Nov. 29, 1966 D. L. CALKINS ETAL 3,288,480

ROD WEEDER

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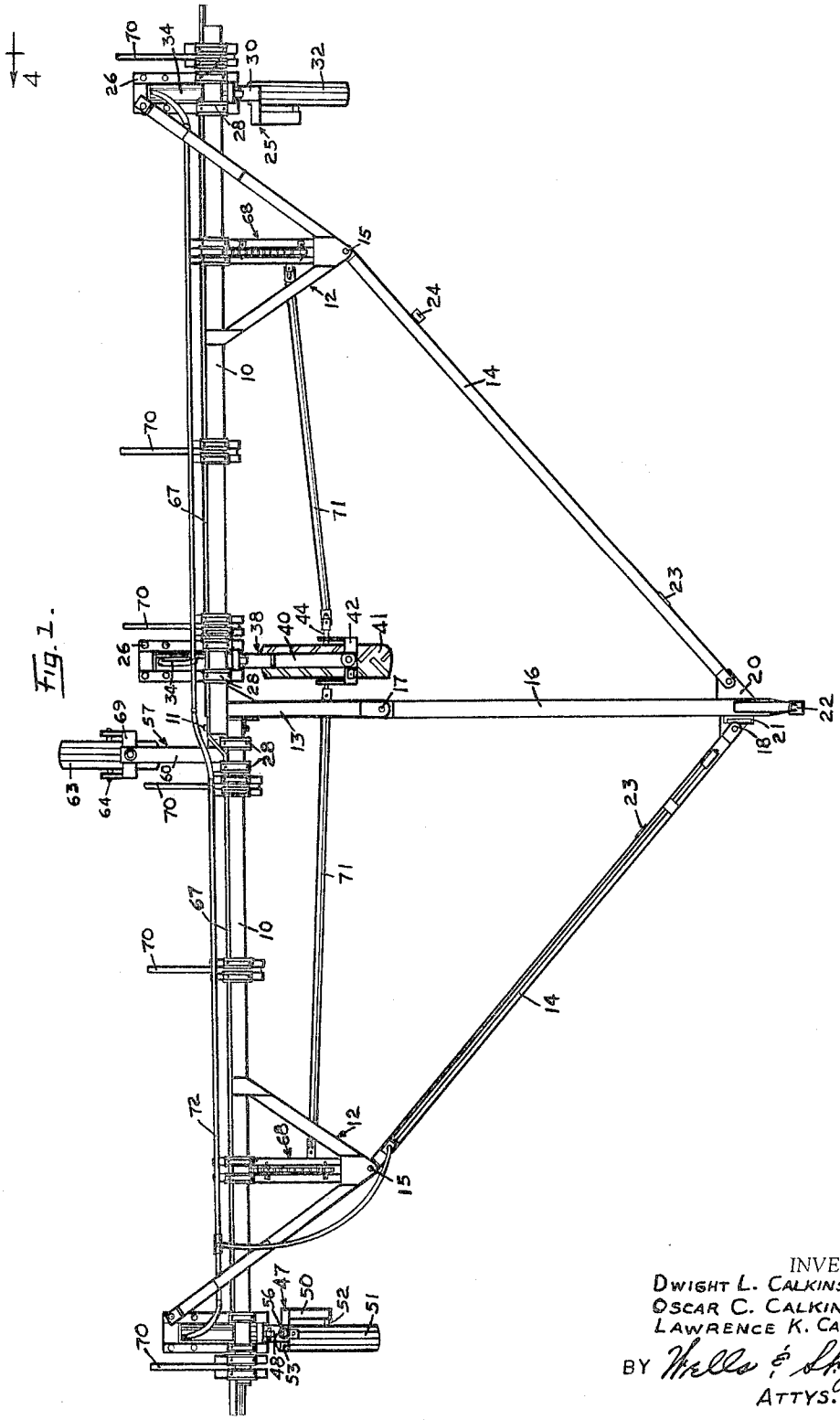


Fig. 1.

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ROD WEEDER

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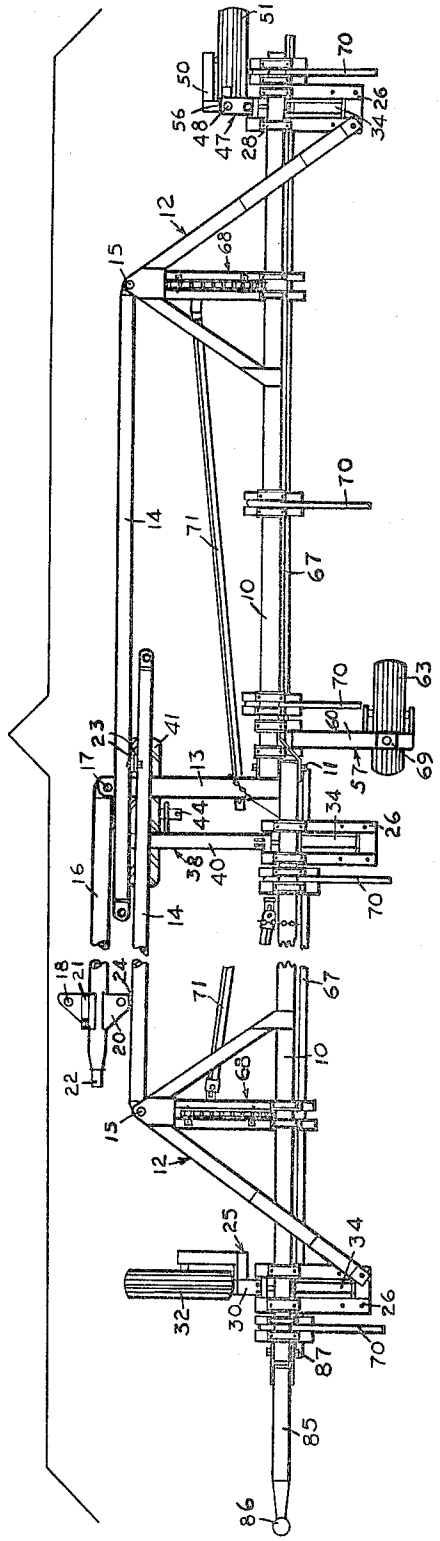


FIG. 2.

