their ends with recesses or notches opening on their lower sides for receiving the rod *k*, and therefore the skids may be adjusted longitudinally to dispose their opposite ends nearer to or further from the carrier-bars or screws 19, this selected distance depending upon the width of the sawed lumber to be moved and loaded in the seasoning house, the operation of parts, as explained, permitting the foremost plank or planks disposed forwardly of the ends of the skids 39 to engage the stop-member *n*, the remaining planks being elevated above the cables and, therefore, remaining stationary until the carrier-bars, together with said foremost plank or planks, move upwardly and until said carrier-bars have moved downwardly to normal position.

While members 4 and 4' have been designated as parallel supports for the cables 3 and lumber carried by said cables, it should be explained that said members 4 and 4' or parts thereof are used in connection with the pawl-rods 10 and 10' for supporting the car frame 5 and for maintaining said car-frame in a stationary position while loading the lumber. By referring to Fig. 27 it will be seen that the apertures 11 in the supporting member or plate 4 are disposed in non-alignment or non-aligning planes with the apertures 11' in the supporting-plate 4', the operation being that after the car frame has been moved on the track 6 a distance equal to the thickness of the sawed lumber to be stored plus the thick-

ness of a hanger-bar, the hand-lever 9 may be moved in one direction, transversely of the car-frame to cause both of the pawl-rods to move, one end of the pawl-rod 10' moving into an aperture 11 of the support 4 and one end of a pawl-rod 10 moving into an aperture 11' of a support 4', while the opposite end of pawl-rod 10 is disposed midway between two adjacent apertures 11 of the support 4, and the opposite end of pawl-rod 10' being disposed midway between two adjacent apertures 11' of the support 4', both of the pawl-rods remaining in the positions mentioned until the planks have been elevated and stored between the hanger-bars of a section *a*.

Both of the pawl-rods are then moved by a reverse, swinging movement of the hand-lever 9 so that the car frame 5 may be moved a distance above mentioned, at which time a further swinging movement of the hand-lever 9 in the direction last mentioned will cause the pawl-rods which before were disposed in non-aligning positions with any apertures, to engage in apertures for maintaining the car in a stationary position. The pivotal mounting for the hand-lever 9 is indicated at *t*.

It is, of course desirable that the planks, during their upward movements, should move in a vertical plane in the space between two adjacent sections *a*, and it will be appreciated that the adjustment of parts should be accurate in such a degree that the planks, while moving upwardly should not be pressed transversely against the hanger-bars of one section *a* in a degree greater than the pressure against the hanger-bars of the adjacent section *a* forming the space in which the planks move. However, since there may be an unequal pressure, it is important and quite necessary that the apertures 11 and 11' be correctly formed and that the pawl-rods shall be of suitable proportion and of strong construction to resist stresses which may be directed to them; also, for the same reason, it is important that the material between the apertures 11 of the support 4 and apertures 11' of the support 4' shall be of such size and quality that it will withstand the strain.

Under these last named conditions, then, it will be apparent that the movement of the car frame 5 would, with other than the device here presented, be equal to one-half the diameter of two apertures plus the width of the material between any two adjacent apertures; thus then compelling the placing the car at times, in such position that the plane of the plank being elevated could not be close to the plane between the sections in which it was desired to place them; whereas, by use of the principle of having the opposite ends of the same pawl-rod respectively come in line with an aperture at the one end

and in-line with material between apertures at the other end of such pawl-rod, the variation by which the plank being elevated, might be out of the plane of the space between any adjacent sections *a* in which they were desired to be placed, would be reduced by one-half.

It is understood that it is desirable that any distances through which the car-frame 5 is moved, shall always be some multiple of the unit thickness (as one inch) of which the lumber is cut, and by making the apertures and the distance between adjacent apertures of the same measurement and that same measurement being a multiple of such unit thickness of lumber (as one inch), the placing of the car in position, so the lumber being elevated in hooks 24, will be close to the same plane as the spaces between any adjacent sections *a* in which it is desired to place the plank, is greatly facilitated and the movement of the car frame 5 then may equal one-half of the distance from each other of the centers of adjacent apertures 11 or 11'.

