

No. 674,262.

Patented May 14, 1901.

G. H. DUNCAN & E. C. HEARON.
LUMBER STACKER.

(No Model.)

(Application filed Feb. 21, 1900.)

4 Sheets—Sheet 1.

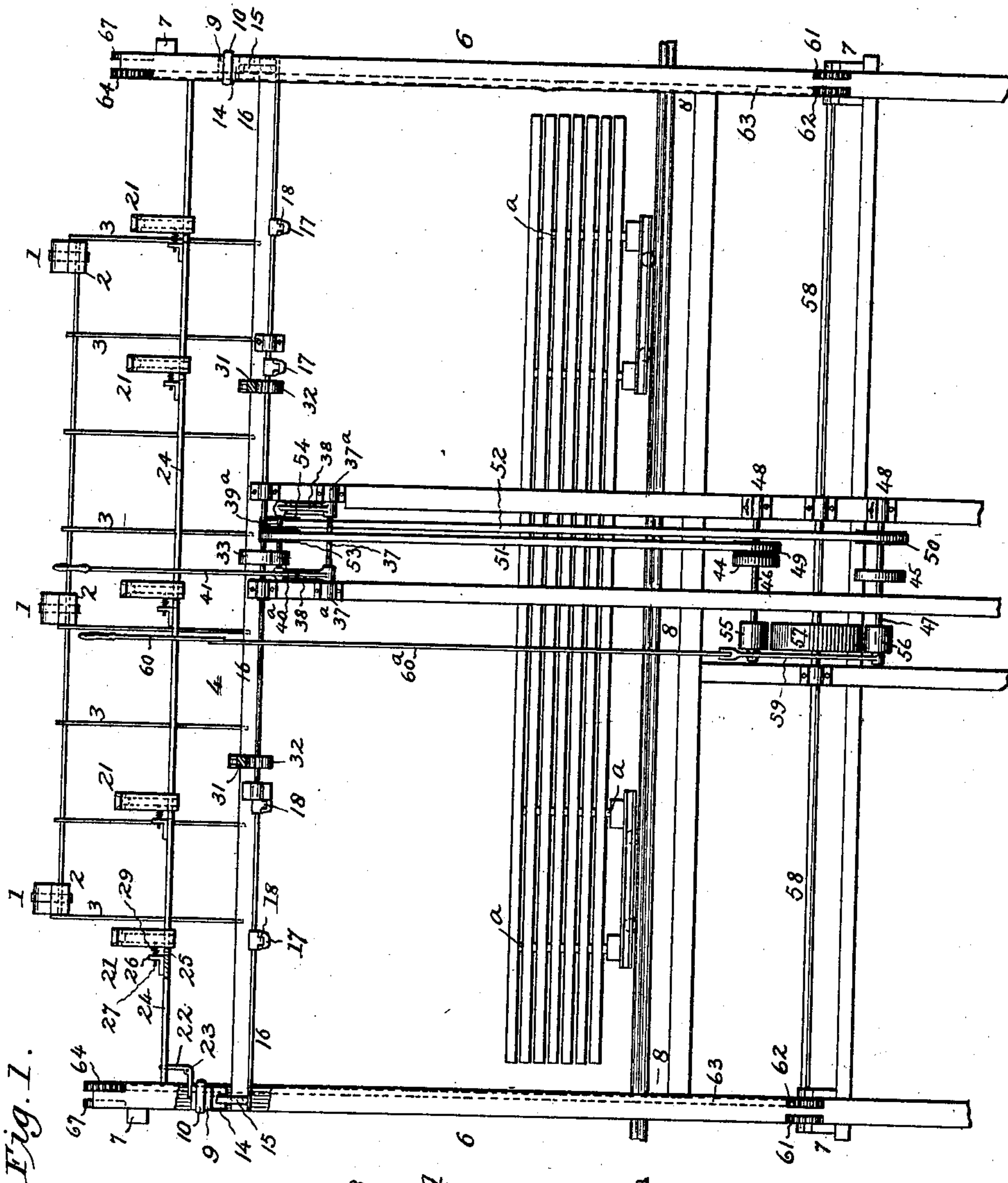
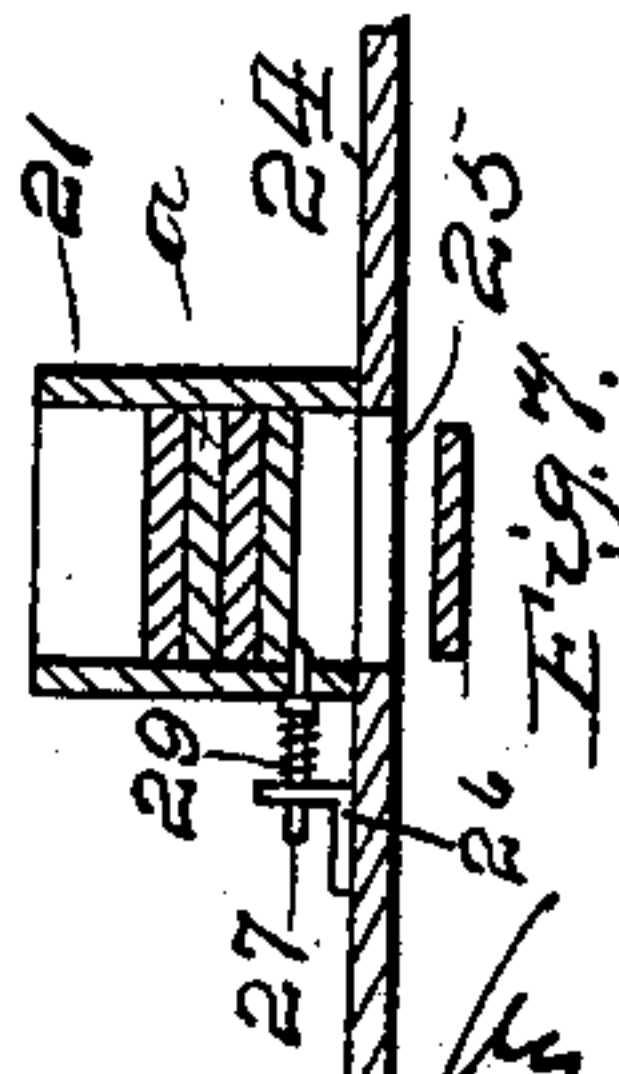
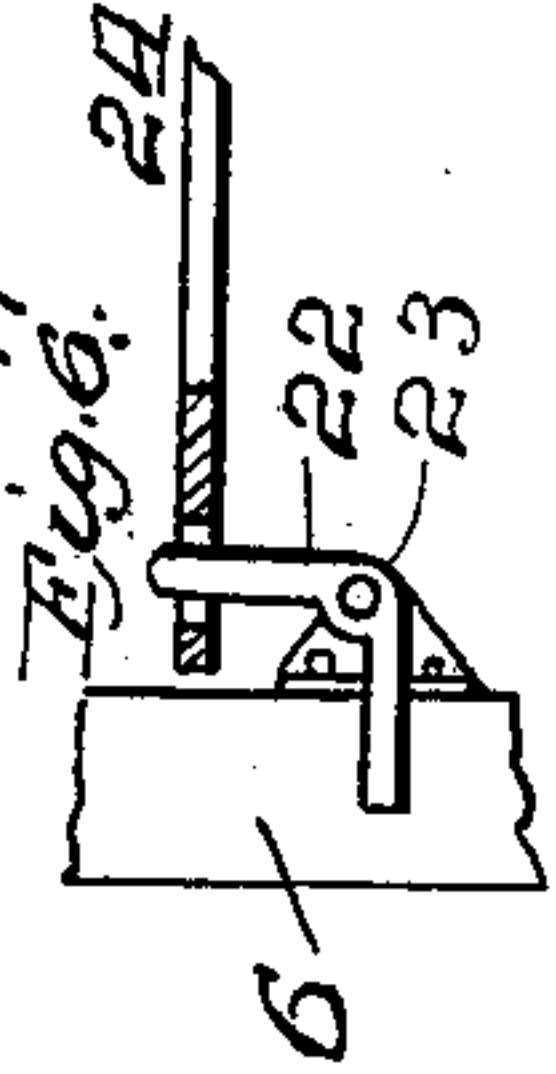
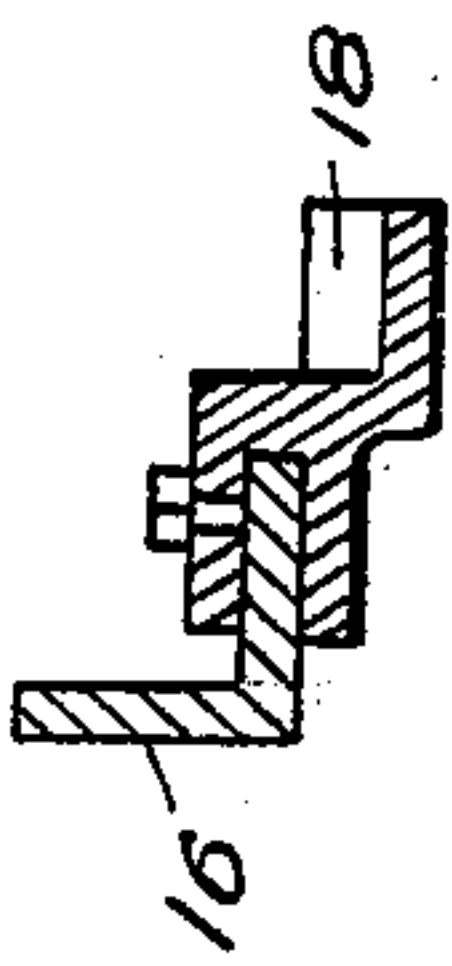


Fig. 1.

Fig. 5.



