D. A. BIEBINGER.

PLOW.

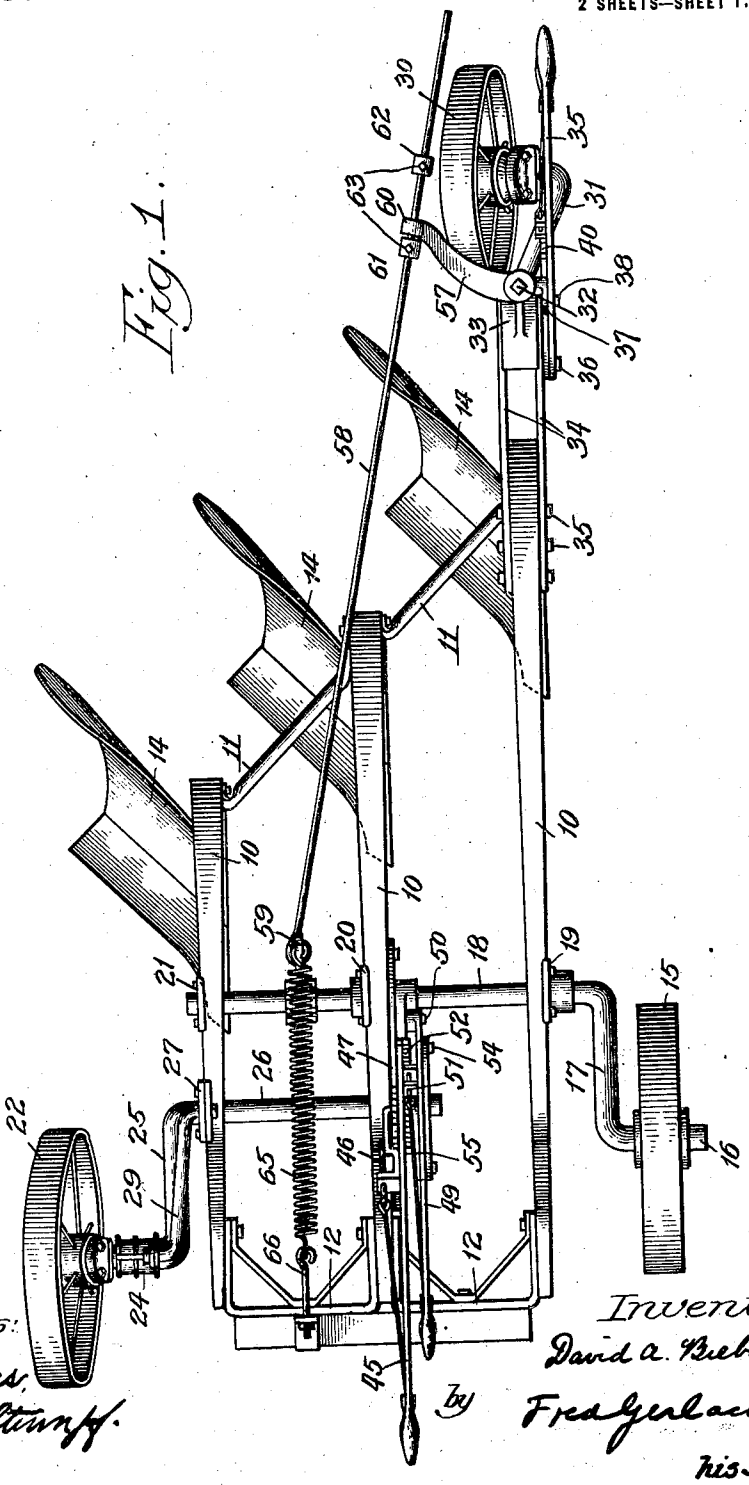
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1,161,919.

Patented Nov. 30, 1915.

2 SHEETS—SHEET 1.

Fig. 1.



