

[54] **MANUAL OR POWERED SINGLE-LEVER
HAUL-IN AND HAUL-OFF APPARATUS**

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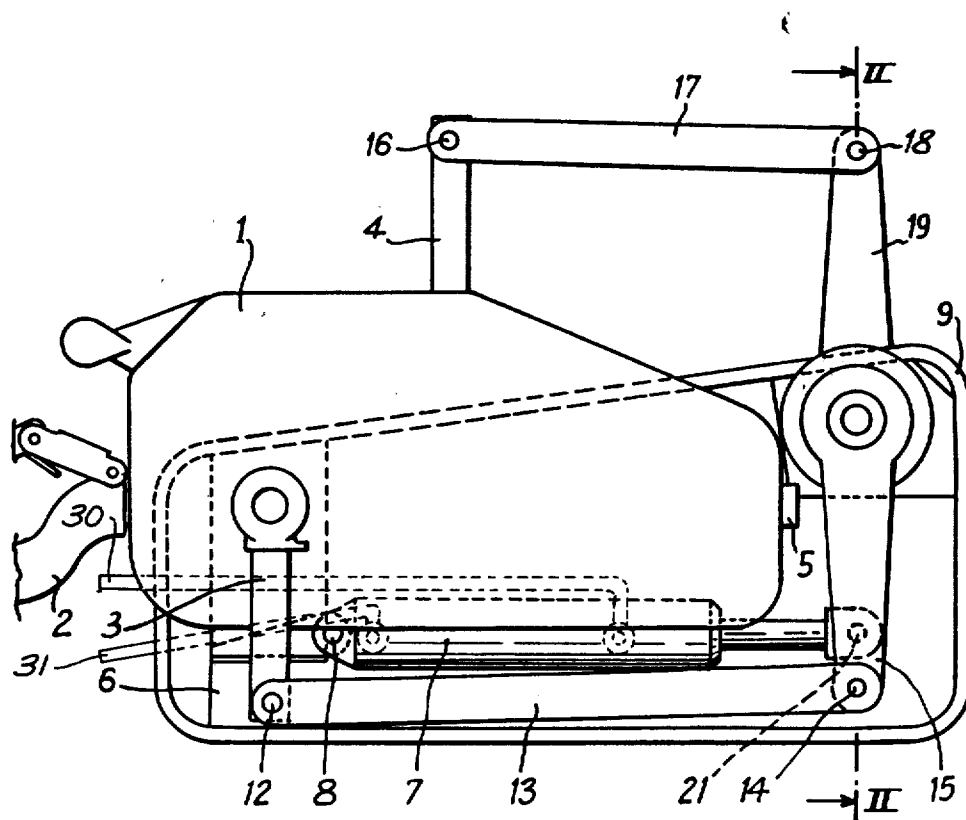
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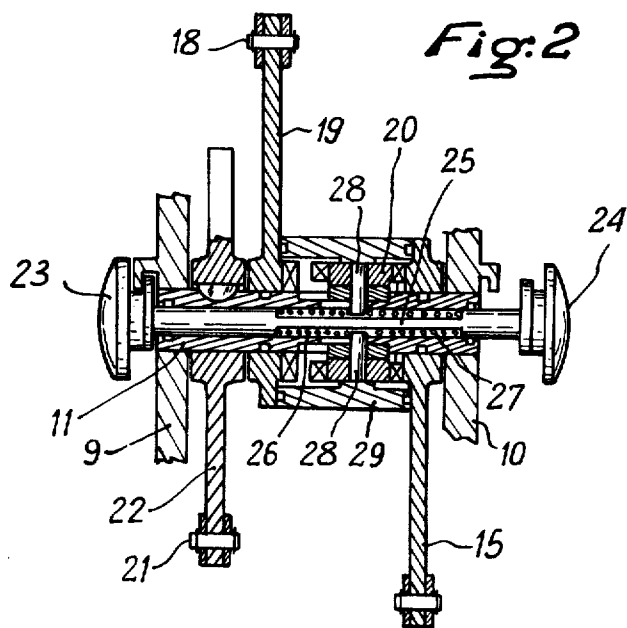
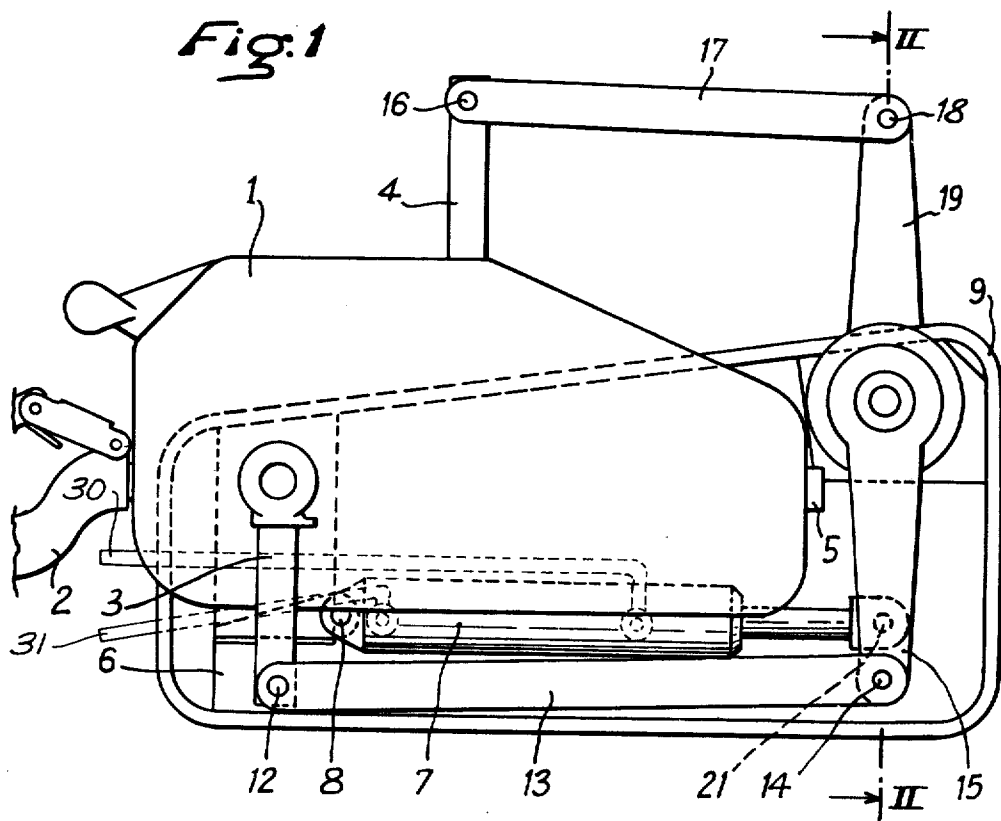
[57] **ABSTRACT**

