

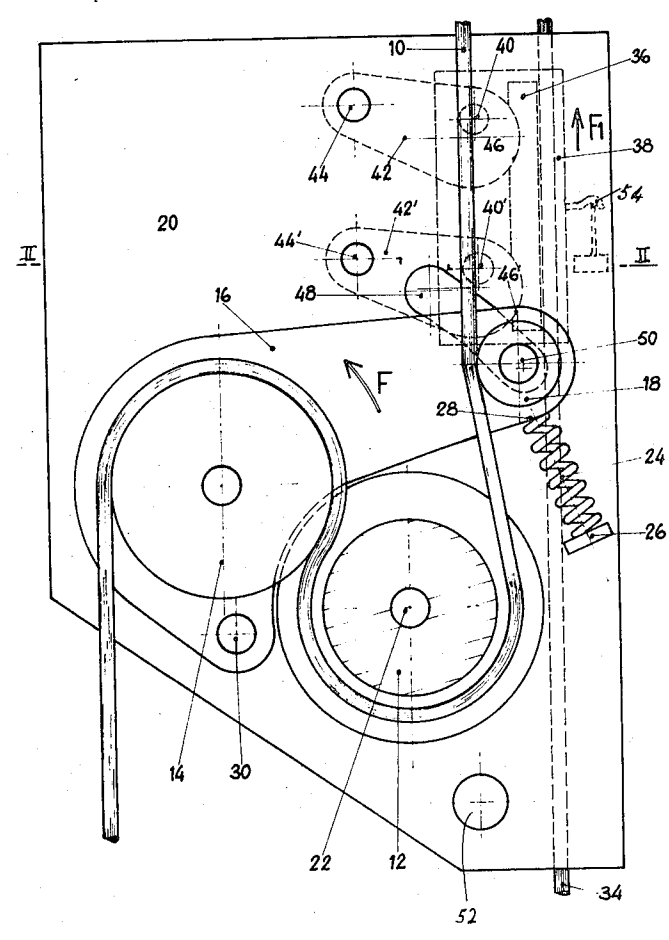
- [54] **SCAFFOLDING WINCH** 3,516,642 6/1970 Pomagalski..... 254/167
3,586,125 6/1971 Durand..... 182/112
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- [22] **Filed: Mar. 22, 1972**
- [21] **Appl. No.: 236,922**
- [30] **Foreign Application Priority Data**
Mar. 26, 1971 Switzerland..... 4524/71
- [52] **U.S. Cl.**..... **182/112**
- [51] **Int. Cl.**..... **E04g 3/10**
- [58] **Field of Search** 182/112, 142, 143, 144;
254/167; 188/65.1, 65.3
- [56] **References Cited**
UNITED STATES PATENTS
3,021,918 2/1962 Medawar..... 182/112

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[57] **ABSTRACT**

The invention relates to an apparatus for raising and lowering a scaffolding platform along a support cable and a safety cable. The safety cable gripping means enters automatically into action when the support cable become slack and an articulated lever for pressing the cable in a grooved pulley rotates into an inactive state.

