

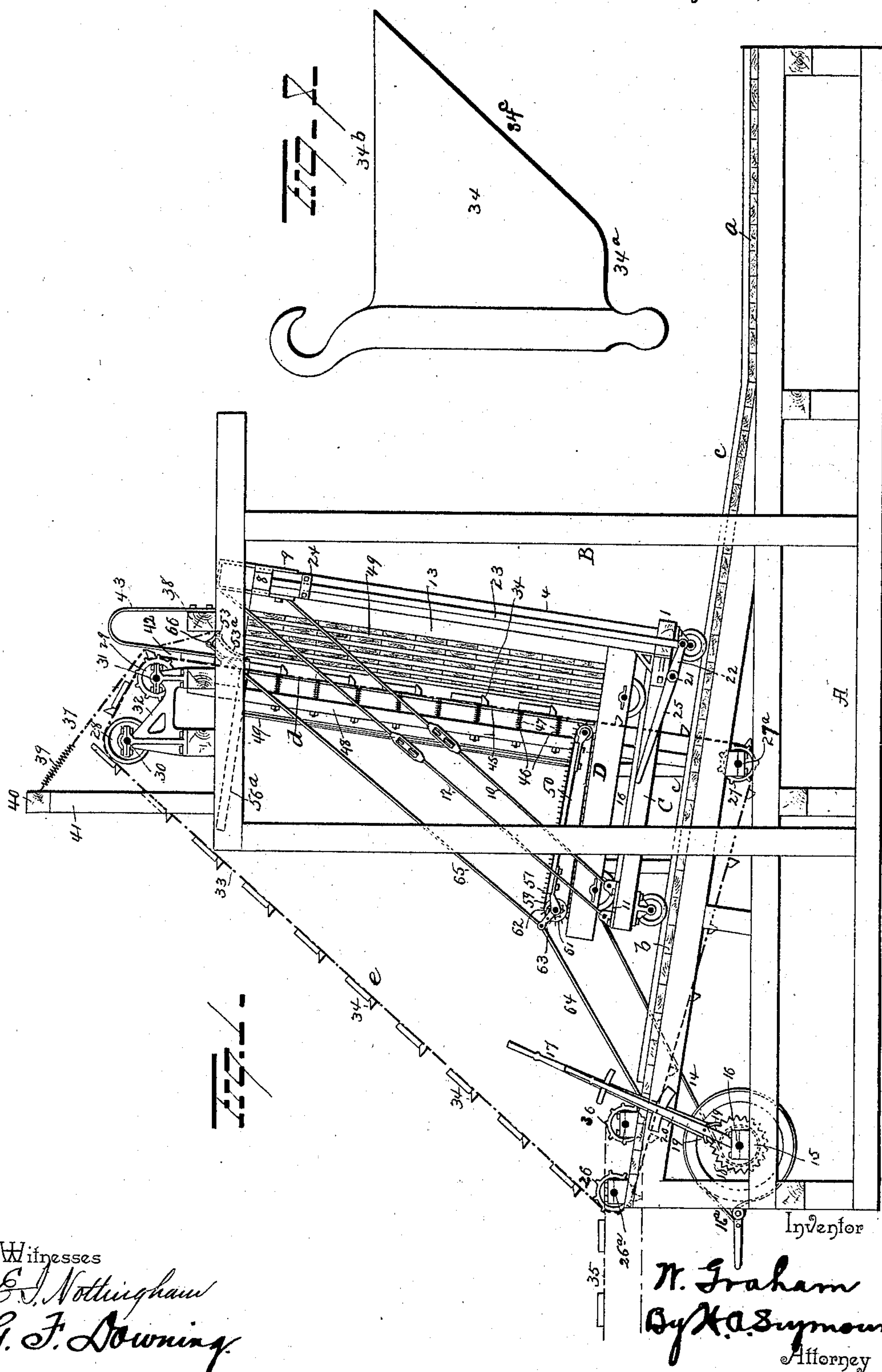
(No Model.)

4 Sheets—Sheet 1.

W. GRAHAM.
LUMBER STACKING APPARATUS.

No. 604,146.

Patented May 17, 1898.



