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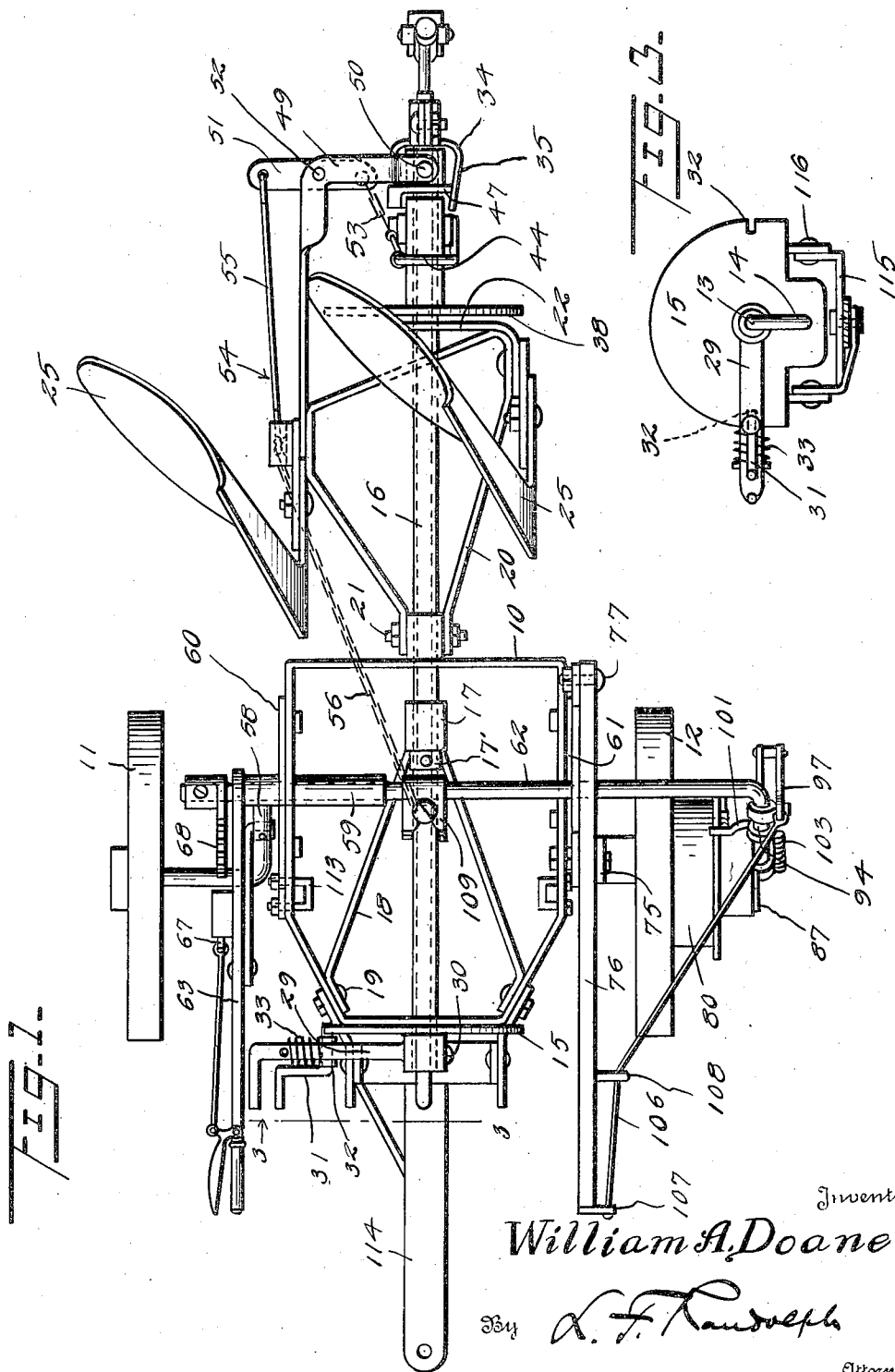
W. A. DOANE

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TWO WAY REVERSIBLE TRACTOR FLOW.

