May 29, 1962 A. SCHÜLE 3,036,531

AERIAL ROPEWAY WITH AT LEAST ONE LOAD CARRIER

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Fig. 1

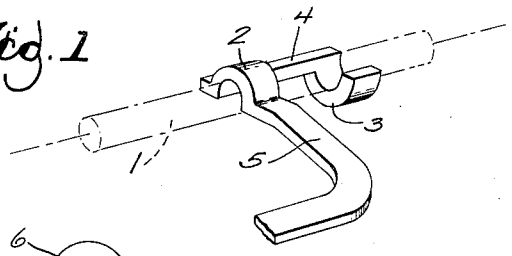


Fig. 4

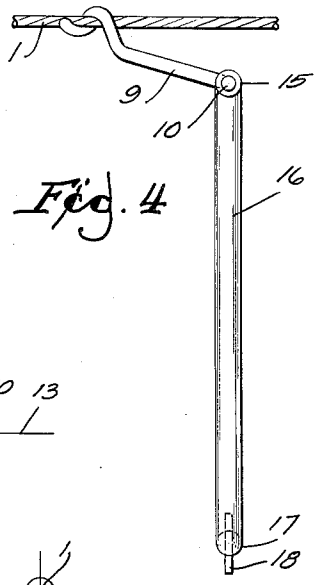


Fig. 2

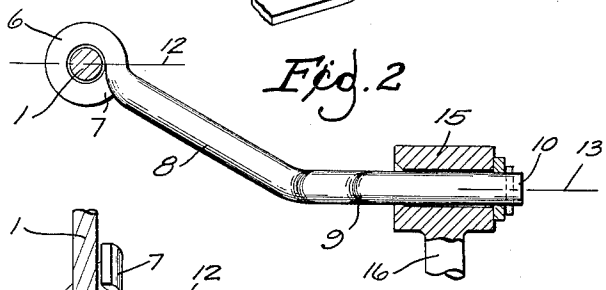


Fig. 3

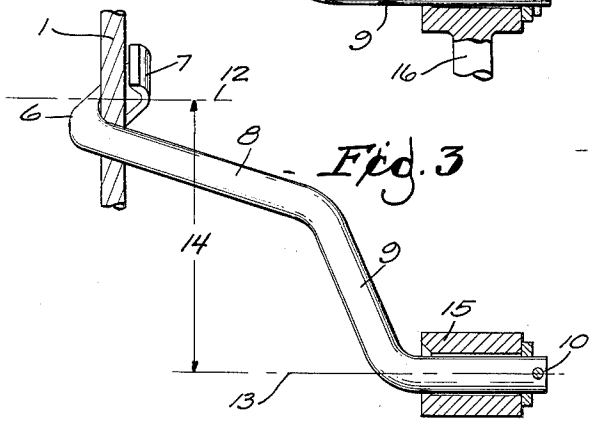


Fig. 5

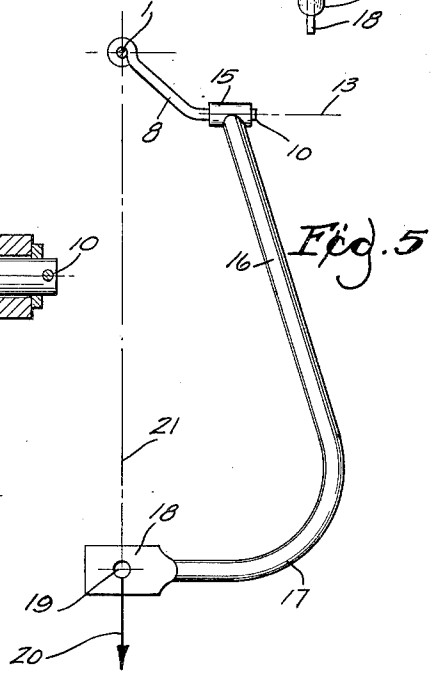
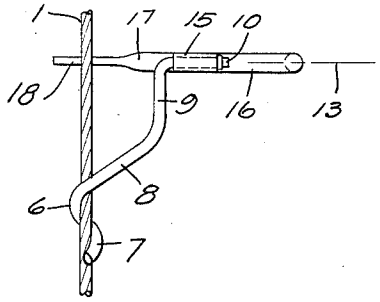


