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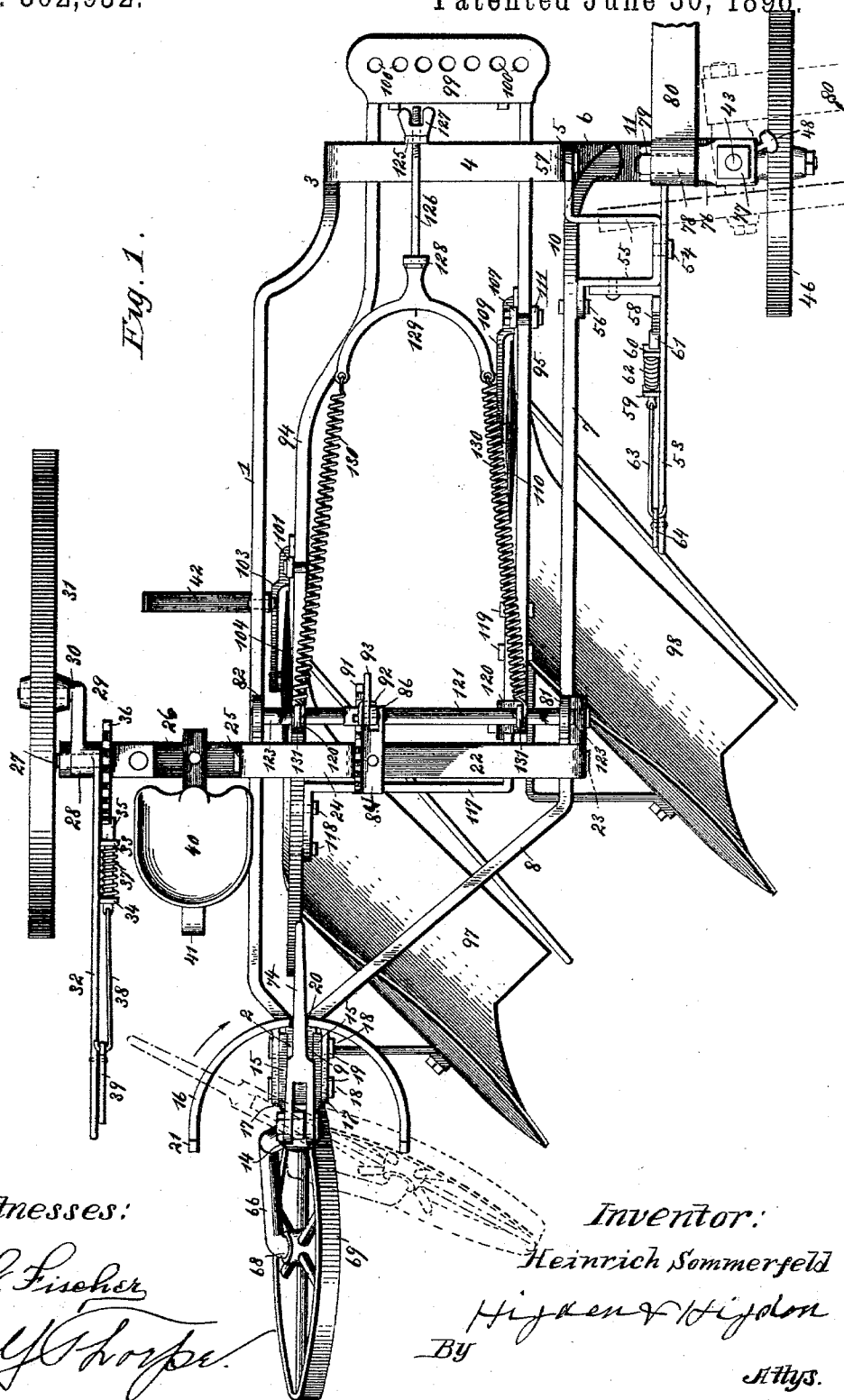
3 Sheets—Sheet 1.

