No. 837,074. PATENTED NOV. 27, 1906.

A. G. KERN.

STEAM GANG PLOW.

APPLICATION FILED APR. 28, 1906.

4 SHEETS—SHEET 1.

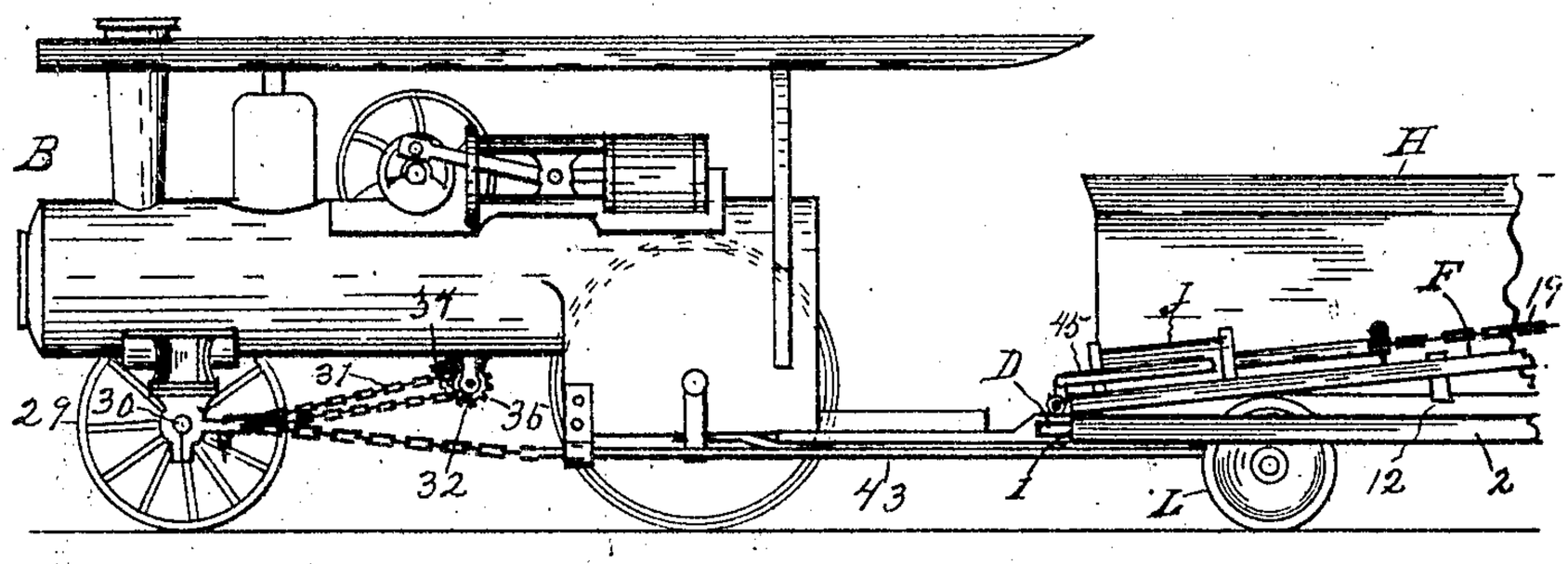

