Oct. 15, 1929. T. CARLSON 1,731,970

HOISTING APPARATUS

Filed July 26, 1927

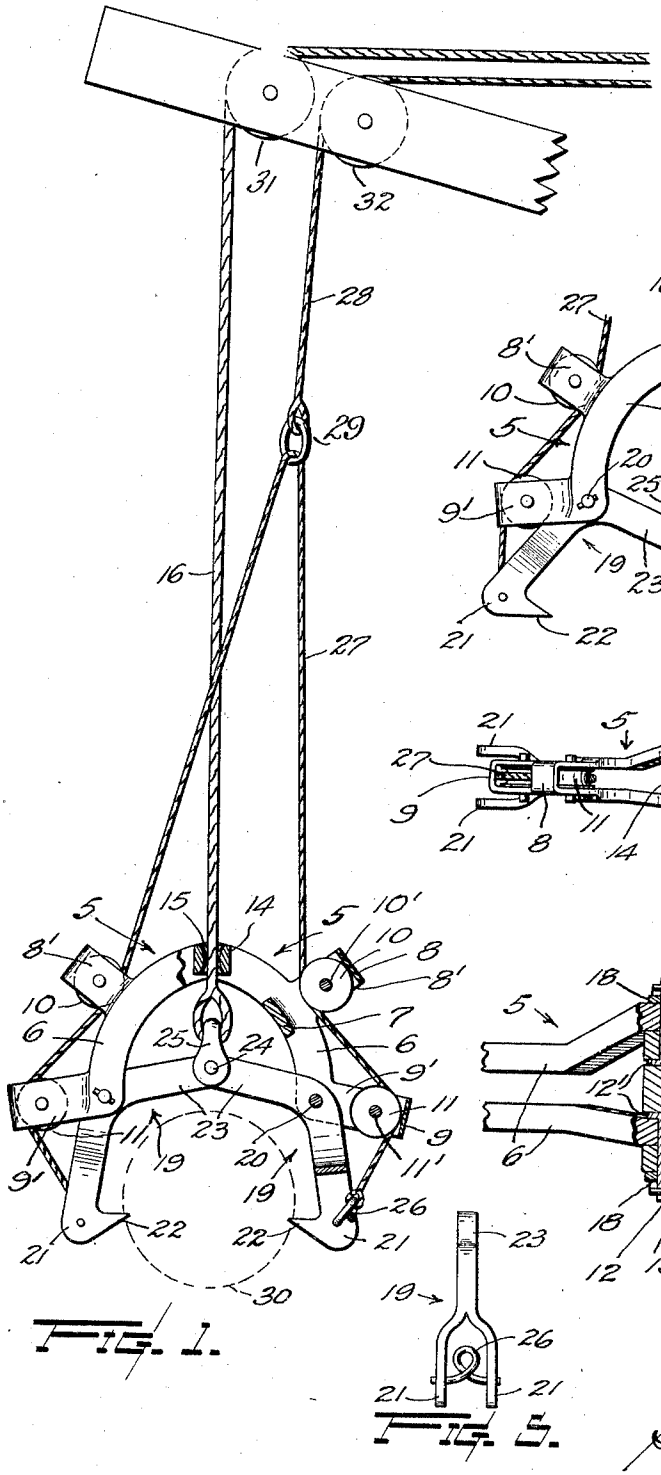


FIG. 1.

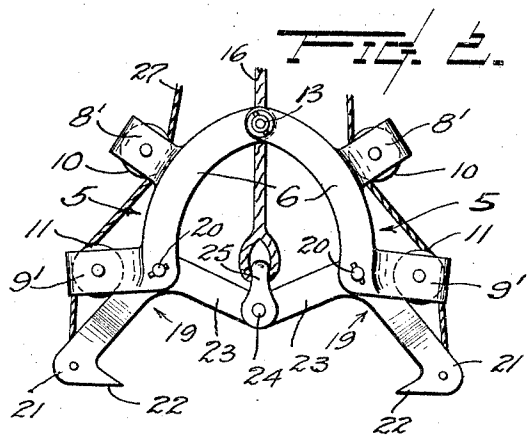


FIG. 2.

