March 5, 1946. M. S. BOWEN 2,396,079

RESILIENTLY MOUNTED CONVEYER

Filed Jan. 22, 1944 3 Sheets-Sheet 1

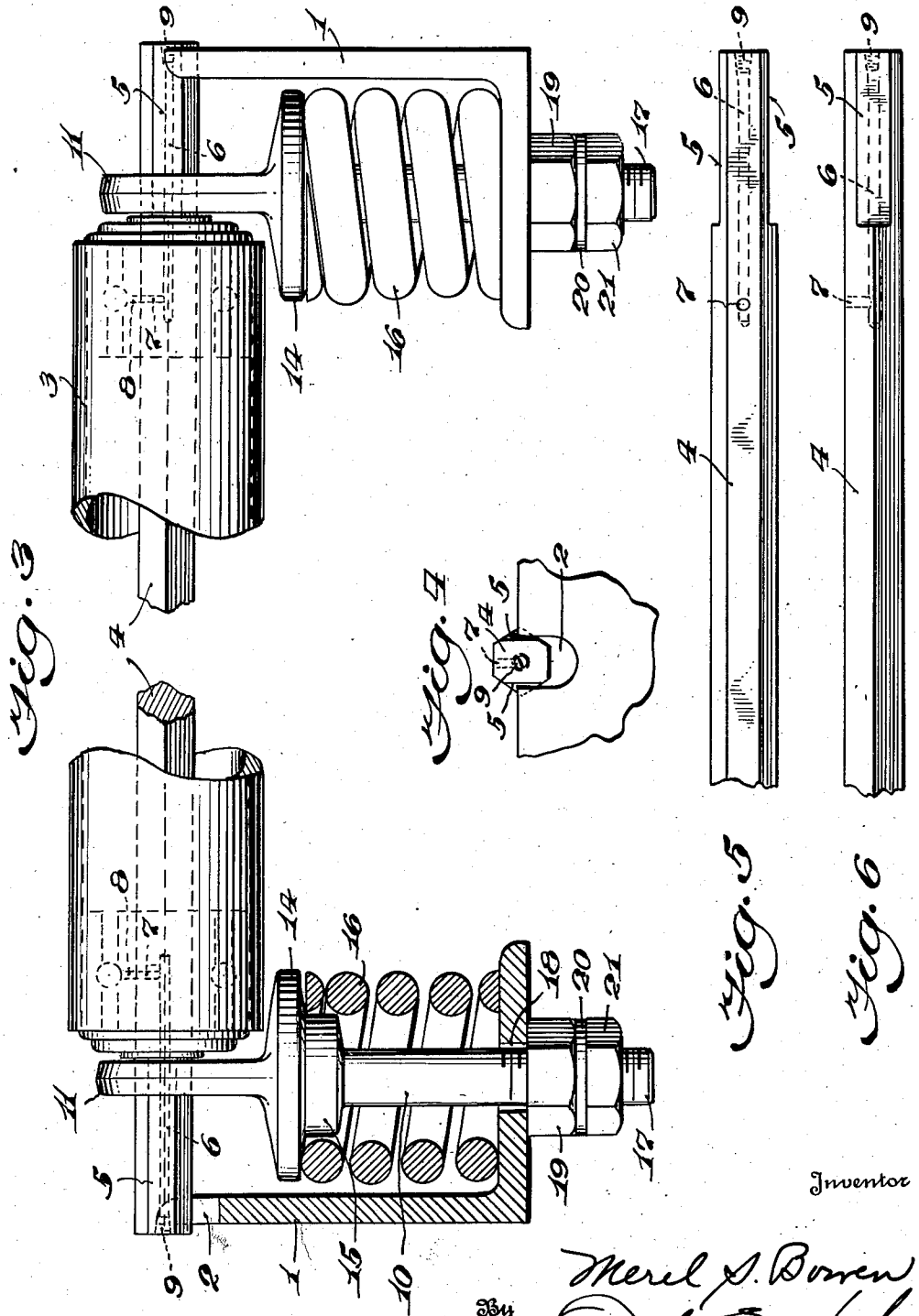


Fig. 3

Fig. 4

Fig. 5

Fig. 6

