No. 777,685. PATENTED DEC. 20, 1904.

T. S. MILLER.

CONVEYING APPARATUS.

APPLICATION FILED APR. 15, 1901.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 2.

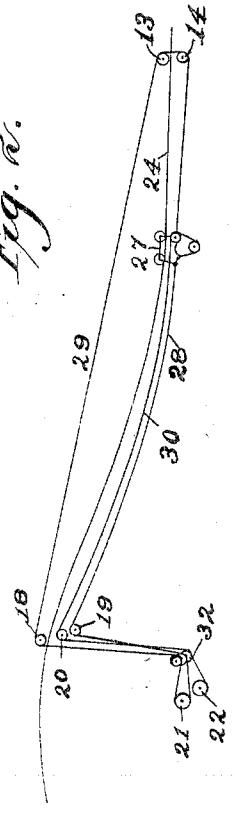
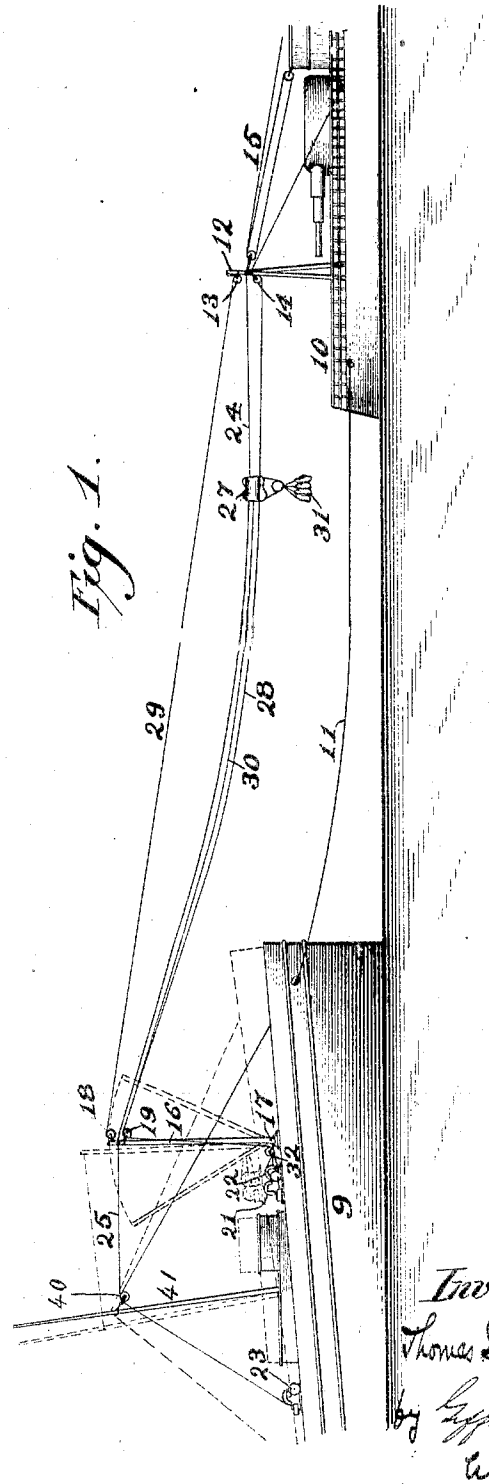



Fig. 1.




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Inventor:

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by Eggleston & Bell

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 5.

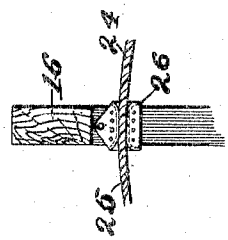



Fig. 7.

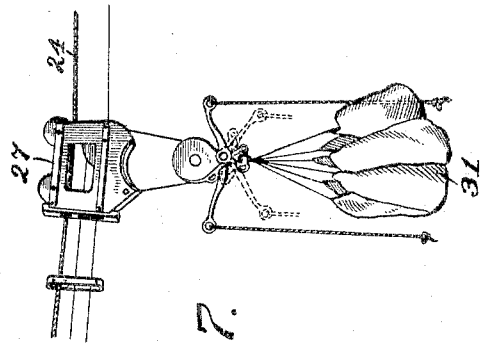



Fig. 4.

