

May 3, 1955

E. M. POPE ET AL
 DRY KILN TRUCKS

2,707,443

Filed Feb. 8, 1951

2 Sheets-Sheet 1

FIG 1.

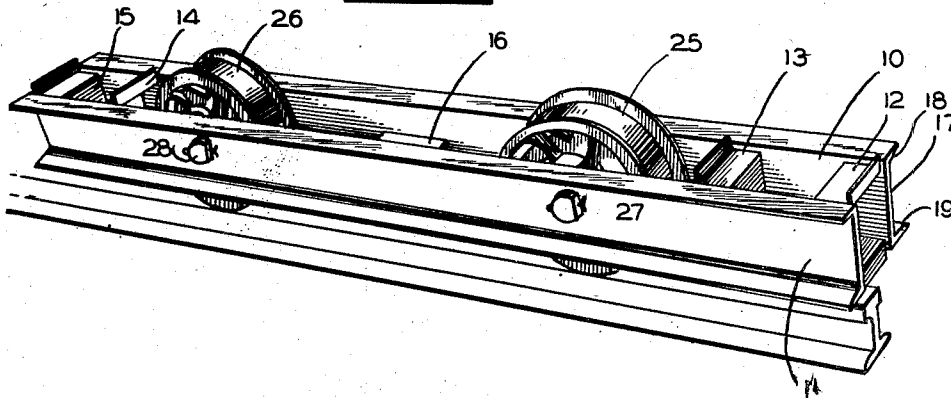


FIG 2.

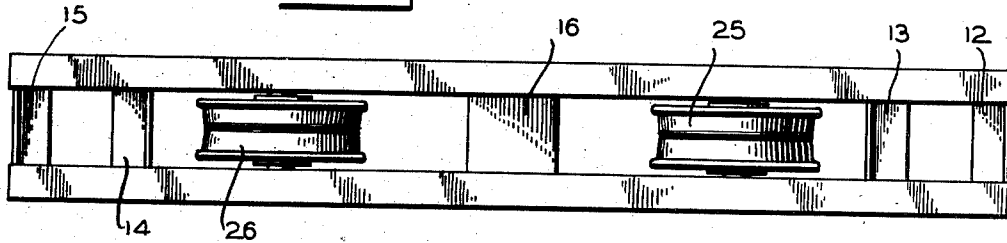


FIG 3.

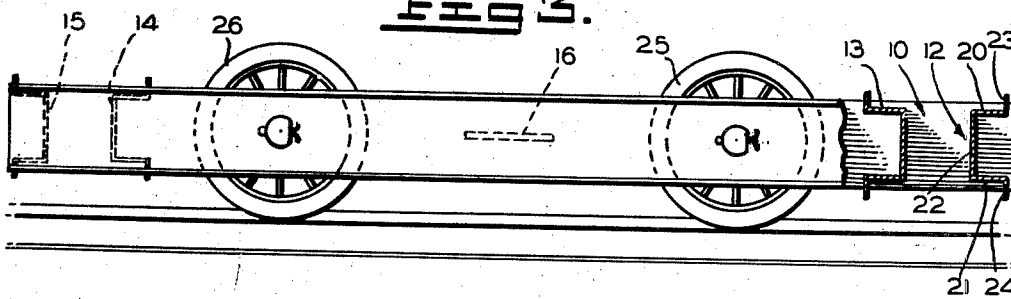
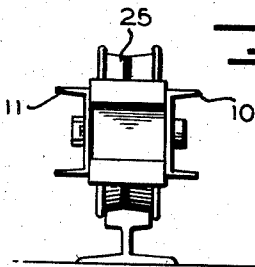


FIG 4.



INVENTORS
 ERASTUS MARION POPE
 LLOYD L. WILLAMS

BY *Cushman, Darby & Cushman*

ATTORNEYS

May 3, 1955.

