July 24, 1934. T. C. SMITH ET AL 1,967,376

ADJUSTABLE AERIAL PLATFORM

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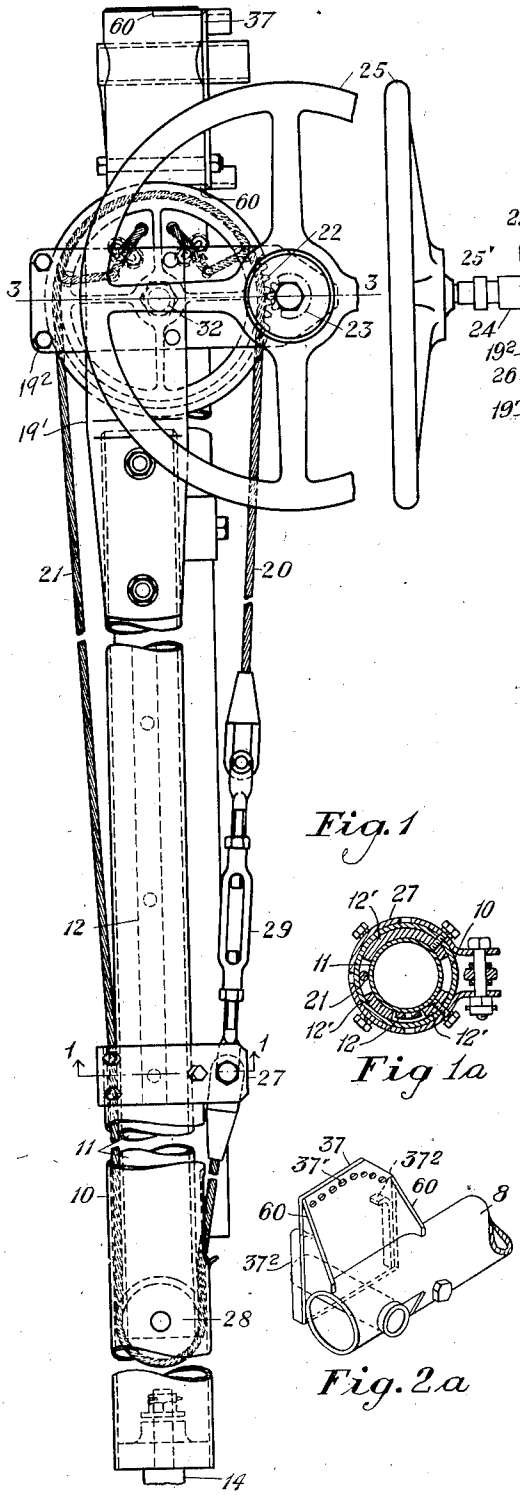


