

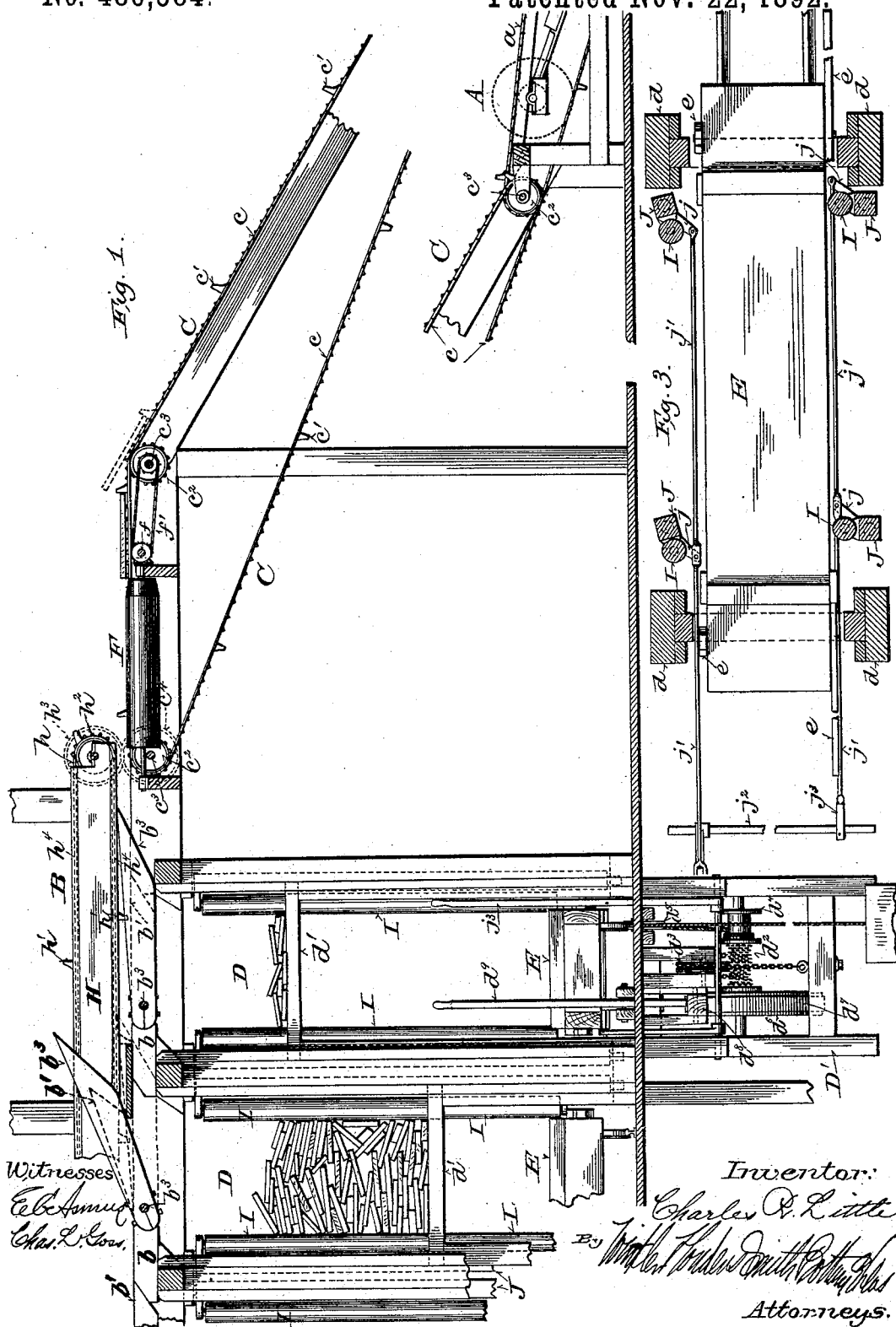
(No Model.)

4 Sheets—Sheet 1.

C. R. LITTLE.
LUMBER SORTER.

No. 486,584.

Patented Nov. 22, 1892.



(No Model.)

