

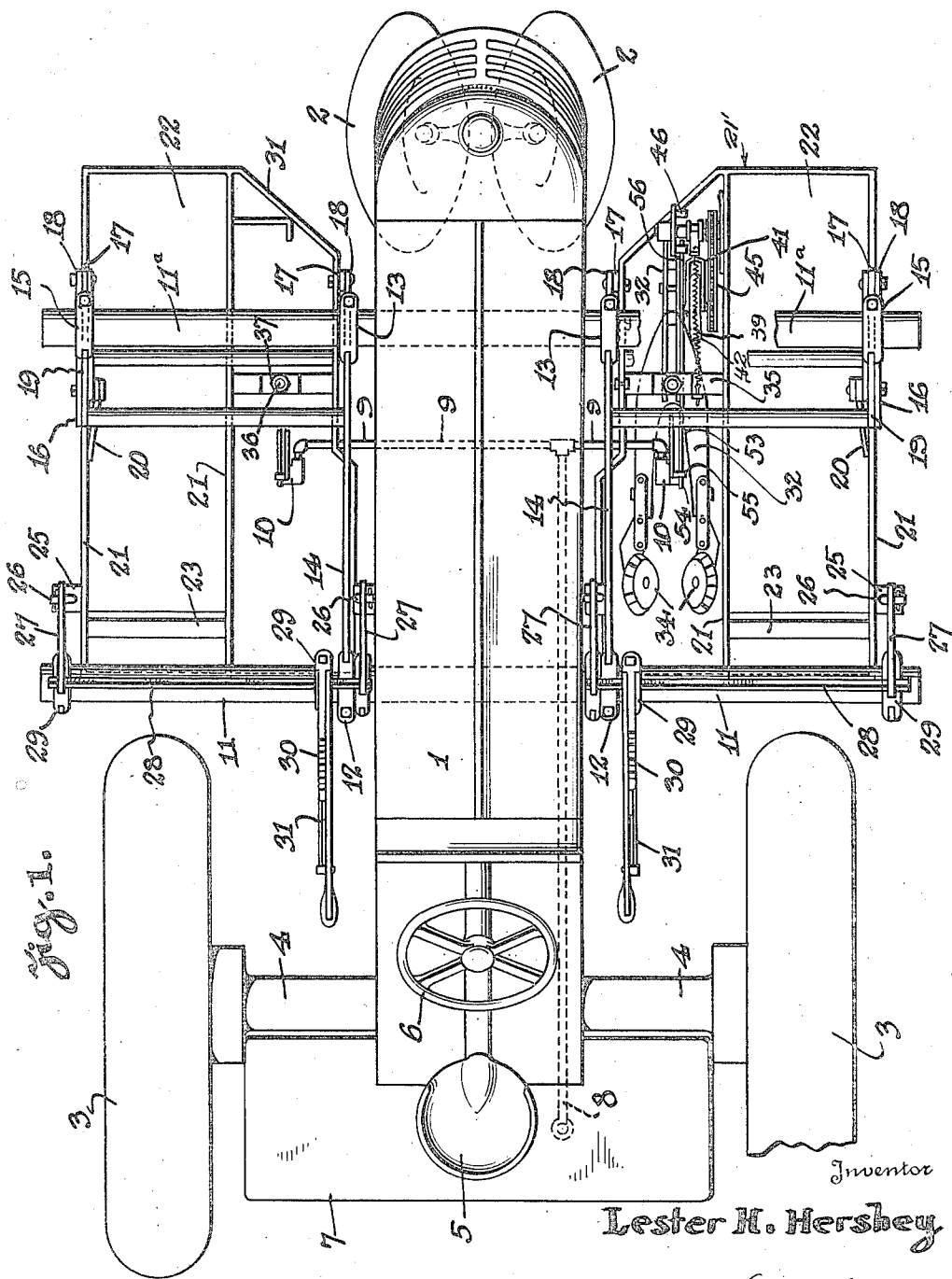
Feb. 4, 1941.