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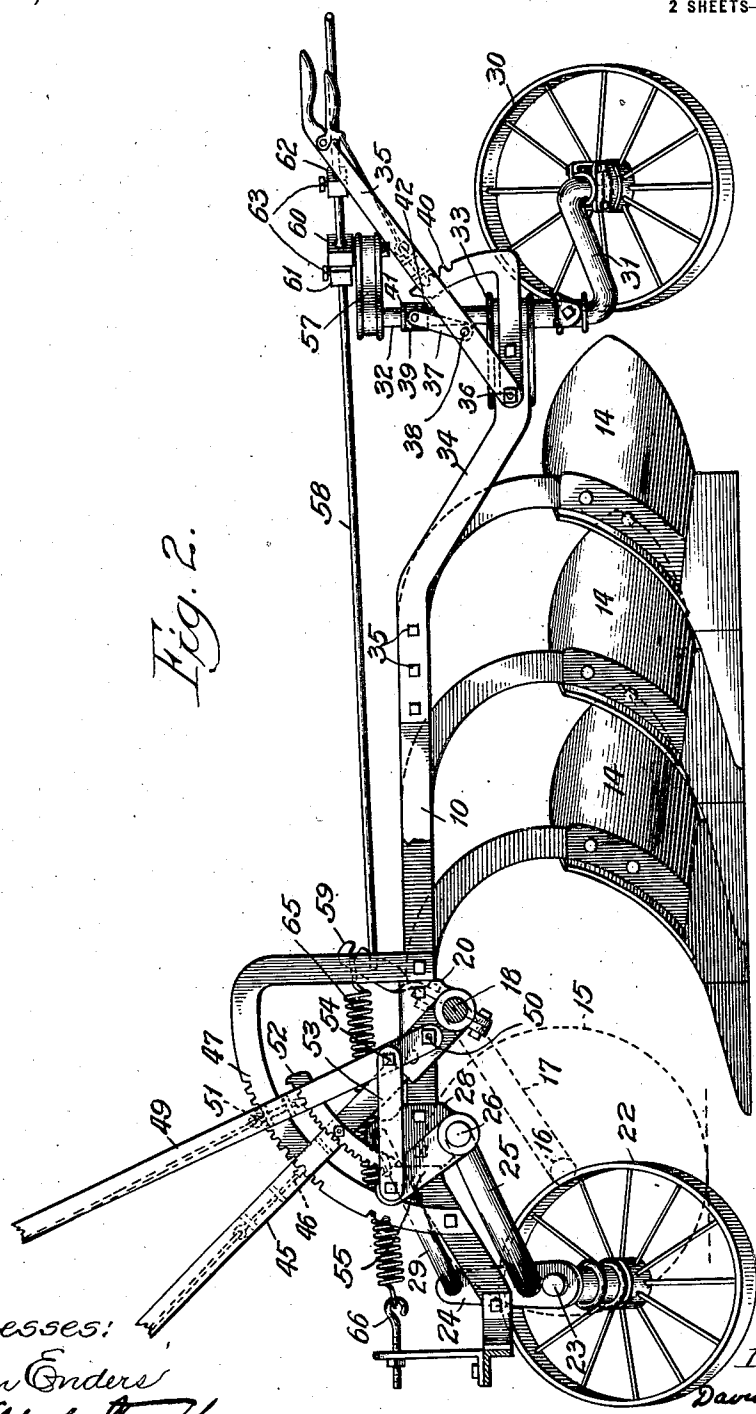


Fig. 2.

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UNITED STATES PATENT OFFICE.

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PLOW.

1,161,919. Specification of Letters Patent. Patented Nov. 30, 1915.

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To all whom it may concern:

Be it known that I, DAVID A. BIEBINGER, a resident of Moline, in the county of Rock Island and State of Illinois, have invented certain new and useful Improvements in Plows, of which the following is a full, clear, and exact description.

The invention relates to plows.