In order that the screws 19 will not move downwardly or upwardly an undue distance, which might be caused by a careless operator when using the lever 59, means which operate automatically are provided to prevent a contact of either of the friction-rollers 46 or 47 with the friction-roller 51 of shaft 49, said non-contact occurring when the screws 19 have moved downward or upward adjacent to their lowermost or uppermost positions, said means consisting, in part, of rock-levers *u* and *u'*, rock-lever *u* having a pivotal mounting approximately at its middle upon the yoke 48, its inner end having an upright contact-piece *v* with an inclined face *v'* adapted to be engaged by the pivot-pin *b* of one of the screws 19, the outer end of said lever *u* being provided with an elongated aperture 69 best shown in Figs. 14 and 20 of the drawings, for receiving the upper end of the upright actuating-bolt 70, the lower end of said bolt 70 engaging in a block which is secured to the links 58 (Fig. 24), and it will be understood that when the screws 19 move downwardly a sufficient distance, the pin *b* of one of said screws 19 will engage the inclined part of the contact-piece *v* and said lever *u* will have a swinging movement, the actuating-bolt 70 being moved for moving the links 58, the result being that the roller 51 will not be engaged by the rollers 46 or 47.

The rock-lever *u'* has a pivotal mounting approximately at its middle upon a member of car frame 5, its inner end having a down-right contact-piece *v''* with an inclined face *v'''* adapted to be engaged by a set-ring *y* which set-ring *y* is adapted to be placed on one of the screws 19, and when so placed to be held in place by set-screw *y'*, the outer end of said rock-lever *u'* being provided with

an elongated aperture 69', best shown in Fig. 49 of the drawings for receiving the lower end of the downright actuating-bolt 70', the upper end of said bolt 70' engaging in a block which is secured to the links 58 (Figs. 50, 53), and it will be understood that when the screws 19 move upwardly a sufficient distance the set-ring *y*, on one of said screws 19, will engage the inclined part of the contact-piece *v''* and said lever *u'* will have a swinging movement, the actuating-bolt 70' being moved for moving the links 58, the result being that the roller 51 will not be engaged by the rollers 46 or 47.

Assuming that an upward movement of the hand-lever 59 which causes the roller 46 to engage the roller 51, will cause the screws 19 to move downwardly, it will be seen that when the screws have moved to, or approximately adjacent to, their lowermost positions, the pivot-pin *b* of one of the screws will engage the inclined part *v'* and will cause a swinging movement of the lever *u*, its outer end and the bolt 70 and links 58 moving in a direction of said hand-lever 59, and thereby causing a limited outward movement of the levers 56 and 60, the result being that the roller 46 will be immediately disengaged from the roller 51 to terminate any further downward movement of the screws, and thereby prevent any undue shocks or injury, the operation and proportion of parts being such that the contact of the pin *b* with the inclined part *v'* of the lever *u* will cause a very limited movement of the box 44 together with the shaft 42 and said roller 46, but sufficient to cause disengagement of said roller 46 from the roller 51; and thereafter, any further upward movement of the hand-lever 59 will be prevented while the pivot-pin *b* remains in engagement with the inclined part *v'*; but, of course, this hand-lever may be moved downwardly to permit engagement of the roller 47 with the roller 51 for causing the screws 19 to move upwardly.

Again assuming that a downward movement of the hand-lever 59, which causes the roller 47 to engage the roller 51, will cause the screws 19 to move upwardly, it will be seen that when the screws have moved to, or approximately adjacent to, their uppermost positions, the set-ring *y* of one of the screws will engage the inclined part *v'''* and will cause a swinging movement of the lever *u'*, its outer end and the bolt 70' and links 58 moving in a direction away from said hand-lever 59, and thereby causing a limited outward movement of the levers 57 and 61, the result being that the roller 47 will be immediately disengaged from the roller 51 to terminate any further upward movement of the screws, and thereby prevent any undue shocks or injury, the proportion of parts being such that the contact of the set-ring *y*

with the inclined part v''' of the lever u' will cause a very limited movement of the box 45 together with the shaft 43 and said roller 47, but sufficient to cause disengagement of said roller 47 from the roller 51; and thereafter, any further downward movement of the hand-lever 59 will be prevented while the set-ring y remains in engagement with the inclined part v''' , but, of course, this hand-lever may be moved upwardly to permit engagement of the roller 46 with the roller 51 for causing the screws 19 to move downwardly.

It will be appreciated that a seasoning house to support the great weight of lumber should be of strong construction, and therefore the ends of girders 13 are supported upon trusses, one of these trusses being shown in Fig. 28, each consisting of a lower chord 71, an upper chord 72, a pair of inclined braces 72', a pair of vertical posts 73 and a pair of crossed stay-rods 74.

The frames for the sides of the seasoning house are of strong construction, head-blocks 84 and foot-blocks 85 being employed in connection with inclined braces 86, the cap-plates 87 being provided for the piles 88. While piles 88 are shown, other equivalent supports may, of course, be provided.

