United States Patent [19]

Koller

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[54] **OVERHEAD ROPEWAY CRAB FOR CONVEYING LOADS**

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Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 252,835, May 12, 1972, abandoned.

[30] **Foreign Application Priority Data**

May 17, 1971 Austria 4254/71

[52] **U.S. Cl.** **212/94;** 212/96; 212/122

[51] **Int. Cl.** **B66c 21/00**

[58] **Field of Search** 212/94, 81, 122, 96, 119, 212/84, 89, 99

[56] **References Cited**

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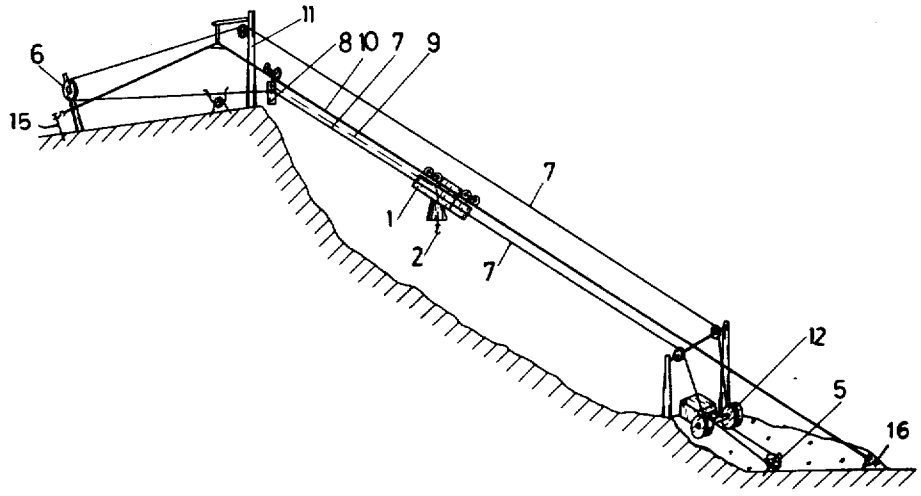
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Primary Examiner—Robert J. Spar
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[57] **ABSTRACT**

An overhead ropeway crab assembly uses a fixed guide cable and a endless cable moving adjacent the guide cable. A crab is selectively coupled to one cable or the other by clamping jaws. The endless cable includes a connector from which the crab is spaced and a line extends from the connector through the crab and includes a hook or the like for engaging a load. The line is lowered or raised by adjusting the position of the crab.

