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United States Patent
Watkins**4,109,928**
August 29, 1978

Sectional grain drill hitch

Abstract

A hitch of modular construction adaptable for coupling to a tractor any number of implements from one to five, the hitch modules being pivotally interconnected and articulated for following uneven land surfaces, and being further provided with means for adjusting the hitch into a configuration convenient for transportation of the assembled implements.

Inventors: Watkins; James F. (Alexandria, MN)**Assignee:** *Clyde Machines, Inc.* (Glenwood, MN)**Family ID:** 24964245**Appl. No.:** 05/737,521**Filed:** November 1, 1976**Current U.S. Class:** 172/311; 172/253; 172/310; 280/492**Current CPC Class:** A01B 51/04 (20130101); A01C 15/005 (20130101)**Current International Class:** A01B 51/04 (20060101); A01B 51/00 (20060101); A01C 15/00 (20060101); B60D 001/14 ()**Field of Search:** ;280/411R,411A,411B,411C,412,413,491R,492,493,479R,479A
;172/311,456,459,474,488**References Cited** [\[Referenced By\]](#)**U.S. Patent Documents**

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Primary Examiner: Pekar; John A.*Attorney, Agent or Firm:* Merchant, Gould, Smith, Edell, Welter & Schmidt**Claims**

what is claimed is:

1. A hitch comprising:

a drawbar unit articulated for pivotal movement about a first transverse axis and including releasable means normally preventing said pivotal movement about said first axis;

and at least one pair of pivotal connection means mounted on said drawbar unit, and spaced oppositely from said first transverse axis thereof, at locations such that they define a common longitudinal axis of pivotal movement.

2. A hitch comprising:

a drawbar unit articulated for pivotal movement about a first transverse axis and including releasable means normally preventing said pivotal movement about said first axis;

and means for connecting said hitch to at least one wheeled implement in supported pivotal relation thereto about a second transverse axis, in which said drawbar unit comprises a generally rectangular structure having a draft tongue projecting from one of a first pair of opposite sides and having articulations in another pair of sides, near the other side of said first pair, to enable pivoting about said first axis.

3. A modular hitch comprising, in combination:

a drawbar unit articulated for pivotal movement about a first transverse axis and including releasable means for normally preventing said pivotal movement about said first axis;

means for connecting said hitch to a wheeled implement in supported pivotal relation thereto about a second transverse axis;

and means positioned along said drawbar in front of and behind said first axis to receive a lateral unit for pivotal relative movement about a longitudinal axis.

4. The structure of claim 3 including a plurality of lateral units located on both sides of said drawbar unit.

5. The structure of claim 3 in which said drawbar unit comprises a generally rectangular structure having a draft tongue projecting from one of a first pair of opposite sides and having articulations in the other pair of sides, near the other side of said first pair, to enable said pivoting about said first axis.

6. The structure of claim 3 in which said lateral unit comprises a generally U-shaped structure pivotally connected at its open end to said drawbar unit, the transverse member of the U having an articulation coaxial with the articulation of said drawbar unit.

7. The structure of claim 3 in which said lateral unit comprises a generally polygonal first structure having a member in common with one leg of a generally U-shaped second structure, the other leg of the U and one side of the first structure being provided with coaxial pivot means for connection to said drawbar unit, and the transverse member of the U having an articulation coaxial with the articulation of said drawbar unit.

8. In an agricultural implement system in combination:

a plurality of independently wheeled implements to be drawn by a common traction source;

a drawbar unit;

primary lateral units removably connected to said drawbar unit at longitudinally spaced sites therealong for pivotal movement with respect thereto about longitudinal axes;

longitudinally spaced therealong and articulated coaxially with said drawbar unit;

a secondary lateral unit removably and pivotally connected to said primary lateral unit at points longitudinally spaced therealong, and articulated coaxially with said drawbar unit;

and means for connecting at least one of said units to a wheeled implement in supported pivotal relation thereto about a further transverse axis.

15. A modular hitch connecting a traction vehicle in draft relation to a plurality of independently wheeled implements in general side-by-side relationship, comprising, in combination:

a center module and at least one lateral module, each of said modules including a front portion, a rear portion, articulating means interconnecting said portions for relative pivotal movement about a transverse axis, and releasable means normally disabling said articulating means and locking said portions in a generally flat relative configuration;

means for connecting the front portion of said center module in supported relation to a traction vehicle;

means interconnecting said modules laterally along adjacent edges thereof, with said transverse axes lying in a common plane transverse to said hitch, for relative pivotal movement about at least one longitudinal axis;

and means for connecting a wheeled vehicle in supporting relation to the rear portions of at least one of said modules for pivotal movement with respect thereto about a further transverse axis.

16. The structure of claim 15 and motor means for applying torque between said portions of one of said modules about said transverse axis thereof.

17. a modular hitch for connecting a traction vehicle in draft relation to a plurality of independently wheeled implements in general side-by-side relationship, comprising, in combination:

a center module, a primary lateral module, and a secondary lateral module, each of said modules including a front portion, a rear portion, articulating means interconnecting said portions for relative pivotal movement about a transverse axis, and releasable means normally disabling said articulating means and locking said portions in a generally flat relative configuration;

means for connecting the front portion of said center module in supported relation to a traction vehicle;

means interconnecting said modules laterally along adjacent edges thereof, with said transverse axes lying in a common plane transverse to said hitch, for relative pivotal movement about longitudinal axes normal to said plane;

and means for connecting wheeled vehicles in supporting relation to the rear portions of said lateral modules for pivotal movement with respect thereto about further transverse axes.