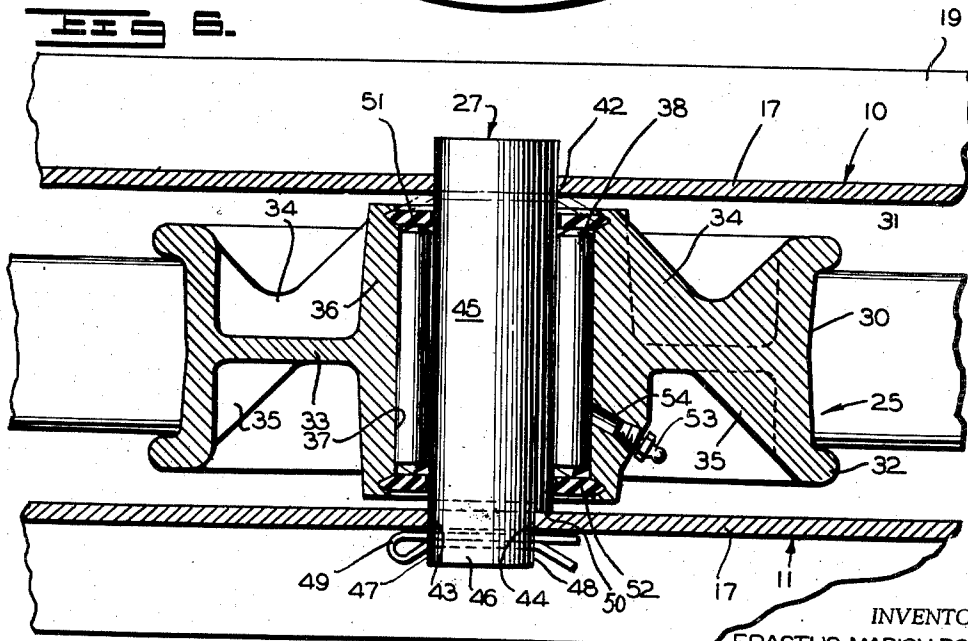
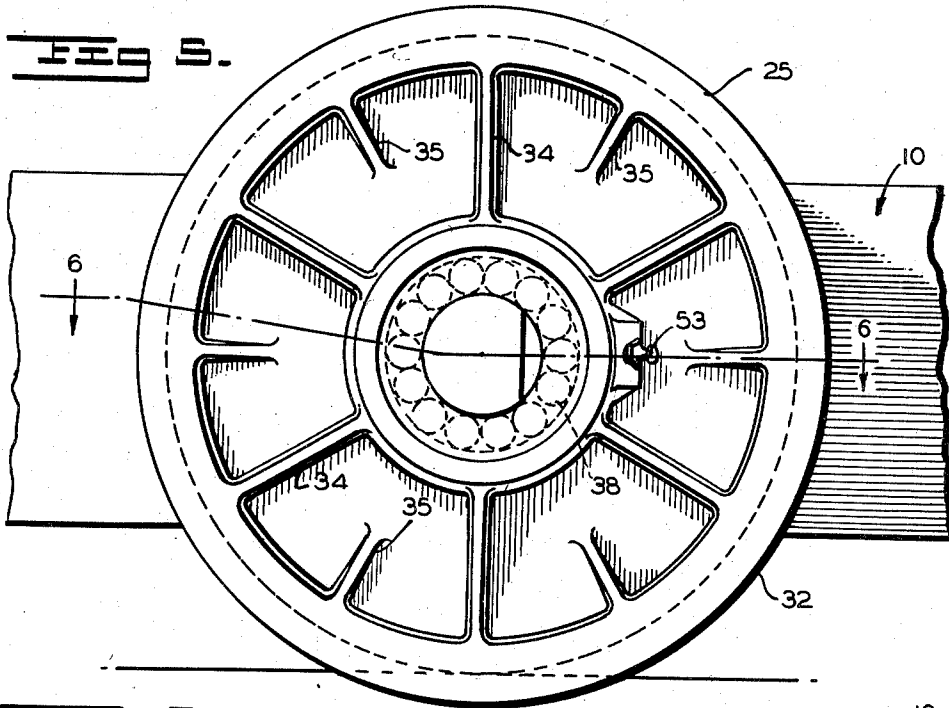
E. M. POPE ET AL