L. H. HERSHEY
TRANSPLANTER

2,230,643

Filed May 20, 1938

4 Sheets-Sheet 1



Inventor

Lester H. Hershey

By *Lester K. Sargent*

Attorney

Feb. 4, 1941.

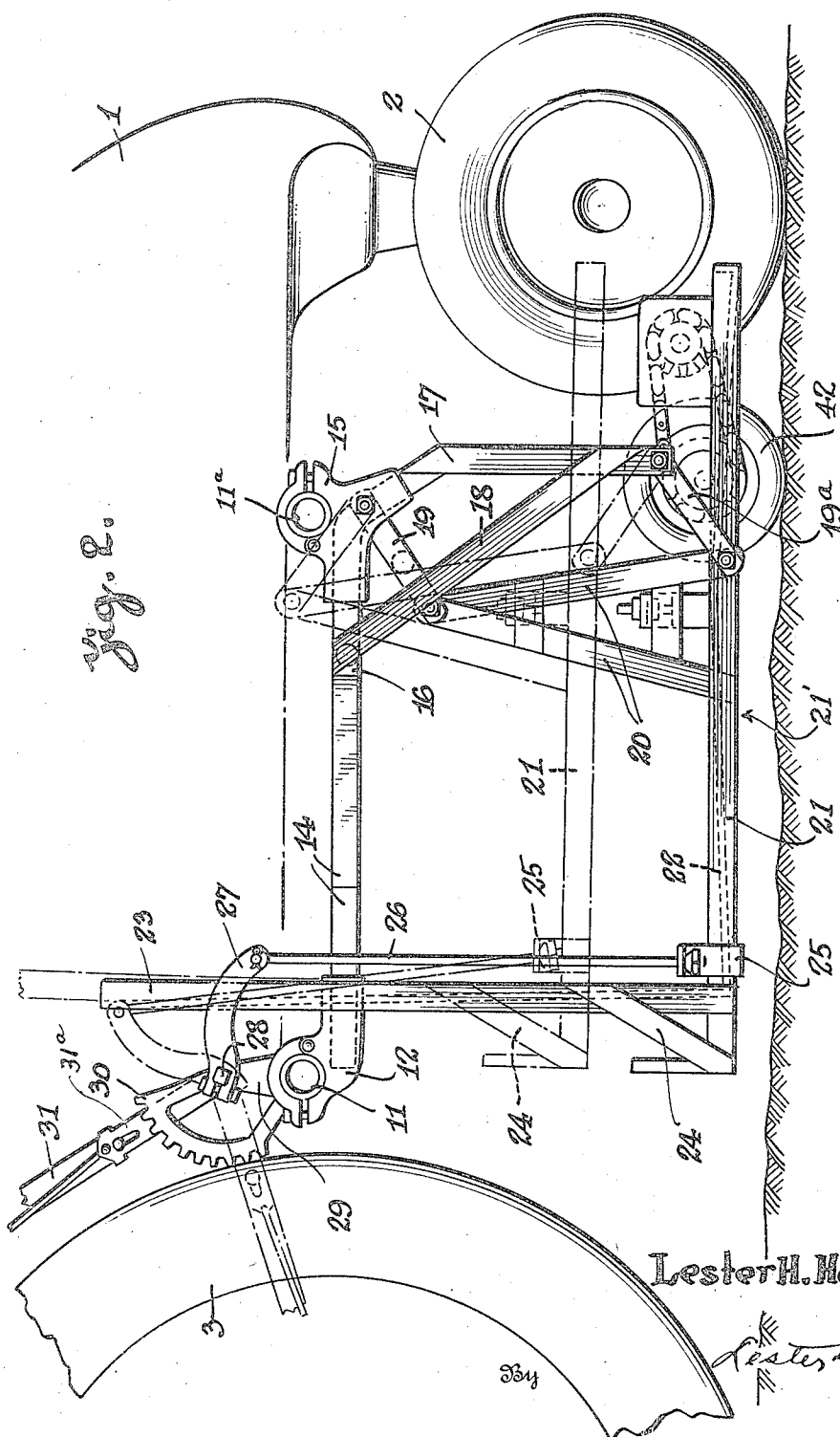
L. H. HERSHEY

2,230,643

TRANSPLANTER

Filed May 20, 1938

4 Sheets-Sheet 2



Feb. 4, 1941.

