T. S. MILLER.

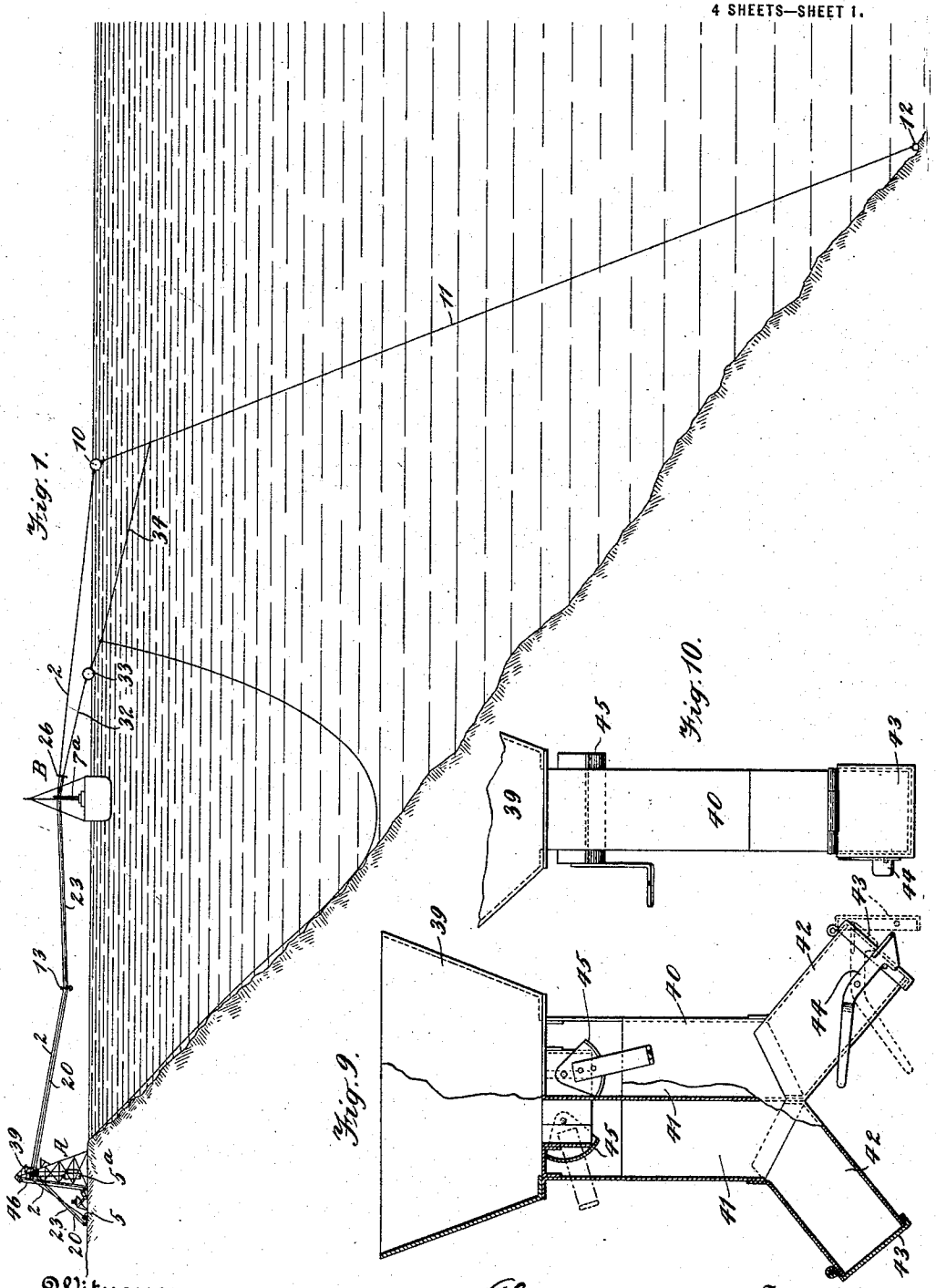
CABLEWAY.

APPLICATION FILED OCT. 28, 1913.

1,187,540.

Patented June 20, 1916.