Fig. 1

Fig 1a

Fig. 2a

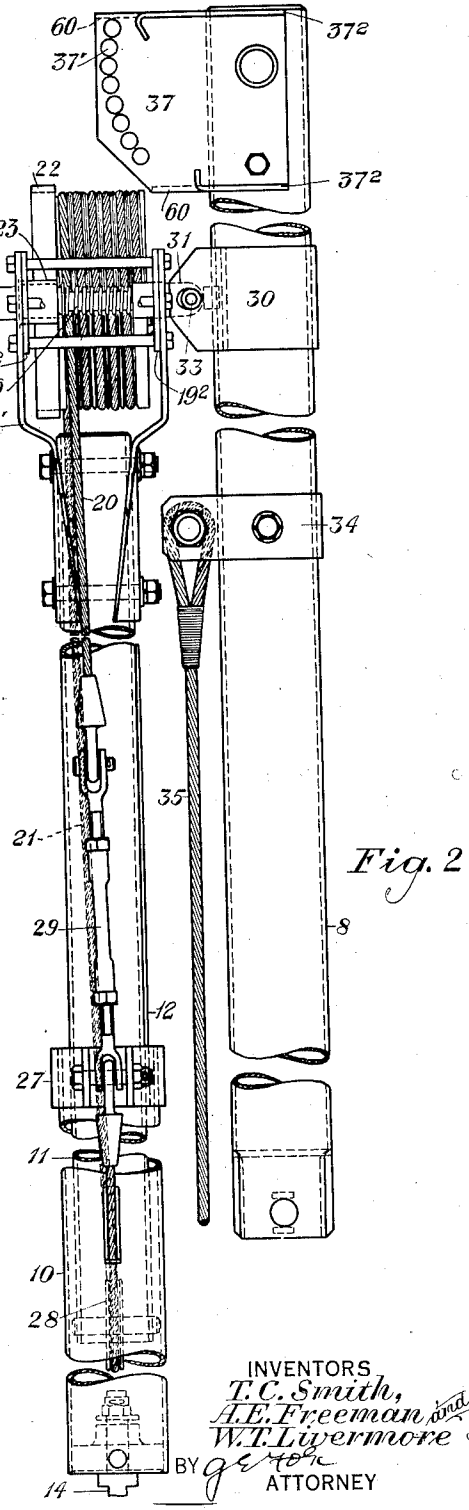


Fig. 2

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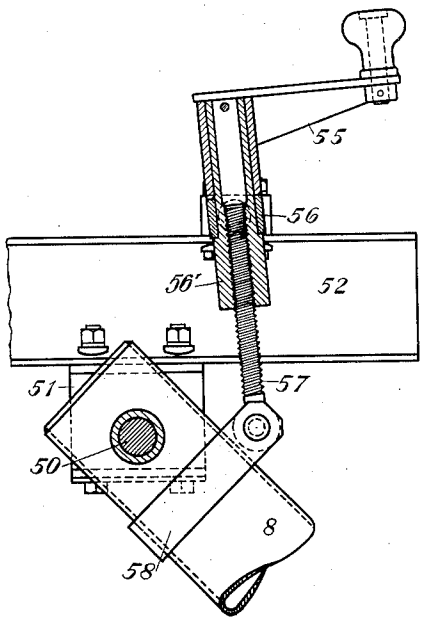


Fig. 5

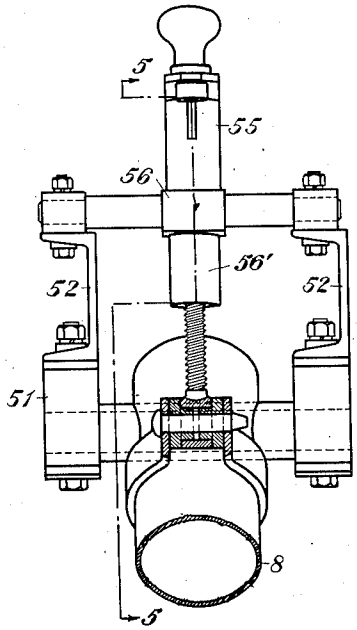


Fig. 6

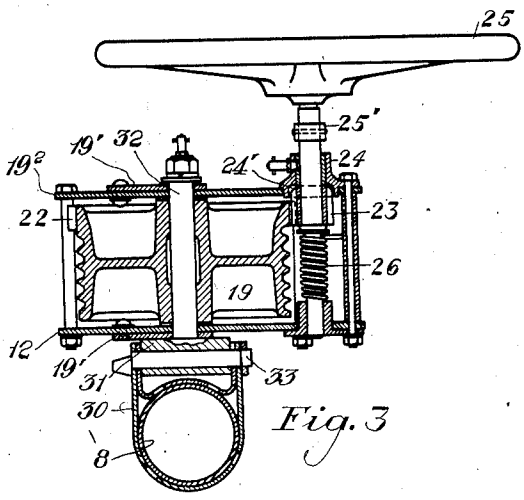


Fig. 3

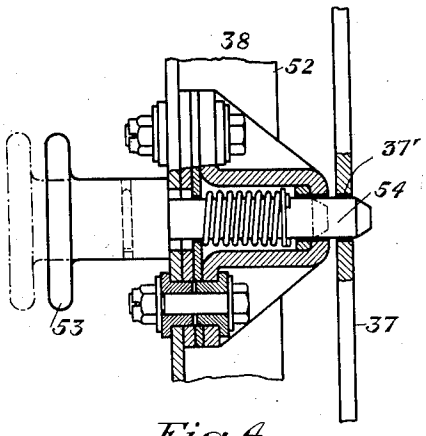


Fig. 4

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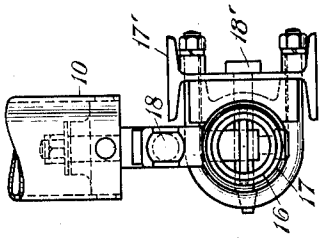
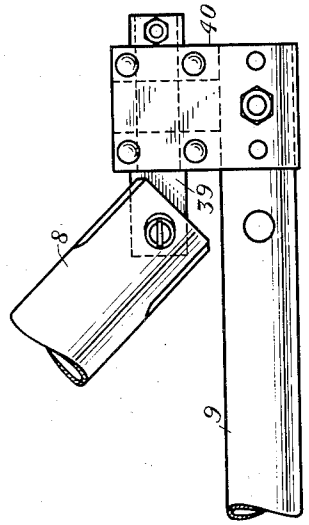