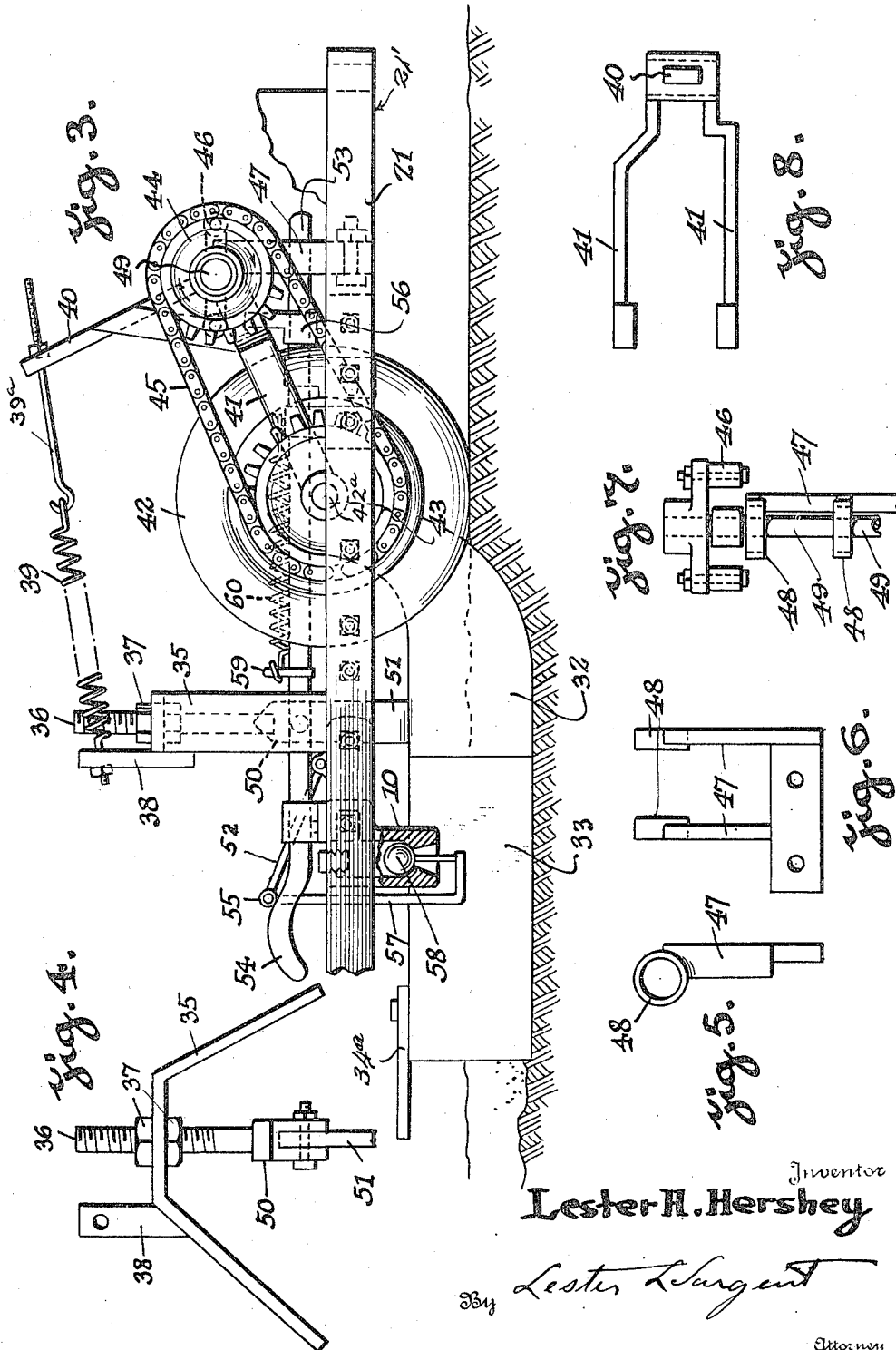
L. H. HERSHEY

2,230,643

TRANSPLANTER

Filed May 20, 1938

4 Sheets-Sheet 3



Feb. 4, 1941.

