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(54) Traction limiting device for winches

Antriebbegrenzungsvorrichtung für Winden

Dispositif de limitation de traction pour treuils

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Description

The present invention relates to a traction limiting device for winches.

Traction limiting devices for winches are known for example from GB-A-2,156,763 and intervene to stop the winch drive in case of overload.

The devices currently in use work by either sensing the torque of the epicyclic reduction unit or by sensing the torque applied to a framework that supports the winch: this framework is accordingly articulated to a footing about one side that is substantially parallel to the axis of the cable winding drum and is drawn back by elastic means into the activation configuration.

Such known traction limiting devices do not take into account the considerable variations in the torque applied to the drum as a consequence of variations in the cable winding diameter.

A principal aim of the present invention is to obviate the described drawbacks of known devices, i.e. to provide a traction limiting device for winches that is capable of intervening independently of the variations in the diameter on which the cable is wound on the drum.

A further object of the present invention is to achieve the above aim with a structure that is simple, relatively easy to produce in practice, safe in use, effective in operation, and has a relatively low cost.

This aim and this object are both achieved by the present limiting device, characterized in that it comprises: a fixed framework, constituted by two end cross-members which are mutually connected by two parallel longitudinal members; two cross-members which are provided with bushings for sliding along said longitudinal members, have means for fixing below the winch, are mutually coplanar, and are parallel to the cable winding drum; retainer means with adjustable strain which are interposed between said fixed framework and one of said sliding cross-members; and a microswitch which is circuitally connected to the power supply of the winch and is adapted to interrupt it when a relative motion of said sliding cross-member with respect to the fixed framework is sensed.

Further characteristics and advantages will become apparent and evident from the following detailed description of a preferred but not exclusive embodiment of a traction limiting device for winches according to the invention, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

figure 1 is a schematic side view of a traction limiting device for winches;
figure 2 is a top view of said limiting device.

With particular reference to the above figures, the reference numeral 1 generally designates a traction limiting device for winches according to the invention.

The limiting device 1 comprises a fixed framework 2 constituted by two end cross-members 3 and 4 which are substantially identical to each other, have a substantially square cross-section, are provided, at their ends, with holes B with vertical axes for fixing the assembly to a footing, and are mutually connected by two longitudinal members 5 and 6 which are parallel to each other and preferably have a circular cross-section.

The reference numerals 7 and 8 designate two cross-members that have a preferably square cross-section, have antifriction bushings, not shown in the figure, for sliding along the longitudinal members 5 and 6, and have means for fixing below the winch, means which are constituted by threaded holes 9: in figure 1, the dashed line schematically illustrates a winch A which has a drum T and a traction cable which runs parallel and in the direction of the arrow F: the cross-members 7 and 8 are co-planar and parallel to the cable winding drum, whereas the longitudinal members 5 and 6 are slightly longer than the longitudinal dimension of the cross-members 7 and 8.

The reference numeral 10 designates retainer means with adjustable strain which are interposed between the fixed framework 2 and one of the sliding cross-members; the means 10 are constituted by two elastic cylindrical elements 11 which can be made of a material such as rubber and rest against the cross-member 8 on one side and against a plate 12 on the other side; the plate 12, the pads 11, and the cross-members 8 and 4 are crossed by respective pairs of holes for the insertion of two packing bolts 13a and 13b: the holes 14 of the cross-member 4 are threaded, and lock nuts 15 are screwed onto the stems 13 so as to allow to adjust the packing force applied by the elastic elements 11.

The cross-members 3 and 7 are crossed by respective holes 16 and 17; a microswitch 18 is fixed to the cross-member 7 and has an activation pushbutton 19 that fits inside the hole 17: a stem 20 is screwed into the threaded hole 16, can be coupled to the cross-member 3 by means of a lock nut 21, and extends into the hole 17 proximate to the pushbutton 19: when the winch is operating and the cable starts to pull, the cross-member 7 is actuated so as to move towards the fixed cross-member 3, in contrast with the action applied by the elastic elements 11: when the strain that corresponds to the presetting of the elastic elements 11 is reached, the stem 20 operates the pushbutton 19 of the microswitch 18.

The microswitch 18 is circuitally connected to the power supply of the drive unit with the interposition of a timer which is set with a delay of, for example, a couple of seconds: the microswitch is adapted to interrupt the power supply when a discrete relative movement of the sliding cross-member 7 with respect to the cross-member 3 of the fixed framework is detected, and the timer prevents the interruption of the power supply in case of overloads due for example to the elasticity of the cable or of the structure of the crane.

