Aug. 8, 1961 B. E. WALLACE 2,995,094

ADJUSTABLE GANTRY WITH JACKING DEVICE

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Fig. 1.

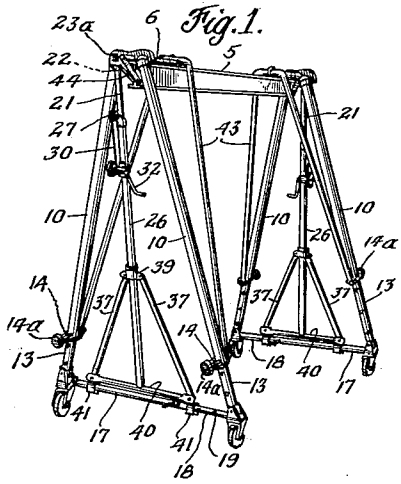

Fig. 2.

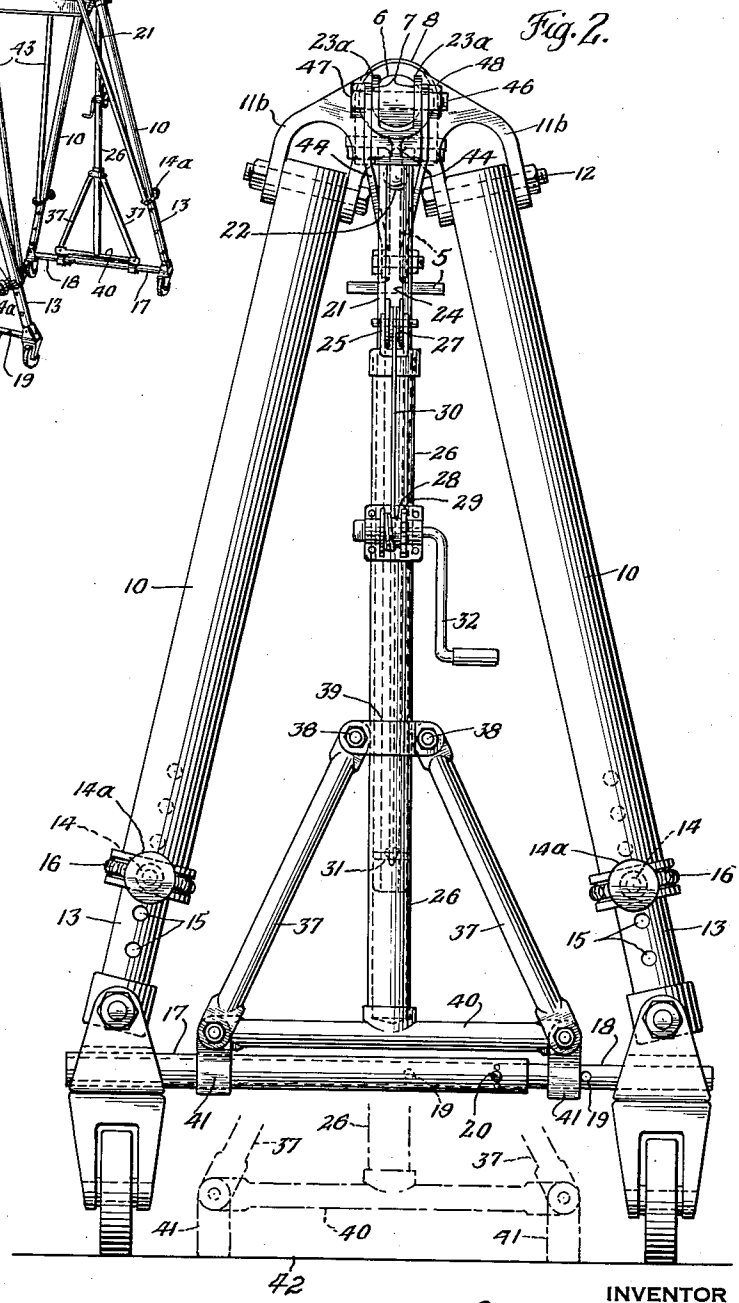

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Fig. 3.