Fig. 6



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AERIAL ROPEWAY WITH AT LEAST ONE LOAD CARRIER

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Fig. 7

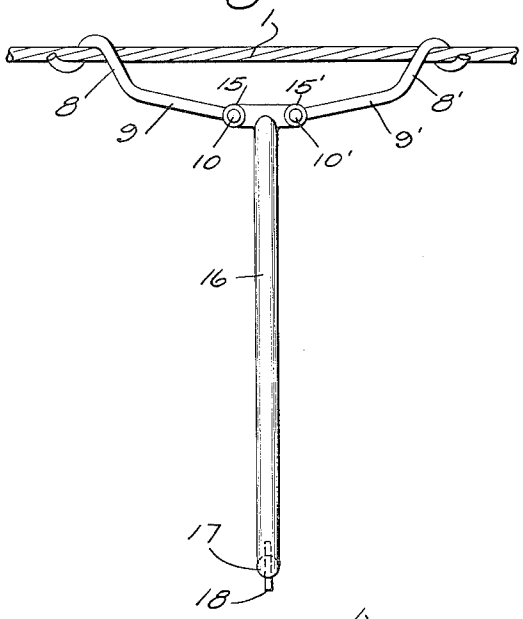


Fig. 8

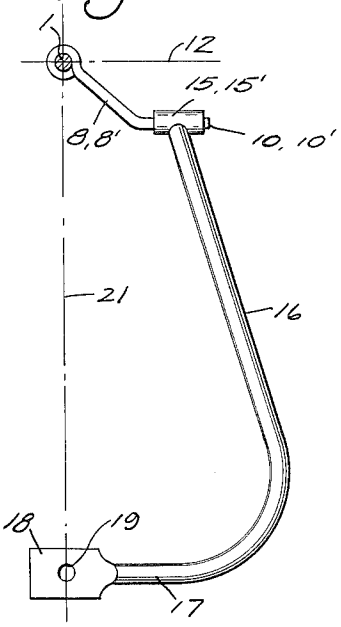


Fig. 9

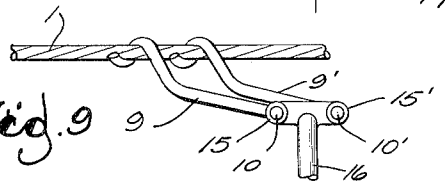


Fig. 10

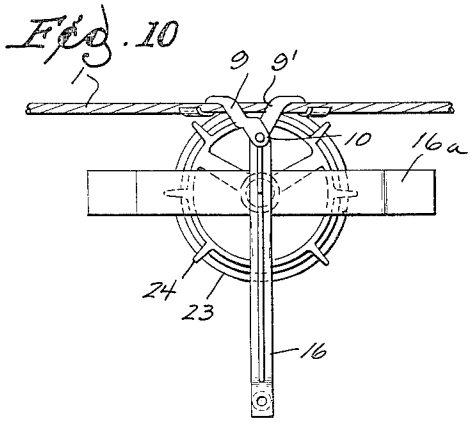
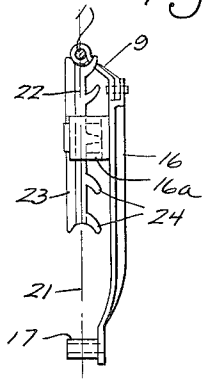


Fig. 11



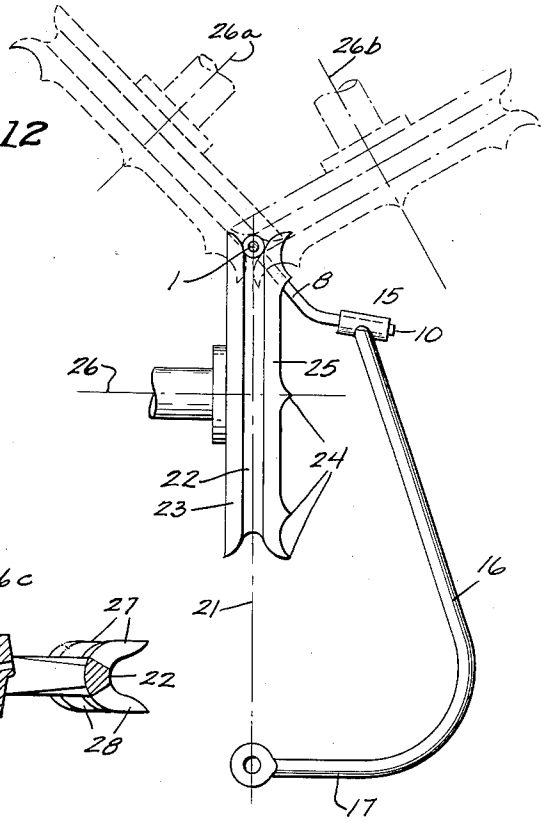
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AERIAL ROPEWAY WITH AT LEAST ONE LOAD CARRIER