In a traction apparatus for hauling in and off a wire rope, of the type comprising a pair of gripping devices to which rectilinear alternating movements are impressed in opposite directions, whereby the gripper travelling in the direction in which it is desired to move the wire-rope will be clamped on said wire-rope while the other gripper moves along the wire-rope in the opposite direction in a release condition, this apparatus further comprising a pair of actuating lever moving in different planes.

The improvement whereby a single control lever adapted to be reciprocated can be coupled at will to either of the pair of crank arms driving said actuating levers, the coupling being obtained through the medium of a shift member slidably mounted on a common control shaft, the arrangement permitting the actuation of said single lever either by means of a fluid-operated actuator of the cylinder and piston type engaging one end of said single lever, or manually at the opposite end of said single lever. (FIG. 2)

5 Claims, 2 Drawing Figures





MANUAL OR POWERED SINGLE-LEVER HAUL-IN AND HAUL-OFF APPARATUS

BACKGROUND OF THE INVENTION

This invention relates to traction apparatus of the type utilizing a wire-rope adapted to be hauled in and off by a pair of self-clamping devices or grippers to which rectilinear reciprocating movements are impressed in opposite directions, the gripper that travels in the direction of movement to be imparted to the wire-rope being adapted to clamp this wire-rope so as to move bodily therewith while the other gripper travels along the wire-rope in the opposite direction in its haul-off or release condition.

