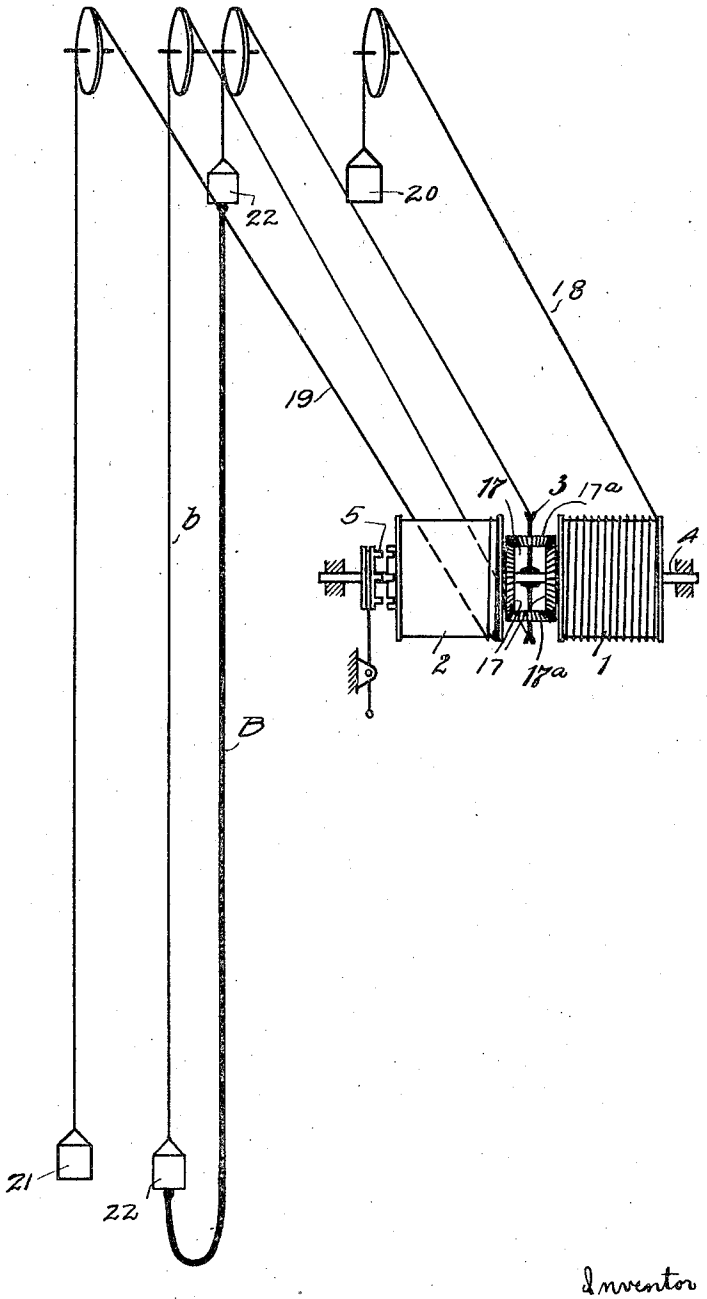
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L. THALLMAYER

BALANCING OF THE WEIGHT OF ROPES

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BALANCING OF THE WEIGHT OF ROPES.

Application filed November 23, 1921. Serial No. 517,411.

To all whom it may concern:

Be it known that I, LUDWIG THALLMAYER, a citizen of the Austrian Republic, residing at Berlin-Charlottenburg, Germany, have invented certain new and useful Improvements in and Relating to the Balancing of the Weight of Ropes, of which the following is a specification.

It is not possible to suspend the balance rope for the cages in the case of adjustable winding rope driving means, for instance, when the winding rope is lengthened, the balance rope will trail in the sump, or when shortened will sway to and fro in the shaft and damage it. Therefore the balance rope has hitherto been operated by a separate drum or the like on the axle of the winding drum. This drum as well must be adjustable, so that after the adjustment of the winding drum the rope balance can be again rectified, while, for obtaining a complete balance, only half the movement must be made that is made for adjustment, as that part of the balance rope which is deducted from one side is added to the other.