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Fig. 12



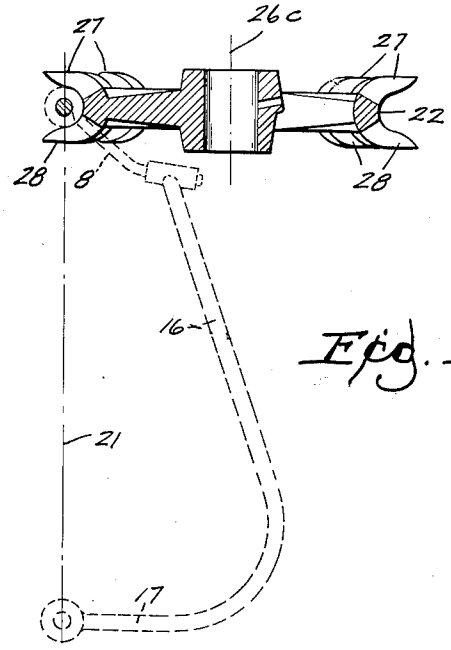


Fig. 13

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AERIAL ROPEWAY WITH AT LEAST ONE LOAD CARRIER

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Fig. 14

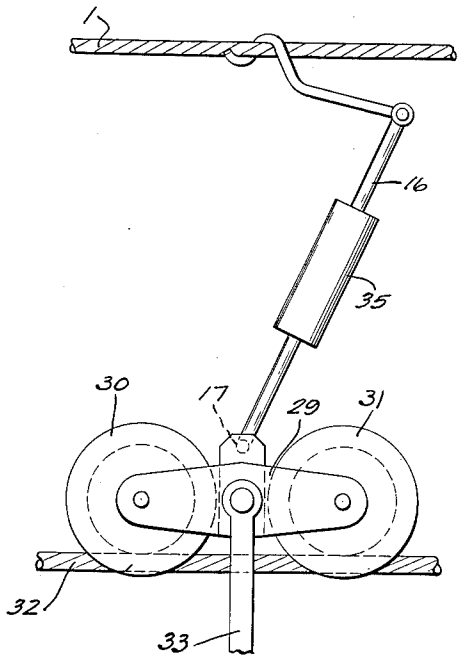


Fig. 15

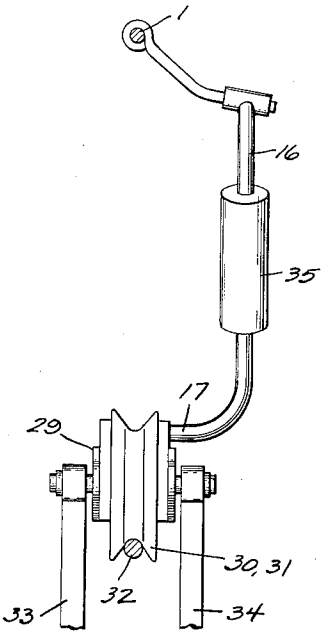


Fig. 16

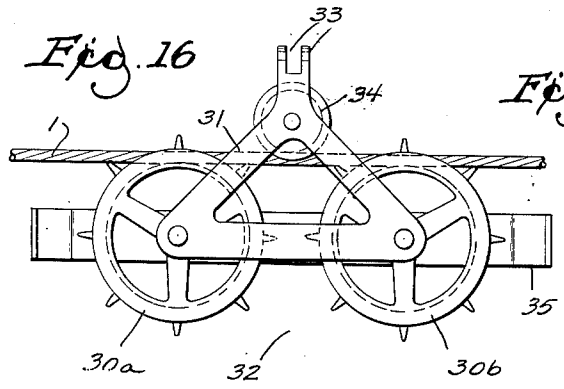
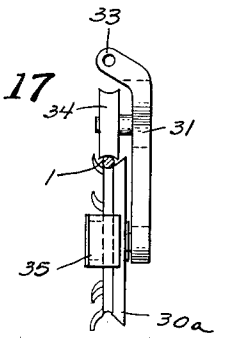