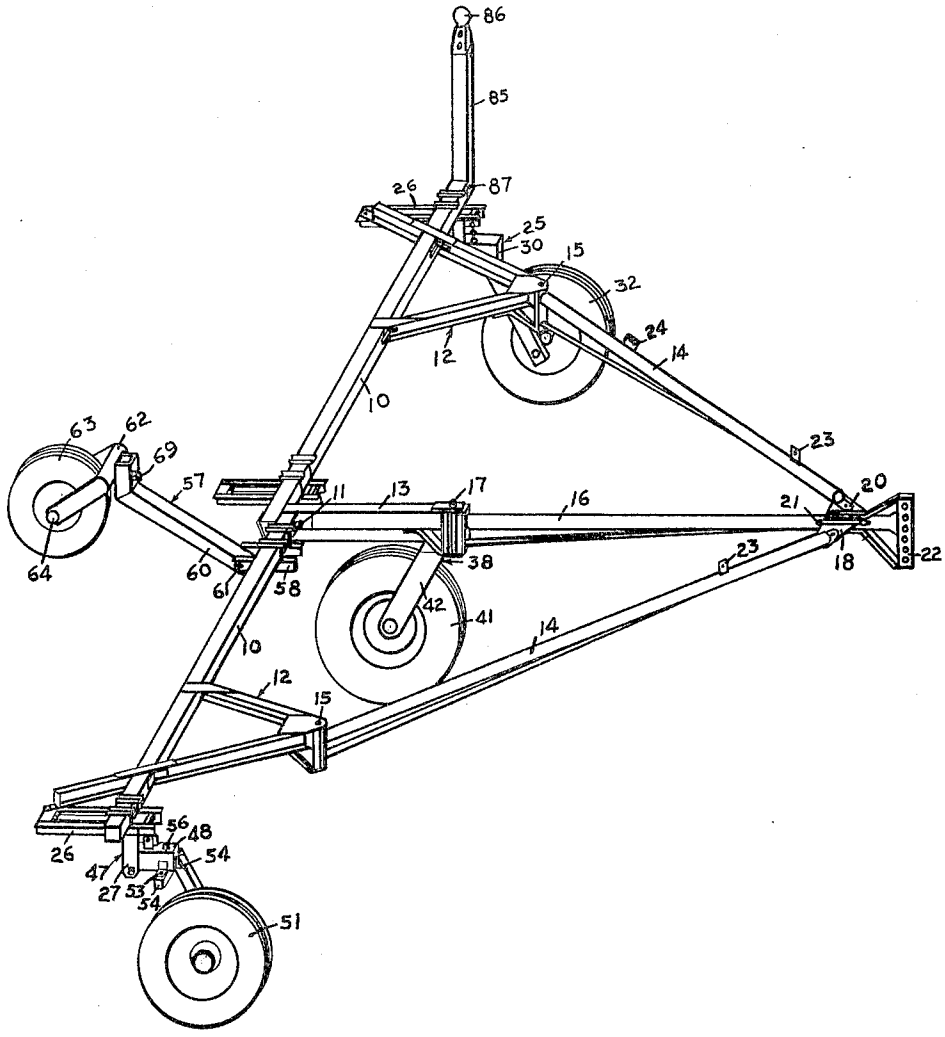
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Fig. 3.



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ROD WEEDER

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Fig. 4.

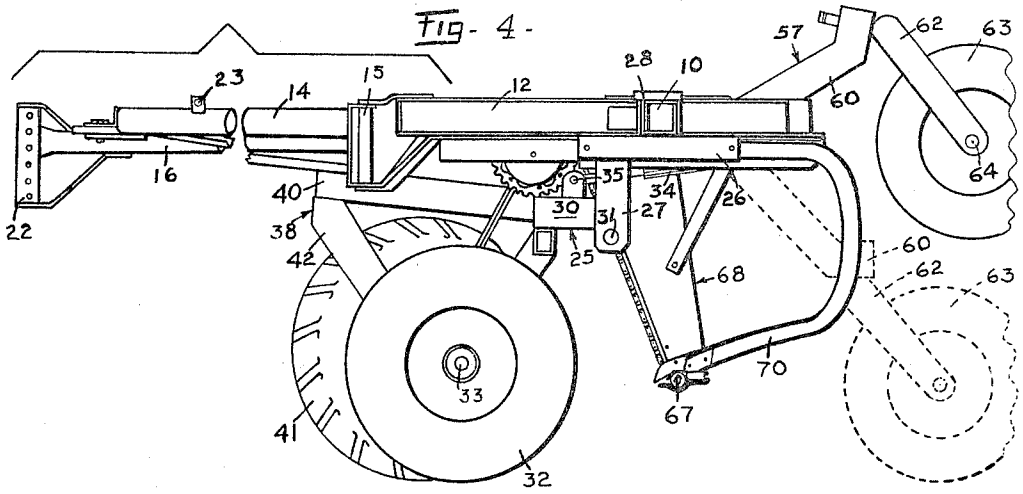
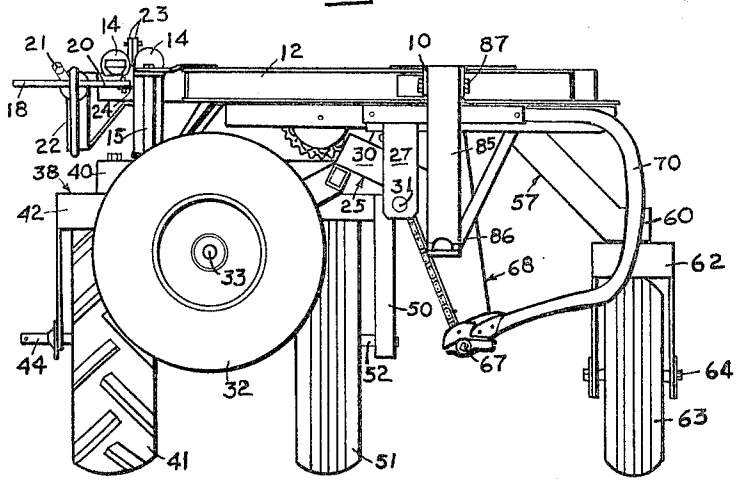


Fig. 5.