Witnesses
E. J. Nottingham
G. F. Downing

Inventor
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Attorney

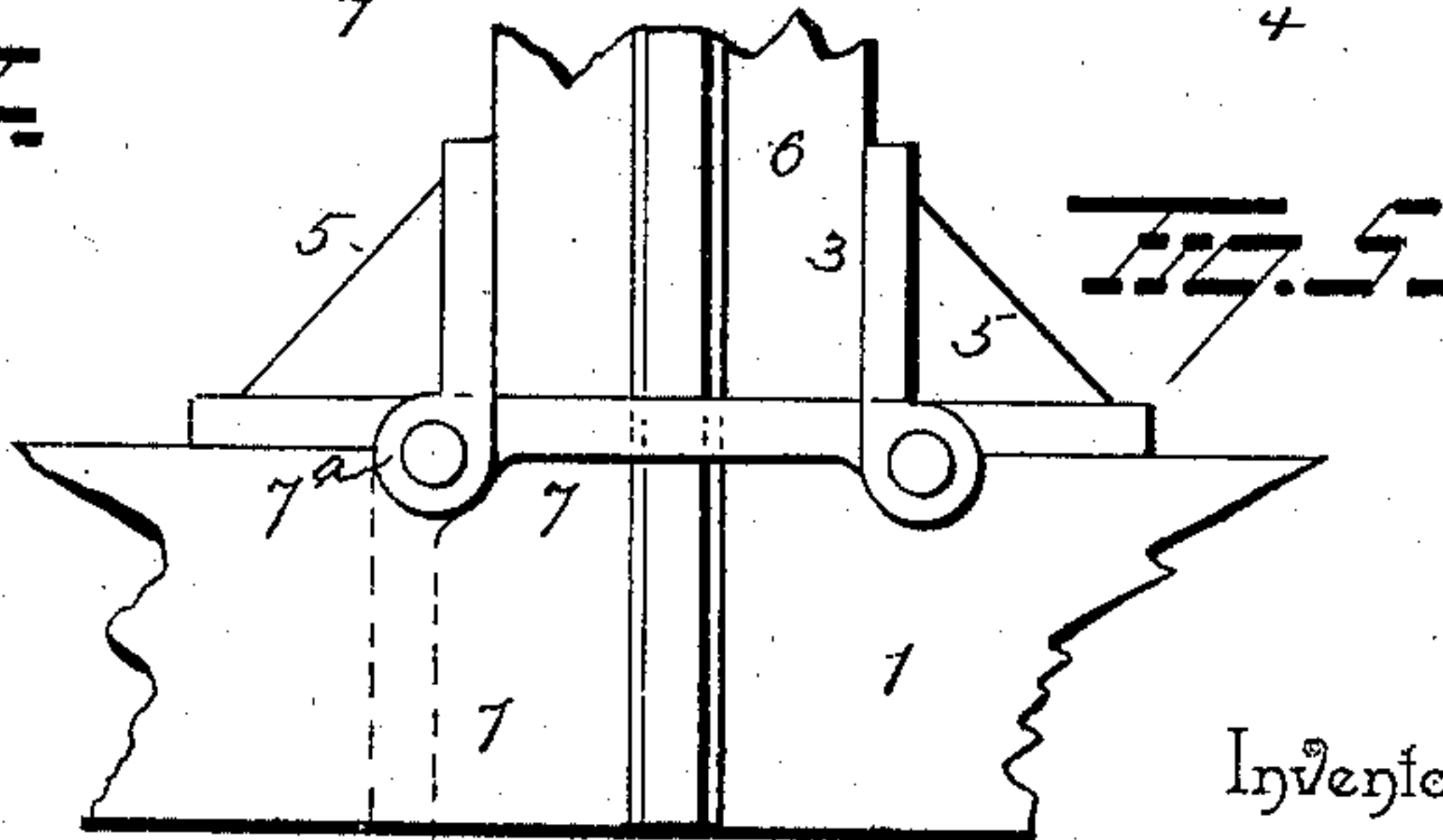
