

Aug. 8, 1961

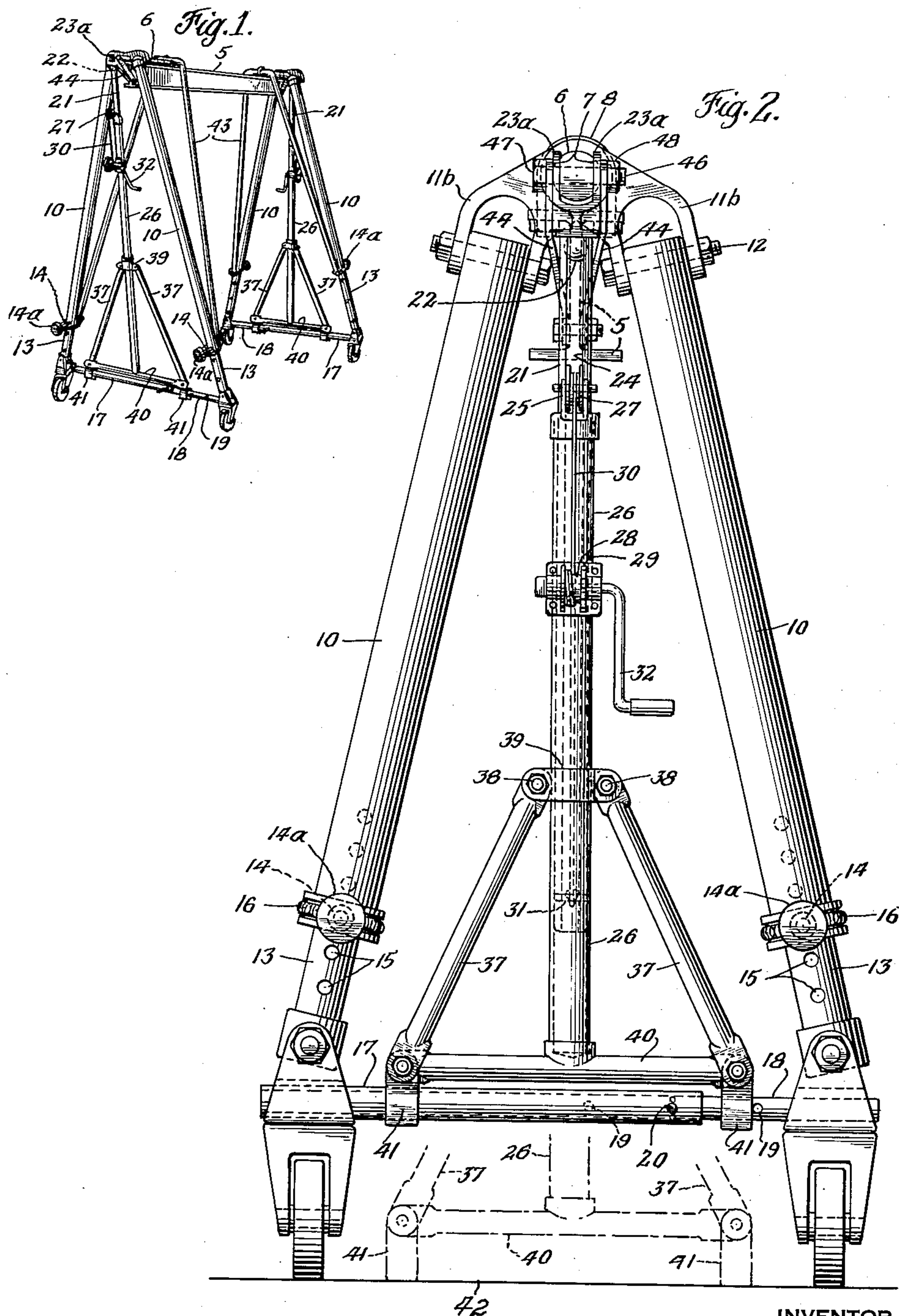
B. E. WALLACE

2,995,094

ADJUSTABLE GANTRY WITH JACKING DEVICE

Filed Jan. 22, 1960

2 Sheets-Sheet 1



INVENTOR
Bernard E. Wallace
BY
Sylvester E. Lechner
ATTORNEYS

Aug. 8, 1961

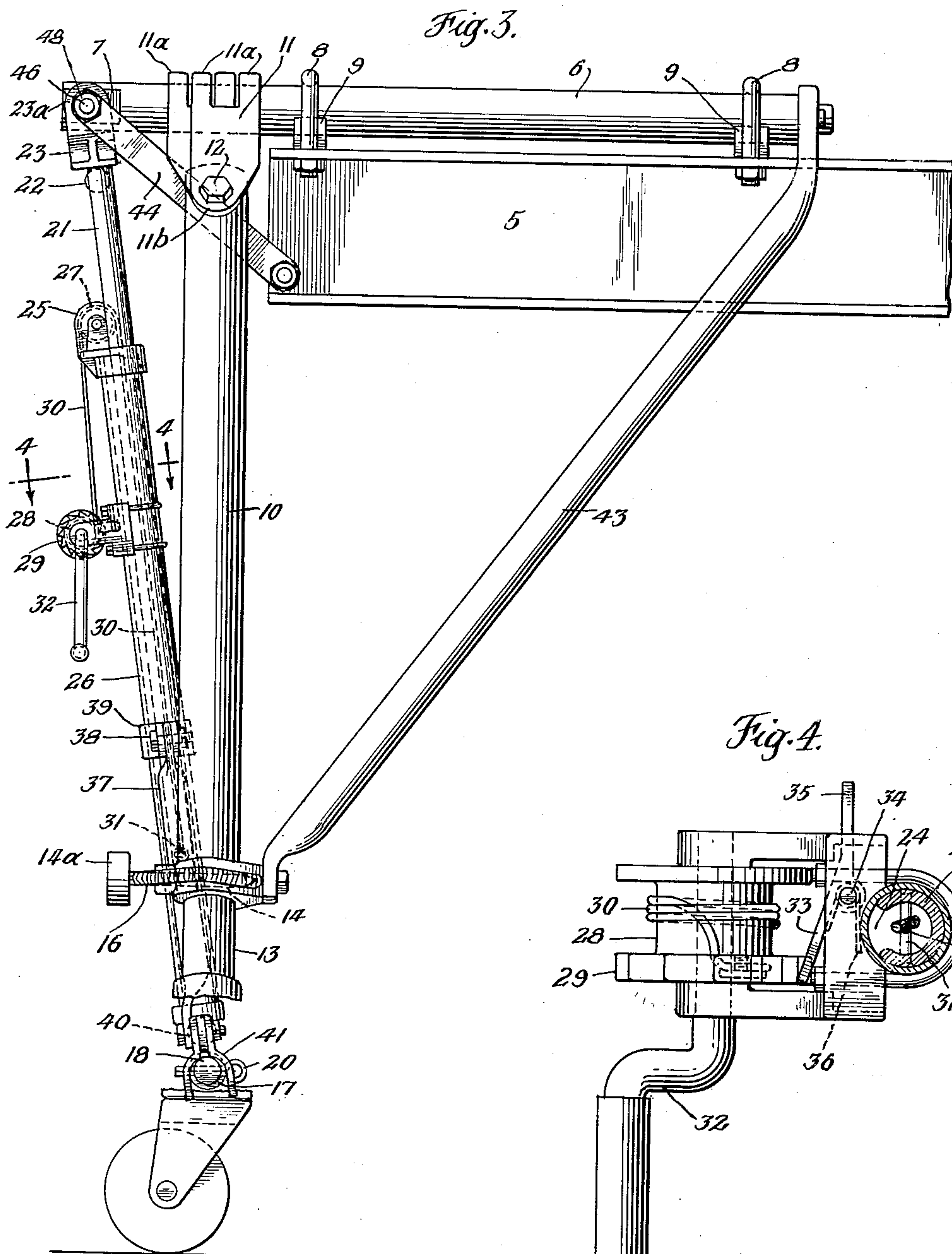
B. E. WALLACE

2,995,094

ADJUSTABLE GANTRY WITH JACKING DEVICE

Filed Jan. 22, 1960

2 Sheets-Sheet 2



INVENTOR
Bernard E. Wallace
BY
Symmestvedt & Lechner
ATTORNEYS

1

2,995,094

ADJUSTABLE GANTRY WITH JACKING DEVICE

Bernard E. Wallace, Box 163, Exton, Pa.

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

2

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 11a 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 11b 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 14a 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 23a 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 23a 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 23a 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.

References Cited in the file of this patent

UNITED STATES PATENTS

2,342,015	Scheihing	Feb. 15, 1944
2,421,209	Lindner et al.	May 27, 1947
2,772,004	Noble	Nov. 27, 1956
2,822,067	Price	Feb. 4, 1958