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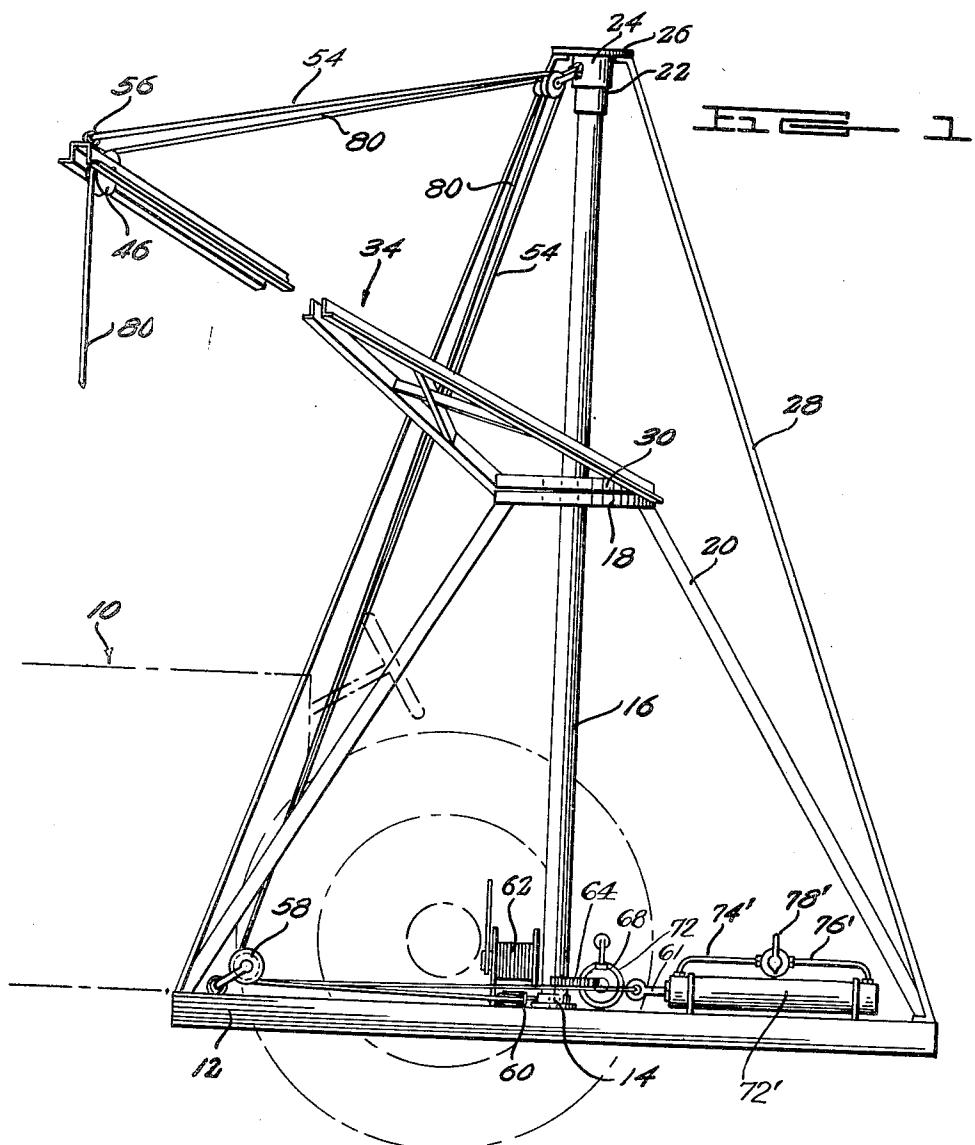
W. SPANN

