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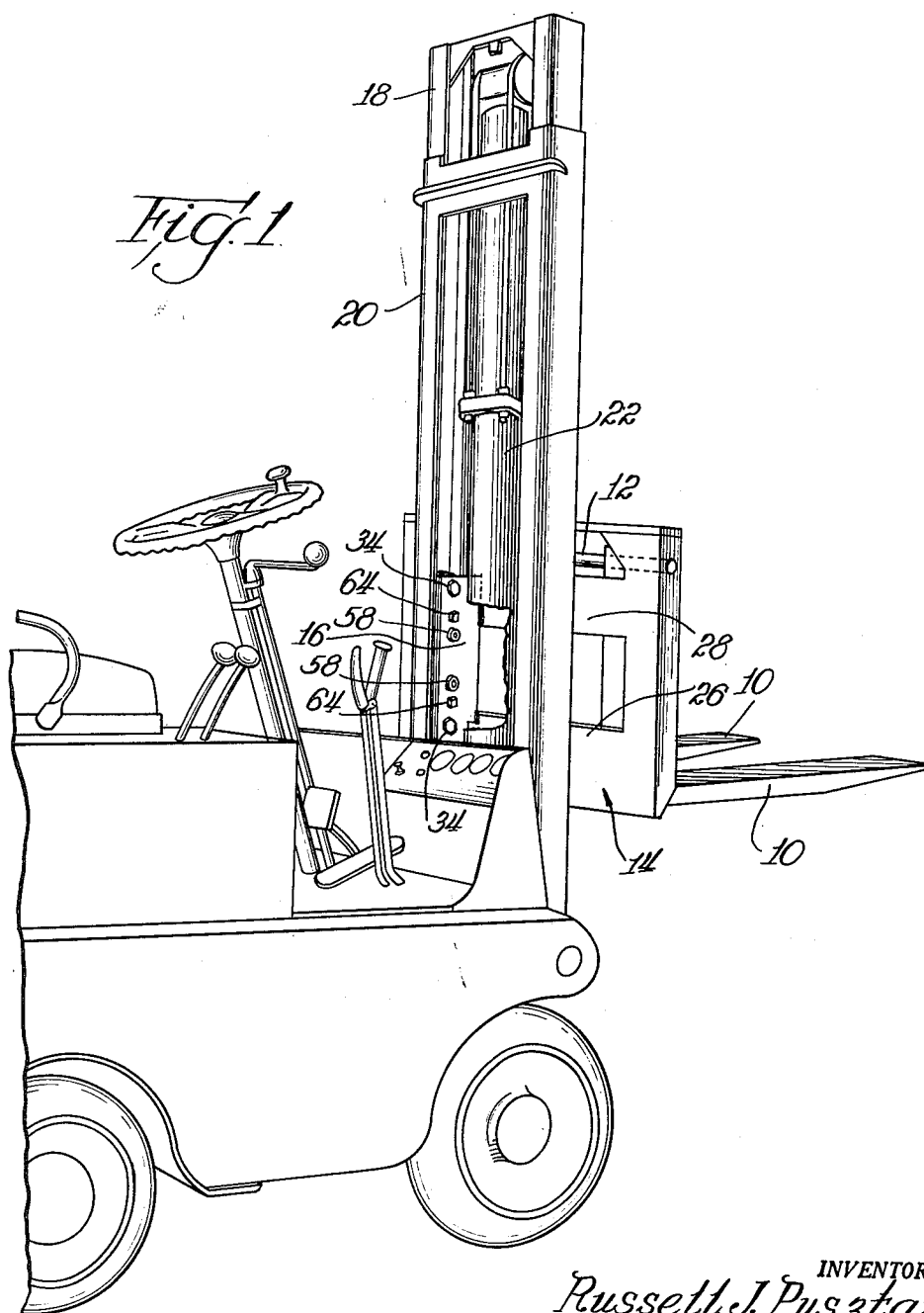
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CARRIAGE SIDE CLEARANCE ADJUSTER