4 SHEETS—SHEET 1.



Witnesses:

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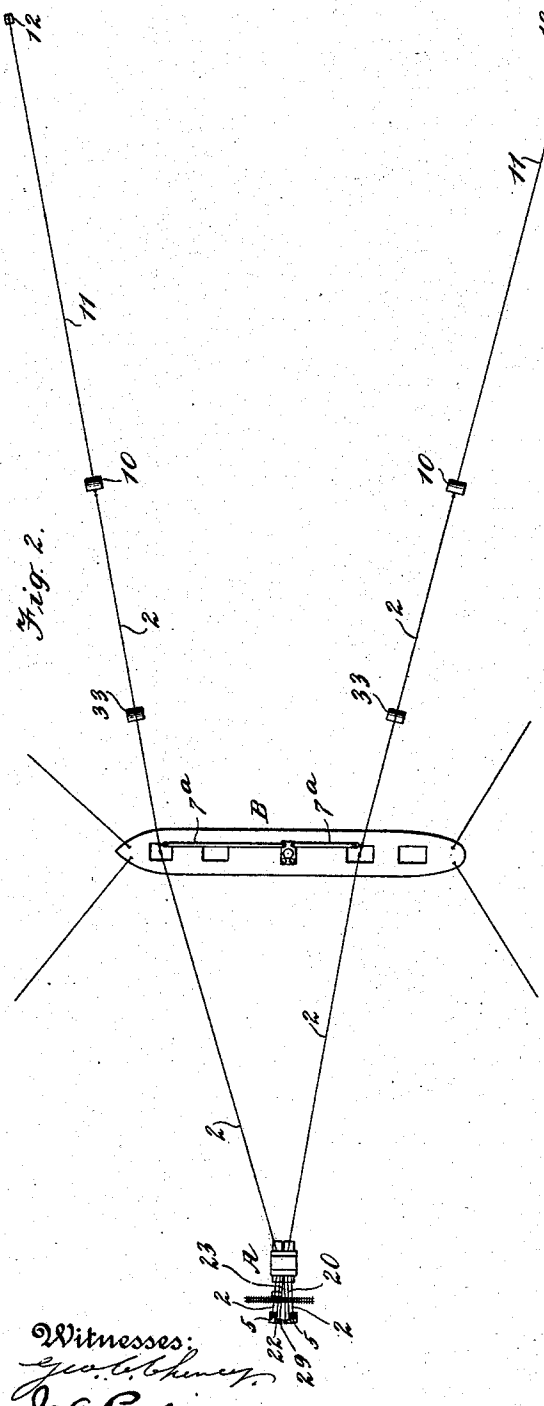


Fig. 2.

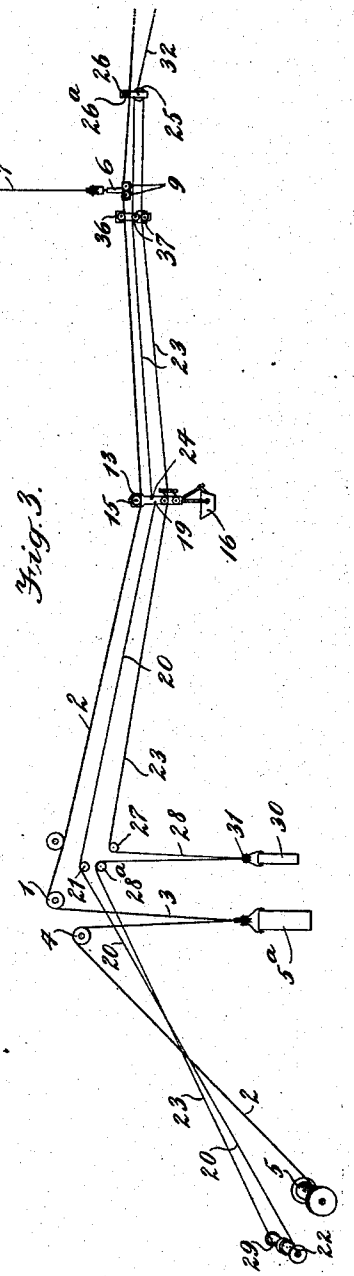


Fig. 3.