7 Claims, 2 Drawing Figures



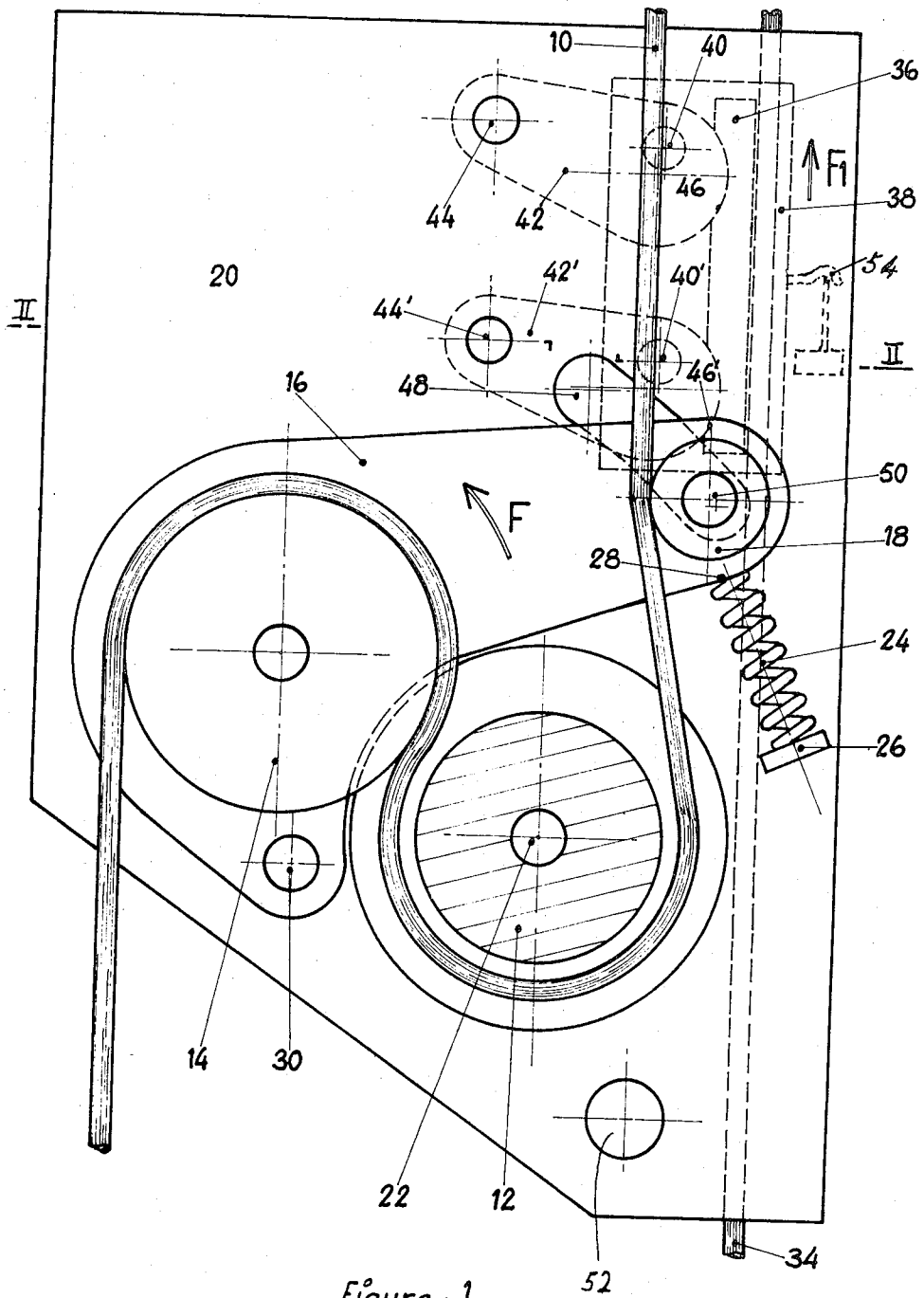


Figura: 1

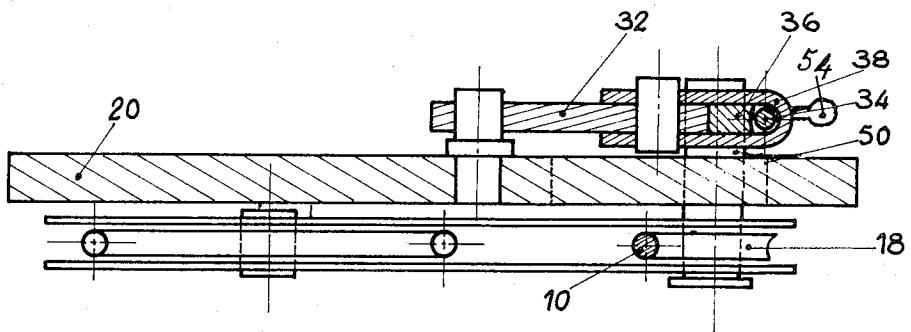


Figure : 2

SCAFFOLDING WINCH

The invention relates to an apparatus for the raising and the lowering of a gangway or a scaffolding platform comprising at least a winch secured to the platform and adapted to co-operate with a support cable and locking means capable of gripping a safety cable to stop the descent and hold the said platform.