Filed Aug. 18, 1951

2 Sheets-Sheet 1



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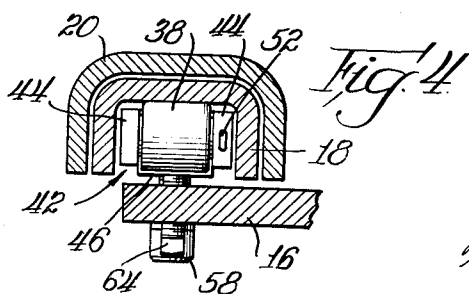
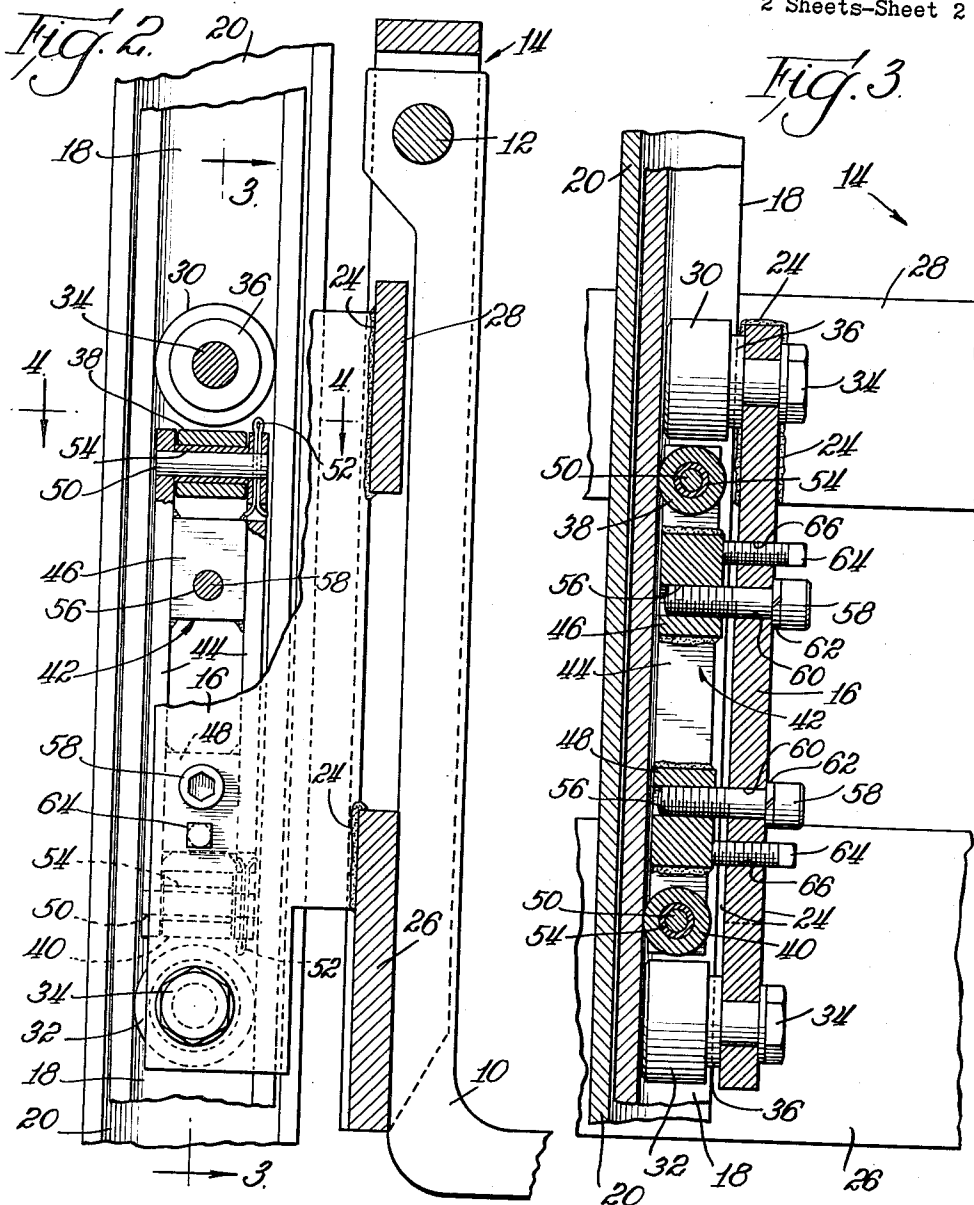
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UNITED STATES PATENT OFFICE