Inventors
G. H. Duncan,
Edward C. Hearon,
Attorneys.

Witnesses
M. B. Cole
G. B. Bull.

No. 674,262.

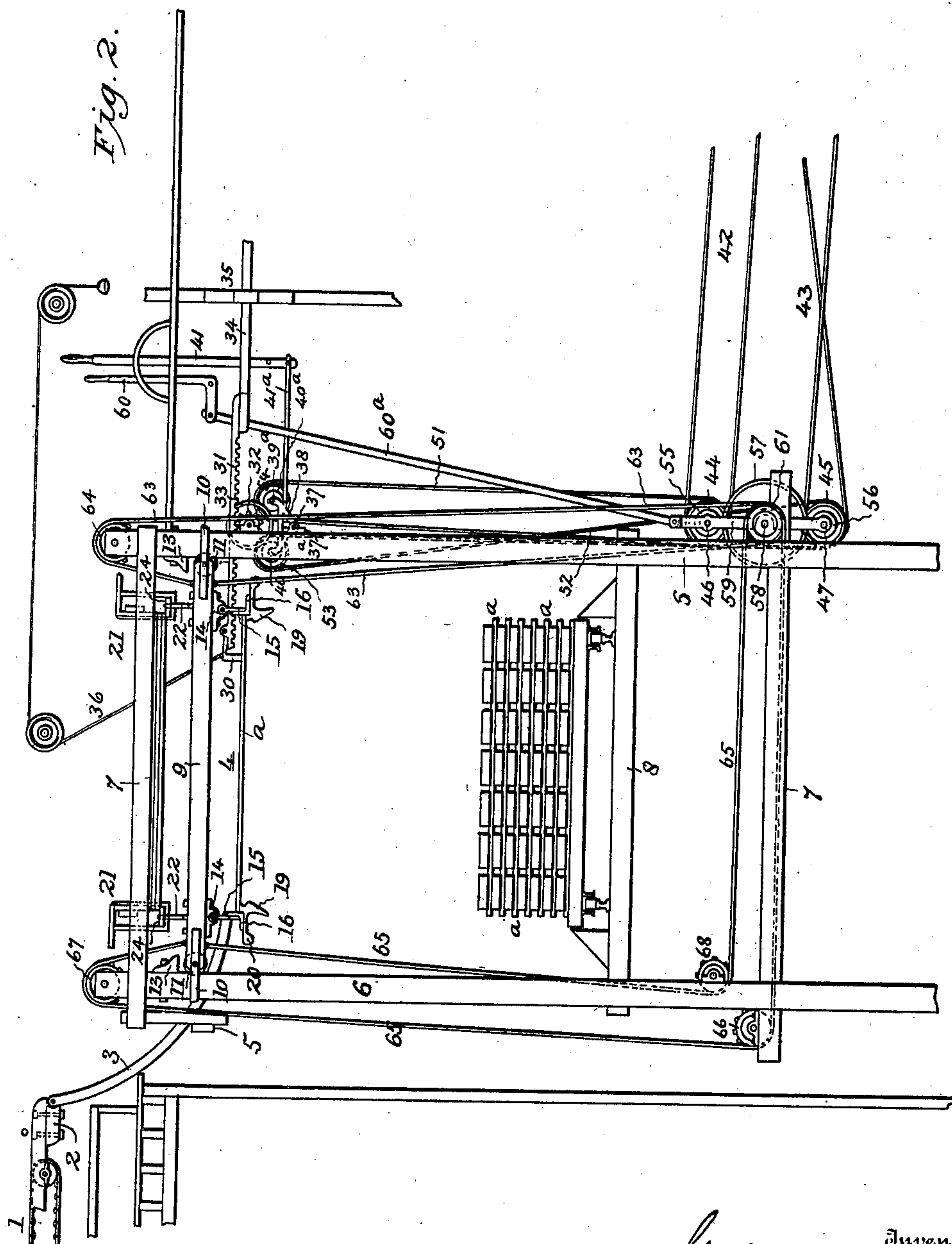
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Witnesses
M. B. Cole
G. D. Bull.

Inventors
G. H. Duncan,
Edward C. Hearon,
by J. H. W. 1st March, Attorneys.

No. 674,262.