3 Claims, 3 Drawing Figures



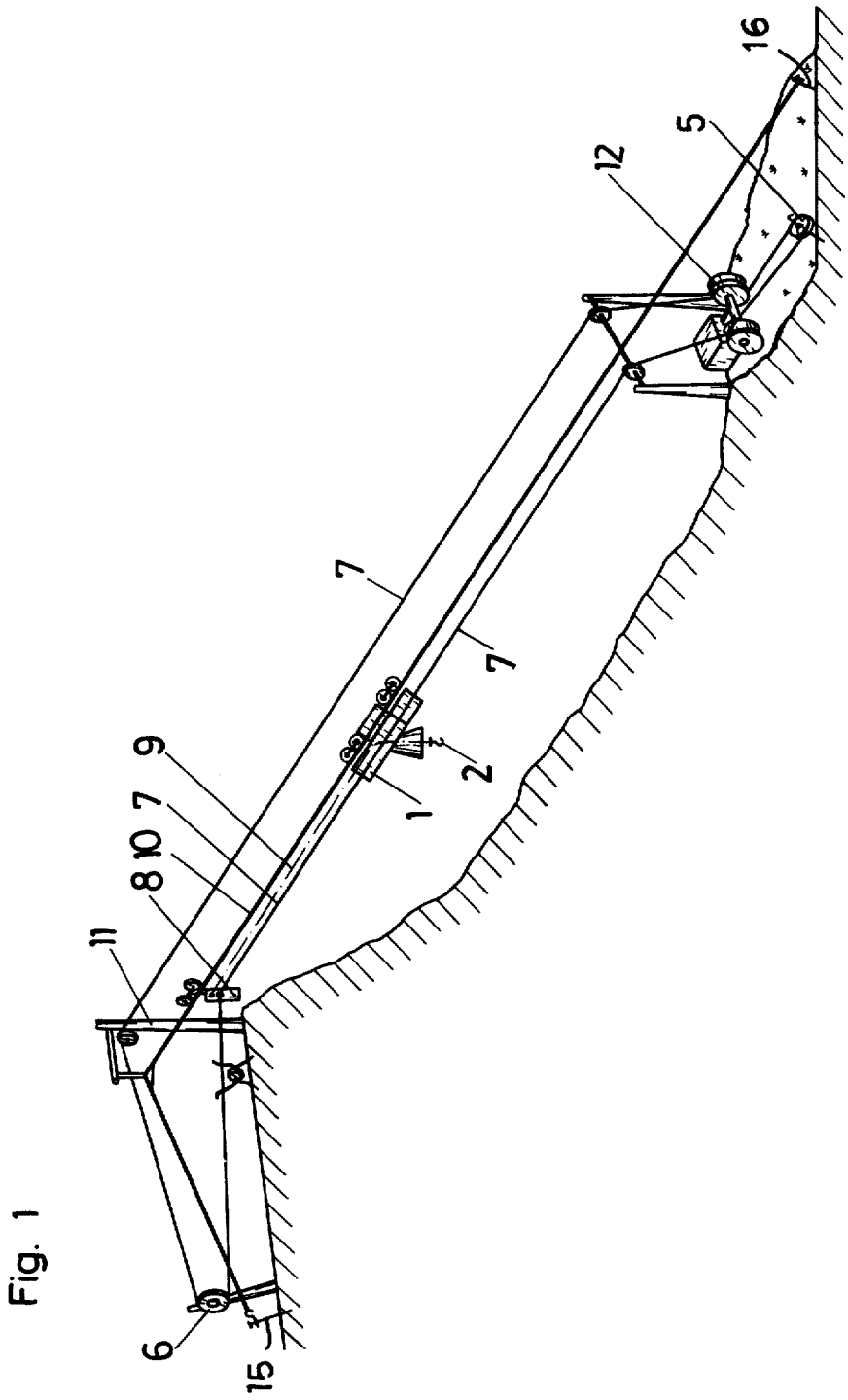


Fig. 1

Fig. 2

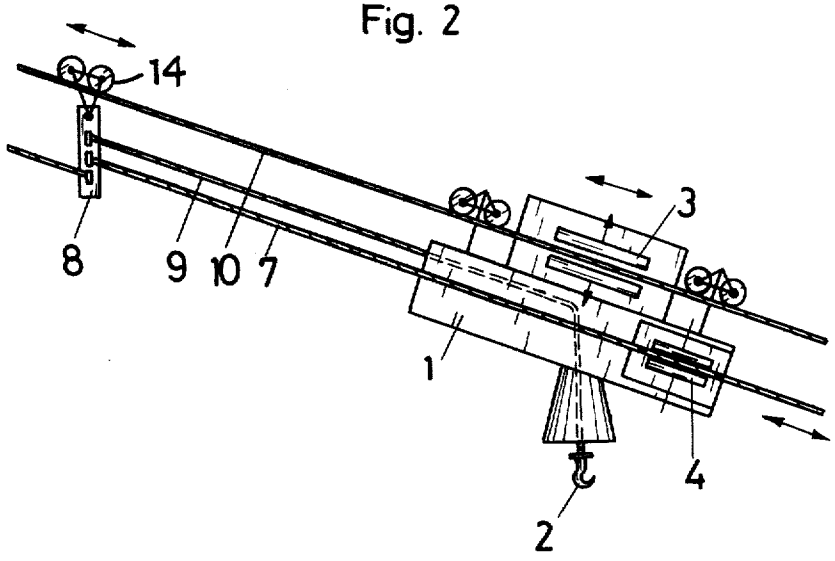
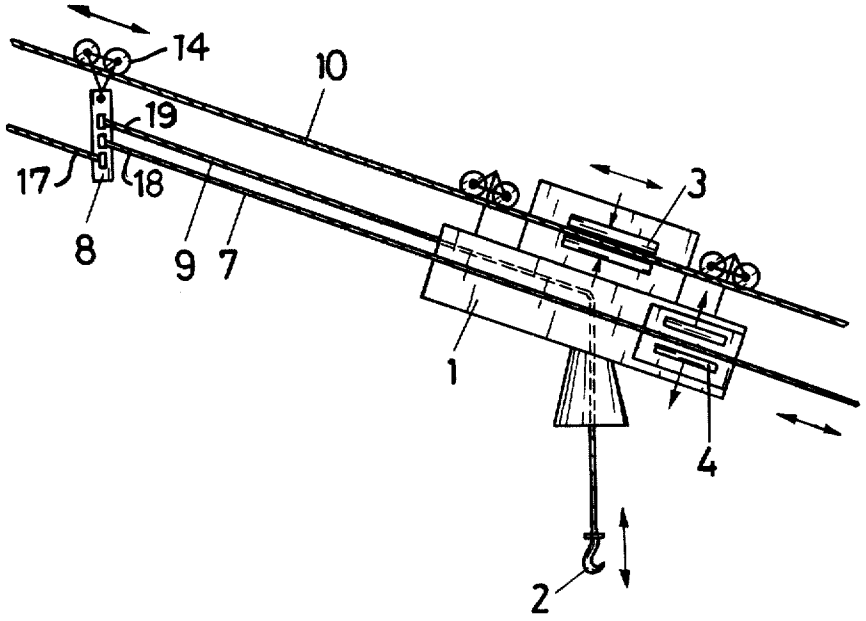