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ROD WEEDER

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Fig. 6.

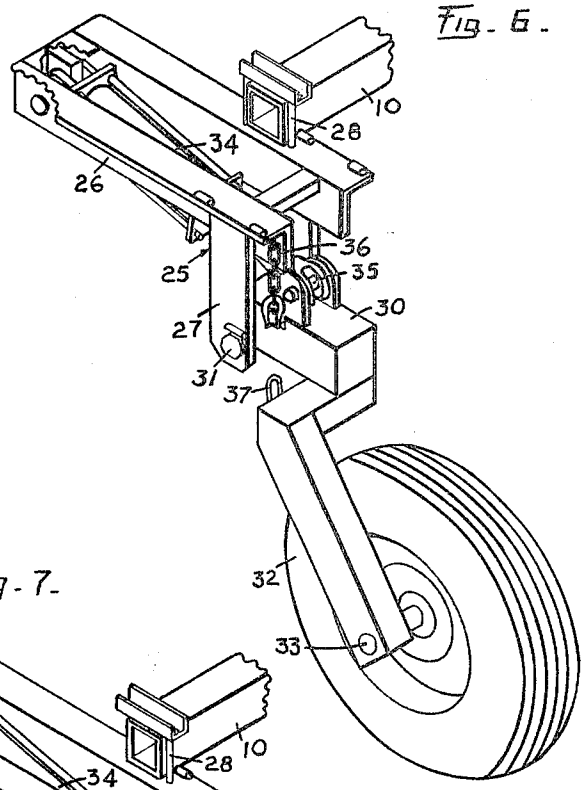
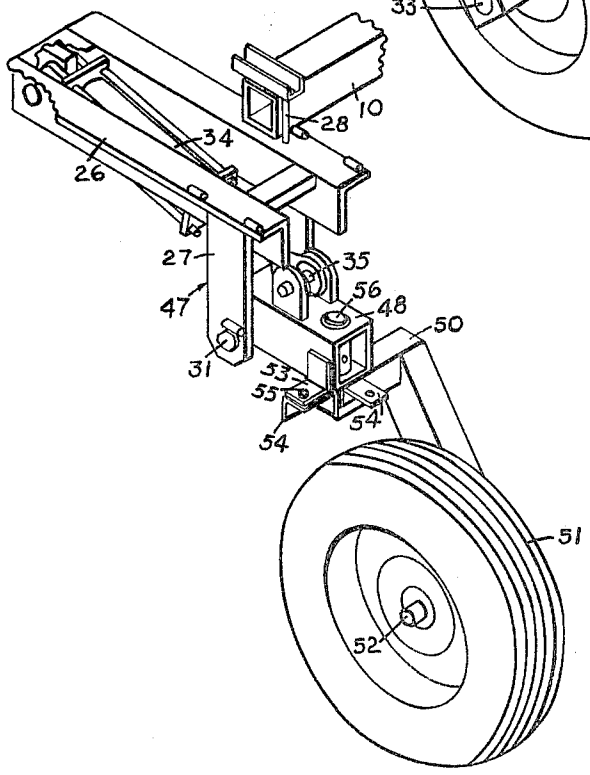


Fig. 7.



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ROD WEEDER

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Fig. 8.

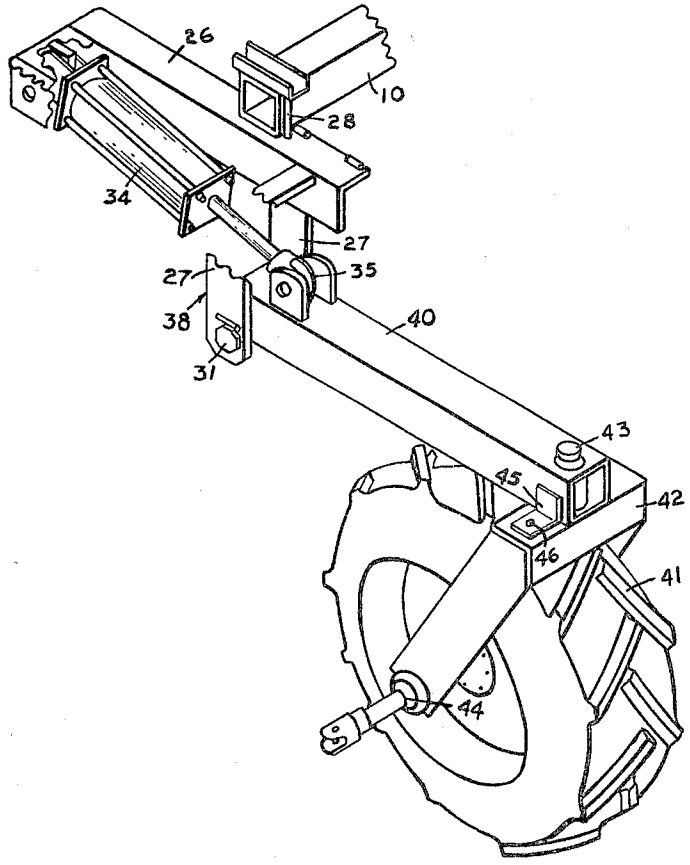
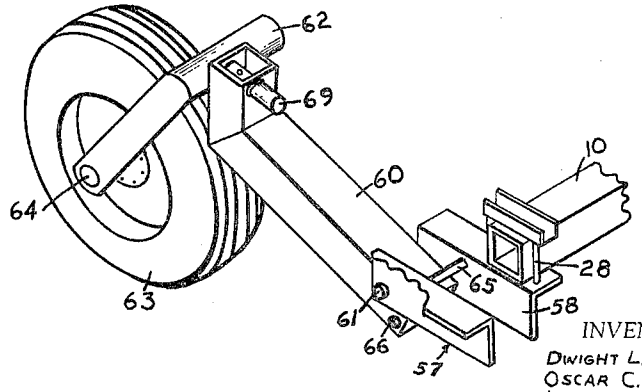


