

April 26, 1960

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2,934,383

CRAWLER TYPE ASSEMBLY WITH SELF STABILIZING FRAME

Filed Jan. 22, 1958

2 Sheets-Sheet 1

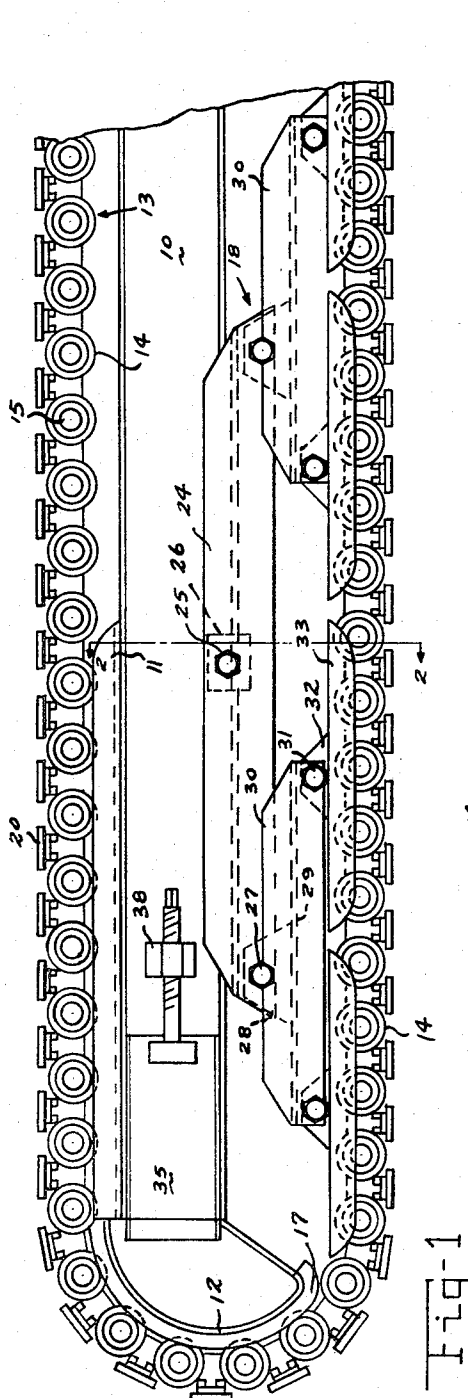


Fig-1

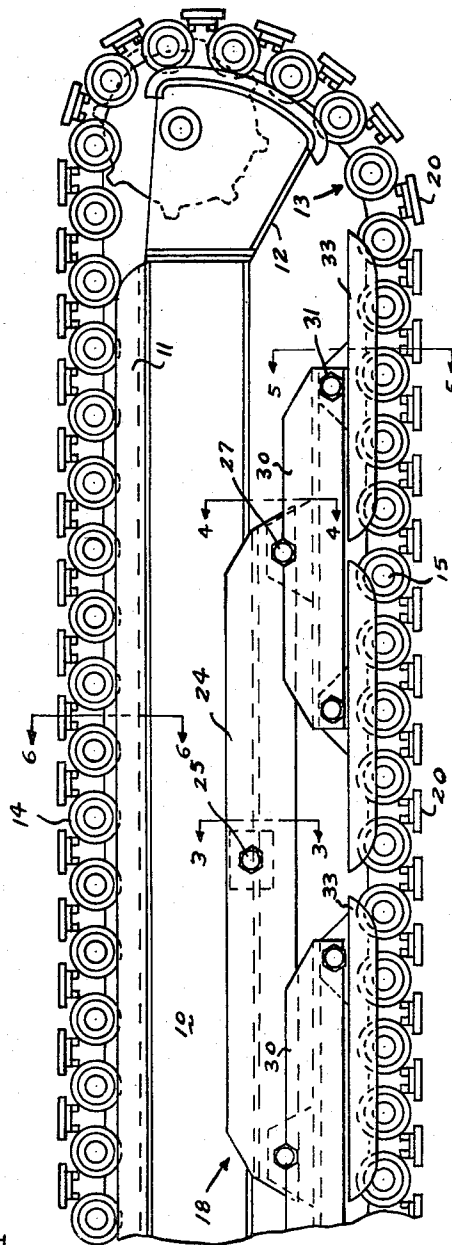


Fig-1a

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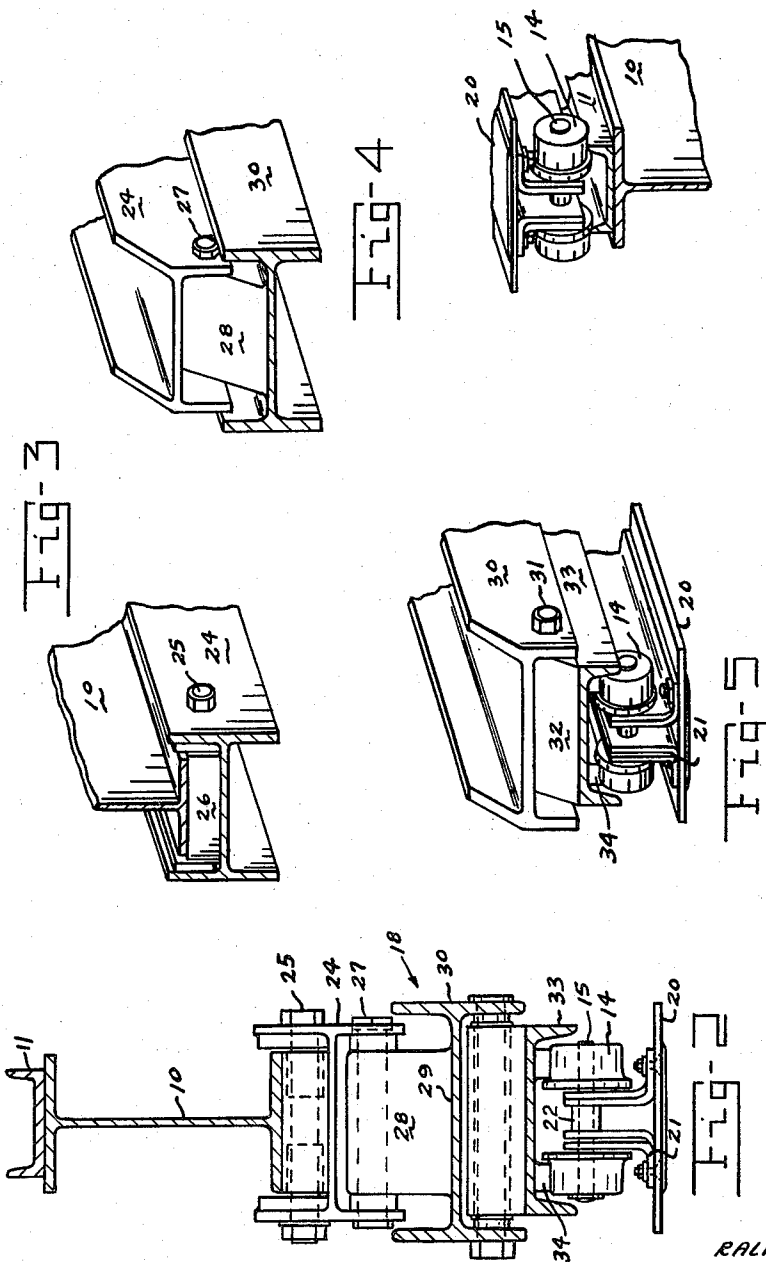
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CRAWLER TYPE ASSEMBLY WITH SELF STABILIZING FRAME

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Application January 22, 1958, Serial No. 710,457

2 Claims. (Cl. 305-4)

This invention relates to crawler type tracks and more particularly to an improved track having a flexible frame which causes it to be self-stabilizing. While crawler tracks are applicable to various vehicles or platforms, the invention will be particularly described herein with reference to grading and paving equipment. However, it will be readily apparent that the application of the invention is not so limited, nor is such intended.

Crawler tracks of the prior art are provided with substantially rigid frames with the result that movements of the tracks over irregular surfaces are abruptly and directly reflected to and through the frame to structure supported thereby. This causes unbalance, severe load on the tracks, and shock transmission to and through the frame.

The invention apparatus is particularly advantageous in application to highway grading or paving units which generally mount a strike off bar to extend transversely of the road to be paved. Heretofore, these units have been supported on rigid type straight line crawler tracks respectively disposed in specially provided trenches to either side of the stretch of highway to be paved. The bottoms of these trenches have surface irregularities which are directly reflected to the strike off bar as the rigid type tracks move along the trenches. This naturally introduces irregularities in the surface being worked, generally causing undulations in the nature of long waves. While the surfaces may be generally within the limits of specifications, long waves in the highway pavements render them dangerous to drive on at high speeds. It is noted that even a careful finish of the paved surface with straight edges does not remove the long waves though the surface may be modified to come within the range of straight edge specifications.

The present invention was primarily developed to effect a flexible self-stabilizing type of crawler track to eliminate the long waves introduced by the rigid type track in grading and paving operations. Embodiment of the invention is relatively simple and the movement of the flexible frame crawler track over a projection or obstruction in the terrain provides a successive reduction of the load applied within the body of the track frame so as to render it self-stabilizing. Accordingly, the structure supported and carried by these track units is relatively stabilized and free of shock. Improved road surfaces obtain thereby which increase the safety factor in driving over the concrete or asphalt pavements at relatively high speeds.