4 Sheets—Sheet 2.

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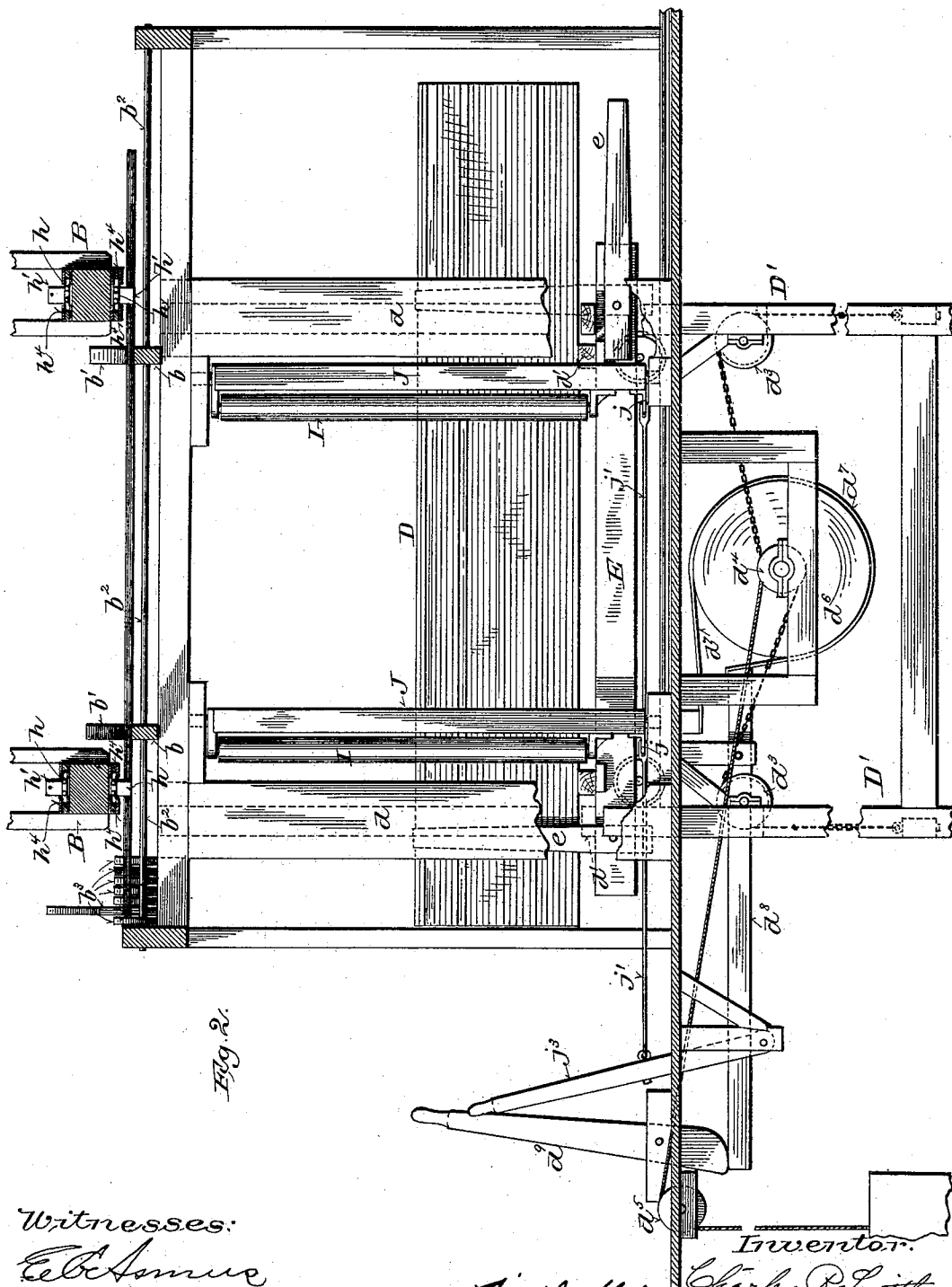


Fig. 2.