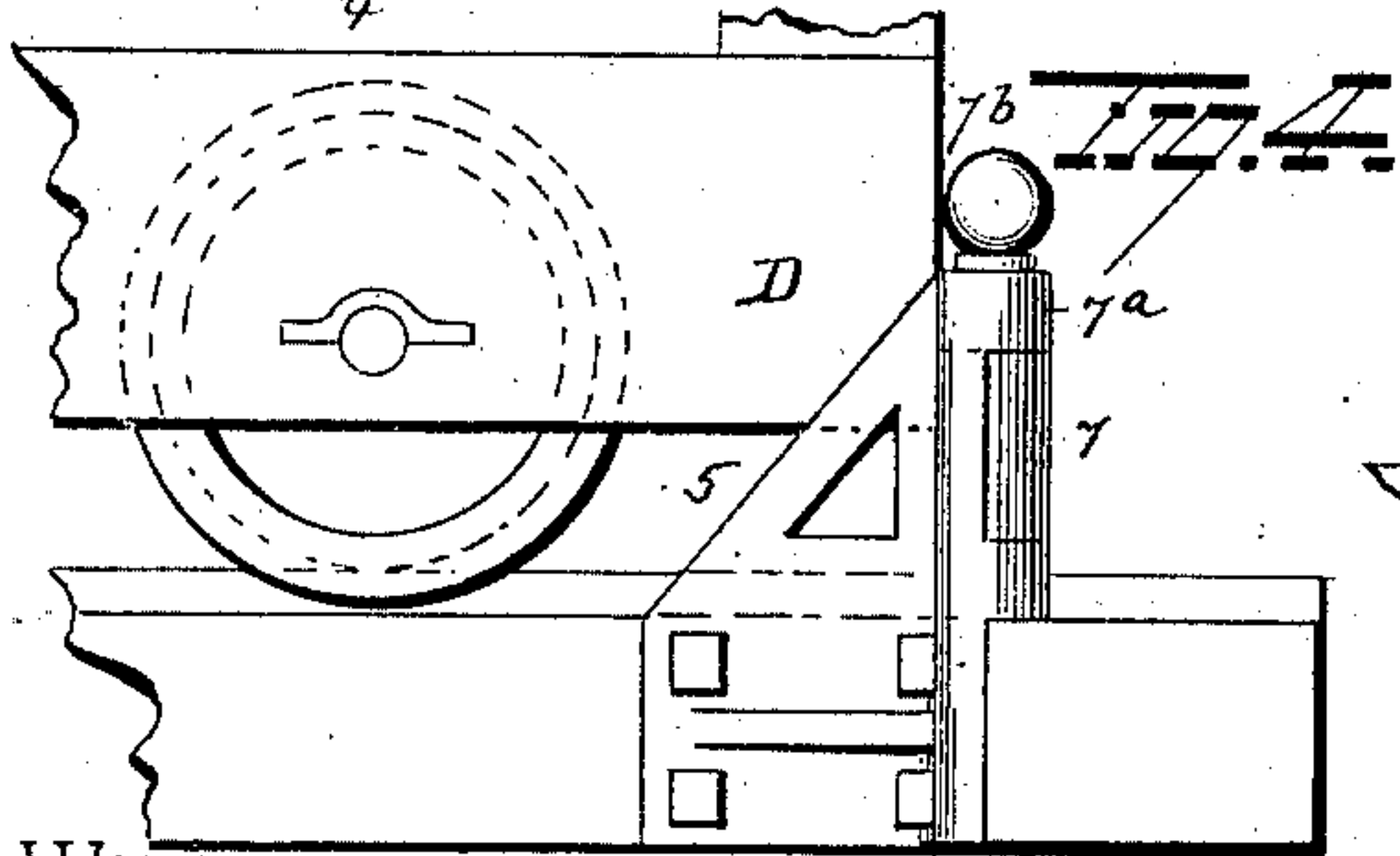
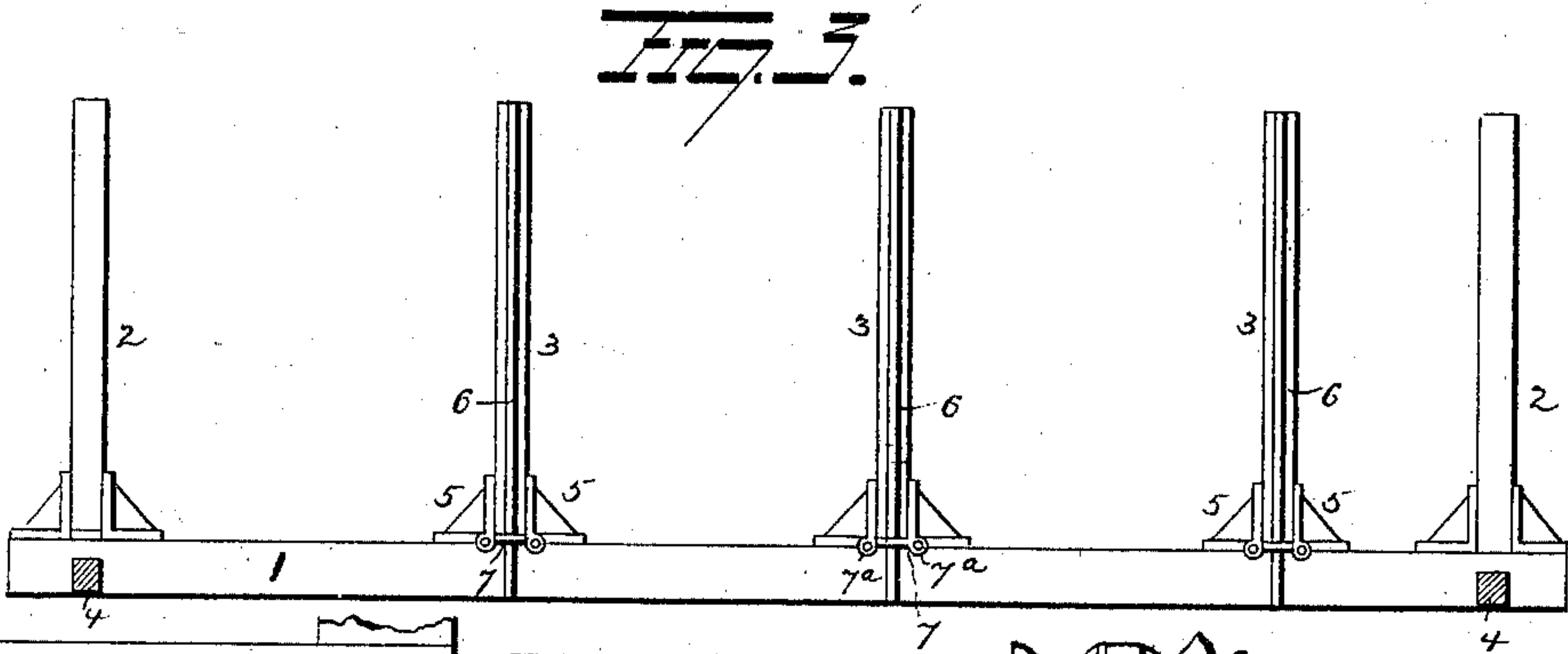
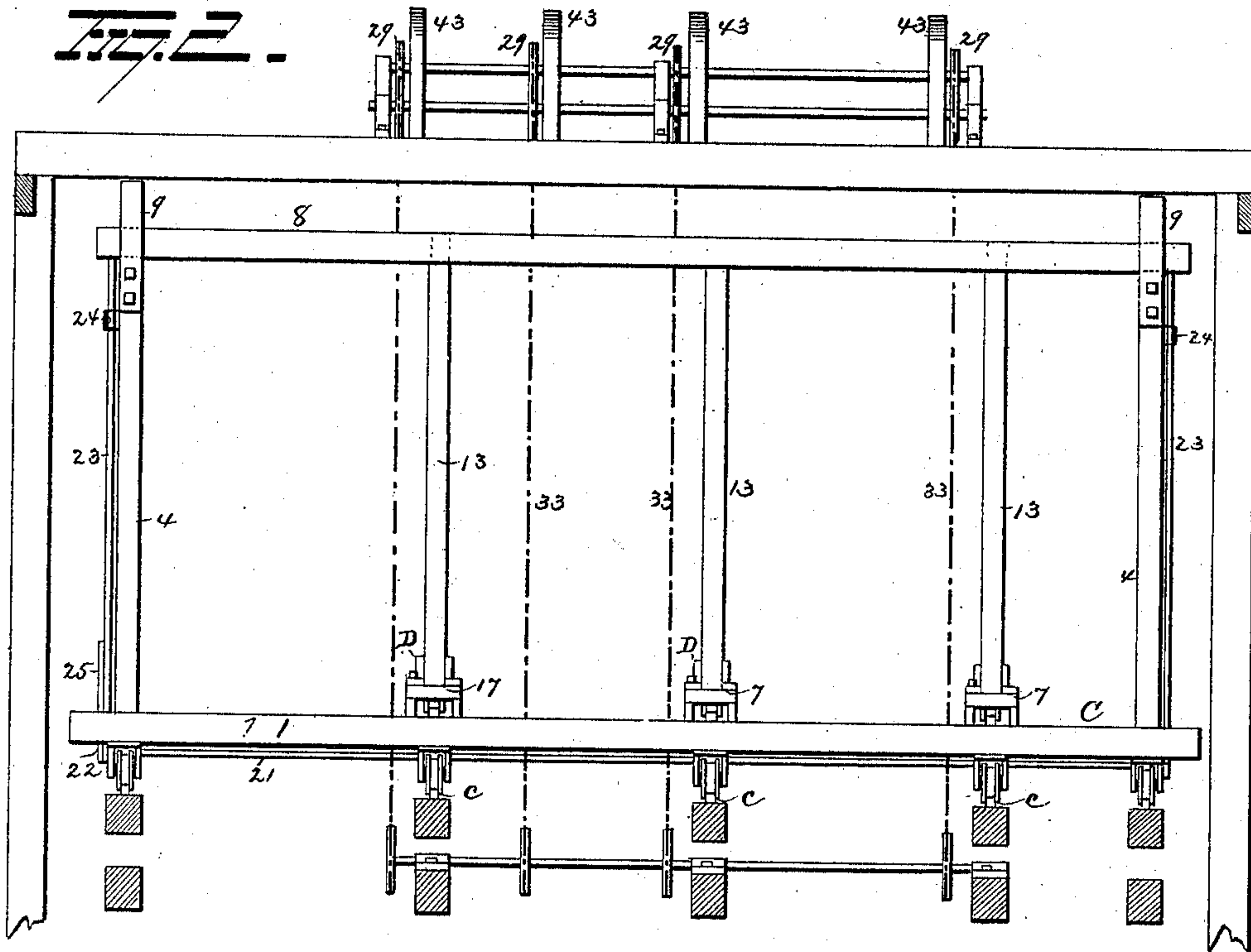
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4 Sheets—Sheet 2.

