Dec. 5, 1939. S. EGGLESTON 2,182,756

ROLLER CONVEYER

Filed July 28, 1938

Fig. 1

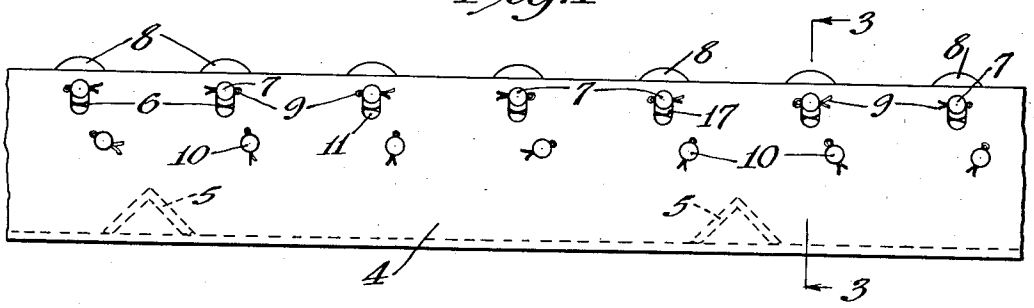


Fig. 2

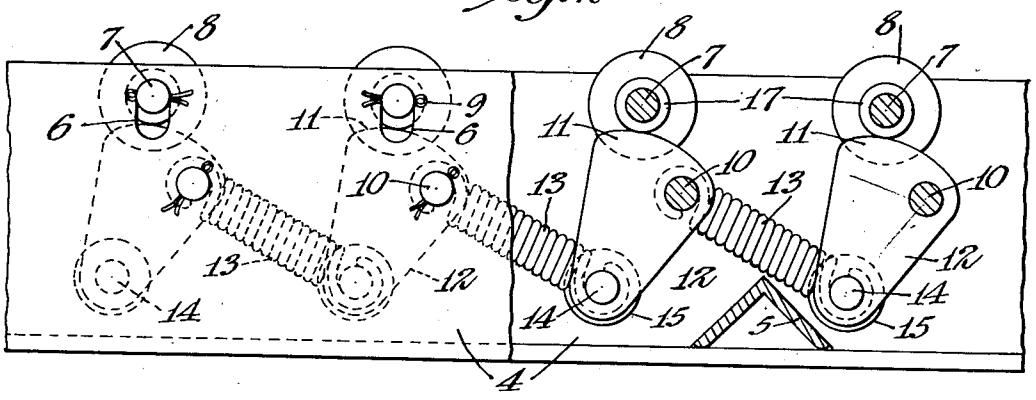
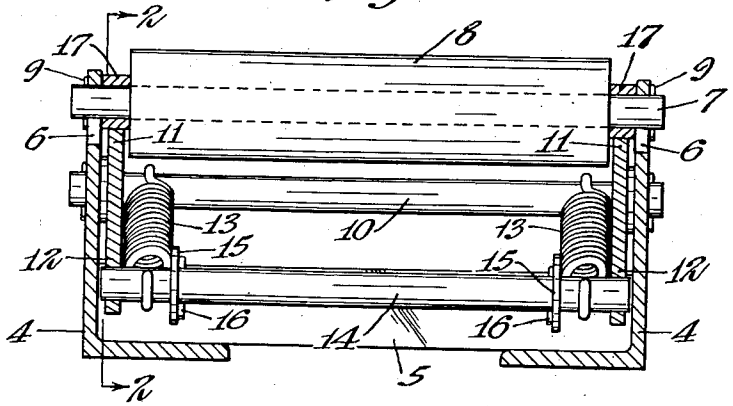


Fig. 3



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ROLLER CONVEYER

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Application July 28, 1938, Serial No. 221,803

8 Claims. (Cl. 193—35)

This invention relates to a roller conveyer of the general character described in my co-pending application, Serial No. 218,624, filed July 11, 1938.

It is an object of this invention to provide a roller conveyer with a novel arrangement of resilient and independently movable supports for the rollers whereby movement of heavy loads having uneven riding surfaces is facilitated and the rollers are protected against damage from overloads and impact.

