

May 12, 1936.

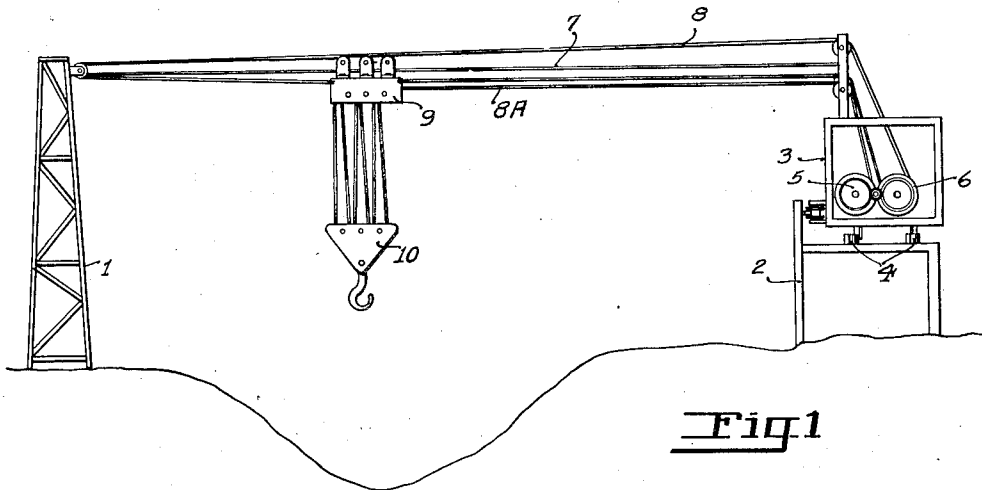
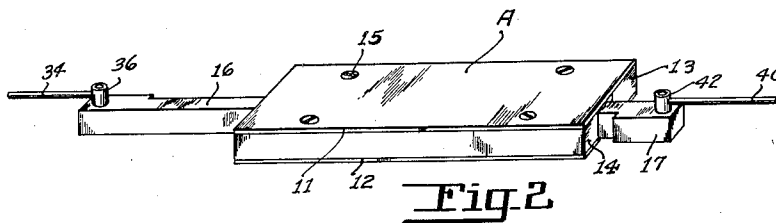
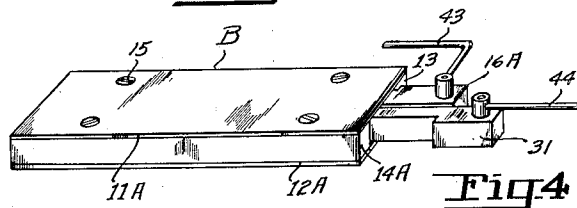
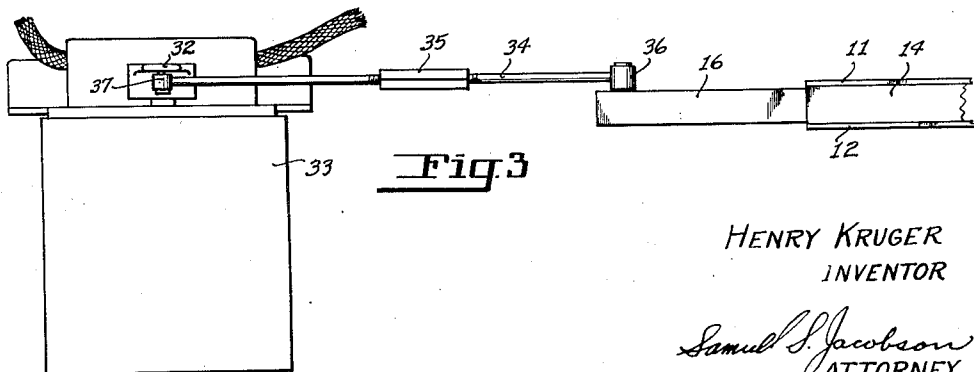
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2,040,388