Fig. 9



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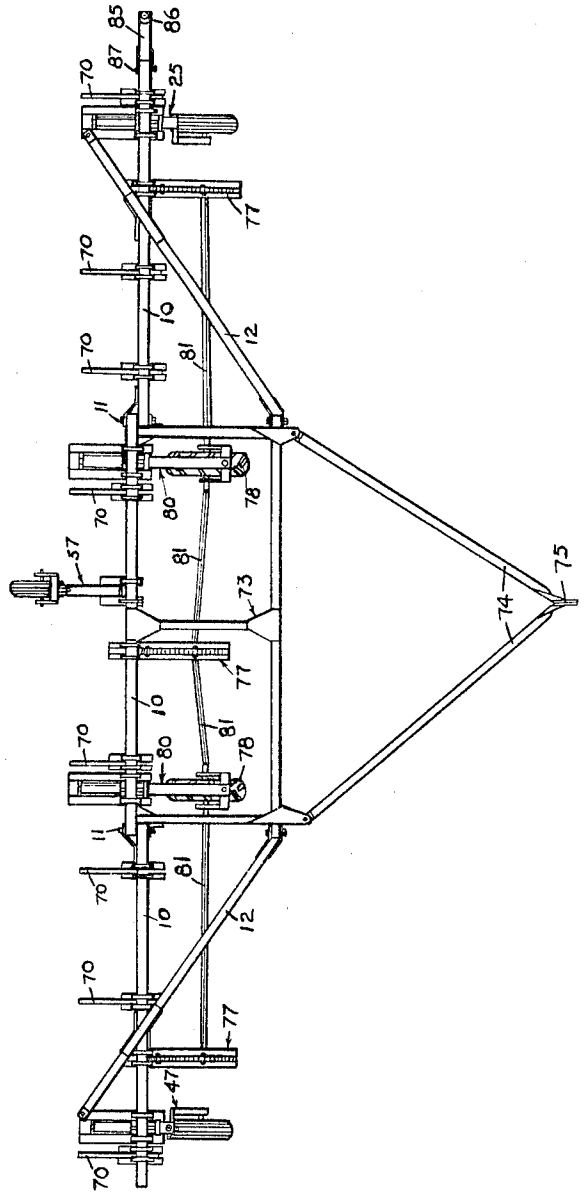
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ROD WEEDER

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Fig. 10.



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ROD WEEDER

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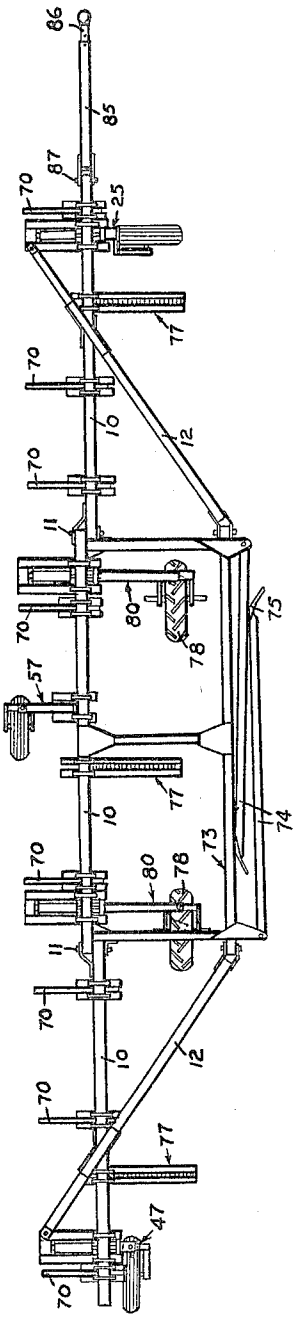


FIG. 11.

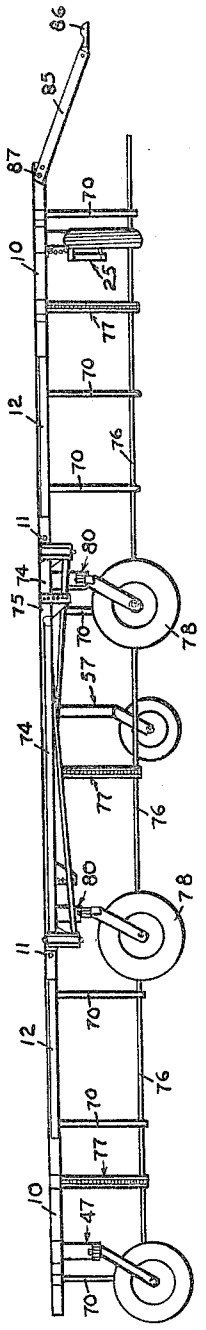


FIG. 12.

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United States Patent Office 3,288,480 Patented Nov. 29, 1966

3,288,480

ROD WEEDER

Dwight L. Calkins, Oscar C. Calkins, and Lawrence K. Carrick, Spokane, Wash., assignors to Calkins Manufacturing Company, Spokane, Wash.

Filed Apr. 16, 1964, Ser. No. 360,330
3 Claims. (Cl. 280—43.23)

This invention relates to a rod weeder apparatus, and more broadly to a trailing type frame for rod weeders or similar farm implements.

It is desirable to utilize farm implements having a maximum width for field use far beyond that which can be trailed on a highway or road between fields. In the past, this factor has limited the width of such implements, or has required that they be made into detachable sections for transport on a truck bed. The present invention combines a novel framework and interrelated supporting wheel assemblies so that the apparatus can be trailed lengthwise along a highway without requiring any disassembly of the various components. In addition, a single set of wheels is utilized for field use, highway use, and field depth control.

It is a first object of this invention to provide such an arrangement utilizing a simple transverse frame braced so as to provide the required drawing power for field use of the implement, as well as transport, while utilizing a minimum of structural members.

Another object of this invention is to provide such an apparatus wherein the width of the arrangement can be substantially lessened prior to the trailing of the implement along a highway in a longitudinal position.

Another object of this invention is to provide wheel assemblies on the apparatus capable of being utilized for both field and transport use, the wheel assemblies further providing depth control of the working elevation of the implement carried thereon.