L. H. HERSHEY

2,230,643

TRANSPLANTER

Filed May 20, 1938

4 Sheets-Sheet 4

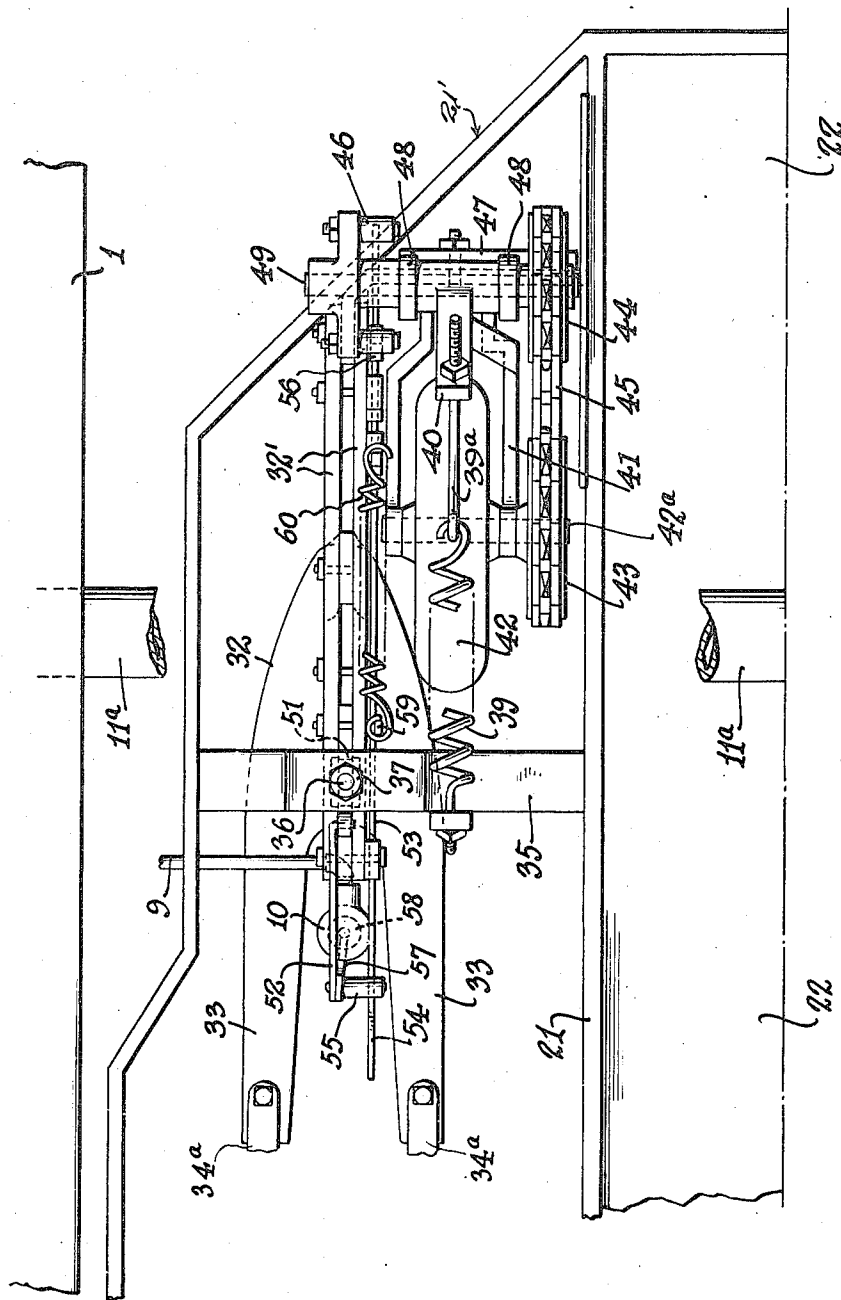


Fig. 9.