SAFETY DEVICE FOR CABLEWAY SWITCHES

Filed Feb. 16, 1935

2 Sheets-Sheet 1



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SAFETY DEVICE FOR CABLEWAY SWITCHES

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2 Sheets-Sheet 2

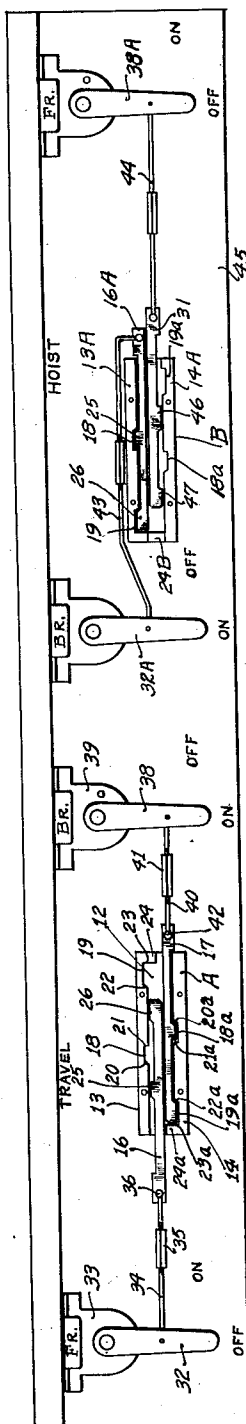


Fig. 5

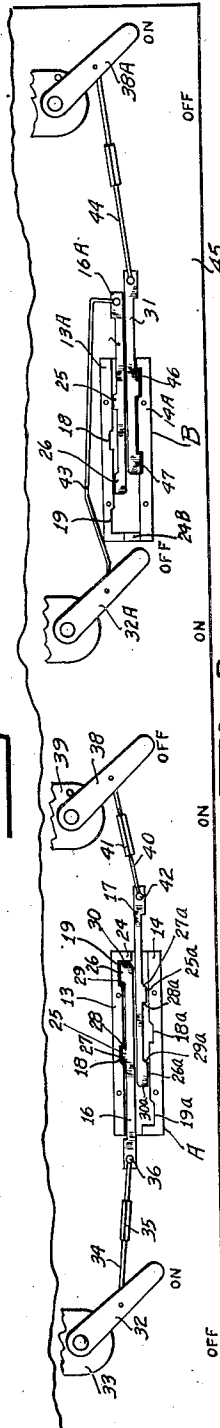


Fig. 6

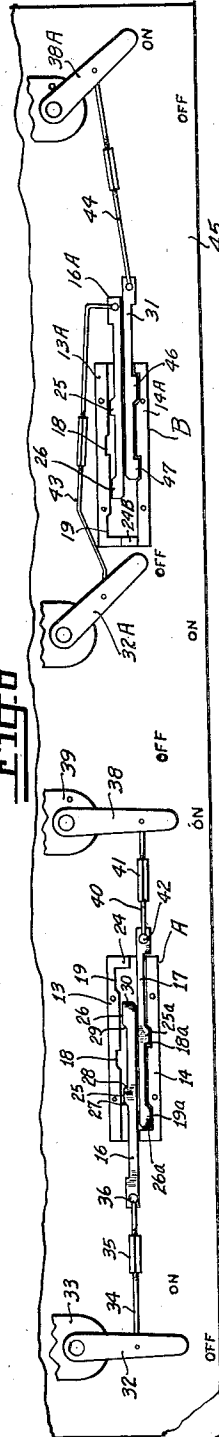


Fig. 7

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SAFETY DEVICE FOR CABLEWAY
SWITCHES

Henry Kruger, Portland, Oreg.

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2 Claims. (Cl. 74—483)

This invention relates to a safety device which employs locking members that are operatively connected to the control levers of switches which actuate the motors in order to control the movement of the drums, cables, travel carriage and hoisting block of cableways.