In order that the hanger-bars 12 may be securely mounted, each girder 13, as best shown in Fig. 34, consists of a pair of opposed, parallel beams, provided on their inner sides with notches or ledges 75, adapted to be engaged by the projections 76 of a pair of opposed detent-blocks 77 which are secured to the hanger-bars, bolts 78 being used which extend through the metallic reinforcing strips 14, this construction being of great advantage for resisting stresses. Clamping-bars are provided which are approximately of inverted U-shape, and any suitable number of these bars may be used, and may be mounted for preventing spreading apart of the two-part girders 13, one of these bars being indicated at 79 and having a flange f'' (Figs. 34, 35); another clamping-bar of modified form may be used if desired, as the clamping-bar 80, having flanges f'' and f''' , and shown in Figs. 40 and 41.

Numeral 81 (Fig. 36.) indicates a spacing-block, and it will be understood that these blocks may be disposed between the hanger-bars of the sections a intermediate the adjacent beams of the girders 13. The thickness of the spacing-blocks should, of course, correspond to the thickness of the lumber to be stored, and at 82, 82' and 82'' (Figs. 37, 38, 39,) are indicated spacing-blocks differing in thickness, and each of these blocks are provided with projections 83 to co-operate with the projections 76 of the blocks 77.

Since lumber to be stored may have varying lengths, the spreader-strips heretofore designated at 28 and 29 should also have

varying lengths, and therefore I provide horizontal plates or stall-supports and arrange them in pairs, as the lower stall-supports 89 and the upper pair of horizontal plates or supports 90, upright spindles 91 being suitably secured thereto, this construction being shown in Fig. 28 and being a modified construction and a substitute in some instances for the brackets 30 and 31 shown in Fig. 1 of the drawings. It will be seen by referring to Fig. 28 that supporting-strips 92 may be placed between the spindles 91, nearer to the middle of the seasoning house or further therefrom for supporting shorter or longer spreader-strips, as may be found convenient in use.

Since lumber to be stored between the hanger-bars of the sections a may be of varying thickness it is obvious that if the spreader-strips are of greater thickness they should have a greater vertical width, due both to the length and the increased weight of the member itself, than otherwise would be required, in order that they may not become broken during the operation of unloading the lumber, and such a spreader-strip is indicated at 93 (Fig. 31).

Also it is apparent that if boards of considerable length are to be stored, the spreader-strips used should have a greater vertical width than would be used if the boards were of lesser length; and while, as shown in Fig. 30, the spreader-strip 94 may be used between the hangers in instances when comparatively short planks are to be stored, in cases where longer planks are to be stored, the strip 93 (Fig. 31) will be more appropriate. And it may be stated that the kind of spreader-strips to be used, to avoid becoming broken, depends upon the length and thickness of the lumber to be stored, an increase in the length of lumber requiring an increase in the vertical width of the spreader-strips, and comparatively thick lumber requiring spreader-strips of adequate vertical width.

In order that lumber, when stored, may become quickly and uniformly seasoned, means are provided in the lower part of the seasoning house to control the movements of air so that it may be distributed to advantage. By referring to Fig. 28 it will be seen that an air duct 95 is provided at the medial line of the seasoning house, and that longitudinal pits, recesses or depressions 96 are provided at the outer sides of the air duct 95 to permit the free travel of the carrier-bars or screws 19, and that outwardly of the longitudinally disposed pits 96 are air-ducts 97, all of said air ducts being provided with an upper floor 98. As best shown in Fig. 33, the floors 98 consist of removable boards 99, as shown, and in operation, any number of these boards may be removed to permit air to move into the seasoning house from the

air ducts, or air to be moved into the air ducts or any one of them, from the seasoning house; and boards 99' may be disposed in suitable positions to deflect moving air and thereby control the movements of air either to the air ducts or therefrom.

Numerals 100 indicate a pair of doors adapted to be swung upwardly from a part of the walls 101 of compartments 102 which are disposed upon the top and which communicate with the seasoning house, said doors operating to control movements of air to or from said seasoning house, and being adapted to swing from double-leaf hinges 103, the middle hinge-member 104 (Figs. 43, 44) of each hinge being stationary, and the wings 105 being mounted upon the doors. Numerals 106 indicate hand-holds for moving and locking the doors, the stem of each being disposed in a recess 107 (Fig. 42) opening on an edge of one of the doors, the stem of each hand-hold being provided with collars 108 adapted to cover a recess 107.