Inventor
Lester H. Hershey

3341
Lester Sargent

Attorney

UNITED STATES PATENT OFFICE

2,230,643

TRANSPLANTER

Lester H. Hershey, Lititz, Pa.

Application May 20, 1938, Serial No. 209,107

9 Claims. (Cl. 111-7)

The object of my invention is to provide a novel transplanter which can be attached to opposite sides of a tractor and which will make a furrow on each side thereof; to provide automatic means for discharging water into the furrows, and to provide means for packing down the soil around the furrows after plants have been placed in them; to provide a seat for each of the operators who perform the transplanting as the machine forms the furrows; to provide novel means for raising this seat, and to provide novel means for regulating the operation of the mechanism when obstacles are encountered.

It is also an object of my invention to provide a novel arrangement of parts as shown and described.

I attain these and other objects of my invention by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a top plan view illustrating my transplanter attached to a tractor, a portion of the tractor being broken away and most of the transplanter on the left hand side of the tractor being omitted;

Fig. 2 is a side elevation of the lifting frame drawn on an enlarged scale, parts of the transplanter mechanism being omitted to make the structure clearer;

Fig. 3 is a side elevation of the transplanter mechanism on an enlarged scale, parts of the mechanism being broken away and other parts being shown in section;

Fig. 4 is an enlarged detail front elevation of the means for adjusting the shoe for forming a furrow;

Fig. 5 is an enlarged side elevation of the journal bracket;

Fig. 6 is an enlarged front elevation of the journal bracket;

Fig. 7 is an enlarged detail top plan view of the journal bracket, shown supporting a shaft carrying spaced fingers;

Fig. 8 is an enlarged plan view of the bracket which supports the measuring wheel; and

Fig. 9 is a plan view of an enlarged scale of the transplanter mechanism, parts of the mechanism being broken away.

Referring to the accompanying drawings, there is illustrated a tractor chassis 1, having front wheels 2, rear wheels 3, mounted on axle 4, a conventional seat 5, a conventional steering wheel 6, and a water tank 7. Extending from the water tank is a pipe or hose 8, which extends longitudinally of the tractor and connects with the transversely extending water pipe or hose 9,

which terminates in a pair of opposite valve-controlled nozzles 10.

The tractor has a rear tool mounting bar 11, and a front tool mounting bar 11a, as shown in Fig. 1, a rear inner clamp 12 and a rear outer clamp 29 attached to the rear tool mounting bar 11, and a front inner clamp 13 and a front outer clamp 15 secured to the front tool mounting bar 11a. A horizontal bar 14 is attached at its forward end to inner clamp 13 and at its rear end to inner clamp 12. A stationary frame member 16 is secured to outer clamp 15. An approximately vertical bar 17 extends downwardly from clamp 15 and to the lower end of this bar is pivoted a lower link 19a. The other end of the lower link 19a is pivotally connected to a seat frame member 21. This frame member 21 has rigidly secured thereto an upstanding brace frame 20 which is of an inverted V-shape, as shown in Fig. 2. To the upper end of frame 20 is pivotally connected one end of an upper link 19, the other end of the link being pivoted to clamp 15. The aforesaid frame member 21 and another like inwardly disposed member 21' form part of a lower frame 21' carrying an operator's seat 22. A brace member 18 extends from bar 17 to the rear end of frame member 16 on each unit. Members 14, 16, 17 and 18 form an upper frame to which the lower frame 21' is connected by means of links 19 and 19a and frame 20. To protect the operator, his seat is provided with a suitable upright or slanting back 23, as shown in Fig. 2. A suitable brace or braces 24 secure the back 23 to the member 21. A bar or angle piece 25 is fastened to the under side of seat 22 and to the offset upper end of this angle piece 25 is attached a link 26, which in turn is pivotally connected at its upper end to an arm 27 mounted on a shaft 28, which shaft is secured to the lower end of a seat adjusting lever 31 and operated thereby. Referring to Figs. 1 and 2, there are two like arms 27 and two like links 26 on each side of the machine, or four of each altogether. Seat adjusting lever 31 is pivotally mounted on member 29 which carries a segment 30 with which the latch 31a on lever 31 is releasably engageable.