It is the present practice in the operation of cableways of the type herein illustrated to provide four switches; two for the control and operation of the mechanism controlling the movement of the travel carriage and two for the control and operation of the mechanism controlling the movement of the hoisting mechanism. Each switch is actuated independently of the other switches. At once, it becomes apparent that the operator may become confused, under stress of his work, and accidentally actuate a wrong switch or a switch at the wrong time causing either the travel carriage or the hoisting block to run wild on the cables. By the application of my invention to the switch control levers, this danger is entirely eliminated and the operator, in view of the positiveness of the controls, is enabled to execute his orders with greater certainty and promptness which, of course, is vital in the operation of cableways.

The primary object of my invention is to provide means operatively connected to the control levers of switches which positively prevents the indiscriminate actuation of the control lever of one of the switches without regard to the position of the control levers of the remaining switches.

An equally important object of my invention is to provide a safety device which will prevent the intentional or accidental actuation of the control levers of one of the switches without the control lever of the complementary switch being in position to thereby avoid the danger of releasing the travel carriage or hoist block to "run wild" on the cables.

Another object of my invention is to provide means operatively connected to the control levers of switches which are capable of maintaining one of said control levers locked against actuation while the other of the control levers is in unlocked position, these means being particularly adapted for use with switches that control the operation of cableways.

Another object of the invention is to provide safety means, including two locking members, which are operatively connected to and control levers of switches and which insures that one of said locking members will be held against opera-

tion when the other of said locking members is being shifted and put into operation.

A further object of the invention is to provide mechanism which will positively lock one of the control levers until the other of the control levers is applied into proper position, whereby the applied lever locks the remaining lever against actuation.

A further object of my invention is to provide a safety device, positive in action, simple, durable, practical and inexpensive and which admirably lends itself to economical and rapid construction and application.

Other objects and advantages and the nature and characteristic features of my present invention will become apparent and readily understood from the following description which must be read in conjunction with the accompanying drawings forming a part hereof and which illustrate, by way of example only, the preferred embodiment of my invention and in which:

Figure 1 is an elevation of a cableway that is electrically operated and controlled and to the switches of which my invention is operatively connected.

Figure 2 is a perspective, plan view of the device which embodies my invention and which is admirably adapted for use in connection with the switch control levers used for the operation and control of the apparatus forming the cableway.

Figure 3 is a front view of a switch and a portion of the device shown in Figure 2, illustrating graphically the connection between one of the switch control levers and one of the locking members embodying a portion of my invention.

Figure 4 is a perspective, plan view of the device which embodies my invention with the locking members slightly re-arranged to adapt them for use in connection with the switch control levers used for the operation and control of the hoist block cables and drums.

Figure 5 is a top, plan view of a switch assembly used in operating and controlling the movement of the travel carriage and hoist block, and illustrating the relationship between the device embodying my invention and the said switches and graphically showing the position of the respective locking members of the device when the switches are in neutral position.

Figure 6 is a top, plan view of a switch assembly used in operating and controlling the movements of the travel carriage and hoist block, and illustrating the relationship between the de-

vice embodying my invention and the said switches and graphically showing the position of the respective locking members of the device when the switches are in position for operating their respective cables and drums to effect travel of the carriage.

Figure 7 is a top, plan view of a switch assembly used in operating and controlling the movements of the travel carriage and hoist block, and illustrating the relationship between the device embodying my invention and the said switches and graphically showing the position of the respective locking members of the device when the switches are in position for operating their respective cables and drums to effect the hoisting of a load.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters:

The cableway assembly illustrated in Figure 1, while not a part of the invention itself, is operated by a plurality of switches hereinafter to be more specifically designated, which it is desired to control by the invention hereinafter to be more specifically described. There is shown a tower 1 and a base 2 disposed oppositely to each other. A cab or house 3 is positioned on base 2 and is capable of movement with respect to the base on tracks 4. The cab or house 3 contains the cable drums 5 and 6, and motors (not shown), which are operated by remote control by the switches, hereinafter to be described. Cable 7 is connected to tower 1 and, indirectly, to cab 2 in any well known manner. Cable 8 is secured to travel carriage 9, passes around suitable pulley blocks secured to the tower 1 and indirectly to cab 3 and wraps around drum 6. Cable 8A has one end secured to the travel carriage 9 and the other end secured to drum 5 after passing over suitable pulley blocks secured to cab 3 and after being interwound around suitable pulley blocks disposed within the travel carriage 9 and hoist block 10.