Fig. 1

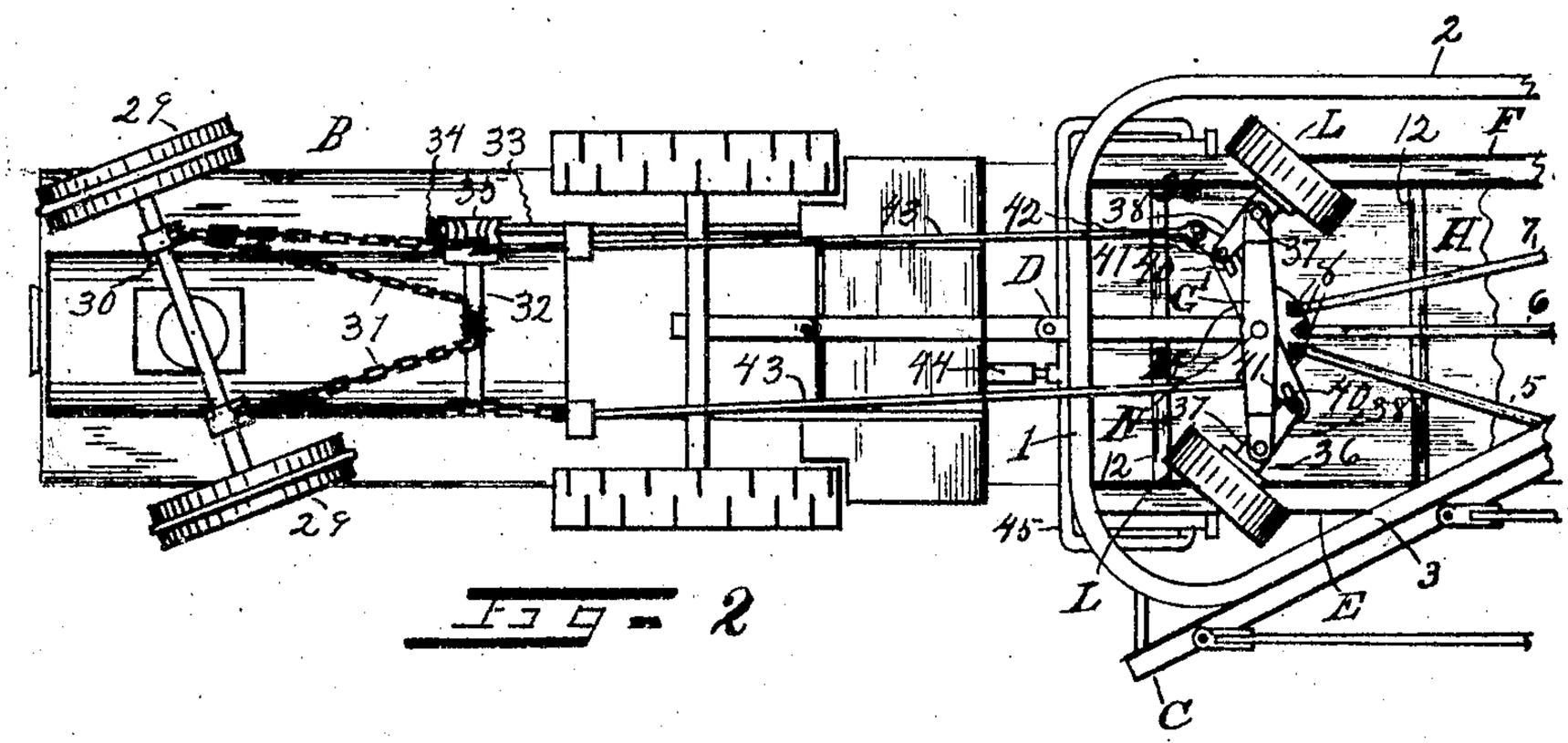

Fig. 2

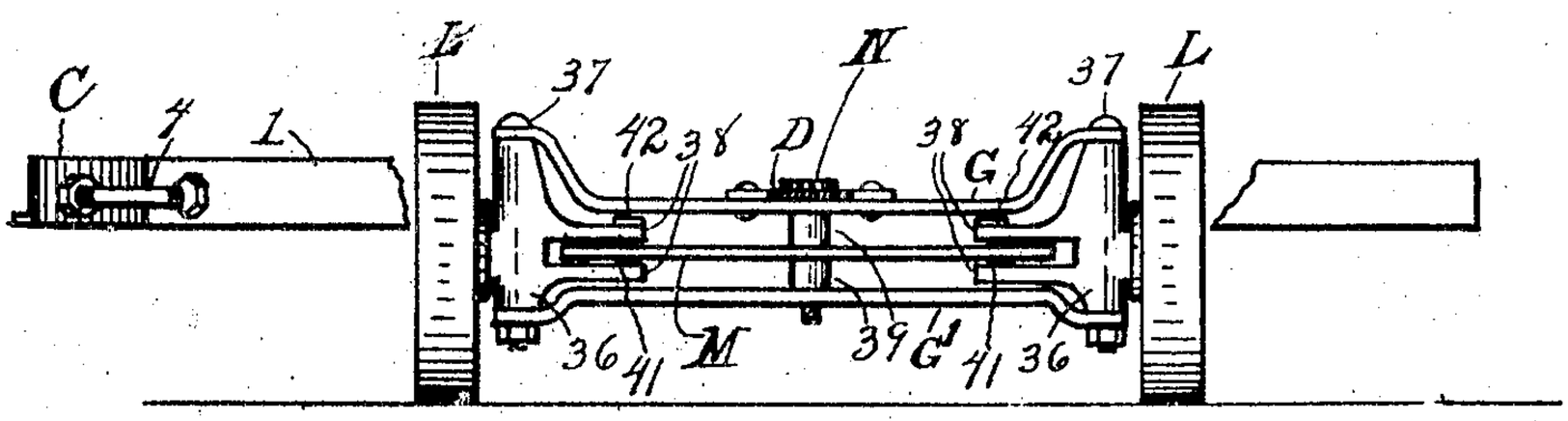

Fig. 3

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