As shown in Figs. 1 and 3, a furrow-forming shoe 32 is secured to the forward end of the lower frame 21' by bars 32', this shoe having a cut-away rear portion 33 and carrying metal strips 34a and trailing tilted ground packing wheels 34, as shown in Fig. 1, to pack the soil around the transplanted plants. There is a distance of approximately two inches between shoe

32 and wheel 42, due to the shape of the shoe and wheel.

Bolted or otherwise affixed to the sides 21 of seat 22 is a bridge element 35, as shown in Figs. 3 and 4 carrying an adjusting screw 36 which is secured in adjusted position by nuts 37. The lower end of this adjusting screw carries a clevis 50 to which in turn is pivotally attached a link 51, which is attached to the shoe 32. Also affixed to and integral with bridge 35 is an upstanding apertured bracket 38. One end of a spring 39 is secured to bracket 38 and the other end of spring 39 is adjustably secured to a hook 39a which is secured to the upper end of a bracket 40, as shown in Fig. 9. Bracket 40 is shown in detail in Fig. 8 and has spaced rearwardly extending arms 41, as shown in Fig. 3, on which an axle 42a of a measuring wheel 42 is mounted. Axle 42a revolves with measuring wheel 42. A sprocket 43 is also rigidly mounted on axle 42a and revolves with it. A sprocket chain 45 connects sprocket 43 with a smaller front sprocket 44 which is mounted on and rotates with a cross shaft or axle 49. This axle or cross shaft 49 extends considerably beyond sprocket 44 and carries spaced fingers 46 which rotate with shaft 49 and sprocket 44.

Suitable brackets 47 carry journals 48 which support the extended portion of axle or cross shaft 49, as shown in detail in Figs. 6 and 7, and bracket 47 is suitably secured to frame member 21. A flat bar 53 extends longitudinally of the machine parallel with the frame members 21, as shown in Figs. 1 and 3, and at its rear end has an upward projection or cam nose 54, as shown in Fig. 3, which engages and intermittently lifts a joint 55 on a pivoted lever 52 to which is pivotally attached a depending rod 57, the rod 57 carrying a ball valve 58 which normally seats in a valve seat in nozzle 10 and which is unseated by lifting of rod 57 to discharge water, as shown in Fig. 3. Pipe 9 is suitably supported on the tractor frame, as indicated in Fig. 1.

Affixed to a bar 53, as shown in Fig. 3, is a finger 59 to which is attached a spring 60, the other end of the spring being anchored to a portion of the frame. Bar 53 also has affixed to it in proximity to the forward end of the bar, a finger 56 positioned to be operatively engaged by fingers 46 as they are rotated. In Fig. 3 the bar 53 has just been operated by the member 46 and has not yet been retracted by the spring 60. In this figure the spring 60 has hardly begun its action and the left hand member 46 has just completed its action on member 56, thereby having moved bar 53 to its extreme left hand position.

The operation of the mechanism of raising and lowering the operator's seat 22 is illustrated in dotted lines in Fig. 2; the full lines show the seat in its lowered position while the dotted lines show the lever 31 moved to a lowered position in which position the movement of the lever has raised arm 27, rod 26 and members 25, 21, 22, 24 and 25 to a raised position, as indicated in dotted lines. This operation of the lever causes the links 19 and 19a to swing to the upper position indicated by dotted lines, thus raising the forward end of the seat at the same time that the rear end of the seat is raised by rod 26 and angle piece 25. The lift applied at 25 by link 26 lifts the platform as a whole. The right hand brace 20 connects the ends of links 19 and 19a; raising the free end of member 19 necessarily also raises the free end of 19a and vice versa. The left hand element 20 which is

pivotally connected to the free end of member 19 and affixed at its lower end to member 21, makes the whole platform or operator's seat 22 rigid.