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Fig. 8

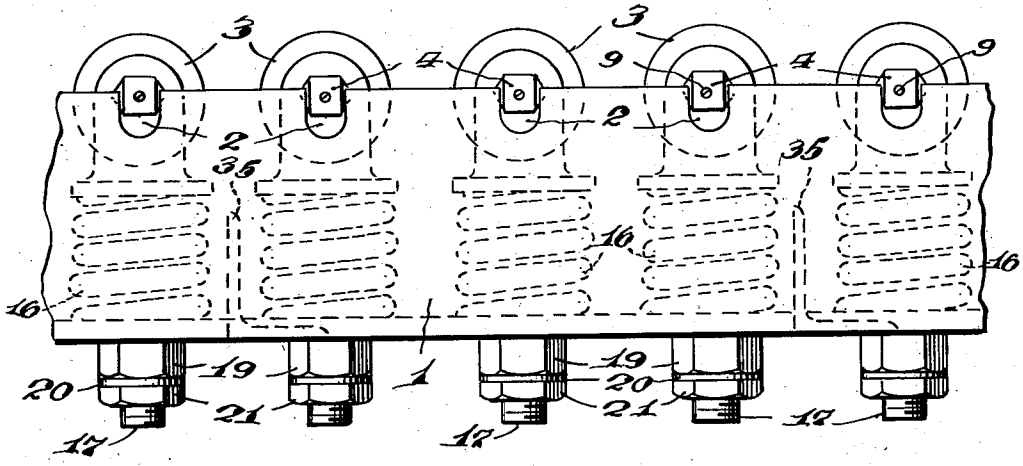


Fig. 9

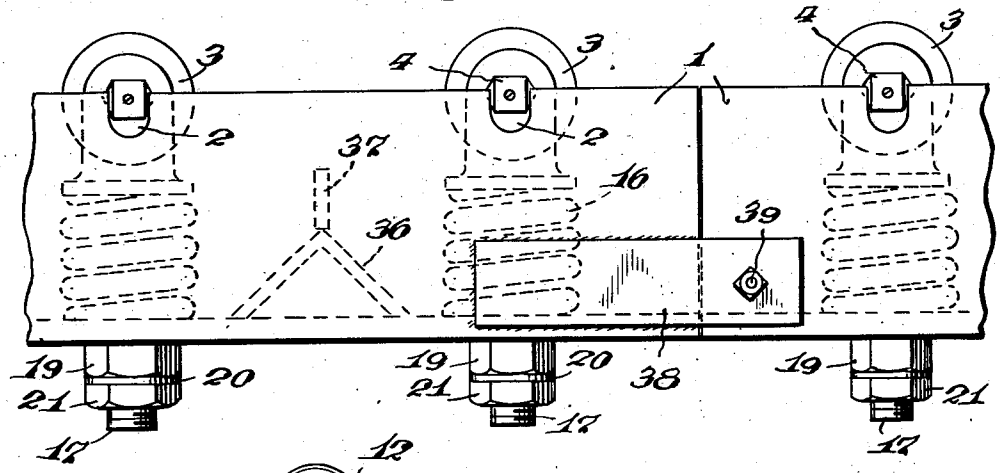
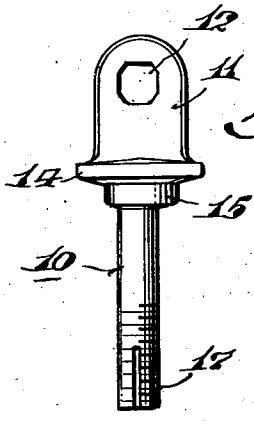


