Nov. 25, 1930. K. BERGER 1,782,528

HOISTING AND HAULING CARRIAGE FOR USE ON ELEVATED TRACKWAYS

Filed July 23, 1929 2 Sheets-Sheet 1

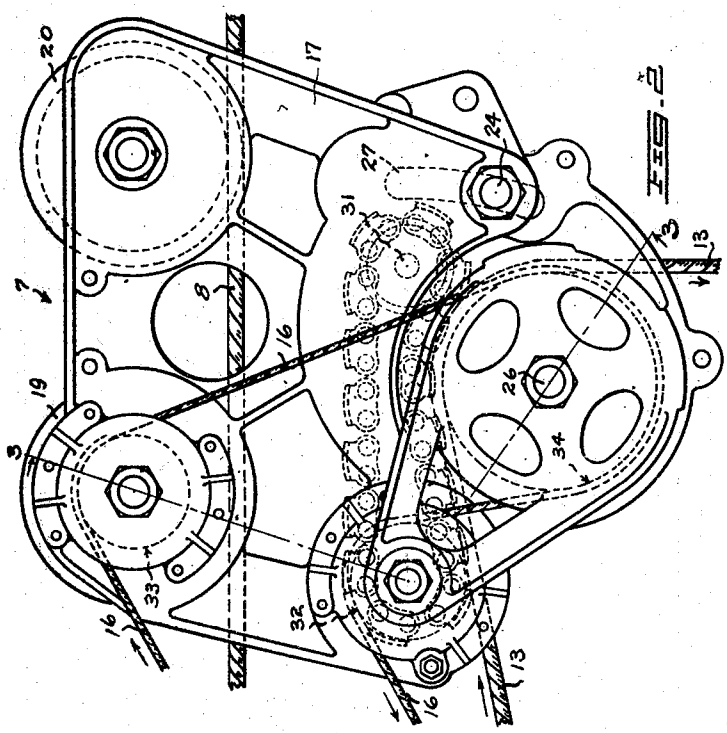


FIG. 2