The operation of the mechanism for periodically dumping water in the furrow where the plants have been or are to be transplanted is illustrated in Figs. 3 and 1. The rotation of the measuring wheel 42 which rolls along on the ground also rotates the sprocket 43 as both are rigidly mounted on the same axle 42a. The rotation of the sprocket 43 drives sprocket chain 45 and sprocket 44, which in turn drives the axle or cross shaft 49. The shaft 49 rotates the fingers 46 which successively engage the finger 56 affixed to bar 53 and thus with each half revolution of the sprocket 44, moves bar 53 rearwardly against the tension of spring 60, said spring thereafter returning bar 53 to its extreme forward position, in which position member 56 will be in position to again be engaged by member 46. As the bar 53 is moved rearwardly by the action of member 46 against member 56 the cam nose 54 of bar 53 engages joint 55 which is the connection between the lever 52 and depending rod 57, thereby raising depending rod 57 and valve 58. As the valve 58 is lifted from its seat, water is released by gravity through nozzle 10 from transverse pipe 9, longitudinal pipe 8 and water tank 7, thus water is discharged into the furrow which has been made by the shoe 32, the rear portion of the shoe being cut away at 33 to provide space for the nozzle 10, as shown in Fig. 4. The plants are deposited in the furrow by the individual operator who is seated on the seat 22 and who leans to one side to place the plants in the furrow after it has been formed by the shoe 32.

As the bridge 37 affixed to the frame 21 carries the bracket member 38 to which the spring 39 is attached, this spring in turn being attached by hook 39a to the bracket 40, rearward tension is thus exerted on bracket 40 which in turn tends to tilt arms 41 downwardly and thus exerts downward spring tension on the axle 42a to hold the measuring wheel 42 in tractive engagement with the ground. However, if an obstruction is encountered, the measuring wheel can rise against the tension of spring 39 to pass over the obstruction, as wheel 42 is floatingly mounted.

The bridge element 35 shown in Figs. 3 and 4 being affixed to the frame members 21 of the seat 22 provides a support by which the adjusting screw 36 is adjustably mounted. This adjusting screw in turn is operatively connected by clevis 50 and link 51 with the shoe 32, whereby the depth of the furrow may be regulated by adjusting the position of adjusting screw 36 and consequently of shoe 32 relative to the bridge support 35. To adjust the adjusting screw 36, the lower nut 37 will be unscrewed to a lower position on the adjusting screw, and a wrench would then be applied to the upper nut 37, the turning of which against the upper surface of the bridge 35 raises the screw 36, and consequently would raise link 51 and shoe 32. A reverse operation would lower the shoe.

Like transplanter mechanisms are provided on each side of the tractor and to which the respective nozzles 10 extend, only one of the transplanter mechanism being shown in detail in Fig. 1 to simplify the drawings.

What I claim is:

1. In a transplanter, the combination of an operator's seat extending substantially parallel with the ground, lever operated means connected with the rear portion of the seat for raising same,

upstanding members connected with the forward portion of the seat, and links connected to the upper ends of said upstanding members and to the forward portion of the seat whereby when the rear portion of the seat is raised the links will swing upwardly and the forward portion of the seat will also be raised.

2. In a transplanter, the combination of a suspended seat for the operator, a bridge support mounted on said seat, an adjusting screw adjustably mounted on the bridge support, a shoe for forming a furrow, a link connecting said shoe with the adjusting screw whereby the position of the shoe relative to the operator's seat may be adjusted.

3. In a transplanter, the combination of a water tank, a pipe leading from the water tank, a nozzle in which said pipe terminates, a valve seated in said nozzle and normally closing same, a depending rod connected to said valve to operate same, a pivoted lever with which said rod is jointed, a longitudinally movable bar, a cam nose engaging the joint of said lever and rod to actuate same and operate the valve, and means for periodically actuating the movable bar.

