No. 655,062. Patented July 31, 1900.

H. DAVERKOSEN & L. NIELSON.

COMBINED PLOW AND HARROW.

(Application filed Apr. 12, 1900.)

(No Model.) 3 Sheets—Sheet 1.

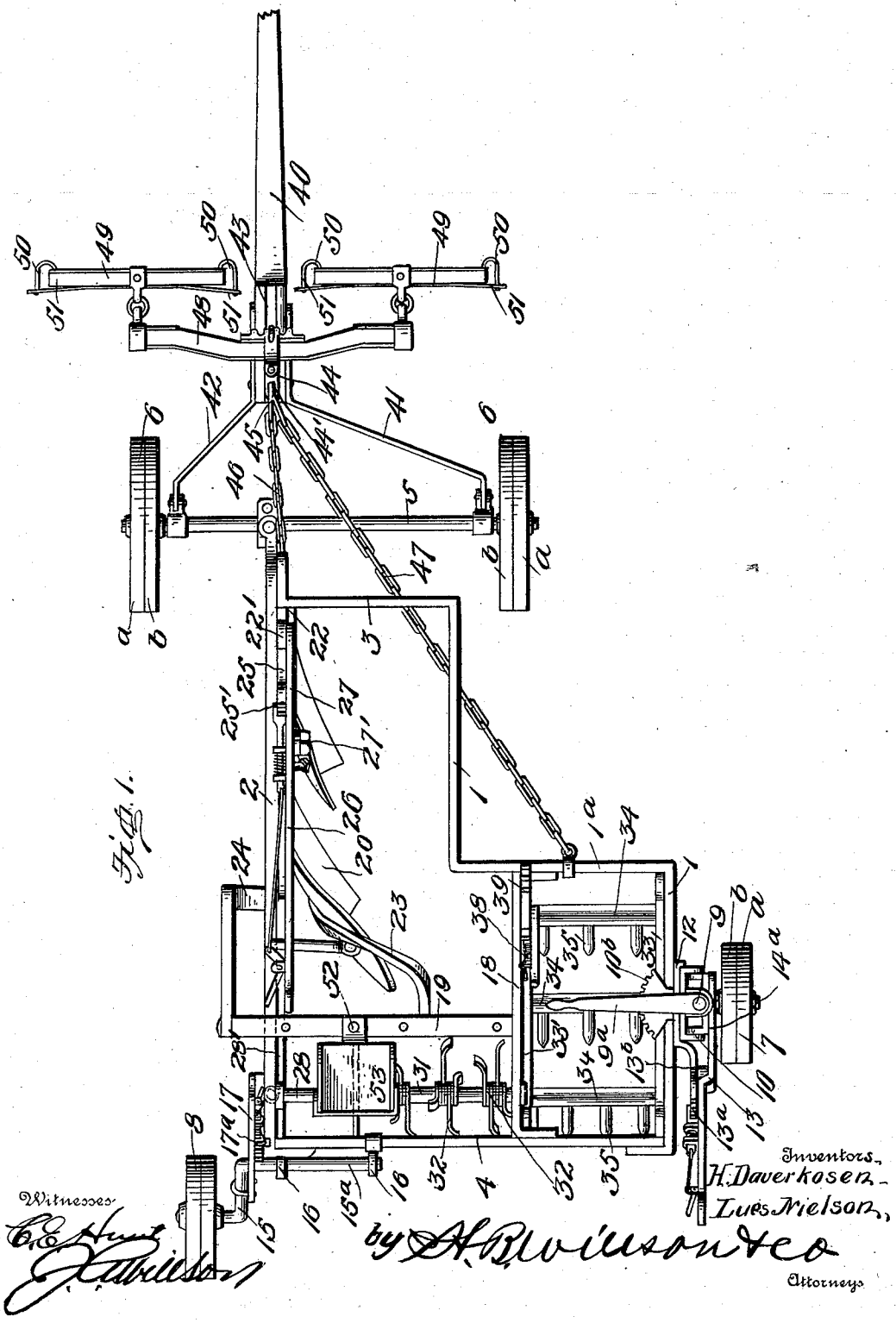


Fig. 1.