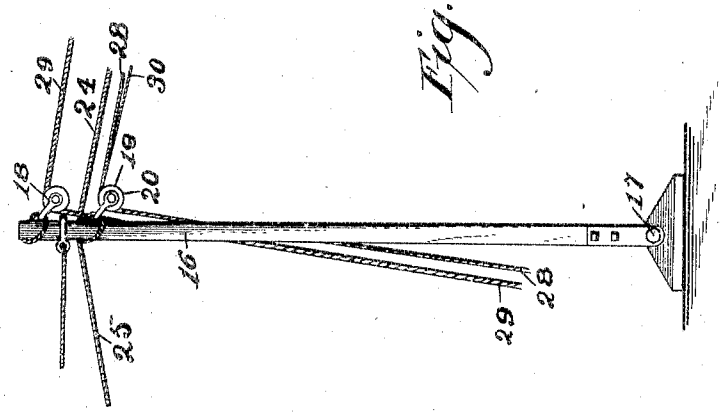



Fig. 3.

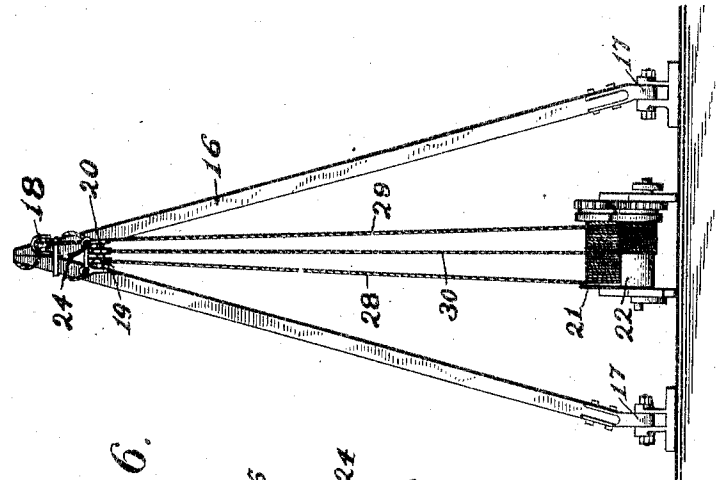
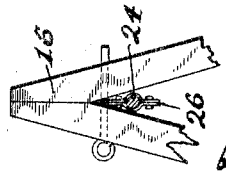



Fig. 6.




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No. 777,685. Patented December 20, 1904.

# UNITED STATES PATENT OFFICE.

THOMAS SPENCER MILLER, OF SOUTH ORANGE, NEW JERSEY.

## CONVEYING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 777,685, dated December 20, 1904.

Application filed April 15, 1901. Serial No. 55,862.

*To all whom it may concern:*

Be it known that I, THOMAS SPENCER MILLER, a citizen of the United States, and a resident of South Orange, in the county of Essex and State of New Jersey, have invented a new and Improved Conveying Apparatus, of which the following is a full, clear, and exact description.

My invention relates to a device for transferring loads between two points by means of a cableway in which the supporting-cable is permitted under some conditions to have a longitudinal movement relative to one or both of its supports and is particularly adapted for use in transferring loads between two relatively movable bodies, as between two boats or between a boat and a fixed object, as a wharf.

My invention comprises certain parts and combination of parts, which will be particularly pointed out in the claims.

In the accompanying drawings I have illustrated my present invention in the form which is at present preferred by me. I am, however, aware that the invention may be embodied in forms differing from those herein shown and applied to other uses without departing from the spirit of my invention and without exceeding the scope of my claims. I do not, therefore, wish to be limited to the forms herein shown or the uses herein indicated.