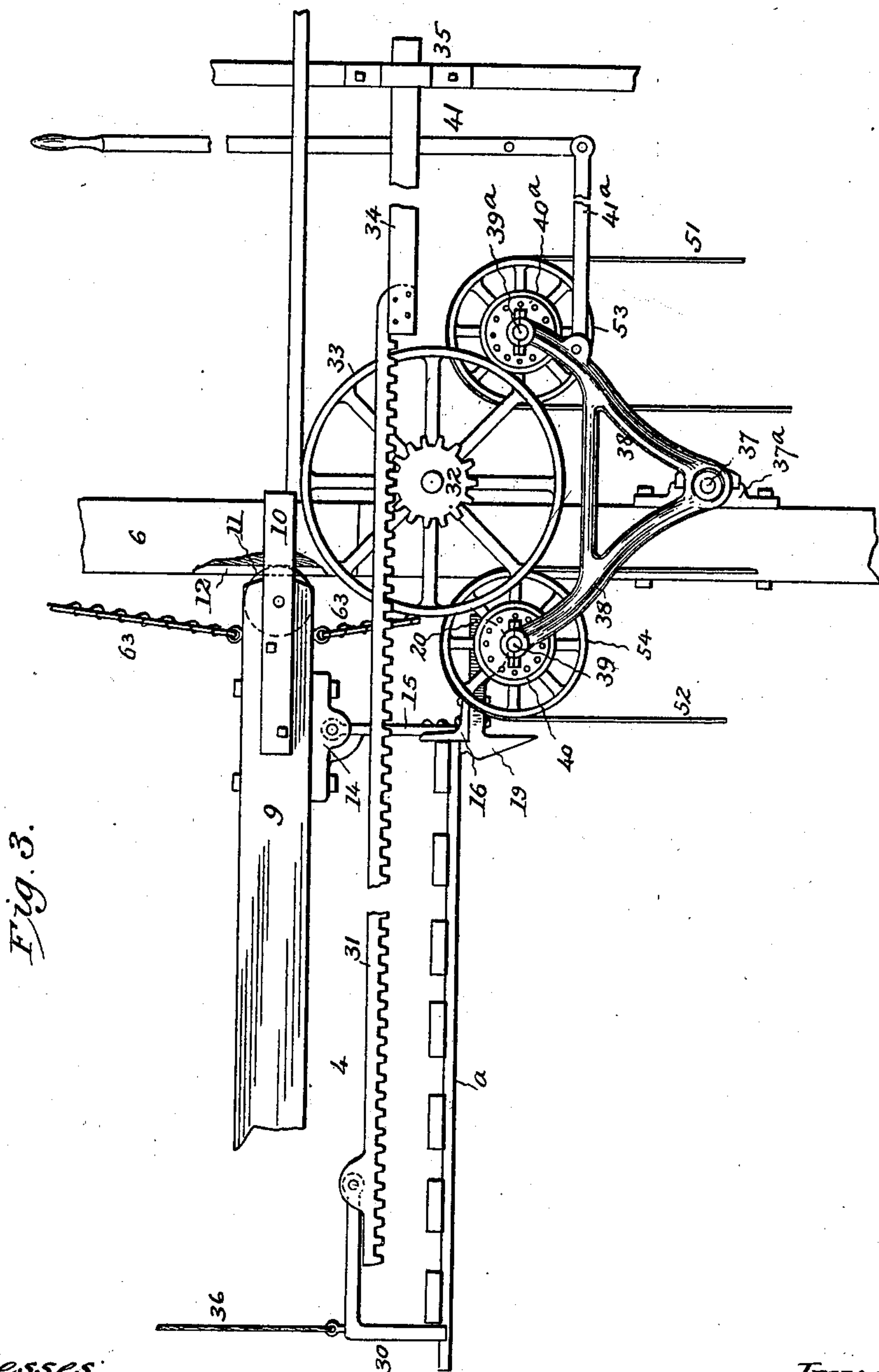
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(Application filed Feb. 21, 1900.)

4 Sheets—Sheet 3.



Witnesses:
M. B. Cole
C. P. Bull.

Inventors:
G. H. Duncan
Edward C. Hearon
by W. T. Heard, Attorneys

No. 674,262.