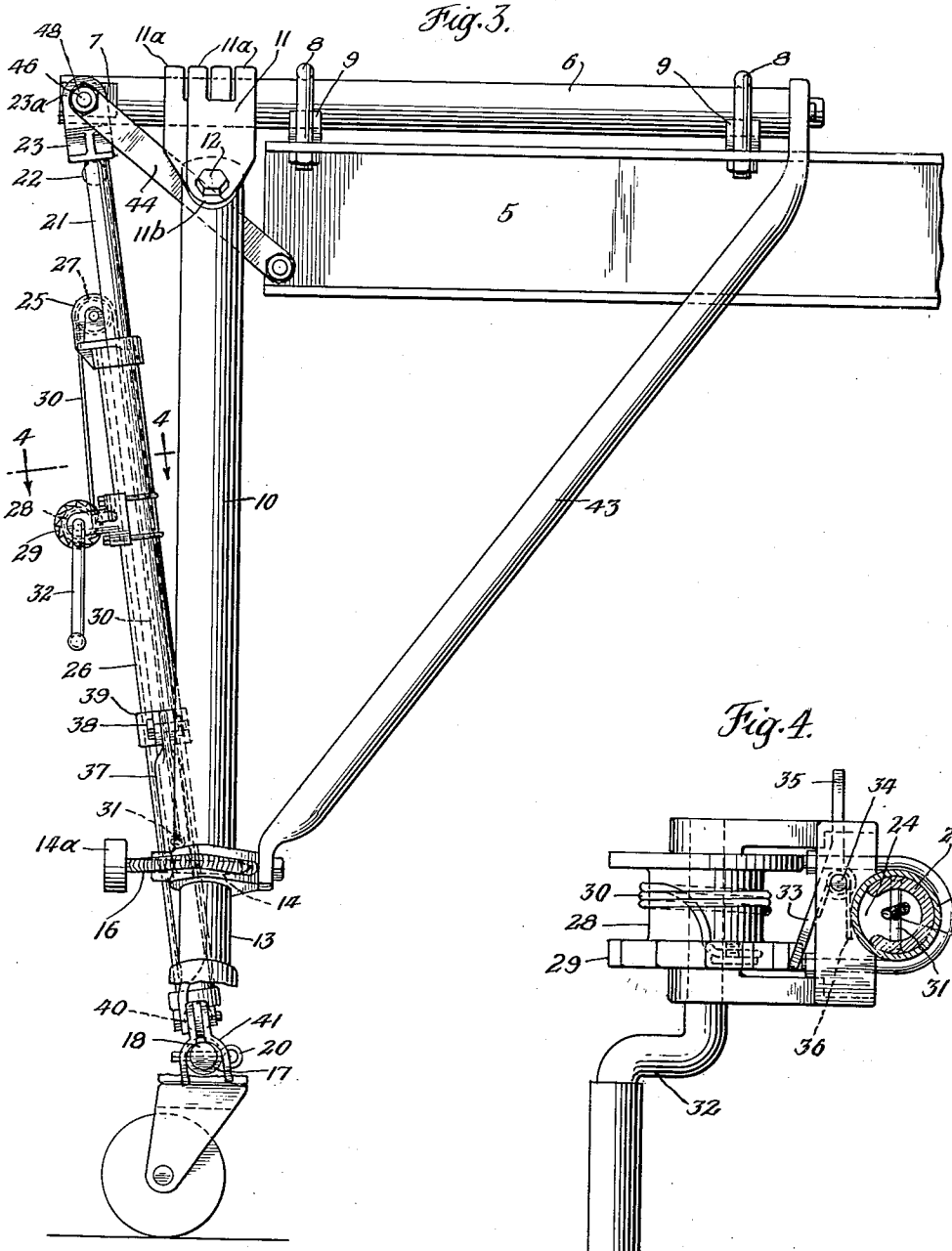

Fig. 4.