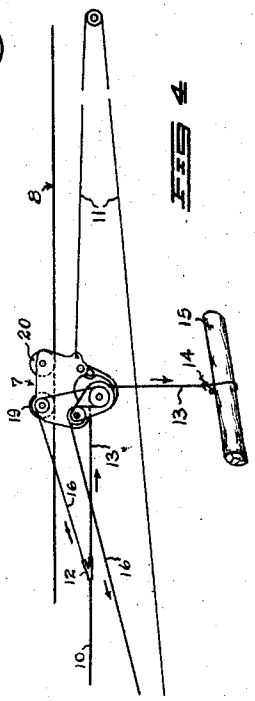


FIG 4

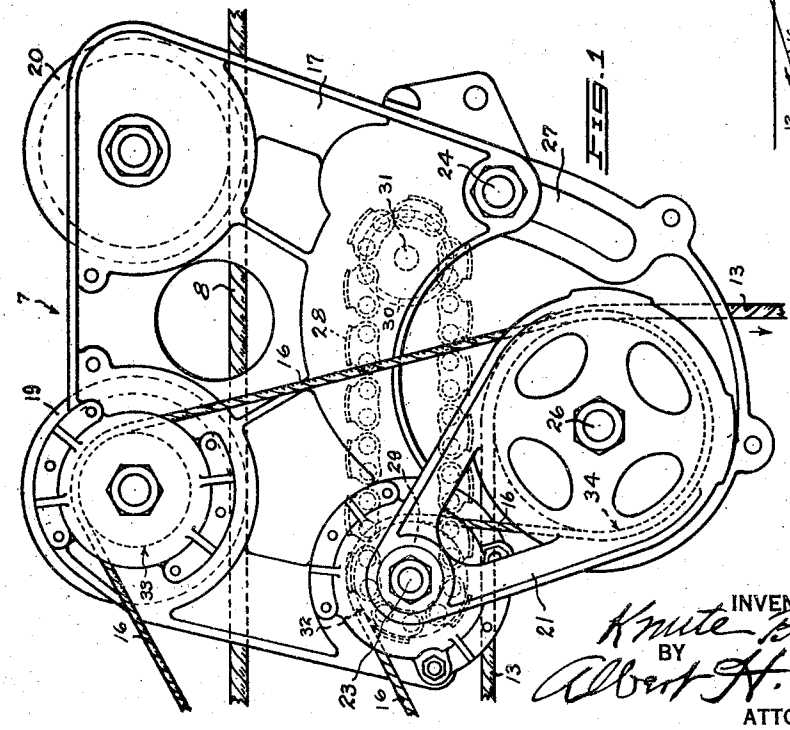


FIG. 1

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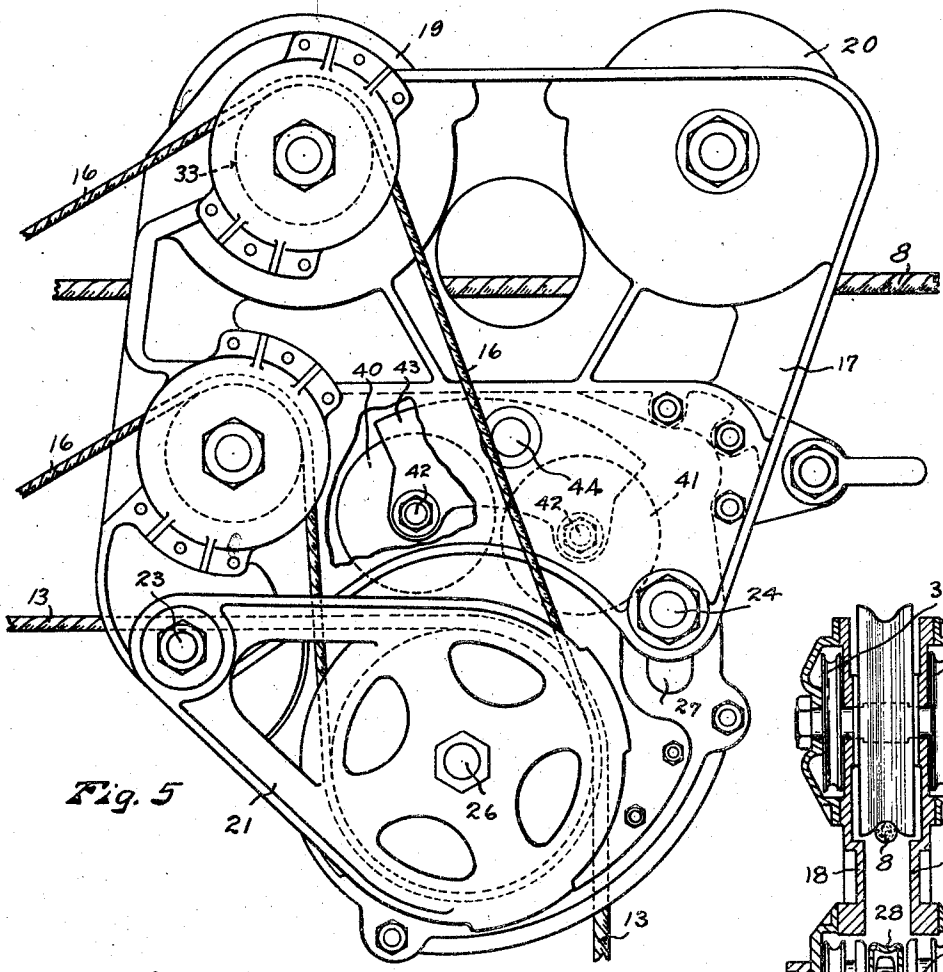