Fig. 7



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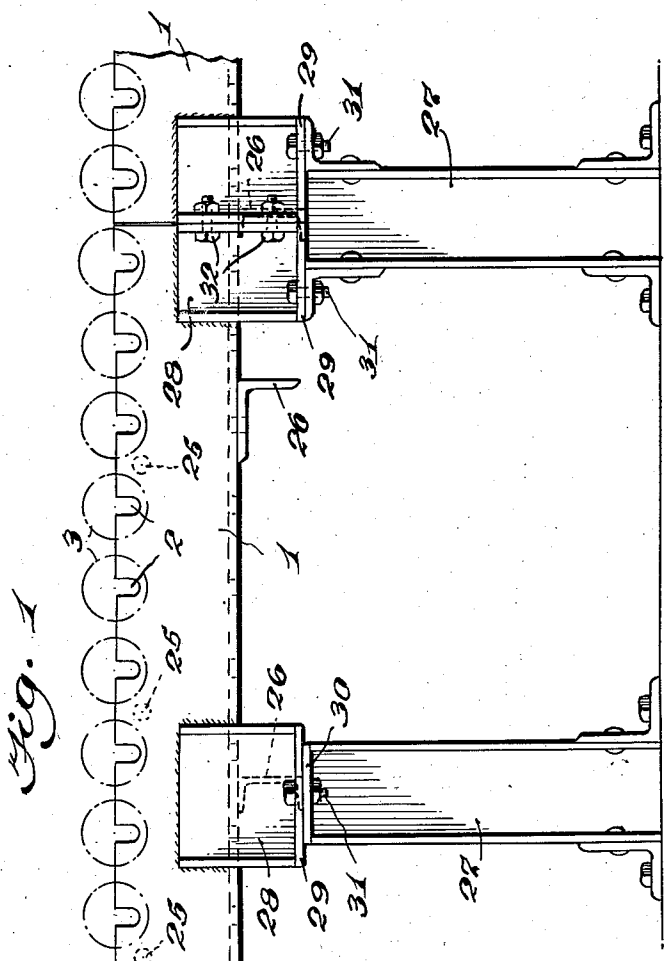


Fig. 1

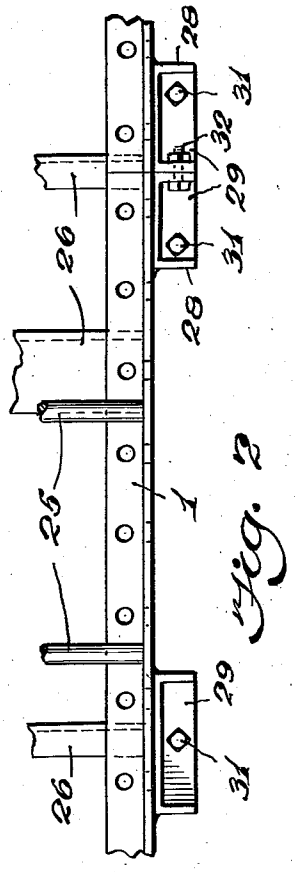


Fig. 2

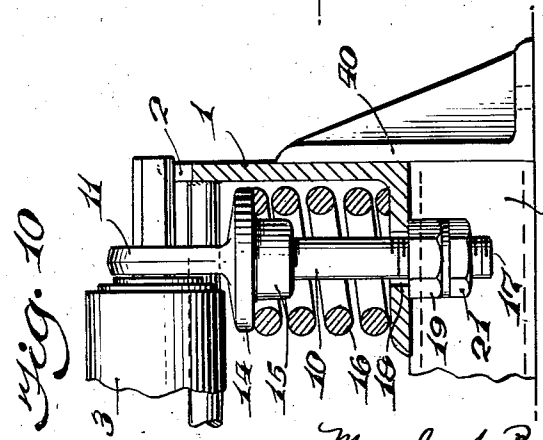


Fig. 10

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UNITED STATES PATENT OFFICE

2,396,079

RESILIENTLY MOUNTED CONVEYER

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Application January 22, 1944, Serial No. 519,359

3 Claims. (Cl. 193—35)

This invention relates to conveyers and has particular reference to resiliently mounted roller conveyers wherein the rollers are supported by springs and are movable with respect to the supporting frame.

The primary object of the present invention is to provide a novel form of construction for a spring mounted roller conveyer wherein the individual rollers are spring mounted in a single pair of side frame members, thereby reducing the overall height to a minimum and permitting the use of this type of conveyer in many places heretofore denied because of the increased height of resiliently mounted rollers over rigidly mounted rollers.

Another object is to provide a conveyer of this character which shall consist of relatively few parts that may be easily standardized so that individual installations requiring rollers of a definite length and spacing may be easily and quickly assembled from such parts.

Another object is to provide a novel form of construction of the aforesaid character which shall be readily adapted to curves in the conveyer line, thereby simplifying the construction and reducing the expense thereof.

A further object is to provide a spring mounted roller conveyer wherein the individual rollers shall be guided in their vertical movement by slots in the side rails, thereby eliminating lateral movement of the rollers and the tendency to vibrate laterally as a load passes thereover.

A still further object is to provide a spring mounted roller conveyer which shall be relatively simple in construction, easy to assemble, inexpensive to manufacture and which shall be relatively light in weight by reason of the reduced number of parts required.

