July 12, 1927. 1,635,276

G. M. JOHNSON

CHAIN RAIL CAR CONVEYER

Filed Aug. 22, 1924 2 Sheets-Sheet 1

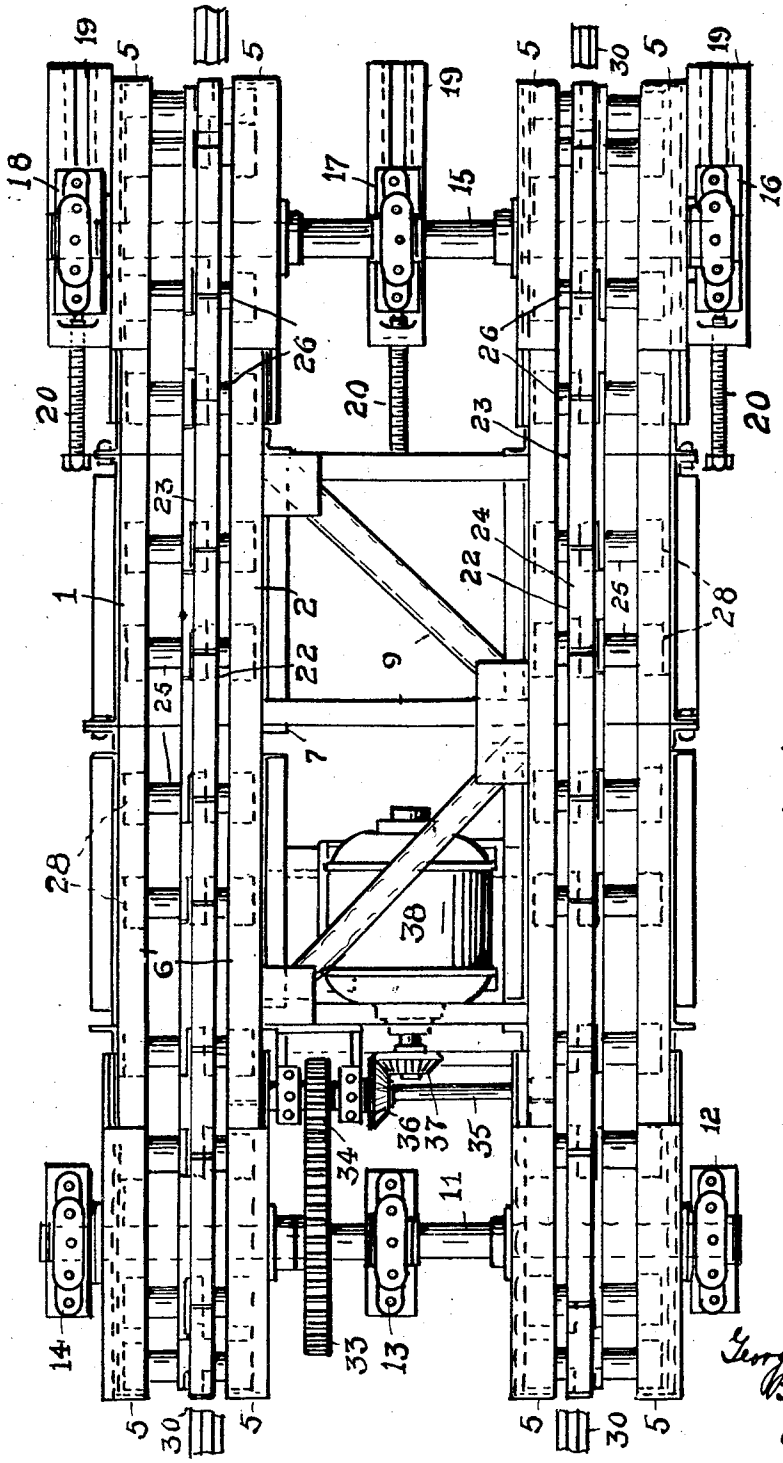


Fig. 1

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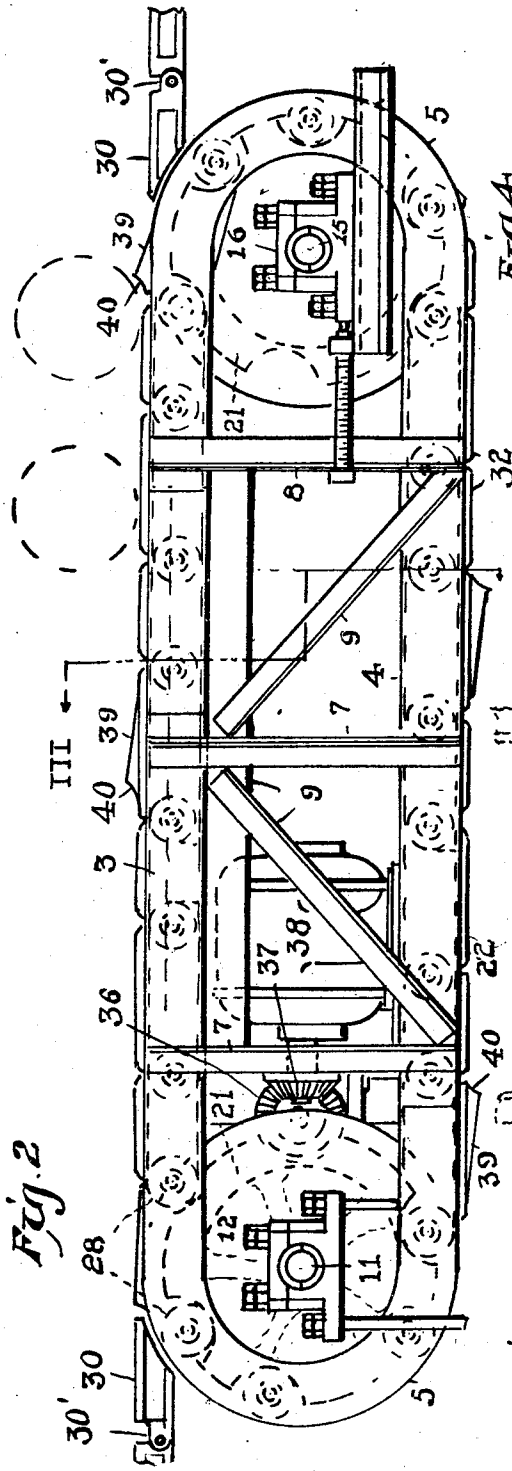


Fig. 2

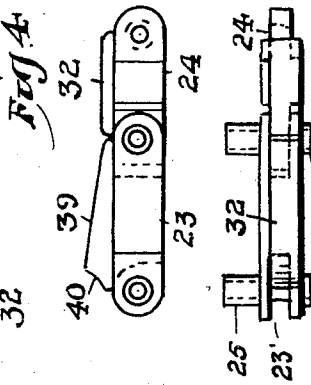


Fig. 4

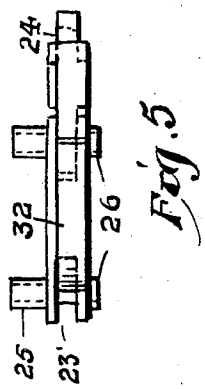


Fig. 5

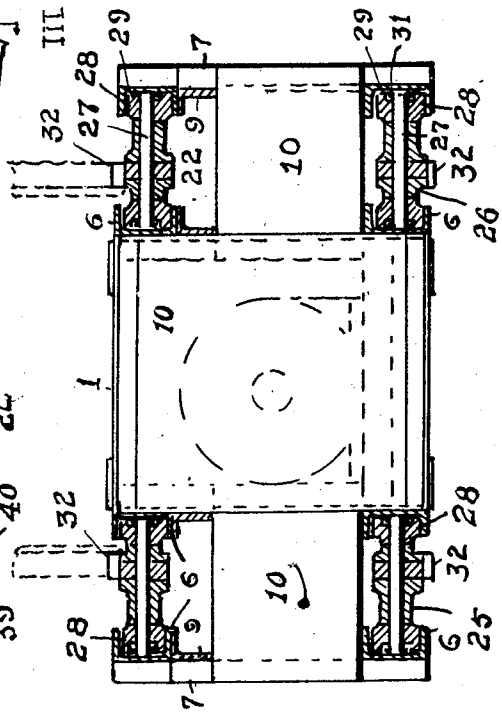


Fig. 3

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Patented July 12, 1927. 1,635,276

UNITED STATES PATENT OFFICE.

GEORGE M. JOHNSON, OF JEANNETTE, PENNSYLVANIA, ASSIGNOR TO FORT PITT MINE EQUIPMENT COMPANY, OF JEANNETTE, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

CHAIN RAIL-CAR CONVEYER.

Application filed August 22, 1924. Serial No. 733,528.

This invention relates to chain rail car conveyers and while primarily intended for use in connection with car haulage in mining industries, it will be obvious that the device may be adapted to the operation of certain amusement apparatus, to facilitate and expedite railroad operations, or for any other purposes wherein it is found to be applicable.