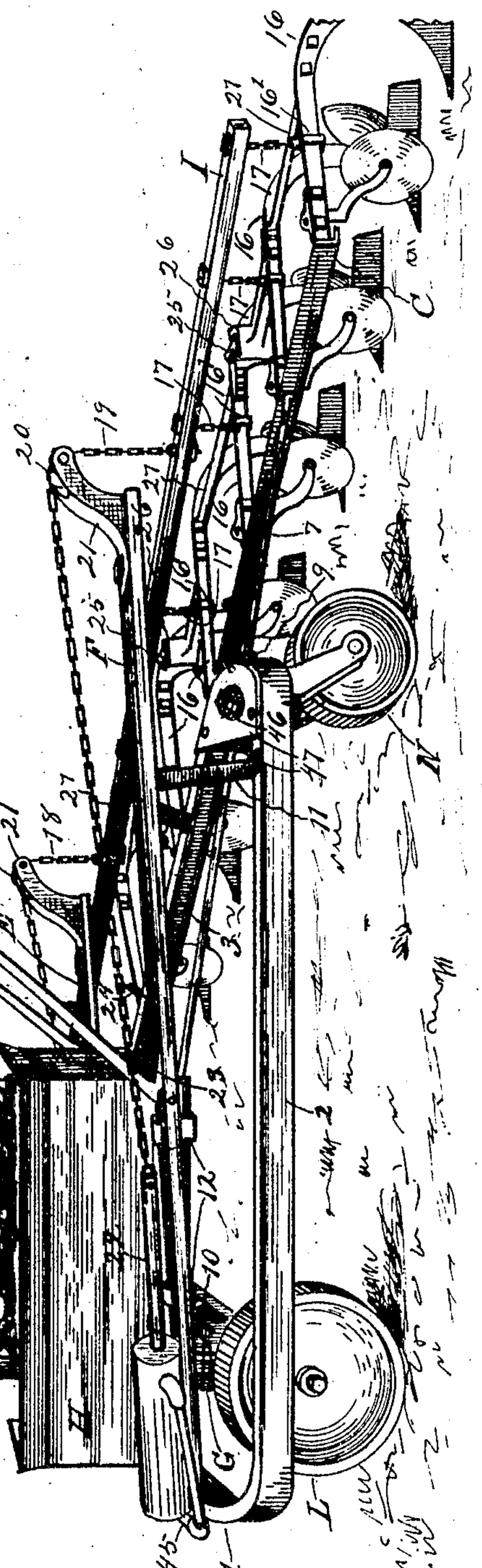

Witnesses.
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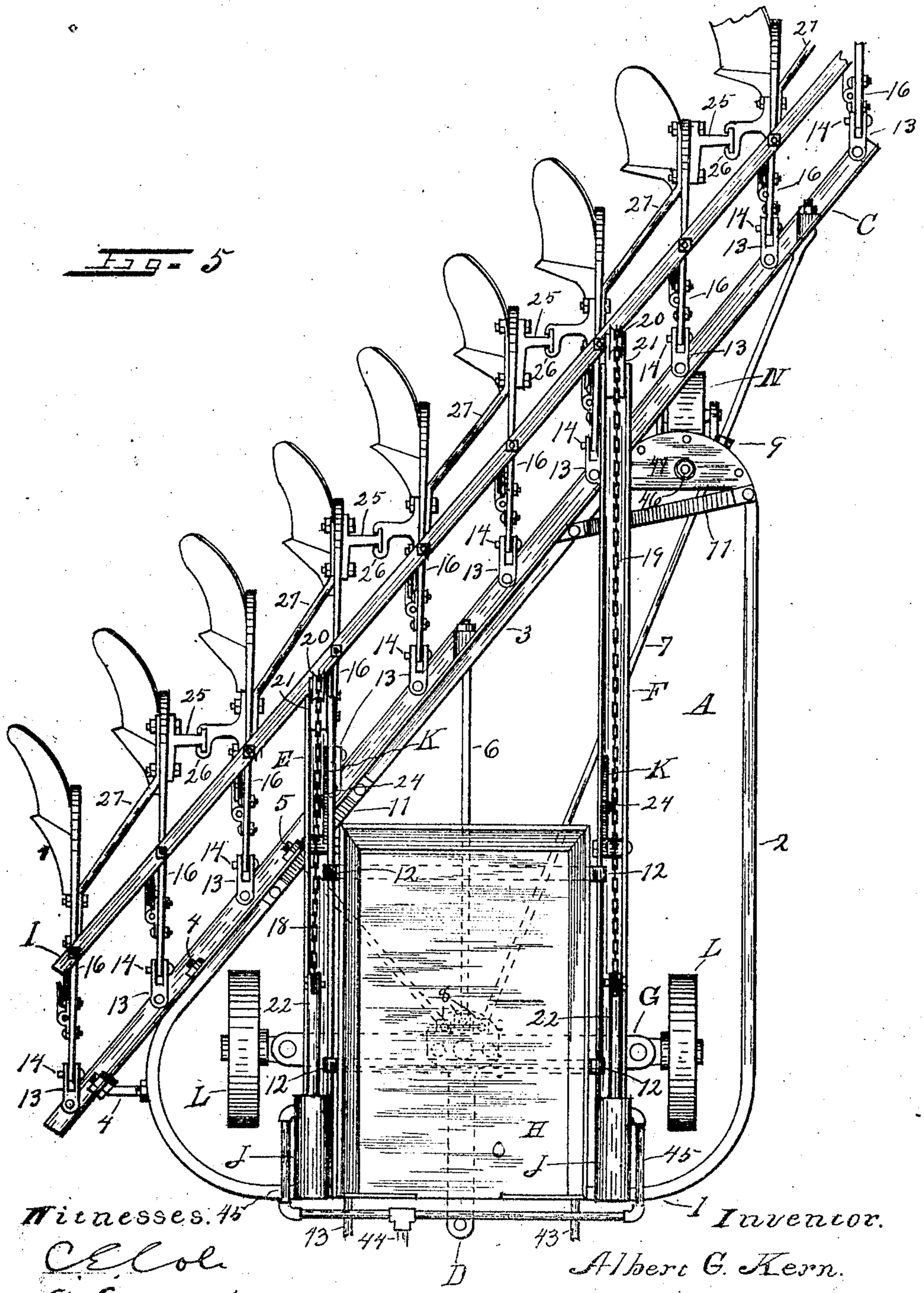
4 SHEETS—SHEET 3.