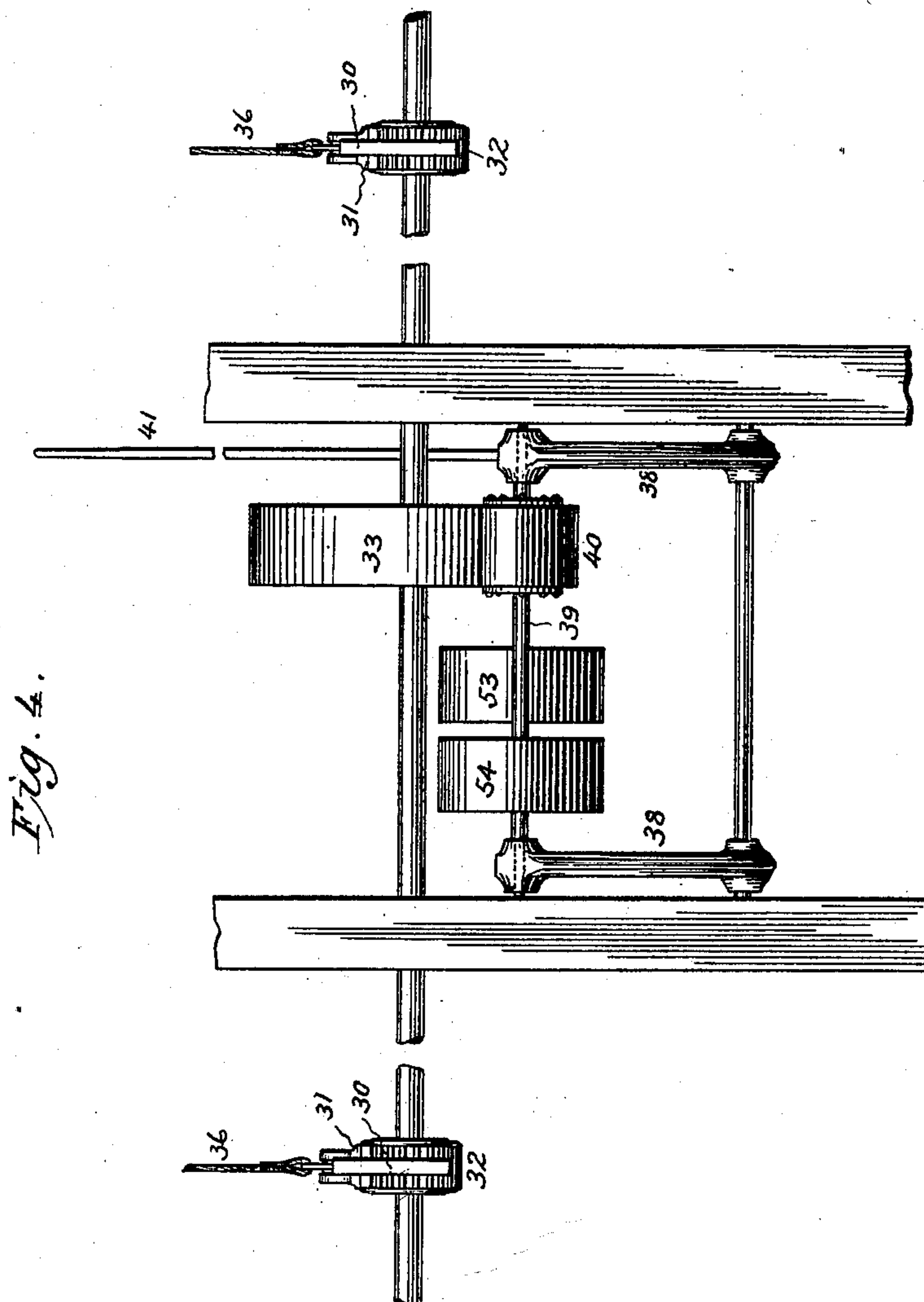
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G. H. DUNCAN & E. C. HEARON.
LUMBER STACKER.

(Application filed Feb. 21, 1900.)

(No Model.)

4 Sheets—Sheet 4.



Witnesses
M. B. Cole
C. B. Bull.

Inventors
G. H. Duncan,
Edward C. Hearon,
by G. H. W. T. M. M. M., Attorneys.

UNITED STATES PATENT OFFICE.

GARLAND H. DUNCAN, OF RIDERVILLE, ALABAMA, AND EDWARD C. HEARON, OF HOWISON, MISSISSIPPI.

LUMBER-STACKER.

SPECIFICATION forming part of Letters Patent No. 674,262, dated May 14, 1901.

Application filed February 21, 1900. Serial No. 6,062. (No model.)

To all whom it may concern:

Be it known that we, GARLAND H. DUNCAN, residing at Riderville, in the county of Chilton and State of Alabama, and EDWARD C. HEARON, residing at Howison, in the county of Harrison and State of Mississippi, citizens of the United States, have invented certain new and useful Improvements in Lumber-Stackers, of which the following is a specification, reference being had to the accompanying drawings and to the numerals of reference marked thereon.

Our invention relates to improvements in lumber stackers or pilers, the object being to provide a machine of this character simpler and more efficient than those already known in the art and furnishing in operation a successful substitute for the usual method of piling lumber by hand.

As is well known, in the ordinary manner of piling by hand spacing-sticks are first laid upon the ground and upon these the lumber is placed, said strips being arranged upon each successive tier of boards to permit of proper ventilation, the arrangement of spacing-sticks and the boards continuing until the pile of lumber has reached the desired height. This manner of piling is carried out by the use of our machine.

The invention will be more readily understood by reference to the accompanying drawings, in which—

Figure 1 is a side elevation of the lumber-stacker. Fig. 2 is an end elevation of the same. Fig. 3 is an enlarged detail of the spacing mechanism. Fig. 4 is an enlarged detail of the mechanism for dropping the spacing-sticks. Fig. 5 is an enlarged sectional view of a spacing-stick holder and pocket. Fig. 6 is an enlarged view of the sliding rod and bell-crank lever, and Fig. 7 an enlarged sectional view of the magazine.

Like numerals of reference indicate corresponding parts in all the figures.