The primary object of my invention is to provide a device of the type described, which virtually constitutes a travelling section of track providing controlled propulsion to a car or train of cars, particularly on grades, by the engagement of the cars on their passage thereover.

Further objects of my invention are to provide a conveyer of the character stated, in a manner as hereinafter set forth, which provides a safe means for transferring cars from a lower to a higher plane or from a higher to a lower plane, or from one point to another without liability of damage to the car, its mechanism or to the structure bearing the car; which will propel cars from one point to another without the use of a track locomotive or other independent driving mechanism; which is self-contained having its driving motor arranged and situated within the limitation of the haul structure; which is reliable and positive in its action, and which requires no special car attachments for engagement therewith.

Still further objects of the invention are to provide a device of the class specified which is simple in its construction and arrangement, strong, durable and efficient in its use, and comparatively inexpensive to manufacture, install, operate and maintain.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the detail of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention hereinafter disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

In the drawing forming a portion of this specification and wherein like numerals of reference designate corresponding parts throughout the several views:—

Figure 1 is a top plan view of a chain rail car conveyer in accordance with my invention.

Figure 2 is a side elevation thereof.

Figure 3 is a sectional view on line III—III, Figure 2.

Figure 4 is a side view of a pair of associated track links.

Figure 5 is a top plan view thereof.

Referring in detail to the drawing the car conveyer comprises two pairs of chain rail supporting guides, one pair of which extends along one side of the apparatus while the other pair extends along the other side of the apparatus. The outer supporting guide of each pair of supporting guides is indicated at 1 and the inner supporting guide of each pair of supporting guides is indicated at 2.

Each of the supporting guides 1 and 2 is constructed to provide a continuous member and consists of a longitudinal upper portion 3 and a lower portion 4 of the same length. The portions 3 and 4, of each of the supporting guides 1 and 2, are spaced from and extend parallel relatively to each other, and the adjacent ends thereof are connected together by respective curvilinear portions 5.

The supporting guides 1 and 2 are preferably constructed from structural steel channels, and the flanges 6 of the latter are disposed to extend toward each other in each pair of supporting guides, as clearly illustrated in Figure 3, of the drawing. The inner flanges of the curvilinear portion 5, of each of the supporting guides 1 and 2, is removed for the purpose to be described.

The supporting guides 1 and 2 of each pair of guides are spaced from each other and are fixed to extend parallel relatively to each other. The pair of supporting guides, disposed at one side of the apparatus, are also arranged to extend parallel with respect to the pair of supporting guides disposed at the other side of the apparatus.

All of the supporting guides 1 and 2 are rigidly braced, and fixedly connected together by a suitable frame structure consisting of a plurality of vertical, diagonal and horizontal braces and plates, indicated

at 7, 8, 9 and 10, respectively, in a manner to assure absolute rigidity to all stationary parts of the structure.

A horizontally extending drive shaft 11, disposed concentrically relatively to the curvilinear portions 5 of the forward ends of the supporting guides 1 and 2, is rotatably supported in the bearings 12, 13 and 14. The bearings 12 and 14 are positioned at respective ends of the drive shaft 11 outwardly of the outer supporting guides 1, and the bearing 13 is preferably disposed centrally of the drive shaft 11 intermediate of the inner supporting guides 2.

A horizontally extending shaft 15, disposed concentrically relatively to the curvilinear portions 5 of the rear ends of the supporting guides 1 and 2, is rotatably supported in the bearings 16, 17 and 18. The bearings 16 and 18 are positioned at respective ends of the shaft 15 outwardly of the outer supporting guides 1, and the bearing 17 is preferably disposed centrally of the shaft 15 intermediate of the inner supporting guides 2. Each of the bearings 16, 17 and 18 is shiftably mounted on a bearing block 19 and is adjustable on the latter by means of an adjusting screw 20, as clearly shown in Figure 1, of the drawing.

Four large sprocket wheels 21 are fixedly mounted on each of the shafts 11 and 15 to turn therewith. Each of the sprocket wheels 21 is preferably of a width commensurate to the width of the supporting guide flanges 6.

The inner flanges of the curvilinear portions 5 of the supporting guides 1 and 2 being removed, each of the sprocket wheels 21 on respective shafts 11 and 15, is positioned in close proximity to an opposed face of an associated pair of supporting guides 1 and 2, and is of a diameter to position the periphery thereof in close proximity to the inner face of the outer flange of the curvilinear portion 5 of respective supporting guides 1 and 2. In other words, each of the curvilinear portions 5 of the supporting guides 1 and 2, is positioned adjacent to a sprocket wheel 21 with the flange 6 of the former overlapping the periphery of the latter.