Fig. 5

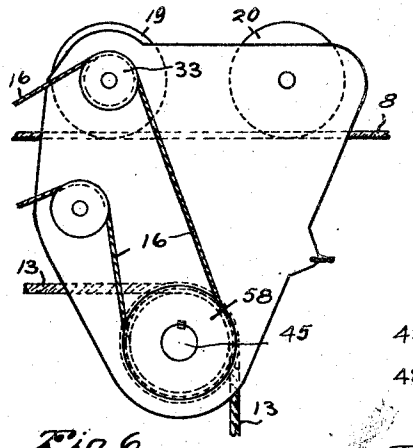


Fig. 6

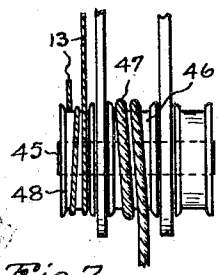


Fig. 7

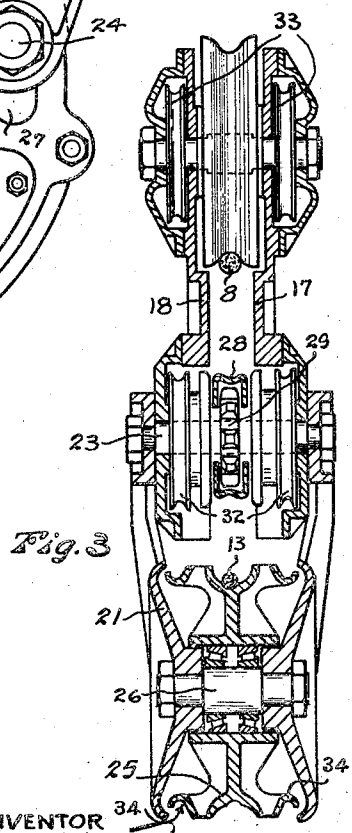


Fig. 3

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UNITED STATES PATENT OFFICE

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HOISTING AND HAULING CARRIAGE FOR USE ON ELEVATED TRACKWAYS

Application filed July 23, 1929. Serial No. 380,330.

My invention relates to improvements in hoisting and hauling carriages for use on elevated trackways and the general object of my invention is to provide a carriage of this nature which is equipped with positively driven means for winding down or lowering the load carrying end of the hoisting line, hereinafter termed the tong line.

A more specific object is to provide hoisting and hauling carriage mechanism of this nature in which a slack pulling line is used for operating the mechanism by which the load carrying end of the tong line is lowered.

A further specific object is to provide apparatus of this nature in which the sheave over which the tong line passes is positively driven by the slack pulling line and in which means are provided for holding the tong line firmly in engagement with the sheave over which it passes during the time a pull is being exerted on the slack pulling line, thus insuring that the load carrying end of said tong line will be lowered when the hauling line is slackened.

Other and more specific objects will be apparent from the following description taken in connection with the accompanying drawings.

My invention is shown as applied to a logging carriage adapted to run on an elevated track cable of the form commonly termed a sky line, said carriage having the usual hauling line and tong line together with a haul back line and a slack pulling line, but it will be understood that the invention may be utilized in other forms of hoisting and hauling apparatus.

In the accompanying drawings Figure 1 is a side elevation of a hoisting and hauling carriage constructed in accordance with my invention showing the tong line sheave lowered into the position it will occupy at all times except when the slack pulling line is taut and in use.

Fig. 2 is a similar view showing the position the tong line sheave will occupy when the slack pulling line is drawn taut and is being wound in.

Fig. 3 is a sectional view substantially on broken line 3, 3 of Fig. 2.

Fig. 4 is a diagrammatic elevation illustrating the operation of my carriage.

Fig. 5 is an elevation of a slightly modified form of carriage in which rollers are provided for holding the tong line in engagement with its sheave instead of the driven link belt shown in Figs. 1 and 2.

Fig. 6 is a side elevation of another modified form of the invention in which the tong line and the slack pulling line are both wound one or more complete turns about sheaves which are rigidly connected with each other.

Fig. 7 is a fragmentary elevation of parts of the carriage shown in Fig. 6.

Like reference numerals designate like parts throughout the drawings.