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CARRIAGE SIDE CLEARANCE ADJUSTER

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mesne assignments, to Allis-Chalmers Manu-
facturing Company, a corporation of Delaware

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7 Claims. (Cl. 308—6)

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My invention relates to carriage side clearance adjuster for use on fork lift trucks and the like.

In fork trucks it is essential to maintain side clearance between the carriage and the upright channels at a minimum to prevent the loads from becoming unstable and hence tipping over, especially when high stacking is being done. Excessive side clearance causes increased wear and all types of carriage accessory attachments operate to better advantage when excessive side clearance is eliminated.

In the past excessive side clearance has been compensated for by measuring the clearance with feeler gauges and then making shims of the necessary thickness and fastening these shims, as by tack welding, to the roller supports after the roller supports have been removed from the truck. The rollers and roller supports are then re-installed on the carriage and if the measurements were correct and the shims accurately made the side clearance is reduced to the proper amount. It will take a half day or more for a skilled maintenance man to make this service adjustment. My novel side clearance adjuster meets all of the necessary requirements and overcomes difficulties heretofore experienced.

An object of my invention is to provide a new and improved carriage side clearance adjuster that can take up side clearance without disassembling any of the parts associated with the carriage mount.

Another object is to provide a novel carriage side clearance adjuster that is made up of but a small number of inexpensive parts.

Another object is to provide a new and improved carriage side clearance adjuster that may be installed on one side of the fork carriage to give complete and convenient control over the side clearance.

Another object is to provide a simple carriage side clearance adjuster that permits easy adjustment of the side clearance by manipulating readily accessible screws.

A further object is to provide a novel carriage side clearance adjuster that reduces the time required for service adjustments of side clearance to a very few minutes.

A still further object is to provide a novel carriage side clearance adjuster that will eliminate the necessity of holding production tolerances exceedingly close on the mating parts when the carriage, roller support frame, rollers, and various other parts associated with the mechanism for mounting the carriage on the vertical channels are produced, since an accurate final adjust-

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ment may be made in a matter of minutes after the parts are assembled.

These and other objects and advantages will become apparent from the following description and the accompanying drawings, in which:

Fig. 1 is a perspective view of a fork lift truck incorporating my invention with the forks and carriage shown in a partly raised position and with the piston and cylinder broken away to expose the carriage support member and the screws for adjusting side clearance between the carriage and the upright channels;

Fig. 2 is a detail view, partly in section, looking into the open side of the left-hand upright channels of Fig. 1 with a part of the carriage support member broken away to expose the rollers and the side roller frame;

Fig. 3 is a sectional view taken on line 3—3 of Fig. 2 showing particularly the arrangement of the adjusting screws and set screws with respect to the carriage support member and the spacer blocks; and

Fig. 4 is a sectional view taken on line 4—4 of Fig. 2 showing to advantage the location of a side roller and the side plates within the upright channels.

In Fig. 1 I have shown a conventional fork lift truck on which my invention may be used. The forks 10 are mounted on a rod 12 supported in a carriage framework 14. A carriage support member 16 is secured to the carriage framework 14, as by welding, and serves to provide a mount for the rollers, as will be hereinafter described. The rollers ride within an inner upright channel 18 which slides within the outer upright channel 20. A hydraulic cylinder 22, shown broken away to expose the carriage support member, operates to raise and lower the carriage framework and forks.