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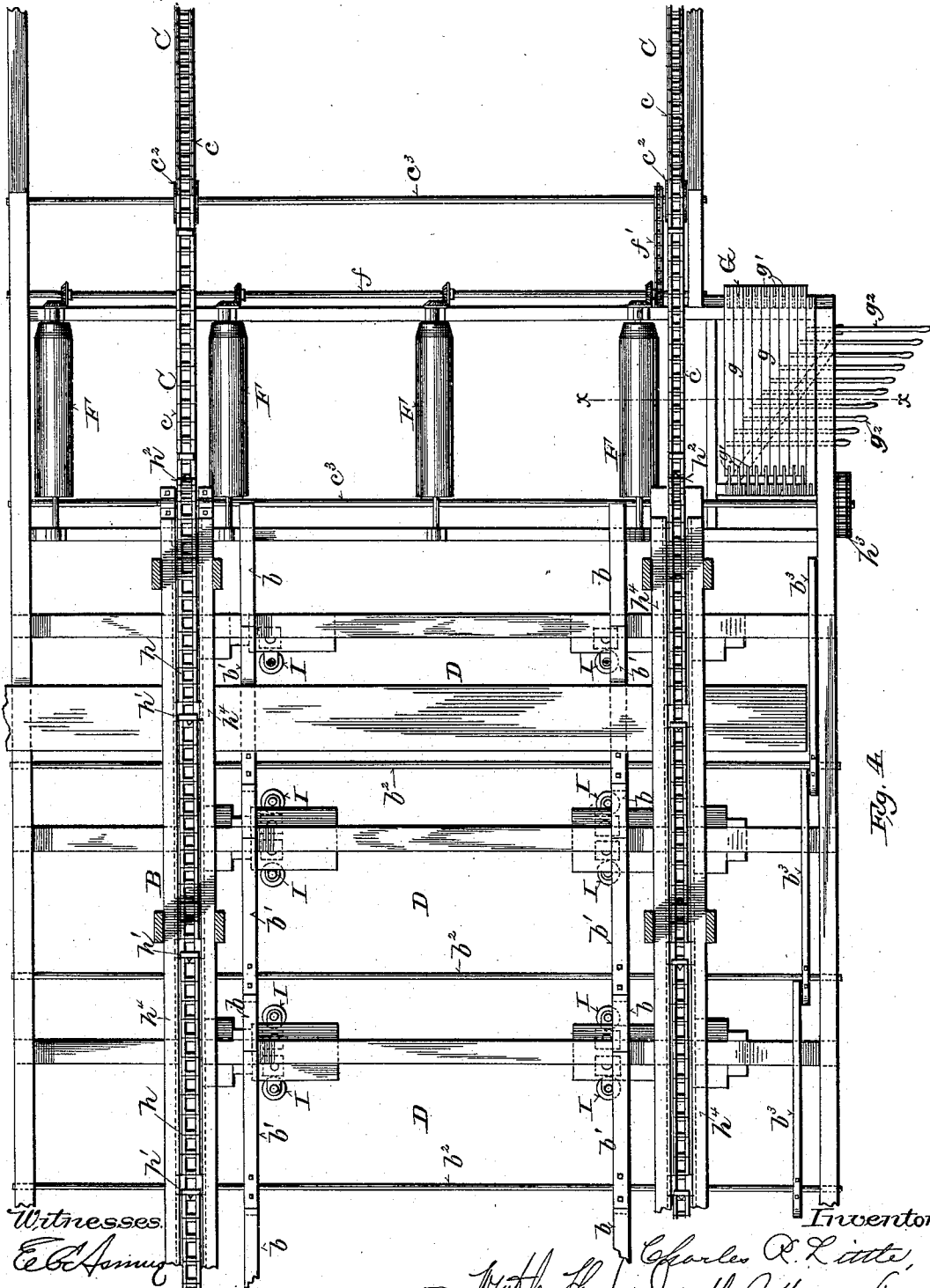
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4 Sheets—Sheet 3.