A track rail forming element comprising an endless chain 22, consisting of a plurality of alternately disposed elongated bifurcated links 23 and comparatively short tenoned links 24, is mounted for movement in each pair of supporting guides 1 and 2. Each bifurcated end 23′ of the elongated links 23 is integrally formed with a laterally disposed long hub 25 on its outer side face, and with an aligned laterally disposed short hub 26 on its inner side face. The tenon ends 24′ of the short links 24 interengage the bifurcated ends 23′ of adjacent elongated links 23 and are pivotally connected together by means of link pins 27. The latter extend through the short link tenon ends 24, through the elongated link bifurcated ends 23′, and through the associated hubs 25 and 26.

A roller 28 is rotatably mounted on each end of the link pin 27, and is of a diameter commensurate to the distance between the flanges 6, of the channel supporting guides 1 and 2, between which it is positioned and operates.

The outer face of each of the rollers 28 is formed with a recess 29. In an associated pair of rollers 28, the recesses 29 formed therein, are adapted for the reception of the link pin projections and the cotter pins 31 extending therethrough. This arrangement permits of the assembly of the endless chain 22 with the outer faces of the rollers 28 in close proximity to the respective opposed guide of the associated pair of supporting guides 1 and 2, and prevents the lateral movement of the chain 22 when positioned and operating in the latter.

The chain 22 extends around the sprocket wheels 21 and the peripheral contour of the latter is such that the chain rollers 28 will be engaged and carried thereby during the travel of the chain during the operation of the apparatus.

The top of each of the chain links 23 and 24 is provided with an integrally formed longitudinally extending rail head 32. When the links 23 and 24 are in the assembled position to form the endless chain 22, the rail heads 32 thereof will extend in longitudinal alignment relatively to each other, and in combination form a length of track rail adapted to receive the wheel of a car.

A large driving gear 33 is fixed to the drive shaft 11 and meshes with the reduction gear 34 which latter is fixed to the horizontally disposed shaft 35. The shaft 35 is suitably journaled for rotation in the frame structure of the apparatus and further carries a fixed bevel gear 36 which latter is in mesh with the bevel gear 37 mounted on the drive motor 38. The drive motor 38 is suitably supported in position within the limitations of the frame structure of the apparatus, thereby obviating the necessity of a separate installation in providing a driving medium for the apparatus.

The apparatus is adapted to be installed in a rail track and is positioned so that the rail heads 32 of respective chains 22 are properly aligned with the rail track approaches between which the apparatus is installed. It will be apparent that it may be necessary to provide an excavation for properly positioning the apparatus and that the latter may either be supported on a suitable foundation or suspended from some suitable structure.

It will be noted that the chains 22 are

carried by the link rollers 28 which are supported and rotate between the flanges 6 of the respective supporting guides 1 and 2, whereby the path of travel of the link rollers 28 is definitely determined and fixed.

By providing the elongated link 23 with the hubs 25 and 26, the tendency of the chain 22 to overturn and bind when carrying a load is entirely eliminated.

The rail heads of certain of the elongated links 23 are provided with projections 39 which are formed at their forward ends with curved recesses 40. The projections 39 are designed for engaging the car wheels, which seat in the recesses 40, and prevent the rearward movement of the car when the latter is being carried forwardly by the operation of the endless rail chains 22. By this arrangement no special car attachment for engagement by the chains 22, for the purpose above stated, is required, and a positive and substantial engagement, capable of propelling any load is established.

By the operation of my conveyer apparatus, cars may be safely conveyed from a lower to a higher plane or vice versa or may be utilized for providing propulsion to a train of connected cars. The action of the traveling chain rails will pick up a car from the track approaches 30 at one end of the device, transport the same along the distance occupied by the apparatus itself, and safely deposit the car on the track approaches 30 abutting to the other end of the apparatus.

The track approaches 30 are hingedly connected, as indicated at 30′, to respective track rails, to allow the free ends thereof to shift upwardly when engaged by the projections 39 during the travel of the chain 22. The track approaches 30 will return to the normal position by gravity after the passage of any links formed with the projection 39.

When the apparatus is installed in a grade of the rail track, the operation of the device in one direction will convey the cars along the grade from a lower to a higher plane, while its operation in the reverse direction will retard and control the movement of the cars when conveying the latter from a higher to a lower plane.