Each movement, whether for hauling-in or hauling-off the wire-rope, is obtained by operating a separate lever. In certain known apparatus of this type the two levers extend in different parallel planes.

SUMMARY OF THE INVENTION

The present invention is concerned with an apparatus of the general type set forth hereinabove which comprises two control levers disposed in different planes and it is the primary object of this invention to provide a device designed for drivingly coupling at will a single actuating lever of the reciprocating motion type to either of the pair of crank arms actuating each control lever, respectively, said coupling being obtained through the medium of a shift member adapted selectively to slide on a common control shaft. This single lever may in turn be actuated at will either by a hydraulic actuator at one of its ends, or manually at its opposite end.

A typical form of embodiment of the apparatus according to this invention will now be described by way of example with reference to the attached drawing, in which:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevational view of the apparatus from which one of the pair of half-frames has been removed in order to afford a clearer view of the mechanism, and FIG. 2 is a detail shown in section taken along the line II-II of FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The hauling apparatus 1 comprising an anchor hook 2, a haul-in lever 3 and a haul-off lever 4, is shown only in its external contour in FIG. 1, for its internal mechanism is well-known in the art and is no part of the present invention. For the sake of clarity, it may be mentioned herein that this apparatus is adapted to be traversed longitudinally by a haul-in and haul-off wire-rope (not shown) of which the section to be subjected to the tractive efforts and connected to the load to be hauled or released penetrates into the apparatus through a tubular end-piece 5. The apparatus 1 is secured to an anchor or fastening member 6 to which a hydraulic actuator 7 of the cylinder and piston type is attached via a pivot pin 8, a pair of half-frames 9 and 10 being also secured to this fastening member 6. These half-frames 9, 10 comprise two bearings in which the two ends of control shaft 11 are journaled. The fastening member 6 and the pair of assembled half-frames 9, 10 constitute together a rigid structure whereby the

control shaft 11 can be properly positioned in relation to the hauling apparatus 1.

The haul-in lever 3 receives therethrough at one end a pivot pin 12 for one end of a longitudinal link 13 having its opposite end pivoted by means of another pin 14 to a crank arm 15 adapted to rotate freely on said control shaft 11.

The haul-off lever 4 is pivotally connected at one end, by means of a pivot pin 16 to one end of a longitudinal link 17 having its opposite end pivoted by means of a pin 18 to another crank arm 19 also adapted to rotate freely about the shaft 11.

The two levers 15 and 19 have notches cut therein which are adapted to be engaged by the driving dog teeth of a shift member 20 adapted to selectively slide on said shaft 11 via coupling splines holding said member 20 against rotation thereon.

The hydraulic actuator 7 pivoted at one end to the fastening member 6 by means of a pivot pin 8 has its other end connected via another pivot pin 21 to the single lever 22 rigid with control shaft 11, so that the movement of the actuator piston rod is transmitted to said control shaft 11 via said single actuating lever 22 thus causing said control shaft 11 to present an oscillating movement.

The control shaft 11 is hollow and its bore has slidably fitted therein the corresponding stems of a pair of opposite control knobs or push members 23, 24; however said stems are directly and rigidly interconnected by a rod 25 whereby any movement imparted to one push member, whether for rotation or translation, is transmitted to the other push member. These push members 23, 24 are provided with groove and cam means so that they can easily be locked in the selected position along their common axis with the assistance of corresponding means provided on said half-frames 9 and 10, respectively.

A pair of coil compression springs 26 and 27 surrounding the rod 25 react with one end against the push members 23, 24 and with the opposite end against a pair of radial pins 28 secured to the shift member 20 and extending through the control shaft 11.

A cylindrical sleeve 29, in which grooves containing adequate seals are formed at either ends, encloses the dog-shift mechanism; its seals engage corresponding lapped side faces of crank arms 15 and 19. Four seals or packings are provided on shaft 11 to insure sealing between the outer face of the shaft and the crank arms 15 and 19 and to insure sealing on the internal bore of the shaft at the place of the stems of push members 23 and 24. This arrangement permits of constantly having a reserve of oil or grease for lubricating the mechanism and prevents any ingress of foreign matters from the surrounding atmosphere. The single actuating lever 22 has an extension such that another lever can be attached thereto to permit the manual actuation of the apparatus without having to remove any component thereof.