Fig. 17



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AERIAL ROPEWAY WITH AT LEAST ONE LOAD CARRIER

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Fig. 18

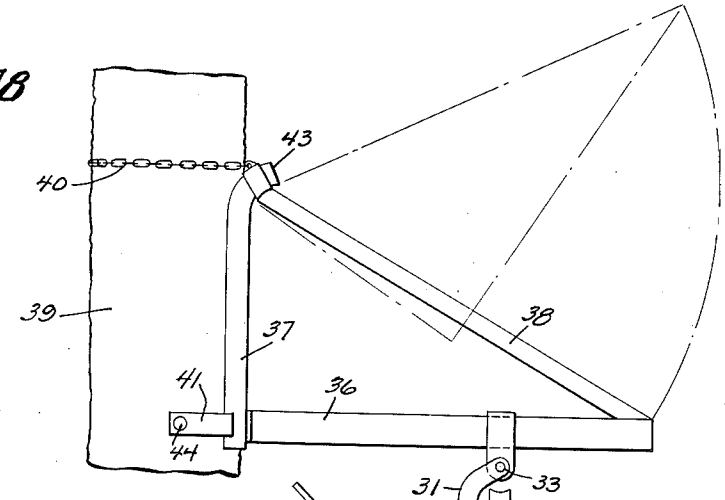


Fig. 19

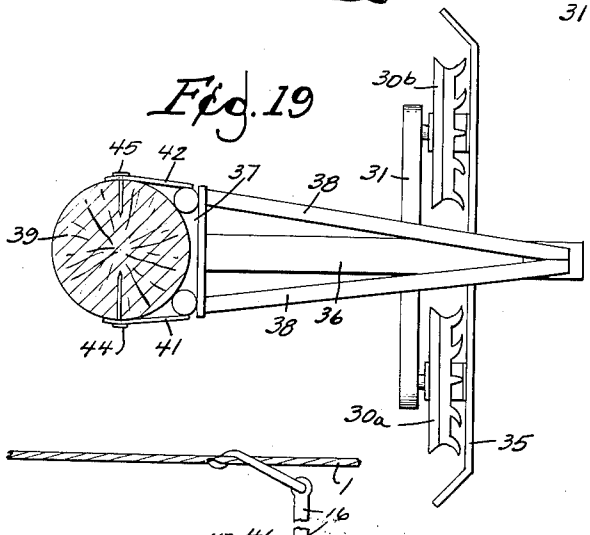
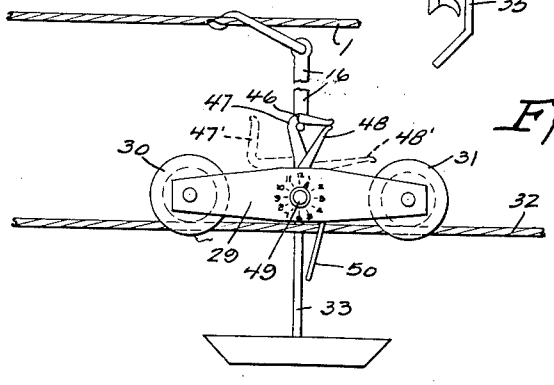


Fig. 20



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United States Patent Office 3,036,531 Patented May 29, 1962

3,036,531

AERIAL ROPEWAY WITH AT LEAST ONE LOAD CARRIER

Albert Schüle, Basel, Switzerland, assignor to Lasso Ropeways Ltd., Basel, Switzerland, a corporation of Switzerland

Filed Apr. 8, 1955, Ser. No. 500,055
17 Claims. (Cl. 104—202)

The present invention relates to aerial ropeways with moving carrying ropes and load carriers which can be suspended from any point of the carrying rope and clamp themselves automatically to the said rope, it being possible to guide the carrying ropes over snatch blocks and guide pulleys.

Aerial ropeways of this kind are already known and they generally make use of pincer-shaped rope clamps for suspending the carriers, which clamps, either by the action of the load to be transported or in some other way, are locked about the carrying rope and thus secure the carrier to the said rope. The suggestion has also already been made to surround the carrying rope with hooks twisted in the shape of a spiral. These known designs of aerial ropeways, however, are by no means satisfactory, especially as regards a reliable method of suspending and removing the carriers, and thus, in the event of these operations being made partly or fully automatic, disturbances are caused.

The present invention aims at eliminating imperfections of this kind and relates to an aerial ropeway with a moving carrying rope, at least one load carrier which can be suspended from any desired point of the rope and clamps itself automatically to the said rope, as well as with guide pulleys and snatch blocks for the said rope. The invention is characterized by the fact that the carrier has on one gripper arm at least one rope gripper, bent in two places, which encircles the carrying rope in an axial direction with approximately one whole turn and which, at the point where it joins the gripper arm in the latter's operating position, passes over the carrying rope with its first half turn and under the said rope with its second half turn. Secured to that end of the gripper arm which faces away from the rope gripper is a hanging carrying leg which is arranged to receive the load and is swivelable in at least one direction. The shape of the gripper arm, relative to the longitudinal axis of the rope gripper, is such that the carrying leg, both when loaded and unloaded, exerts on the rope gripper a twisting moment which presses the first half turn of the said gripper downwards and the second half turn upwards against the carrying rope. The gripper arm is set at an angle to the vertical plane through the carrying rope and the carrier's center of gravity. The invention is also characterized by the fact that the guide pulleys and snatch blocks are provided with at least one star-shaped edge for the rope guide groove.

In the following a few typical embodiments of the invention are described in detail in conjunction with FIGS. 1 to 13. In the drawings:

FIG. 1 is a view in perspective of a typical embodiment of the rope gripper.

FIGS. 2 and 3 are a side and horizontal projection respectively of another typical embodiment of the rope gripper and gripper arm.

FIGS. 4, 5 and 6 are a front, side and horizontal projection respectively of a typical embodiment of the carrier with a rope gripper.

FIGS. 7 and 8 are a front and side view respectively of a carrier similar to that shown in FIGS. 4 to 6, but with two rope grippers.

FIG. 9 is a front view of another carrier similar to that shown in FIGS. 4 to 6, also with two rope grippers.

FIGS. 10 and 11 are a front and side view respectively of another carrier with two rope grippers, together with a star-shaped guide pulley.

FIGS. 12 and 13 are both side views of a carrier similar to that shown in FIGS. 4 to 6, together with typical embodiments of a star-shaped guide pulley or snatch block.