C. R. LITTLE.
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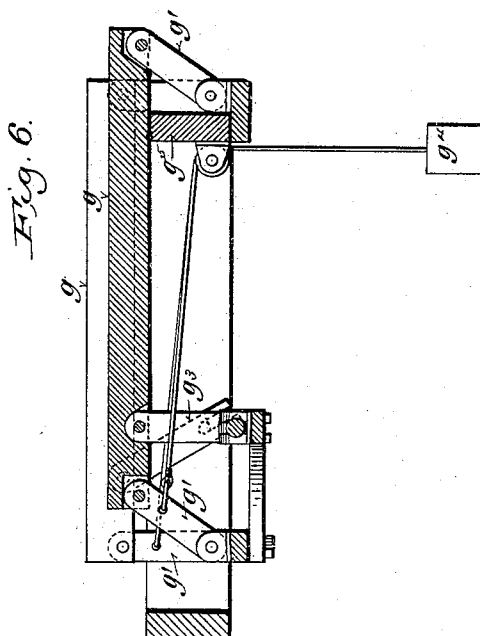
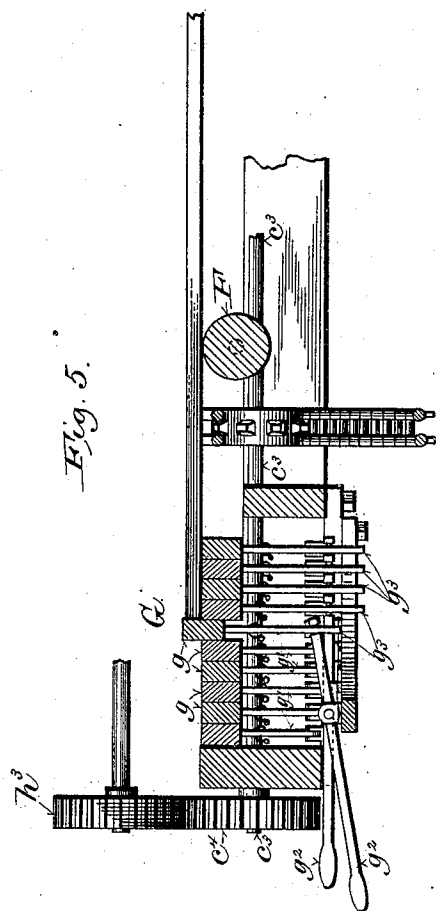
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4 Sheets—Sheet 4.

C. R. LITTLE.
LUMBER SORTER.

No. 486,584.

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UNITED STATES PATENT OFFICE.

CHARLES R. LITTLE, OF WEST DULUTH, MINNESOTA.

LUMBER-SORTER.

SPECIFICATION forming part of Letters Patent No. 486,584, dated November 22, 1892.

Application filed April 11, 1892. Serial No. 428,713. (No model.)

To all whom it may concern:

Be it known that I, CHARLES R. LITTLE, of West Duluth, in the county of St. Louis and State of Minnesota, have invented certain new and useful Improvements in Lumber-Sorters; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

The main object of my invention is to facilitate the handling and sorting of lumber according to quality or dimensions.

It consists, essentially, of a number of pockets or receptacles for lumber of different grades or dimensions, conveying mechanism arranged to carry the lumber to and deposit it in said receptacles, and mechanism under the control of the operator, by which lumber of the various dimensions or grades is directed into the proper pockets or receptacles, and of certain other novel features in the construction and arrangement of the apparatus, hereinafter particularly described, and pointed out in the claims.

In the accompanying drawings like letters designate the same parts in the several figures.

Figure 1 is a partial side elevation and vertical section of my improved apparatus. Fig. 2 is a vertical cross-section of the same on an enlarged scale, showing one of the pockets or receptacles and the associated mechanism in side elevation. Fig. 3 is a horizontal section of one of the pockets or receptacles with a plan view of one of the trucks used in connection therewith. Fig. 4 is a plan view of the apparatus; and Figs. 5 and 6 are detail views, on an enlarged scale, of the adjustable stops by which the lumber of different grades or dimensions is directed into the proper receptacles, Fig. 5 being a vertical cross-section on the line *xx*, Fig. 4, and Fig. 6 a vertical longitudinal section at right angles to that shown in Fig. 5.

A represents a trimmer, such as is commonly employed in sawmills for trimming the ends and cutting lumber to the desired lengths.

B represents the sorter; C, a conveyer by

which the lumber is carried from the trimmer to the sorter; D D, pockets or receptacles into which the lumber is delivered by the sorter according to its grade, dimensions, kind, or quality, and E E are tram cars or trucks upon which the lumber is deposited in said pockets to be conducted away to the desired points for piling or other disposition.

The trimmer A has a conveyer *a*, consisting of chains or belts provided with dogs or spurs by which the lumber is fed in the proper position to the trimming-saws and delivered to the conveyer C to be carried thereby to the sorter. The conveyer C consists of two or more parallel chain belts *cc*, provided at suitable intervals with dogs *c' c'* and carried upon sprocket-wheels *c² c²*, which are mounted upon horizontal shafts *c³ c³*. Ordinarily it will be found necessary or convenient to place the sorter above the trimmer in order to provide pockets or receptacles of the required depth. In such cases the conveyer is constructed and arranged to elevate the stuff from the level of the trimmer to that of the sorter, and at its upper end the chain belts pass over two sets of sprocket-wheels or sheaves *c² c²*, arranged in the same horizontal plane, by which the upper sides of the chain belts between said sprocket-wheels or sheaves are carried in a horizontal position. The conveyer C may be driven through the lower sprocket-wheel shaft *c³* by the belts of the trimmer-conveyer *a*, which run over sprocket-wheels upon the same shaft. In some cases it may be found convenient to place the sorter on the same level with the trimmer, and in such cases the conveyer C may be run in a horizontal position, or nearly so, throughout its entire length.