2,707,443

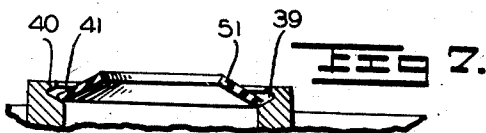
DRY KILN TRUCKS

Filed Feb. 8, 1951

2 Sheets-Sheet 2



INVENTOR
ERASTUS MARION POPE
LLOYD L. WILLIAMS



BY Cushman, Darby & Cushman

ATTORNEY

1

2,707,443

DRY KILN TRUCKS

Erastus Marion Pope and Lloyd L. Williams, Jacksonville, Fla., assignors to Moore Dry Kiln Company, Jacksonville, Fla., a corporation of Florida

Application February 8, 1951, Serial No. 209,954

5 Claims. (Cl. 105—160.5)

The present invention relates to improvements in trucks of the type used to support large, heavy stacks of lumber during a drying operation in a kiln. Trucks of the type to which the present invention relates comprise a pair of double-flanged wheels mounted in longitudinal alignment on axles carried by relatively closely spaced elongated side frame members. Each truck travels along a single track, and a plurality of such trucks, disposed on fairly widely spaced, parallel tracks are used to support the lumber. The trucks are usually loaded on the outside of the kiln and then run into the kiln, where they remain until the drying operation has been completed, after which they are withdrawn to the outside and the lumber removed. Necessarily, the trucks are subjected to fairly wide variations in temperature, with consequent expansion and contraction of the parts thereof and are also subjected to wide variations in the humidity of the surrounding atmosphere.

A primary object of the invention is to simplify the construction of dry kiln trucks and, at the same time, to increase the rigidity of the trucks, to make them more rugged and to increase their period of normal useful life. To this end, the invention provides a truck frame of all welded construction, thereby eliminating the possibility of inadvertent loosening of bolts, rivets, or the like.

A further object of the invention is to provide improved reinforcing elements or spreaders, which may be welded to the side frame members by continuous welds, to provide a structure of maximum rigidity and ruggedness.

Another object is to provide reinforcing members or spreaders which perform the additional function of acting as stops for the timbers stacked on the trucks, to prevent inadvertent longitudinal movement thereof.

Another object is to provide a truck having all of the advantageous features referred to, which may be turned upside down and used with either side as the top or bottom, thereby materially increasing the useful life of the truck.

Another object of the invention is to provide an improved wheel and axle construction, in combination with the parallel side frame members, having the advantage that the axle may be withdrawn by endwise movement from the side frame members and the wheel readily dropped from between them.

Another object is to provide improved and simplified means for sealing the ends of the central bore in the wheel hub and constituting means for retaining the roller bearings and lubricant in place.

Other and further objects and advantages of the invention will be apparent from a consideration of the following description of the specific embodiment of the invention shown in the accompanying drawings, in which

Figure 1 is a perspective view of the truck;

Figure 2 is a plan view;

Figure 3 is a side elevation and partial vertical section;

Figure 4 is an end view;

2

Figure 5 is an enlarged elevation, with the near side frame member removed;

Figure 6 is a horizontal section on line 6—6 of Figure 5, and

Figure 7 is a fragmentary sectional detail illustrating the way in which the grease and bearing retaining washer is assembled with the wheel hub.

The truck consists essentially of parallel side frame members 10 and 11, right hand end spreaders 12 and 13, left hand end spreaders 14 and 15 and a central spreader 16. The side frame members 10 and 11 each comprises an outwardly facing C-section channel member having a vertical web 17, an outwardly projecting upper flange 18 and a similar bottom flange 19. Each spreader comprises a metal plate bent to "hat" shape or U-section, as clearly shown in the right hand portion of Figure 3. The spreaders of each pair of the two ends of the truck face in opposite directions. The spreader 12, for instance, comprises a U-section with its legs 20 and 21 disposed horizontally, its bottom 22 disposed vertically and its end flanges 23 and 24 disposed vertically and projecting above and below the upper and lower flanges 18 and 19 of the side frame members 10 and 11. The flanges 23 and 24 may be considered brim flanges of the hat-shaped spreaders, the sections 20 and 21 the crown webs, and the section 22 the top section.