1 designates a conveyer of ordinary construction for feeding the lumber from the mill or other source of supply to the stacking-machine. It is elevated above the stacker, and if the point from which the lumber is derived is at a distance a series of conveyers may be employed. Located at the outer end of the

conveyer and secured to a support 2 are a number of downwardly-curving guide-bars 3, with sufficient curve and drop to permit of the lumber sliding to the stacking-cradle 4, the lower ends of the guide-bars 3 terminating thereat. A hanger 5, secured to the frame of the machine, supports from the under side the guide-bars 3, insuring strength and rigidity thereto.

The framing of the machine comprises four posts or uprights 6, which are braced by connecting-pieces 7, located at the top and bottom of the posts 6. A platform 8 is carried by the framing, forming a support for the tracks upon which runs a truck on which the lumber is to be piled and by which it is transported to the desired points.

The cradle-support upon which the lumber is piled consists of two horizontal beams capable of vertical movement on opposite pairs of the posts 6, to which they are held by straps 10, encircling the same. In order to allow of a free and easy movement of the beams 9, they carry at their ends guide-rollers 11, running in grooves 12 in the posts 6. Stops 13, secured near the top of the posts, limit the upward movement of the beams. Near each end of each of the beams 9 and on the under side thereof is a hanger 14, to which is pivoted an arm 15, the said arms supporting a cross-bar 16 of angle-iron at each side of the machine. These cross-bars 16 are provided at suitable intervals with rigidly-attached spacing-stick holders 17, having pockets 18, into which the spacing-sticks *a* for the piled lumber are automatically fed, as will be explained hereinafter. Located at each end of each of the cross-bars 16 is a tripper 19, provided with a counterbalance-weight 20. When the stacking-cradle is lowered, these trippers 19 engage the ground or the cross-sticks of the partly-formed pile of lumber, and being connected through the medium of the bars 16 to the arms 15 swing outwardly, moving the bars 16, thereby releasing the spacing-sticks from the pockets 18 in the stick-holders and permitting the tier of lumber carried by the cradle to fall to the ground or upon the partly-formed pile of lumber.

The spacing-sticks *a* are automatically fed to the pockets 18 in the stick-holders 17 from

a series of magazines 21, each of which is secured to the framing of the machine and located directly above a pocket, so that the sticks falling from opposite pairs of the magazines will drop into the pocket thereunder. This is accomplished in the following manner: When the stacking-cradle dumps the tier of lumber thereon and is raised to almost its utmost limit or just before the beams come in contact with the stops 13, the beams come into engagement with the bell-crank levers 22, pivoted at 23, and the said levers engaging the slides 24, which extend the width of the machine and are located under the mouths of the magazines 21, move the slides so that the notches 25 therein register with the mouths of the magazines and permit the bottom spacing-stick in each to drop out and fall into the pockets of the stick-holders 17. Secured to the slides 24, one of said slides being located at each side of the machine, so as to operate with the magazines disposed above it, are projections 26, carrying pins 27, one of which passes through an opening in the side of the adjacent magazine, and when the slides 24 are moved and the notches 25 register with the mouths of the magazines 21 and the bottom stick is released the pins (which are automatically slid by springs, so as to serve as stops) hold the second stick in each magazine from falling out. A coiled spring 29 is placed around each pin 27 between the projection 26 and the magazine, and when the stacking-cradle is lowered and the bell-crank levers are released the springs force the slides back to their normal position, leaving the bell-crank levers to be operated upon again when the stacking-cradle rises. The magazines 21 are open at the side facing the machine to permit of the downward movement of the spacing-sticks when fed to the stacking-cradle and may be made of sufficient height to hold a number of sticks.

In order to properly space the lumber to secure thorough ventilation thereof, we provide a spacing mechanism to be manipulated by the operator, which consists of a hook or finger 30, hinged to a rack-bar 31 and driven by a pinion 32, keyed to a shaft on which is mounted a friction-wheel 33. On the outer end of each of the rack-bars 31, there being two spacing-hooks, is an extension 34, traveling in a guide 35, the rack-bar and its extension being of such length that the spacing hook or finger 30 may be caused to move entirely across the machine. The fingers 30 are raised and lowered by ropes 36, placed within convenient reach of the operator, and are employed to straighten any board that might get crossed or out of place or to pull or push the lumber to either side of the cradle and to properly space the boards to insure proper ventilation.

Secured to a shaft 37, journaled in bearings 37^a at the side of the machine where the spacing mechanism is located, are two yokes 38,

in the arms of which are journaled shafts 39 39^a, carrying friction-wheels 40 40^a and driven in reverse directions by connection hereinafter described, whereby the pinion 32 may be operated, through the medium of the friction-wheels 33, 40, and 40^a, to drive the spacing-fingers backward and forward. The friction-wheels 40 40^a may be alternately thrown into engagement with the friction-wheel 33 through the medium of a lever 41, connecting with the yoke 38 by a rod 41^a. The lever 41 is suitably fulcrumed upon some stationary part of the frame structure.