Figure 1 shows my device as in use for conveying loads between two boats. Fig. 2 is a diagram showing the arrangement of the operating-ropes. Fig. 3 is a rear view, and Fig. 4 a side view, of the hinged mast or boom which supports one end of the cable. Figs. 5 and 6 are details showing a method of supporting the cable from the boom or mast, and Fig. 7 is a detail of the carriage and load.

In Fig. 1 two boats 9 and 10 are shown having my device applied thereto for the transmission of coal or any other article. These boats are preferably connected by a tow-line 11, which maintains them at as constant a distance as possible. The relative positions of the two boats may be reversed, and either boat may be used to tow the other, or one or both of the boats may be anchored and kept apart either by the pull of the anchor-chains or by operating the engines of one or both.

Supports are provided upon both boats for carrying the supporting or trackway cable at such height as will keep it and the loads conveyed out of the water. Upon the boat 10, which is herein represented as a war-ship, is shown a boom or sheer-legs 12, to which one end of the supporting or trackway cable 24 is secured and which is stayed by a block-and-fall arrangement 15 or other equivalent means which will resist the pull of the cable 24.

Upon the boat 9, which is herein represented as a merchant vessel or collier, is shown a boom, mast, or sheer-legs 16, which is hinged at one end, as at 17, so that its free end may swing toward and from the other boat 10. To the free end of this boom the supporting or trackway cable 24 is secured, as by a clamp 26. This boom or mast is acted upon by any suitable means by which the required strain may be maintained upon the cable 24, said means acting to swing the boom away from the opposite boat. The means herein shown consists of an engine 23, from the drum of which extends a cable 25 to the boom 16. The cable 25 may be separate from the cable 24 or an extension thereof, as desired. When the strain upon the cables 24 and 25 rises above the power of the engine, the boom 16 will swing toward the opposite boat. When the strain upon the cable drops below the normal or that for which the engine 23 is designed or adjusted, the cable 25 will be wound up. Thus the yielding pressure of the fluid by which the engine is actuated constitutes the means whereby the load-carriage is maintained at normal elevation throughout variations in the distance between the boats. The power of the fluid makes the engine ready to instantly take up any slack. The yielding nature of such power makes it ready to pay out when the demand occurs. One end of the cable 24 is thus given a longitudinal movement relative to its support—the boat.

Upon the supporting or trackway cable 24 is placed a load support or carriage 27, which may be of any usual or desired construction, so that it may be moved with the load along the cable 24 from one boat to the other. Any of the means usually employed in cableways

and analogous constructions for moving the load-carriage and for handling the load may be employed. The means I have herein shown comprise a traversing rope 28 29, a fall-rope 30, and an engine carried by the boat 9 and having drums 21 and 22, receiving, respectively, the two ends of the traversing rope and the fall-rope. Fall-rope carriers may be used if desired.

The above mechanism is given simply as a convenient means by which the loads may be transported between the two supports and raised and lowered and not as the only means available. Any other means for securing the traversing, hoisting, and lowering of the load may be used, and if the load may be taken and delivered substantially at the point of support of the cable 24 the hoisting and lowering feature may be omitted.

The two runs 28 and 29 of the traversing rope pass over sheaves 20 and 18, secured to the free end of the boom 16, and then over sheaves 32, secured substantially coincident with the axis or pivot 17 of the boom 16, and thence to the drum 21. The mast or support 12 upon the other boat has a sheave or sheaves 13 14, which receive the loop of the traversing rope. The fall or hoist rope 30 extends from the carriage over sheave 19 and a sheave which is back of and similarly located with the sheave 32 and then to the drum 22. If the drums 21 and 22 are located sufficiently near the axis of the boom 16, the sheaves 32 at the pivot of said boom may be dispensed with.