With the foregoing and other objects in view, the invention may be stated to consist in the various novel features of construction and arrangement or combination, all of which will be fully described hereinafter and pointed out in the appended claims.

In the drawings accompanying and forming a part of this application,

Figure 1 is a fragmentary side elevation of a conveyer constructed in accordance with my invention, and showing the rollers on relatively close centers;

Figure 2 is a fragmentary top plan view thereof;

Figure 3 is a vertical sectional view thereof;

Figure 4 is a fragmentary detail view in side elevation illustrating an axle in a slot in a side frame;

Figures 5 and 6 are fragmentary views in top plan and side elevation respectively of an axle;

Figure 7 is a side elevation of one of the axle supporting members;

Figure 8 is a fragmentary side elevation of a modified form of conveyer frame wherein the rollers are on more widely spaced centers than that illustrated in Figure 1;

Figure 9 is a similar view showing the rollers on still more widely spaced centers and also illustrating a splice in the side rails; and

Figure 10 is a fragmentary transverse section of a conveyer adapted to rest directly upon a continuous support.

A conveyer constructed in accordance with my invention comprises a pair of side rails, 1, each in the form of an angle iron. As clearly shown in Figure 3, these angle irons are preferably arranged with their horizontal portions projecting toward each other so that the outer side walls of the rails will present a smooth surface. It is obvious, however, that they may be arranged in reverse position if desired.

Each side rail is punched or otherwise formed with vertically slotted cut-outs 2 on the axial center lines of the rollers 3. These cut-outs preferably intersect the top edge of the side rails and are adapted to receive roller axles 4 upon which the rollers 3 are journaled.

Referring to Figures 3, 4, 5 and 6, it will be noted that each roller may be formed from a suitable length of steel tubing having the ball-bearing assemblies pressed into each end thereof and the inner race formed with a hexagonal aperture through which the axle 4 projects. Diametrically opposite sides 5, 5 of each end of each axle are flattened and these flattened portions are adapted to engage in the aforementioned slotted cut-outs 2 with sufficient clearance to permit free vertical movement therein. Preferably each end of each axle is formed with a longitudinal bore 6 which intersects a transverse bore 7 that is aligned with a bore 8 in the inner race of each bearing so that lubricant may be introduced therein. A removable plug 9 normally closes the outer end of each bore 6 to keep dirt and other foreign material from entering the bearing.

The ends of each roller are supported by a pair of specially formed eye bolts indicated generally at 10. Referring to Figures 3 and 7, it will be noted that each eye bolt is formed with a vertical head 11 having opposed flat surfaces and an

aperture 12 which conforms to the cross-sectional area of the flattened end portions of an axle. The head 11 merges with an integrally formed circular collar 14 arranged normal to the head and formed with a skirt 15 of reduced diameter. This circular collar is adapted to overlie the top surface of a coil spring 16 interposed between the collar and the horizontal flange of a side rail 1, and the skirt 15 is adapted to fit within the convolutions of the spring as clearly illustrated in Figure 3. A threaded stem 17 projects from the skirt and extends through an aperture 18 formed in the horizontal flange of the side rail. This stem receives a nut 19 for placing the spring 16 under compression, a lock washer 20 and a lock nut 21. The degree of precompression of springs 16 depends, of course, upon the loads to be carried by the conveyer and the relative size of the parts.

Referring to Figures 1 and 2 wherein I have illustrated a conveyer having the rollers on relatively close centers, the side frames 1 are tied together by transversely disposed rods 25 welded or otherwise secured thereto, and angle irons 26 also welded at the bottom surfaces of the horizontal flanges of the side frames. The entire conveyer may be conveniently supported by a plurality of channel supports 27. Preferably a short section 28 of a channel member is welded at suitable intervals to the side frames and a plate 29 is welded across the bottom surface thereof. Similar plates 30 are welded to the tops of the channel supports 27 and a bolt and nut indicated at 31 secures the parts together. Where the side rails are to be spliced, as shown at the right hand end of Figures 1 and 2, a short section 28 is welded flush with each end of the abutting side rails 1, and the abutting flanges are bolted together as indicated at 32. The bolts 31 which secure the plates 29 to the support 27 are here shown as passing through angles 33 secured to the support.

In Figure 8, wherein the rollers are on more widely spaced centers than in Figure 1, the side frames are tied together with angle members 35 butt welded to the inner edges of the base flanges of the side rails, otherwise the construction may be similar to that shown in Figure 1.