Before describing the specific construction of my carriage I will describe briefly the arrangement of a well known form of hoisting and hauling system of which it forms a part and which is the same as the system diagrammatically shown in Fig. 4. Referring to said Fig. 4, the numeral 7 designates a carriage which is supported for movement along an elevated track cable 8 and is arranged to be moved in one direction by a hauling line 10 and in the opposite direction by a haul back line 11. The hauling line 10 is connected, at the location of a swivel 12, with a tong line 13 which passes over a suitable sheave in the carriage and drops downwardly therefrom, said tong line usually being provided on its downwardly hanging end with means, as a hook or hooks 14, by which it may be attached to a load, as to a log 15. For the purpose of pulling the hauling line toward the carriage to slacken the tong line and allow the hooks 14 to drop down, I provide a slack pulling line 16 which extends from the swivel 12 over one or more sheaves in the carriage as hereinafter specifically described and thence outwardly, preferably to the same source of power with which the hauling line and the haul back line are connected. This source of power, not shown, may be a logging engine located near one end of the track cable. With apparatus of this nature the hooks 14 on the lower end of the tong line 13 are drawn up against the carriage while said carriage is being moved outwardly by the haul back line

to a location where a load is to be picked up. When it is desired to lower the load carrying end of the tong line 13 a pull is exerted on the slack pulling line 16 to slacken the tong line for the purpose of allowing the load carrying end of said tong line to descend by gravity. It has been found, however, that often the end of this tong line which carries the hooks 14 will not drop down but will stay up against the carriage until some action is taken to pull it down or to otherwise assist it in coming down. This limits the length of the tong line which may be permitted between the swivel and the carriage and further causes much unnecessary trouble and labor and often results in an expensive loss of time for an entire crew. In accordance with my present invention I overcome this objection by providing means whereby the slack pulling line will actually and forcibly lower the load carrying end of the tong line at the same time it is pulling a slack into said tong line.

In accordance with my invention as disclosed in Figs. 1 to 4 inclusive the carriage 7 is constructed of two side plates 17 and 18 rigidly secured together in parallel spaced apart relation and having two track sheaves 19 and 20 mounted between their upper portions and adapted to run on the track cable 8. A movable sheave frame 21 is secured by a pivot bolt 23 and another bolt 24 to the lower portion of the carriage frame and has a tong line sheave 25, see Fig. 3, rotatably mounted therein on a bearing pin 26, the tong line 13 passing over said sheave 25. The bolt 24 passes through a slot 27 in the sheave frame 21. This slot 27 is curved with the bolt 23 as a center and said slot permits a substantial amount of movement of said sheave frame. Disposed directly above the tong line sheave 25 is a link belt 28 in which the links are transversely concave to fit the curvature of the tong line, see Fig. 3, said tong line being adapted to be pressed against said links, as hereinafter described, when the slack pulling line is being wound in. The link belt 28 is mounted on two sprocket wheels 29 and 30, the sprocket wheel 29 being rotatable on the bolt 23 and the sprocket wheel 30 being mounted on a bearing pin or bolt 31 in the frame. The sprocket wheel 29 is integral with, or rigidly secured to, sheaves 32 over one of which the slack pulling line 16 passes, so that when the sheaves 32 are turned by movement of the slack pulling line the sprocket wheel 30 will be turned therewith and the link belt 28 driven. The slack pulling line 16 extends from the swivel 12 over one of two sheaves 33 on the upper portion of the carriage, thence downwardly under and around one of two sheaves 34 which are rigidly connected with the tong line sheave 25 and thence upwardly over one of the two sheaves 32 and outwardly to the source of power. By this arrangement the slack pulling line 16 is caused to drive both the tong line sheave 25 and the link belt 28 and at the same time said slack pulling line is passed under and around the sheave 34 that is integral with or rigidly secured to the tong line sheave 25 in such a manner that when tension is exerted on the slack pulling line the frame 21 will be raised and the tong line 13 will be pressed against the driven link belt 28. If the slack pulling line is wound in or drawn in the direction indicated by the arrows the tong line will be driven both by the tong line sheave 25 and the link belt 28 and the load carrying end of said tong line will be wound down or lowered.

Sheaves 32 and 33 and 34 are preferably in duplicate on both sides of the carriage so that the slack pulling line may be placed on either side of the carriage which may be most convenient, it being understood that only one slack pulling line is ordinarily used. The sheaves 34 and 25 are substantially the same size so that the lines 13 and 16 will move at the same speed.