According to the invention this adjusting movement is effected automatically by exactly the right amount, by the operating means for the balance weight when adjusting making half the movement as during working.

In the accompanying drawings I have shown in diagrammatic fashion one of the forms in which my invention may be reduced to practice.

Referring to these drawings, balancing rope B is shown by a heavy line. It is suspended by auxiliary rope *b* which passes over a sheave 3 loosely mounted on main driving shaft 4, and located between the fixed winding drum 1 and the adjustable winding drum 2. It is operated by these drums through a differential gear 17. The hoisting ropes with their cages are shown at 18, 19 and 20, 21 respectively.

So long as the adjustable or loose drum 2 is coupled with drum 1, permanently fixed on the shaft—which coupling is accomplished by means of coupling 5—the two small bevel wheels 17^a of differential gear 17, which are mounted on sheave 3 are prevented from rotating on account of being in mesh with the two large differential gear wheels 17^b of which one is fixed on each of the drums 1 and 2. Thus, sheave 3 becomes tightly coupled with the two drums 1 and 2 and thus rotates in unison with these drums. If on the other hand, loose drum 2 is uncoupled from fixed drum 1, for the purpose of changing the range of hoisting, and if now, drum 1 is revolved to set the main cages 20 and 21 for the new hoisting distance, and if at the same time, as is customary in such devices, the loose drum 2 is held fast, the two small bevel wheels 17^a roll off on the two larger bevel wheels 17^b of the differential gear. Thus sheave 3 revolves only at half the speed at which drum 1 revolves. Therefore, owing to this arrangement each angular shifting of the two hoisting drums against each other causes the sheave 3 to be only shifted one half the angular distance. By these means the balance rope B is shifted such that it will again completely balance the weights of the two hoisting ropes in any hoisting position.

The balance for the weight of the hoisting rope can of course be effected with balancing ropes whose weight per unit length varies with the length of the rope, for instance, where, in the case of great depths, winding ropes of similar character are used. All rope driving means usually employed for the winding ropes can be used as driving means for the balance weight, so that, when the driving means for the winding rope are adjusted any variations in the balance of the weight of the rope can be effected.

To the ends of the auxiliary rope *b*, by which the balance rope B is suspended, conveying baskets 22 can be attached, for instance, for the conveyance of workmen, tools, pit timbers and the like, both during the winding of material or when the driving means for the winding rope are stationary.

What I claim is:—

1. A winding rope arrangement for hoisting machinery, comprising two winding ropes, driving means therefor capable of relative adjustment, a balance rope and driving means for said balance rope, said latter driving means being suitably geared to both of said winding rope driving means to correspondingly adjust the balancing effect of said balance rope during the relative

adjustment of the driving means for the winding ropes.

2. A winding rope arrangement for hoisting machinery, comprising two winding ropes, driving means therefor capable of relative adjustment, a balance rope and driving means for said balance rope, said latter driving means having a differential gear connection with both of said rope driving means to correspondingly adjust the balancing effect of said balance rope during the relative adjustment of the driving means for the winding ropes.

3. A winding rope arrangement for hoisting machinery, comprising two winding ropes, driving means therefor capable of relative adjustment, a balance rope and driving means for said balance rope, said latter driving means having a differential gear connection with both of said rope driving means to correspondingly adjust the balancing effect of said balance rope during the relative adjustment of the driving means for the winding ropes, the gearing ratio of said differential gear being suitably chosen so that at every position of the winding rope driving means relative to each other, a complete balance of the weight of the winding rope is produced.

4. A winding rope arrangement for hoisting machinery, comprising two winding ropes, driving means therefor capable of relative adjustment, a balance rope and driving means for said balance rope, said latter driving means being suitably geared to both of said winding rope driving means to correspondingly adjust the balancing effect of said balance rope during the relative adjustment of the driving means for the winding ropes, and baskets, for conveying workmen and appliances, attached to the ends of the balance rope for the purpose set forth.

In testimony whereof I affix my signature.

LUDWIG THALLMAYER.