Filed Jan. 4, 1940

3 Sheets-Sheet 1



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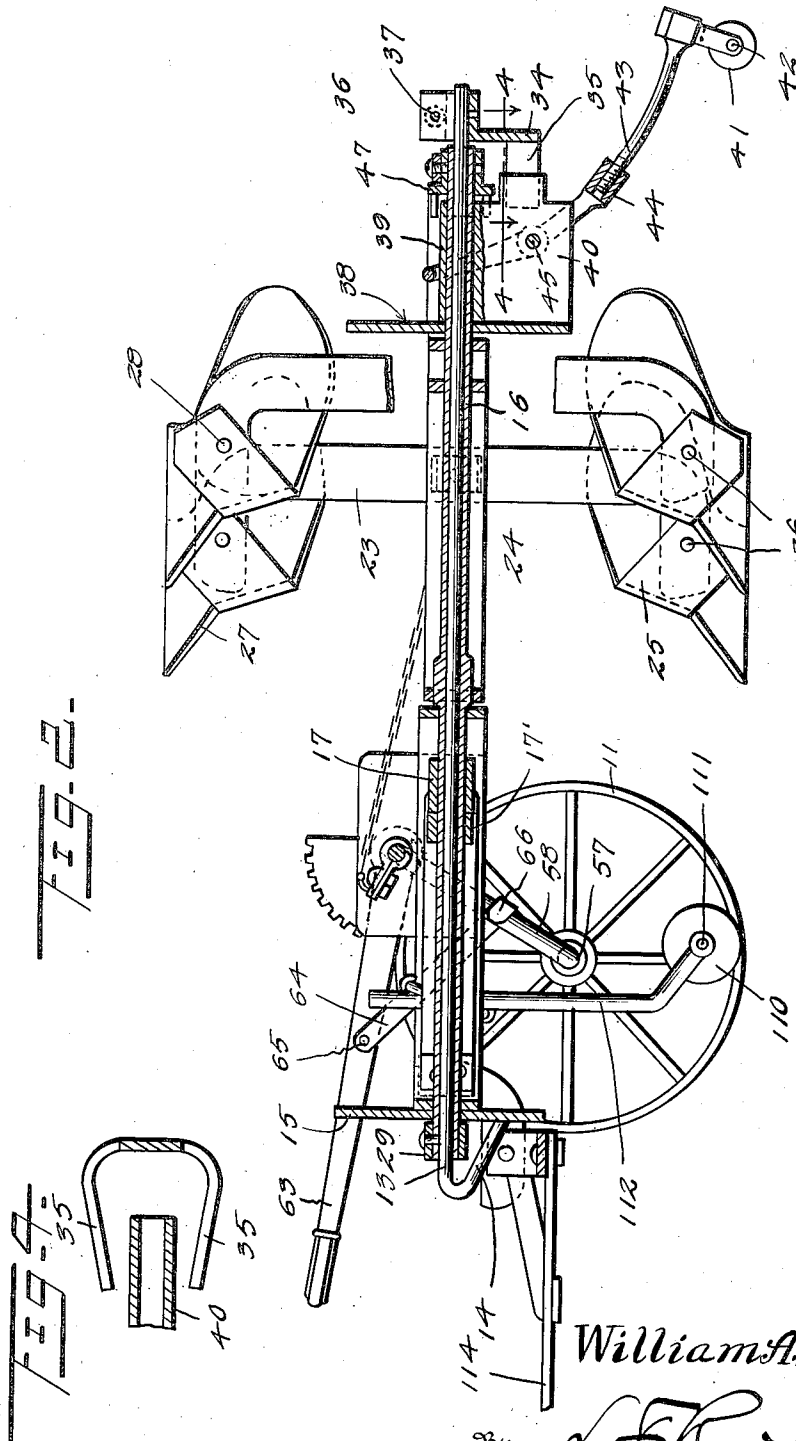
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3 Sheets-Sheet 2