In the operation of this invention, it is apparent that the slack pulling line and the tong line, being connected with each other by the swivel 12 will ordinarily move at the same speed and in the same direction. When the carriage is being hauled out by the haul back line 11, preparatory to picking up a load, the hooks 14 on the outer end of the tong line 13 will usually be drawn up against the carriage. When it is desired to lower said hooks a pull is exerted on the slack pulling lines 16 tending to draw the swivel 12 toward the carriage. The tightening of the slack pulling line lifts the sheave frame 21 until the tong line 13 on the top of sheave 25 is caused to engage with and press against the link belt 28. Further movement of the slack pulling line 16 drives both the link belt 28 and the tong line sheave 25 in the correct direction to wind down and lower the load carrying end of the tong line.

In Fig. 5, I have disclosed a modification of my invention in which the means for pressing the tong line against the tong line sheave when the slack pulling line is being wound in, is in the nature of two rollers 40 and 41 mounted on pivots 42 within a block 43 which is supported on a fulcrum 44 so that the two rollers are self adjusting to the tong line. The other parts of the carriage may be substantially identical with those shown and described in connection with the preceding figures and the method of connection of the same with the track cable 8, the hauling line 10, the tong line 13, the slack pulling line 16, and the haul back line 11 may be substantially the same.

In the operation of this form of the invention, the slack pulling line 16, passes downwardly and around the sheave 34 in a manner previously described so that when a pull is

exerted on the slack pulling line the tong line sheave will be rotated and, at the same time, will be lifted to bring the tong line into contact with the rollers 40 and 41 which will press the tong line against the driven tong line sheave thus preventing slippage of the tong line on its sheave and causing the load carrying end of said tong line to be wound down and lowered.

In all forms of the invention in which the movable sheave frame is used, the slack pulling line will lift the sheave frame easily when no load is carried on the tong line but as soon as a load is made fast to the lower end of the tong line and a pull exerted thereon the sheave frame will be moved downwardly and the tong line will be clear of the link belt 28 or other equivalent means even though a tension is maintained on the slack pulling line. This prevents needless friction and wear of the tong line and sheave.

In Figs. 6 and 7, I have shown another modified form of the invention in which the pivot or axle 45 of the tong line sheave 46 is not movable but is supported in a fixed part of the carriage. In this form, the tong line 13 is wound one or more turns around the tong line sheave, as indicated at 47, in Fig. 7 and the slack pulling line 16 is also preferably wound one or more turns about its sheave 48 so that neither of said lines will slip on their respective sheaves. When the slack pulling line is wound in the tong line sheave will be rotated and the load carrying end of the tong line will be lowered.

The foregoing description and accompanying drawings clearly disclose a preferred embodiment of my invention but it will be understood that this disclosure is merely illustrative and that such changes in the invention may be made as are fairly within the scope and spirit of the following claims.

I claim:

1. In apparatus of the class described, a carriage having a plurality of sheaves therein, two of which are upon the same axis and are connected to rotate together, vertically-movable means for connecting said two last-named sheaves to the carriage to permit them to have a rising and falling movement, one of the other of said sheaves being located in a higher plane than the said last-named two, a hauling line, a tong line leading over one of said connected-together sheaves, a slack pulling line passing around the other of said connected-together sheaves and up and around said higher sheave, said two last-named lines being connected to the hauling line at a point comparatively near said carriage, and movable means mounted in said carriage in position to be frictionally engaged by said tong line when said connected-together sheaves are moved toward said means.

2. In apparatus of the class described, a carriage having a plurality of sheaves therein, two of which are upon the same axis and are connected to rotate together, vertically-movable means for connecting said two last-named sheaves to the carriage to permit them to have a rising and falling movement, one of the other of said sheaves being located in a higher plane than the said last-named two, a hauling line, a tong line leading over one of said connected-together sheaves, a slack pulling line passing around the other of said connected-together sheaves and up and around said higher sheave, said two last-named lines being connected to the hauling line at a point comparatively near said carriage, and flexibly mounted means in said carriage in position to frictionally engage said tong line when said connected-together sheaves are moved toward said means.