4. The combination with a tractor of a pair of transplanter units mounted on opposite sides of the tractor, each of said units comprising a frame having a seat extending substantially parallel with the ground and having a back, manually operable means for raising and lowering said frame at will, a shoe for forming a furrow, means for adjustably mounting said shoe on said frame for operating at different depths, valve operating means mounted on said frame for automatically and periodically releasing a valve on the frame to discharge water into a furrow, a nozzle in which said valve is mounted, a conduit connected to the nozzle, and a tank with which the said conduit connects.

5. In combination with a tractor, a water tank, a conduit extending longitudinally of the tractor from the water tank, a transverse conduit with which the first conduit connects, discharge nozzles on the ends of said transverse conduit supported on transplanter units mounted on either side of the tractor, each of said transplanter units comprising a frame having a seat, lever operated means operatively connected with the frame for raising and lowering same while retaining the seat in a position substantially parallel with the ground.

6. In combination with a tractor, a water tank, a conduit extending longitudinally of the tractor from the water tank, a transverse conduit with which the first conduit connects, discharge nozzles on the ends of said transverse conduit supported on transplanter units mounted on either side of the tractor, each of said transplanter units comprising a frame having a seat, lever operated means operatively connected with the frame for raising and lowering same while retaining the seat in a position substantially parallel with the ground, a shoe, supporting means connected with the frame from which the shoe is adjustably suspended, whereby the shoe may be raised or lowered relative to the frame.

7. In combination with a tractor, a water tank, a conduit extending longitudinally of the tractor from the water tank, a transverse conduit with which the first conduit connects, discharge noz-

zles on the ends of said transverse conduit supported on transplanter units mounted on either side of the tractor, each of said transplanter units comprising a frame having a seat, lever operated means operatively connected with the frame for raising and lowering same while retaining the seat in a position substantially parallel with the ground, a shoe, supporting means connected with the frame from which the shoe is adjustably suspended whereby the shoe may be raised or lowered relative to the frame, a floatingly mounted measuring wheel rolling on the ground and rigidly affixed to its axle, a sprocket rigidly attached to the axle and operatively connected with a shaft mounted on said frame and carrying spaced fingers, a longitudinally extending bar on the frame arranged to be intermittently operated by said fingers, a valve mounted in the aforesaid nozzle of the transverse water conduit and normally seated, and means operatively connected with said valve and adapted to be operated by the movement of the intermittently operated bar to automatically and periodically unseat the valve and discharge water from the nozzle.

8. In a transplanter, the combination of nozzles for the discharge of water to transplanted plants, valves in said nozzles, mechanism for actuating said valves, said mechanism including a longitudinally slidable bar having an upstanding finger, rotating fingers intermittently actuating said bar, and means for driving said rotating fingers, said means including a floating measuring wheel rolling along on the ground, a bracket on which said measuring wheel is rotatably mounted, a cross shaft to which said yoke is pivotally connected, a sprocket secured to the axle of the wheel, a second sprocket secured to the cross shaft and driven from the first sprocket, spring tension means operatively connected to the bracket on which the measuring wheel is mounted and exerting downward pressure on the measuring wheel to urge same into tractive engagement with the ground.

9. In combination with a tractor chassis, a transplanter having nozzles for the discharge of water to the transplanted plants, valve means in said nozzles, means for actuating said valves, said valve actuating means including a slidable bar having an upstanding finger, rotating fingers intermittently actuating said slidable bar, means for driving said rotating fingers, said driving means including a floating measuring wheel rolling along on the ground, sprockets driven by said measuring wheel, a shaft on which one of the sprockets is mounted, bracket arms pivotally mounted on said shaft and having rearwardly extending free ends on which is mounted the rolling measuring wheel, an upstanding bracket affixed to the forward ends of the said pivoted bracket arms, adjustable spring tension means connected with the upper end of said upstanding bracket, a fixed bracket to which the other end of said spring tension means is attached whereby to yieldingly hold the measuring wheel in tractive engagement with the ground, a seat for the operator, means for supporting the said seat from the tractor chassis, a shoe suspended from the transplanter for forming a furrow, and means for simultaneously raising and lowering the shoe, and transplanter frame and the measuring wheel.

LESTER H. HERSHEY.