2,539,169

HAY LOADER

Filed Oct. 17, 1946

3 Sheets-Sheet 1



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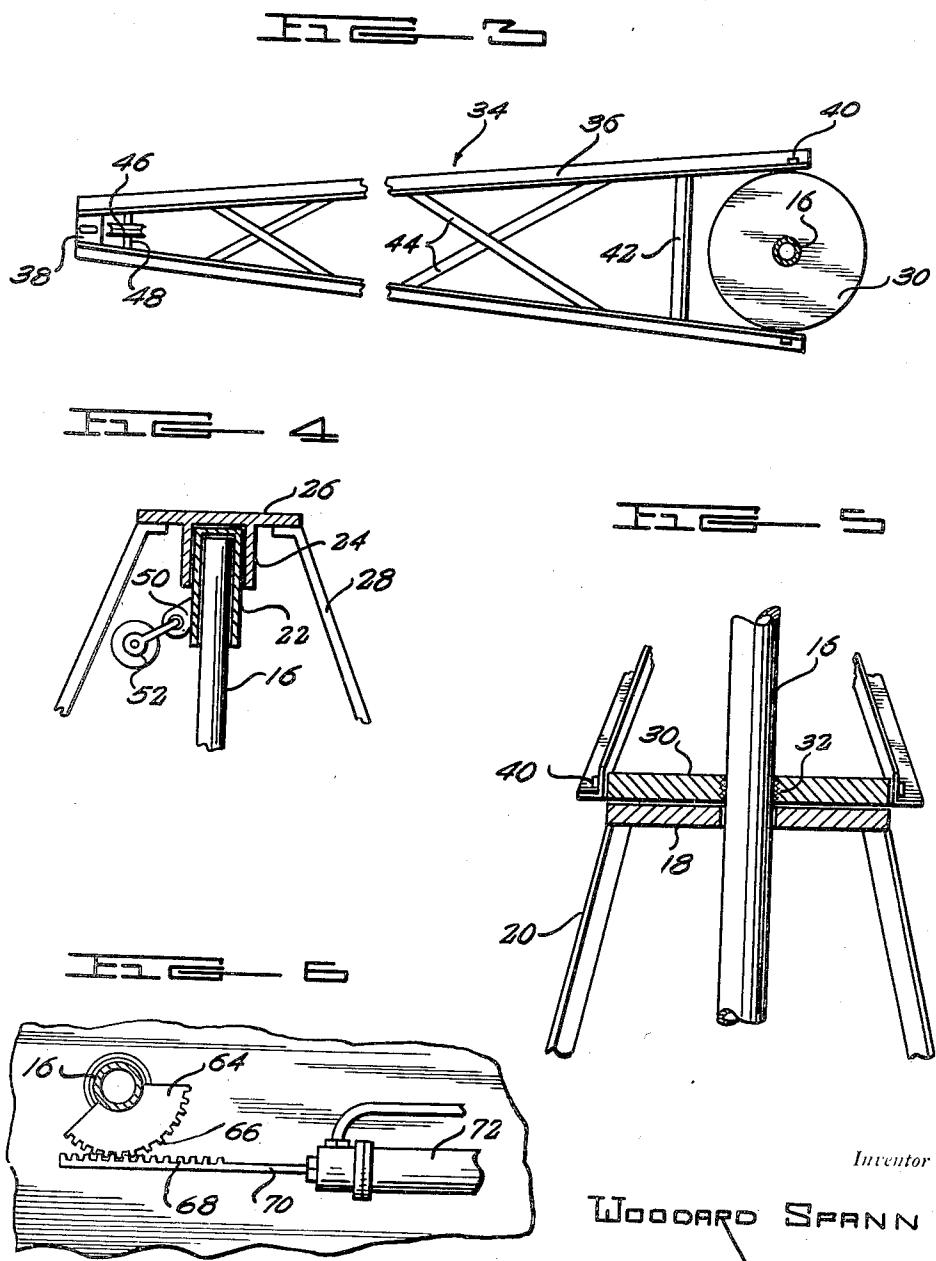
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HAY LOADER

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UNITED STATES PATENT OFFICE

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HAY LOADER

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3 Claims. (Cl. 212—65)

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The present invention relates to novel and useful improvements in a hay loader and more generally pertains to a novel construction of a power operated derrick of a portable nature.