A particular object is to provide conveyer rollers which are individually movable substantially vertically and normally held in a predetermined elevated position by a novel arrangement of springs and levers whereby the force of the springs is exerted on the levers at an angle to the direction of movement of the rollers and with substantial mechanical advantage over the load.

Other objects are to provide a conveyer along which the loads may be moved with equal facility in either direction; to reduce the weight of the springs required to support heavy loads, and to render the conveyer unusually compact and neat in appearance by novel mechanism for transmitting a predetermined fractional part of the total load from the rollers to the springs for restraining deflection of the rollers.

Referring to the accompanying drawing:

Figure 1 is a side elevation of my improved roller conveyer;

Fig. 2 is a part side elevation on an enlarged scale and part vertical section taken on the line 2—2 of Fig. 3, and

Fig. 3 is a vertical cross section taken on the line 3—3 of Fig. 1.

The conveyer has a frame comprising spaced, parallel side members 4 extending longitudinally of the conveyer and rigidly connected together by cross members 5. The members 4 are angle bars formed with vertically elongated slots 6 near their upper edges to receive and confine horizontal shafts 7 for supporting conveyer rollers 8. The rollers 8 are freely revoluble on the shafts 7 and the ends of the shafts project from the outer faces of the members 4 and are confined against longitudinal movement by cotter keys 9. These cotter keys project from suitable perforations in the ends of the shafts. Each of the shafts 7 is movable vertically within the limits of a pair of the slots 6 and is normally held at the upper extremity of these slots by a pair of levers pivoted on a horizontal shaft 10. Each lever has a laterally projecting portion or arm 11 for supporting a roller and a downwardly projecting arm 12 connected to a spring 13 by a horizontal rod 14. The shafts 10 are parallel to the shafts 7 and project in a similar manner from perforations in the frame members 4, being held in place by cotter keys.

Each of the rods 14 is movably supported on the lower extremities of a pair of the lever arms 12 and has a pair of the springs 13 connected respectively to its ends. An end of each spring 13 is confined between one of the lever arms 12 and a large washer 15, the latter being held against movement away from the spring by a cotter key 16 projecting from a perforation in the rod, as best shown in Fig. 3. The opposite end of each spring is fixed relative to the frame by bending the end coil about the shaft 10 for supporting an adjacent pair of the levers. The upper surface of each lever arm 11 is a cam surface engaging and supporting a sleeve 17 which is freely revoluble on the shaft 7 between the end of the roller and frame member 4.

The lever arms 11 are substantially shorter than the arms 12 so that the springs 13 have a substantial mechanical advantage over the load applied to the lever arms 11. The springs 13 are normally completely retracted while the roller supporting shafts 7 are held at the upper extremities of the slots 6. As best shown in Fig. 2 each spring 13 is formed with the several convolutions tightly contracted one against another so that there is no deflection or extension of the spring until a load of a predetermined substantial magnitude is applied thereto. Heavy loads are usually supported on two or more of the rollers 8 and may be moved freely along the conveyer in either direction. When the load on any particular roller exceeds a predetermined magnitude, ordinarily called the rated capacity of the roller, the roller is deflected downward from its elevated position in the slots 6. This causes one or both of the springs 13 supporting the roller to be elongated, an increment of the load being transmitted through the connected lever arms 11 and 12 to cause the levers to pivot about their supporting shaft 10 while the anti-friction sleeves 17 ride on the cam surfaces of the arms 11.

By this arrangement movement of heavy loads having uneven riding surfaces is facilitated and unusually smooth operation results. Any unevenness or projection on the riding surface of a load which would have a tendency to overload a particular roller or obstruct the movement of the load causes the roller encountered to be deflected downwardly so that the projection can-

not damage the roller or materially interfere with the movement of the load along the conveyer. My arrangement of angularly disposed lever arms further makes it possible to extend the relatively long, light springs substantially longitudinally of the conveyer and to locate these springs within the space defined by the planes through the upper and lower edges of the side frame members or rails so that an unusually compact and neat conveyer is afforded.