FIGS. 14 and 15 are a front and side view respectively of a typical embodiment of a carrier with a bogie wagon designed to be supported on a stationary second rope.

FIGS. 16 and 17 are a front and side view respectively of a typical embodiment of a support rocker.

FIGS. 18 and 19 are an upright and horizontal projection respectively of a tree bracket for an aerial ropeway.

FIG. 20 is a side view of a carrier with automatically disengageable bogie wagon.

FIG. 1 is a diagrammatic reproduction in perspective of a typical embodiment of the rope gripper according to the present invention. The gripper is shown in its operating position on the movable carrying rope **1** which is indicated by dotted lines. The rope gripper consists here of a flat bar bent in two places; the first semi-circular bend **2** encloses the rope **1** from above and the second semi-circular bend **3** grips the rope **1** from below. A web **4** running approximately parallel to the axis of the rope connects the two bends **2** and **3** of the flat bar. The first bend **2** is located just where the rope gripper joins the gripper arm **5** which is only partly shown in FIG. 1.

As shown in FIGS. 2 and 3, the rope gripper may also consist of a flat bar, the bends **6** and **7** of which are drawn apart in the direction of the rope's axis so that there is no longer a clearly discernible connecting web between the two. In the typical embodiment shown in FIGS. 2 and 3, the gripper arm consists of a front section **8**, a middle section **9** and an end piece **10**. In the normal operating position, the curves will depend on the diameter of the carrying rope, the angle of inclination of the aerial ropeway and the load to be carried. It is, of course, also possible to use an aerial ropeway for transporting loads of varying sizes with differently dimensioned carriers and rope grippers.

The rope grippers illustrated in FIGS. 1 to 3 reveal sharp edges on the surfaces touching the carrying rope. They have, of course, only been drawn thus in order to obtain a clear reproduction, and in actual fact the surfaces—those, at least, which come into contact with the carrying rope—are provided with rounded edges. The rope grippers shown in FIGS. 1 to 3 and the gripper arms are preferably made in one piece, but they can, of course, also be composed of two or more sections, should this be desired.

The end piece **10** of the grab arm shown in FIGS. 2 and 3 is designed as a pivot for the top bearing **15** of a hanging carrying leg **16**. A typical embodiment of the latter can be seen in FIGS. 4 to 6. It consists of the upper section **16** and the cross arm **17** with the flat fish plate **18** for securing the load in the hole **19**. If the load is sufficiently large and acts in the direction of arrow **20**, the carrier will occupy the position illustrated in FIGS. 4 to 6, in which the gripper arm, or at least its front section **8**, forms an angle (FIGS. 5 and 6) with the vertical plane **21** determined by the carrying rope **1** and the center of gravity, or in other words, the gripper arm lies transverse to the said plane. The net weight and the shape of the different parts of the carrier are, however, so attuned to each other that even when the carrying leg **16**, **17** is unloaded, the carrier has a center of gravity in which the gripper arm, or its front section **8**, still forms a sufficiently wide angle with the vertical plane **21**. The fact that the gripper arm, or at least its front

section 8, runs transverse to the vertical plane 21 is characteristic of the carrier according to the present invention and facilitates the design of the snatch blocks and guide pulleys to be explained subsequently.

The hanging carrying leg 16, 17 of the carrier as shown in FIGS. 4 to 6 is swivellable about the axis 13 of the gripper arm's end piece 10. This ensures, on the one hand, that the force acting on the gripper arm, or the end piece 10, is always directed vertically downwards but, on the other hand, that the load secured to the fish plate 18 maintains, if desired, a predetermined position in respect of the longitudinal axis of the carrying rope 1. This is advantageous when bulky loads are being carried. It is, of course, also possible to arrange for the carrying leg 16, 17 to be swivellably secured to the gripper arm in a different manner depending on the use the aerial ropeway is put to and on its carrying rope guide.

FIGS. 4 to 6 illustrate a carrier in which the hanging carrying leg 16, 17 is only secured to a single gripper arm. The present invention, however, is not restricted to this and two gripper arms 8, 9, 10 and 8', 9', 10', running in opposite directions to each other, can also be used. The method, too, ensures that the load on each gripper arm acts in an at least approximately vertical downwards direction and that both gripper arms, at least with their front sections 8, 8', make an angle with the vertical plane 21. When two gripper arms are used, they may, however, also run parallel to each other as shown in FIG. 9. But in the case of two gripper arms of this type it is only possible to provide one common axis of rotation for the coaxially arranged end pieces 10, as is illustrated by the typical embodiment in FIGS. 10 and 11.

The design of the rope gripper and gripper arm described in the foregoing enables the rope gripper to be disengaged from the carrying rope simply by raising the load and thus the carrying leg, and, conversely, it enables the rope gripper to be securely connected to the carrying rope when the front section of the gripper arm hanging from the carrying leg is mounted on the carrying rope and the load and carrying leg are lowered. This simple method of removing and suspending the loads to be carried together with the carriers from the carrying rope enables these operations to be extensively mechanized.