The object of the invention is to simplify the construction as well as the means and mode of operation crawler type track, whereby such track may not only be economically manufactured, but will be more efficient and satisfactory in use, adaptable to a wide variety of applications, and be unlikely to get out of order.

Another object of the invention is to provide a crawler type track of a non-rigid nature.

A further object of the invention is to provide a flex-

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ible frame for crawler tracks particularly applicable to paving and grading equipment to afford improved traction and load support therefor and maximum paving or grading efficiency.

5 An additional object of the invention is to provide an improved crawler type track having a flexible frame that will accommodate and adjust to abrupt surface irregularities in a resilient shock absorbing fashion.

10 Another object of the invention is to provide an improved crawler type track possessing the advantageous structural features, the inherent meritorious characteristics, and the mode of operation and application herein described.

15 With the above and other incidental objects in view as will more fully appear in the specification, the invention intended to be protected by Letters Patent consists of the features of construction, the parts and combinations thereof, and the mode of operation as hereinafter described or illustrated in the accompanying drawings, or their equivalents.

Referring to the accompanying drawings wherein is shown one but obviously not necessarily the only form of embodiment of the invention.

25 Figs. 1 and 1a jointly present a side elevation of an improved crawler track in accordance with the invention;

Fig. 2 is a cross-sectional view taken on line 2-2 of Fig. 1;

30 Fig. 3 is a fragmentary perspective view taken on line 3-3 of Fig. 1a;

Fig. 4 is a cross-sectional view in perspective taken on line 4-4 of Fig. 1a;

35 Fig. 5 is a cross-sectional view in perspective taken along line 5-5 of Fig. 1a; and

Fig. 6 is a fragmentary perspective view taken along line 6-6 of Fig. 1a.

Like parts are indicated by similar characters of reference throughout the several views.

40 The invention can be best described with reference to the drawings. The track assembly illustrated includes a longitudinally extending I-shaped carriage beam 10 which has channel shaped guides 11 fixed to its uppermost surface and arcuate channel sections 12 connected at its respective extremities. A continuous link belt chain 45 13 having outside rollers 14 rotatably mounted on its hinge pins 15 is disposed about the frame sections 10, 11 and 12 in continuous fashion to have its upper run mounted so that its outside rollers ride on the externally projecting parallel sides of the channel members 11. The rollers 14 are provided with inside flanges 16 to maintain the guided relation of the link belt to the carriage beam during its upper run. Parallel tracks 17 are externally applied to the arcuate end frame sections 12 to similarly mount and contain the outer rollers on the continuous link belts 13.

50 Stabilizing hinge assemblies 18 are pivotally connected to the undersurface of the carriage beam 10 at points identically spaced inwardly from its respective extremities. These hinge assemblies 18 are interposed between the carriage beam and the lower run of the endless chain 13 to effect a jointed flexible frame assembly. Track pads 20 are connected by right angled brackets 21 in pivotal relation to successive hinge pins 15 of the link belt immediately inwardly of the links thereof. Spacers 60 22 on the hinge pins 15 maintain the spacing of the brackets 21 thereon. An endless jointed flexible track is thus provided externally of the frame assembly.

70 The respective hinge assemblies 18 which depend in balancing positions to either end of the carriage beam 10 include an H-beam 24, the upper legs of which are centrally bridged by a pivot pin 25 mounted in bearings

26 connected transversely of the undersurface of the carriage beam 10. The depending leg portions of the H-beam 24, at its respective extremities, are bridged by hinge pins 27 centrally and pivotally supporting bearing blocks 28 fixed to the bridging elements 29 of relatively shorter H-beams 30, intermediate their extremities. This arrangement provides a pair of longitudinally spaced H-beams 24 in hinged relation to the undersurface of the carriage beam 10 with relatively shorter H-beams 30 hingedly connected to their respective extremities.

The depending extremities of each H-beam 30 are respectively bridged by a hinge pin 31 centrally and pivotally mounting a hinge block 32 fixed centrally and externally of the base of a relatively short channel member 33. The channel members 33 are disposed to have their parallel sides mutually depend and nest the outside rollers 14 of the link belt 13 at its lower run, the rollers 14 riding on parallel tracks 34 fixed to the undersurface of the base elements of the channel members 33 so their inner flange portions are laterally contained for positive control in guiding of the endless link belt and connected pads 20.