Fig. 9



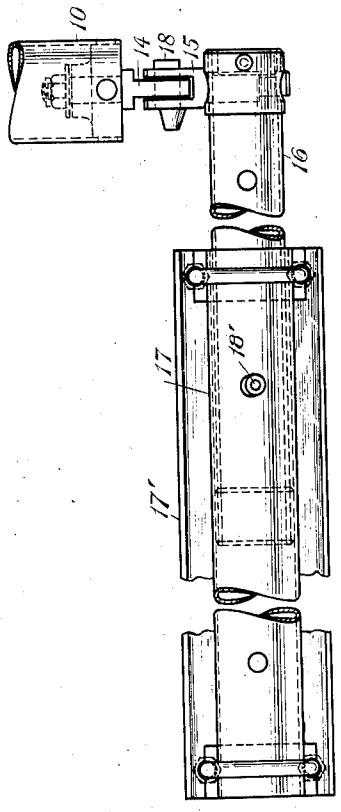


Fig. 8

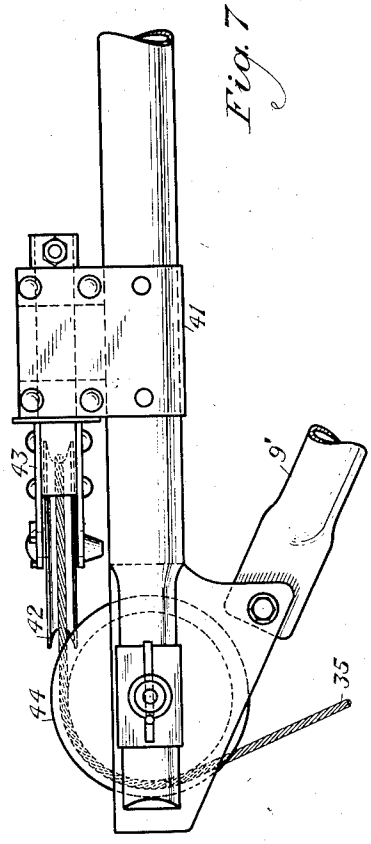


Fig. 7

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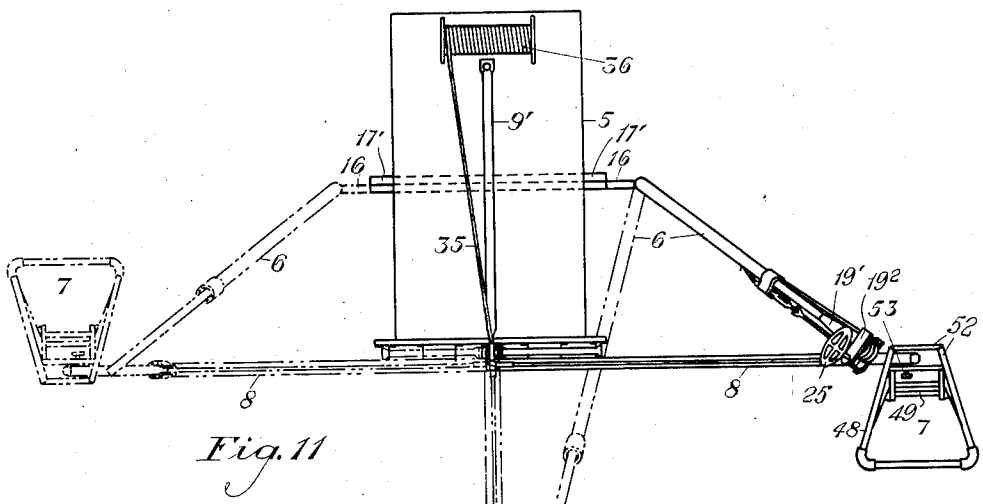