The typical embodiments of the carriers according to the present invention which have been described in the foregoing enable particularly simple and effective guide pulleys or snatch blocks to be used in the aerial ropeway according to the present invention. A typical embodiment of a pulley of this sort is shown in FIG. 12 together with a carrier of the type illustrated in FIGS. 4 to 6. The pulley in FIG. 12 possesses the usual rope guide groove 22, only one rim 23 of which is raised, while the opposite rim is formed merely by the scalloped extensions 24 with intermediate rimless gaps 25. As has already been mentioned several times, the front section 8 of the gripper arm makes an angle with the vertical plane 21, as can be seen in FIG. 12, and can therefore run without hindrance and together with the carrying rope 1 over a guide pulley of the type envisaged in the invention, the gripper arm moving each time into a gap 25 in the rim. The scalloped extensions 24 facilitate the movement of the carrier over the pulley concerned and at the same time form webs which prevent the carrying rope 1 slipping out of the guide groove 22. In the case of such star-shaped pulleys, the pulley's axis of rotation 26 may also run at an oblique angle to the horizontal, as is indicated, for instance, by 26*a* or 26*b*, without fear of the tautly stretched carrying rope 1 slipping off. Another typical embodiment of a pulley which can also be used with a vertical axis of rotation 26*c* is illustrated in FIG. 13. Here, the rope guide groove 22 is bounded on both sides by a plurality of prong-like extensions 27, 28 in such a way that the front section 8 of the gripper arm can run over the pulley between adjacent prong-like extensions even when the guide groove 22 is horizontal. The prongs 28 located underneath prevent the carrying rope 1 from sliding off the pulley. If, in the case of an unsymmetrical load on the carrier, there is a fear of the hanging carrying leg 16 knocking against the guide wheel, a slide plate 16*a* is arranged on the said leg as is shown in FIGS. 10 and 11.

In the case of heavy loads it may be desirable to relieve the moving carrying rope of part of the weight of the goods it is transporting. For this purpose, as shown in the FIGS. 14 and 15, a bogie wagon 29 with wheels 30, 31 are arranged on the bottom cross arm 17 of the carrying leg of a carrier similar to that illustrated in FIGS. 4 to 6. The said wagon runs on a stationary auxiliary rope 32. The load is then suspended from this bogie wagon 29 via a fork 33, 34. Here, therefore, the rope 1 carries only part of the load, but propels the bogie wagon 29 by means of the rope gripper clamped to it and by means of the carrier. In order to balance differences in the distance between carrying rope 1 and auxiliary rope 32, the carrying leg 16, 17 of the carrier can in the present instance be equipped with an elastic connecting link 35.

FIGS. 16 and 17 show, as a further typical embodiment, a so-called support rocker tip with two guide pulleys or snatch blocks 30*a*, 30*b* which can be designed in accordance with FIGS. 10, 12 or 13 as desired. Both these pulleys 30*a*, 30*b* are swivellably secured to a triangular frame 31 which, in its turn, has an eye 33 which is located in the symmetry plane 21 and to which the said frame is movably secured on all sides. Here, the carrying rope 1 running over the pulleys 30*a*, 30*b*, is prevented from slipping off by upper holding pulley 34. As in the typical embodiment already shown in FIGS. 10 and 11, here, too, a slide plate is provided in order to prevent an undesirable bumping of the carriers as they run over the support rocker. Experience has shown that the carriers run more smoothly over a support rocker of this sort than over individual support or snatch blocks. In addition, such a support rocker allows the carrying rope 1 greater deviation in the vertical plane. The symmetry plane 32 of the support rocker is always parallel to the line bisecting the angle between the feed and delivery ends of the carrying rope. In this position, the support rocker can yield elastically to one-sided impacts on one of its pulleys, thus ensuring smooth operation of the ropeway.

An excellent device for the rapid erection of guide pulleys or snatch blocks as shown in FIGS. 10 to 13 and of support rockers as shown in FIGS. 16 and 17 is diagrammatically illustrated in FIGS. 18 and 19. This device consists of a tree bracket with the approximately horizontal carrying arm 36, the back prop 37 and the oblique struts 38. The tree bracket is designed for quick fastening to a tree trunk 39 and possesses for this purpose a chain 40 and a fish plate 41 or 42 on the left or right side respectively. The chain 40 is secured to a nose 43 of the back prop 37 which is bent out from the tree trunk 39. The length of the chain is adjustable link by link. The whole bracket is placed against the tree trunk 39 in the position indicated by dotted lines in FIG. 18, the chain 40 being reduced to its shortest length and secured to the nose 43. The bracket is then swung downward into its operating position until the back prop 37 bears against the tree trunk 39. Here, the chain 40 is tautened as a result of the lever action exerted by the bent-over nose 43 of the back prop 37 and thus holds the bracket rigidly in the pre-selected position. To prevent the bracket from jerking back, the fish plates 41 and 42 are provided with through holes through which nails or hooks 44 or 45 are driven into the trunk 39. The carrying arm 36 serves to receive the guide and support pulleys, as indicated in FIGS. 18 and 19 for instance, of the support rocker shown in FIGS. 16 and 17. Depend-

ing on the desired course of the carrying rope **1**, the said support rocker is adjustable along the carrying arm **36** and swivellable in its eyes 33 about the longitudinal axis of the said arm.