H. SOMMERFELD.
GANG PLOW.

No. 562,932.

Patented June 30, 1896.

Fig. 1.



Witnesses:

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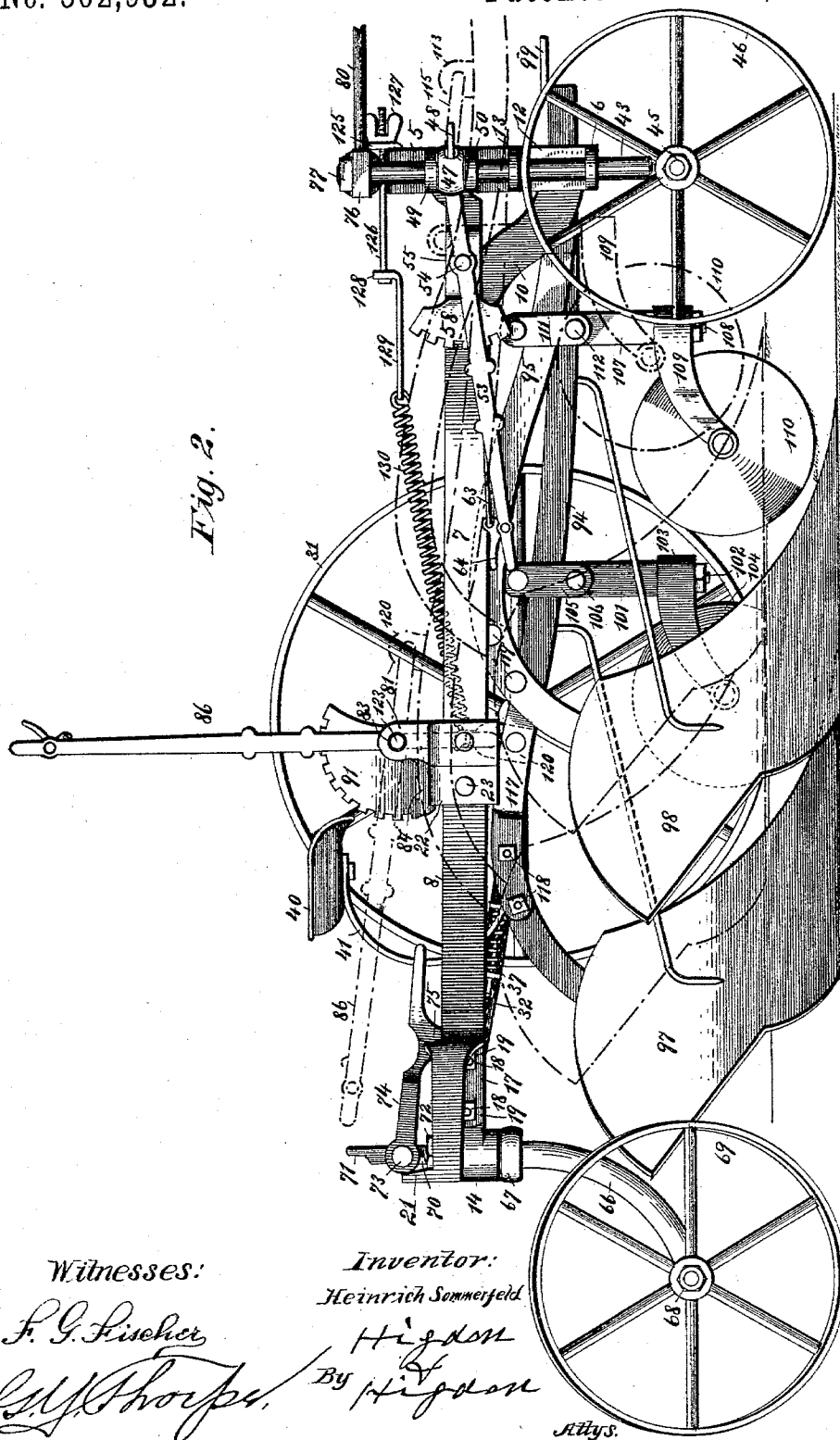
By