These and further objects of the invention will be evident from a study of the following detailed description, taken together with the accompanying drawings, which illustrate a preferred form of the invention and a modification thereof adapted for various working widths. It is to be understood that the concept of the invention can be applied to many different structural embodiments, and that the details of the structures shown in the drawings are not to restrict the scope of the invention, which is set out in the claims which follow.

In the drawings:

FIGURE 1 is a top plan view of the complete rod weeder as made in two sections, the transport hitch not being shown in this view;

FIGURE 2 is a top plan view of the rod weeder shown in FIGURE 1 after repositioning of the wheels for transport use and and folding the field hitch, the center portion of the apparatus being broken away;

FIGURE 3 is a perspective view of the basic supporting framework shown in FIGURE 1;

FIGURE 4 is an enlarged cross sectional view taken along line 4—4 in FIGURE 1, a portion of the field hitch being broken away;

FIGURE 5 is a front view of the apparatus as seen from the left in FIGURE 2;

FIGURE 6 is a fragmentary perspective view of the front wheel assembly;

FIGURE 7 is a fragmentary perspective view of the rear wheel assembly;

FIGURE 8 is a fragmentary perspective view of the driving wheel assembly;

FIGURE 9 is a fragmentary perspective view of the tail wheel assembly;

FIGURE 10 is a top plan view of a second embodiment of the invention;

FIGURE 11 is a view similar to FIGURE 10 showing the apparatus in transport position; and

FIGURE 12 is a front elevation view of the apparatus as seen in FIGURE 11.

The basic concept of this invention is to provide a rod weeder or similar implement with a supporting framework having minimum structural detail and adapted to be reduced in width for transport hauling of the implement in a longitudinal direction, the wheel assemblies carrying the framework being designed for both transport and field use. The same wheel assemblies are also used for proper depth control. The basic framework and arrangement can be seen in FIGURES 1 through 3. The individual wheel assemblies are shown in FIGURES 6 through 9.

The frame structure includes a transverse frame member **10** formed of tubular material and shown in the first embodiment as two sections pivoted to one another about a centrally located pivot shaft **11**. The frame member **10** is provided with the central joint at shaft **11** in order to allow it to better conform to the ground contour over which it must travel. The tubular frame member **10** is reinforced by a series of triangular braces generally designated in the drawings by the numeral **12**. The braces **12** are welded or otherwise fixed to the frame member **10** and to the various wheel assemblies and driving boots for the powered rod as will be evident from the following description. It is to be noted that the braces **12** generally extend forward of the frame member **10**, although they extend rearwardly beyond the frame member **10** at each end thereof. There also is provided a centrally located brace **13** that is also horizontal and which extends forwardly adjacent to the pivot shaft **11**.

Extending forwardly from the front ends of the braces **12** are two side extensions **14** that join to a center extension **16** that is pivotally connected to the front end of the brace **13**. The three extensions **14** and **16** form a triangular apex at the front of the rod weeder when the apparatus is set up for field use as seen in FIGURE 1. The side extensions **14** are pivoted to the triangular braces **12** about upright pivot shafts **15**, while the center extension **16** is pivoted to the brace **13** about an upright pivot shaft **17**. The two pivot shafts **15** are angularly offset slightly from the vertical so that when the extensions **14** are pivoted to locations parallel to the transverse frame member **10** (FIGURE 2) they overlap the center brace **13**. The center extension **16** is pivoted about a vertical axis at shaft **17** so as to lie alongside the folded side extension **14**.

At each side of the center extension **16** adjacent its forward end is a bracket **18**, **20** designed to be rigidly connected to the forward end of the respective side extensions **14** to complete a triangular horizontal frame configuration that is symmetrical about the center of the apparatus. The bracket **18** is provided with a horizontal longitudinal pivot shaft **21** so that the forward portion of the framework is pivoted coaxially with the pivot shaft **11** of the transverse frame member **10** in order to accommodate the ground contour without producing undue strain on the triangular members.

The front end of the center extension **16** is provided with a hitch connection **22** of conventional construction, the hitch connection **22** being provided with a series of vertical apertures by which the hitch **22** can be secured to a tractor or other vehicle. The choice of connecting aperture determines the angular position of the frame member **10** relative to the supporting ground structure.

The two side extensions **14** are provided with complementary upright tie brackets **23** which are adapted to be bolted to one another when the extensions **14** have been folded to the lateral positions shown in FIGURE 2. The right hand extension **14** shown in FIGURE 1 also has a

horizontal tie bracket **24** adapted to be secured to the bracket **20** on the center extension **16** when the center extension **16** has been folded to the transverse position shown in FIGURE 2. Thus, the forwardly extending extensions **14** and **16** can be selectively positioned in a trailing triangular configuration shown in FIGURE 1 for field use in pulling the transverse frame member **10** in a direction perpendicular thereto, or can be folded and fixed to one another to form a parallel frame structure relative to the frame member **10** in a direction perpendicular thereto, or can be folded and fixed to one another to form a parallel frame structure relative to the frame member **10** for trailing purposes parallel thereto. In this manner a strong triangular trailing framework is provided for field use, which can be folded to a more narrow rigid structure for highway trailing purposes.

The basic structure shown in the first embodiment of the invention is carried by four wheel assemblies. The front wheel assembly, used only for field use, is generally designated by the numeral **25**. The second wheel assembly, which is the driving wheel for the rod weeder, is designated by the numeral **38**. The third wheel assembly, located at the rear of the apparatus when positioned for transport, is designated generally by the numeral **47**. The fourth wheel assembly is a tail wheel shown by the numeral **57**. The three wheel assemblies **38**, **47**, and **57** are utilized for both field and transport use.

During the description of the structure, the end of the apparatus shown to the left in FIGURES 1 and 2 shall be termed the front transport end of the frame and the opposite end shall be termed the rear transport end, referring to their relative locations when the frame is used for transport purposes. When referring to field use of the machine, the bottom of the apparatus as shown in FIGURE 1 shall be termed the front field end of the various members and the top of the apparatus shown in FIGURE 1 shall be termed the rear field end of the various members.