The actuator 7 is of a conventional type and has ducts 30 and 31 for feeding the two chambers of the actuator with fluid under pressure.

To operate the hauling apparatus by means of the hydraulic actuator 7, it is only necessary to depress to push member 23 and to lock same in its operative position. Thus, the spring 26 is compressed and urges the dog teeth of shift member 20 against the corresponding notches of crank arm 15, the latter being connected via a longitudinal link 13 to the haul-in lever 3 of apparatus

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1. When the actuator 7 operates the apparatus and the dog teeth register with the notches of crank arm 15, the coil spring 26 urges against the shift member 20 for engagement with crank arm 15, thus actuating the apparatus for a hauling operation i.e. transmitting to the haul-in lever 3 the oscillating movement of the control shaft 11.

To operate the apparatus under haul-off conditions it is only necessary to rotate the push member 24 in order to release the other push member 28 and then push said member 24 home and lock same in position, in turn. Under these conditions, the coil compression spring 26 is fully released or expanded and its companion spring 27 is compressed and urges the shift member 20 whereby the latter is disengaged from crank arm 15 and engages the other crank 19. When the positions of the dog teeth of both members register with each other, these members snap into mutual engagement and the apparatus is driven in the haul-off direction i.e. the haul-off lever 4 receives the oscillating movement of the control shaft 11.

Under these conditions, the apparatus can be shifted to one condition of operation to the other either during the operation or when the apparatus is inoperative. Similarly, when it is desired to drive the apparatus manually, it is only necessary to interconnect the two chambers of the cylinder and piston actuator 7, and also to connect these chambers to the oil reservoir, and fix a hand lever to the proper end of the single lever 22 so as to actuate manually, the desired direction of operation being selected in the manner explained hereinabove in connection with the actuator control.

It is obvious that the invention is not restricted to the embodiment described and illustrated herein but that it can be modified in various ways without departing from the basic principle of the invention, as will be clearly apparent to those conversant with the art. Thus, the applicant does not intend this description to be construed as limiting the scope of his invention which he now claims.

What I claim is:

1. In a cable hauling apparatus with actuating mechanism, wherein said hauling apparatus has a pair of oscillating actuating levers disposed in different planes with a first actuating lever of said pair controlling hauling in of a cable passing through the apparatus while the

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second actuating lever of said pair controls the hauling off of said cable, and wherein said actuating mechanism comprises a single control lever, a control shaft rigid with said control lever for receiving therefrom an alternative rotating movement, and a pair of crank arms pivotally mounted about said control shaft, mechanical means capable of transmitting the movement of said single control lever to said first and second actuating levers through said pair of crank arms, said mechanical means including a shift member slideably mounted on said control shaft between said pair of crank arms, said shift member being capable of selectively engaging one crank arm of said pair of crank arms and coupling said single control lever to said crank arm and consequently to the corresponding actuating lever of the hauling apparatus.

2. Apparatus as set forth in claim 1, including a rigid frame integral with the apparatus, a fluid-operated actuator of the cylinder and piston type, of which one end is pivotally connected to a fixed point of said rigid frame and the other end is connected to said single control lever.

3. Apparatus as set forth in claim 1, including a casing and said control shaft extends through said casing and reacts against opposite faces thereof.

4. Apparatus as set forth in claim 1, wherein said control shaft is hollow and has a transverse opening, external push members extend into the ends of said shaft, a rod passes through said control shaft and connects said push members, a pair of springs are disposed within said control shaft, each spring of said pair being disposed between the corresponding push member and an extension of said shift member passing through said control shaft transverse opening whereby a thrust exerted on one push member causes the spring associated with this push member to push said shift member to engage one crank arm of said pair of crank arms, while a thrust exerted on the other push member causes said shift member to engage the other crank arm of said pair.

5. Apparatus as set forth in claim 1, wherein an external sleeve member, coaxial to said control shaft and provided with convenient seals, covers said shift member for protection purpose.

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