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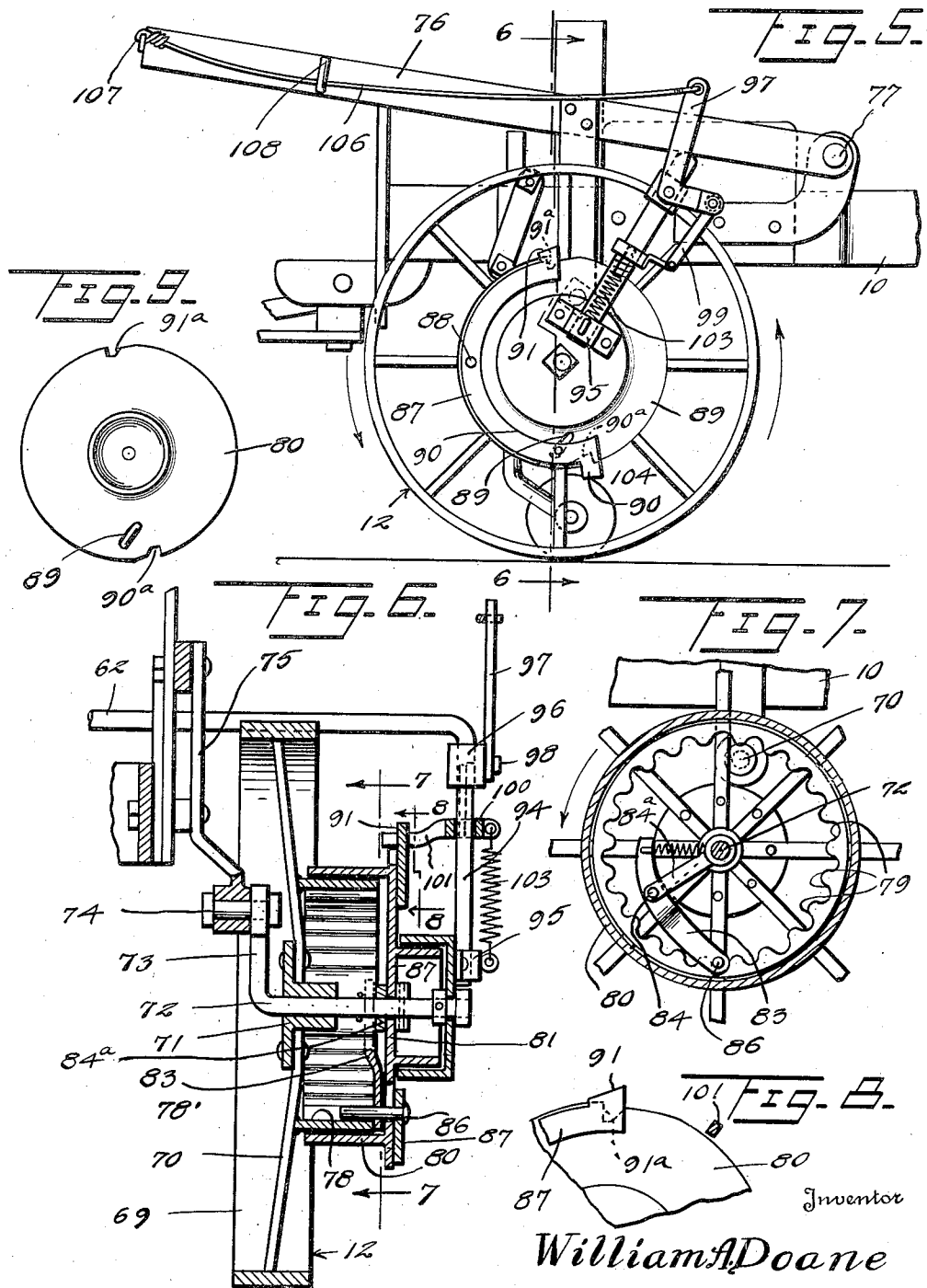
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Filed Jan. 4, 1940

3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,239,596

TWO WAY REVERSIBLE TRACTOR PLOW

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Application January 4, 1940, Serial No. 312,422

4 Claims. (Cl. 97—26)

This invention relates to a plow construction and it aims to provide one of the type usually drawn by a tractor, and which will work two ways rather than a single way, and which will eliminate dead furrows, generally save time, and may operate at less power and at less cost.

It is further aimed to provide a novel structure wherein rotatable means are provided substantially centrally and longitudinally of the plow which carry the plow members so that they may be reversed through rotation of such means.