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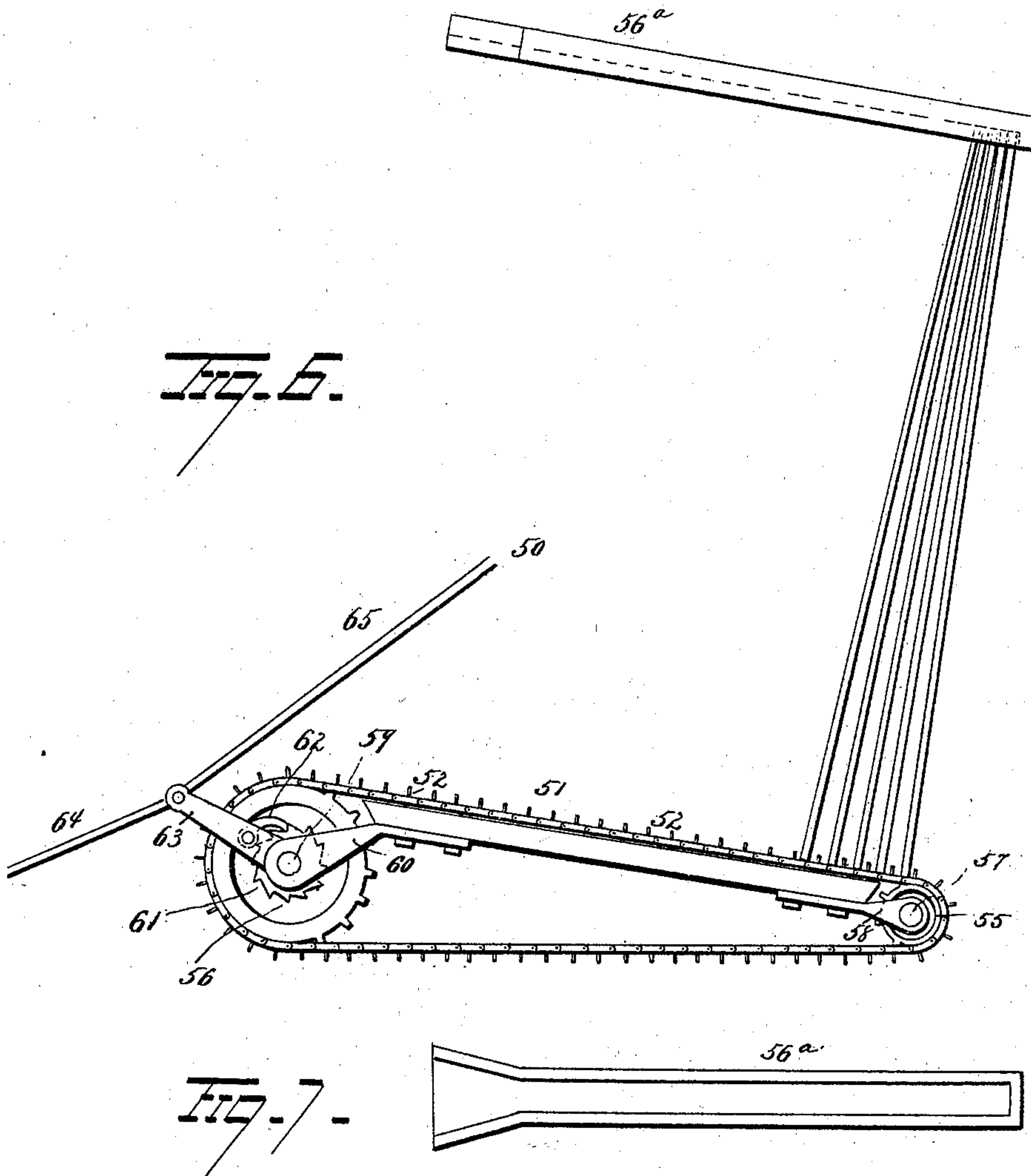
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(No Model.)