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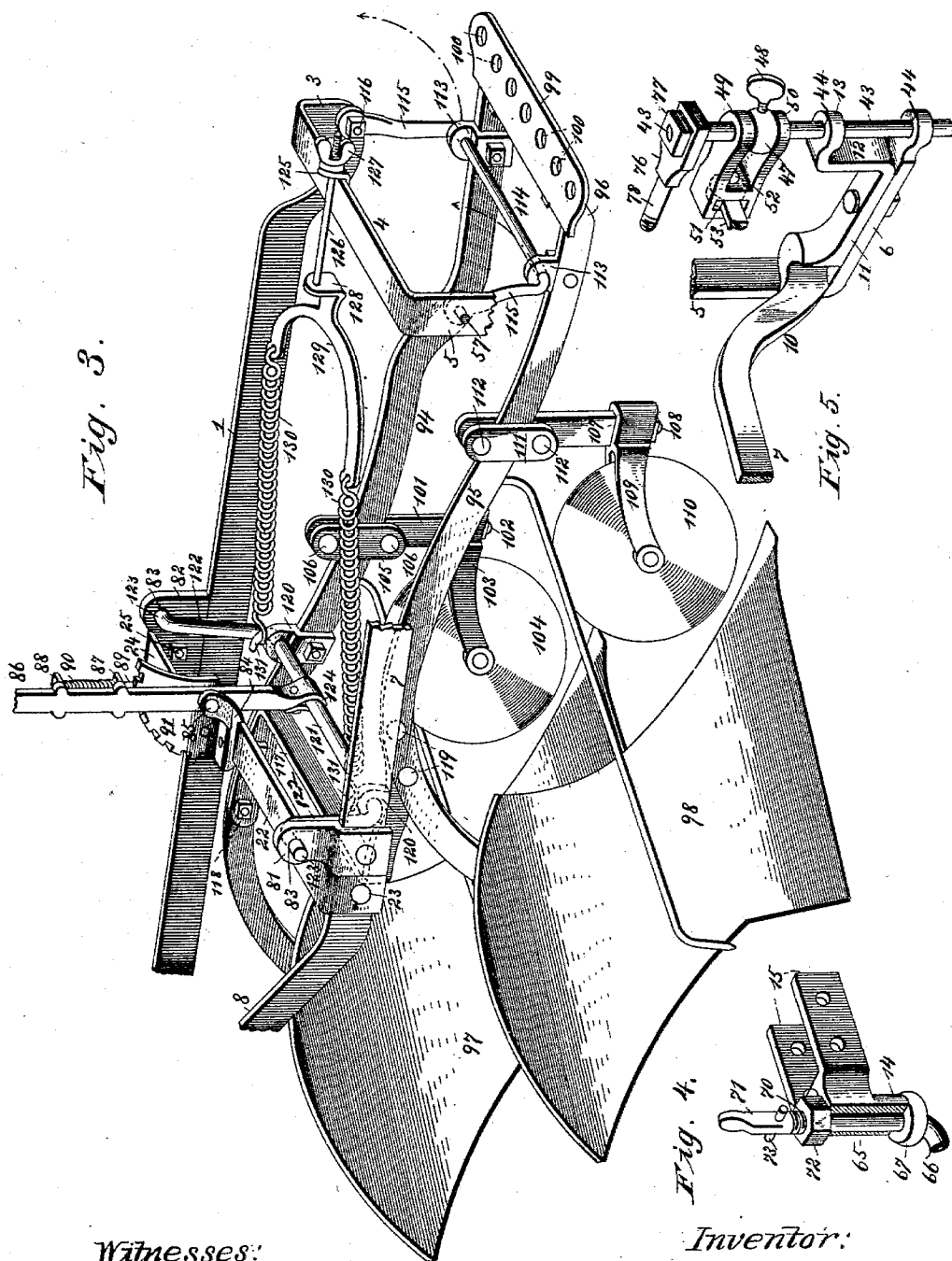
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3 Sheets—Sheet 3.