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United States Patent Office 2,995,094 Patented Aug. 8, 1961

2,995,094

ADJUSTABLE GANTRY WITH JACKING DEVICE

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Filed Jan. 22, 1960, Ser. No. 4,107
3 Claims. (Cl. 104—126)

The present invention relates to adjustable gantries of the type illustrated in my copending application Serial No. 726,560, filed April 4, 1958, and is particularly concerned with the provision of a jacking device in a gantry of this type wherein the gantry legs may be relieved of the load which they support in order to permit adjustment of the legs as to height and angular relationship. In other words, the present invention is concerned with means whereby a gantry which has both vertically and angularly adjustable legs may be easily and quickly adjusted in the field.

With the foregoing in mind, it can be said that the principal object of my invention is to provide an adjustable gantry which includes a suitable jacking device by means of which the desired adjustments of the gantry legs can be made more easily and quickly. A concomitant object is to save labor and expense in connection with any adjustments of the gantry legs which may be required in the field.

As is well known to those skilled in the art a gantry consists primarily of what may be termed a top or bridge member having at either end some suitable supporting structure upon which it can be moved from place to place. In the present instance this supporting structure takes the form of an A-frame at each end of the top member which frame has a pair of legs hinged at the top of the A and interconnected near the bottom by means of a cross bracing member. As disclosed in the said copending application, the legs are preferably hinged for angular swinging movement in a direction longitudinally of the axis of the top member and also angularly around the axis of the top member. In addition, the legs are adjustable upwardly and downwardly so that their length and consequently the height of the gantry may be increased or decreased as desired. The cross bracing member near the bottom of the legs is also adjustable whereby the distance between the legs may be varied to suit different operating conditions. Finally, the lower ends of the legs are provided with casters after the manner disclosed in my said copending application.

Preferably, the legs and the cross bracing member are of telescoping construction with suitable pins being provided which pass through cooperating holes in the telescoping members whereby the adjustments can be effected. Constructions of this kind are illustrated in the said application and also in my United States Patent No. 2,896,982, issued July 28, 1959.

The accompanying drawings illustrate a preferred embodiment of the present invention, wherein

FIGURE 1 is a perspective view of an adjustable gantry of the type described, in which a jacking device involving the features of the present invention has been applied to each end of the gantry;

FIGURE 2 is an end elevational view on a much enlarged scale;

FIGURE 3 is a side elevational view of one end of an adjustable gantry having my improved jacking device applied thereto; and

FIGURE 4 is a somewhat enlarged section on the line 4—4 of FIGURE 3.

Examination of the drawings will show that the gantry includes a top supporting member **5** which in the present instance takes the form of an I-beam. Above each end of the I-beam is a supporting bar **6**, the outer end of which projects beyond the end of the I-beam and is somewhat flattened at each side as shown at **7**. The I-beam is

hung from the upper bar **6** by means of the inverted U-bolts **8** the legs of which project down through openings in the adjacent flange of the I-beam, there being suitable cradles or pillows **9** between the upper flange of the I-beam and the underside of the supporting bars.

Between each end of the I-beam **5** and the adjacent end of the top bar **6** are located a pair of A-frame legs **10** having hinge members **11** by means of which they can be swung angularly around the bar **6** as an axis. The hinges are formed with spaced ears **11***a* which are slightly offset with respect to each other and arranged to interleave as shown in FIGURE 3. By this means I am enabled to substantially centralize the load supporting point in line with the axes of the legs which makes for stability and strength and avoids setting up undue twisting or other stresses and strains in the structure.

Each leg has its upper end fitted into a yoke-like portion **11***b* of its respective hinge member and is mounted in such yoke by means of a pivot pin **12**, said yokes and pins providing for angular or swinging movement of the legs in a direction longitudinally of the axis of the supporting bars **6**.