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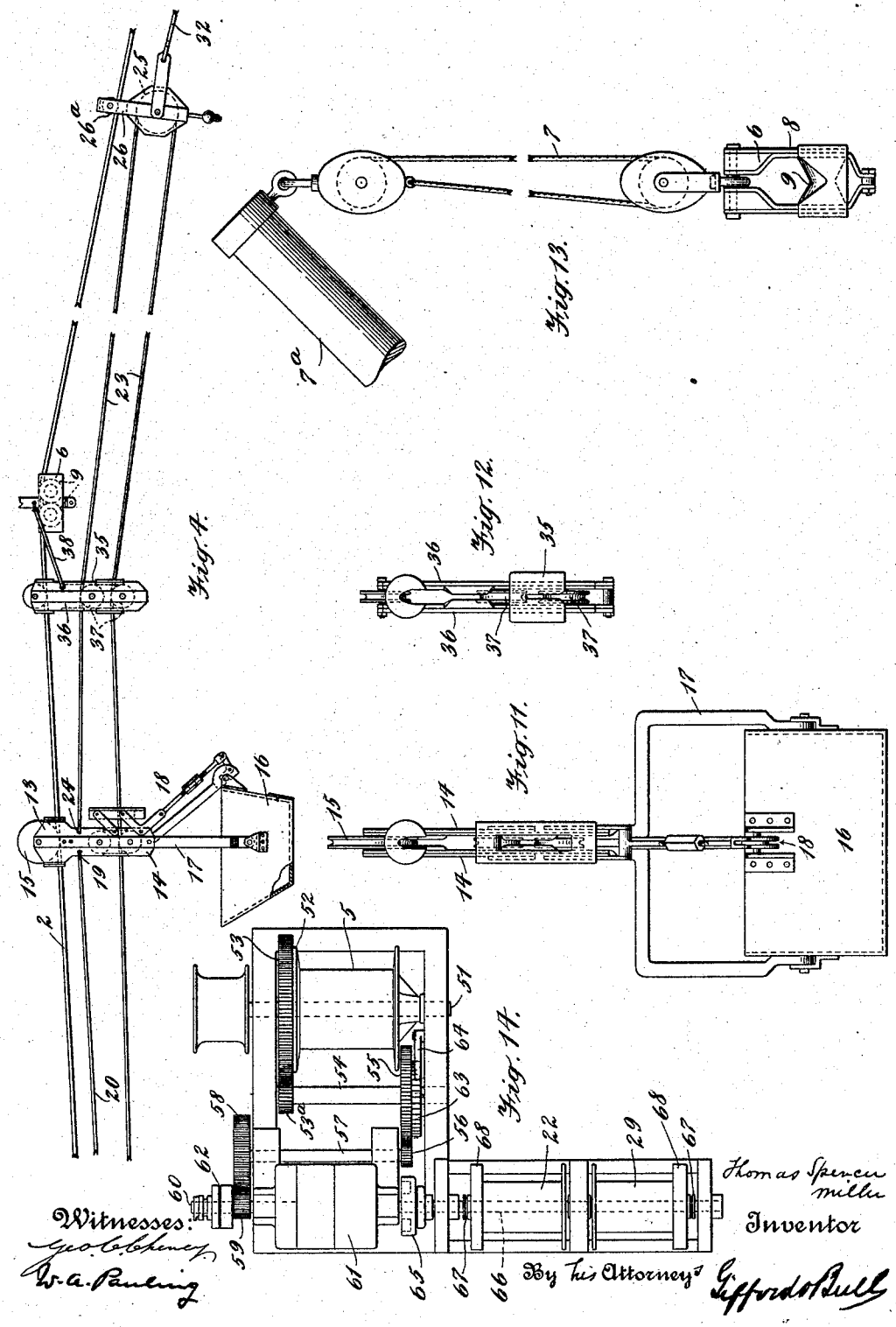
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4 SHEETS—SHEET 3.



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4 SHEETS—SHEET 4.

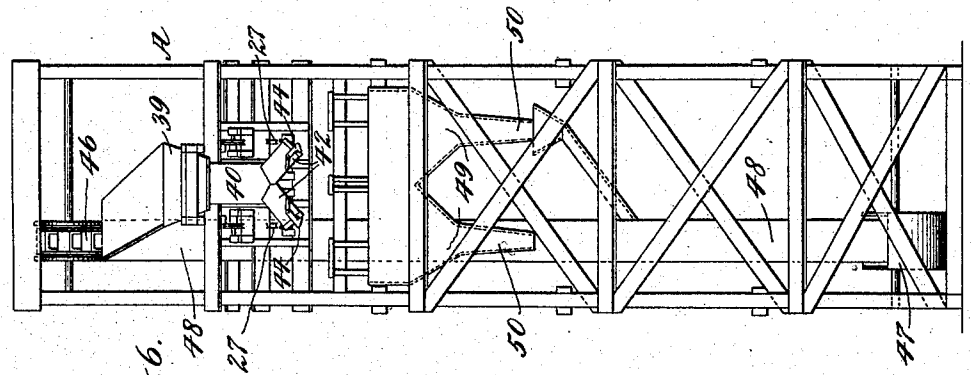


Fig. 6.