The U.S. Pat. No. 3,586,125 discloses such an apparatus wherein the unlocking control means are so coupled to the winch motor control means for lowering the platform that the safety system is activated to lock or unlock only when the motor is stopped (as far as lowering of the platform is concerned) and cannot therefore intervene and lock as long as the operator activates the motor to lower the platform. It will be appreciated that if, due to some malfunction, the support cable should become slack, for instance by breaking of the cable, the safety system could enter into action to hold the platform only after releasing of the motor control means by the operator. Such a time lag is dangerous.

An object of the present invention is to provide an apparatus for raising and lowering a scaffolding platform whereby perfect safety may be ensured in operation and any possibility of a false manoeuvre prevented.

According to the invention the safety system is activated directly and only when the support cable slackens by means of an articulated lever, known per se, having a cable engaging roller and compression means to press the cable in a grooved pulley.

Another object of the invention is to provide a winch apparatus with a safety system, wherein the raising and lowering are controlled by the actuation of the drive means of said winch particularly of a winch motor.

A further object of the invention is to provide an apparatus wherein the perfect working of the safety device can be easily checked.

Still another object is to provide an apparatus which may be driven by any type of drive means such as electrical, pneumatical, combustion motors, manual drive means, several drive means working even separately or together.

A further object of the invention is to provide an apparatus with a locking device activated by additional safety devices, for instance when the platform cants.

Other advantages, objects and features of the present invention will become apparent from the following description of an embodiment of the invention represented in the annexed drawings in which :

FIG. 1 is a view in elevation of a winch according to the invention;

FIG. 2 is a section along line II—II of FIG. 1.

On the drawings, a support cable 10 fastened at a fixed point (not shown) is lodged in the V-shaped groove of a hauling pulley 12 which it embraces over part of its circumference. A compression wheel 14, fitted on a lever 16, articulated on a pin 30, presses the slack strand of cable 10 into the groove or pulley 12 under pressure derived from the tractive stress exerted on cable 10 by a roller 18 carried by lever 16 and engaging the cable 10. The hauling pulley 12 and the articulated lever 16 are secured to a frame having a plate 20 and the pulley 12 is driven in rotation manually or by any motor (not shown). The motor can be electrical, pneumatical, a combustion engine and operates for instance a shaft 22, in either direction, on which pulley 12 is keyed. A compression spring 24 located between

an abutment 26 of frame 20 and a face 28 of the articulated lever 16 bias the latter towards a "second" state in a direction shown by arrow F on FIG. 1. In said second state of the articulated lever 16 the compression wheel 14 is drawn out of the groove of pulley 12. During normal working of the winch the stress in cable 10 maintains the articulated lever 16 in the first state shown on FIG. 1 against the spring action 24. A winch of this type is described in U.S. Pat. No. 3,516,642.

To the other side of plate 20 is secured a locking device of a safety system 32. The safety system 32 cooperates with a safety cable 34 fastened to a fixed point preferably different of the fastening point of cable 10. The safety cable 34 passes between two jaws 36, 38 of safety system 32 which are capable of grip and clamp the cable 34. Jaw 38 in the form of a "U" enclosing cable 34 and jaw 36, is articulated at 40, 40' on two locking rods 42, 42', the opposite end of each rod being fitted so as to pivot on a fixed axle 44, 44' of frame 20 of the winch. The ends of the locking rods 42, 42' articulated respectively at 40, 40' are in the form of a cam or an eccentric 46, 46' coacting with jaw 36 in such a manner that a limited movement upwards of jaws 36, 38 in the direction of arrow F on the drawings results in a limited pivoting of rods 42, 42' in the trigonometric direction (arrow F₁) and therefore in a closing of jaws 36, 38. A movement downwards in the opposite direction provokes the opening of jaws 36, 38. The safety device 32 is during normal operation of the apparatus maintained in a first state, in a downward inactive position by a spring (not shown) or by its weight. In this first state the jaws 36, 38 are opened and allow free passage of cable 34 in both directions.

A circular opening 48 is provided in plate 20 and a finger 50 fitted to the articulated lever 16 passes through the opening 48. The finger 50 is for instance an extension of the shaft of the roller 18 and it protrudes on the face of plate 20 with the safety system 32 so as to coact with the latter when the support cable 10 slackens and when the articulated lever 16 is rotated on axle 30 in the direction of arrow F by spring 24. The finger 50 draws upwards the jaws 36, 38 and pivots the whole safety system on axles 44, 44' of locking rods 42, 42' to close the jaws 36, 38 and to clamp the safety cable 34. It is easily understood that the slightest relative movement of cable 34 in the direction of arrow F₁ in relation to frame 20 tends to increase the clamping of the cable 34. By breaking of the support cable 10 the platform is automatically supported by the safety cable 34.