The legs **10** have internal telescoping members **13** as shown to best advantage in FIGURE 2 by means of which they are adjustable upwardly and downwardly, pins **14** being provided for holding the legs in any desired position of adjustment which pins pass through suitable apertures **15** in the telescoping member **13**.

Each pin **14** is provided with a head **14***a* by means of which it can be pulled out of the hole into which it was fitted in order to permit of said adjustment. The pins are biased inwardly by means of a spring **16**. This type of construction is fully illustrated, described and claimed in my Patent 2,896,982 referred to above to which reference may be made if so desired.

Each leg is provided with a foot member pivoted thereto upon an axis which is parallel to the axis around which the leg is angularly adjustable as shown in FIGURES 1 and 2 and each foot member is equipped with a caster upon which the gantry can be rolled.

A cross brace member extends between the foot members on the legs of each A-frame and consists of an outer part **17** and a telescoping inner part **18** (see FIGURE 2) there being a series of apertures **19** in the inner member through which a pin **20** may be extended in order to establish any desired horizontal spacing between the lower ends of the legs.

The jacking device which I provide consists essentially of an upper member **21** which is adapted to engage the outer end of the top member **6**. In the present embodiment I prefer to make this engagement by virtue of a ball **22** carried by a member **23** which is forked as shown in **23***a* in FIGURE 2, the forked portion being constructed and adapted to engage the flat sides **7** at the end of the top member **6**.

The upper member **21** of the jacking device is yoke-shaped in cross section as shown to best advantage in FIGURE 4, from examination of which it will be seen that the yoke extends for the major distance around a circle leaving a gap **24** having a purpose to be described below. The ball **22** fits down into the interior of the upper member **21** which, in effect, acts as a socket for receiving the ball. It will be understood, of course, that a reverse arrangement could be adopted just as well, namely with a ball on top of the member **21** and a cooperating socket formed in the member **23**.

It will be obvious that the structure just described creates a longitudinal slot in the upper member **21** of the jacking device which slot cooperates with a pulley block **25** secured to the upper end of the lower jacking member **26**. In the block **25** is a suitable pulley or sheave **27** and, as seen in FIGURE 3, the block with its pulley

projects somewhat into the slot **24** formed in the upper member **21**.

At a suitable point on the outer wall of the outer member **26** is secured a winch-like device consisting of a drum **28** carrying a ratchet **29**. Secured to the drum is an operating cable **30** which extends from the drum up to the pulley **27** and then around the pulley and down into the interior of the upper member **21** to a point near the bottom thereof where it is secured to the member **21** by means of a suitable transverse pin **31** (FIGURE 4).

It will be seen that the slot **24** provides a recess for the cable **30** and brings the thrust of the cable to approximately the center line of member **21**.

The drum is provided with a crank **32** by means of which it can be turned so as to wind the cable **30** on the drum **28** whereby to raise the inner member **21** and so elevate the upper member **6** and the I-beam **5** of the gantry.

Examination of FIGURE 4 will show that I have provided a pawl **33** pivoted at the point **34** and having an externally protruding arm **35**. This pawl is spring-biased by means of a spring **36** so that under normal conditions of operation it will enter the spaces between the teeth on the ratchet **29**. The ratchet is designed to function when the crank is turned so as to raise the inner member **21**. When it is desired to lower the inner member the ratchet is pulled out of engagement with the ratchet teeth **29** by pulling on the arm **35** of the pawl.

The lower member **26** of the jacking device is provided with legs **37** the upper ends of which legs are secured to the lower member in any desired manner as by pins **38** and a clamping device **39**. The lower ends of these legs **37** are interconnected by the member **40** which also supports the lower member **26** of the jack as shown to best advantage in FIGURES 1 and 2.