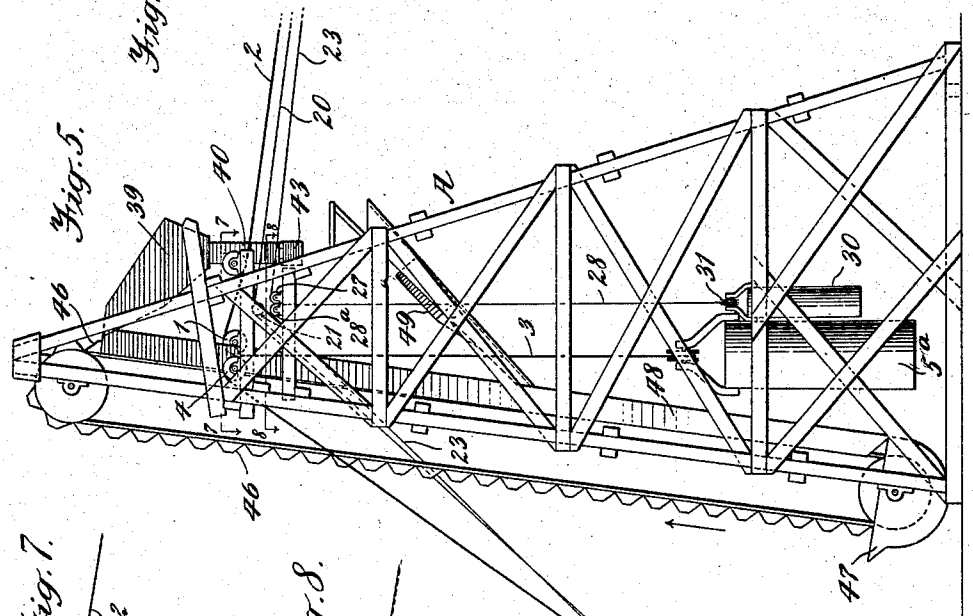


Fig. 5.

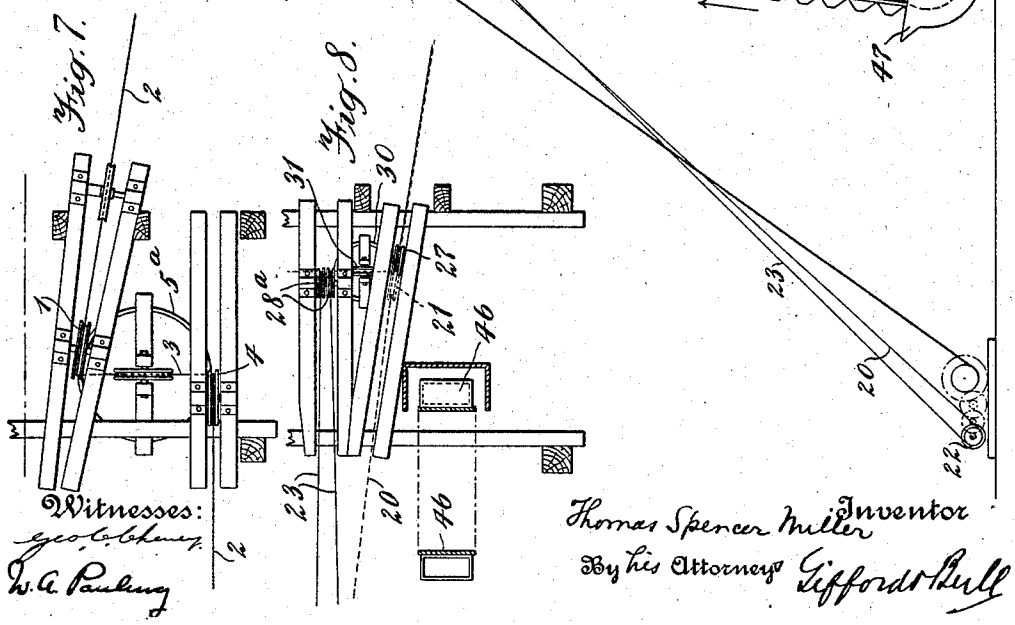


Fig. 7.