4 Sheets—Sheet 4.

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Fig. 9.

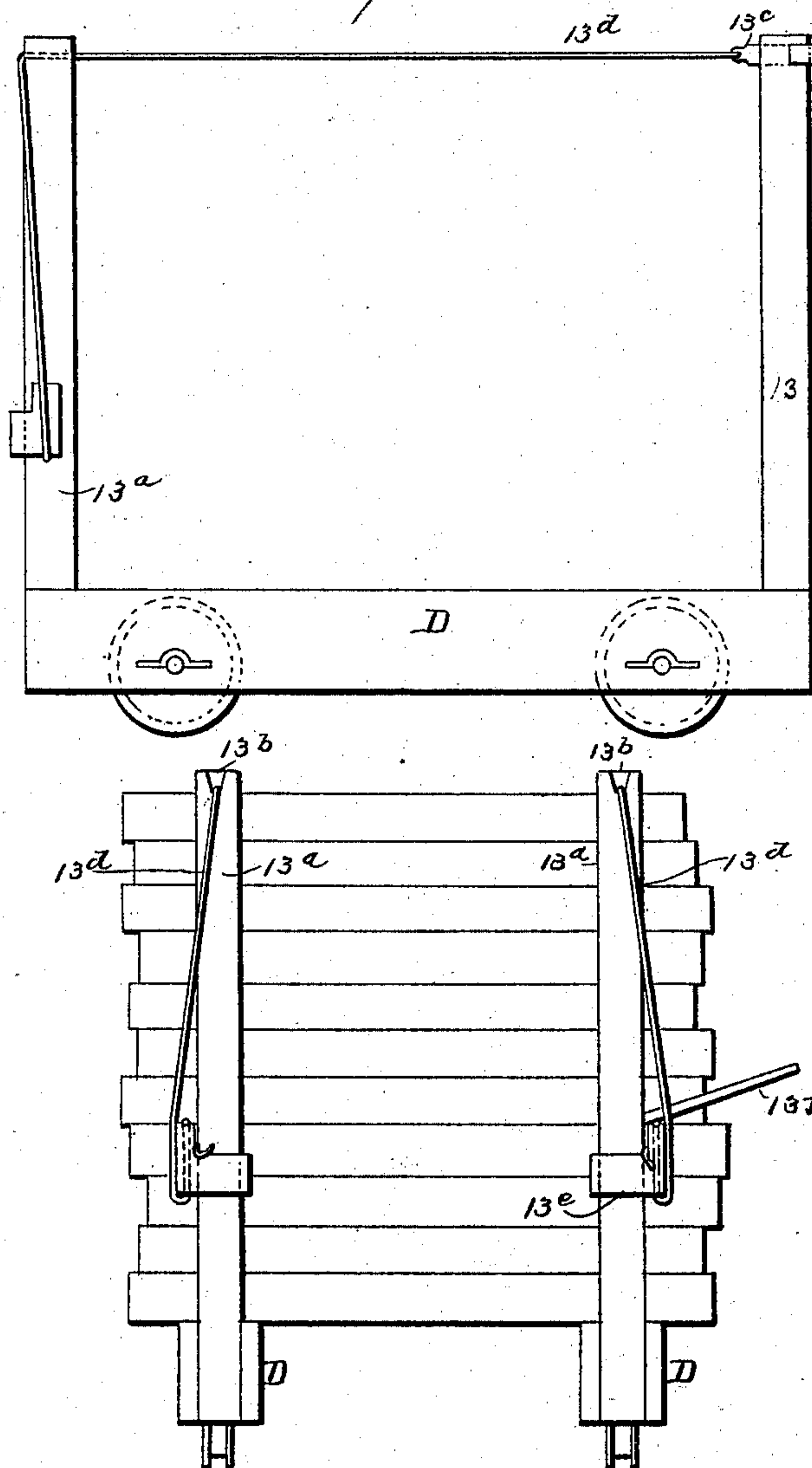


Fig. 10.

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UNITED STATES PATENT OFFICE.

WILLIE GRAHAM, OF MERIDIAN, MISSISSIPPI.

LUMBER-STACKING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 604,146, dated May 17, 1898.

Application filed November 19, 1895. Renewed October 21, 1897. Serial No. 655,960. (No model.)

To all whom it may concern:

Be it known that I, WILLIE GRAHAM, a resident of Meridian, in the county of Lauderdale and State of Mississippi, have invented certain new and useful Improvements in Lumber-Stacking Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in lumber-stacking apparatus, the object of the invention being to produce an apparatus for stacking lumber which shall be simple in construction, automatic in operation, and effectual in all respects in the performance of its functions.

With this object in view the invention consists in certain novel features of construction and combinations and arrangements of parts, as hereinafter set forth, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a lumber-stacking apparatus embodying my improvements. Figs. 2, 3, 4, 5, 6, 7, 8, 9, and 10 are detail views.