Fig. 29 illustrates the preferred form for apertures 109 which receive the tapered hooks *f* of the adjusting-rods 32 and 33 which engage in said apertures 109 of the ledges 34, the form of these apertures being upwardly divergent so that the hooks *f* will readily engage in said apertures.

Numerals 110 (Figs. 34, 40) indicate keepers which are threaded in the clamping-bars for securing said bars to the girders, it being understood that the inner ends of said keepers are countersunk to permit the clamping-bars to be readily placed upon the girders, and after the clamping-bars have been thus placed, the keepers may be rotated and moved into engagement with the girders.

I claim as my invention:—

1. In lumber moving and storage means, upright hanger-bars disposed side by side and provided with metallic reinforcing-strips, brackets on the reinforcing-strips having apertured projections, an upright movable carrier below the hanger-bars for moving lumber between said hanger-bars above the apertured projections of the brackets, and a plurality of tie-bars engaging in the apertures of the projections for maintaining the hanger-bars equi-distant from each other.

2. In lumber moving and storage means, upright hanger-bars disposed side by side having convergent end-portions, metallic reinforcing strips on two opposed sides of the hanger-bars, a plurality of brackets having apertured projections each being secured to a reinforcing-strip of a hanger-bar, an upright, movable carrier for moving lumber between the convergent end-portions of said hanger-bars and disposing it above the apertured projections of the brackets, and a plurality of tie-bars approximately of inverted U-shape adapted to be removably mounted

in the apertures of said projections for maintaining the hanger-bars at uniform distances from each other.

3. In lumber moving and storage means for a seasoning house having apertured ledges, upright hanger-bars arranged in adjacently disposed sections and having brackets provided with projections, an upright, movable carrier for moving lumber upwardly between the hanger-bars of the sections, tie-bars connecting the hanger-bars of said sections by engaging the projections of said brackets, a plurality of adjusting bars arranged in pairs engaging the projections of the brackets and engaging in the apertures of said ledges, and means to increase or decrease the length of one of the adjusting-bars of each of said pairs for maintaining the hanger-bars of the sections in stationary relation relative to each other.

4. In lumber moving and storage means for a seasoning house having apertured ledges, upright hanger-bars arranged in adjacently disposed sections and provided with apertured projections, an upright movable carrier for conducting lumber upwardly between the sections, a plurality of tie-bars each extending from the hanger-bar of one section to the hanger-bar of a section adjacent thereto and engaging in the apertures of the projections thereof, a plurality of adjusting-bars each disposed approximately at right-angles to and engaging in an aperture of a ledge and engaging in an apertured projection of a hanger-bar, a plurality of second adjusting-bars engaging in the apertures of a ledge, each being disposed adjacent to and in inclined relation to a first named adjusting-bar and engaging in an aperture of a projection of a hanger-bar, and means for increasing or decreasing the length of the second adjusting-bars.

5. In lumber moving and storage means for a seasoning house having apertured ledges, upright hanger-bars arranged in adjacently disposed sections, a movable carrier for conducting lumber upwardly between the hanger-bars of the sections, a plurality of adjusting-bars arranged in pairs each adjusting-bar having a removable mounting on an apertured ledge and hanger-bar of a section, and means for increasing or decreasing the length of one of the adjusting-bars of each pair.

6. In lumber moving and storage means, a seasoning house having a pair of stationary wall supports, upright hanger-bars arranged in adjacently disposed sections, tie-bars connecting the hanger-bars of said sections, spreader-strips between the hanger-bars of said sections having end-portions normally disposed on the stationary wall supports, and a pair of carrier-bars movable for conducting lumber upwardly between the hanger-bars of the adjacently disposed sec-

tions and causing disengagement of the spreader-strips from said stationary wall supports.