Since the quintessence of the invention is to provide means whereby positive assurance is given the operator of the switches, which, through the actuation of the electric motors, operates the travel carriage 9 and hoisting block 10, there is provided, as shown in Figure 2, a lock generally designated by reference character A, which consists of plates 11 and 12 forming the top and bottom of the lock and locking bars 13 and 14 forming the sides of the lock. The plates and the locking bars are secured to each other by threaded members 15 although they may be joined in any other suitable manner.

For a more detailed description of the lock A, shown in perspective in Figure 2, attention is called to Figures 5, 6, and 7 and particularly to that portion of these figures containing the reference character A. It will be seen that the locking bars 13 and 14 form between themselves a channelway in which locking members 16 and 17 may slide. It will be seen that locking bar 13 has notches 18 and 19 therein. Notch 18 has an inclined side 20 and a straight side 21 and notch 19 has an inclined side 22 and a straight side 23. Stop lug 24 is formed as a continuation of one end of the locking bar 13. Locking bar 14 is constructed in identically the same manner but is positioned with respect to plate 12 in a manner diametrically opposite to that occupied by locking bar 13 on plate 12. However, in order to prevent confusion, the details

of construction of locking bar 14 will be designated with the same reference numerals but with the addition of the small letter "a".

Locking member 16 possesses lugs 25 and 26. Lug 25 has a beveled edge 27 and straight edge 28 and lug 26 has a beveled edge 29 and straight edge 30. Lug 27 is constructed in such manner as to fit neatly into notch 18 and lug 26 is constructed in such manner as to fit into notch 19, as shown in Figure 6. Locking member 17 is constructed in identically the same manner and its lugs fit into the notches incorporated in locking bar 14 in the same manner as those embodied in locking member 16, but is positioned with respect to locking bar 14 in a manner diametrically opposite to that occupied by locking member 16 to locking bar 13. However, in order to prevent confusion, the construction of locking member 17 will be designated with the same reference numerals but with the addition of letter "a".

Locking member 16 is operatively connected to control lever 32 of switch 33 in any desirable manner, such as by the use of link 34 which may be adjusted in length by member 35. Link 34 is joined to locking member 16 in any well known manner as by swivel 36 and to control lever 32 in any well known manner as by stub shaft 37. Locking member 17 is operatively connected to control lever 38 of switch 39 in any desirable manner, such as by link 40 which may be adjusted in length by member 41. Link 40 is joined to locking member 17 in any well known manner as by swivel 42 and to control lever 38 in the same manner used in joining link 34 to control lever 32.

Attention is now called to Figure 4 of the drawings which discloses a lock generally designated by reference character B, the elements of which are substantially similar in construction to those heretofore described in detail but whose positions with respect to plates 11A and 12A are slightly different. This difference in arrangement, but not in construction, is shown in detail in those portions of Figures 5, 6, and 7 which are identified by reference character B.

Locking bar 13A is in reality locking bar 13 in reversed position, whereas locking bar 14A is in reality locking bar 14 in reversed position with the stop lug 24A removed and a stop is disposed between locking bars 13A and 14A, as shown at 24B. Locking member 31 possesses lugs 46 and 47, the inclined surfaces of which are diametrically opposite to the inclined surfaces 20A and 22A of locking member 17. Locking member 31 is operatively connected to control lever 32A in any well known manner, as by link 43; and locking member 16A is operatively connected to control lever 38A in any well known manner, as by link 44.

The groups of switches and locking devices heretofore described are secured to support 45 upon which certain indicia is disposed to designate to the operator the respective uses to which the switches and related elements may be put.