Fig. 11

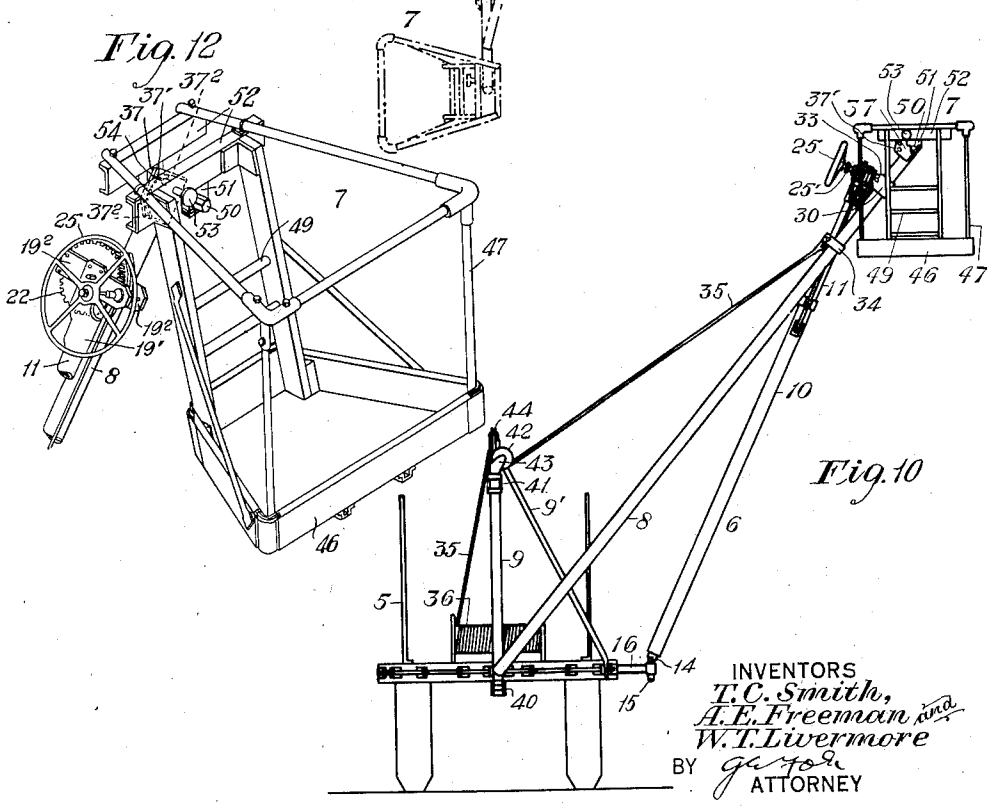


Fig. 12

Fig. 10

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Patented July 24, 1934 1,967,376

UNITED STATES PATENT OFFICE

1,967,376

ADJUSTABLE AERIAL PLATFORM

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Application January 31, 1933, Serial No. 654,486

10 Claims. (Cl. 189—11)

This invention relates to platforms, and more particularly to aerial platforms of the character adapted to be adjustably mounted on motor trucks and operated to desired heights by mechanism carried thereby.

In the construction of aerial electric transmission lines considerable difficulty and time-consuming operations are involved in placing and securing the lines in position. These operations require that the lineman climb poles or trees, in the case of tree trimming or threading the lines through the trees. It is also necessary for linemen to descend to the ground between operations on successive poles or trees.

It is an object of this invention to eliminate these difficult and time-consuming operations by providing a platform mounted on a motor truck and adapted to be adjustably raised or lowered by mechanism carried by the truck to enable the lineman standing on the platform to perform such work as may be required in the construction or maintenance of aerial transmission lines.

This and further objects will be apparent from the following description, when considered in connection with the accompanying drawings, in which one embodiment of the invention is illustrated.

Referring to the drawings, Figure 1 is a plan view of a telescoping side support or leg; Fig. 1*a* is a section taken on the line 1—1 of Fig. 1; Fig. 2 is a side elevation of Fig. 1 showing a main leg attached to the side leg; Fig. 2*a* is an isometric view of the plate, shown in Figs. 1 and 2, which is mounted on the upper end of the main leg and is provided with a series of openings in which a pin registers to lock the platform in a desired position, as shown in Fig. 12; Fig. 3 is a section taken on the line 3—3 of Fig. 1; Fig. 4 illustrates one form of locking mechanism which may be used to maintain the elevated platform in a level position; Fig. 5 is a section taken on the line 5—5 of Fig. 6 and illustrates a modification of the locking mechanism shown in Fig. 4 and also shows the manner in which the platform is connected to its supporting leg; Fig. 6 is an end view, partly in section, of Fig. 5; Fig. 7 is a side view of a stanchion which carries sheaves through which a winch line is guided from a winch to the main leg; Fig. 8 is a support for the telescoping side leg; Fig. 9 is an end view of Fig. 8; Fig. 10 is a rear end view showing the main leg, telescoping leg and platform in extended position to one side of the truck; Fig. 11 is a plan view of the platform showing it in the alternate positions it may be mounted on a truck and Fig. 12 is a perspective view of the platform showing the manner in which it is mounted and locked to its supporting leg. The platform is shown in extended position from one side of the truck in full lines and in extended position from the other side in dotted lines; the intermediate position of the platform in the center of the truck which is also shown in dotted lines illustrates the extreme rear position the platform assumes when mounted in either of the side positions.