The principal objects of my invention reside in providing a portable power operated derrick or the like which is particularly adapted to be attached to and operated by a conventional type of farm tractor; which is specifically designed and adapted to perform a wide variety of functions and operations about a farm or the like; wherein an improved means for controlling the positioning of the boom of the derrick is afforded, wherein novel and highly efficient control means for the device are provided; and wherein such a device is specifically designed for fabrication from readily obtainable standard industrial shapes and forms.

These, together with various ancillary objects of the invention which will later become apparent as the following description proceeds, are realized by my invention, one embodiment of which has been illustrated by way of example only in the accompanying drawings, wherein:

Figure 1 is a side elevational view of the device, parts of a tractor being shown in phantom construction;

Figure 2 is an end elevational view of the device;

Figure 3 is a detail view in top plan of the operating boom and its attachment to the mast of the device;

Figure 4 is a fragmentary detail view in vertical elevation of a portion of the top of the mast showing the manner of bracing the same;

Figure 5 is a detail view in vertical section showing the construction of the rotating construction of the mast boom; and,

Figure 6 is a fragmentary detail view in top plan of the boom rotating means of the invention.

Attention is now directed more specifically to the accompanying drawings, wherein like numerals indicate similar parts throughout the several views, and wherein numeral 10 designates generally a portion of a conventional type of farm tractor upon which is supported, in any suitable or preferred manner, a base 12 from the central portion of which is rotatably and vertically supported as by means of bearings 14, a mast 16, which may be conveniently formed of a tubular steel member or the like.

At some suitable point intermediate its ends, such as the mid-point thereof, the mast 16 extends through and is loosely journaled in an apertured plate 18, comprising a bearing plate,

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which is rigidly supported upon the upper ends of the plurality of legs 20 whose lower ends are rigidly attached upon the base 12. The upper end of the mast 16, as shown best in Figure 4, is rotatably journaled in a cap member 22 in the form of an inverted cup or cylinder, which latter element is rotatably received in the depending sleeve portion 24 of a head piece 26 which is preferably in the form of a circular plate or disk, and which is rigidly supported upon the upper end of a plurality of reinforcing members 28 whose lower ends are rigidly secured upon the base plate 12. By means of the foregoing construction, the mast 16 is laterally braced and 15 rotatably journaled at each of its extremities and is guided, braced and journaled intermediate its ends for a purpose to be subsequently set forth.

Attention is now directed more specifically to Figures 1, 3 and 5 wherein it will be seen that 20 a circular disk 30 is rigidly attached as at 32 to a portion of the mast 16, in such position as to rest upon and be rotatably supported by the supporting plate 18. A boom, indicated generally at 34, and consisting of a pair of angularly disposed arms 36, rigidly joined at their outer extremities by a gusset plate 38 and having their inner extremities pivoted upon diametrically opposite sides of the disk 30 by means of pivot pins or fulcrums 40 to permit the oscillation in a vertical plane of the boom. The side members 36 are held in rigid engagement and position by a transversely disposed brace member 42 and a plurality of sets of reinforcing cross-bars 44. Adjacent its outer extremity, the boom is 25 provided with a pulley 46 rotatably supported in the lateral arms 36 as by an axle 48.

In order to simplify and render more economical the construction of my device, the members 20, 28 and 30, together with the brace members 42 and 44 are preferably all formed of standard industrial angle iron material.

As shown more clearly in Figures 1 and 4, the mast cap 22 is provided with a laterally extending lug 50 to which is pivotally mounted a sheave block 52. A boom elevating cable 54 is rigidly attached at the outer end of the boom 34 as at 56 and is entrained over a pulley of the block 52, and thence encircles a pulley of a block 58 loosely pivoted upon the base 12 and then passes about a pulley 60 loosely and pivotally mounted at any suitable location upon the base 12 as adjacent the journal 14, and is then connected to a drum 62 operated in any suitable manner for raising or lowering the boom 34. It 50 will thus be seen that by appropriate manipula-

tion of the drum 62, the cable 54 is actuated to raise or lower the boom 34 as desired, and by the loose swivelling engagement of the pulley blocks 52, 58, and 60, this actuation is freely permitted despite various rotational positions of the boom 34 and the mast 16 as set forth hereinafter.