It is now common practice to provide a caster or trail-wheel adapted to run in the furrow behind the rearmost plowshare of a gang to support the rear portion of the plow-carrying structure. In practice, the trail-wheel is mounted upon an arm and standard which are pivoted to permit the wheel to turn relatively to the plow-carrying structure. This wheel is usually angled vertically to aid in overcoming a lateral pressure resulting from pressure of the soil against the moldboard of the plowshare or shares. Unless controlled, the tendency of the train-wheel is to run toward land. For this purpose, stops have been used for limiting this turning movement of the trail-wheel to cause it to remain angled away from land to resist the lateral pressure toward land. Usually, this stop-device was controlled by the draft-mechanism which would operate the stop to permit the trail-wheel to turn in turning a corner. In these prior structures, however, no provision was made for controlling the stop-device for the trail-wheel according to the depth at which the plowshares were being operated in the soil.

The present invention provides a stop-device for limiting the turning of the trail-wheel, which is controlled by the mechanism for raising and lowering the plow, so that the position of the trail-wheel will be angled away from land according to the depth at which the plowshares are being operated. Resultantly, the position of the trail-wheel will be automatically controlled by the plow-shifting mechanism and will be angled away from land according to the depth of the cut and the lateral pressure exerted upon the plow-structure. This stop-device, when thus controlled, will cause the trail-wheel to offer more or less resistance to lateral movement of the plow-carrying structure according to the depth of the cut, compensate in varying degree for side pressure exerted upon the carrying-structure, and will cause the plow to run in a straight course despite variations in side pressure due to variation in the depth of the cut. By connecting the controlling stop for the trail-wheel to the plow-raising and lowering mechanism, a separate adjustment lever for the stop and its manipulation for different depths of the cut become unnecessary.

The invention consists in the several novel features hereinafter set forth and more particularly defined by claims at the conclusion hereof.

In the drawings: Figure 1 is a plan of a plow embodying the invention. Fig. 2 is a side elevation, parts being broken away and shown in section.

The plow illustrated as an exemplification of the invention comprises beams 10, which are rigidly secured together at their rear ends by braces 11 and at their front ends by brackets 12 to form a frame or supporting-structure. A plowshare 14 is suitably secured to each beam 10. A land-wheel 15 is journaled on the out-turned spindle 16 of a crank 17 on a shaft 18 which is journaled in bearings 19, 20 and 21 on the beams 10, respectively. A side furrow-wheel 22, adapted to travel in a previously cut furrow, is journaled on a spindle 23 which is suitably fixed in a bracket 24 and this bracket and spindle are connected to the supporting-structure by a crank 25 on a shaft 26 which is journaled in bearings 27 and 28 on two of the beams 10, respectively. The bracket is also connected to the supporting-structure by a link 29 which is substantially parallel with the crank 25 and is pivotally connected to the upper end of bracket 24 and to bearing 27 on the left hand beam 10. The rear portion of the plow is sustained by a trail-wheel 30 which is journaled on the out and downturned end of an arm 31 on a standard 32 which is pivotally held in a bracket 33 secured to and between bars 34 which are bolted, as at 35, to the right hand beam 10. Bracket 33 is adjustably connected to standard 32 by means of a lever 35, which is pivoted, as at 36, and a link 37 which is

pivoted to said lever, as at 38, and to a collar 39 on standard 32. A rack 40, secured to the side of one of the bars 34, and engaged by a locking-bolt on lever 35, adjustably secures the rear end of the plow-carrying structure at the desired elevation. Collar 39 is held against vertical movement on standard 32 by collars 41 and 42 which are fixed to the standard.

A main raising and lowering lever 45 is rigidly secured to the shaft 18 and is provided with a lock 46 which is adapted to engage the teeth of a segmental rack 47, which is fixed to the central beam 10. Lever 45 is also connected to operate crank 25 to which the furrow-wheel 22 is connected, by a lever 49, which is pivoted, as at 50, to lever 45 and is normally locked to swing with lever 45 by a locking-bolt 51 engaging a rack 52 which is fixed to lever 45, and a link 53 which is pivoted, as at 54, to lever 49 and to an arm 55 rigid with axle 26. When lever 45 is locked to rack 47, cranks 17 and 25 will be secured in fixed relation to the plow-carrying-structure and will sustain it. Assuming the parts to be in position shown in Fig. 2, at which time the plowshares are lowered substantially to the level of the furrow-wheels, the carrying-structure and plow-shares may be raised by unlocking lever 45 from rack 47, forcing it downwardly and relocking it in lowered position. Backward movement of lever 45 will operate crank 17 as well as the crank 25 to lower the shares relatively to the furrow-wheel 22 and the land-wheel 15 and into the ground. By adjusting lever 49, along rack 52, the furrow-wheel 22 may be adjusted relatively to the carrying-structure and the land-wheel to travel substantially at the level of the bottom of the plows. This mechanism exemplifies means whereby the plows may be raised or lowered.