At the left hand end of the structure as shown in FIGURE 2 is a pivoted hitch member **85** having a conventional hitch assembly **86** and carried about a pivot shaft **87**. The hitch member **85** can be selectively locked in an upright position for field use or in a lowered position for transport use. The hitch is not shown in FIGURE 1, due to size considerations, but would extend from the left or front transport side thereof.

The first wheel assembly **25**, shown to the far right in FIGURE 1, and shown in enlarged detail in FIGURE 6, is used only during field use of the rod weeder. It includes a bracket **26** adapted to be fitted directly beneath the transverse member **10** and releasably fixed thereto by connecting U-bolts **28**. The bracket **26** includes downwardly extending ears **27** which carry an extended wheel frame **30** about a pivot shaft **31** that is parallel to the length of the transverse frame member **10**. The wheel frame **30** in turn carries a wheel **32** about a horizontal wheel axle **33**.

Mounted within the bracket **26** and connected at the rear end thereof is a cylinder **34** having a piston rod connection to the wheel frame **30** at a removable shaft **35**. The cylinder **34** is adapted to angularly locate the wheel frame **30** and wheel **32** relative to the transverse frame member **10** about the pivot shaft **31** for depth control purposes while the wheel **32** is maintained in ground contact.

The bracket **26** is also provided with a short length of chain **36** adapted to be selectively tied to a loop **37** on the wheel frame **30** in order to maintain the wheel frame **30** in an elevated position about the shaft **31** so that the wheel **32** is maintained out of ground contact. In most instances, it is necessary to disconnect the cylinder **34** from the wheel frame **30** by release of the connecting shaft **35** prior to the manual lifting of the wheel frame **30** and attachment of the chain **36** to loop **37**. The wheel **32** will remain in a straight-ahead position at all times. It is used for depth control of the adjacent end of the frame member **10** during field use of the assembly and is elevated out of ground contact during transport. The weight of the forward transport end of the transverse frame member **10** is borne by the hitch **32** while the apparatus is being trailed between fields.

The second wheel assembly, shown as the driving wheel for the rod mechanism, is best seen in FIGURE 8. It includes several elements identical to those previously described and designated by identical numbers. These include the bracket **26**, ears **27**, U-bolts **28** and pivot shaft **31**. A modified wheel frame **40** is pivoted about the axis of the shaft **31** and extends forwardly therefrom in the same direction as the previously described wheel frame **30**. The wheel frame **40** carries a ground engaging wheel **41** mounted on a wheel support **42**. The wheel support **42** is a caster wheel support pivoted to the wheel frame **40** about an upright pivot shaft **43**. The wheel frame **40** has a bracket **45** fixed at one side thereof adapted to receive a bolt **46** to selectively lock the wheel support **42** in the position shown in FIGURE 8 where the wheel axle **44** is aligned parallel to the transverse frame member **10**. This locked position is utilized for field use of the apparatus. The bolt **46** is removed and the wheel **41** is allowed to freely pivot about the axis of the shaft **43** during transport use of the apparatus.

The second wheel assembly **38** is provided with a cylinder **34** connected to the wheel frame **40** at a shaft **35** in a manner identical to that previously described. The wheel **41** always remains in ground contact during field or transport use, but is locked in a straight-ahead position for field use, while used as a free caster wheel during transport.

The third wheel assembly **47**, shown at the left in FIGURE 1 and best seen in FIGURE 7, also utilizes the previously described bracket **26**, ears **27**, U-bolts **28** and pivot shaft **31**. In this instance, the pivot shaft **31** carries a relatively short wheel frame **48** that has mounted at its forward end a wheel support **50** carried about an upright pivot shaft **56**. The wheel support **50** carries a ground engaging wheel **51** mounted about a horizontal axle **52**. The wheel support **50** is not really pivotable in use, but is locked in a position wherein the axle **52** is either parallel to the transverse frame member **10** or perpendicular thereto. The positioning of wheel **51** is attained by means of a bracket **53** fixed at one side of the wheel frame **48** and complementary alternate brackets **54** fixed to the upper portion of the wheel support **50**. The brackets **54** are offset 90 degrees relative to one another, and are adapted to be alternately fixed to the bracket **53** by means of a bolt **55**. In this manner, the wheel **51** is located in a straight ahead position for field or transport use.

The third wheel assembly **47** is also angularly positioned about the shaft **31** by means of a cylinder assembly **34** having a piston rod connection at shaft **35**. The line of ground contact of the three wheels **32**, **41** and **51** is substantially aligned across the apparatus when the various wheels are positioned for field use, so that the three cylinders **34** can be operated in concert by conventional control mechanisms to vary the elevation of the transverse frame member **10** relative to the supporting ground surface and thereby provide depth control for the rod mechanism.

The fourth wheel assembly **57** is a tail wheel that extends rearwardly from the transverse frame member **10** in a direction perpendicular thereto when used in the field. The tail wheel assembly **57** is used only for highway transport, and provides a second free caster wheel located laterally relative to the second or driving wheel assembly **38**. Its sole purpose is to provide lateral stability to the apparatus when being trailed longitudinally behind a towing vehicle. As seen in FIGURE 9, it includes a modified bracket **58** fixed below the transverse frame member **10** by means of U-bolts **28** as previously described. A wheel frame **60** is pivoted to the bracket **58** about a pivot shaft

61. The other end of the frame 60 pivotally carries a wheel support 62 about shaft 69. The pivoted wheel support 62 is provided with a wheel 63 rotatably mounted on support 62 by a central axle 64. The wheel frame 60 is selectively held in an upper position out of ground contact by abutment of a releasable pin 65 that extends across the bracket 58 in the position shown in FIGURE 9. For highway use, the pin 65 is received within an aperture 66 formed through the frame 60 so as to maintain the wheel 63 in ground contact, wherein it acts as a free caster wheel.