In Figs. 2, 3 and 4 I have shown in detail my novel carriage side clearance adjuster which is the subject matter of the instant application. Attention is invited to these figures for a full understanding of the novel concepts on which my invention is based.

Figs. 2 and 3 show the support member 16 welded, as indicated by beads 24, to cross-members 26 and 28 of the carriage framework 14. The support member 16 extends rearwardly adjacent the open sides of the channels 18 and 20 and has secured thereto rollers 30 and 32, which roll within the inner channel 18 against the inner faces of the flanges to hold the carriage framework parallel at all times to the channels and yet permit movement of the carriage with respect to the channels. The rollers 30 and 32 may be

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secured to the support member in any suitable manner, and I have shown for the sake of illustration machine screws 34 for this purpose. Wear washers 36 are inserted between the rollers 30 and 32 and the support member 16.

Side rollers 38 and 40 are located intermediate the rollers 30 and 32 and are supported on a side roller frame, generally designated 42. The side roller frame comprises two side plates 44 and spacer blocks 46 and 48 which are secured between the side plates as by welding. As shown particularly well in Fig. 2, the side rollers 38 and 40 are held between the side plates 44 by shafts 50, which are placed in aligned holes in the side plates and secured therein by cotter keys 52. Bushings 54 between the side rollers 38 and 40 and the shafts 50 reduce wear between the side rollers and the shafts.

As seen in Fig. 3, the spacer blocks 46 and 48 have tapped holes 56 formed therein which receive machine screws 58. These screws 58 will be referred to hereinafter as locking screws. The locking screws pass through unthreaded bores 60 in the support members 16 and have washers 62 positioned between their heads and the support member. Adjusting screws 64 are threaded into tapped holes 56 in the support member 16 in position to bear against the spacer blocks 46 and 48. As seen in Figs. 3 and 4, the side rollers 38 and 40 bear against the inner face of the web of channel 18 when the side roller frame 42 is in the position shown.

The foregoing description has been directed to the carriage mounting means associated with the left-hand upright channels of Fig. 1. It should be understood that a carriage mounting means similar to that disclosed above could be mounted between the carriage and the right-hand upright channels of Fig. 1. While I prefer to provide each side of the carriage with my novel carriage side clearance adjuster, this is not necessary. A single side clearance adjuster on either side of the carriage is sufficient and the other side of the carriage may be provided with any conventional or suitable roller type mounting means.

In taking up side clearance between the carriage and the upright channel 18 it is simply necessary to thread the locking screws 58 out of spacer blocks 46 and 48 a short distance and then position adjusting screws 64 to provide proper clearance between the side rollers and the inner face of the web of channel 18. The locking screws 58 are then retightened to lock the side roller frame in position. If the side clearance is reduced to the point that the side rollers tend to jam between the inner upright channels, the side clearance may be increased by slightly loosening adjusting screws 64, and then threading locking screws 58 into the spacer blocks until the roller frame is locked in a new position by the locking and adjusting screws. It is evident from the foregoing how simple my novel carriage side clearance adjuster makes a service adjustment. From Fig. 1 it should be equally evident that the locking screws 58 and adjusting screws 64 are readily accessible without removing any parts from the carriage support mechanism.

From the foregoing description it should be appreciated that I have provided a new and novel carriage side clearance adjuster that is entirely different from anything heretofore used on fork trucks to provide control over side clearance between the carriage and the upright channels. My invention overcomes practically all of the problems heretofore encountered due to excessive side

clearance, from the initial stages of production when the parts are being made to service adjustments made on the fork truck after it is in operation.

5 While I have illustrated and described only a single form of my invention, it is to be understood that my invention is not limited to the details shown and described, but includes all modifications, variations, and equivalents coming within the scope of the following claims.

I claim:

1. In a carriage side clearance adjuster for controlling clearance between a carriage and a carriage supporting means along which said carriage moves, a roller supporting frame, a roller rotatably mounted on said frame and adapted to engage said carriage supporting means, an adjusting screw threaded through a part of the carriage and bearing against said frame, said frame being moved relative to said carriage when said adjusting screw is rotated, and a locking screw passing through a part of said carriage and threaded into said frame, said frame being locked against movement relative to said carriage when said locking screw is tightened to hold said frame against said adjusting screw.