7. In lumber moving and storage means, a seasoning house having a pair of opposed, stationary wall supports, upright hanger-bars arranged side by side in adjacently disposed sections, a plurality of spreader-strips between the hanger-bars of said sections having end-portions normally disposed on the opposed, stationary wall supports, and a pair of carrier-bars movable for conducting lumber between the hanger-bars of the adjacently disposed sections and adapted to cause disengagement of the spreader-strips from said pair of stationary wall supports.
8. In lumber moving and storage means for a seasoning house having opposed, stationary wall supports and having opposed, secondary, stationary wall supports, upright hanger-bars arranged in adjacently disposed sections, tie-bars connecting the hanger-bars of said sections, spreader-strips between the hanger-bars of said section normally disposed on the first named stationary wall supports, spreader-strips between the hanger-bars of said sections normally disposed on the secondary stationary wall supports, and a pair of carrier-bars movable for conducting lumber upwardly between the hanger-bars of the adjacently disposed sections adapted to cause said spreader-strips to move upwardly from their respective stationary wall supports.
9. In lumber moving and storage means, a car, upright hanger-bars arranged in adjacently disposed sections above the car, a carrier-bar on the car adapted to be vertically reciprocated and provided with a hook, a horizontal carrier for conducting lumber to said hook, said carrier-bar during its upward movement being adapted to conduct said lumber between the hanger-bars of the said adjacently disposed sections, and a latch-bar associated with said car movable for engaging and maintaining said lumber between the hanger-bars of said sections during the downward movement of said carrier-bar.
10. In lumber moving and storage means, a car, upright hanger-bars disposed side by side in adjacently disposed sections, a pair of carrier-bars on the car adapted to be vertically reciprocated, each carrier-bar being provided with a pivotally mounted hook, a pair of movable cables for conducting lumber to said hooks to be conducted between the hanger-bars of the adjacently disposed sections by an upward movement of the carrier-bars, and a pair of upright-pivotally mounted latch-bars associated with said car for engaging the lumber while the carrier-bars are moving downwardly.
11. In lumber moving and storage means, a car, upright hanger-bars arranged in ad-

jacently disposed sections, a pair of carrier-bars on the car adapted to be vertically reciprocated each carrier-bar being provided with a pivotally mounted hook, a pair of movable cables for conducting lumber to said hooks to be conducted between the hanger-bars of the adjacently disposed sections by an upward movement of said carrier-bars, and tie-bars adapted to engage the hanger-bars of the adjacently disposed sections for preventing a downward movement of said lumber from the hanger-bars while the carrier-bars are moving downwardly.

12. In lumber moving and storage means, a car, upright hanger-bars arranged in adjacently disposed sections, a pair of carrier-bars on the car each having a pivotally mounted hook and a projection and adapted to be vertically reciprocated, a pair of cables for moving lumber to said hooks to be conducted upwardly between the hanger-bars of the adjacently disposed sections by an upward movement of the carrier-bars, means to prevent a downward movement of lumber after it has been conducted upwardly between the hanger-bars, a pair of skid-plates normally disengaged from the lumber, and a pair of dogs pivotally mounted on the car adapted to be engaged by said projections during a downward movement of the carrier-bars to cause swinging movements of the skid-plates for preventing the lumber from being moved by said pair of cables.

13. In lumber moving and storage means, upright hanger-bars arranged in adjacently disposed sections, a car frame provided with a supporting-rod and disposed below the hanger-bars, a pair of carrier-bars on the car frame, each carrier-bar being provided with a hook and projection and adapted to be vertically reciprocated, movable cables for conducting lumber to said hooks to be moved upwardly between the hanger-bars of the adjacently disposed sections, latches for engaging the lumber moved upwardly by the carrier-bars, a pair of skid-plates normally disposed in a plane below said cables and having recesses opening on their lower sides for receiving the supporting-rod of said frame, and a pair of dogs adapted to be engaged by said projections when the carrier-bars move downwardly for causing the skid-plates to move to a plane above the movable cables to control the movement of lumber on said cables.

14. In lumber moving and storage means, upright hanger-bars disposed side by side and arranged in adjacent sections, tie-bars connecting the hanger-bars of one section with the hanger-bars of an adjacent section, a car frame below the hanger-bars and provided with a supporting-rod, carrier-bars on the car frame adapted to be vertically re-

reciprocated each carrier-bar being provided with a hook and a projection, movable cables for conducting lumber to said hooks to be conducted between the hanger-bars of the 5 adjacently disposed sections by the upward movement of the carrier-bars, pivotally mounted latches for preventing a downward movement of the lumber after it has been conducted between said hanger-bars, a pair 10 of skid-plates normally disposed in a plane below the cables and provided at longitudinal intervals with recesses for receiving the supporting-rod of the car frame, and a pair of pivotally mounted dogs adapted to be en- 15 gaged by said projections when the carrier-bars move downwardly to cause the skid-plates to swing upwardly above the movable cables for controlling the movement of lum-ber on said cables.

20 15. In lumber moving and storage means, upright hanger-bars disposed side by side in adjacently disposed sections, a car frame, a pair of casings on the car frame, mechanism on the car frame for conducting lum- 25 ber upwardly and disposing it between the hanger-bars of the adjacently disposed sections, tie-bars connecting the hanger-bars of a section with the hanger-bars of an adjacent section, pivotally mounted latch-bars 30 projecting outwardly of the casings for engaging the lumber after it has been conducted between said hanger-bars, and a pair of coupling-plates each having a pivotal mounting on a casing and adapted to be re- 35 movably connected with a hanger-bar.