Fig. 8.

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UNITED STATES PATENT OFFICE.

THOMAS SPENCER MILLER, OF SOUTH ORANGE, NEW JERSEY.

CABLEWAY.

1,187,540. Specification of Letters Patent. Patented June 20, 1916.

Application filed October 28, 1913. Serial No. 797,707.

To all whom it may concern:

Be it known that I, THOMAS SPENCER MILLER, a citizen of the United States, residing at South Orange, in the county of Essex and State of New Jersey, have invented new and useful Improvements in Cableways, of which the following is a specification.

My invention relates to new and useful improvements in cableways, and more particularly to cableways of the type for transporting loads from a fixed loading station, for example, one located on land to a vessel located off-shore.

The primary object of the invention is to provide a cableway which will be comparatively simple in construction, efficient in operation and which will permit high speed in transfer of the load.

Further objects, among others, are to provide a cableway which will not, under strain of the load, alter the position of the load-receiving ship during the transfer operation; to provide improved means for anchoring the off-shore end of the cableway, and for regulating the tension on the cableway whereby the latter will be maintained at the proper deflection and elevation, independently of the movements of the load-receiving vessel, the position of the off-shore anchorage for the cableway, and the weight and position of the load traversing the cableway.

The invention consists in the improvements to be more fully described hereinafter, and the novelty of which will be particularly pointed out and distinctly claimed.

I have fully and clearly illustrated my invention in the accompanying drawings to be taken as a part of this specification and wherein:

Figure 1 is a view in elevation of a cableway installation embodying my present invention; Fig. 2 is a plan view of the system shown in Fig. 1; Fig. 3 is an enlarged detail view in side elevation of the rope leads shown in Fig. 1; Fig. 4 is an enlarged detail view in side elevation at that end of the cableway adjacent the vessel being loaded; Fig. 5 is a view in side elevation of a tower for supporting the land-end of the cableway; Fig. 6 is a view in front elevation of the tower shown in Fig. 5; Fig. 7 is a section on the line 7—7 of Fig. 5; Fig. 8 is a section on the line 8—8 of Fig. 5; Fig. 9 is a view in elevation, partly in section and with parts broken away, of a feed hopper; Fig. 10 is a view in side elevation of a portion of said hopper; Fig. 11 is a view in rear elevation of a dumping bucket employed in connection with my invention; Fig. 12 is a view in elevation of a trip-block for dumping said bucket; Fig. 13 is a detail view of a saddle-block for supporting the cableway on the load-supporting vessel; Fig. 14 is a plan view of a preferred form of winding engine for operating a cableway.

Referring to the drawings by characters of reference, A designates generally a support, shown for example, as consisting of a land tower adapted to be located at a point on shore from which the material is to be shipped or to which it is to be delivered, and B is a vessel to receive or discharge the material. The tower may be of any construction suitable to the purposes for which it is employed, said tower having journaled thereon a guide wheel or pulley 1, over which passes the main cable 2 of the cableway. The main cable 2, at its inner portion is looped down within the tower A, as at 3 and then carried over a second guide pulley 4 on said tower, whence it is carried down and wound upon a winding drum 5, to be more specifically described hereinafter. Hanging in the loop 3 of the main cable, is a counterweight 5^a, preferably located inside the tower and freely movable upward and downward under conditions, and for a purpose to be presently set forth.

At its outer end portion the main cable passes over the vessel B, and is preferably supported thereon by a saddle-block 6, adjustably swung by a block and fall 7 from the end of a boom 7^a mounted on the vessel. This saddle is preferably so constructed that the main cable may move in either direction relative to the vessel, or the latter may move relative to the cable, and for this purpose the saddle-block may consist of a frame 8, having side members between which are journaled two sheaves 9, 9, over which the cable passes. By means of the block and fall 7, the saddle may be adjusted vertically to regulate the position of the cable above the vessel. The saddle is located over the hatch of the vessel which is to receive the load, or such other point at which the load

is to be deposited. At its outer end the main cable is connected in any suitable manner to what I may call a "restrained float" which is preferably in the form of a buoyancy device anchored to a suitable anchorage.