Fig- 5



Witnesses.

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4 SHEETS—SHEET 4.

Fig. 6

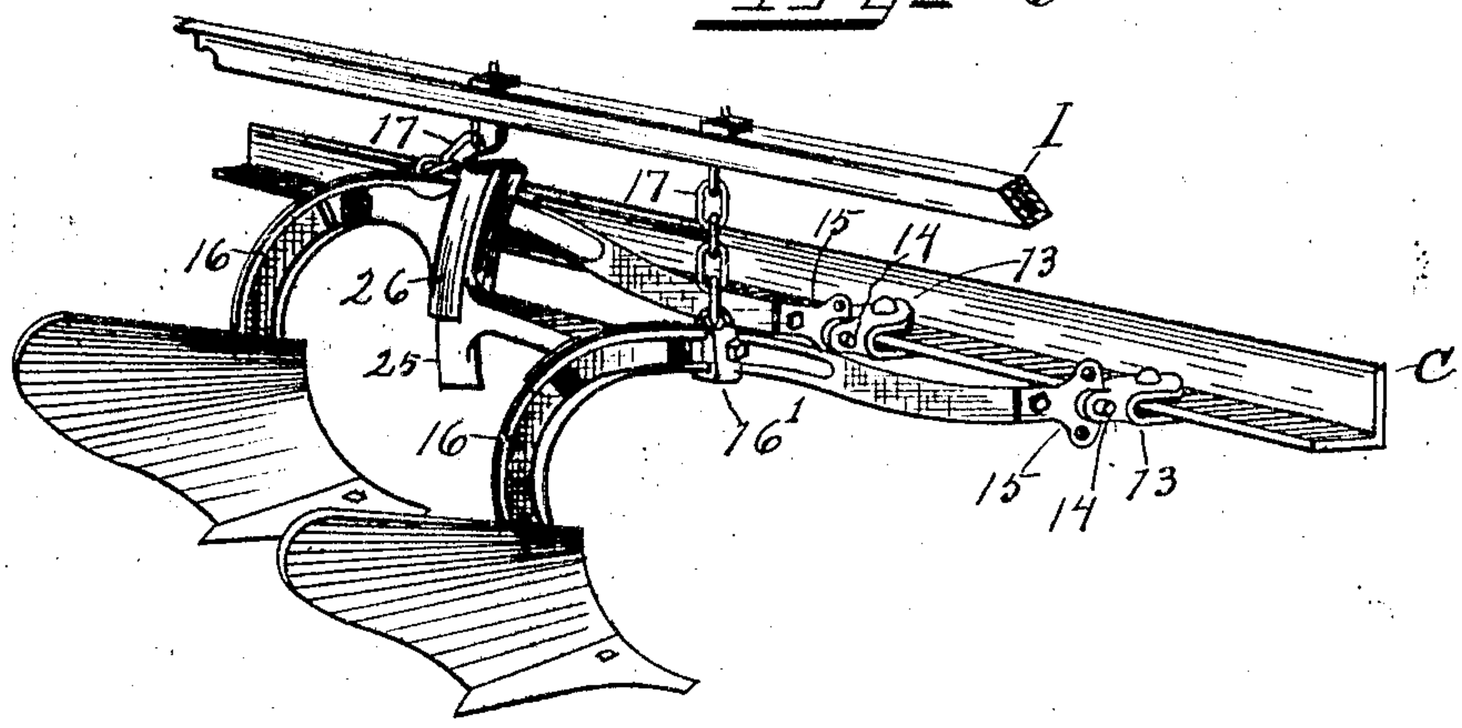


Fig. 8

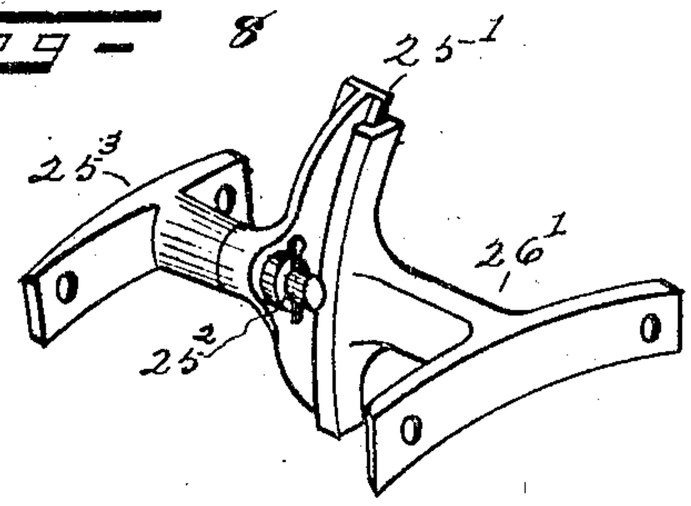


Fig. 7

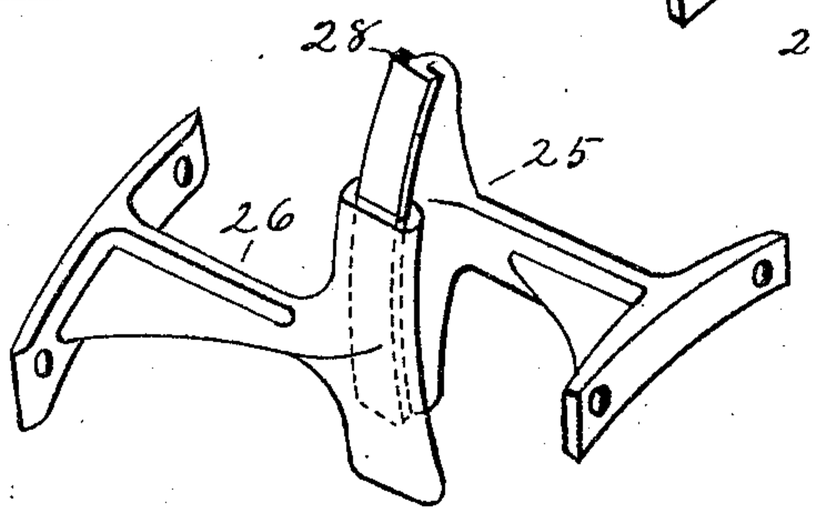
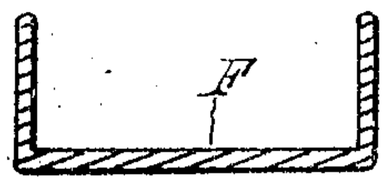


Fig. 11



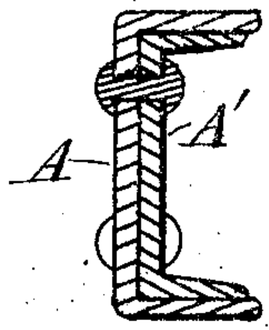