The rod weeder mechanism shown in the drawings is conventional and shown only by way of example as an implement to which this concept is applicable. It includes two transverse rods 67, each of which is driven by a conventional driving boot 68 and supported by spaced gooseneck assemblies 70. The respective driving boots 68 are powered in the example by means of universal connecting rods 71, releasably coupled to the axle 44 of the second driving wheel assembly 38, although the rods 67 could be driven from a power take off or any other conventional source in order to turn the rods 67 about their longitudinal central axes. The driving boots 68 are mounted on supporting brackets fixed to the triangular braces 12 as previously described so that the framework provides a direct towing connection for field use to the driving boots 68, while also insuring that the tranverse frame member 10 has sufficient field towing connections throughout its length in order to properly pull the rod 67 through the field. The working elevation of the rods 67 is governed by manipulation of the cylinders 34 by means of fluid lines 72 connected to a source of fluid pressure, conventionally located on the towing vehicle or tractor.

Basically, the apparatus shown is designed to produce a double purpose framework, so that the apparatus drawn through a field to span a wide swath can be narrowed for pulling along a road during transport. The manner by which the field tongue assembly folds is believed to be evident from the above description and the illustration of FIGURE 2. When in field use, the three wheel assemblies 25, 38 and 47 are utilized to carry the transverse frame member 10 at the desired elevation selected by operation of cylinders 34. The fourth wheel assembly 57 is utilized, but is maintained in its elevated location with the wheel 63 out of ground contact (see FIGURE 4).

For towing purposes, the extensions 14 and 16 are locked relative to one another to provide a rigid central frame and to prevent damage to the frame member 10 during transport. The first wheel assembly 25 is released from its cylinder 34 and held with the wheel 32 out of ground engagement by means of the chain 36. Hitch 32 bears the weight of the front transport end of the assembly.

The second wheel 38 is prepared for transport use by release of the bolt 46 and rods 71, thereby allowing the wheel support 42 to pivot freely about the shaft 43. The fourth wheel assembly 57 is lowered by release of the pin 65 from the position illustrated in FIGURE 9, and mounting of the pin 65 through the aperture 66. The wheel 63 is in ground contact as a free caster wheel spaced to the side of the wheel 41, which also is a free caster wheel. In this manner the two wheels 41 and 63 form free pivoting wheels in order to lessen the turning radius of the relatively long frame assembly when pulled parallel to the member 10.

The third wheel assembly 47 is prepared for transport use by release of the bolt 55 and repositioning of bolt 55 through the alternate bracket 54 so that the wheel 51 is locked in a position aligned with the frame member 10.

In this manner, the weight of the front end of the apparatus for transport is carried by the hitch 86, the wheels 41 and 63 act as pivoted front wheels and the locked rear wheel 51 trails and supports the rear end of the framework. It is to be noted that the vertical axes of the two

wheel supports 42 and 50 are in spaced planes parallel to the transverse frame member 10, so that the wheels 41 and 51 are not in alignment when turned for transport use (see FIGURE 5). In this manner the wheels used for transport use (41, 51 and 63) are each offset relative to one another to provide lateral stability to the rigid framework during pulling of the framework parallel to the frame member 10. However, by the same token, the three wheel assemblies 35, 38 and 46 are designed so that the wheels thereof, 32, 41 and 51 contact the supporting ground surfaces at a substantially aligned location when locked in a straight ahead direction for field use of the apparatus so that these three wheels can be effectively used in concert for depth control of the rods 67.

The same basic consideration and structures illustrated previously are shown in FIGURES 10 through 12 as applied to a wider apparatus used in three sections. In this instance, the frame member 10 is pivoted twice along its length about pivot shaft 11 and the triangular braces 12 are likewise pivoted about aligned axes so that the rigid framework can really accommodate to the ground contour during field use. In this instance, a rigid central rectangular framework 73 is added to the framework previously described. Framework 73 carries at each end thereof extensions 74 which extend outwardly to an apex 75 at which is located the pulling hitch for field use.

In this wider version, there are provided three rods 76, powered from a pair of driving wheels 78 mounted on wheel assemblies 80 identical to the wheels assemblies 38 previously described. The boots 77 that turn the rods 76 are powered by means of universal rod connections 81 that are turned by axles of the two wheels 78.

The wheel assemblies are identical to those previously described, including a front wheel assembly 25, two second wheel assemblies 80 identical to the previously described assemblies 38, a third or rear wheel assembly 47 and a fourth or tail wheel assembly 57. The framework is utilized for towing purposes in the field in the configuration shown in FIGURE 10, and the extensions 74 can be folded back parallel to one another as shown in FIGURE 11 for transport. The various wheel assemblies are alternately used in the manner previously described. Where additional stability is required for long trips, the rear wheel assembly 80 is preferably locked parallel to member 10 in the same manner as described relative to wheel assembly 47.

While the two embodiments shown has utilized two or three sections in the basic frame member 10, any number of sections can be used by duplicating the triangular framework so as to provide direct towing connections to the frame member 10 along spaced locations in order to be sure of proper towing strength for support of the rod mechanism. In each case, the frame member 10 supporting braces 12 are pivoted about spaced axes so as to accommodate ground contour, and the towing frame work is foldable so as to reduce its width during transport. The various wheels serve double duty for transport and field use, and the same wheel assemblies are also used for depth control of the rod mechanism. Minor modifications can obviously be made in the structure described without deviating from the basic concept embodied therein and for this reason the invention is intended to be restricted only by the following claims.

Having thus described our invention, we claim:

1. In a farm implement adapted to be trailed behind a towing vehicle:

a transverse horizontal frame member;

hitch means at one end of said transverse frame member adapted to be selectively coupled to a vehicle for transport purposes;

additional horizontal frame members fixed to said transverse frame members in triangular configurations extending forwardly to a central apex;

hitch means at said apex adapted to be selectively coupled to a towing vehicle for field use;

first wheel means mounted on said transverse frame member adjacent said one end thereof including a wheel carried thereon for rotation about an axis parallel to said transverse frame member, said wheel means being pivotally carried on said transverse frame member, said wheel means being pivotally carried on said transverse frame member about a transverse pivotal axis;

first power means operatively connected between said transverse frame member and said first wheel means adapted to selectively locate said first wheel means angularly about said transverse pivotal axis relative to said transverse frame member with the wheel thereof in ground contact;

and means engageable between said transverse frame member and said first wheel means adapted to selectively maintain the wheel of said first wheel means in an elevated location not in ground contact;

second wheel means mounted on said transverse frame member intermediate the ends thereof and spaced from said first wheel means, said second wheel means including a wheel frame pivotally carried on said transverse frame member about a transverse pivotal axis, said second wheel means further including a wheel mounted on said wheel frame for rotation relative thereto about a horizontal axis, said wheel being carried on a wheel support pivoted to said wheel frame about an upright axis;

second power means operatively connected between said transverse frame member and the wheel frame of said second wheel means adapted to selectively locate said wheel frame angularly about its transverse pivotal axis relative to said transverse frame member with the wheel thereon in ground contact;

and means engageable between said wheel frame and said wheel support adapted to selectively lock said wheel support relative to said wheel frame with the wheel axis thereof parallel to said transverse frame member or perpendicular thereto.