It will be evident that the capacity of the rollers to sustain loads is affected by the stiffness and lengths of the springs 13 and the direction in which the force of these springs is applied, and these elements may be changed to meet the various conditions found in practice. The degree of mechanical advantage of the springs over the load may also be varied between wide limits by suitable changes in the angle between the arms 11 and 12, or in the relative lengths of said arms, or in the form of the cam surfaces of the arms 11 on which the rollers are supported, or two or more of these controlling elements may be changed within the scope of my invention as defined in the appended claims.

Having described my invention, what I claim as new and desire to protect by Letters Patent is:

1. In a roller conveyer, a frame having spaced side members, a roller extending between said members and movable substantially vertically relative to the frame, a lever pivotally connected to said frame and having a laterally projecting arm for supporting said roller and a downwardly projecting arm to be actuated, and resilient means engaging said downwardly projecting arm to maintain said roller in elevated position.

2. In a roller conveyer, a frame having spaced side members, a roller extending between said members and movable substantially vertically relative to the frame, means limiting the upward movement of said roller relative to the frame, a lever pivotally connected to said frame and having an arm supporting said roller in a plane offset horizontally from the pivotal axis of said lever and a second, relatively long, arm projecting at an angle to said first mentioned arm, and resilient means engaging said relatively long arm to normally maintain said roller at the upper limit of its movement and permitting downward deflection of said roller under loads of predetermined magnitude.

3. In a roller conveyer, a frame, a roller support, means guiding said support for limited, substantially vertical movement relative to said frame, a roller revolubly mounted on said support, a lever pivotally connected to said frame and having a laterally projecting arm operatively engaging said support and a relatively long arm projecting at an angle to said first mentioned arm, the axis of said roller being offset longitudinally of the conveyer from the pivotal axis of said lever, and resilient means connected to the free extremity of said relatively long arm to raise said support and roller toward the upper limit of movement relative to the frame.

4. In a roller conveyer, a frame, a roller support, means guiding said support for limited, substantially vertical movement relative to the frame, a roller revolubly mounted on said support, a lever pivotally connected to said frame and having a laterally projecting arm operatively engaging said support, the axis of said roller being offset longitudinally of the conveyer from the pivotal axis of said lever, and a coiled spring actuating said lever to raise said support and roller and extending substantially longitudinally of the conveyer.

5. In a roller conveyer, a frame having spaced, parallel side members, a roller support extending substantially horizontally between said side members, means guiding said support for limited, substantially vertical movement relative to the frame, a roller revolubly mounted on said support, a lever pivotally connected to said frame and having a laterally projecting cam surface operatively engaging said support, the axis of said roller being offset substantially horizontally from the pivotal axis of said lever, and resilient means for actuating said lever to raise said support and roller.

6. In a roller conveyer, a frame having spaced side members, a roller shaft extending substantially horizontally across said side members and movable substantially vertically relative to the same, a roller carried by said shaft, a pair of levers pivotally connected to said frame members respectively and having arms projecting in substantially parallel relation to each other from their pivotal axes, said shaft being supported on said arms, and resilient means for actuating said levers to raise said shaft and roller relative to the frame.

7. In a roller conveyer, a frame having spaced side members, a roller shaft extending substantially horizontally across said side members and movable substantially vertically relative to the same, a roller mounted on said shaft, a pair of levers pivotally connected to said frame members respectively and having arms projecting in substantially parallel relation to each other and from their pivotal axes, said arms having cam surfaces supporting said shaft, and resilient means for actuating said levers to raise said shaft and roller.

8. In a roller conveyer, a frame having spaced side members, a roller shaft extending substantially horizontally between said side members, said members having vertically elongated guide slots confining the ends of said shaft, a roller mounted on said shaft, a pair of levers pivotally connected to said frame members respectively and having arms projecting in substantially parallel relation to each other from their pivotal axes, said shaft being supported on said arms, and resilient means for actuating said levers to raise said shaft toward the upper extremity of said slots.

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