In conclusion, it must also be pointed out that the aerial ropeway and the various carriers can, if desired, be provided with automatic devices for disengaging the carriers or the load hanging from the said carriers at predetermined and preselected stations along the aerial ropeway. A device of this sort, arranged on a carrier similar to that shown in FIG. 14, is illustrated diagrammatically in FIG. 20 and is designed for use in the event of the bogie wagon **29**, **30**, **31** being automatically separated from the grip **46** of the carrier **16** with which it is coupled via a hook **47**. The hook **47** enclosing the grip **46** is located at the rear by a pawl **48** so that in the position illustrated in FIG. 20 the coupling of carrier to bogie wagon via the grip **46** is ensured. Both the hook **47** and the pawl **48** are each swivellable about an axis in the body of the bogie wagon **29** and can spring apart into the position **47'** or **48'**, marked with dashes, but only when they are released by an adjustable automatic mechanism actuated by the turn-knob **49**. This automatic mechanism comprises a mechanical counter which is shifted one step further each time the feeler lever **50** is actuated, the hook **47** and the pawl **48** only being released, owing to the fact that the feeler lever **50** has been operated several times in succession, when the counter reaches the position previously selected on the turn-knob **49**. In this way it can be determined from any departure station at which of the following stations the coupling between carrier and bogie wagon is to be released, since at each station the feeler lever **50** will, as it passes the station, be automatically actuated once, or, in other words, the counter located in the bogie wagon will be advanced one step each time.

I claim:

1. A carrier for an aerial rope way for transporting a suspended load, said carrier comprising a gripper with offset oppositely opening hook portions respectively engageable with a rope from above and below, and means for suspending a load from said gripper to be sustained and propelled by a rope with which the gripper is connected, said means including a load sustaining portion disposed beneath the gripper in a substantially vertical plane including the hook portions and having an intermediate arm portion extending from the gripper laterally away from said plane.

2. The combination of claim 1 in which said downwardly opening hook portion is connected with the upwardly opening hook portion by an intermediate portion extending along the rope, whereby said load sustaining portion is offset from the gripper beyond the downwardly opening hook portion of the gripper from the upwardly opening hook portion thereof, whereby weight on said load sustaining portion will tend to clamp the gripper upon a rope with which it is engaged.

3. For use in a rope way having a load propelling rope, the combination with at least one gripper engageable with such a rope and having downwardly and upwardly opening hook portions offset from each other axially of the rope, an arm in substantially rigid connection with said gripper and projecting therefrom laterally of a vertical plane through said gripper hook portions, a load supporting device having a swivel connection with said arm at a point laterally offset from said vertical plane through the gripper hook portions, said device including load supporting means carried substantially in said vertical plane through the hook portions of the gripper whereby weight imposed through said device upon said arm and gripper will maintain said swivel connection laterally offset from said plane.

4. The combination of claim 3 in which the swivel connection between said device and arm is offset beyond the downwardly opening hook portion of the gripper from the upwardly opening hook portion thereof whereby to subject the gripper to a rope-cramping moment.

5. The combination of claim 3 in which the gripper and arm are in unitary rigid connection.

6. The combination of claim 3 in further combination with a second gripper having a swivel connection with said device and having hook portions respectively opening upwardly and downwardly and disposed substantially in the aforesaid plane to be adapted to be engaged concurrently with the same rope with which the hook portions of the first mentioned gripper are engaged.

7. The combination of claim 5 in which both grippers are offset in the same longitudinal direction from said device.

8. For use on the supporting and propelling rope of a rope way, a load suspending and propelling means comprising in combination a gripper including an upwardly opening hook engageable with the rope, a first arm extending from said hook in the direction of a rope so engaged, a downwardly opening hook rigidly connected with said first arm and therethrough with the upwardly opening hook, a second arm extending from the downwardly opening hook in a direction having components both lateral and longitudinal respecting a rope engaged by said hooks, bearing means mounted on the second arm to be carried thereby in a position laterally offset from a vertical plane through the hooks of said gripper and longitudinally offset from said gripper hooks sufficiently to subject said hooks to a rope-cramping moment, and a load supporting member swiveled on the bearing means and extending downwardly therefrom and inwardly toward said plane and having a load support substantially in said plane.