At each end the cross brace member **40** of the jack is provided with a suitable yoke-shaped foot **41** which is adapted to embrace and rest upon the cross brace member **17—18** of the gantry leg construction. These feet may also rest upon the ground or supporting structure **42** under the gantry when desired. This is shown in dot and dash lines at the bottom of FIGURE 2.

It might also be noted in connection with the gantry construction that suitable diagonal bracing members **43** are provided which extend from the inner end of each top member **6** downwardly and outwardly to a point near the bottom of each gantry leg as shown to best advantage in FIGURES 1 and 3. Also there may be provided supplementary bracing strips **44** extending upwardly and outwardly from the lower portion of the web of the I-beam **5** to a pin **46** which secures the legs **23***a* of the ball supporting member against the flat surfaces **7** of the top member **6**. All of this is shown to best advantage at the top of FIGURE 2. However, it is to be understood that the bracing members **44** are not essential to the invention but are useful, especially in larger units where added strength and stability may be desirable. The parts **23***a* and **44** are held tightly on the pin **46** between the head **47** on one end of the pin and a nut **48** threaded on the other end of the pin.

While the method of operation of my improved structure is believed to be obvious, it might be summarized as follows. In order to raise the top member of the gantry, the feet **41** are placed on the cross brace member **17—18** and the upper end of the inside tube **21** is arranged to embrace the ball **22** at the end of the top member **6**. The crank arm **32** is then turned to wind the cable **30** on the drum **28** until the load on the bolts **14** of the gantry legs has been sufficiently relieved so that they can be pulled out of their apertures **15**. The crank is then turned to still further wind up the cable until the desired height has been attained, whereupon the pins **14** are projected into the holes **15** which correspond to the new position of adjustment.

When lowering the top member of the gantry the operation just described is repeated except that the holding pawl **33** is held in release position by pulling on the arm **35** so that the crank handle **32** can be turned to unwind the cable **30** and thereby permit the inner member **21** to telescope into the outer member **26**.

If it is desired to adjust the tread width between the legs at an end of the gantry, the feet **41** may be rested upon the ground or other supporting structure, after which the gantry can be lifted slightly from the ground by means of the jacking structure. The cross brace member **17—18** can then be adjusted by pulling out the pin **20** and expanding or contracting the members **17—18** as may be required to effect the desired adjustment of the tread width. Following this, of course, the pin **20** is replaced in the proper hole **19**. When so adjusting the tread width, it is important to suitably block or lock the casters at the opposite end of the gantry in order to prevent the device from rolling away which, of course, would permit the gantry to slip off the jack.

I claim:

1. A gantry having a top supporting member, a pair of supporting legs at each end of said member, each of said legs including a pair of telescoping members which are relatively adjustable to vary the height of the top member and each leg being angularly adjustable around the top member as an axis, a foot member pivoted to the lower end of each leg upon an axis which is parallel to the axis around which the leg is angularly adjustable, a horizontally adjustable bracing member joining the foot members at each end of the gantry, and a jacking device having an upper member adapted to engage the top member, a lower member telescoping with said upper member and adapted to rest on said horizontal bracing member, and means for raising and lowering the upper jacking member with relation to the lower whereby the supporting legs may be relieved of load.

2. A gantry according to claim 1 wherein the engagement between the upper member of the jacking device and the end of the top supporting member includes a ball on one of said members and a cooperating socket on the other.

3. A gantry according to claim 1 wherein the upper member of the jacking device is longitudinally grooved and wherein the upper end of the lower member carries a pulley block fitting into said groove, a pulley in the block, a ratchet drum mounted on the outer wall of said lower jacking member, a spring-loaded pawl engaging the teeth of said ratchet, a cable extending from the drum around the pulley and down into the upper member to a point near the lower end thereof, said cable being secured to the drum and to the upper member, a crank on the drum, and an arm on the pawl whereby the pawl may be released from the teeth during a lowering operation.

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