It has thus been observed that the invention achieves the intended aim and objects.

The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

All the details may furthermore be replaced with other technically equivalent elements.

In practice, the materials employed, as well as the shapes and dimensions, may be any according to the requirements without thereby abandoning the scope of the protection of the appended claims.

Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. Traction limiting device for winches, characterized in that it comprises: a fixed framework (2), constituted by two end cross-members (3,4) which are mutually connected by two parallel longitudinal members (5,6); two cross-members (7,8) which are provided with bushings for sliding along said longitudinal members (5,6), have means (9) for fixing below the winch, are mutually co-planar, and are parallel to the cable winding drum; retainer means (10) with adjustable strain which are interposed between said fixed framework (2) and one of said sliding cross-members; and a microswitch (18) which is circuitally connected to the power supply of the winch and is adapted to interrupt it when a relative motion of said sliding cross-member with respect to the fixed framework (2) is sensed.

2. Limiting device according to claim 1, characterized in that said longitudinal members (5,6) are slightly longer than the longitudinal dimension of said sliding cross-members.

3. Limiting device according to claim 1, characterized in that said retainer elements (10) with adjustable strain comprise at least one elastic element (11) which is advantageously cylindrical and is made of a material such as rubber which is packed together with one of said fixed cross-members (7,8) and with a sliding one by means of a bolt (13a,13b) whose tightening is adapted to preset the packing force.

Patentansprüche

1. Zugkraftbegrenzungsvorrichtung für Seilwinden, dadurch gekennzeichnet, daß sie aufweist: einen feststehenden Rahmen (2), der aus zwei endseitigen Querbauteilen (3, 4), die durch zwei parallele langgestreckte Bauteile (5, 6) miteinander verbunden sind, zusammengesetzt ist; zwei Querbauteile (7, 8), die mit Lagern versehen sind zur Verschiebung entlang der langgestreckten Bauteile (5, 6) mit einer Einrichtung (9) zur Befestigung unterhalb der Seilwinde, in derselben Ebene liegen und parallel zur Seilwickelrolle sind; Halteeinrichtungen (10) mit einer einstellbaren Vorspannung, die zwischen dem feststehenden Rahmen (2) und einem der verschiebbaren Querbauteile angeordnet sind; und einen Mikroschalter (18) der schaltungstechnisch mit der Stromversorgung der Seilwinde verbunden ist und dazu ausgebildet ist, die Verbindung zu unterbrechen, wenn eine Relativbewegung des verschiebbaren Querbauteiles bezüglich des feststehenden Rahmens (2) erfaßt wird.

2. Zugkraftbegrenzungsvorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß die langgestreckten Bauteile (5, 6) geringfügig länger sind als die Längsabmessung der verschiebbaren Querbauteile.

3. Zugkraftbegrenzungsvorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß die Halteeinrichtungen (10) mit einstellbarer Vorspannung wenigstens ein elastisches Element (11) aufweisen, welches in vorteilhafter Weise zylindrisch und aus einem Werkstorf wie insbesondere Gummi gebildet ist, der mit einem der feststehenden Querbauteile (7, 8) und mit einem der verschiebbaren Bauteile mittels eines Bolzens (13a, 13b) zusammen geklemmt ist, dessen Anzugskraft zur Voreinstellung der Klemmkraft angepaßt ist.

Revendications

1. Dispositif de limitation de traction pour treuils, caractérisé en ce qu'il comprend : un châssis fixe (2) constitué par deux traverses d'extrémité (3,4) qui sont mutuellement reliées par deux éléments longitudinaux parallèles (5,6), ; deux traverses (7,8) qui sont pourvues de manchons pour coulisser le long desdits éléments longitudinaux (5,6), comportent des moyens (9) de fixation sous le treuil, sont mutuellement dans un même plan et sont parallèles au tambour d'enroulement de câble ; des moyens de retenue (10) à force réglable qui sont interposés entre ledit châssis fixe (2) et une desdites traverses coulissantes ; et un microcontact (18) qui est connecté en circuit à l'alimentation en énergie du treuil et qui est prévu pour interrompre cette alimentation lorsqu'un mouvement relatif de ladite traverse coulissante par rapport au châssis fixe (2) est détecté.

2. Dispositif de limitation selon la revendication 1,caractérisé en ce que lesdits éléments longitudinaux (5,6) sont légèrement plus longs que la

dimension longitudinale desdites traverses coulissantes.