In accordance with this invention supports are adapted to be mounted at the rear of a truck 5. These supports include an adjustable side leg 6 which may be pivotally attached to either side of the truck, and extends upwardly and is pivotally attached to the upper end of a main leg 8. The main leg 8 extends from the center at the end of the truck and forms a main support for an elevated platform 7. This main leg in turn is pivotally attached at its lower end to a vertical stanchion 9, and suitable braces 9′, fixed to the truck, may be provided for the stanchion. The adjustable leg 6 includes two tubular portions 10 and 11 which telescope with respect to each other. Sector spacers 12′ (Fig. 1*a*) are inserted between the inner and outer telescoping members, and a key 12, Fig. 1, which is fastened to the inner tube, registers between one of these spacers. By this arrangement the relative turning of the inner and outer tubes is prevented.

The telescoping portion 10 of the adjustable leg 6 is pivotally attached at its lower end to the truck 5 by means of a universal connection, Figs. 8 and 9. This connection consists of a lug 14 which is rotatably carried at the bottom of the portion 10 and registers in a fork member 15 rotatably carried by a horizontally positioned tubular support 16 detacably carried on the side of the truck. This tubular support is adapted to telescope within a transverse tube 17 permanently attached to an I-beam 17′ which extends across the truck body frame. The tubular support 16 is adapted to be withdrawn from one end of the tube 17 and inserted in the other end thereof and a pin 18′, which may be provided with an eccentric head, passes through the I-beam 17′ and the tubes 16 and 17 to prevent the rotation or lateral movement of the tube 16. The eccentric headed pin 18′ and other like pins appearing at different points in the drawings may be of a type disclosed in Patent No. 1,797,337, dated March 24, 1931, granted to A. E. Freeman. The member 16 may be thus mounted on either side of the truck as a support for the leg 6, depending upon which side the platform, to be presently described, is to be used. The detachable pin 18 secures the lug 14 to the fork member 15. The attachment of the rotatable lug 14 to the rotatable fork member 15 by means of the pivotal connection provided by

the pin 18 provides a joint by which the side leg 6 may be universally rotated.

A drum 19 is mounted on the telescoping portion 11 on the opposite or upper end of the adjustable leg 6, upon which two ropes 20 and 21 may be wound in one direction and unwound in another direction, Figs. 1 and 2. The drum 19 is attached to the end of the leg 11 by means of parallel straps 19′ which are attached to and extend upwardly from the top of leg 11, as more clearly shown in Fig. 2. The straps 19′ are attached at their upper ends to parallel plates 19² and the drum is positioned between these plates. The drum 19 is provided with a gear having peripheral teeth 22 which engage with a pinion 23, which in turn engages with internal teeth 24′ which are integral to a casting 24, Fig. 3. A hand wheel 25 mounted on the drum has a shaft about the lower end of which a helical compression spring 26 is provided. This spring tends to maintain all the gear members just described in engagement and normally locks the drum against rotation. To release the drum, the hand wheel 25 is pressed down on its shaft against the tension of the spring 26 until the collar 25′ limits its movement in this direction. The drum is thus permitted to rotate upon the turning of handle 25. The ropes 20 and 21 are attached at one of their ends to a collar 27 carried by the outer telescoping member 10. The rope 21 is passed about a pulley or sheave 28 which is journaled in the member 11, travels over grooves in the drum and is clamped to a web of the drum. The other rope 20 extends from turn-buckle 29, which is attached at one end to the collar 27, about the drum and is wound thereon in a direction opposite to the rope 21. This rope is also clamped to the web of the drum. The turning of wheel 25 in one direction causes the telescoping side leg 6 to be lengthened, and the turning of the wheel 25 in the opposite direction causes the telescoping side leg 6 to be shortened. The operation of the wheel in this manner causes a platform, to be presently described, which is carried on the main leg 8 to be swung in an arc of approximately 90 degrees between side and rear positions on the truck.