Between the two upper shafts *c³ c³* I provide a number of shifting-rollers F F, which are supported in suitable bearings provided therefor in the frame of the sorter, parallel with the conveyer-belts *cc*. These rollers are constantly rotated toward the stop at one side of the sorter by means of a shaft *f*, provided with bevel-gears working with similar gears on the roller-shafts and driven by a chain belt *f'* from the adjacent shaft *c³*, as shown in Figs. 1 and 4.

At the front side of the sorter, in line with the series of shifting-rollers F, I provide a graduated stop G, consisting of a series of

vertically-movable bars g g . (Shown in Figs. 4, 5, and 6.) These bars are placed close together, parallel with the rollers F , and are supported at or near their ends by links g' g' , pivoted thereto and to the framework of the sorter. They are elevated by means of levers g^2 , fulcrumed to a suitable support on the frame and connected at their inner ends by links g^3 with said bars, as shown in Figs. 5 and 6. When the operating-levers g^2 are released, the bars g are automatically returned to their lower position by weights g^4 . The bars g are arrested in their downward movement at the proper point by a cross-beam g^5 , against which the adjacent links g' are brought to a vertical position, thus arresting said bars at the proper points in their upward movement. In their lower and normal position the tops of the bars g are slightly below the tops of the rollers F .

b b are horizontal supporting-ways having their upper faces in the same plane with the tops of rollers F and the horizontal portions of the chain belts c . They are provided over the pockets or receptacles D with movable sections b' b' , which are secured at one end to shafts b^2 , extending horizontally across the sorter at right angles to said ways. At the front side of the sorter said shafts are each provided with an arm b^3 , placed in line with one of the bars g of stop G and beveled at its free end on the under side, as shown in Fig. 1. The upper end of said bevel projecting above the plane of the way b sufficiently to allow the edge of a board or other piece of lumber to pass underneath it, thereby turns the arm upwardly and with it the movable sections b' b' , constituting in effect arms upon the same shaft b^2 . The arms b^3 are made somewhat longer than the arms b' , so that the latter will be raised by the engagement of a board or piece of lumber with the beveled ends of the arms b^3 in time to permit said board or piece of lumber to be discharged through the openings in the ways thus presented into the receptacles below. The free ends of the arms b' are correspondingly beveled, so as to more readily direct the lumber when they are raised through the openings thus presented in the ways b and to afford supporting-bearings when they are closed upon the adjacent ends of the fixed portions of said ways. The lumber is taken from the shifting rollers F and carried upon the ways b to the openings into the several pockets or receptacles below by a conveyer H , which consists of two or more chain belts h h , provided with dogs h' , and carried by suitable sprocket-wheels h^2 , with their lower sides above and parallel with said ways b b . The conveyer H may be conveniently driven from the conveyer C by means of gears c^4 h^3 , as shown in Figs. 4 and 5, the gear c^4 being mounted upon one of the upper sprocket-wheel shafts C^3 , and the gear h^3 , meshing therewith, being mounted upon the sprocket-wheel shaft carrying the adjacent end of the conveyer-belts h .

The pockets or receptacles D consist of up-rights d d , which may serve as a part of the framework of the apparatus and are formed on their inner sides with vertical ways, in which are guided vertically-movable rectangular frames D' , the upper horizontal ends d' of which are made removable and afford supports upon which the lumber is deposited, gradually descending therewith as the pile increases, until a load is formed and deposited upon the truck E at the bottom of the receptacle. The lumber is held in the receptacles D within the desired limits on each side thereof by upright rollers I I , which are supported in bearings on vertical bars J , journaled at the ends in suitable bearings provided therefor on the frame, so as to permit of said rollers being swung into and out of operative position, as shown in Fig. 3. The bars J are provided with crank-arms j j and are connected on each side of each receptacle by rods j' , which are in turn connected with arms on a rock-shaft j^2 , provided with a lever j^3 , by which said rollers I I of each receptacle may be simultaneously moved by the operator into or out of operative position.