Fig. 10

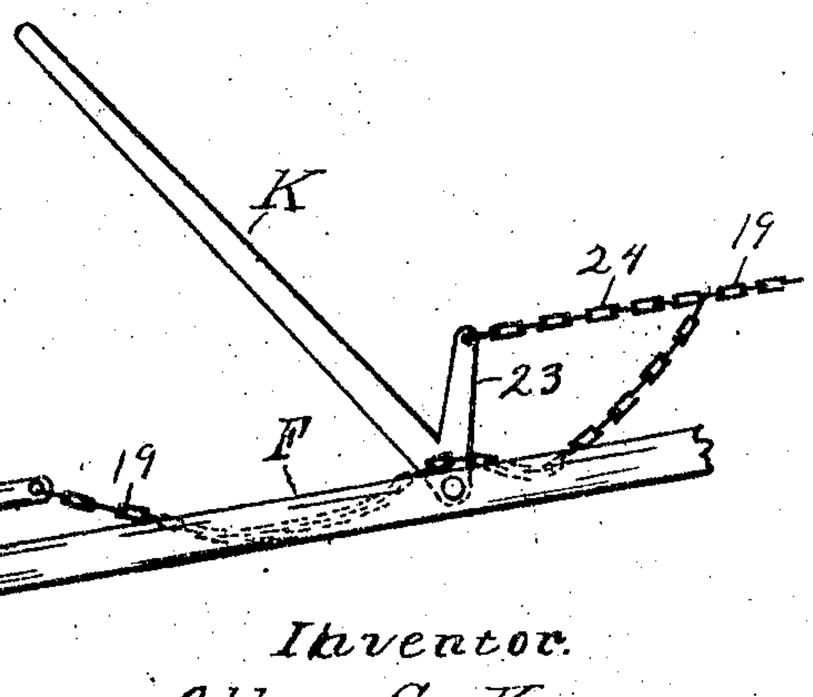


Fig. 9

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UNITED STATES PATENT OFFICE.

ALBERT G. KERN, OF BATTLE CREEK, MICHIGAN.

STEAM GANG-PLOW.

No. 837,074. Specification of Letters Patent. Patented Nov. 27, 1906.

Application filed April 28, 1906. Serial No. 314,314.