The main leg 8 is attached at its upper end to the adjustable side leg 6 by means of a collar 30. This collar is pivotally connected to an extended lug 31 of the drum shaft 32 through the agency of an eccentric headed pin 33, Figs. 2 and 3. The connection of the legs 6 and 8 in this manner permits them to be universally rotated similarly to the rotation of the lower extremity of the leg 6, previously referred to in connection with Figs. 8 and 9. A second collar 34 is positioned about the leg 8, and a rope 35 attached thereto and also attached to a winch 36 carried by the truck 5, Figs. 10 and 11. This rope as it is wound and unwound on the winch causes the legs 6 and 8 to be raised and lowered about their pivotal points. The main leg 8 carries a locking device on its upper end which serves to maintain the platform 7 in a level position, as will be later described. One modification of this locking device is shown in Fig. 4, and another modification is shown in Figs. 5 and 6. A flat plate 37 is used in connection with the modification shown in Fig. 4, and this plate is provided with a series of arcuately arranged openings 37′. This plate is attached by welding or the like to the surface of the upper end of the main leg 8 and a reenforcing brace 60 is provided at each end of the plate 37 and extends at right angles thereto. These braces have curved surfaces which conform to the shape of the leg 8 and are seated thereon and rigidly connect the plate 37 in position on said leg. Stops 37² may be provided on one surface of the plate 37 and these stops may engage with the casting positioned about the plunger 54 to be presently described. This engagement serves to limit the platform tilting previous to the time it is locked by the operator as shown in Fig. 2a.

The main leg 8 at its lower end is pivotally connected to a lug 39, Fig. 7, and this lug is rotatably connected with a bracket 40 which is connected with the stanchion 9. This stanchion, as previously mentioned, is supported at the approximate center of the rear of the truck 5 and maintained in position by means of braces 9′. The connection of the main leg 8 in this manner provides a universal joint whereby the leg may be rotated with respect to the lug 39, Fig. 7, and the lug may be rotated in the bracket 40. The stanchion 9 carries a bracket 41 near its upper end which is similar to the bracket 40 just referred to. A sheave 42 is eccentrically mounted on a support 43 rotatably positioned in the bracket 41. The eccentric mounting of the sheave 42, as may be more clearly seen in Fig. 10, permits it to oscillate without interference with the leg 9. A second sheave 44 is journaled in the upper end of the stanchion 9 and the rope 35 from the winch 36 passes thereover and thence under the sheave 42. The end of said rope is secured to the collar 34 on the main leg 8, Fig. 2, as previously described. The sheave 42 is adapted to oscillate with the pivoted support 43 and partake of the angular movement of the leg 8, and the rope 35 will thus be guided in this angular direction from the groove of the sheave to the collar 34 attached to leg 8.

The platform 7 is composed of framework which, as seen from a plan view as in Fig. 11, is of substantially trapezoidal formation. A base 46 which may be of any suitable character, is provided for the platform, and vertical posts 47 extend from the base to a top rail 48. A ladder 49 is carried at one side of the platform, Figs. 10 and 11, and is suitably secured thereto. The platform is supported at its top portion on the end of the main leg 8 to which it is pivotally connected by means of a pin 50. This pin passes through openings in blocks 51 on the platform, Figs. 5 and 6, and through an opening in the end of the leg 8. The blocks 51, 51 are attached to parallel channel members 52, 52 which in turn are suitably attached to the rail 48. Suitable insulation is provided throughout the platform to prevent grounding should the platform accidentally contact with high tension wires.

To maintain the platform in the horizontal or level position, a locking device is provided. The form of locking device shown in Fig. 4 includes an insulated knob 53 which is provided with a spring actuated plunger 54. This mechanism is mounted on one of the channel members previously referred to. The spring actuated plunger 54 engages a selected opening in the plate 37 mounted on the end of the main leg 8, and locks the platform in a level horizontal position.

In the modification of the locking device illustrated in Figs. 5 and 6, a control handle

55 is rotatably mounted in a bushing 56 supported on the channel members 52. This handle is provided at its lower portion with an internally threaded shank 56' which engages with a screw 57 secured to a collar 58. This collar surrounds the end of the main leg 8 and as the control handle is rotated the platform is adjusted to a level position in an obvious manner.