A represents a base composed of suitable timbers and having a floor thereon, the portion *a* of said floor being horizontal or level and the portion *b* being inclined. An upright framework B is secured to the base A for a purpose presently explained.

Tracks *c* are located in the floor *a b* for the accommodation of a carriage C. The carriage C comprises a transverse timber 1, horizontal end bars 2 2, projecting at right angles from the transverse timber, intermediate parallel bars 3 3 3, and uprights 4 4, the bars 2 3 being secured to the transverse timber by means of braces or angle-irons 5. On the bars 3 tracks 6 are located and extend transversely across the timber 1. Onto these tracks dry-kiln trucks D are run for the reception of the lumber, which is piled edgewise thereon, and the said trucks are afterward run into the drying-kiln. The lumber is deposited onto the trucks (in a manner hereinafter explained) while the carriage is on the inclined portion of the tracks *c*, and to prevent the escape of the trucks while being loaded gates 7 are provided. These gates are hinged to lugs 7^a, projecting from some of the braces 5,

one end of each gate being hinged to lugs projecting from one brace 5 and the other end being detachably connected to lugs projecting from an adjacent brace by means of a removable pin 7^b. As the lumber is piled edgewise and quite high on the trucks the gates 7, against which the trucks bear, would not of themselves be hardly sufficient to retain the trucks in proper position to accurately receive the lumber, and for this reason devices located at the top of the stack of lumber on the trucks will be provided. These devices will now be explained. A transverse timber 8 is disposed on the uprights 4 and held in guides 9, secured to and projecting above said uprights. A truss-rod 10 is secured to each standard, preferably at the base of the guide 9, and at its lower end said truss-rod is secured to a bracket 11 on the carriage. Another truss-rod 12 is secured at its upper end to the upper end of each guide and at the lower end to said bracket on the carriage. Normally the standards 13, which project upwardly from the trucks D, bear against the transverse timber 8, and by the latter the upper portion of the loaded trucks are maintained in their fixed positions to receive the timber.

The carriage C is maintained in its proper position on the inclined tracks while the trucks are being filled, and fed along, as the tiers of lumber accumulate on the trucks, by means of ropes 14 and the devices to which said ropes are attached. The ropes 14 are secured at one end to the carriage and at their other ends are wound on drums 15, carried by a shaft 16. Motion is transmitted to this shaft by means of a lever 17 through the medium of a ratchet device 18, said ratchet device being provided with two dogs 19, and to the lever 17 a finger-bar 20 is attached for shifting said dogs when desired. It will be seen that when the shaft 16 shall have been released (which can be accomplished by raising both dogs 19 free of the ratchet-wheel) the carriage C will run down the inclined tracks onto the level tracks. This will be done when the trucks shall have been loaded with lumber, and then the trucks will be run off of the carriage and onto suitable tracks which extend to the drying-kiln. To release the trucks from the carriage, the gates 7 must be

opened and the transverse timber 8 raised. The gates can be readily opened by removing the pins 7^b; but in order to raise the timber 8 above the truck-standards the devices now
 5 to be described will be employed. A transverse shaft 21 is mounted in suitable brackets secured to the carriage, and from the ends of this shaft arms 22 project, the free ends of said arms being pivotally connected to the
 10 lower ends of vertical rods 23. The rods 23 project upwardly parallel with the uprights 4 and through guides 24, secured to said uprights, the upper ends of said rods 23 terminating immediately under the ends of the
 15 transverse timber 8. One of the arms 22 is extended to form an operating-lever 25, by moving which the shaft 21 will be oscillated, the vertical rods 23 moved upwardly, and by engagement with the transverse timber 8
 20 raise the latter clear of the truck-standards and permit the latter to run off of the carriage onto the tracks which lead into the drying-kiln. The carriage can then be pulled back up the incline by operating the lever
 25 17 (after the dogs 19 shall have been shifted) and other trucks run onto the carriage.

Various appliances and mechanism have been employed for piling lumber edgewise on dry-kiln trucks and properly spacing the tiers
 30 of lumber apart; but such devices have heretofore been more or less complicated in construction, expensive to manufacture, and productive of results not entirely satisfactory. To obviate the defects heretofore met with in
 35 this class of apparatus and to produce a simple and successful machine, I have devised the appliances for stacking the lumber on the trucks and spacing the tiers apart which will now be explained in detail.

40 Sprocket-wheels 26 27 are carried by suitable shafts 26^a 27^a, mounted in brackets secured to the base portion of the framework, and similar sprocket-wheels 28 29 are carried by shafts 30 31, mounted on brackets 32, disposed on top the framework B. Over these
 45 sprocket-wheels chains 33 pass, a portion of said chains being at all times so disposed as to be parallel with the truck-standards and the tiers of lumber on the trucks, as shown
 50 at *d*, Fig. 1. The endless chains 33 are provided with lugs or projections 34, and these may be made as shown in Fig. 8—viz., said lugs may be made integral with links of the chains and having a comparatively narrow
 55 shoulder 34^a and a wide shoulder 34^b. The lumber will be received on the chains 33 from conveyer-chains 35, or by hand, which pass over sprocket-wheels 36, disposed forwardly of the wheels 26, the lumber being
 60 met by the smaller shoulders 34^a on the portion *e* of the chain and carried upwardly over the sprocket-wheels 28 29. The lumber will be guided over the wheels 28 29 by chains or flat band-irons 37, one end of which is se-
 65 cured to a timber 38 on the framework B and the other end to springs 39, the ends of the latter being secured to an elevated tim-