The frames D' are yieldingly supported in an elevated position and allowed to descend as the lumber accumulates thereon by the following mechanism: Chains wound in opposite directions over a drum d^2 pass over sheaves d^3 and are attached at their ends to the lower cross-pieces of said frames D' . A cable wound over another drum d^4 on the same drum-shaft in the proper direction by its unwinding to wind the chains upon drum d^2 passes over a sheave d^5 and is provided at the opposite end with a weight. A brake-wheel d^6 is mounted upon the drum-shaft, and a brake-strap d^7 , passing around its periphery, is connected at one end with a lever d^8 , against the outer end of which a cam-lever d^9 operates to draw and hold said strap d^7 in engagement with the periphery of the brake-wheel d^6 . The weight by which the drum-shaft is actuated is arranged to come to rest upon the floor or other suitable support (not shown) when the load carried by the cross-supports d' is deposited upon the truck E , and thereby relieve said supports of the pressure of said weight and permit of their removal. The trucks E are provided on the sides with stakes e e , which are pivotally or detachably connected therewith, so as to be turned down, as shown at the right hand of Fig. 2, or removed while the loads are being accumulated in the receptacles between the rollers I .

My improved apparatus operates as follows: The lumber, having been trimmed and cut to certain lengths by the trimmer A , is carried by the conveyer C to and deposited upon the shifting-rollers F , which are constantly rotating toward the stop G . The operator now depresses the proper lever g^2 to raise the bar g , corresponding with the pocket into which the board or piece of lumber is to be deposited, according to its length, quality,

or kind. The end of said board or piece of lumber abutting against the bar *g* thus elevated, as shown in Fig. 5, is thereby arrested in its lengthwise movement in position to be carried under and raise the beveled end of the arm *b*³ of the receptacle into which the board or piece of lumber is intended to be dropped. The chain belts *c c* of conveyer C carry the board or piece of lumber in question off from the shifting-rollers F, delivering it upon the ways *b b*, where it is engaged and moved forward by the dogs *h'* on the chains *h* of the overhead conveyer H. The front end passing under the beveled end of the arm *b*³, corresponding to the pocket D into which it is to be deposited, lifts said arm, as shown in Figs. 1 and 2, and through the shaft *b*², to which it is attached, raises the beveled ends of arms *b'* above ways *b*, thus directing the board or piece of lumber into the pocket below. As soon as the board has passed through the openings thus presented in the ways *b b* the arms *b'* and *b*³ drop back into place, closing said openings and forming unbroken ways for the passage of other pieces of lumber. The boards or lumber dropped into each pocket gradually accumulate therein, as shown in Figs. 1 and 2, upon the cross-supports *d'* of the vertically-yielding frames *D'*, which descend as the pile increases in size and finally deposits it upon the car or truck E below. The pocket being filled or a sufficient load accumulated and lowered upon said car or truck, the weighted drum-shaft connected with the vertically-movable frames *D'* is locked in place by means of the lever *d*³, the cross-supports *d'* are removed, the stakes *e e* of the car or truck are turned into an upright position, the rollers I I are then thrown outwardly away from the load and the car with its load resting thereon is withdrawn from the pocket or receptacle, which is arranged as before for the reception of another load by replacing the cross-pieces *d'*, releasing the drum-shaft, thus allowing the frames *D'* to be raised, and by turning the rollers I I into operative position.

It will be understood by those familiar with the manufacture of lumber that the trimmer A is not an essential part of the sorting apparatus, inasmuch as the lumber may be taken directly from the sawmill or from any other convenient machine or point, and it is obvious that various changes in details of construction and arrangement of the various parts of the apparatus may be made within the intended scope of my invention.

In certain cases it may be practicable and desirable to dispense with the pockets or receptacles D D and conduct the various kinds of lumber in chutes from the sorter to the various points where it is to be deposited or otherwise disposed of. It may also be found feasible to dispense with the shifting-rollers F and stop G and to operate the movable sections in the ways of the sorter manually or by other means than those shown.

To cause the several kinds of lumber to engage the proper trip-arms *b*³ and drop through the ways *b* at the desired points, it is necessary to prevent the endwise movement of the stuff after it leaves the stop G. For this purpose the chain belts are made, as shown in Figs. 1, 2, and 4, to run in guides *h*⁴ *h*⁴ between the sprocket-wheels *h*² *h*², and the advancing faces of dogs *h'* *h'* are provided with points to engage with and hold in place the boards or other pieces of lumber. The rollers F F are beveled at their receiving ends, as shown in Figs. 1 and 4, to raise the lumber slightly out of contact with the chain belts *c c* while it is being shifted endwise.