In the present instance I have shown said device as consisting of a buoy 10 of any suitable form and dimensions, connected by a cable 11, or other suitable connection, to an anchor 12. This buoy is of such dimensions and buoyancy, and the anchorage is of such weight or resistance, that the combined resistance of the buoy and anchor will be ample to resist pull on the main cable from whatever cause. By this buoy and anchorage the main cable is kept under uniform tension at all times due to the counterweight 5^a hanging in the loop 3. In a smooth sea the anchorage buoy will remain substantially stationary; when the sea is moderate the waves will move the buoy slightly, under which conditions should the buoy be moved by a wave toward the shore it will create slack in the main cable, which slack will be taken up by the counterweight 5^a acting under the force of gravity. Should the buoy 10 be moved seaward by a wave the pull thereby exerted on the main cable will lift the counterweight thereby serving to pay out the cable to maintain the proper tension thereon.

Mounted on the main cable to travel thereon between the tower A and the vessel B, is a load carriage 13, consisting of special side plates 14, 14, between which is journaled a grooved running wheel 15, traveling on the main cable. This carriage supports a suitable load carrier, in the present instance in the form of a dumping bucket 16, pivoted to a suitable bail 17 suitably connected.

The bucket is provided with a suitable latch-tripping device 18 for maintaining it in load carrying position, and adapted to be automatically tripped to permit the bucket to dump when it reaches the vessel B. This device 18 may be of any suitable type and need not be specically described here.

Connected at one end to the carriage 13, as at 19 is an inhaul line 20, the opposite end of which line passes over a pulley 21, on the tower A, and thence down to a winding drum 22, the latter being operable to take up said line 20, to inhaul the load carriage from the vessel B to the tower A.

The carriage is outhauled to the vessel B by means of an outhaul line 23, the same being connected at one end to the off-shore side of the carriage, as at 24, and being carried seaward beyond the vessel B, and carried over a tail block 25, suspended from and running on the main cable 2, said block 25 being carried by a frame 26 having a pulley-wheel 26^a, traveling on the main cable. From the block 25 the outhaul line is doubled upon itself, run through the carriage 13, as shown, and carried to the tower A, where it passes down over a pulley 27, formed into a depending loop or bight 28, and then carried up over a pulley 28^a, whence it is carried to a winding drum 29, which operates on said outhaul line to pull the carriage from the tower A toward the vessel B. In the loop or bight 28 of the outhaul line is suspended a counterweight 30, having a pulley 31, through which the line passes, which counterweight serves a purpose to be presently described.

The tail-block pulley 25, heretofore described is connected by an anchorage line 32 to a restrained float 33, preferably in the form of a buoy, which is in turn connected to a fixed anchorage, preferably the anchor 12, by means of a line 34. By the counterweight 30, and the buoy 33, the outhaul line is at all times maintained at a substantially uniform tension, is kept uniformly taut, and responds to the motion of the tail-block 25.

Mounted on the main cable over the point of dump is a buffer or trip-block 35, arranged in the path of the bucket so as to be struck by the trip-latch 18, to operate the latter to release the bucket to dump its load. This trip-block 35, consists of side frames 36 between which the runs of the outhaul line pass, pulleys 37 upon which said runs travel being journaled between the said side frames. The trip-block is connected to the saddle-block 6, by a flexible connection 38, whereby its proper location relative to the point of dump is maintained.

Means is provided at the tower A for filling the bucket with the material to be transported, which means will now be described, it being understood that the loading installation shown is for the accommodation of two cableway installations traveling to one vessel, as shown in Fig. 2, or two vessels if desired. Hereinbefore, I have described only one cableway as the description of one is sufficient.

At the upper portion of the tower A, and above the cableway described hereinbefore, is a hopper 39, to receive the loose material to be shipped, and having a divided feed trunk 40, the separate legs, 41, 41, of which lead to feed spouts 42, 42, which are so located relative to the cableway that the bucket may be inhauled to take position under one of the same to receive a load. Each of the spouts 42 is provided with a pivoted gate or valve 43, adapted to be held in closed position by a latch hook 44, adapted to be released in any suitable manner to deposit a load in the bucket when the latter is beneath the spout. Entrance to each of the legs of the feed trunk is controlled by a pivoted valve 45 adapted to regulate the amount of material deposited in the leg 41, to be fed from the latter to the bucket, and

to cut off communication from the hopper to the leg, when the valve 43 is open and thereby prevent as much as possible overfilling of the bucket.