To all whom it may concern:

Be it known that I, ALBERT G. KERN, a citizen of the United States, residing at Battle Creek, in the county of Calhoun and State of Michigan, have invented certain new and useful Improvements in Steam Gang-Plows; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention especially relates to that class of plows wherein a framework is provided to which a series of plows are attached, the same being hauled by a traction-engine; and among other objects the present invention contemplates the use of a triangular frame within the forward front side of which a pivotal axle is provided and to the rear extremity and land side of which a caster-wheel is attached, the individual stubs of the pivotal axle of which are directly connected to the forward axle of the engine by means of guide-rods, whereby the plow-gang will simultaneously be guided to follow the engine without a long detour at the end of the headland, whereby the framework will be simple, compact, and rigid and self-supporting independent of the engine, whereby the trucks of the plow-frame will always track on hard and unplowed ground, whereby the individual plows may be independently adjusted in their attachment to the plow-frame, whereby the plows may be raised from the soil independently of the steam hoisting-cylinders, whereby the plows may yield or rise independently of one another when striking obstructions, whereby a tender having a large capacity for holding water and fuel may be carried between the forward trucks of the frame, and, finally, it consists in certain other novel features in construction and manipulation, which will be more fully set forth in the following specification and particularly pointed out in the claims.

In the drawings forming a part of this specification, Figure 1 is a side view of a traction-engine with the gang-plow attached, the plow being represented only by the forward truck and its tender. Fig. 2 is a bottom or reverse side of a traction-engine and the forward framework to the gang-plow, showing the connections for attaching the engine to the plow-frame. Fig. 3 is a detail front view of the forward or pivotal axle to the plow-frame. Fig. 4 is a land-side elevation of the gang-plow. Fig. 5 is a plan view of the same. Fig. 6 is a detail and shows the individual means for attaching a plow to the main frame and also shows a plow elevated and the yielding connection between plows. Fig. 7 is a detail of the yielding brackets comprising a way and its guide partially moved in their connection. Fig. 8 is a modified form of the yielding brackets. Fig. 9 is a detail of the hoisting mechanism and shows a hand lifting-lever brought forward in the mode of lifting the plow-gang independently of a hoisting-cylinder. Fig. 10 is a cross-section of the plow-frame loop and its connecting-plate, and Fig. 11 is a cross-section of the parallel frame-supports.

In the drawings like marks of reference refer to corresponding parts throughout the different views.

The main frame A comprises a triangular metallic loop formed from U-shaped channel-iron joined together by a similar-shaped plate A′, by rivets, or otherwise, the channel of the frame facing inwardly. This frame has two substantially rectangular sides, of which the side 1, adjacent to the engine B, is designated as its "forward" or "front" side, and the side 2 at right angles therewith forms the land side, the oblique side 3 being designated as the "furrow" side.

Within the forward portion of the plow-frame and normally parallel with the front side thereof, is fitted the main wheel-carrying axle to the plow-frame, supported by the wheels L, and at the intersection of the land side 2 and the oblique or furrow side 3 a third or caster wheel N is located. This caster-wheel is in alinement with the outer land side front wheel and is secured to the frame A by two oppositely-disposed plates 44, through which the stem of the caster is received, as shown.

To the furrow side of the plow-frame an L-shaped metallic bar C is attached. This bar forms the main-plow draw-beam, to which the individual plows of the gang are attached, and it is secured to the plow-frame by means of bolts 4 and draw-rods 5, 6, and 7, the several rods radiating from a broadened rear extremity of the main draw-bar D, to which they are secured by means of nuts 8, run on an L or upturned end of the same, the rod 7 passing obliquely through the rear extremity of the angular looped frame A and being attached very closely to the extremity of the bar C.

The rod 7 where it passes through the main frame is provided with jam-nuts 9 either side of the frame to render its attachment rigid therewith. In the drawings, jam-nuts are shown on the outer side of the frame only, owing to the concave cross-section thereof.

Longitudinally with the frame two rearwardly-inclined frame-pieces E and F are provided, their forward ends being bolted directly to the front side of the main frame, and at points where they pass over the axle G, tapering shims 10 are placed, and bolts connectively unite the several parts, and at their rear extremities double-legged brackets 11 securely hold the same to the main frame, the legs of the respective brackets being bolted directly to the main frame, as shown.

Suspended between the frame-pieces E and F upon hangers 12, hooked over the inner edges of said frame-pieces, a tender H is carried. This tender is very large and roomy, capable of holding a large volume of water for the engine, and is provided with a coal-bunker on the top thereof of considerable capacity. This tender is placed over the axle to the plow-frame and in immediate proximity to the engine, where water and coal may be supplied to the engine without any inconvenience whatever.

To the L of the main-plow draw-beam C individual clevises 13 are pivoted, and to these clevises individual plows are attached by means of bolts 14.

The forward ends of the respective plow-beams are either flattened and drawn out or are provided with clevises 15, Fig. 6, having a series of vertically-arranged pin-holes for attachment to the clevises 13, the arrangement of the clevises being such that the individual plows may be set to plow deep or shallow, as may be found expedient.