I claim—

1. In a lumber-sorter, the combination of a way having a number of transverse openings which are normally closed by movable sections of said way, an overhead conveyer arranged above and parallel with said way to move the stuff to be sorted over said way, and trips arranged to be operated by the stuff for opening said movable sections, substantially as and for the purposes set forth.

2. In a lumber-sorter, the combination of a suitable way having a number of openings therein and movable sections normally closing said openings, an overhead conveyer arranged above and parallel with said way to move the stuff to be sorted over said way, and mechanism under the control of the operator by which the movable sections are opened and the lumber is dropped through said way at the proper points, substantially as and for the purposes set forth.

3. In a lumber-sorter, the combination of a suitable way having openings normally closed by movable sections, trip arms or levers connected with said movable sections and arranged in different vertical planes, a conveyer arranged to move the lumber to be sorted over said way, and a stop under the control of the operator arranged to direct the lumber to the sorter in the proper position to engage the trip arm or lever of the opening through which such lumber is to be dropped, substantially as and for the purposes set forth.

4. In a lumber-sorter, the combination of a way having openings at intervals therein and movable sections normally closing said openings, trip arms or levers connected with said movable sections and arranged in different vertical planes, a conveyer arranged to move the lumber to be sorted over said way, and a graduated stop under the control of the operator, arranged to guide any piece of lumber to the sorter in the proper position as to its length to engage with and operate the trip arm or lever of the opening through which such piece of lumber is to be dropped, substantially as and for the purposes set forth.

5. In a lumber-sorter, the combination of a way having openings therein at intervals and movable sections normally closing said openings, trip arms or levers connected with said movable sections and arranged in different

vertical planes, a conveyer arranged to move the lumber to be sorted over said way, shifting-rollers arranged at the receiving end of the sorter parallel with said way, and a graduated stop at one side of said sorter in line with said rollers, substantially as and for the purposes set forth.

6. In a lumber-sorter, the combination of a suitable way having transverse openings therein and movable sections normally closing said openings, trips connected with and arranged to open said movable sections by the engagement of the lumber therewith, and an overhead conveyer arranged to move the lumber to be sorted over said way, substantially as and for the purposes set forth.

7. In a lumber-sorter, the combination of an approximately-horizontal way having transverse openings therein at intervals and movable sections normally closing said openings, an overhead conveyer arranged to move the lumber laterally over said way, trips connected with said movable sections and arranged in different vertical planes, mechanism at the receiving end of the sorter to move the lumber lengthwise, and a stop under the control of the operator, arranged to arrest the lumber in its lengthwise movement in position to engage with the trip of the opening through which it is to be dropped, substantially as and for the purposes set forth.

8. In a lumber-sorter, the combination of a conveyer comprising parallel chain belts provided at suitable intervals with dogs, horizontal shifting-rollers arranged parallel and with their upper sides approximately in the same plane with the upper sides of said belts, ways parallel with said rollers, having transverse openings at intervals therein and movable sections normally closing said openings, an overhead conveyer comprising chain belts provided with dogs and arranged parallel with said ways, trips connected with the movable sections of said ways and arranged in different vertical planes, and a graduated stop comprising a series of vertically-movable bars corresponding in number and position with said trips, substantially as and for the purposes set forth.

9. In a lumber-sorter, the combination of an approximately-horizontal way having a series of transverse openings therein and movable sections normally closing said openings, a series of pockets or receptacles below said openings for the reception of various kinds of lumber, an overhead conveyer arranged above and parallel with said way to move the lumber to be sorted laterally over said way, and means for opening the movable sections therein and dropping the several kinds of lumber into the proper receptacles, substantially as and for the purposes set forth.

10. In a lumber-sorter, the combination of a suitable way having transverse openings at intervals therein and movable sections normally closing said openings, and receptacles underneath said openings for holding the

different kinds of lumber, said receptacles being provided with vertically-movable yielding supports and a space below said supports for the introduction of a wagon or truck, said supports being removable to deposit their load upon such wagon or truck, substantially as and for the purposes set forth.

11. In a lumber-sorter, the combination of a suitable way having openings at intervals therein and movable sections normally closing said openings, a conveyer arranged to move the lumber laterally over said way, receptacles underneath said openings for holding different kinds of lumber, vertically-movable yielding supports upon which the lumber falls in said receptacles, and laterally-movable uprights arranged on opposite sides of said receptacles, substantially as and for the purposes set forth.