It will be seen that rope 25, which constitutes the take-up and pay-out of the ropeway, extends backward from the vibrating member 16 approximately in the line of reciprocation of such member. It preferably then extends over a sheave 40 on the mast 41 of the boat 9 on its way to the take-up and pay-out actuator 23. On the other hand, the ropes 28, 29, and 30 for operating the carriage and hoist are by the guides 18, 19, and 20 on the vibrating member 16 deflected from the line of reciprocation and extend laterally therefrom down toward the deck of the boat 9. In other words, if we consider the take-up and pay-out rope 25 as a continuation of the supporting-cable 24 the carriage operating and supporting ropes extend side by side on the span, but at the end of the span part company, the rope 24 25 continuing approximately in the cableway-line extended, while the carriage-operating ropes are deflected sharply therefrom toward their operating-engine below. In referring to the rope 25 as the "take-up" and "pay-out" rope I make no distinction as to whether it is integral with the carriage-supporting rope 24 or separate therefrom.

In operating the device as herein shown the load is first attached to the fall-block, which is sufficiently lowered from the carriage for this purpose, the carriage being at the time over the boat from which the load is to be taken. The load is then hoisted to the carriage and the carriage caused to travel along the supporting-cable to the other boat, when the load is lowered to the deck or to wherever it is to be delivered. The reverse operation brings the carriage back, and with it the empty sack, which contained the load or any return load which it is desired to convey. As the distance between the boats changes, either by reason of their rise and fall on the waves or by reason of the slackening or tightening of the tow-rope or from any cause or combination of causes, the swinging boom or mast 16 under the influence of the engine 23 and the weight on the cableway swings back and forth, as indicated by dotted lines, thus automatically adjusting itself to the changing conditions and preventing sudden increase of strain, which would cause violent oscillations of the cableway. The cableway being regulated to a substantially constant tension, its span will of course occupy a higher position when unloaded than when loaded. The tension on the cableway should, however, be adjusted to maintain the requisite minimum elevation for the heaviest load contemplated. Any elevation greater than this would not be objectionable.

The arrangement of ropes herein shown for handling the load is one which is common in cableways and may be replaced by any other arrangement of analogous character. Such cableways as previously used are, however, lacking the yielding support for one end of the supporting-cable and the laterally-extending section of the hoisting and traversing ropes, so that while the main or supporting cable may vary in length the load-handling ropes may remain of constant length, or at least of constant length for any position of the load-carrier. It also enables the load-carrier to be propelled at a uniform speed irrespective of the movement of the swinging boom or mast, which acts as one support.

I have not herein endeavored to point out all the modifications which might be made in the parts of my invention, but only to describe a preferred form of construction and to bring out the principles embodied, so that those skilled in the art may be enabled to employ them at will either when embodied in the constructions shown or in modified constructions. Many of the details and combinations illustrated and above described are not essential to my invention, broadly considered. This will be indicated in the concluding claims, in which the omission of any element or the omission of reference to the detail features of the elements mentioned is intended to be a formal declaration of the fact that the omitted elements or features are not essential to the inventions therein severally covered.

Having thus fully described my invention,

I claim as new and desire to secure by Letters Patent—

1. In combination, a boat, an elevated support thereon, a rope extending from said support to another support located off of said boat, a load-carriage traveling to and from said boat on said rope and a means for maintaining a normal elevation of said load-carriage during its excursions, which means consists of mechanism whereby the yielding power of a fluid is applied in opposition to the strain on said rope, substantially as described.

2. In a conveying device the combination with two relatively movable bodies each carrying a cableway-support, one of said supports containing a hinged member, a cable extending from said hinged member to the other support, means for producing tension on said cable acting through the hinged member, and means for transferring loads over said cable comprising ropes leading substantially through the pivot-axes of the said hinged member.

3. In combination two boats, a cable extending between said boats, a hinged support for said cable on one boat, means acting on said hinged support to produce tension on the said cable, a carriage traveling on said cable, a traversing rope for said carriage, and guides for said traversing rope located to substantially coincide with the pivot-axes of the hinged support.