The other spreader of each pair is identical, except that it faces in the opposite direction and the crown projects from the brim toward the right, instead of toward the left. (Figure 3.)

The side edges of the spreader are welded by continuous welds to the inner faces of the vertical webs 17 of the side frame members 10 and 11, thereby providing an extremely rigid structure.

The central spreader 16 may comprise a simple flat plate having its side edges welded to the inner faces of the channel members 10 and 11, along lines substantially equidistant between the upper and lower flanges 18 and 19.

A pair of wheels 25 and 26 are mounted on stub axles 27 and 28, between the side frames. Referring to Figures 5 and 6, each wheel comprises a tread 30, outwardly projecting flanges 31 and 32, a continuous radial web 33 and a plurality of spoke-like reinforcing flanges 34 and 35, disposed in alternation on opposite sides of the wheel. Each wheel further comprises a central hub 36 having a cylindrical inner bore 37, in which a plurality of roller bearings 38 are disposed, in a circular series. Adjacent each end of the cylindrical bore 37, there is an enlarged groove 39, defined by an end wall 40 having a circular edge 41 of a diameter intermediate the cylindrical bore 37 and the bottom of the groove 39; that is to say, having a diameter greater than the bore 37 but less than the groove 39. The groove may be V-shaped in cross-section or of any desired conformation.

The vertical web 17 of one of the side frame members, for instance the member 10, may be provided with a circular opening 42, having its center substantially midway between the upper and lower flanges 18 and 19, and the web 17 of the other side frame member 11 has a non-circular opening aligned therewith, which may be of generally D-shape, including an arcuate margin 43 and a straight margin 44 constituting a cord intersecting the ends of the arcuate margin, or, in other words, provide a flat side for the opening. The arcuate marginal portion of this opening is in axial alignment with, and constitutes a projection of, the circular margin of the opening 42.

Each axle comprises a cylindrical portion 45 extending through the opening 42 in the side frame member 10 toward the inner surface of the side frame member 11 and a non-circular projection 46, extending through and close-

ly fitting the non-circular opening in the side frame member 11. This projecting portion of the axle has a surface 47 which is cylindrical and a flat surface 48, which surfaces lie against and fit with the arcuate and flat margins 43 and 44 of the opening in the side frame member 11, thereby preventing rotation of the axle.

The projection 46 is provided with a diametric transverse bore, in which a cotter pin 49 or the like may be disposed, to prevent withdrawal of the axle, movement in the opposite direction being prevented by the abutment of the shoulder 50 with the inner surface of the side frame member 11.

The ends of the central bore in the hub of the wheel are closed by annular washers 51 and 52 having their outer margins disposed in the grooves 39 and their inner margins in closely spaced relation to the cylindrical portion 45 of the axle. Referring to Figures 6 and 7, the manner of installing the washers is indicated diagrammatically. At the outset, the washers are of generally conical form, as shown in Figure 7, with their outer margins of a diameter which will just clear the opening 41, but too large to enter the bore 37. Hence, each washer when in the conical form, will have its outer margin supported on the inner wall of groove 39. Axial pressure is now applied to the inner margin of the washer to distort it from the conical to the flat shape, with the result that the outer margin is expanded into the groove 39 and increased in diameter beyond that of the opening 41, so that the washer is firmly seated in the groove 39 and its displacement therefrom positively prevented. This distortion of the washer provides a tight seal with the groove 39 and a substantially running fit with the axle 27, thereby retaining the rollers 38 in place, as well as grease which may be introduced into the bore by a grease fitting 53 communicating therewith through a passage 54.