Secured to the respective plow-beams 16, backward of their attachment to the main plow-frame, a series of clips 16′ are provided, and from these clips short chain-sections 17 are united to a lift-beam I. From the lift-beam hoisting-chains 18 and 19 are trained over grooved rollers 20 in brackets 21 at the rear extremities of the frame-pieces E and F and are connected to pistons 22 of the steam hoisting-cylinders J, secured to the forward extremities of said frame-pieces.

From the engine a steam-pipe 44 communicates with the pipe 45, which leads to the cylinders J either side of the tender.

Located at or near the rear extremity of the tender and pivoted between the sides of the frame-pieces E and F hand-levers K are provided. These levers have short angular projections 23, which lie within the bottom of the side pieces when the levers are in a normal or backward position, as in Fig. 4. From these projections short chains 24 are united with the main hoisting-chains.

It is often of convenience to employ a hand lifting mechanism for loosening or raising the plows, and especially a certain portion of the plow-gang, independent of the steam hoisting-cylinders. For this reason I provide a series of levers, as stated.

That the plows may follow very closely the unevenness of the land I produce means whereby the plows may raise or lower independently of one another, yet keep in alinement with respect to the gang. This mechanism consists of a series of brackets 25 and 26, bolted to the respective plow-beams and having vertical sliding joints at their interlocking connections.

In the drawings I have shown the plows arranged in pairs and alternating pairs provided with sliding connections therebetween, the oppositely-disposed plows being solidly united by means of a connecting-bar 27. However, it would be apparent that the sliding connections could be placed between every plow in the gang or at various intervals in the gang other than between every other pair, as shown.

The bracket or race 25 has a T-shaped head 28, which is adapted to loosely fit within a corresponding recess or groove within the bracket or way 26, the T-shaped head 28 and the way 26 being arc-shaped and describing a circle from the clevis-bolt 14, where the plow is attached to the draw-beam C. In Fig. 8 a modified form of bracket for this purpose is shown. The race 25′ is pivoted to a stud 25^2, forming a part of the main bracket 25^3, the way or bracket 26′ not differing from the way heretofore described.

Referring now to the mechanism for steering the plow-gang, B represents a traction-engine of ordinary construction having the forward steering-wheels 29 mounted at either end of the swivel-axle 30, to which is attached the customary guide-chain 31, which in turn is wound about the drum 32, suspended beneath the boiler and operated by means of the hand-wheel shaft 33 and connective worm-gear mechanism 34 and 35, as ordinarily employed for steering traction-engines.

The axle within the forward end of the frame A comprises two angular oppositely-disposed metallic plates or axletrees G and G′, between the curved ends of which the wheel-stubs 36 are pivoted by vertically-arranged bolts 37. To these stubs the two main-frame-supporting wheels L are fitted. In alinement with the individual stubs and opposite the pivotal connection thereof the stubs are forked or slotted, as at 38, and between these slotted ends the outer extremity of the pivotal connecting-bar M is fitted. This bar is secured between the axle-pieces G and G′ by means of a king-bolt N, which also passes through the main draw-bar D. At either side of the bar between the pieces G and G′ spacing-spools 39 are provided. The bar M at either end thereof is provided with a slot

40, and at the tips of the forked ends 38 of the axle-stubs a pin 41 is placed, which is received through the slotted ends of the aforesaid bar, the object of the slotted extremity to the bar providing a yielding means for the oscillation of the wheel-stubs on their pivots in their connection therewith. At the outer extremities or forked ends of the wheel-stubs ears 42 are provided, and to these ears the steering-rods 43 from the engine are attached.

From either end of the swivel-axle 30 the flexible extremity or chain connection with the steering-rods 43 are attached, as shown in Figs. 1 and 2. These connections run directly back from the axle at either side of the engine and attach directly to the ears 42 of the pivotal wheel-stubs 36.

From the foregoing description, taken in connection with the drawings, further explanation of the operation of my improved gang-plow seems not necessary to a full understanding thereof.

Having, therefore, described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination in a gang-plow frame, of a rectangular-shaped loop, its right angles forming a front and a land side face, respectively, and its oblique angle a furrow-side face, a wheel-carrying axle supported within the forward end of said frame normally parallel with said front-side face, and a caster-wheel pivoted at the rear end of the loop and in alinement with a front land-side wheel, a plow-attaching draw-beam secured to the oblique angle of said loop, and parallel-arranged frame-pieces extending from the forward or front side and extending upwardly and outwardly over the oblique angle of said loop and secured thereto by means of elevated supports.