Fig. 3



OVERHEAD ROPEWAY CRAB FOR CONVEYING LOADS

OTHER APPLICATIONS

This is a continuation-in-part of copending application Ser. No. 252,835 filed May 12, 1972, now abandoned.

FIELD OF INVENTION

This invention relates to arrangements of the type having an overhead ropeway crab for conveying loads having a clamping device for engaging a cable to lock said crab and a load lifter adapted to be connected with the overhead ropeway crab by interlocking, the clamping device being actuated when the direction of travel of the crab is reversed or the interlocking of the load lifter adapted to be lifted or lowered is released by means of clamping jaws which are disengageable from the cable.

PRIOR ART

Various embodiments of overhead ropeway crabs of the aforementioned kind are known including embodiments which are energized by a rotary drive. All known embodiments have a hoisting unit mounted in an overhead ropeway crab. These hoisting units are not only complicated in their construction but are also costly. Their construction is such that the rotary cable runs over a driving pulley mounted in an overhead ropeway crab which driving pulley puts a cable drum into rotation on which a hoisting cable coils or uncoils. A load lifter means is thus raised or lowered. During operation of the overhead ropeway crab, these hoisting units have to be locked by special devices which, due to their complicated construction, can cause further susceptibility to trouble such as jamming of the hoisting cable on the drum which results in difficulties when said cable is lowered.

It is furthermore a shortcoming with known arrangements using an automatic overhead ropeway crab that a rotary cable whose ends are spliced has to be used. The splicing requires besides an annoying loss of time, a specially trained worker, and splice itself moreover has to be continuously controlled for reasons of security. Therefore, additional costs are involved in operating such an overhead ropeway construction.

SUMMARY OF INVENTION

It is therefore an object of the invention to provide an automatic overhead ropeway construction which is simple to assemble and is less susceptible to trouble than known types. By avoiding the aforementioned shortcomings, an overhead ropeway crab can be operated very economically.

This object is obtained, according to the invention, by using an additional clamping mechanism which is controlled when the direction of travel of the crab is reversed. This mechanism clamps on a rotary cable running over deflector rolls. After releasing of the clamps of the additional clamping mechanism and locking of the overhead ropeway crab on the cable, the interlocking of the load lifter is released and the load lifter thus can be lowered or lifted by the rotary cable.

As the rotary cable can pull the overhead ropeway crab up and down a slope, such an overhead ropeway construction is largely independent of the terrain of the line and no minimum inclination is necessary as with known constructions. Long horizontal distances, even with counterslopes, can be worked. Contrary to systems with a non-rotary cable, the transport of the overhead ropeway crab is quiet and non-oscillating and constitutes a further advantage of the construction of the invention.

Advantageously, the clamping device and the additional clamping mechanism as well as the interlocking of the load lifter may be actuated by a common source of energy, e.g., by a hydraulic reservoir known per se. The controlling actions can be initiated by some control means tightly connected with the rotary cable with the end of the hoisting cable running through the overhead ropeway crab.

The rotary cable need not be spliced in accordance with the invention. Instead it can be advantageously fixed with its two ends to a rigid member such as a bar or rod by means of screwing, wedge-rail anchors or the like. This member is furthermore slidably mounted by a pulley or the like on a fixed guide cable.

BRIEF DESCRIPTION OF THE DRAWING

The invention is next described in detail with reference to the accompanying drawing in which:

FIG. 1 shows a complete overhead ropeway mechanism according to the invention;

FIG. 2 shows the overhead ropeway crab in conveyed position; and

FIG. 3 shows the overhead ropeway crab in clamped position on the cable.