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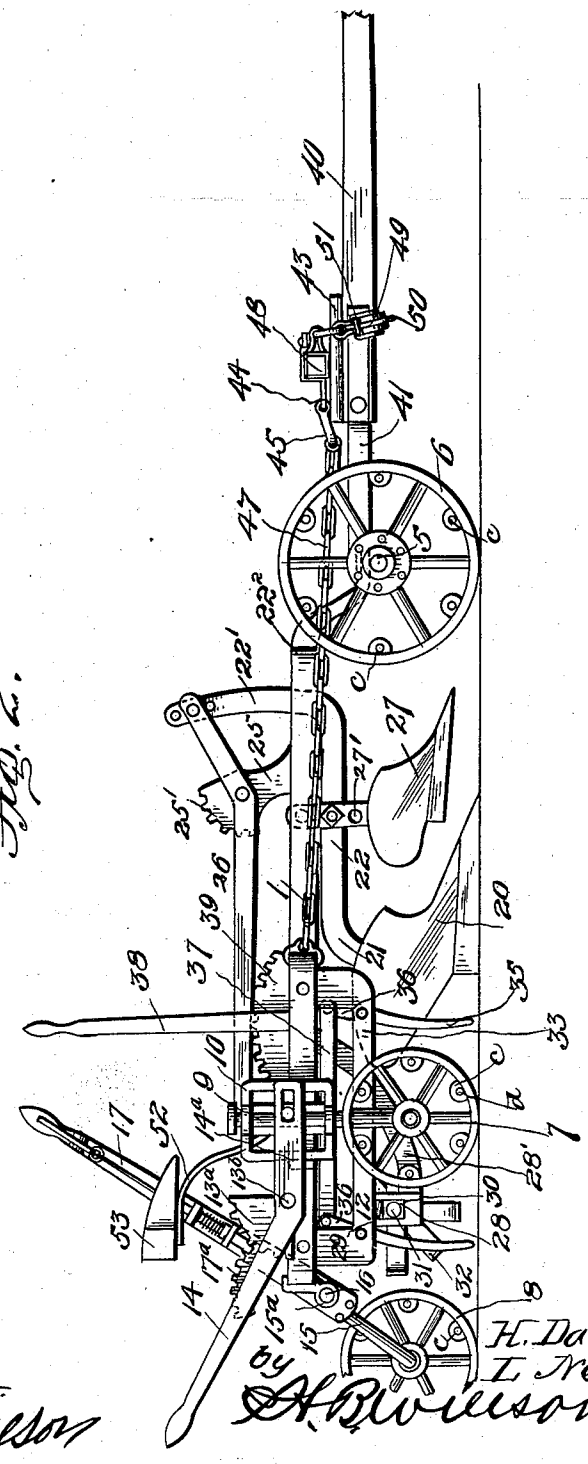
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Fig. 2.



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(No Model.) 3 Sheets—Sheet 3.

Fig. 3.

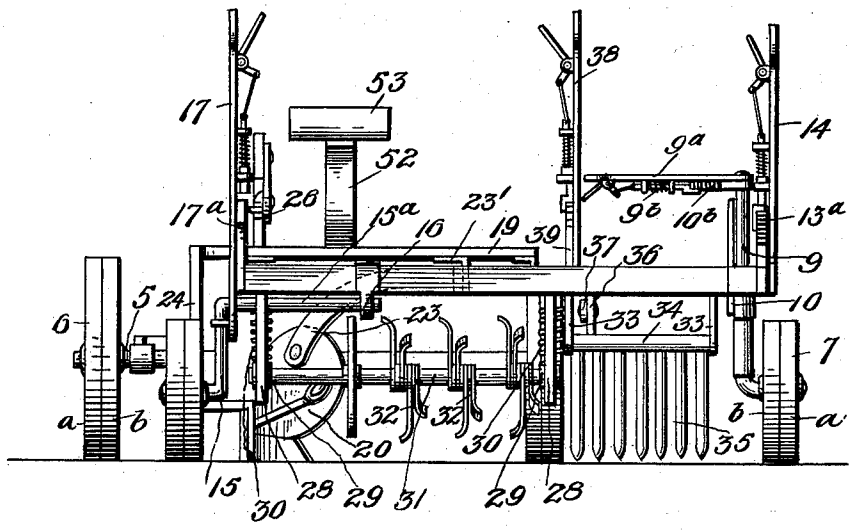


Fig. 4.