Modus operandi

The operation of the devices embodying the invention in connection with switches, which it is desired to actuate one at a time, is as follows, reference being had to Figures 5, 6, and 7:

In Figure 5, switch 33, actuating the friction mechanism of the travel carriage 9, is shown in "off" position, and switch 39, actuating the brake mechanism of the travel carriage 9, is shown in "on" position. When these switches are in the position shown in Figure 5, locking member 17

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is held against movement in the channelway by locking member 16, which itself is free to move in said channelway. This arrangement gives positive assurance that, when the friction mechanism is "off", the brake will be "on" and that the travel carriage will be in neutral position, but held against movement by the brake. By the same token, it is obvious that, when the friction mechanism is in "on" position, the brake may be released and placed in "off" position. This fact is graphically shown in Figure 6, wherein switch 33 is in "on" position, indicating that the friction mechanism is engaged with the travel drum and switch 39 is in "off" position, indicating that the brake has been released from the travel drum.

Consequently, it is obvious that it would be impossible to release the brake when the friction is not applied or to release the friction when the brake is not applied.

Referring now to the hoist control levers 32A and 38A and their associated switches, the friction is applied to the hoist drum by placing lever 38A into the "on" position and the brake is released from the hoist drum by placing the lever 32A in "off" position. It should also be noted here that the hoist brake cannot be released until friction is applied to the hoist drum and that the friction cannot be released from the hoist drum until the brake is applied. This condition makes it impossible at any time for the travel carriage or the hoist to become free to travel; that is, controlling power will be applied at all times to the mechanism either by the brake being "on" or the friction being applied to the drums.

In Figure 6, the operating levers are shown in position to effect travel of the carriage 9. In order to effect travel of the carriage, it is necessary that the hoist also be in operation because the load on the hoist block must be maintained at the desired height above the ground. Figure 5 also graphically illustrates how it is impossible to release the friction before the brake has been applied to the travel drum and also how it is impossible to release the friction of the hoist drum before the brake has been applied.

The order of operation of the control levers to effect travel is as follows: The friction of the travel hoist is applied by moving the lever 32 to the "on" position. Then the brake of the travel hoist is released by moving the lever 38A to "off" position. The lever 38A is then moved to "on" position which applies the friction to the hoist drum and the lever 32A is moved to "off" position which releases the brake from the hoist drum.

In order to effect hoisting of a load without movement of the travel carriage, it is first neces-

sary to move all the levers into neutral position as illustrated in Figure 5. The order of this operation of the levers is directly reversed from the order of operation to effect travel, heretofore stated. After all levers are placed in the neutral position, the friction of the hoist drum is applied by moving the lever 38A to the "on" position and the brake is released by moving the lever 32A to "off" position. This procedure is best illustrated in Figure 7.

This completes the detailed description of the elements applied in my invention; and from the foregoing description, it will be seen that I have produced a safety device for cableway switches which substantially fulfills the objects of the invention, set forth herein. While this specification sets forth in detail the present and preferred construction of the invention; still, in practice deviations from such detail as come within the skill of the mechanic may be resorted to, but which do not depart from the spirit of the invention herein described and claimed.

It should, therefore, be understood that I consider as my own all such modifications and adaptations of the invention defined in the appended claims, provided, the elements set forth in the following claims or their equivalents are employed.

Having thus described my invention, what I claim as new and useful and upon which I desire to secure Letters Patent is:

1. A device of the class described to be used for controlling pair of switches, comprising a lock box having a channelway disposed longitudinally therethrough, locking bars, having notches therein, formed at each side of said lock box, a pair of members slidable, one at a time, within said channelway, and lugs formed within each of said members adapted for insertion within the complementary notches in the respective locking bars, whereby the movement of one of the slidable members locks the other of said slidable members against movement.

2. Means for controlling the movement of pairs of switches to be used in conjunction with cableways, comprising, a pair of locking bars having notches therein and a pair of locking members slidably disposed between said locking bars, said locking bars being in stationary relationship to the locking members and to each other and said locking members selectively adapted, one at a time, for being retained in operative connection with one of the locking bars while the other of said locking members moves freely between said locking bars.

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