16. In lumber moving and storage means, upright hanger-bars disposed side by side in adjacently arranged sections, a car frame, a pair of carrier-bars provided with projec- 40 tions and mounted on the car frame, actuated mechanism on the car frame for causing vertical reciprocation of said carrier-bars to elevate and dispose lumber between the hanger-bars of the adjacently arranged 45 sections by the upward movement of the carrier-bars, means for preventing a downward movement of lumber after it has been elevated, and co-operating devices on the car frame movable by a projection of one of the 50 carrier-bars during the downward movement of said bars to terminate actuation of said mechanism for terminating the downward movement of said carrier-bars.

17. In lumber moving and storage means, 55 upright hanger-bars disposed side by side in adjacently disposed sections, a car frame adapted to be moved between the sections of said bars, a support provided at longitudinal intervals with apertures and disposed at 60 a side of the car frame, a second support disposed at that side of the car frame opposite to the first named support and provided at longitudinal intervals with apertures disposed in planes midway between 65 the apertures of said first named support,

cables on said supports for conducting lum-ber, mechanism on the car frame for conducting the lumber from said cables and depositing it between the hanger-bars of said adjacently disposed sections, a pivotally 70 mounted hand-lever, a pawl-rod carried by the hand-lever, a second pawl-rod carried by the hand-lever, said hand-lever being adapted to have a swinging movement transversely of the car frame to cause an end- 75 portion of the first named pawl-rod to enter an aperture of the second support, an end-portion of the second pawl-rod entering an aperture of the first named support for maintaining the car frame in stationary relation with said supports, an end-portion 80 of the first named pawl-rod being disposed mid-way between two apertures of the first named support and an end portion of the second pawl-rod being disposed midway between two apertures of the second support. 85

18. In lumber moving and storage means, the combination with a plurality of hanger-bars disposed side by side in adjacently disposed sections, of a support below the 90 hanger-bars provided longitudinally at uniform intervals with apertures, a second support disposed adjacent to and approximately parallel with the first named support and provided longitudinally at uniform inter- 95 vals with apertures disposed in planes midway between the apertures of said first named support, a car frame adapted to be moved between and approximately parallel with said supports, a pair of cables movable 100 on said supports for conducting lumber to be deposited between the hanger-bars of said adjacently disposed sections, a pivotally mounted hand-lever, a pawl-rod mounted on the hand-lever, a second pawl-rod mount- 105 ed on the hand-lever, said hand-lever being adapted when swung in one direction to cause an end-portion of a first named pawl-rod to enter an aperture of the first named support, an end-portion of the second pawl-rod entering an aperture of the 110 second support for maintaining the car frame in stationary relation with said supports, an end-portion of the first named pawl-rod being disposed midway between 115 two apertures of the second support and an end-portion of the second pawl-rod being disposed midway between two apertures of the first named support.

19. In lumber moving and storage means, 120 upright hanger-bars disposed side by side in adjacently disposed sections, a pair of parallel supports, a car frame adapted to be moved between said parallel supports intermediate the hanger-bars of said adjacent- 125 ly disposed sections, cables on said supports for conducting lumber, mechanism on the car frame for conducting lumber from the cables and depositing it between the hanger-bars of said adjacently disposed sections, 130

tie-bars on the hanger-bars of the adjacently disposed sections, and movable engaging means on the car frame for securing it to the supports at selected longitudinal intervals of said supports.

20. In lumber moving and storage means, a car, upright hanger-bars arranged in adjacently disposed sections, a pair of carrier-bars on the car adapted to be vertically reciprocated, each carrier-bar being provided with a pivotally mounted hook, a pair of movable cables for conducting lumber to said hooks to be conducted between the hanger-bars of the adjacently disposed sections by an upward movement of said carrier-bars, and tie-bars adapted to engage the hanger-bars of the adjacently disposed sections for preventing a downward movement of said lumber from the hanger-bars.

21. In lumber moving and storage means, upright hanger-bars disposed side by side in adjacently arranged sections, a car frame, a pair of carrier-bars mounted on the car frame, a set-ring on one of said carrier-bars, actuated mechanism on the car frame for causing vertical reciprocation of said carrier-bars to elevate and dispose lumber between the hanger-bars of the adjacently arranged sections by the upward movement of the carrier-bars, means for preventing a downward movement of lumber after it has been elevated, and co-operating devices on the car frame movably by the set-ring on said carrier-bar during the upward movement of said bars to terminate actuation of said mechanism for terminating the upward movement of said carrier-bars.