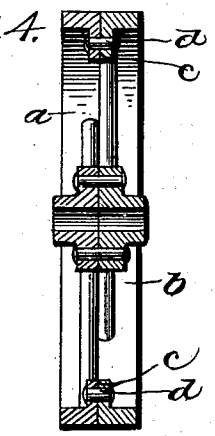
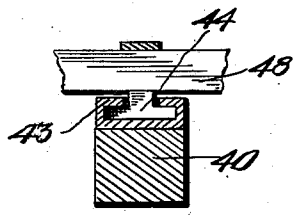


Fig. 5.



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UNITED STATES PATENT OFFICE.

HARRY DAVERKOSEN AND LUES NIELSON, OF JANESVILLE, WISCONSIN.

COMBINED PLOW AND HARROW.

SPECIFICATION forming part of Letters Patent No. 655,062, dated July 31, 1900.

Application filed April 12, 1900. Serial No. 12,539. (No model.)

To all whom it may concern:

Be it known that we, HARRY DAVERKOSEN and LUES NIELSON, citizens of the United States, residing at Janesville, in the county of Rock and State of Wisconsin, have invented certain new and useful Improvements in a Combined Plow and Harrow; and we do 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.

This invention relates to combined plows and harrows, and particularly to subsoil-plows with harrow attachments, one object being to provide a combined machine of this character which will, with once going over a field, prepare the same for planting. In other words, it does the work in one operation that would require at least three separate machines to do.

Further objects of this invention are to provide a machine of this character that can be cheaply manufactured, that will be light in draft and the parts of which can be readily adjusted by the driver from his seat, and that will thoroughly do the work required of it.

With these and other objects in view the invention consists in the construction and arrangement of parts, as will be hereinafter described and claimed, reference being had to the accompanying drawings, in which—

Figure 1 is a top plan view of the combined plow and harrow. Fig. 2 is a side elevation of the same. Fig. 3 is a rear elevation. Fig. 4 is a transverse vertical section through one of the supporting-wheels removed from the machine. Fig. 5 is a detail transverse vertical section through the tongue and inverted-T-shaped draft-head.

Like characters of reference denote like parts throughout the drawings.

The main frame of the machine is preferably constructed of light metal bars bolted together to form an open right-angular-shaped frame composed of the side bars 1 and 2 and the front and rear end bars 3 and 4. The side bar 1 of the frame is bent laterally about midway its length, forming the portion 1^a, then rearwardly and bolted to the end bar 4, the front end bar 3 being formed by a reverse laterally-bent portion of the side bar 1, the free end of the front bar 3 being bolted to the side bar 2, as shown.

The forward end of the side bar 2 of the main frame is curved downwardly and forwardly and pivotally bolted to the clip fastened to the axle 5 of the front supporting-wheels 6.

The rear end of the main frame is supported by the rear supporting-wheels 7 and 8, the wheel 7 being journaled on the laterally-projecting arm of a vertical standard 9, having a pivotal connection with the vertically-adjustable frame 10, having a sliding engagement with the bracket 12, rigidly attached to the side bar 1 of the main frame. The bracket 12 has a rearwardly-projecting arm 13, on the outer end of which is formed a segmental rack 13^a, and a laterally-projecting stud-bolt 13^b, on which is pivoted an adjusting-lever 14, carrying a spring-actuated detent which engages the segmental rack 13^a. The lever 14 is provided with a forwardly-projecting arm 14^a, having a slot therein in which engages a laterally-projecting stud 10^a of the vertically-adjustable frame 10, and by means of the lever 14 the frame 10 and the wheel 7 may be raised or lowered, as desired. The upper end of the frame 10 is provided with an inwardly-projecting horizontal segmental rack 10^b. The upper end of the wheel-standard 9 is provided with a rigid inwardly-projecting arm or lever 9^a, carrying on its under side a spring-actuated detent 9^b for engaging the segmental rack 10^b, so that by moving the lever 9^a the wheel 7 may be turned and held in any desired position, which will throw the machine from one side to the other on its pivot on the front axle, thereby causing the furrow made by the plows to be increased or diminished in width according to the direction the wheel 7 is turned.

The wheel 8 is journaled on a laterally-projecting arm of a vertical standard 15, having its upper portion 15^a bent inwardly and journaled in rearwardly-projecting bearing-lugs 16, rigidly connected with the rear cross-bar 4 of the main frame. The standard 15 is provided with a rigid upwardly-projecting lever 17, carrying a spring-actuated detent, which engages a segmental rack 17^a, rigidly connected to side bar 2 of the main frame and projecting rearwardly in the path of said detent. Thus by actuating said lever 17 the standard 15 is rocked and the supporting-wheel 8 thrown backward or forward, which

mechanism, together with the adjusting mechanism described in connection with the wheel 7, can be operated to raise or lower the main frame and the working parts of the machine out of engagement with the ground.