9. A load carrier for use on an aerial rope way and including a rope traveling over sheaves, the carrier comprising a pair of grippers each having offset oppositely opening hook portions severally engageable with the rope from above and below the rope, the hooks of the pair of grippers engaging the rope in spaced relation axially thereof, means for attachment of the load and suspension thereof between and in substantially a vertical plane below the hooks, and swivel means connecting both the grippers with the load attaching means for movement of the load relative to the grippers.

10. A load carrier for use on an aerial rope way and including a rope traveling over sheaves, the carrier comprising a pair of grippers each having offset oppositely opening hook portions severally engageable with the rope from above and below the rope and arms extending laterally from the rope, the hooks of the pair of grippers engaging the rope in spaced relation axially thereof and the gripper arms extending toward each other, means for attachment of the load and suspension thereof between and in substantially a vertical plane below the hooks, and swivel means connecting both the grippers with the load attaching means for movement of the load relative to the grippers.

11. A load carrier for use on an aerial rope way and including a rope traveling over sheaves, the carrier comprising a pair of grippers each having offset oppositely opening hook portions severally engageable with the rope from above and below the rope, the hooks of the pair of grippers engaging the rope in spaced relation axially thereof and the gripper arms extending toward each other at an acute angle with the rope, means for attachment of the load and suspension thereof at substantially equal distances from and in substantially a vertical plane below the hooks, and swivel means connecting both the grippers with the load attaching means for movement of the load relative to the grippers.

12. A load carrier for use on an aerial rope way and including a rope traveling over sheaves, the carrier comprising a pair of grippers each having offset oppositely opening hook portions severally engageable with the rope from above and below the rope, the hooks

of the pair of grippers engaging the rope in spaced relation axially thereof and extending in opposite directions along the rope, means for attachment of the load and suspension thereof in substantially a vertical plane below the hooks, and swivel means connecting both the grippers with the load attaching means for movement of the load relative to the grippers.

13. A load carrier for use on an aerial rope way and including a rope traveling over sheaves, the carrier comprising a pair of grippers each having offset oppositely opening hook portions severally engageable with the rope from above and below the rope and arms extending laterally from the rope and in substantially parallel relation, the hooks of the pair of grippers engaging the rope in spaced relation axially thereof and extending in the same direction along the rope, means for attachment of the load and suspension thereof in substantially a vertical plane below the hooks, and swivel means connecting both the grippers with the load attaching means for movement of the load relative to the grippers.

14. A load carrier for use on an aerial rope way and including a rope traveling over sheaves, the carrier comprising a pair of grippers each having offset oppositely opening hook portions severally engageable with the rope from above and below the rope and in spaced relation axially thereof and arms extending laterally from the rope and in substantially parallel relation, means for attachment of the load and suspension thereof in substantially a vertical plane below the hooks, and swivel means connecting both the grippers with the load attaching means for movement of the load relative to the grippers.

15. A load carrier for use on an aerial rope way and including a rope traveling over sheaves, the carrier comprising a pair of grippers each having offset oppositely opening hook portions severally engageable with the rope from above and below the rope, the hooks of the pair of grippers engaging the rope in spaced relation axially thereof, means for attachment of the load and suspension thereof in substantially a vertical plane below the hooks, swivel means connecting both the grippers with the load attaching means for movement of the load relative to the grippers, and a plate fixed on the load attaching means for sliding on the sheaves upon movement of said means toward the sheaves.

16. A load carrier for use on an aerial rope way including a propelling rope and a supporting rope and sheaves carrying the ropes, the carrier comprising a pair of grippers each having offset oppositely opening hook portions severally engageable with the rope and from above and below the rope and arms extending laterally from the rope, a wheeled bogie wagon for attachment of the load thereto and running on the supporting rope, leg means attached to the bogie wagon, and swivel means attaching the leg means to the gripper arms, the leg being divided into two portions extensibly connected for compensating for differences in spacing between the ropes.

17. For use in a ropeway having a load propelling rope, the combination with a leg having a load propelling portion adapted to lie substantially in a vertical plane beneath said propelling rope, said leg extending from said portion laterally from said plane and upwardly to a level offset at the side of and slightly beneath the position of such a rope, and a pair of arms pivoted transversely to said leg and extending therefrom laterally toward said vertical plane and upwardly to the level of the rope and respectively provided with helical rope gripping portions of opposite pitch and projecting in opposite directions along the rope.

References Cited in the file of this patent

UNITED STATES PATENTS

586,762	Eaves et al.	July 20, 1897
1,101,635	Koselak	June 30, 1914
1,170,007	Shields et al.	Feb. 1, 1916
2,079,491	Cooke	May 4, 1937
2,473,300	Puricelli	June 14, 1949
2,617,363	Anketell	Nov. 11, 1952
2,632,402	Reussner	Mar. 24, 1953
2,737,124	Schule	Mar. 6, 1956

FOREIGN PATENTS

511,790	Belgium	June 14, 1952
281,683	Germany	Feb. 25, 1914
4,095	Great Britain	Feb. 19, 1912
671,134	Great Britain	Apr. 30, 1952