2. The combination in a gang-plow frame, of a rectangular-shaped loop formed of substantial U-shaped metal in cross-section, the concavity of the metal forming the inner surface of the loop, the right angles of said loop forming a front and a land side face, respectively, and its oblique angle a furrow-side face, an L-shaped plow-attaching draw-beam secured to the oblique side of the loop, metallic, U-shaped, parallel-arranged frame-pieces extending from the front side of said loop and extending upwardly and rearwardly of the oblique angle of said loop, a pivoted, wheel-supported axle suspended within the forward end of said loop and normally parallel with the front side thereof, a caster-wheel pivoted at the rear extremity of the loop and in alinement with a front land-side wheel, and elevated supports connecting the rearward ends of said parallel-arranged frame-pieces with said loop, substantially as, and for the purpose set forth.

3. The combination in a gang-plow frame, of a metallic, rectangular-shaped loop, its right angles forming a front and a land side face, respectively, and its oblique side a furrow-side face, a pivoted wheel-supported axle mounted within the forward end of said frame, normally parallel with said front-side face, a caster-wheel pivoted at the rear end of the loop and in alinement with a front land-side wheel of the pivoted axle, a plow-attaching beam secured to the furrow-side face of said loop a draw-bar rigidly secured at the center of said axle and connected to the front-side face of said loop, and triple braces connecting at the rear end of the draw-bar, the two outer of which diverge from the central brace and all of which pass through the oblique or furrow-side face of said loop and engage the plow draw-beam, substantially as, and for the purpose set forth.

4. A triangular plow-frame, a plow-gang draw-beam obliquely disposed with said frame on the furrow side thereof, a plow-gang attached to said beam, frame-pieces extending above and over said beam, a lift-beam obliquely disposed above said plow-gang and to the rear of said draw-beam, linked connections from said lift-beam to the individual plows of said gang, and lift-chains trained over said frame-pieces and connected with said lift-beam and means to raise and lower said lift-chains, substantially as, and for the purpose set forth.

5. A triangular plow-frame, a pivotal wheel-supported axle mounted within the forward end of said frame, a caster-wheel pivoted at the rear extremity thereof and in alinement with a forward land-side wheel, a plow draw-beam obliquely disposed on the furrow side of said frame. a plow-gang attached to said beam, frame-pieces extending above and over said beam, a lift-beam parallelly arranged backward and above said draw-beam, lift-chains trained over sheaves at the extremities of said frame-pieces and connected with said lift-beam, linked connections from said lift-beam to the individual plows of said gang, and means to raise and lower said gang.

6. A plow-frame, a plow-gang attached to said frame, the individual plows of said gang being individually attached to said frame in an oblique angle to said frame, a lift-beam, flexible connections from said beam to the individual plows of said gang, flexible connections between the respective plows of said gang, and means to raise and lower said gang from said frame.

7. The combination with a plow-frame, a plow-gang attached to said frame, and steam hoisting-cylinders mounted upon said frame, of lifting-levers pivotally mounted upon said frame, and a chain connection from said levers with the hoisting-cylinder chains, substantially as, and for the purpose set forth.

8. A plow-frame, a plow-gang, the indi-

vidual beams of the respective plows in said gang being pivoted and vertically adjustable from an oblique draw-beam of said frame, a lift-beam suspended above said gang, flexible connections between said beam and the respective plows of said gang, and means to raise and lower said gang.

9. A plow-frame, a plow-gang, the individual plows of said gang being pivoted and vertically adjustable from an oblique beam of said frame, a lift-beam suspended above said gang, flexible connections from said beam to the respective plows of said gang, and slidable connections between the plows of said gang capable of permitting said plows to have vertical movement, yet retaining them in parallel arrangement, and hoisting means attached to said lift-beam, as and for the purpose set forth and described.

10. A plow-frame, a plow-gang, the individual plows of said gang being pivoted and vertically adjustable at their forward ends from an oblique draw-beam of said frame, a way secured to a plow, a race secured to an opposite plow and adapted to slide within said way that said plows may have vertical movement independent of one another, and means to raise and lower said plows in unison.

11. A plow-frame, a plow-gang, the individual plows of said gang being independently pivoted at their forward ends to a draw-beam, a way secured to a plow, a race secured to an opposite plow and adapted to slide within said way that said plows may have vertical movement independently of one another, and means to raise and lower said plows.

12. A plow-frame, a plow-gang, the individual plows of said gang being independently pivoted and vertically adjustable at their forward ends to an oblique draw-beam of said frame, an arc-shaped way secured to a plow and an arc-shaped race secured to an opposite plow and adapted to slide in said way, a lift-beam backward of the pivotal connection of said plows, chain connections from said beam to the individual plows of said gang and means to raise and lower said lift-beam and actuate the individual plows of said gang, simultaneously, substantially as, and for the purpose set forth.

13. A triangular plow-frame presenting one side to the front, supporting-wheels pivotally mounted within and near either front corner of said frame and a caster-wheel mounted backward of the land-side front wheel at the rear extremity of said frame, a plow-gang, the individual plows of said gang being attached to an oblique and furrow side of said frame, the outer plows of said gang extending beyond the path of said wheels that said wheels may track upon the land side of the follow, substantially as, and for the purpose set forth.

ALBERT G. KERN.

Witnesses:
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O. S. RUSSELL.