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UNITED STATES PATENT OFFICE.

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GANG-PLOW.

SPECIFICATION forming part of Letters Patent No. 562,932, dated June 30, 1896.

Application filed July 13, 1894. Renewed November 11, 1895. Serial No. 568,640. (No model.)

To all whom it may concern:

Be it known that I, HEINRICH SOMMERFELD, of Canton, McPherson county, Kansas, have invented certain new and useful Improvements in Gang-Plows, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to gang-plows, and has for its object to produce, in a machine of this character, a plow-carrying framework which may be raised to its inoperative position by the forward movement of the draft-animals, and thereby relieve the driver of the necessity of lifting said frame by the operation of the lever, and also to produce means to assist the driver or the draft-animals in raising said frame.

A further object is to produce a guide mechanism which upon the completion of a turn automatically locks the guide-wheel in such position that the machine is compelled to travel in a direct line.

With these objects in view the invention consists in certain peculiar and novel features of construction and combinations of parts, as will be hereinafter fully described and claimed.

In order that the invention may be fully understood, I will proceed to describe it with reference to the accompanying drawings, in which—

Figure 1 is a top plan view of a plow embodying my invention. Fig. 2 is a side elevation of the same, showing the plows in operative position in full lines and in inoperative position in dotted lines. Fig. 3 is a detail perspective view of a portion of the wheeled or supporting frame and the adjustable plow-carrying frame carried thereby. Fig. 4 is a detail perspective view to show more clearly the connection between the guide-wheel standard and the rear end of the supporting-frame. Fig. 5 is a detail perspective view to show more clearly the connection between the supporting-frame and the front-wheel standard, and also the connection between said standard and the lever for raising or lowering the front end of the supporting-frame.

In the said drawings, 1 designates a longi-

tudinal beam, which is bent inward near its rear end to form the short longitudinal portion 2, and at its front end the said beam is also bent inward and vertically upward a suitable distance, as shown at 3, and is then bent to the right to form the horizontal portion 4, which is disposed at right angles to the longitudinal beam proper, and is then bent vertically downward to form the vertical portion 5, which portion extends a suitable distance below the plane of the body portion 1, and is then bent transversely to the right to form a horizontal portion or arm 6.

A second beam comprises the longitudinal portion 7, which is arranged in the same horizontal plane and parallel with the longitudinal beam 1, and said beam 7 is bent a suitable distance from its rear end at an angle to the longitudinal portion to form the portion 8, which extends obliquely to the left and rearwardly, and said portion is then bent to form the short longitudinal portion 9, which fits snugly against the corresponding portion 2 of the beam 1. The beam 7 is curved downwardly near its front end, as shown at 10, and is then bent transversely to the right to form the horizontal portion 11, which fits squarely upon and is bolted to the portion 6 of the first-mentioned beam. At the outer end of the portion 11 the beam is bent to form the vertical and upwardly-projecting portion 12, and said portion at its upper end is bent to form the outwardly-projecting portion 13, which is parallel with and a suitable distance above the outer end of the portion 6 of the beam 1.

A casting comprises the vertical sleeve 14, and the forwardly-projecting and parallel arms 15, which embrace snugly the outer sides of the portions 2 and 9 of the beams 1 and 7. A semicircular guide-plate 16 is horizontally arranged, and is provided at equal distances from its center with the rearwardly-projecting and parallel arms 17, which embrace or fit snugly the outer sides of the arms 15 of said casting, and bolts 18, extending transversely through aligned opening in the arms 17, the arms 15, and the portions 2 and 9 of said beams, are engaged at their projecting and threaded ends by the nuts 19, which thus clamp these parts firmly and securely together. The semicircular guide-plate is pro-

vided at its middle and in its upper margin with the notch or recess 20, and at its ends with the vertically-projecting shoulders or stops 21. The object of this construction will be hereinafter explained.