Another important object is to provide a construction wherein one or both of the main wheels may be adjusted in a novel manner as to height to insure rotation of the wheels on horizontal axes, regardless of the inclination of the land.

The more specific objects and advantages will become apparent from a consideration of the description following taken in connection with the accompanying drawings illustrating an operative embodiment.

In said drawings:

Figure 1 is a plan view of a reversible plow construction according to my invention;

Figure 2 is a substantially central vertical longitudinal sectional view through the plow construction of Figure 1;

Figure 3 is a vertical section of parts taken on the plane of line 3—3 of Figure 1;

Figure 4 is a horizontal section taken on the plane of line 4—4 of Figure 2;

Figure 5 is a fragmentary side elevation of the plow construction;

Figure 6 is a vertical section taken on the plane of line 6—6 of Figure 5;

Figure 7 is a vertical section taken on the plane of line 7—7 of Figure 6, and

Figure 8 is a vertical section taken on the plane of line 8—8 of Figure 6.

Referring specifically to the drawings wherein like reference characters designate like or similar parts, the machine has a skeleton metallic frame as at 10, of any suitable shape supported by ground wheels at 11 and 12, mounted and operable as hereinafter described, so that they may be adjusted to operate at different heights to maintain the frame 10 level with respect to the ground. Extending centrally and longitudinally of the machine and mounted by said frame 10 is a fixed shaft 13 having a returned end or terminal 14, which may be welded or otherwise secured to a segment or plate 15 fastened to the adjacent end of said frame 10.

Surrounding and journaled on the fixed shaft 13 is a tubular or hollow shaft 16 which extends

through and is also journaled in the frame 10 and plate 15. Tubular shaft 16 is also journaled in a bearing 17, within the frame 10 and supported from the latter by arms 18, bolted thereto as at 19. A collar 17' is clamped on shaft 16 to abut bearing 17.

An open or skeleton frame 20 is bolted in any suitable manner as at 21, to the hollow shaft 16 and is fastened by an arm 22 to the same shaft. Such frame 20 has parallel beams 23 rigidly fastened thereto preferably removably as at 24, on opposite sides of the shaft 16, and preferably laterally disaligned as shown in Figure 2. Each beam 23 at one end carries similar plow members 25, preferably removably fastened in place by bolts at 26. At the other ends, said beams 23 carry plows 27, preferably removably as by means of bolts 28. It will be seen from the drawings that the plows 25 are reversed to the plows 27 so that when one set of plows 25 is in operation, it will turn the furrow in the opposite direction to the turning by the other set of plows 27, when the latter are in operative position.

Said hollow shaft 16 is rotatable so as to arrange either set of plows 25 or 27 lowermost or in operative position. As shown in Figure 2, the plows 25 are in operative position but rotation of the shaft 16, 180°, would exchange the positions of the plows 25 and 27, disposing the latter in operative position. Rotation of the hollow shaft 16 may be effected manually through the turning of a lever 29 fastened on such shaft 16 as at 30, in front of the plate 15 and the lever 29 is adapted to be locked or latched to said plate 15 in the position where the plows 25 are operative and in the position where the plows 27 are operative, through the engagement of a latch 31 with notches 32, provided in the peripheral edge of the plate or segment 15, 180°, apart. Such latch 31 may be conventional, for instance having a collar 32, slidable along the lever 29 and urged by an expansive coil spring 33 on such lever toward said segment 15.

At the rear end of the fixed shaft 13 is an abutment member 34, U-shaped in plan, as best shown in Figures 1 and 4, so as to have forwardly extending spaced arms 35. A suitable clamp 36 forms part of the abutment device 34 and it is rigidly but removably secured in place by a bolt 37 to the fixed shaft 13. Between such abutment device 34 and the arm 22 of frame 20, a bracket 38 is provided which has a sleeve 39, loosely mounted or journaled upon the tubular shaft 16. Such bracket 38 below tube 39 has walls 40 which extend between the arms 35 with clear-