In the operation of the improved device the supporting legs for the platform are adjusted to require heights by the winch controlled rope which raises or lowers the supporting legs about their pivotal supports and the platform partakes of these movements. The platform can be swung from a position at the rear of the truck through an arc of approximately 90 degrees to the side of the truck, or vice versa, by means of the hand wheel 25. A workman on the platform may readily reach the hand wheel, and by rotating it cause the telescoping leg to be lengthened or shortened, and thus bring the platform to a desired position. The locking device carried by the platform so functions that it causes the platform to be secured in a level horizontal position. When it is desired to use the platform on the opposite side of the truck it is only necessary to disconnect the telescoping leg from one side of the truck and connect it with the other side of the truck.

What is claimed is:

1. An aerial platform including a truck, a main support and an auxiliary support pivotally connected with the truck, operable means for adjusting the auxiliary support to move it and the main support in an arc between side and rear positions on the truck, a platform pivotally connected with the main support, and means for raising and lowering said supports and platform.

2. An aerial platform including a truck, a main support pivotally connected with the truck, an auxiliary support pivotally connected with the truck and with the main support, operable means for adjusting the auxiliary support to move it and the main support in an arc between side and rear positions on the truck, a platform pivotally connected with the main support, and means for raising and lowering the supports and platform.

3. An aerial platform including a truck, supporting legs pivotally connected with the truck and with each other, a platform mounted on said legs, and operable means for adjusting one of said legs to move the platform in an arc between side and rear positions on the truck.

4. An aerial platform including a truck, supporting legs pivotally connected with the truck and with each other, a platform pivotally mounted on said legs, operable adjusting means for one of said legs to move said legs and platform in an arc between side and rear positions on the truck, winch mechanism carried by said truck, and means carried by said winch and connected to one of said legs for raising and lowering said legs and platform under control of said winch.

5. An aerial platform including a truck, supporting legs pivotally connected with the truck and with each other, a platform pivotally mounted on one of said legs, operable adjusting means connected with one of said legs to move said legs and platform in an arc between side and rear positions on the truck, and means for locking the platform in a level position.

6. An aerial platform including a truck, a main support and an auxiliary telescoping support pivotally connected at one of their ends with the truck and at their other ends with each other, operable means for adjusting the auxiliary support to move it and the main support in an arc between side and rear positions on the truck, a platform pivotally connected with the main support, means for locking the platform in a level position, and means for raising and lowering said supports and platform.

7. An aerial platform including a truck, a main support pivotally connected at one end with the truck, an auxiliary support having telescoping portions pivotally connected with the truck and with the other end of the main support, operable adjusting means connected with the telescoping portions of the auxiliary support to lengthen and shorten said auxiliary support and move it and the main support in an arc in accordance with the adjustment of said telescoping portions between side and rear positions on the truck, a platform pivotally connected with the main support, and means for raising and lowering the supports and platform.

8. An aerial platform including a truck, a main support and an auxiliary support pivotally connected with the truck and with each other, said auxiliary support being adapted to be pivotally connected to each side of the truck, operable means for adjusting the auxiliary support to move it and the main support in an arc between side and rear positions on the truck, a platform pivotally connected with the main support, a winch carried by said truck, a rope wound on the winch and connected to the main support to raise and lower said supports and platform under the control of said winch, and means for guiding said rope in accordance with the angular position of the main support.

9. An aerial platform including a truck, a main support pivotally connected with the truck, an auxiliary support pivotally connected with the truck and with the main support, operable means for adjusting the auxiliary support to move it and the main support in an arc between side and rear positions on the truck, a platform pivotally connected with the main support, winch mechanism carried by the truck, a rope wound on said winch and connected to said main support for raising and lowering the supports and platform under control of said winch, and means for guiding said rope in accordance with the angular position of the main support.

10. An aerial platform including a truck, a main support pivotally connected at one end to the center and the end of the truck, an auxiliary support having telescoping portions, one portion being pivotally connected with the side of the truck and the other portion with the other end of the main support, operable adjusting means connected with the telescoping portions of the auxiliary support to lengthen and shorten said auxiliary support and move it and the main support in an arc in accordance with the adjustment of said telescoping portions between side and rear positions on the truck, a platform pivotally connected with the main support, and means for raising and lowering the supports and platform.

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