Any suitable means may be provided for feeding material to the hopper 39, but I prefer to employ an endless bucket conveyer 46, preferably arranged in rear of the tower A, and discharging at its upper end into said hopper. This conveyer takes its load from a receptacle 47, and the return run of said conveyer travels in a trunk or gutter 48. Arranged beneath each of the spouts 42, is a hopper 49, to catch overflow from the bucket 13 when loaded, said hopper being provided with discharge spouts 50 leading to said trunk or gutter 48 so that the overflow is returned to the conveyer and again elevated to the hopper 39, to be fed to the buckets 13.

In Fig. 14 I have shown a preferred form of winding engine for operating the cableway, but I desire it understood that other forms of engine suitable for the purpose may be employed without departing from the scope and intention of my invention. The engine illustrated includes the drums 5, for the main cable 2, mounted on a shaft 51, and having at one end a friction clutch member or flange 52 adapted to be connected by movement of the drum lengthwise of the shaft, by any suitable thrust means, with the friction face of a gear 53, mounted on said shaft and driven by a pinion 53^a on driving shaft 54. This shaft 54 carries a larger gear 55, meshing with a pinion 56, on a drive shaft 57, having a gear 58 driven by a pinion 59 mounted loosely on the armature shaft 60 of a motor 61, and adapted to be clutched to the latter by a multiple tooth clutch 62, when it is desired to drive the said drum 5. The shaft 54 is provided with a ratchet disk 63 keyed thereto, and adapted to be engaged by a pawl lever 64 to lock said shaft 54 and the drum, when the main cable is in proper position. The armature shaft is provided with a suitable solenoid brake 65 and coupling for connecting the said shaft to a shaft 66 in longitudinal alinement therewith, and upon which the drums 22 and 29 are loosely mounted. Each of these drums 22, 29 is provided with a clutch 67 for connecting the same to and disengaging it from the shaft 66, and each is provided with its own brake disk and brake band 68. It will be understood from Fig. 3 of the drawings that the lines 20 and 23 are wound on their respective drums 22 and 29 in directions the reverse of each other.

When the system is to be installed the main cable is suspended from the vessel, and is connected to its buoy 10 and the tail-block for the outhaul line is connected to its buoy 33, after which the motor is connected to the drum 5 to drive the latter to take up the main cable until a proper tension is produced. When the main cable is tightened the weight 5^a is raised and hangs free in the loop of said cable and the pawl lever 64 is engaged with the ratchet disk 63 to lock the main cable drum. The tension of the main cable is then automatically controlled by the counterweight 5^a and the buoy 10.

After the main cable has been adjusted the motor is disconnected from the drum 5, and connected to the shaft 66, to drive the latter, and each of the drums 22 and 29 through its own clutch and brake, is operated to adjust the inhaul and outhaul lines as to length, whereupon the clutches are permanently thrown into engagement and the motor running in one direction propels the carriage outward, and in the opposite direction propels it inward.

The motor is controlled by a master controller, which, when thrown in one direction, causes the motor to drive the drums 22 and 29 to move the carriage outward, and when thrown in the opposite direction reverses the motor to move the carriage inward. When the controller is moved to a central position the carriage is stopped and the solenoid brake applied.

The operation of the embodiment of the invention as above described is as follows, it being premised that the parts are in the relative positions shown in Figs. 1, 2 or 3, in which the bucket or other load-carrying device is in a position between the load-taking and load-depositing stations and unloaded. In order to bring the bucket, or other load-carrying device to the load-taking station, the drums 22 and 29 are operated to take up the inhaul line 20 and pay out the outhaul line 23, which serves to move the carriage to the tower. Upon the bucket reaching the tower, the carriage is stopped, and the valve 45 and gate 43 of the spout 42, beneath which the bucket is placed, are operated to cause the bucket to be filled. When the bucket has been loaded, the drums 22 and 29 are operated in the opposite direction from that just described, to take up the outhaul line 23 and pay out the inhaul line 20, whereupon the bucket is moved toward the vessel B, until it strikes the trip-block 35, which serves to trip the latch 18 and permit the bucket to dump its load. The inhauling operation just described is then repeated to return the carriage to the load-taking station.

The invention has the advantage of providing for loading operations at high speed, and uninterruptedly for long periods, and the tension of the cableway is automatically maintained without constant attention to the winding drums for the purpose of adjusting the lines. The system of tensioning

the cableway by means of the restrained float is also important because it can be used in deep water, in situations where the use of a fixed anchor alone would result in the ship being gradually moved toward the shore.

It is clear that the same apparatus can be used for unloading. The cable support at the ship can be lowered and a load filled into the bucket, or hung to the carriage. When a loaded carriage has crossed the span to shore tower it can be dumped into the receiving chute or in any of the usual known ways lowered to land.