3. In apparatus of the class described, a carriage having a plurality of sheaves therein, two of which are upon the same axis and are connected to rotate together, vertically-movable means for connecting said two last-named sheaves to the carriage to permit them to have a rising and falling movement, one of the other of said sheaves being located in a higher plane than the last-named two, a hauling line, a tong line leading over one of said connected-together sheaves, a slack pulling line passing around the other of said connected-together sheaves and up and around said higher sheave, said two last-named lines being connected to the hauling line at a point comparatively near said carriage, and flexibly mounted means in said carriage in position to be frictionally engaged with said tong line at a plurality of points when said connected-together sheaves are moved toward said means.

4. In apparatus of the class described, a carriage having a sheave frame pivotally connected therewith, two coaxial sheaves connected together and mounted in said frame, a tong line leading over one of said sheaves, a slack pulling line leading under and around said other sheave, a third sheave journaled in said carriage in a higher plane than the pivot of said sheave frame and over which said slack pulling line leads whereby a pull on such slack pulling line will turn the sheave frame on its pivot to raise the sheaves carried thereby, a hauling line with which both the tong line and the slack pulling line are connected at a comparatively short distance from the carriage, and means rendered operative by tension on the slack pulling line for pressing against said tong line when said sheave frame is swung upward on its pivot.

5. In apparatus of the class described, a carriage having a sheave frame pivotally connected therewith, two coaxial sheaves connected together and mounted in said frame, a tong line leading over one of said sheaves,

a slack pulling line leading under and around said other sheave, a third sheave journaled in said carriage in a higher plane than the pivot of said sheave frame and over which said slack pulling line leads whereby a pull on such slack pulling line will turn the sheave frame on its pivot to raise the sheaves carried thereby, a hauling line with which both the tong line and the slack pulling line are connected at a comparatively short distance from the carriage, and a movable member supported by the carriage adapted to be contacted by the tong line when said sheave frame is in raised position.

6. In apparatus of the class described, a carriage having a sheave frame pivotally connected therewith, two coaxial sheaves connected together and mounted in said frame, a tong line leading over one of said sheaves, a slack pulling line leading under and around said other sheave, a third sheave journaled in said carriage in a higher plane than the pivot of said sheave frame and over which said slack pulling line leads whereby a pull on such slack pulling line will turn the sheave frame on its pivot to raise the sheaves carried thereby, a hauling line with which both the tong line and the slack pulling line are connected at a comparatively short distance from the carriage, a pivotally-mounted block supported by the carriage, and means mounted in said block for contacting said tong line at a plurality of points when said sheave frame is in raised position.

7. In apparatus of the class described, a carriage having a sheave frame pivotally connected therewith, two coaxial sheaves connected together and mounted in said frame, a tong line leading over one of said sheaves, a slack pulling line leading under and around said other sheave, a third sheave journaled in said carriage in a higher plane than the pivot of said sheave frame and over which said slack pulling line leads whereby a pull on such slack pulling line will turn the sheave frame on its pivot to raise the sheaves carried thereby, a hauling line with which both the tong line and the slack pulling line are connected at a comparatively short distance from the carriage, a plurality of alined rollers located over said tong line and adapted to contact such line when said sheave frame is in its raised position.

8. In apparatus of the class described, a carriage having a sheave frame pivotally connected therewith, two coaxial sheaves connected together and mounted in said frame, a tong line leading over one of said sheaves, a slack pulling line leading under and around said other sheave, a third sheave journaled in said carriage in a higher plane than the pivot of said sheave frame and over which said slack pulling line leads whereby a pull on such slack pulling line will turn the sheave frame on its pivot to raise the sheaves carried thereby, a hauling line with which both the tong line and the slack pulling line are connected at a comparatively short distance from the carriage, a swinging block on the carriage, and a pair of alined rollers journaled in said block and adapted to be contacted by the tong line when said sheave frame is in raised position.

In testimony whereof I hereunto affix my signature.

KNUTE BERGER.