It will, of course, be readily understood that in place of the windless drum 62, I may employ suitable power operated means similar to that for actuating the mast 16, and to be now described.

As shown more clearly in Figures 1, 2 and 6, the mast 16 has rigidly attached adjacent the lower end thereof, a segmental or mutilated gear sector 64 provided with axially extending teeth 66 constantly in mesh with a rack bar 68 rigidly connected as at 70 to a piston, not shown, reciprocable in the hydraulic or fluid pressure operated cylinder 72. As will be apparent from Figures 1 and 2, the hydraulic cylinder is of the double acting type, and is supplied at the opposite ends thereof selectively with pressure fluid by means of the conduits 74 and 76 through the control of a selector valve 78 from any suitable fluid pressure source not shown.

As one convenient embodiment of the principles of this invention, I find that three substantially equally spaced members 20 and three correspondingly spaced members 28 are sufficient to impart the desired rigidity to my device and yet afford sufficient operating movement for the swinging of the boom 34 in a horizontal plane in order to perform the functions for which the device is designed. It will be readily understood that the arcuate extent of the mutilated gear or sector 24 together with the longitudinal extent and amplitude of movement of the rack bar 68 will be so chosen as to permit the desired rotational movement of the mast 16 through about 130 degrees of movement in a horizontal plane. It should be distinctly understood, that I contemplate rotationally adjusting the segmental gear 64 upon the mast 16 in order to rotate the latter in any predetermined direction, this adjustment being made by any suitable means, not shown, such as the conventional set screw or the like. A cable 80 for supporting any suitable tool such as a hay fork, clam bucket scoop or any other desired implement is preferably entrained over the sheave pulley 46 at the end of the boom 34, through a pulley in the block 52 and if desired through the block 58 to the actuating arm 61 connected to the cylinder 72' which is operated by any suitable fluid power source, and admitted through the valve 78' and conduits 74' and 76' similarly as described with respect to the fluid pressure operated cylinder 72.

From the foregoing explanation, it is believed that the construction and mode of operation of my device, together with its manifest advantages will be readily understood, and as it is obvious various modifications may be resorted to within the scope and spirit of this invention, I do not limit myself to the exact construction shown but to all embodiments falling within the intended claims.

I claim:

1. A derrick including a base, a superstructure mounted on said base, a bearing plate carried by said superstructure, a mast rotatably supported on said base and journaled in said bearing plate, a boom, means pivotally mounting one end of said boom on said mast and rotatable upon said bearing plate, control means on said base for rotating said mast and said boom, said first mentioned means including a bearing disk rotatably seated upon said bearing plate for rotation thereon and fixedly secured to said mast, said boom having arms pivoted upon diametrically opposite sides of said disk for movement in a vertical plane.

2. A derrick including a base, a superstructure mounted on said base, a bearing plate carried by said superstructure, a mast rotatably supported on said base and journaled in said bearing plate, a boom, means pivotally mounting one end of said boom on said mast and rotatable upon said bearing plate, control means on said base for rotating said mast and said boom, said first mentioned means including a bearing disk rotatably seated upon said bearing plate for rotation thereon and fixedly secured to said mast, said boom having arms pivoted upon diametrically opposite sides of said disk for movement in a vertical plane, and means for elevating said boom comprising a cap embracing and freely rotatable upon the upper end of said mast, a sheave block carried by said cap and a cable secured to the outer end of said boom, entrained over a pulley of said sheave block and actuating means for said cable mounted on said base.

3. A derrick including a base, a superstructure mounted on said base, a bearing plate carried by said superstructure, a mast rotatably supported on said base and journaled in said bearing plate, a boom, means pivotally mounting one end of said boom on said mast and rotatable upon said bearing plate, control means on said base for rotating said mast and said boom, and a head piece journaled on the top of said mast, braces securing said head piece to said base, a cap rotatably embracing said top of said mast and rotatably journaled in said head piece.

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