2. In a farm implement adapted to be trailed behind a towing vehicle;

a transverse horizontal frame member;

hitch means at one end of said transverse frame member adapted to be selectively coupled to a vehicle for transport purposes;

additional horizontal frame members fixed to said transverse frame members in triangular configurations extending forwardly to a central front apex;

hitch means at said apex adapted to be selectively coupled to a towing vehicle for field use;

first wheel means mounted on said transverse frame member adjacent said one end thereof including a wheel carried thereon for rotation about an axis parallel to said transverse frame member, said wheel means being pivotally carried on said transverse frame member about a transverse pivotal axis;

first power means operatively connected between said transverse frame member and said first wheel means adapted to selectively locate said first wheel means angularly about said transverse pivotal axis relative to said transverse frame member with the wheel thereof in ground contact;

and means engageable between said transverse frame member and said first wheel means adapted to selectively maintain the wheel of said first wheel means in an elevated location not in ground contact;

second wheel means mounted on said transverse frame member intermediate the ends thereof and spaced from said first wheel means, said second wheel means including a wheel frame pivotally carried on said transverse frame member about a transverse pivotal axis, said second wheel means further including a wheel mounted on said wheel frame for rotation relative thereto about a horizontal axis, said wheel being carried on a wheel support pivoted to said wheel frame about an upright axis;

second power means operatively connected between said transverse frame member and the wheel frame of said second wheel means adapted to selectively locate said wheel frame angularly about its transverse pivotal axis relative to said transverse frame member with the wheel thereon in ground contact;

means engageable between said wheel frame and said wheel support adapted to selectively lock said wheel support relative to said wheel frame with the wheel axis thereof parallel to said transverse frame member;

third wheel means mounted on said transverse frame member adjacent the remaining end thereof and spaced from said second wheel means, said third wheel means including a wheel frame pivotally carried on said transverse frame member about a transverse pivotal axis, said third wheel means further including a wheel mounted on said wheel frame for motion relative thereto about a horizontal axis, said wheel being carried on a wheel support pivoted to said wheel frame about an upright axis;

third power means operatively connected between said transverse frame member and the wheel frame of said third wheel means adapted to selectively locate said wheel frame angularly about its transverse pivotal axis relative to said transverse frame member with the wheel thereon in ground contact;

and means engageable between the wheel frame and wheel support of said third wheel means adapted to selectively lock the wheel support thereof relative to the wheel frame with the wheel axis thereof parallel to said transverse frame member or perpendicular thereto;

the upright axes of the wheel supports of said second and third wheel means being located in spaced parallel transverse planes.

3. In a farm implement adapted to be trailed behind a towing vehicle;

a transverse horizontal frame member;

hitch means at one end of said transverse frame member adapted to be selectively coupled to a vehicle for transport purposes;

additional horizontal frame members fixed to said transverse frame members in triangular configurations extending forwardly to a central front apex;

hitch means at said apex adapted to be selectively coupled to a towing vehicle for field use;

first wheel means mounted on said transverse frame member adjacent said one end thereof including a wheel carried thereon for rotation about an axis parallel to said transverse frame member, said wheel means being pivotally carried on said transverse frame member about a transverse pivotal axis;

first power means operatively connected between said transverse frame member and said first wheel means adapted to selectively locate said first wheel means angularly about said transverse pivotal axis relative to said transverse frame member with the wheel thereof in ground contact;

and means engageable between said transverse frame member and said first wheel means adapted to selectively maintain the wheel of said first wheel means in an elevated location not in ground contact;

second wheel means mounted on said transverse frame member intermediate the ends thereof and spaced from said first wheel means, said second wheel means including a wheel frame pivotally carried on said transverse frame member about a transverse pivotal axis, said second wheel means further including a wheel mounted on said wheel frame for rotation relative thereto about a horizontal axis, said wheel being carried on a wheel support pivoted to said wheel frame about an upright axis;

second power means operatively connected between said transverse frame member and the wheel frame of said second wheel means adapted to selectively locate said wheel frame angularly about its transverse pivotal axis relative to said transverse frame member with the wheel thereon in ground contact;

means engageable between said wheel frame and said wheel support adapted to selectively lock said wheel support relative to said wheel frame with the wheel axis thereof parallel to said transverse frame member;

third wheel means mounted on said transverse frame member adjacent the remaining end thereof and spaced from said second wheel means, said third wheel means including a wheel frame pivotally carried on said transverse frame member about a transverse pivotal axis, said third wheel means further including a wheel mounted on said wheel frame for motion relative thereto about a horizontal axis, said wheel being carried on a wheel support pivoted to said wheel frame about an upright axis;

third power means operatively connected between said transverse frame member and the wheel frame of said third wheel means adapted to selectively locate said wheel frame angularly about its transverse pivotal axis relative to said transverse frame member with the wheel thereon in ground contact;

means engageable between the wheel frame and wheel support of said third wheel means adapted to selectively lock the wheel support thereof relative to the wheel frame with the wheel axis thereof parallel to said transverse frame member or perpendicular thereto;

the upright axes of the wheel supports of said second and third wheel means being located in spaced parallel transverse planes;

fourth wheel means mounted on said transverse frame member at the center portion thereof, including a caster wheel carried thereon for rotation about a horizontal axis while in ground contact, said fourth wheel means being extended from said transverse frame member oppositely to said second wheel means;

and means engageable between said transverse frame member and said fourth wheel means adapted to fix the location of said fourth wheel means relative to said transverse frame member with the wheel thereof either in ground contact or elevated above ground contact.

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