4. In combination two boats, a cable extending between said boats, a hinged support for said cable on one boat, a tension device operated by fluid under pressure and acting upon said hinged support to produce tension on the said cable, a carriage traveling on said cable, a traversing rope for said carriage and guides for said traversing rope located to substantially coincide with the pivot-axes of the hinged support.

5. In combination two boats, a cable extending between said boats, a hinged support for said cable on one boat, an engine connected with said hinged support to produce tension on the said cable, a carriage traveling on said cable, a traversing rope for said carriage, and guides for said traversing rope located to substantially coincide with the pivot-axes of the hinged support.

6. In a device for transferring loads between two relatively movable bodies, a cableway-support located upon each of said bodies, one of said supports containing a hinged member, a cable suspended between said hinged member and the other support, a winding-engine connected with said hinged member and acting in opposition to the suspended cable, a traversing engine, rope-guides substantially at the pivot-axis and at the point of attachment of the suspended cable with the hinged member, a carriage on said cable and a traversing rope therefor extending from the traversing engine through said guides to the opposite support.

7. In combination two boats, an elevated support upon said boat, said support upon one boat consisting of a hinged boom adapted to swing toward and from the other boat, a cable extending from the free end of said boom to the elevated support upon the other boat, an engine acting to swing the free end of said boom in opposition to said cable, a carriage on said cable, a traversing engine and a traversing rope for the carriage extending from its engine through guides substantially at the pivot of said boom and at the point of attachment of the cable thereto.

8. In a cableway, in combination, a load-carriage, an operating-rope therefor, a vibrating cableway-end support and a take-up and pay-out rope extending from said vibrating support approximately in line with the vibrations thereof.

9. In a cableway, in combination, a load-carriage, an operating-rope therefor, a reciprocating cableway-end support and a take-up and pay-out rope extending from said reciprocating support approximately in the cableway-line extended.

10. In a cableway, in combination, a load-carriage, a cableway-end support, an operating-rope for said load-carriage deflected at said end support from the cableway-line, a carriage-supporting rope extending from the span past said support approximately in said cableway-line extended and a take-up and pay-out mechanism connected therewith.

11. In a cableway, in combination, a load-carriage, an operating-rope therefor, a reciprocating cableway-end support, a take-up and pay-out rope extending from said reciprocating support approximately in line with the reciprocations thereof and a guide approximately in said line over which said rope extends.

12. In a cableway, in combination, a load-carriage, a reciprocating cableway-end support, a take-up and pay-out rope extending from said reciprocating support approximately in line with the reciprocations thereof and a carriage-operating rope extending from said support away from said line of reciprocation.

13. In a cableway, in combination, a load-carriage a carriage-supporting rope, supports 12 and 41 for said supporting-rope, a reciprocating member, adjustable means of engagement 26 between said reciprocating member and said supporting-rope, a carriage-operating rope 28, 29, and guides 18, 19, therefor mounted upon said reciprocating member.

14. Apparatus for transferring cargoes from one vessel to another comprising a fixed anchorage on one vessel, an oscillating anchorage on another vessel, cables connecting said anchorages, a swinging yoke on said oscillat-

ing anchorage and sheaves mounted on said yoke to receive said cables.

15. Apparatus for transferring cargoes from one vessel to another comprising an anchorage to a fixed support on one vessel, an anchorage to a tower oscillating from its point of support on another vessel and a connecting-line passing from one support to the other and return.

16. Apparatus for transferring cargoes from one vessel to another comprising an anchorage to a fixed support on one vessel and a tower oscillating from its point of support on the other vessel, a traveling cable passing from one anchorage to the other and return, a pulley on one of said anchorages around which said cable passes and means to maintain a constant tension on each portion of said cable.

In testimony whereof I have signed my name to this specification in the presence of the two subscribing witnesses.

THOMAS SPENCER MILLER.

Witnesses:
H. L. REYNOLDS,
W. A. PAULING.