Arranged at right angles to the beams 1 and 7, and bridging the space between them just forward of the oblique portion 8 of the beam 7, is the bar 22, and said bar has its vertically-depending arms secured by the bolts 23 and 25 to the beams 7 and 1, respectively, the said bar, adjacent to the inner side of the beam 1, being arched at 24, for a purpose which will be hereinafter explained. The vertical portion of said bar, secured to the beam 1, extends downward a suitable distance, and is then bent to form the horizontal and outwardly-projecting arm 26, which, terminating in the cylindrical portion 27, has mounted rotatably thereon the crank-arm 29, and this crank-arm is provided with the outwardly-projecting cylindrical stud 30, upon which is rotatably mounted the large supporting-wheel 31 of the machine. The lever 32 projects from the hub portion of the crank-arm 29 in the opposite direction to said arm, and projecting inwardly therefrom are the lugs 33 and 34, in which is longitudinally adjustable the dog 35, which is actuated to engage at all times one or the other of the notches of the sector 36, carried by the portion 26 of the bar 22, by the spring 37, and said dog is pivotally connected by the link-rod 38 to the gripping-lever 39, which is pivotally mounted upon and near the free or handle portion of the lever 32. A seat 40, adjacent to said lever, is mounted upon the supporting-standard 41, which is also carried by said bar, and adjacent to said bar and parallel therewith is the foot-rest 42, which is carried by and projects outwardly from the beam 1. The vertical and cylindrical standard 43 is mounted rotatably in the circular bearing-openings 44 in the horizontal portions 6 and 13 of the beams 1 and 7, respectively, and said standard is provided at its lower end with the outwardly-projecting cylindrical stud 45, upon which is rotatably mounted in the usual manner the wheel 46. Mounted adjustably upon said standard is the collar 47, which is clamped at any desired point in its adjustment by the set-screw 48.

A casting comprises the upper and lower horizontal arms 49 and 50, which are rotatably mounted upon said standard, and embraces, respectively, the upper and lower sides of said collar, and this casting, near its free or outer end, is formed with a vertically-elongated aperture 51, in which is fulcrumed upon the horizontal bolt or pin 52 the lever 53, said lever being pivotally mounted at 54 upon the bridge portion of an approximately U-shaped bracket 55, which has its opposite ends secured by bolts 56 and 57 to the beam 7 and to the vertical portion 5 of the beam 1, respectively, and a sector 58 is carried by and projects rearwardly from said bracket. The lever 53 is provided with the inwardly-pro-

jecting lugs 59 and 60, in which is adjustably mounted the dog 61, and said dog is actuated at all times by the spring 62 to engage one or the other of the notches of said sector. A link-rod 63 pivotally connects the dog 61 with the bell-crank lever 64, which is mounted upon the free or handle portion of the lever 53.

A standard comprises the vertical and cylindrical portion 65 and the rearwardly-projecting and downwardly-curved portion 66, a horizontal shoulder or enlargement 67 being formed at the junction of the portions 65 and 66. The lower end of the curved portion is provided with the laterally-projecting cylindrical stud 68, upon which is rotatably mounted in the usual manner the guide-wheel 69. The sleeve portion 14 of the casting hereinbefore described rotatably embraces the cylindrical portion 65 of said standard, and said standard, above said sleeve, is screw-threaded for a suitable distance, as shown at 70, and terminates in the upwardly-projecting and preferably-rectangular portion 71. A nut 72 engages the threaded portion of said standard, and bearing against the upper side of the sleeve 14 prevents the elevation of the rear end of the machine. A pin or bolt 73 projects laterally from each side of the rectangular portion of said standard, and pivotally mounted thereon, to operate in a vertical plane, is the forwardly-projecting guide-arm 74, and said arm is provided with a depending tooth or shoulder 75, which engages the notch 20 when the machine is traveling in a direct line, and which slides upon the upper surface of the guide-plate when the machine is making a turn. Rigidly mounted upon the upper end of the standard 43, and projecting therefrom oppositely from the stud 45, is an arm 76, which is clamped firmly into position by the nut 77, and mounted rotatably to operate in a vertical plane upon the cylindrical portion 78 of said arm, and retained in such position by the nut 79, is the plate 80, to which is adapted to be bolted a tongue. (Not shown.)