The controlling mechanism for the trail-wheel 30 comprises an arm 57 fixed on the upper end of the standard 32, a rod 58 which has its front end pivotally connected to an arm 59 which is rigid on shaft 18, and its rear end extended through an eye 60 which is pivotally held in the distal end of the arm 57, a stop-collar 61 for limiting the turning of arm 57 in one direction and a stop-collar 62 for limiting the turning of the arm in the opposite direction. Each of the collars 61 and 62 is adjustably connected to rod 58 by a set screw 63. Stop 61 serves to limit the turning of the trail-wheel 30 toward land and when the plow is traveling forwardly in a substantially straight direction, said stop will be active to prevent the wheel 30 from swinging toward land. Thus, this stop will serve to counteract side pressure resulting from the pressure of the soil against the moldboard of the plows. Arm 59, to which the front end of the controller-rod 58 is connected, swings with the shaft 18 of the plow-raising and lowering mechanism, and when lever 45 is adjusted backwardly to cause the plows to be lowered, stop 61 will also be operated backwardly to cause the trail-wheel 30 to be held in position to be directed away from land and thus the angle of the trail-wheel will be adjusted according to the depth of the cut. This feature is an important one, because when the plows are lowered, the position of the stop 61 will be automatically adjusted according to the depth to which the plowshares are lowered. When lever 45 is operated forwardly to raise the plows out of the ground, stop 61 will be operated forwardly to permit the trail-wheel to be free to travel forwardly in a substantially straight line and without being held to travel away from the landside of the plow. By adjustment of collar 61 on rod 58, the angle at which the trail-wheel will be held against movement toward the land, when the plowshares are working in the soil, may be varied according to the character of the soil and the lateral pressure exerted upon the mold-board thereby. Stop 62 serves to limit rearward swinging of arm 57 in turning a corner and is usually set on rod 58, so that it will permit the trail-wheel to swing laterally sufficiently to easily turn a corner. Stop 62, being connected to rod 58, will also be adjusted with stop 61 when lever 45 is shifted.

A counter-balance spring 65 is connected to the upper end of arm 59 and to an eye-bolt 66, which is suitably connected to the carrying-structure to aid the operator in lifting the plows out of the ground and to retard their descent.

The invention thus exemplifies an improved plow in which provision is made for controlling the angle at which the trail-wheel travels by the plow-raising and lowering mechanism, so that the trail-wheel will be arrested in position to tend to travel away from land in different degrees and according to the depth of the cut.

The invention is not to be restricted to the details set forth, since these may be modified within the scope of the appended claims without departing from the spirit and scope of the invention.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent is:

1. In a plow, the combination of a plow-share, a carrying-structure, carrying-wheels including a trail-wheel pivotally connected to the structure, so it can swing laterally, plow-shifting means, and means for controlling the swinging of the trail-wheel, operated by the plow-shifting mechanism so as to vary the controlling means when the shifting means is operated.

2. In a plow, the combination of a plow-

share, a carrying-structure, carrying-wheels including a trail-wheel pivotally connected to the structure, so it can swing laterally, plow-shifting means, and a stop for controlling the swinging of the trail wheel, operated by the plow-shifting mechanism so as to shift the stop when the shifting means is operated.

3. In a plow, the combination of a plowshare, a carrying-structure, carrying-wheels including a trail-wheel pivotally connected to the structure so it can swing laterally, plow-shifting means, a stop-device for limiting the swinging of the trail-wheel toward land, and a connection between the stop-device and the plow-shifting mechanism for operating said device when the plow is shifted.