ance so that the bracket 33 may move on the shaft 39 to either side, to the extent permitted by the abutment arms 35. A rear or furrow wheel 41 is provided, being journaled as at 42 to a hanger or bracket 43, having an open or loop portion 44, surrounding the walls 40 and being pivoted to a pin or shaft 45 mounted by such walls. In front of the clamp 36, a bracket 47 forms a bearing for the tubular shaft 16 and in combination with arm 22 positions the bracket, being mounted by an L-shaped arm 49 fastened to the frame 20 and by means of screws 50 to the bracket or bearing 47. It will be understood that the lever or bracket 44 is moved to press wheel 41 against the ground to elevate the frame, to provide clearance for reversal of the plows and that the wheel 41 is swung slightly either to the left or right and travels in a tilted position to one side or the other so as to travel in the furrow, according to the plow or plows operating in the ground. The use of the wheel 41, also enables me to locate the front wheels 11 and 12 farther from the plows, so that more weight of the machine will be imposed on the plows to facilitate engagement with the ground.

A lever 51 is pivoted at 52 to the bracket 49 adjacent the angle thereof and it has a chain or flexible connection 53 connected thereto and also connected to the top of the portion 44. Said lever 51 on the opposite side of the pivot 52 to the flexible connection 53 also has a flexible or draw connection 54 consisting of a link 55 and a chain 56 connected thereto, for example, and extending to the front of the machine.

Reverting to the wheel 11, it is journaled on an axle 57 of a hanger 58 including a horizontal sleeve 59, which is journaled in a plate or bearing 60 rising from one side of the frame 10. Disposed transversely of the frame and journaled to rock in the sleeve 59 and in a plate or bearing 61 similar to that at 60 but at the other side of the frame 10, is transverse shaft or rod 62. Rod 62 has a lever 63 rigidly connected to it and a link 64 is pivoted at 65 to said lever, having a hook 66 at its lower end, engaged with the hanger 58, so that through the raising or lowering of the lever 63, the depth of the wheel 11 may be regulated, and the frame 10 correspondingly raised or lowered. Such lever 63 may be fastened in its different adjusted positions through the co-action of conventional latch mechanism 67 thereon with a toothed segment 68, which is fastened to the adjacent end of the cross shaft 62.

The previously mentioned wheel 12 has a rim 69, spokes 70 and a hub 71. Hub 71 is journaled on an axle 72 having an upwardly extending crank arm 73 which is pivotally suspended by a pin 74 on an arm 75 depending from a lever 76 pivoted at 77 to the frame 10. An annular drum 78 at the inner edge thereof is welded or otherwise fastened to the spokes 70, concentrically of the wheel 12 and it has longitudinal corrugations or teeth 79 on the inner surface thereof.

An outer drum 80 surrounds the drum 78, having an outer wall or disk 81 which is pinned or otherwise rigidly fastened to the axle 72. Within the drum 78 is a latch member 83 which is pivoted at 84 to an arm 84a fixed on axle 72, to which latch member and arm a contractile coil spring is fastened to urge a pin 86 journaled on the latch 83 into engagement with adjacent teeth 79, to latch or lock the drums 78 and 80 together. Said pin 86 is rigid on an arcuate lever 87 pivoted at 88 on the exterior of

drum 80 and extends through an enlarged slot 89 in drum 80. Said lever 87 has enlarged ends 90 and 91 located adjacent notches 90a and 91a in the periphery of drum 80.

The said transverse shaft or rod 62 has a depending arm or crank 94 which is slidably engaged in a bearing 95, fastened to the cap 91. A collar 96 surrounds the crank 94 and a bell crank lever 97 is pivoted thereto at 98 to one end of which a link 99 is pivoted and which in turn is pivoted to a slidable element 100 mounted on the crank 94. Such element 100 has an arm 101 which is engageable against enlargement 90 and in notch 90a or in enlargement 91 and notch 91a, according to whether wheel 12 is to be raised or lowered, and in either of which positions lever 87 will be rocked and pin 86 disengaged from teeth 79 to enable relative movement of the drums or parts adjustably mounting the wheel. Lever 97 may be actuated by a draw element such as a cable 106 fastened to the same at one end and at 107 at the other end to the lever 76, the cable passing through a guide 108 on such lever. When the elevation of the wheel 12 is to be varied to regulate the level or position of the frame 10, lever 97 is rocked in order to slide the arm 101 to rock lever 87 and engage the latch pin 86 with the teeth 79, whereupon the axle 72 will swing to the desired extent on the pin 74, following which, the lever 97 is released, slide 100 is restored by spring 103 to normal position and the arcuate rod 89 again restores the latch 83 out of engagement with adjacent teeth 79, the movement of the crank 94 having been accommodated in the slide 95 mounted on the turnable cap 91.