In Figure 9, wherein the rollers are on still more widely spaced centers, the side rails may be tied together by transversely disposed angle members 36 arranged between adjacent rollers. These angle members are preferably arranged in inverted V position and are welded to the base flanges of the side rails. In addition, a transversely extending strip 37 is butt welded to each side flange of the side rails. In this figure, I have also illustrated a modified form of splice for the side rails 1 which consists in welding a plate 38 to the end portion of each side rail and bolting the overhanging portion of the plate to the abutting side rail as indicated at 39.

Where it is desirable to place the conveyer directly on the floor or other continuous support, I utilize the construction shown in Figure 10. This consists in providing suitable supports 40 which may be welded or otherwise secured to the side rails 1 in such position as to elevate the side rails a distance sufficient to permit the axle supporting members 10 to move freely without danger of the lower threaded end 17 striking the support. If desired, suitable transverse braces 41 may also be provided between the side rails at suitable intervals.

With the constructions thus described, it is obvious that the rollers and axles for various width conveyers may be made up in standard sizes, and that one size axle supporting member 10 will serve for various size conveyers. The side rails are punched at intervals depending upon the spacing of the rollers desired for a particular installation, after which the entire conveyer may be easily and quickly assembled.

It will also be noted that movement of the axles is confined to a vertical direction due to the engagement of the ends thereof in the slots 2. Hence, movement of heavy loads over the conveyer will not cause the rollers to move longitudinally of the conveyer with consequent vibration as they spring back to their normal position.

The use of the axle supporting members with the springs interposed between these members and the base flanges of the side rails eliminates sub frames and permits each roller to move vertically independently of the adjacent rollers. This provides a smoother ride or passage of irregular shaped articles over the conveyer and also greatly simplifies the construction and reduces to a minimum, the time required for assembly.

What I claim is:

1. A resiliently mounted roller conveyer comprising a pair of longitudinally disposed and transversely spaced side rails each having a vertical side flange and a base flange extending transversely therefrom, a plurality of roller supporting members having stems projecting downwardly from head portions through longitudinally spaced apertures formed in the base flanges of each of said side rails, bearing means carried by said head portions supporting transversely disposed rollers between pairs of said supporting members, resilient elements surrounding the stem portion of each of said supporting members between the head portions thereof and the base flanges to resiliently support said rollers on said side rails, fastening means on each of said stems below the base flanges arranged to engage said flanges for limiting upward movement of the supporting members and the rollers carried thereby, and projections extending oppositely from said bearing means into elongated slots formed in the side flanges of said side rails and vertically aligned with said apertures to guide vertical movement of said rollers.

2. A resiliently mounted roller conveyer comprising a pair of longitudinally disposed and transversely spaced side rails each having a vertical side flange and a base flange extending transversely therefrom, a plurality of roller supporting members having stems projecting downwardly from head portions through longitudinally spaced apertures formed in the base flanges of each of said side rails, bearing means carried by said head portions supporting transversely disposed rollers between pairs of said supporting members, a compression spring surrounding the stem portion of each of said supporting members between the head portions thereof and the base flanges to resiliently support said rollers on said side rails, fastening means on each of said stems below said base flanges to engage said flanges for limiting upward movement of the supporting members and the rollers carried thereby, and projections extending oppositely from said bearing means into open-ended elongated slots formed in the upper edges of the side flanges of said side rails and vertically aligned with said apertures to receive said projections and guide vertical movements of said rollers, said fastening means

being arranged to prevent movement of said projections out of said slots.

3. A resiliently mounted roller conveyer comprising a pair of longitudinally disposed and transversely spaced side rails each having a vertical side flange with a horizontal base flange extending transversely therefrom, a plurality of roller supporting members having stems projecting downwardly from head portions through longitudinally spaced apertures formed in the base flange of each of said side rails, transversely disposed axles carried by the head portions of pairs of said supporting members, rollers journaled on each of said axles between said pairs of supporting members, a compression spring surrounding the stem portion of each of said supporting members between the head portion thereof and the base flanges to resiliently support said axles and the rollers thereon, and fastening means on each of said stems below the base flanges to engage said flanges for limiting upward movement of the supporting members and the rollers carried thereby, said axles extending oppositely into elongated slots formed in the side flanges of said side rails and vertically aligned with said apertures to guide vertical movements of said rollers but restrain longitudinal movement thereof.

MEREL S. BOWEN.