ber 40, supported by posts 41 on the framework B. The lumber will be guided by the chains or band 37 into an elongated throat
 70 42, formed by inverted-U-shaped springs 43, secured to the timber 38 and the portion *d* of the chains 33, and as the lumber enters this throat the boards will fall onto the wide shoulders 34^b of the preceding lugs 34, said boards
 75 being then carried downwardly and deposited onto the trucks, one board edgewise on another. It will be observed that the sprocket-wheels over which the chains 33 pass are so
 80 disposed that the portion *d* of said chains extend a distance above and below the standards of the trucks and below the trucks, the carriage on which the trucks are mounted, and below the tracks on which the carriage
 85 runs. It is apparent that in order that the lugs 34 be permitted to pass the lumber which has been piled the chains must be permitted to yield, and for this purpose a yielding or
 90 presser bar 45 is disposed behind said chains and supported on pins 46, said yielding or presser bar being maintained normally in position by means of springs 47, disposed on
 95 said pins 46 between the bar 45 and a bar 48, to which said pins are secured, said last-mentioned bar 48 being secured at its upper end to the top of the frame B and at the lower end
 100 to the base portion A of the framework. There will preferably be several of these yielding devices employed between the trucks, one for each chain 33. As the lugs carrying a
 105 board reach the last board deposited the inclined edges 34^c will strike the latter, and the chains will be forced back, and the board on said lugs will be deposited onto said last-mentioned board. When a tier of lumber shall
 110 have been piled on the trucks, the carriage carrying the trucks will be permitted to move down the incline by operating the lever 17 a sufficient distance to accommodate the spacing-sticks 49 and another tier of lumber.
 115 These spacing-sticks are placed in position automatically when the lever 17 is operated, as above explained, by means of devices which will now be described.

Two or more stick-frames 50 will be employed for holding said sticks, and said frames
 120 are secured rigidly in an inclined position to the base-timbers A. The bottom or base of each stick-frame is composed of an endless chain 51, the links (or some of them) of which
 125 are provided with pockets 52 for the reception of the lower ends of the sticks, said chains being mounted on suitable sprocket-wheels 55 56 and adapted when moved to deposit the sticks, one at a time, against the last tier of
 130 lumber piled, and when the sticks are thus placed against the last tier of lumber piled their upper ends (which normally rest in the upper portions 56^a of the stick-frames) will be caught and held in position by means of arms
 135 or hoods 53^a, carried by a shaft 53, mounted in the upper portion of the framework B.

The sprocket-wheels 55, above referred to, will be carried by a shaft 57, mounted in

brackets 58, secured to the stick-frames, and the sprocket-wheels 56 will be carried by a shaft 59, mounted in brackets 60, secured to the stick-frames, said wheels 56 preferably being larger than the wheels 55. A ratchet-wheel 61 is secured to the shaft 59 and adapted to be engaged by a dog 62, pivotally connected to the free end of an arm 63, the latter being loosely connected to the shaft 59. A rod 64 is connected at one end to the lever 17 and at the other end to the free end of the arm 63. Another rod 65 is connected at one end to said arm 63 and at the other end to an arm 66, projecting from the hood-shaft 53.

From this construction and arrangement of parts it will be seen that when the lever 17 is operated the carriage will be permitted to move down the incline and carry the trucks forward sufficiently to permit the insertion between the last tier of lumber piled and the chains 33 of the spacing-sticks and another tier of lumber. Simultaneously with the forward movement of the lever 17 the arm 63 will be moved through the medium of the rod 64, and the dog 62, by its engagement with the ratchet-wheel 61, is made to turn the shaft 59, and thus cause the chains 51 to move and deposit the forward sticks carried thereby against the last tier of lumber piled. The forward movement of the lever 17 also causes a partial rotation of the shaft 53 through the medium of the rods 64 and 65 and arm 66 on said shaft 53. This serves to raise the hoods 53^a. Now when the lever 17 is moved back it will not affect the position of the carriage, but it will move the arm 63 back to its normal position, the dog 62 riding backwardly over the teeth of the ratchet-wheel 61 without effecting a backward movement of the chains 51, said chains being made to move always in the same direction. During the back or return movement of the lever 17, however, the shaft 53 will be oscillated through the medium of the rods 64 and 65 and the arm 66 on said shaft and the hoods brought down in position to hold the upper ends of the sticks against the tier of lumber last piled. Thus it will be seen that by a forward-and-backward movement of the lever 17 the trucks will be adjusted for another tier of lumber and the spacing-sticks, which latter will be placed in position against the tier of lumber last piled and held there. I prefer to provide the shaft 16 with a friction-brake 16^a.

My improvements are simple in construction, comprise comparatively few parts, and are effectual in all respects in the performance of their functions.

When the trucks shall have been loaded as above explained, it is desirable that the loaded lumber be bound before the trucks are run from the stacker to the kiln. For this purpose the devices shown in Figs. 9 and 10 are employed. Each truck is provided at its respective ends with standards 13 13^a, the latter having notches 13^b in their tops. A hook 13^c engages the upper end of standard 13, and

to this hook a wire rope 13^d is attached, said rope being extended over the pile of lumber, through the notch 13^b of the standard 13^a, and at its free end attached to a friction-clamp 13^e, which engages said standard 13^a. The clamp 13^e can be forced down the standard 13^a by means of a lever 13^f until the rope becomes tight, and then when the lever is removed the clamp will bind on the standard.

Various slight changes might be made in the details of my invention without departing from the spirit thereof or limiting its scope, and hence I do not wish to limit myself to the precise details herein set forth; but,

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

1. In a lumber-stacking apparatus, the combination with a carriage, of trucks adapted to run onto said carriage, and gates connected with the carriage for preventing the escape of said trucks while lumber is being piled on the latter, substantially as set forth.