While I have shown the invention as being employed to transport loads to a ship, it will be understood that the broad principle of the invention may be employed for transferring loads from a ship or other float to the shore without departing from the spirit of my invention.

What I claim is:

1. In a cableway, in combination, a support, a restrained float, a cableway suspended by the said support and connected to said float, and a floating support located between said first-named support and said float, and provided with a supporting seat upon which the cable is freely movable in the direction of its length.

2. In combination with an aerial cableway and a load carriage traveling thereon, of a support for one end of said cableway, a restrained float for the opposite end of the cableway, and a floating support elevated above the float and supporting said cableway intermediate the first-named support and the float.

3. In combination with a cableway and a load carriage traveling thereon, of a tower supporting the cableway near one end thereof, a float to which the opposite end of the cableway is connected, an anchorage for said float, and a floating support elevated above the float and supporting said cableway intermediate said float and the tower.

4. In a cableway, in combination, a land support, a cableway extending therefrom to a point off-shore, a restrained float to which the off-shore end of said cableway is connected, and a floating support located between said land support and restrained float, and supporting said cableway.

5. In a cableway, in combination, a land support, a cableway extending therefrom to a point off-shore, a restrained float to which the off-shore end of said cableway is connected, a floating load support located between said tower and restrained float and supporting said cableway, and a counterweight acting on said cableway.

6. In a cableway, in combination, a land tower, a cableway extending therefrom to a point off-shore, a buoyancy device to which the off-shore end of said cableway is connected, a fixed anchorage to which said device is connected by a flexible connection, and a counterweight swung in a loop of said cableway.

7. In a cableway, in combination, a land tower, a cableway extending therefrom to a point off-shore, a buoy to which the off-shore end of said cableway is connected, a load carriage on the cableway, a traversing line for the carriage, and a second buoy to which said traversing line is connected.

8. In a cableway, in combination, a land tower, a cableway extending therefrom to a point off-shore, a buoy to which the off-shore end of said cableway is connected, a fixed anchor connected to said buoy by a flexible connection, a load carriage on the cableway, a traversing line for the carriage, a tail-block about which said line passes, and a second buoy to which said tail block is connected.

9. In a cableway, in combination, a land tower, a cableway extending therefrom to a point off-shore, a buoy to which the off-shore end of said cableway is connected, a fixed anchor connected to said buoy by a flexible connection, a load carriage on the cableway, a traversing line for the carriage, a tail-block about which said line passes, and a second buoy to which said tail block is connected, said second buoy being connected to said anchor by a flexible connection.

10. In a cableway, in combination, a land tower, a cableway extending therefrom to a point off-shore, a buoy to which the off-shore end of said cableway is connected, a fixed anchor connected to said buoy by a flexible connection, a vessel located between the buoy and the land tower, and a saddle block on the vessel and supporting the cableway.

11. In a cableway, in combination, a land tower, a floating load receiving station, a cableway extending from said tower to said vessel and supported thereby, a counterweight exerting its force on a loop of said cableway, and a restrained float opposing the pull on the cableway.

12. In a cableway, in combination, a land tower, a floating load receiving station, a cableway extending from said tower to said vessel, means at the said station for slidably supporting the cableway whereby the latter and the said station are movable relative to each other lengthwise of the station, and a restrained float located seaward of the station and to which the cableway is connected.

13. In a cableway, in combination, a land tower, a restrained float located off-shore, a cableway extending from said tower and connected to said float, and a counterweight hung in a loop of said cableway, said float and weight acting in conjunction to maintain the tension of the cableway.

14. In a cableway, in combination, a land

tower, a restrained float located off-shore, a main cable extending from said tower and connected to said float, a counterweight hung in a loop of said cableway, said float and weight acting in conjunction to maintain tension of the cableway, a carriage, a traversing line for the carriage and a restrained float to which said line is connected.

15. In a cableway, in combination, a land tower, a restrained float located off-shore, a main cable extending from said tower and connected to said float, a counterweight hung in a loop of said cableway, said float and weight acting in conjunction to maintain tension of the cableway, a traversing line for the carriage, a tail block about which said line passes, a restrained float to which said tail block is connected, and a counterweight hung in a loop of said line.

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

THOMAS SPENCER MILLER.

Witnesses:

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ERNEST PULSFORD.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."