The apparatus according to the invention functions in the following manner :

The frame 20 is secured, for instance by axle 52, to a scaffolding platform (not shown) and the winch hauls the platform along the support cable 10. The articulated lever 16 is maintained in the first state to press the cable 10 in the groove of pulley 12 by the stress in cable 10. In the position shown in FIG. 1, corresponding to the normal working of the apparatus, the finger 50 of lever 16 passing through the opening 48 stands back from the safety system 32 which is in the first state shown in FIG. 1. The raising and lowering are allowed, the safety system remaining in its inactive position.

In the case of breaking of the support cable 10, releasing the roller 18, the lever 16 is rotated in the direction shown by the arrow F by the spring 24. The finger 50 of lever 16 engages the lower face of jaws 36, 38 and

draws the latter upwards to close the jaws 36, 38 by cams 46, 46'. The gripping of cable 34 by the jaws 36, 38 is automatically increased by the stress in cable 34 and the winch 20 is thus locked on the cable 34.

The safety system 32 works instantaneously when the cable 10 slackens and a perfect safety is ensured as the slightest movement of the safety device 32 brings the jaws 36, 38 against the cable 34 and the friction between the jaws and the cable provokes the self locking on the cable. The perfect working of the safety device can be checked by raising upwards the jaws 36, 38 in the direction of arrow F₁, for instance by shifting upwards a control finger 54 secured to jaw 38. The control finger 54 may be actuated by additional safety means particularly a cant detecting device of the platform, which could include a control rod (not shown) inserted between finger 54 and the platform and laterally shifted with respect to the support cable 10 so as to actuate the finger 54 if the platform cants.

The winch and the associated safety system are very simple and the safety system locks the platform when the support cable slackens, by breaking of the support cable or its fastening or by some malfunction of the drive means particularly by unkeying of pulley 12.

It should be mentioned that a plurality of winches, according to the invention, can be used to support a platform, the control of all winches being performed from a single post in a very simple manner as the working of the safety system is automatical.

The invention is of course in no way limited to the applications most particularly described and shown as examples in the attached drawings.

What is claimed is :

1. Apparatus for raising and lowering a scaffolding platform and adapted to be secured to such a platform, said apparatus including a winch having a grooved pulley, a support cable lodged in the grooved pulley, an articulated lever with cable engaging means adapted to co-operate with the support cable so as to maintain said articulated lever in a first state when the cable is taut and in a second state when the cable is slack, compression means secured to said articulated lever adapted to

press the support cable in the grooved pulley in said first state of the articulated lever, a safety cable, locking means adapted to co-operate with said safety cable passing therethrough and arranged in a first state of the locking means to allow passage of the cable cooperating therewith and in a second state to prevent such a passage, coupling means to couple said articulated lever and said locking means in such a manner that the locking means is moved in said second state when the articulated lever is moved in said second state.

2. An apparatus according to claim 1, further comprising biasing means to bias said articulated lever in said second state.

3. An apparatus according to claim 2, wherein said locking means comprises a brake device with jaws capable of gripping a cable passing therebetween and two articulated rods with one end coacting with the said jaws to induce their closing or opening when pivoted.

4. An apparatus according to claim 3, comprising a frame with a plate arranged to support on one side of said plate said grooved pulley and said articulated lever, and on the other side said locking means, said plate having an opening and said coupling means passing through the opening to couple said articulated lever and said locking means.

5. An apparatus according to claim 4, wherein said articulated lever comprises a finger extending horizontally through said opening and beneath said jaws and arranged so as to move said jaws upwards in a closing state when said articulated lever is moved in said second state.

6. An apparatus according to claim 1, wherein said coupling means is arranged to couple unidirectionally the articulated lever and the locking means, the latter having additional control means arranged for moving the locking means in said second state.

7. An installation including a scaffolding platform, an apparatus according to claim 6 secured to said platform a detector arranged on said platform so as to detect the cant of the platform and to operate said additional control means.

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