4. In a plow, the combination of a plowshare, a carrying-structure, carrying-wheels including a trail-wheel pivotally connected to the structure so it can swing laterally, plow-shifting means, a stop-device for limiting the swinging of the trail-wheel toward land, a connection between the stop-device and the plow-shifting mechanism for operating said device when the plow is shifted, and an adjustable connection between the stop-device and said first mentioned connection.

5. In a plow, the combination of a plowshare, a carrying-structure, carrying-wheels including a trail-wheel pivotally connected to the structure so it can swing laterally, plow-shifting means, a stop-device for controlling the swinging of the trail-wheel away from land, and a connection between said stop-device and the shifting-mechanism for operating said device when the plow is shifted.

6. In a plow, the combination of a plowshare, a carrying-structure, carrying-wheels including a trail-wheel pivotally connected to the structure so it can swing laterally, plow-shifting means, a stop-device for controlling the swinging of the trail-wheel away from land and a connection between said stop-device and the shifting-mechanism for operating said device when the plow is shifted, said stop-device being adjustably connected to said connection.

7. In a plow, the combination of a plowshare, a carrying-structure, carrying-wheels including a trail-wheel pivotally connected to the structure so it can swing laterally, plow-shifting means, a pair of stop-devices for controlling the swinging of the trail-wheel, and a connection between said devices and the plow-shifting mechanism for operating them when the plow is shifted.

8. In a plow, the combination of a plowshare, a carrying-structure, carrying-wheels including a trail-wheel pivotally connected to the structure so it can swing laterally, plow-shifting means, a pair of stop-devices for controlling the swinging of the trail-wheel and a connection between said devices and the plow-shifting mechanism for operating them when the plow is shifted, said stop-devices being adjustable on said connection.

9. In a plow, the combination of a plowshare, a carrying-structure, carrying-wheels including a trail-wheel pivotally connected to the structure so it can swing laterally, plow-shifting means, means for controlling the swinging of the trail-wheel, an arm operated by the plow-shifting mechanism, and a connection between said arm and said controlling means.

10. In a plow, the combination of a plowshare, a carrying-structure, carrying-wheels, including a trail-wheel pivotally connected to the structure so that it can swing laterally, plow-shifting means, means for controlling the swinging of the trail-wheel, an arm operated by the plow-shifting mechanism, and a connection between said arm and said controlling means, the latter being adjustably connected to said connection.

11. In a plow, the combination of a plowshare, a carrying-structure, carrying-wheels including a trail-wheel pivotally connected to the structure, so that it can be swung laterally, plow-shifting mechanism, means between said trail-wheel and the shifting-mechanism for automatically adjusting the swing of the trail-wheel to overcome the pressure of the soil against the plowshare according to the depth of the cut.

12. In a plow, the combination of a plowshare, a carrying-structure, carrying-wheels including a trail-wheel pivotally connected to the structure, so that it can be swung laterally, plow-shifting mechanism and means between said trail-wheel and the shifting-mechanism for automatically adjusting the swing of the trail-wheel to overcome the pressure of the soil against the plowshare according to the depth of the cut and to cause the plow to run laterally with the line of draft while the plow is being transported.

13. In a plow, the combination of a plowshare, a carrying structure, carrying-wheels for the front portion of the structure, sustaining means for the rear of the plow comprising a standard, means for limiting the movement of the standard to resist side thrust upon the plowshare while plowing, and means for automatically adjusting the resisting means according to the side thrust caused by plowing at different depths.

14. In a plow, the combination of a plowshare, a carrying-structure, carrying-wheels pivotally connected to the structure so that it can be swung laterally, plow-shifting mechanism, and means connected to said trail-wheel for automatically adjusting the same to overcome side pressure upon the plowshare according to the depth at which

the plow is traveling in the soil and for bringing the wheel into position for transportation when not plowing.

15. In a plowing machine, the combination of a frame, a plow sustained thereby and movable up and down, a swiveling sustaining wheel mounted on the frame, and means governed by the up and down movements of the plow for controlling the swiveling movements of the wheel.

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