3. Dispositif de limitation selon la revendication 1, caractérisé en ce que lesdits éléments de retenue (10) à force réglable comprennent au moins un élément élastique (11) qui est avantageusement cylindrique et est fabriqué en une matière telle qu'un caoutchouc, qui est assemblé avec une desdites traverses fixes (7,8) et avec une traverse coulissante au moyen d'une vis (13a,13b) dont le serrage permet de prérégler la force d'assemblage.

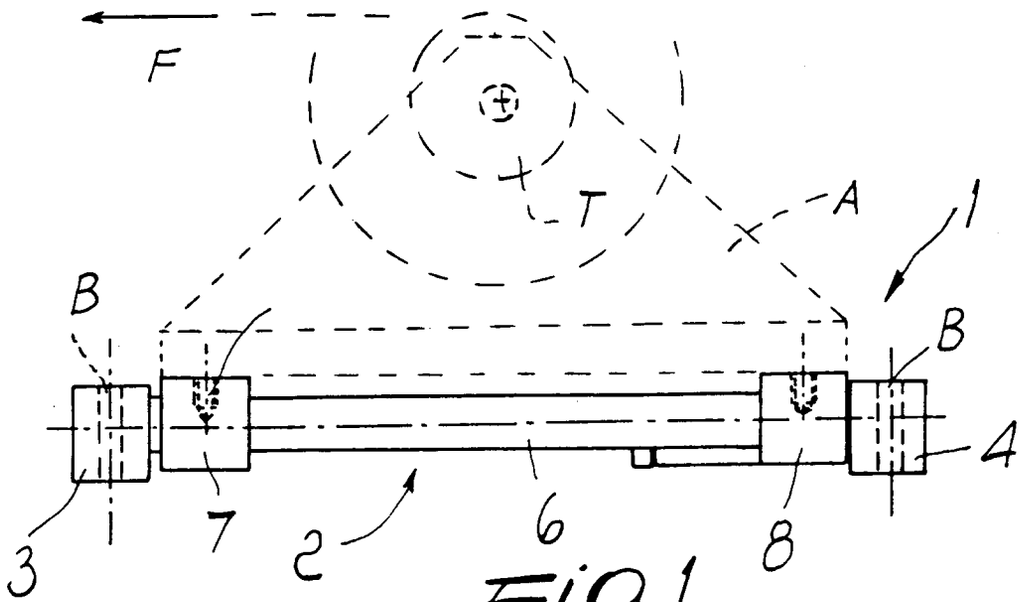

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Fig.1

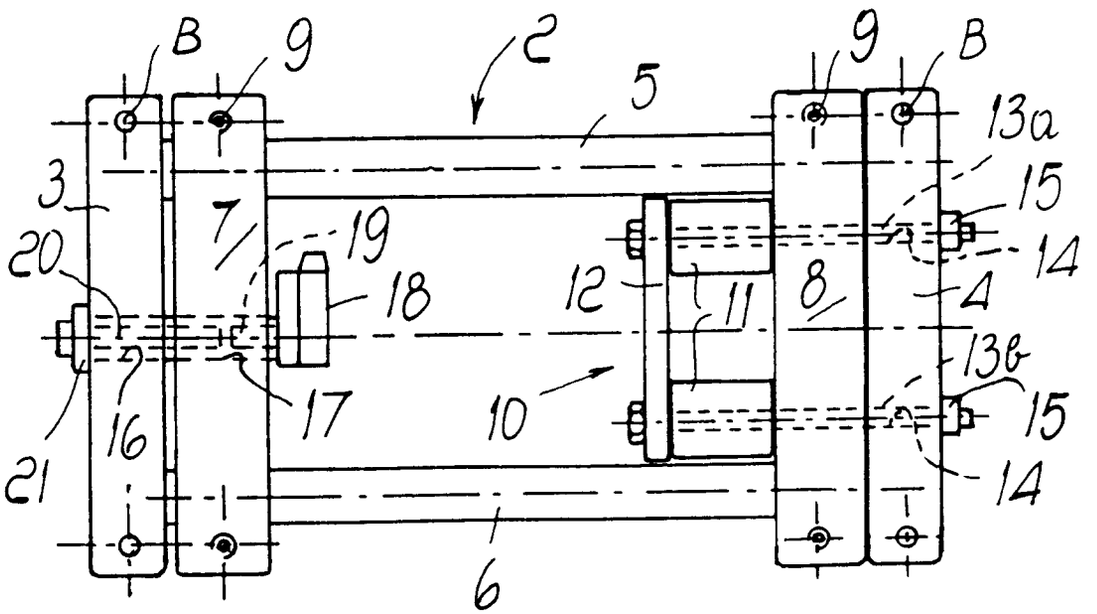

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13b
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Fig.2