22. In lumber moving and storage means, upright hangers disposed to form adjacently arranged sections, a carriage movable across the ends of said sections, means on said carriage for conveying lumber into the spaces between said sections, and means for automatically stopping said lumber conveying means at a desired point in its movement.

23. In lumber moving and storage means, upright hangers disposed to form adjacently arranged sections, a movable carriage, means on said carriage for elevating lumber between said sections, and means for automatically stopping the upward movement of said lumber elevating means when it has reached a predetermined height of movement.

24. In lumber moving and storage means, upright hanger-bars disposed to form adjacently arranged sections, a movable carriage, reciprocating means on said carriage for elevating lumber into the spaces between said sections, and means for automatically stopping the descent of said reciprocating means when it has reached a predetermined point in its descent.

25. In lumber moving and storage means, upright hanger members disposed to form adjacently arranged sections, a movable carriage, a vertically movable member on said car for elevating lumber into the spaces between said sections, a projection on said vertically movable member, means on said car for actuating said vertically movable member, and a movable member associated with said car operated by said projection to stop the movement of said vertically movable member at a predetermined point.

26. Lumber handling apparatus comprising a movable carriage, hoisting mechanism on said carriage for moving the lumber with relation to depending hanger member, a longitudinally extending supporting member adjacent each side of said carriage, each of said supporting members having a series of openings, the openings in one of said members being staggered with relation to those in the other, and a locking rod mounted on said carriage slidable to cause its end to enter whichever of said openings it is in registry with to lock said carriage against movement longitudinally of said supporting members.

27. Lumber handling apparatus comprising a movable carriage, hoisting mechanism on said carriage for moving the lumber with relation to depending hanger member, a longitudinally extending supporting member adjacent each side of said carriage, each of said supporting members having a series of openings, the openings in one of said members being staggered with relation to those in the other, and a pair of laterally spaced locking rods on said carriage, and means for sliding said rods in opposite directions for engagement with said openings to lock the carriage.

28. Lumber handling apparatus comprising a movable carriage, hoisting mechanism on said carriage for moving the lumber with relation to depending hanger member, a longitudinally extending supporting member adjacent each side of said carriage, each of said supporting members having a series of openings, the openings in one of said members being staggered with relation to those in the other, and a pair of laterally spaced locking rods on said carriage, and means for sliding said rods in opposite directions for engagement with said openings to lock the carriage, the end of each of said rods not in engagement with the openings being positioned between two adjacent openings so that upon slight movement of the car said last mentioned ends will each be brought into registry with an opening and may be caused to enter the same upon movement of the rods in a direction opposite to that first mentioned.

29. In lumber moving apparatus, a car-

riage, lumber elevating mechanism on said carriage, an upstanding member adjacent said elevating mechanism, and a latch pivoted in said upstanding member and arranged to recede as the lumber moves thereby and to automatically move into position when the lumber has passed the same to support the lumber upon recession of the elevating mechanism.

30. In lumber moving apparatus, a carriage, lumber elevating mechanism on said carriage, an upstanding member adjacent said elevating mechanism, and a latch pivoted in said upstanding member and arranged to recede as the lumber moves thereby and to automatically move into position when the lumber has passed the same to support the lumber upon recession of the elevating mechanism, the pivot of said latch with relation to the lumber supporting part of the latch being so positioned that as the latter is swung away from beneath the supported lumber there will be no upward movement of the lumber supporting part of the latch with relation to the supported lumber.

31. In lumber moving and storage means, upright hanger members disposed to form adjacently arranged sections, a carriage movable below the sections, lumber elevating mechanism on said carriage, an upstanding member adjacent said elevating mechanism, a lumber supporting latch pivoted in said upstanding member arranged to recede as the lumber moves thereby and to advance to support the lumber as soon as it has passed the same, the speed of the lumber elevating mechanism being such that the lumber already in position between the hanger members will not move downwardly during the short interval elapsing between the recession of the latch and the contact of the additional piece of lumber being elevated with that already stored above the latch.

32. In lumber moving and storage means, upright hanger members disposed to form adjacently arranged sections, a carriage, lumber elevating mechanism on said carriage, an upstanding member adjacent said elevating mechanism, and a latch pivoted in said upstanding member and arranged to recede as the lumber moves thereby and to automatically move into position when the lumber has passed the same to support the lumber upon recession of the elevating mechanism, and retaining members adapted to be mounted on said hanger members to support the load when the carriage is moved to another section.