The rear end bar 4 and the portion 1^a of the side bar 1 are connected and braced by a short longitudinally-extending bar 18. This bar 18 is provided about midway its length with an angular bracket, to which is bolted one end of a transversely-extending bar 19, being bolted near its opposite end to a similar angular bracket, which is in turn bolted to the side rail 2. These two auxiliary bars serve as braces to the main frame and also as supports to the various working parts of the machine, as will hereinafter appear.

20 denotes the subsoil-plow, the standard 21 of which is preferably formed of a part of the forwardly-extending beam 22. Rising from the moldboard of this plow is an upwardly and rearwardly curving bar 23, the free end of which is pivoted to the angular brackets 23′, fixed to the under side of the transverse bar 19. The landside of this plow is provided with a similar laterally and upwardly extending supporting-bar 24, having its free end pivoted on the reduced extreme end of the bar 19 outside the main frame, as shown. The beam 22 is provided at its forward end with an upwardly-extending slightly-curved arm 22′, having vertical movement through a guide-bracket 22^2, fixed upon the inner side of the side bar 2.

25 denotes a rigid arm bolted to the side bar 2 immediately in the rear of the guide-bracket 22^2. On the upper end of the arm 25 is formed a segmental rack 25′. Pivoted to the arm 25 is a rearwardly-inclined adjusting-lever 26, carrying a spring-actuated detent for engaging the rack 25′. The forward end of the lever 26 is pivoted to the upper end of the arm 22′ of the plow-beam 22 in one of a series of adjusting-holes provided in the upper end of said arm 22′. By actuating the lever 26 we are enabled to raise and lower the plow-beam and to remove the plows entirely out of the ground.

27 denotes the surface plow, having an adjustable standard 17′ bolted to the beam of the subsoil-plow and immediately in front of the same.

It will be seen from this construction that we are able to vary the width and depth of the furrow. The surface plow can be set to turn a furrow seven inches wide and from two to four inches deep. The subsoil-plow can be lowered to plow from six to twelve inches deep and a furrow fourteen inches wide. It will also be seen that as the surface plow turns a seven-inch lap the subsoil-plow, coming behind and making a fourteen-inch furrow, turns the seven-inch lap over into the bottom of the furrow. Thus the top soil is thoroughly covered by the subsoil, this being of great advantage in plowing stubble-fields, pasture-lands, and the like, where it is desired that all vegetation should be worked deeply into the ground and well covered.

Depending from near the ends of the side bar 2 and brace-bar 18 are slotted hangers 28, suitably braced by the inclined brace-bars 28′. 29 denotes journal-boxes having a vertically-slidable connection in the slotted hangers 28 and being normally pressed downwardly by the coiled springs 30, confined within the slots of the hangers 28, between the upper wall of said slots and the top of the journal-boxes 29.

31 denotes a transversely-disposed shaft the ends of which are journaled in the boxes 29. The shaft 31 carries the disk and rotary spading-harrows 32, located on the said shaft in the rear and to one side of the plows. This harrow serves to spade up or loosen the soil and being under the control of the coiled springs 30 will give to any unevenness of the ground.

In the portion of the main frame formed by the rear end bar 4, the brace-bar 18, the rear portion, and the portion 1^a of the side bar 1 is a frame for carrying the tooth-harrow now to be described. The said frame consists of two parallel longitudinally-disposed hangers 33, bolted at their upper ends to the side bar 1 and the brace-bar 18 of the main frame and having in their lower side pieces a series of bearings in which are journaled the reduced ends of a series of horizontal transversely-disposed tooth-bars 34, carrying downwardly-depending slightly-curved harrow-teeth 35, and having upon their upper sides short upwardly-extending arms 36, connected together by a bar or link 37. We have shown these tooth-bars to be three in number, carrying, respectively, three and four teeth, but it is obvious that any number of bars carrying any number of teeth might be used.

Rigidly connected to the forward tooth-bar 34 is an upwardly-extending lever 38, carrying a spring-actuated detent which engages the teeth of a segmental rack 39, fixed to the brace-bar 18. It will be seen that by actuating the lever 38 the tooth-bars 34 will be rocked and more or less inclination will be given the harrow-teeth 35, which will thoroughly pulverize the soil and prepare the same for planting.