The endless chain 22 is provided with alternately disposed elongated links 23 and short links 24, instead of links of the same construction in order to reduce the height of the apparatus, as links of greater length would necessarily require a sprocket wheel of greater diameter to permit of their travel around the latter.

What I claim is:

1. A conveyer for the purpose set forth comprising a pair of parallel disposed endless track rails, supporting means therefor, operating means providing for the travel of said track rails, each of said track rails consisting of a plurality of alternately disposed elongated bifurcated links and short tenoned links pivotally connected together, and rotatable means carried by said rails and engaging said supporting means to facilitate the travel of said rail therein.

2. A conveyer for the purpose set forth comprising a pair of parallel disposed endless track rails, supporting means therefor, operating means providing for the travel of said track rails, each of said track rails consisting of a plurality of alternately disposed elongated bifurcated links and short tenoned links, each end of said bifurcated links formed with a pair of laterally disposed hubs, link pins for pivotally connecting said bifurcated and tenoned links together and extending through said hubs, and rotatable means carried by said pins and engaging said supporting means to facilitate the travel of the said links therein.

3. A conveyer for the purpose set forth comprising a pair of parallel disposed endless track rails, supporting means therefor, operating means providing for the travel of said track rails, each of said track rails consisting of a plurality of alternately disposed elongated bifurcated links and short tenoned links pivotally connected together, and rotatable means carried by said rails and engaging said supporting means to facilitate the travel of said rail therein, certain of said links being provided with recessed projections, substantially as described and for the purpose set forth.

4. A conveyer for the purpose set forth comprising a pair of parallel disposed endless track rails, supporting means therefor, operating means providing for the travel of said track rails, each of said track rails consisting of a plurality of alternately disposed elongated bifurcated links and short tenoned links, each end of said bifurcated links formed with a pair of laterally disposed hubs, link pins for pivotally connecting said bifurcated and tenoned links together and extending through said hubs, and rotatable means carried by said pins and engaging said supporting means to facilitate the travel of the said links therein.

5. A conveyer for the purpose set forth comprising a pair of parallel disposed endless track rails, supporting means therefor, operating means providing for the travel of said track rails, each of said track rails consisting of a plurality of alternately disposed bifurcated links and intermediate links pivotally connected together, and rotatable means carried by said rails and engaging said supporting means to facilitate the travel of said rail therein.

6. A conveyer for the purpose set forth comprising a pair of parallel disposed endless track rails, supporting means therefor,

operating means providing for the travel of said track rails, each of said track rails consisting of a plurality of alternately disposed bifurcated links and intermediate links pivotally connected together, and rotatable means carried by said rails and engaging said supporting means to facilitate the travel of said rail therein, certain of said links being provided with recessed projections, substantially as described and for the purpose set forth.

7. A conveyer comprising a pair of laterally spaced parallel chains, each composed of a plurality of links whose adjacent ends are connected by a single pin on the ends of which rollers are mounted, and each provided with a rail head mounted in end-to-end relation with the rail head of an adjacent link, and a guide-way for said rollers, to prevent lateral movement of the chains in vertical and horizontal planes.

8. Conveyer structure comprising a pair of parallel chains mounted in laterally spaced relation, and composed of a plurality of links, the adjacent ends of which are connected by a single pin and each of which is provided with a rail head that cooperates with the rail heads of associated links to form a substantially continuous movable track, and means for supporting the links against lateral movement during travel thereof along one flight of the conveyer.

9. Conveyer structure for cars having flanged wheels, comprising a pair of laterally spaced parallel chains, each composed of a plurality of links, and a rail head on each link that cooperates with the rail heads of associated links to form a substantially continuous movable track, the rail heads on each chain being spaced laterally of the rail heads on the other chain, a distance equal to the gage of the car wheels.

10. Transfer apparatus for flange-wheeled cars, comprising in combination with a fixed track rail, a conveyer composed of links each of which is provided with a rail head mounted in end-to-end relation with the heads of associated links, and means for maintaining the rail heads in approximately longitudinal alinement with the said fixed rail while said heads are moving along one flight of the conveyer.

11. Transfer apparatus for flanged wheeled cars, comprising the combination with a pair of fixed track rails, of a conveyer composed of two chains, each of which is mounted in approximately longitudinal alinement with one of the fixed rails, and each composed of links having rail head sections mounted in end-to-end relation with the heads of associated links, and a pair of sprocket wheels for driving the chains, each of the fixed rails extending to a point above one of the sprocket wheels, and terminating adjacent to the point of commencement of that chain flight which is in longitudinal alinement therewith.

In testimony whereof I affix my signature.

GEORGE M. JOHNSON.