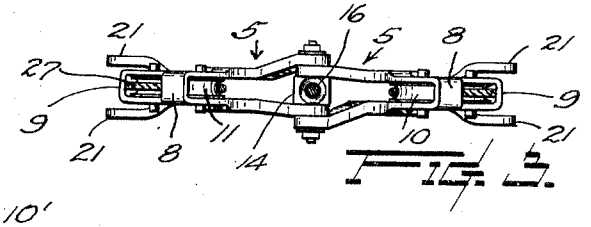


FIG. 3.

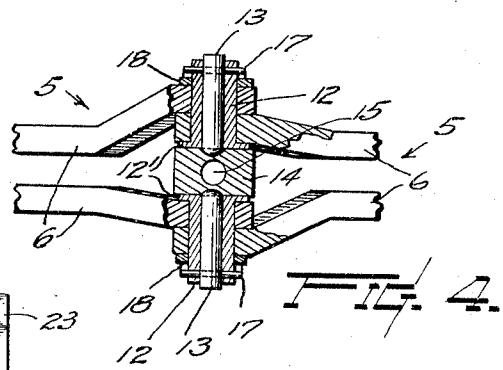


FIG. 4.

FIG. 5.

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UNITED STATES PATENT OFFICE

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HOISTING APPARATUS

Application filed July 26, 1927. Serial No. 208,446.

This invention relates to hoisting apparatus and is in the nature of an improvement in the apparatus shown and described in United States Patent No. 1,369,963 issued to me March 1, 1921; and its object, generally, is to perfect the construction of the grappling device to render the same stronger, and more efficient in operation.

A more specific object of the invention is to provide an improved frame to better accommodate the grappling devices and the operating and controlling cables therefor so as to more effectively engage and disengage the grappling device with and from a load.

In the accompanying drawing,—

Figure 1 is a view in front elevation of hoisting apparatus embodying my improvements, a portion of one of the frame members being broken away, and showing parts in section; Fig. 2 is a front elevation of the grappling means and the frame therefor, the parts thereof being in different relative positions than those in which they are shown in Fig. 1; Fig. 3 is a top plan view of Fig. 2; Fig. 4 is a detail view, partly in plan and partly in section, illustrating the manner of pivotally connecting the frame members to each other and to the guide block for the hoisting cable; and Fig. 5 is an end elevation of one of the grappling levers.

According to the present invention, the frame of a grapple consists of two rigid members 5. Each of said members comprising a pair of bar elements 6 which are held apart by a spacing element 7 at the inner side of the member and spacing elements 8 and 9 provided at the outer ends of apertured lugs 8^1 and 9^1 which extend laterally from bar elements at about the mid-length and the lower ends, respectively, of the same.

10 and 11 represent peripherally grooved pulleys provided between the associated lugs 8^1 and 9^1 of each frame member, and are mounted for rotation upon pins 10^1 and 11^1 secured to said lugs.

The upper ends of the frame members are pivotally connected to bushings 12 (Fig. 4) through which bushings extend axially aligned studs 13 whose opposing ends engage in recesses provided in opposite sides of a block 14.

This block 14 is provided with an aperture 15 through which extends a cable 16.

Pins 17 extending diametrically through the respective studs and bushings serve to couple the same together and act through the medium of washers 18 and in opposition to peripheral flanges 12^1 of the bushings to retain the studs and the bushings in their operative positions. The grappling devices proper comprise two levers 19 the central portions of which extend into the spaces between the lower portions of the bar elements 6 of the respective frame members and are pivotally connected thereto by means of fulcrum pins 20, one for each lever. The arms of the grappling levers below the fulcrums thereof are bifurcated to provide two jaw elements 21 which terminate in bills 22, the bills of one lever opposing those of the other lever. The other arms 23 of the levers extend substantially horizontally into overlapping relation with each other and are pivotally connected together by means of a pin 24 which also serves as a connection with a clevis 25 which engages in a loop of the cable 16. Each pair of grappling jaws 21 is connected, as by means of a looped bar 26, to an end of a cable 27 extending through a link 29 attached to an end of a cable 28, the leads of the cable 27, one at each side of its sliding connection with the link constituting, in effect, branches of the cable 28.