The arcuate guide 12 to one end of the carriage beam 10 has a plate extension 35 slidably related to the end of the carriage beam 10 to which it is mounted. As schematically shown in Fig. 1 of the drawings, a threaded bolt and nut connection 38 is provided between the plate 35 and the beam 10 for longitudinal adjustment thereof in a relative sense to enable a simple mounting and tensioning of the link belt 13 to suit the required application of the track assembly. Mounted to the arcuate frame section 12 to the other end of the carriage beam 10 is a drive sprocket 36 having a suitable drive means connected therewith which is not shown since it is not pertinent to the present invention.

The function of the flexible self-stabilizing frame in the improved crawler type track assembly as provided herein may be illustrated in application to a paving unit. The track assemblies are mounted to either side of the paving equipment to support its movement in the paving operation. As has been described previously herein, this equipment will include a transverse strike off bar supported intermediately of the track assemblies while the track assemblies run in trenches to either side of the strip to be paved. The surface of the trench is naturally irregular. When the tracks move forward under the influence of the drive sprockets and encounter an obstruction which may be an inch in height, for example, in the embodiment illustrated the forward portion of the lower run of the endless track provided by the link belt 13 and connected pads 20 will rise one inch at the forward extremity of the advance guide channel member 33. Due to the hinged connection of this guide channel section 33 to the hinge pin 31, a fulcrum point will derive at the following end of the channel section which will raise the midpoint thereof at the pin 31 approximately one-half inch. This, in turn, raises the hinge pin 27 one-quarter inch and since the pivotally connected beam 24 is centrally connected by the hinge pin 25 to the carriage beam 10, the hinge point 25 will raise one-eighth inch. Since the hinge assemblies 18 are equi-distantly disposed from the center of the carriage beam, the movement of the hinge point 25 will cause the raising of the carriage beam only one-sixteenth of an inch at its center which would define the position of the strike off bar in the example illustrated. Thus, the effect of the obstruction, in this instance, is reduced to one-sixteenth of its original effect by the time it is translated through the hinge assembly 18 to the striking bar supported by the track assemblies. As the endless track moves on, the obstruction is met by successive track portions guided in successive channel sections 33 and the effects thereof will be similarly absorbed and diminished as reflected from the lower run of the track through the various hinge

points to the carriage beam. In no instance will the reflection of the obstruction to the supported body be more than one-eighth the initially applied distortion in the embodiment illustrated. The latter will occur in the instance when the obstruction is under the hinge point 31 and should be readily obvious from inspection of the drawings. The structure presented provides a completely balanced relationship which disposes the frame elements in normally substantially parallel, relatively hinged relation to adapt to and accommodate any impact or distortion of the track and reduce it to a minimum.

It may be readily seen thereby that when crawler tracks with flexible frames are employed to lend mobility to a transverse strike off bar for leveling a concrete or asphalt highway, irregularities encountered by the crawler tracks will be absorbed and the reflected effects thereof substantially reduced in transmission to the strike off bar. The advantages of the crawler type tracks with flexible frames are believed readily apparent irrespective of their application. Wherever the invention crawler tracks are employed, whether directed to supporting grading and paving equipment or simply to lend mobility to vehicles which are required to move over irregular terrain, the supported structure will be constantly stabilized and subject to a minimum stress and strain in its movements.

From the above description it will be apparent that there is thus provided a device of the character described possessing the particular features of advantage before enumerated as desirable, but which obviously is susceptible of modification in its form, proportions, detail construction and arrangement of parts without departing from the principle involved or sacrificing any of its advantages.

While in order to comply with the statute the invention has been described in language more or less specific as to structural features, it is to be understood that the invention is not limited to the specific features shown, but that the means and construction herein disclosed comprise but one of several modes of putting the invention into effect, and the invention is therefore claimed in any of its forms or modifications within the legitimate and valid scope of the appended claims.

Having thus described my invention, I claim:

1. A crawler type track assembly including, an endless track, a relatively rigid frame member for supporting the upper run of said endless track, means on said relatively rigid frame member for driving said endless track; means having a single pivot connection to said relatively rigid frame member intermediate its extremities and guide shoes respectively freely pivotally connected with the respective extremities of said means having the single pivot connection and forming support means for at least a portion of the lower run of said track means.

2. A crawler type track assembly including, a longitudinally extending rigid frame member having arcuate extremities, an endless track means mounted in continuous relation about said frame member and supported thereby at its upper run, longitudinally spaced beams pivotally connected at their centers to the lower extremity of said frame, relatively shorter beams pivotally connected in depending relation to the respective extremities of the first mentioned beams and spaced shoes pivotally connected to the respective extremities of said relatively shorter beams and providing flexible guides for the lower run of said endless track means.

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