2. A carriage side clearance adjuster for controlling the side clearance between the carriage and the upright channels of a fork truck, said carriage having a portion extending adjacent the open side of one of said channels, a roller supporting frame in said one channel, rollers rotatably mounted on said frame, said rollers being adapted to bear against the web of said one channel, and screws connecting said frame and said portion of said carriage to move said frame between said one channel and said portion of said carriage to thereby adjust the clearance between said rollers and said one channel.

3. A carriage side clearance adjuster for controlling the side clearance between the carriage and the upright channels of a fork truck, said carriage having a portion thereof extending adjacent the open side of one of said channels, a roller supporting frame in said one channel, rollers rotatably mounted on said frame, an adjusting screw threaded through said portion of said carriage and abutting said frame, and locking screws passing through said portion of said carriage and threaded into said frame, said frame and rollers being moved within said one channel between said one channel and said portion of said carriage in response to rotation of said screws to adjust the spacing between said rollers and said one channel.

4. A carriage side clearance adjuster for controlling the side clearance between the carriage and the upright channels of a fork truck, said carriage having a portion thereof extending adjacent the open side of one of said channels, a roller supporting frame in said one channel, rollers rotatably mounted on said frame, an adjusting screw threaded through said portion of said carriage and abutting said frame, locking screws passing through said portion of said carriage and threaded into said frame, said frame and rollers being moved within said one channel between said one channel and said portion of said carriage in response to rotation of said screws to adjust the spacing between said rollers and said one channel, and second rollers secured to said portion of said carriage and disposed within said one channel at spaced points to roll against said flanges of said one channel and maintain said

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carriage in parallel relationship with said channels.

5. A carriage side clearance adjuster for controlling the side clearance between the carriage and the upright channels of a fork truck, said carriage having a portion thereof extending adjacent the open side of one of said channels, a roller supporting frame in said one channel, rollers rotatably mounted on said frame, an adjusting screw threaded through said portion of said carriage and abutting said frame, locking screws passing through said portion of said carriage and threaded into said frame, said frame and rollers being moved within said one channel between said one channel and said portion of said carriage in response to rotation of said screws to adjust the spacing between said rollers and said one channel, second rollers secured to said portion of said carriage and disposed within said one channel at spaced points to roll against the flanges of said one channel and maintain said carriage in parallel relationship with said channels, and roller means mounted on another portion of said carriage and disposed within a second channel to permit movement of said carriage along said second channel, the clearance between said roller means and said second channel and the clearance between said rollers and said one channel being controlled by said screws.

6. In a fork truck having a carriage mounted by rollers on upright channels for movement therealong, a side clearance adjuster comprising a roller supporting frame, side rollers rotatably mounted on said frame, adjusting screws abutting said frame and threaded through a portion of said carriage, said adjusting screws pro-

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viding for movement of said frame toward or away from said portion of said carriage when said adjusting screws are rotated, and locking screws passing through the carriage and threaded into said frame to lock said frame in position after said adjusting screws are in the desired position.

7. A carriage side clearance adjuster for controlling the side clearance between the carriage and the upright channels of a fork truck, said carriage having a portion extending adjacent the open side of one of said channels, a pair of side plates disposed within said one channel, spacer blocks secured between said side plates, shafts extending between said side plates, side rollers rotatably mounted on said shafts, said side rollers being adapted to roll against the web of said one channel, adjusting screws threaded through said portion of said carriage and abutting said spacer blocks, and locking screws passing through said portion of said carriage and threaded into said spacer blocks, said rollers being moved between said web of said one channel and said portion of said carriage to vary the distance between said rollers and said web when said adjusting screw are rotated, and said rollers being secured in position between said web and said portion of said carriage when said locking screws are tightened.

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