Power to drive the machine is supplied from a suitable source (not shown) by means of two belts 42 and 43, serving to drive the belt-pulleys 44 and 45 in reverse directions, the said belt-pulleys 44 and 45 being keyed to shafts 46 and 47, respectively, each of which is journaled at 48 to the framing of the machine. The shafts 46 and 47 carry belt-pulleys 49 and 50, which through the medium of the belts 51 and 52 running over pulleys 53 and 54, carried by the shafts 39 and 39^a of the yokes 38, drive the friction-wheels 40 and 40^a.

At the free ends of the hinged shafts 46 and 47 are keyed friction-wheels 55 and 56, and between and into contact with which they are capable of being alternately thrown is a friction-wheel 57, mounted on a shaft 58, journaled at the corners of the framing of the stacker. The friction-wheels 55 and 56 are connected by a bar 59 and are so disposed that when one wheel is thrown into engagement with the friction-wheel 57 the other is out of engagement, and vice versa, or both friction-wheels 55 and 56 may be thrown out of engagement simultaneously. The result is that as the friction-wheels 55 and 56 are driven in opposite directions the rotation of the friction-wheel 57 may be reversed at will, depending on the friction-wheel with which it is thrown in contact. This is accomplished by means of a lever 60, located in proximity to the lever for operating the spacing mechanism, so as to be within reach of the operator, the lever 60 being connected to the bar carrying the friction-wheels 55 and 56 by a rod 60^a. The shafts 46 and 47 and their bar 59 are held in their proper fixed positions through the medium of a suitable detent (not shown) used in connection with the lever 60 and its sector.

The stacking-cradle is raised and lowered in the following manner: The shaft 58, driven by the friction-wheel 57, has keyed to it at each end two sprocket-wheels 61 and 62. Endless chains 63 travel over the sprockets 62 on the shaft 58 and over the sprockets 64, mounted in the tops of the posts or uprights 6, and are secured to the ends of the beams 9, so that as the chains travel they carry with them and raise and lower the side of the cradle adjacent thereto. The other side of the cradle is moved by the endless chains 65, driven from the sprockets 61 on the shaft 58, passing over the sprockets 66, located at the bottom of the

framing, up and over the sprockets 67 at the top of the machine, then back to the ends of the beams 9 opposite to those to which the sprocket-chains 63 are secured, and then down to and over the sprocket-wheels 68, located near the bottom of the machine.

The operation will be readily understood. Supposing the stacking-cradle to have been elevated to its utmost limit and the spacing-sticks *a* to be in place in the pockets 18 of the stick-holders 17, lumber is placed on the endless carrier at the mill or other source of supply. Traveling the length of the carrier the lumber drops onto the guide-bars 3 and sliding down falls onto the spacing-sticks seated in the pockets of the stick-holders 17.

The spacing mechanism then comes into requisition to straighten the boards should they have become crossed or out of place and to space the boards so as to provide for proper ventilation. The spacing hooks or fingers 30, through the medium of the rack-bars 31, by their connections are drawn backward and forward at will, and being hinged to the rack-bars may be raised or lowered by the operator by means of the rope 36. The operator in order to move the spacing-fingers backward and forward throws, through the medium of the lever 41, connecting with the yoke 38 carrying them, the friction-wheels 40 and 40^a alternately in engagement with the friction-wheel 33, to which the pinion 32, meshing with the rack-bar 31, is secured. The friction-wheels 40 and 40^a being driven in opposite directions, it will be seen that the rack-bars, and thereby the spacing-fingers, may be driven in either direction at will. Having arranged the lumber in proper order on the spacing-sticks in the cradle, the operator then throws both friction-wheels 40 and 40^a out of engagement with the friction-wheel 33, thereby throwing the spacing mechanism out of operation. Then by means of the lever 60 the friction-wheel 55 is thrown in contact with the friction-wheel 57, thereby setting in motion the chains 63 and 65, lowering the stacking-cradle. The cradle descends until the trippers 19 of the swinging arms 15 strike the ground or the spacing-sticks of the partly-formed pile of lumber, whereupon the spacing-sticks in the cradle are released from the pockets of the stick-holders 17 and the layer of lumber is dumped. The friction-wheel 56 is then thrown into engagement with the friction-wheel 57, thereby reversing the movement of the chains and raising the stacking-cradle. Just before the cradle reaches its utmost limit or before the cross-beams 9 come in contact with the stops 13 the bell-crank levers 22 are tripped, moving the slides 24 until the notches 25 therein register with the mouths of the stick-magazines 21, when the bottom sticks in the magazines drop out and fall into the stick-pockets 18 in the holders 17, secured to the cross-bars 16. As the slides remain in this position with the notches 25 registering with the mouths of the magazines until the

cradle is again lowered and as the sticks would fall out of the stick-magazines unless means were provided to prevent, pins 27 are provided for retaining the second stick in each magazine, the said pins being carried by projections 26 and passing through the sides of the magazines impinge upon the second stick and hold it until the cradle descends and the slides are caused to move back to their normal position by the retracting-springs 29. The spacing-sticks having dropped into the stick-pockets, the endless carrier is again started and the operation resumed until the stack of lumber is built up to the required height.