As illustrated, each of such branches is led about the inner and outer sides, respectively, of the pulleys 10 and 11 so as to direct the branches or leads to their connections with the bar attachments 26 of the grappling jaws in a manner to employ the cable most effectually for disengaging the jaws from a load—such as a log, for example—as indicated by dotted line 30 in Fig. 1.

The cables 16 and 28 pass over sheaves 31 and 32 of a boom or an equivalent and thence extend to suitable winding drums, not shown.

With the main or hoisting cable 16 slack and utilizing the other cable 28, the jaws of the device are brought into their relatively open positions (Fig. 2) to receive a load.

For action, the jaws are brought into closing relation by slackening the cable 28 while the hoising cable 16 is drawn taut. It is thus apparent that by suitably regulating the cables 16 and 28, the grappling devices may be caused to engage with or be disengaged from a load, selectively; and, furthermore, that the load may be raised or lowered through the medium of the hoisting cable 16 while the releasing cable is inoperative.

The advantages of the present invention reside principally in the use, first, of an improved form of grappling jaws which ensures a better distribution of the load; secondly, of the swiveled block for guiding the hoisting cable 16 ensures that the latter will act centrally of the grapple in a manner to retain the same vertically; and, thirdly, of the guide pulleys for the grapple releasing cable connections and their arrangement is such as will permit a rapid disengagement of the grappling jaws from a load.

In the present invention, moreover, the apertured swivel block connection 14 of the frame members 5 provides a guide whereby the hoisting cable 16 is attachable directly to the clevis 25 for supporting the grapple. And by the provision of the pulleys 10 and 11 mounted in the lugs 8^1 and 9^1 in offset relation from the bar elements 6 to which the grappling levers 21—23 are connected, enables the latter to be actuated for disengaging the jaws from a load.

What I claim, is,—

1. In apparatus of the character described, a grappling device consisting of two frame members, an apertured block pivotally connected to the upper ends of both of said members, a pair of levers fulcrumed intermediate their respective lengths to the lower ends of said frame members and affording a pair of jaw arms below the frame members and a pair of arms between said members, a hoisting cable extending through the aperture of said block and operatively connected to the last named arms, a releasing cable provided with branches whose lower ends are connected to said jaw arms, and pulleys mounted upon the respective frame members and serving to guide the cable branches to have the lower ends thereof depend from the frame to the respective arms.

2. In apparatus of the character described, a pair of frame members each provided with laterally protruding lug elements, an apertured block, a pin pivotally connecting the upper end of each of the frame members to the block, cable-guiding pulleys rotatably connected to each of the frame lugs, a pair of grappling levers fulcrumed to the lower ends of said frame members, each of said levers having a bifurcated hook arm depending from the adjacent frame member and a second arm located between the frame members, a pin pivotally connecting the second named arms of both levers together, a hoisting cable connected with the second named arms and extending through said apertured block, and a releasing cable having branches the lower ends of which are connected to the hook arms of said levers, said branches being guided by said pulleys in offset relation with respect to the frame.

3. In hoisting apparatus, a grappling device comprising a frame having two companion members, pulleys provided at the lower ends of the respective frame members, an apertured block pivotally connected to an end of each of said frame members, a lever member fulcrumed at approximately its midlength to the free end of each of said frame members, said lever members being formed to provide opposing jaw elements below the frame, a hoisting cable extending through the aperture of said block and connected interiorly of the frame with ends of both of the lever members, a releasing cable, and flexible connections provided upon the releasing cable, said connections extending over and about the pulleys of the respective frame members and connected with said lever jaws whereby the latter are swingable into and from their operative positions by employing one or the other of said cables.

Signed at Seattle, Washington, this 21st day of June, 1927.

THEODORE CARLSON.