12. In a lumber-sorter, the combination of an approximately - horizontal way having openings at intervals therein and movable sections normally closing said openings, a series of receptacles arranged underneath said openings and each provided at the bottom with a removable truck, vertically-movable yielding supports upon which the lumber falls in said receptacles, retractile upright rollers arranged on opposite sides of said receptacles, and connections with the rollers of each receptacle, whereby they are simultaneously thrown into or out of operative position, substantially as and for the purposes set forth.

13. In a lumber-sorter, the combination of horizontal ways having transverse openings at intervals and movable sections normally closing said openings, an overhead conveyer arranged to move the lumber laterally over said ways, and receptacles underneath and corresponding with said openings, each receptacle being provided on opposite sides with upright bars capable of turning in suitable bearings and carrying upright rollers, said bars being connected on each side of the receptacle with a rock-shaft and lever, whereby said rollers are simultaneously moved into or out of operative position, substantially as and for the purposes set forth.

14. In a lumber-sorter, the combination of horizontal ways having transverse openings therein at intervals and movable sections normally closing said openings, a number of receptacles below and corresponding with said openings, vertically - movable frames at or near the opposite ends of said receptacles, the upper cross-pieces of said frames being movable, and a counterweighted drum connected by chains or cables passing over sheaves with the lower parts of said frames, substantially as and for the purposes set forth.

15. In a lumber-sorter, the combination of ways having transverse openings at intervals therein and movable sections normally closing said openings, an overhead conveyer arranged to move the lumber laterally over said ways, trips connected with said movable sec-

tions and arranged in different vertical planes, shifting-rollers parallel with said ways at the receiving end of the sorter, a graduated stop consisting of a series of vertically-movable bars corresponding in number and position with said trips and carried at the ends upon pivoted parallel links, and levers severally connected with and arranged to raise said bars above the tops of said shifting-rollers, substantially as and for the purposes set forth.

16. In a lumber-sorter, the combination of a feeding-conveyer, shifting-rollers arranged parallel therewith, a graduated stop located in line with said shifting-rollers, ways having openings at intervals therein and movable sections normally closing said openings, an overhead conveyer arranged to take the lumber from said shifting-rollers and move it laterally over said ways, and a series of receptacles below said openings, each provided with a truck and with vertically-movable yielding supports upon which the lumber is dropped in said receptacle and lowered upon said truck, substantially as and for the purposes set forth.

17. In a lumber-sorter, the combination of an approximately-horizontal way having openings at intervals therein and movable sections normally closing said openings, trips connected with said sections and arranged in different vertical planes, and a stop consisting of a series of independently and vertically movable bars arranged at or near one side of said way and parallel therewith, substantially as and for the purposes set forth.

18. In a lumber-sorter, the combination of approximately-horizontal ways having transverse openings at intervals therein and movable sections normally closing said openings, rock-shafts to which said movable sections are attached, and trip-arms also attached to said rock-shafts and having their free ends

beveled or inclined on the under side, substantially as and for the purposes set forth.

19. In a lumber-sorter, the combination of ways having transverse openings at intervals therein and movable sections normally closing said openings, rock-shafts to which said movable sections are attached, and trip-arms also attached to said rock-shafts and arranged in different vertical planes, the free ends of said movable sections and trip-arms being beveled or inclined on the under side, substantially as and for the purposes set forth.

20. In a lumber-sorter, the combination of approximately-horizontal ways having openings therein at intervals and movable sections normally closing said openings, means under the control of the operator for opening said movable sections, an overhead conveyer comprising chain belts provided with dogs and supported upon sprocket-wheels or drums with their under sides above and parallel with said ways, and guides in which said chain belts run between said sprocket-wheels or drums, substantially as and for the purposes set forth.

21. In a lumber-sorter, the combination of a conveyer comprising a number of parallel chain belts provided at intervals with dogs, a number of shifting-rollers placed parallel with the upper sides of said chain belts with their peripheries projecting a little above said belts and having their receiving ends beveled, so as to receive and raise the lumber thereon, and a stop against which the lumber is moved endwise by said rollers, substantially as and for the purposes set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

CHAS. R. LITTLE.

Witnesses:

HARVEY P. SMITH,
O. B. LITTLE.