Having described our invention, what we claim is—

1. In a machine for stacking lumber, the combination of a stacking-cradle, pockets carried thereby, and means for feeding spacing-sticks to the pockets, substantially as set forth.

2. In a machine for stacking lumber, the combination of a stacking-cradle, means for feeding spacing-sticks thereto, means for feeding lumber onto the spacing-sticks, and means for spacing the lumber, substantially as set forth.

3. In a machine for stacking lumber, the combination of a stacking-cradle, means for feeding spacing-sticks thereto, means for feeding lumber onto the spacing-sticks, means for spacing the lumber, and means for dumping the lumber, substantially as set forth.

4. In a machine for stacking lumber, the combination of a stacking-cradle, spacing-stick holders carried thereby magazines located above the holders, and means operated by the cradle for feeding the spacing-sticks to the holders, substantially as set forth.

5. In a machine for stacking lumber, the combination of a stacking-cradle, spacing-stick holders carried thereby, magazines located above the holders, slides provided with notches adapted to register with the mouths of the magazines, and means for operating the slides, substantially as set forth.

6. In a machine for stacking lumber, the combination of a stacking-cradle, spacing-stick holders carried thereby, magazines located above the holders, means for feeding lumber to the cradle, and means for dumping the lumber, substantially as set forth.

7. In a machine for stacking lumber, the combination of a stacking-cradle, spacing-stick holders carried thereby, means for automatically feeding spacing-sticks to the holders, means for feeding lumber to the cradle, and means for releasing the spacing-sticks from the holders, substantially as set forth.

8. In a machine for stacking lumber, the combination of a stacking-cradle, spacing-stick holders carried thereby, means for automatically feeding spacing-sticks to the holders, means for feeding lumber onto the

spacing-sticks, and tripping devices for releasing the spacing-sticks from the holders, substantially as set forth.

9. In a machine for stacking lumber, the combination of a stacking-cradle, spacing-stick holders carried thereby, magazines located above the pockets, slides having notches adapted to register with the mouths of the magazines to permit the sticks therein to fall therefrom to the holders, and means for operating the slides, substantially as set forth.

10. In a machine for stacking lumber, the combination of a stacking-cradle, spacing-stick holders carried thereby, magazines located above the holders, slides having notches adapted to register with the mouths of the magazines to permit the sticks to fall therefrom into the holders, and bell-crank levers operated by the cradle for moving the slides, substantially as set forth.

11. In a machine for stacking lumber, the combination of a stacking-cradle, spacing-stick holders carried thereby, magazines located above the holders, slides having notches adapted to register with the mouths of the magazines to permit the sticks to fall therefrom, means for advancing the slides, and means for retracting the same, substantially as set forth.

12. In a machine for stacking lumber, the combination of a stacking-cradle, magazines for feeding spacing-sticks to the cradle, slides having notches adapted to register with the mouths of the magazines to permit the bottom sticks in each to fall therefrom, and means for holding the second stick, substantially as set forth.

13. In a machine for stacking lumber, the combination of a stacking-cradle, means for feeding spacing-sticks thereto, magazines, and slides having notches adapted to register with the mouths of the magazines to permit the bottom stick to fall therefrom, the slides carrying pins adapted to impinge upon the second stick in each magazine and hold it from falling out when the slide is moved forward, substantially as set forth.

14. In a machine for stacking lumber, the

combination of a stacking-cradle and means for feeding lumber thereto, combined with a spacing-finger and means for moving said finger backward and forward, substantially as described.

15. In a machine for stacking lumber, the combination of a stacking-cradle, means for feeding lumber thereto, a spacing-finger, a rack to which the finger is hinged, and means for moving the rack backward and forward, substantially as set forth.

16. In a machine for stacking lumber, the combination of a stacking-cradle, an endless carrier, guide-bars leading from the carrier to the stacking-cradle, spacing-stick holders carried by the cradle, means for feeding spacing-sticks to the holders, and means for automatically releasing the spacing-sticks from the holders, substantially as set forth.

17. In a machine for stacking lumber, the combination of vertically-moving beams, spacing-stick holders depending therefrom, magazines from which spacing-sticks are automatically fed to the holders, and means for tripping the holders to release the sticks, substantially as set forth.

18. In a machine for stacking lumber, the combination of vertically-movable beams, spacing-stick holders depending therefrom, magazines from which spacing-sticks are automatically fed to the holders, means for feeding lumber onto the spacing-sticks carried by the holders, and tripping devices for releasing the spacing-sticks from the holders, substantially as set forth.

In testimony whereof we hereunto set our hands and seals.

GARLAND H. DUNCAN. [L. S.]
EDWARD C. HEARON. [L. S.]

Witnesses to signature of Garland H. Duncan:

ERNEST WELCH,
J. F. WELCH.

Witnesses to signature of Edward C. Hearon:

H. L. HEWES,
F. S. HEWES, Jr.