From the foregoing it will be apparent that by the proper operation of the levers 32 and 53 the framework described may be raised or lowered, and that when the guide-arm 74 is in engagement with the notch 20 the machine will be guided in a direct line.

When desiring to turn, the driver, grasping the guide-arm 74, raises the same, and if he desires to turn to the right he moves the lever slightly to the left and allows it to rest upon the upper surface of the guide-plate, where it will remain until the machine completes its turn and begins to move in a direct line, when it will immediately and automatically reengage the notch 20 and cause the machine to move in a direct line.

In operation, if the turn is abrupt or short, the said arm will swing to the left until it comes in contact with the shoulder 21 at its extreme left end, when the rotatable movement of the wheel will be stopped, and when the arm reaches this position the wheels 46

and 69 are approximately parallel. As the turn gradually becomes less abrupt, the wheel 69 causes the arm to move gradually inward in the direction indicated by the arrow, Fig. 1, and as the turn is completed, as above explained, the arm reengages the notch 20. The operation of the arm 74 is similar when the machine is turned toward the left, it being understood that when about to turn the driver always disengages said arm from the notch and throws it to the left or to the right, accordingly as he desires to turn to the right or to the left.

Bolted rigidly to and projecting vertically upward from the beam 7, immediately in front of the transverse bar 22, is the ear 81, and secured rigidly upon and rising vertically from the beam 1 is the ear 82, and said ears 81 and 82 are provided with the oppositely-disposed and circular bearing-openings 83. The bracket 84 is rigidly mounted upon the transverse bar 22, adjacent to the arch 24, and pivotally mounted to operate in a vertical plane upon the bolt 85, carried by said bracket, is the lever 86. Projecting from said lever are the lugs 87 and 88, and adjustably mounted in said lugs is the dog 89, which is actuated by the spring 90 to engage at all times one or the other of the notches of the sector 91, which is bolted or otherwise rigidly secured to the adjacent vertical portion of the arch 24. The dog 89 is pivotally connected by a rod 92 to the bell-crank lever 93, which is mounted upon and near the free end of the lever 86.

A frame comprises the parallel beams 94 and 95, and the bridge portion 96, which unites these beams at their front ends. The beam 94 is of greater length than the beam 95, and is arranged vertically beneath the arch 24 of the bar 22, and, curving downwardly in the ordinary manner, carries upon its lower end the plow 97. The beam 95 also curves downwardly at its rear end and carries upon its lower portion in a similar manner the plow 98. A plate 99 is bolted or otherwise rigidly secured upon the bridge portion 96 of said beam, and is provided with a transversely-extending series of holes or apertures 100, with one or the other of which the bolt for attaching the clevis (not shown) is adapted to be engaged, so that the draft upon the plow may be adjusted laterally. A standard 101 terminates at its lower end in the cylindrical portion 102, upon which is rotatably mounted to operate in a horizontal plane the bifurcated casting 103, and carried operatively by said casting, and slightly above and in advance of the point of the plow 97, is the colter-wheel 104.