In order to remove a wheel for replacement or repair, it is simply necessary to remove the cotter pin 49 and withdraw the axle by movement through the circular opening 42 in the side frame member 10, whereupon the wheel may be dropped down between the side frame members. The parts may be re-assembled by a reverse procedure. That is to say, the axle may be inserted through the opening 42 from the outside, projected through the washers and the bearings in the wheel and the end portion 46 fitted into the opening in the side frame member 11, whereupon the cotter pin 49 may be reinserted and the parts held in assembled relation.

A plurality of trucks in accordance with the present invention may be used in the conventional manner, in the drying of lumber and the like. Should one or more of the upstanding flanges 23 of the hat-shaped spreaders be damaged, or if desired for any other reason, the truck may be turned upside down, and the lower flanges 19 will then serve as the supporting surface for the lumber.

Although the invention has been described with considerable particularity in this specification, by reference to the accompanying drawings, it must be understood that the invention is not limited to the details of construction shown and described, but includes all modifications coming within the scope of the appended claims and their equivalents.

We claim:

1. A dry kiln truck comprising a pair of spaced, parallel side frame members, and transversely arranged spreaders securing the members in said relation, one of said members having a circular opening therein and the other having a non-circular opening aligned therewith, a cylindrical axle extending through the first-mentioned opening, to the inner face of said other member and

having a non-circular end projection, shaped to fit and extending through said non-circular opening, and means carried by and projecting laterally from said projection and preventing withdrawal thereof through the non-circular opening.

2. A dry kiln truck comprising a pair of spaced, parallel side frame members, and transversely arranged spreaders securing the members in said relation, one of said members having a circular opening therein and the other having an opening aligned therewith, defined by an arcuate margin and a straight margin constituting a cord intersecting the ends of the arcuate margin, a cylindrical axle extending through the first mentioned opening to the inner face of the second frame member and having an end projection shaped to fit and extending through the opening in the latter frame member, and means carried by and projecting laterally from the said projection and preventing withdrawal thereof through the last-mentioned opening.

3. A wheel and axle assembly, said wheel comprising a hub having a cylindrical bore terminating at its opposite ends in a groove having an outer end wall defined by a circular opening of a diameter larger than the bore and smaller than the bottom of the groove, a plurality of roller bearings in the bore and a stiff, annular washer seated in each groove and projecting inwardly therefrom to retain the bearings in the bore, and an axle projecting through said bore making a substantially running fit with the inner margins of the washers.

4. A wheel comprising a hub having a cylindrical bore, an enlarged groove in the hub adjacent one end of the bore defined by a circular outer wall of a diameter intermediate that of the bore and the bottom of the groove, a plurality of roller bearings in the bore, an axle disposed interiorly of the roller bearings and a stiff bearing retaining washer in said groove, said washer being held in place by engagement of its periphery with said circular outer wall, effected by expansion of the washer from a conical form to a flat form after passage through the opening of said outer groove wall.

5. A dry kiln truck comprising a pair of spaced parallel side frame members having a plurality of pairs of aligned openings therein, a cylindrical axle extending through and secured against endwise movement in each pair of openings, and a wheel mounted on each axle, each wheel comprising a hub having a cylindrical bore terminating at its opposite ends in a circumferential groove defined by a circular outer wall of a diameter greater than that of the bore and less than that of the bottom of the groove, a plurality of roller bearings in the bore surrounding said axle, and a bearing-retaining washer having its periphery seated in each groove, said washer being held in place by engagement of its periphery with said circular outer wall, effected by expansion of the washer from a conical form to a flat form after passage through the opening of the outer groove wall.

References Cited in the file of this patent

UNITED STATES PATENTS

582,217	Morton	May 11, 1897
637,044	Straight	Nov. 14, 1899
781,427	Hussey	Jan. 31, 1905
1,019,353	Perkins	Mar. 5, 1912
1,207,449	Vogel	Dec. 5, 1916
1,242,277	Vogel	Oct. 9, 1917
1,430,639	Gillette	Oct. 3, 1922
1,583,785	Evans	May 11, 1926
1,644,012	Edmunds	Oct. 4, 1927
1,974,018	Edmunds	Sept. 18, 1934