33. In lumber moving and storage means, upright hanger members arranged to form adjacently disposed sections, a carriage, lumber elevating mechanism on said carriage, an upstanding member on said carriage and having one edge curved, a latch

pivoted to normally project beyond the other edge of said upstanding member to support lumber, but movable backwardly to permit lumber to move thereby, said upstanding member being adjustable along said carriage to permit either the latch or the curved edge of the upstanding member to be positioned adjacent the elevating mechanism to load lumber into and unload lumber from the sections as desired.

34. In lumber moving apparatus, a carriage, a conveyor for conveying lumber to said apparatus, lumber elevating mechanism on said carriage adapted to elevate the lumber to storage spaces, disengaging means associated with said carriage for moving the lumber out of operative engagement with said conveyor, and means for throwing the disengaging means into operation as the elevating mechanism is passing into a predetermined point of its travel.

35. In lumber moving apparatus, a carriage, a conveyor for conveying lumber to said apparatus, lumber elevating mechanism on said carriage adapted to elevate the lumber to storage spaces, a skid-plate on said carriage below the conveyor, an operating member on said carriage for operating the skid-plate, and means on said lumber elevating mechanism for actuating the operating member to operate the skid-plate to raise the pieces of lumber thereon out of contact with the conveyor as the elevating mechanism passes into its lowermost position.

36. In lumber moving apparatus, a carriage, a conveyor for conveying lumber to said apparatus, a vertically movable carrier-bar on said carriage, means for raising and lowering said carrier-bar, an elongated skid-plate pivoted to the carriage below the conveyor, a lever having one end adapted to raise one end of the skid-plate upon depression of the other end of the lever, and a projection on the carrier-bar adapted to operate said other end of the lever to elevate the lumber directly above the skid-plate out of contact with the conveyor as the carrier-bar reaches its lowest point of travel.

37. In lumber moving apparatus, a carriage, a conveyor for conveying lumber to said apparatus, a vertically movable carrier-bar on said carriage, means for raising and lowering said carrier-bar, an elongated skid-plate pivoted to the carriage below the conveyor, a lever having one end adapted to raise one end of the skid-plate upon depression of the other end of the lever, and a projection on the carrier-bar adapted to operate said other end of the lever to elevate the lumber directly above the skid-plate out of contact with the conveyor as the carrier-bar reaches its lowest point of travel, and

an upstanding lug on said lever to stop movement with the conveyor of the piece of lumber nearest the carrier-bar until the carrier-bar is in lowered position to receive the same.

38. In lumber moving and storage means, a carriage, upright hanger members arranged in adjacently disposed sections, a carrier-bar on said carriage adapted to be vertically reciprocated, a lumber receiving head pivotally mounted on said carrier-bar, a horizontal conveyor for conducting lumber to said receiving head, an upstanding member on said carriage, and a latch movably mounted on said upstanding member for supporting the lumber between the sections during the descent of the carrier-bar.

39. In lumber moving and storage means for a seasoning house having anchor members along its wall, upright hanger-bars arranged in adjacently disposed sections, a movable carriage, means on said carriage for moving lumber upwardly between the sections, means for maintaining the lumber between the sections, and adjustable brace bars extending between some of said hanger-bars and anchor members.

40. In lumber moving and storage means, upright hanger members arranged in adjacently disposed sections, a movable carriage below said hanger members, means on said carriage for elevating lumber into the spaces between said sections, and removable tie-members extending between the hanger

members of adjacent sections to tie the same together and support the lumber stored therein.

41. In lumber moving and storage means, upright hanger members arranged in adjacently disposed sections, a carriage movable below said sections, means on said carriage for elevating lumber between the sections, an upstanding member on said carriage, and means for detachably and rigidly securing said upstanding member to the adjacent hanger member.

42. In lumber moving and storage means, upright hanger members arranged in adjacently disposed sections, a carriage movable below said sections, means on said carriage for elevating lumber between the sections, an upstanding member on said carriage, and means for detachably and rigidly securing said upstanding member to the adjacent hanger member, said last mentioned means being adjustable longitudinally of said carriage.

43. A lumber moving and storage means having spaced hanger-bars, a carriage movable below said hanger-bars, means on said carriage for elevating lumber between said hanger-bars, and means on said carriage for temporarily supporting the lumber between the hanger-bars during the loading operation.

In testimony whereof I have affixed my signature.

ROBERT Z. DRAKE.