The standard 101 and the plate 105 are clamped rigidly upon opposite sides of the plow-beam 94 by means of the bolts 106. The vertical standard 107 is provided at its lower end with the cylindrical portion 108, upon which is rotatably mounted the bifurcated casting 109, and operatively carried by said

casting in the ordinary manner is the colter-wheel 110, which is located a slight distance above and in advance of the point of the plow 98. The standard 107 and the plate 111 are clamped rigidly against the opposite sides of the plow-beam 95 by the bolts 112, and projecting obliquely to the rear from the beams 94 and 95, one in front of each plow, are weed-hooks of ordinary construction. Bolted rigidly to and projecting vertically upward from the plow-beams 94 and 95, and adjacent to their front ends, are the ears 113, and journaled in said ears is the transverse rock-shaft or rod 114, and projecting from the opposite ends of said rod are the approximately parallel arms 115, one of which is pivotally mounted upon the bolt 116, carried near the lower end of the vertical portion 3 of the beam 1. The other arm 115 is rotatably mounted upon the inner end of the bolt 57, which is longitudinally alined with the bolt 116, and secures one end of the bracket 55 to the vertical portion 5 of said beam 1. A brace-bar 117, approximately Z-shape in plan view, has its opposite ends bolted rigidly to the plow-beams 94 and 95, as shown at 118 and 119, respectively, and bolted rigidly to and projecting vertically from the plow-beam 94 and the brace-bar 117, adjacent to the plow-beam 95, are the ears 120, and journaled in and connecting said oppositely-disposed ears is the rock-shaft or rod 121, and this rock-shaft or rod is provided at its opposite ends with the arms 122, extending approximately parallel with each other and with the arms 115 of the rock-shaft 114, and said arms are bent to form the outwardly-projecting and alined cylindrical arms 123, which rotatably engage the circular apertures 83 of the ears 81 and 82, hereinbefore described, and loosely embracing the shaft 121 is the sleeve 124, formed at the lower end of the lever 86.

It will be apparent from the foregoing that when the driver wishes to raise the plows to their inoperative position he grasps the lever 86 and retracts the dog 89. Immediately said dog is disengaged from the sector 91 the draft of the animals raises the plow-carrying beam to the position shown in dotted lines, Fig. 2, said frame swinging upwardly and forwardly, as indicated by the arrows, Fig. 3, upon the pivot-bolts 116 and 57, and in the apertures 83 of the ears 81 and 82. By releasing the dog at the proper time, so that it shall reengage the sector, the plow-carrying beam may be locked at any point in its adjustment desired. It will be apparent also that by the operation of the lever the plow-carrying beam may be raised as described without the cooperation of the draft-animals, and in order to assist the draft-animals, which are the means generally employed in raising the plow-carrying frame from the ground, I provide the following construction: An ear 125 projects vertically upward from the bridge portion of the beam 1, and is located preferably in a vertical plane about midway between the plows, so as to

equally distribute the weight, and extending longitudinally of the machine, and through an aperture in said ear, is a bolt 126, and its threaded and forward end is engaged by an adjusting-nut 127. The opposite end of said bolt is rotatably mounted in the upwardly-projecting ear 128 of a semicircular link-plate 129, the head of said bolt bearing against the rear side of said ear, and the free and rear ends of the link-plate 129 are connected, through the medium of the retraction-springs 130, with the rearwardly-disposed hooks 131, projecting from and formed integral with the ears 120. From this construction it will be apparent when the machine is plowing that the springs are distended, and that when the plow-carrying frame is about to be raised the springs, exerting their retracting power, assist the draft-animals materially in elevating the plows from the ground.

It will be obvious that without the assistance of the springs 130 it would be extremely difficult for the driver to elevate the plow-carrying frame alone, and it will also be apparent that with the assistance of said springs and the driver also, if he desires, the draft-animals will be enabled to raise said frame easily and expeditiously.

Should the springs from use be weakened, by properly operating the nut 127 the bolt 126 may be moved forwardly to tension, and thereby strengthen said springs.