Attention is called to the fact that the draw means 54 at the rear end of the chain 56 is fastened as at 109 to the cross shaft 62. Thus whenever shaft 62 is rocked in connection with the variation in elevation of the frame 10 or wheels 11 and 12, the draw member 54 will be drawn or paid out, with such movement effecting the lever 51 and chain 53, and correspondingly or proportionately swinging the bracket 43 on the pivot 45 in order to raise or lower the wheel 41.

Attention is also called to the fact that two coulters are provided in advance of the plows as at 110, the same being journaled at 111 on the lower ends of standards 112, detachably bolted as at 113, one on each of opposite sides of said frame 10.

A draft tongue 114 is fastened to a bracket 115, in turn secured to the frame 10 and segment 116 at 117, to enable attachment of a tractor or other draft means thereto.

Various changes may be resorted to provided they fall within the spirit and scope of the appended claims.

I claim as my invention:

1. A machine of the class described having a wheeled frame including spaced apart transverse members, a shaft fixed on the frame passing through said members, a tubular shaft journaled on the fixed shaft passing through said members, soil-treating means secured to the tubular shaft in spaced relation, so that the tubular shaft may be rotated to dispose either soil-treating means in operative position, and means to secure the tubular shaft stationary with respect to the fixed shaft in the adjusted positions of the tubular shaft.

2. A machine of the class described having a wheeled frame including spaced apart transverse

members, a shaft fixed on the frame passing through said members, a tubular shaft journaled on the fixed shaft passing through said members, soil-treating means secured to the tubular shaft in spaced relation, so that the tubular shaft may be rotated to dispose either soil-treating means in operative position, means to secure the tubular shaft stationary with respect to the fixed shaft in the adjusted positions of the tubular shaft, comprising a lever on the tubular shaft, latching means between the lever and said frame, said frame including a bearing within the same in which the tubular shaft is journaled.

3. A machine of the class described having a wheeled frame including spaced apart transverse members, a shaft fixed on the frame passing through said members, a tubular shaft journaled on the fixed shaft passing through said members, soil-treating means secured to the tubular shaft in spaced relation, so that the tubular shaft may be rotated to dispose either soil-treating means in operative position, means to secure the tubular shaft stationary with respect to the fixed shaft in the adjusted positions of the tubular shaft, comprising a lever on the tubular shaft, latching means between the lever and said frame, said frame including a bearing within the same in which the tubular shaft is journaled, means operable to vary the relative elevation of the frame and wheels, means mounting an auxiliary ground wheel at the rear of the plow means, and a connection from the last mentioned means to the adjusting means, whereby the auxiliary wheel

means will be adjusted as to height through the adjustment of the frame and wheel means relatively.

4. A machine of the class described having a wheeled frame, a shaft fixed thereon, a tubular shaft journaled on the fixed shaft, soil-treating means secured to the tubular shaft in spaced relation, so that the tubular shaft may be rotated to dispose either soil-treating means in operative position, means to secure the tubular shaft stationary with respect to the fixed shaft in the adjusted positions of the tubular shaft, comprising a lever on the tubular shaft, latching means between the lever and said frame, said frame including a bearing within the same in which the tubular shaft is journaled, means operable to vary the relative elevation of the frame and wheels, means mounting an auxiliary ground wheel at the rear of the plow means, a connection from the last mentioned means to the adjusting means, whereby the auxiliary wheel means will be adjusted as to height through the adjustment of the frame and wheel means relatively, a bracket carrying said auxiliary wheel means, said bracket being pivoted on said tubular shaft, means fixed to the fixed shaft to maintain the bracket in operative position, a collar on the tubular shaft loose with respect thereto and aiding in positioning said bracket, a frame for the plow members, a bracket extending from the last mentioned frame to said collar, and said connection including a lever pivoted to said bracket.

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