2. In a lumber-stacking apparatus, the combination with a carriage comprising a transverse timber and a series of parallel bars or arms projecting at right angles from said transverse timber, of braces securing said timber and bars or arms together, trucks adapted to run onto said carriage, lugs on the braces and gates hinged to some of said lugs and adapted to be removably connected with lugs on other braces, whereby to normally prevent the escape of the trucks from the carriage, substantially as set forth.

3. In a lumber-stacking apparatus, the combination with a framework and inclined tracks, of a carriage on said inclined tracks, means for normally holding said carriage in position, trucks on said carriage for receiving lumber to be piled, standards on said trucks, and devices carried by the carriage for engaging said trucks, and devices for engaging the tops of the standards whereby to retain said trucks normally in position while they are being loaded with lumber, substantially as set forth.

4. In a lumber-stacking apparatus, the combination with a carriage adapted to receive trucks having standards, of uprights projecting from said carriage, guides carried by said uprights, a transverse timber on said standards and in said guides and adapted to be normally engaged by the standards on the trucks, and means for raising said transverse timber out of line with said standards, substantially as set forth.

5. In a lumber-stacking apparatus, the combination with a carriage adapted to receive trucks having standards, of uprights projecting from said carriage, guides at the upper ends of said uprights, a transverse timber supported by the uprights in said guides, said transverse timber being normally disposed in the path of the standards on the trucks, a shaft supported by the carriage, arms projecting from said shaft, rods connected to

said arms and terminating under said transverse timber, and a lever for operating said shaft whereby to raise the rods and lift the transverse timber out of line with the standards on the trucks, substantially as set forth.

6. In a lumber-stacking apparatus, the combination with framework and means for holding trucks in position while being loaded, of a series of endless chains arranged to receive a board, elevate it, and lower it, positively placing it upon the trucks, a portion of said chains being always disposed at right angles to the trucks and parallel with the standards of said trucks, substantially as set forth.

7. In a lumber-stacking apparatus, the combination with a framework and trucks having standards, of a series of endless chains having lugs thereon and means for conveying lumber to said endless chains, said endless chains being so disposed as to receive a board, elevate it, and lower it, positively placing it upon the trucks, one board edge-wise upon another, substantially as set forth.

8. In a lumber-stacking apparatus, the combination with a framework and trucks, of endless chains arranged to receive a board, elevate it, and lower it, positively placing it upon the trucks, a portion of said chains being disposed parallel with the standards of the trucks, spring-actuated presser-bars behind said last-mentioned portions of the chains, and upright beams for supporting said presser-bars, said beams being secured at their upper ends to the upper portion of the framework and at their lower ends to the base portion of the framework, substantially as set forth.

9. In a lumber-stacking apparatus, the combination with a framework and trucks, of flexible devices adapted to deposit lumber onto the trucks, and inverted-U-shaped springs secured to the framework and forming, in conjunction with said flexible devices, a throat for the reception of the lumber, substantially as set forth.

10. In a lumber-stacking apparatus, the combination with framework and trucks, of a series of endless conveyer-chains, a portion of each chain being at all times disposed at right angles to the trucks and extending above and below the same, and a portion of said chains being at all times so disposed as to convey the lumber above the truck-standards, and yielding devices constructed and adapted to direct the lumber from the last-mentioned portions of the chains to the first-mentioned portions, substantially as set forth.

11. In a lumber-stacking apparatus, the combination with a framework and trucks, of sprocket-wheels mounted in the base portion of the framework, upper sprocket-wheels mounted in the top of the framework, a series of endless chains passing over said sprocket-wheels, said chains being adapted to convey lumber and deposit it upon the trucks, a cross bar or timber supported above the frame-

work, springs secured to said cross bar or timber, and chains secured at one end to said springs, extending over the conveyer-chains and upper sprocket-wheels, and secured at their other ends to the framework, substantially as set forth.

12. In a lumber-stacking apparatus, the combination with a carriage adapted to receive trucks having standards, of uprights projecting from the carriage, guides secured to the upper ends of said uprights, a transverse timber on said uprights and in said guides, brackets on the carriage, and truss-rods secured to said brackets and at their upper ends to the said guides, substantially as set forth.

13. In a lumber-stacking apparatus, a stick-feeding device comprising an endless chain having pockets and means for moving said chain step by step, substantially as set forth.

14. In a lumber-stacking apparatus, a stick-feeding device comprising an endless chain having pockets for the reception of the sticks, a ratchet-wheel connected with one of the sprocket-wheels over which said chain passes, a pivoted arm, a dog connected with said arm and adapted to engage said ratchet-wheel and means for vibrating said arm whereby to move the endless chain step by step, substantially as set forth.

15. In a lumber-stacking apparatus, the combination with a framework and a carriage adapted to receive trucks, stick-feeding devices comprising endless chains having pockets, a lever for controlling the movement of the carriage, and step-by-step devices connected with said chains and said lever, substantially as set forth.

16. In a lumber-stacking apparatus, the combination with a framework and means for supporting trucks, of stick-feeding devices comprising endless chains having pockets, an operating-lever, hoods adapted to receive the upper ends of the sticks and hold them in position, step-by-step devices for the said feeding-chains connected with the operating-lever and means connecting said operating-lever with said hoods, substantially as and for the purpose set forth.

17. The combination with a truck adapted for the reception of lumber and having a standard at each end, of a binder consisting of a hook to engage one standard, a rope attached to said hook and adapted to pass over the lumber and the other standard, and a clamp attached to said rope and adapted to engage the last-mentioned standard, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

WILLIE GRAHAM.

Witnesses:

E. B. BROACH,
W. P. THAGARD.