DETAILED DESCRIPTION

The cable **10** is a fixed cable which passes pillars **11** and is anchored, for example, at its ends **15** up a mountain and at **16** down in a valley. The rotary or displaceable cable **7** runs over deflector rolls **5** and **6** and is driven by a drive unit **12.** Its ends **17** and **18** are connected at spaced positions on a device or rigid bar (e.g., by screws or wedging) so that the bar **8** slidably supported by a pulley **14** on the cable **10** follows all movements of the rotary cable **7.**

This rotary cable **7** runs through an additional clamping mechaism **4** fixedly arranged on the overhead ropeway crab **1.** Clamping mechanism **4** clamps said crab on the rotary cable **7** in operating condition, so that the crab is carried along when the rotary cable is displaced. The overhead ropeway crab **1** is moreover provided with the clamping device **3** for locking onto the cable **10.**

The end **19** of the hoisting cable **9** is also fixed to the rigid bar and is attached to the load lifter **2** which is arranged to pass through the overhead ropeway crab **1.**

The clamping device **3** and the additional clamping mechanism **4** as well as the interlocking device for the load lifter **2** are actuated by a common source of energy and are controlled in such manner that, in engaged condition of the clamping device **3,** the jaws of the additional clamping mechanism **4** are opened and vice-versa. These controlling operations are initiated when the direction of travel of the overhead ropeway crab **1** is reversed. When the additional clamping mechanism **4** does not operate and the overhead crab **1** thus is locked on the cable **10** by the clamping device **3,** the interlocking device of the load lifter **2** is disengaged by the controlling common source of energy and said load lifter can be lowered.

The operation of the overhead ropeway according to the invention is described hereinafter from a starting position according to which the overhead ropeway crab **1** is tightly connected with the rotary cable **7** by means of its additional clamping mechanism **4.** The load lifter **2** has a retracted, interlocked position. The rotary cable **7** actuated by the drive unit **12** takes along the overhead ropeway crab, as its clamping on the cable **10** does not operate. The device **8** tightly connected with the rotary cable **7** is thereby actuated as well.

If the load lifter **2** is to be lowered to some desired position, a control is actuated when the direction of travel of the overhead ropeway crab **1** is reversed. By means of this control, the source of energy (comprising, e.g., a hydraulic reservoir) energizes the jaws of the clamping device and locks the overhead ropeway crab **1** onto the cable **10,** opening at the same time the jaws of the additional clamping mechanism **4.** The interlocking of the load lifter **2** is also disengaged by the control. The load lifter lowers relative to the stationary overhead ropeway crab **1** while the control means moves.

In order to lift the load lifter **2,** the rotary cable **7** is actuated in opposite direction. By means of the device **8,** the load lifter then is lifted and locked in the overhead ropeway crab **1.** At the same time, said overhead ropeway crab **1** is clamped onto the rotary cable **7** by the additional clamping mechanism **4** operated by the common source of energy at the same time actuated by the control means and the clamping on the cable **10** by the clamping device **3** is released. The crab **1** thus may be conveyed to the desired position.

The invention offers essential advantages including above all a simple construction and high economy as hoisting device is necessary. While known rotary overhead ropeways having a rotary driving cable can be used only in working places where the distance of the terminals of the overhead ropeway remains the same, the invention may be used in various ways as the rotary cable **7** is fixed to the device **8** and may be fixed on said crab at any place. The height of lift too of the load lifter may be arbitrarily chosen as the length of the hoisting cable **9** is adjustable in that the hoisting cable **9** is connected at any desired length to the rigid device **8.** Superfluous lengths of rotary cable as well as of the hoisting cable can be coiled up on cylinders on the device **8.**

The ends of cables **7, 8** and **9** are spaced on rigid bar **8** which is slidably supported on cable **10** by pulley **14.** This arrangement prevents twisting of the cables.

What is claimed is:

1. Load hauling apparatus comprising a substantially stationary cable, a displaceable cable separate from and displaceable along said stationary cable, a crab, coupling means to clamp said crab selectively to said stationary cable or to said displaceable cable whereby said crab is affixed to said cable or displaceable with said displaceable cable, a load lifter displaceable with the displaceable cable and extending through said crab by an amount corresponding to relative displacement between the crab and load lifter, the displaceable cable including ends, further means connecting said ends and thereby connecting the displaceable cable in a loop, means slidably supporting said further means on said stationary cable and preventing twisting of said cables, the load lifter extending through said crab and including an end connected to said further means, said further means holding the said end of the load lifter in spaced relation relative to the ends of the displaceable cable to promote the avoiding of engagement between the load lifter and displaceable cable, said load lifter including a free end, and load engaging means on the free end of the load lifter.

2. Apparatus as claimed in claim **1** wherein said further means is a rigid bar.

3. Apparatus as claimed in claim **2** wherein the means slidably supporting said further means is a pulley.

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