In order that the draft on this machine shall be equal and light, we provide a novel form of draft connection now to be described.

40 denotes the tongue of the machine, connected to the front axle of the machine by the rearwardly-inclined bars 41 and 42 and the usual coupling-clips. The bar 41 being of greater length than the bar 42 the tongue will be brought directly in line with the plows. Fixed on the inner end of the tongue is a plate 43, having upwardly and inwardly turned guide-flanges. Confined within these flanges and having sliding engagement with the plate 43 is an inverted-T-shaped head 44, having a rearwardly-extending lug 44′, pro-

vided with an eye which is engaged by a two-part draft-hook 45.

46 denotes a draft-chain the inner end of which is connected with the beam 22 of the plows and the outer end of which is connected with one of the members of the two-part draft-hook 45. 47 denotes a similar draft-chain having its inner end connected with the portion 1^a of the main frame and its outer end connected to the other member of the two-part draft-hook 45.

Bolted to the head 44 is the usual clip, in which is pivoted the whiffletree 48, carrying at its outer end the singletrees 49. By the construction just described an easier and more equal draft is provided, necessitating but one team of horses to draw the machine. The singletrees 49 are provided at their outer ends with the trace connections, consisting of a rearwardly-extending hook 50, the free end of which extends through an eye in the end of a flat spring 51, bolted to the rear of the singletree, thereby preventing any possibility of the cockeye on the end of the trace becoming unhooked.

Rising from the transverse brace-bar 19 is a seat-standard 52, preferably constructed of light spring-steel and upon the upper end of which is mounted the square seat 53, formed, as shown, of a single piece of sheet metal.

Referring particularly to Fig. 4 of the drawings, we have illustrated a novel form of supporting-wheel which is to be used on our machine and which we construct in two sections *a* and *b*, cast independently of each other and provided with a series of radially-disposed perforated lugs *c*, cast upon the inner peripheries of the wheel-rims and which will when the two half-sections of the wheels are assembled be coincident with one another, and the perforations therein will register to receive the bolts *d* for clamping the two sections together. A wheel constructed as thus described will be stronger and more durable than those now in use.

In view of the foregoing description, taken in connection with the accompanying drawings, the construction and operation of our invention will be readily understood and a further description is not deemed necessary.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus fully described our invention and set forth its merits, what we claim as new, and desire to secure by Letters Patent, is—

1. In a machine of the character described, the combination with the supporting-frame, of a subsoil-plow having rearwardly-projecting arms which are pivoted to the frame, a forwardly-extending beam connected to the subsoil-plow, and having its forward end projecting upwardly, a surface plow bolted to the said beam, and an adjusting-lever pivoted to the upwardly-projecting end of said beam, and provided with means for locking it in adjustment, substantially as set forth.

2. In a machine of the character described, the combination with the main frame and a bracket secured thereto, and provided with a segmental rack, of a sliding frame mounted to slide vertically in said bracket, and a standard having a pivotal connection with said frame, and having at its lower end an angular extension upon which is journaled a wheel, an adjusting-lever pivoted to said bracket and provided with a spring-actuated detent to engage said segmental rack, a segmental rack carried by said sliding frame, an arm projecting inward from the upper end of said standard, and a spring-actuated detent carried by said arm for engaging the last-named segmental rack, substantially as set forth.

3. In a combined plow and harrow, the combination with the front supporting-axle, having the two-part carrying-wheels of a main frame pivoted to said axle, the two-part rear adjustable supporting-wheels, segmental racks and levers for adjusting said rear wheels, one of said rear wheels being capable of sidewise adjustment for increasing or diminishing the breadth of the furrow, means for producing such sidewise adjustment, the adjustable plow-beam, means for adjusting said plow-beam, a subsoil-plow, and an independently-adjustable surface plow carried by said plow-beam, a spring-controlled rotary harrow supported by said main frame in the rear and to one side of said plows, an adjustable toothed harrow supported by said main frame to one side of said rotary harrow, means for adjusting said toothed harrow, a tongue, a whiffletree having slidable connection with said tongue, chains for connecting said slidable whiffletree with the main frame and with the plow-beam, substantially as set forth.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

HARRY DAVERKOSEN.
LUES NIELSON.

Witnesses:
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J. J. CUNNINGHAM.