A recapitulation of the entire operation of the machine is not deemed necessary, it being desirable only to state that the front wheel 46 and the rear or guide wheel 69 travel in the furrows, and the large wheel 31 upon hard or unbroken ground during the operation of the machine, and that a machine constructed as described is of exceedingly light draft, may be turned in any direction, may be compelled to travel in a direct line, and is strong, and comparatively simple and inexpensive of construction.

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

1. In a gang-plow, the combination with a wheel-supported framework, of a plow-carrying frame pivotally linked to and carried by said wheel-supported framework, and a retracting-spring connected to a fixed point in the wheel-supported framework and to the plow-carrying frame, substantially as set forth.

2. In a gang-plow, the combination with a wheel-supported framework, of a plow-carrying frame pivotally linked to and carried by said wheel-supported framework, a retracting-spring connected to a fixed point in the wheel-supported framework and to the plow-carrying frame, and means to tension said spring, substantially as set forth.

3. In a gang-plow, the combination with a wheel-supported framework, and a plow and colter-wheel carrying frame, of rock-shafts carried by said plow and colter carrying

frame, arms projecting from said rock-shafts, and pivotally mounted in said wheel-supported framework, an adjustable bolt carried by the wheel-supported framework, a link-plate attached thereto, and springs connecting said link-plate with a portion of the plow-carrying frame, substantially as set forth.

4. In a gang-plow, the combination with a wheel-supported framework, and a plow-carrying frame for attachment to draft-animals, of rock-shafts carried by said plow-carrying frame, arms projecting from said rock-shafts and pivotally mounted at their upper ends in said wheel-supported framework, a bolt carried by and longitudinally of the wheel-supported framework, a link attached thereto, retraction-springs connecting said link with the plow-carrying frame, a lever pivoted in the wheel-supported framework and loosely sleeved upon the rear rock-shaft, to coact with the draft-animals and springs in raising the plow-carrying frame, and means to lock said lever at any point within its adjustment, substantially as set forth.

5. In a gang-plow, the combination with a suitable framework, a wheel supporting one side of the same, a wheel supporting the opposite side and front end of the same, and a longitudinal semicircular guide-plate carried at the rear end of the framework, and provided with a notch at its center, and upwardly-projecting arms at its ends, of a standard rotatably mounted in the framework axially of said semicircular guide-plate, a guide-wheel carried thereby, a laterally-projecting pin also carried by said standard above the framework, and a forwardly-projecting gravity-lever pivotally mounted to swing in a vertical plane upon said pin, and provided with a depending lug to automatically engage the notch of the said guide-plate when the machine is starting to move in a direct or straight line, substantially as described.

6. In a gang-plow, the combination with a suitable framework, a plow-carrying frame adjustably carried by said framework, means to adjust said plow-carrying frame and to support it at any desired point in its adjustment, a wheel adjustably supporting one side of the framework, a notched guide-plate carried by the rear end of the framework, a standard rotatably mounted in the rear end of the framework, a wheel carried thereby, and a guide-arm pivotally carried by said standard and engaging said guide-plate, of a standard rotatably mounted at the opposite side and front end of the framework, a wheel carried thereby, a tongue-carrying plate carried by an arm of said standard, a collar upon the said standard, a bracket pivotally mounted upon the same and embracing the upper and lower sides of said collar, a lever mounted in the framework and pivotally connected at its front end to said bracket, and means to lock said lever at any point within its adjustment, substantially as set forth.

7. In a gang-plow, the combination with a

suitable framework, a wheel adjustably supporting one side of the same, a wheel adjustably supporting the opposite side and front end of the same, means to vertically adjust
5 said framework, and a guide-wheel supporting the rear end of the framework, of a plow-carrying frame pivotally linked to the wheel-supported framework, and springs operatively connected to the wheel-supported framework

at one end, and at their opposite ends to the plow-carrying framework, substantially as set forth. 10

In testimony whereof I affix my signature in presence of two witnesses.

HEINRICH SOMMERFELD.

Witnesses:

M. R. REMLEY,
F. G. FISCHER.