Description

BACKGROUND OF THE INVENTION

This invention relates to the field of agriculture and more particularly to apparatus for coupling plural implements in side-by-side relationship to be drawn by a single power unit. An individual press drill for example, may be 8 feet wide: it requires a tractor of only modest size, but also requires many passes to plant a large field. Five such drills connected together plant a field much more rapidly, but involve a much greater financial investment including the cost of a much more powerful tractor. The trade-off between labor costs and costs of equipment is a difficult one which must be made by each farmer on the basis of local conditions including the size and terrain of his fields and the cost and availability of labor skilled in machine operation.

SUMMARY OF THE INVENTION

This invention is designed to give greater flexibility and choice to the purchaser and user of farm machinery, by providing a modular hitch construction which can initially be adapted to a small number of drills, even a single drill, and can be augmented as additional drills are purchased. This avoids the expense of purchasing an entire new hitch when additional seeding equipment is obtained, and further gives the operator the choice of using different numbers of drills in different parts of his farm without requiring him to invest in several hitches to be used alternatively. The hitch construction is fully articulated to accommodate terrain which is other than flat, and also is provided with fluid actuated means for folding it into a compact configuration to permit convenient transportation by flatbed vehicles of known types.

Various advantages and features of novelty which characterize my invention are pointed out with particularity in the claims annexed hereto and forming a part hereof. However, for a better understanding of the invention, its advantages, and objects attained by its use, reference should be had to the drawing which forms a further part hereof, and the accompanying descriptive matter, in which there are illustrated and described certain preferred embodiments of the invention.

BRIEF DESCRIPTION OF THE DRAWING

In the drawing, FIG. 1 is a plan view of a modular hitch according to my invention, shown in use with five drills;

FIG. 2 is a fragmentary side view of the hitch in operating and transporting configurations;

FIG. 3 is a perspective view of the hitch of FIG. 1 in greater detail, showing the construction used to draw an odd number of implements;

FIG. 4 is an exploded view of a portion of FIG. 3 to a larger scale;

FIG. 5 is a fragmentary sectional view taken along the lines 5--5 of FIG. 3;

FIG. 6 is a fragmentary sectional view taken along the lines 6--6 of FIG. 3;

FIG. 7 is a fragmentary view to a larger scale of a pivotal connection used in the structure of FIG. 3; and

FIG. 8 is a view like FIG. 3 showing the construction used for drawing an even number of implements.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring first to FIG. 1, my invention is shown as a hitch 10 for use in connecting an odd number (five) of press drills 11 to the drawbar 12 of a tractor of suitable power. Hitch 10 is shown to comprise a center module or drawbar unit 13, left and right, generally U-shaped intermediate modules or primary lateral units 14 and 15, and left and right, generally U-shaped outer modules or secondary lateral units 16 and 17. The drills may be of any commercially available type: the one used for illustration has a front wheel 20 castored to a supporting frame 21 from which depend mounting brackets 22 suitably braced as desired. The modules of hitch 10 are coupled to the lower ends of brackets 22 as will be described in detail in connection with FIG. 5.

Center module 13 (see FIG. 3) comprises a back-bar 24, left and right side-bars 25 and 26, a draft tongue 27 with an appropriate tractor coupling 28, a cross-bar 30, and diagonal braces 31,32,33,34,35 and 36 welded or otherwise suitably secured together to form a generally flat assembly which in use is generally horizontal.

Side-bar 25 is articulated, as shown in detail in FIG. 4, to have a front portion 40 and a rear portion 41. The latter is bored transversely at 42, and the former is provided with rearwardly extending lateral ears 43 and 44 also bored transversely at 45 and 46, so that a bolt 47 passing through bores 42,44 and 45 and secured by a nut 48 provides an axle for pivotal movement about a generally horizontal axis extending transversely of the hitch. A brace 50 is secured below portion 41 and extends beneath portion 40 to limit counterclockwise rotation of the latter with respect to the former. Brace 50 is transversely bored at 51, and portion 40 is

bed is level all the articulations are coaxial. T-pins 55 are drawn from the module articulations, and the tractor is backed slightly, allowing the articulations to pivot about the common axis and the connections to brackets 22 until the front ends of braces 50 engage the top of the flatbed as at 126. Coupler 28 may now be disconnected from drawbar 12, and hydraulic fluid may be supplied to motors 65 and 72, or to motor 116. The hitch now pivots at its articulations, raising its forward end to the position shown in broken lines in FIG. 2. The hydraulic hoses may now be disconnected, using standard self-closing equipment, so that the tractor is free from the implement and can be coupled to the transporter if it is desired. The hitch is maintained in its elevated position by the residual fluid trapped in each motor by the couplings.

From the foregoing it will be evident that I have invented a new and useful modular hitch made up of a selected number of standard modules which are pivoted together in side-by-side relation and articulated transversely to permit implements drawn thereby to have independent movement as required by the contours of the land being worked, together with means, including fluid motors and the transverse articulations, permitting the major portion of the hitch to be elevated and retained in a convenient configuration for highway transportation.

Numerous characteristics and advantages of my invention have been set forth in the foregoing description, together with details of the structure and function of the invention, and the novel features thereof are pointed out in the appended claims. The disclosure, however, is illustrative only, and changes may be made in detail, especially in matters of shape, size, and arrangement of parts, within the principle of the invention, to the full extent indicated by the broad general meaning of the terms in which the appended claims are expressed.

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