Oct. 9, 1956 H. L. WEBSTER 2,765,756

TRANSPLANTER

Filed July 29, 1955 3 Sheets-Sheet 1

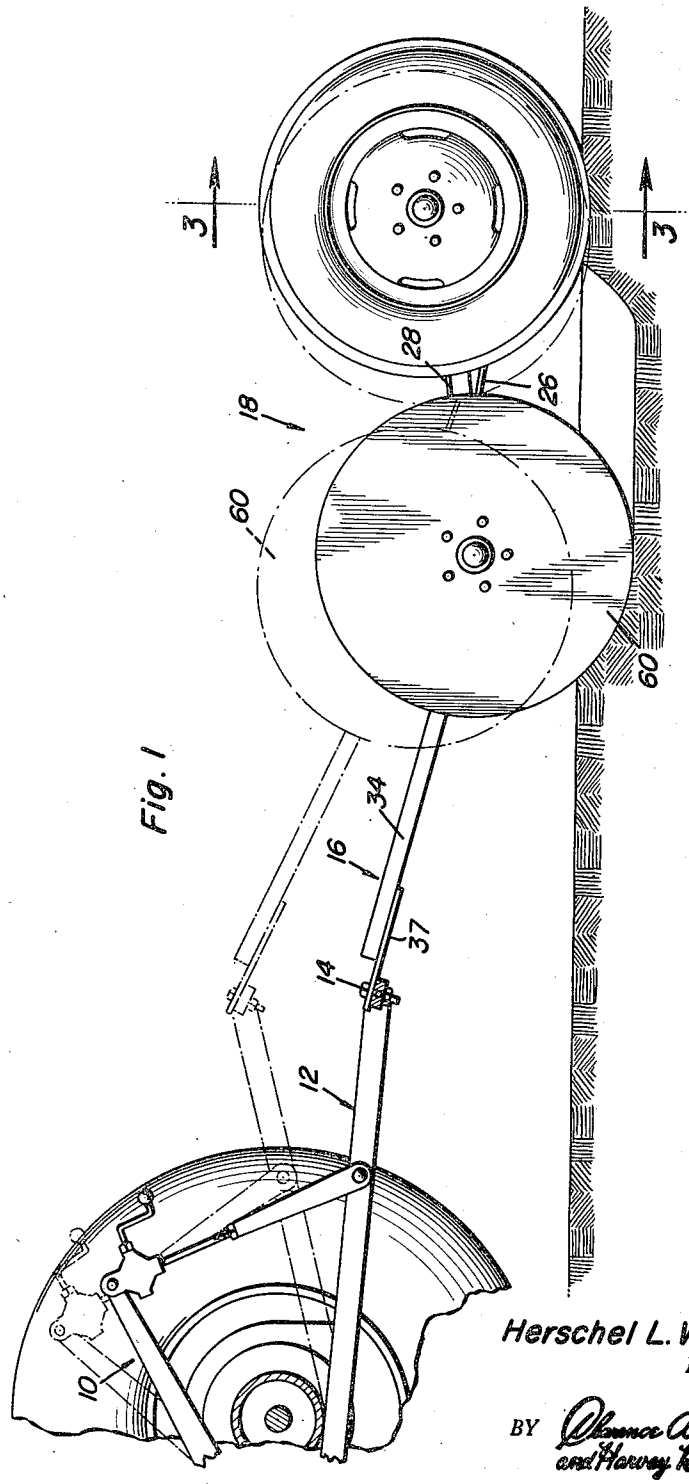


Fig. 1

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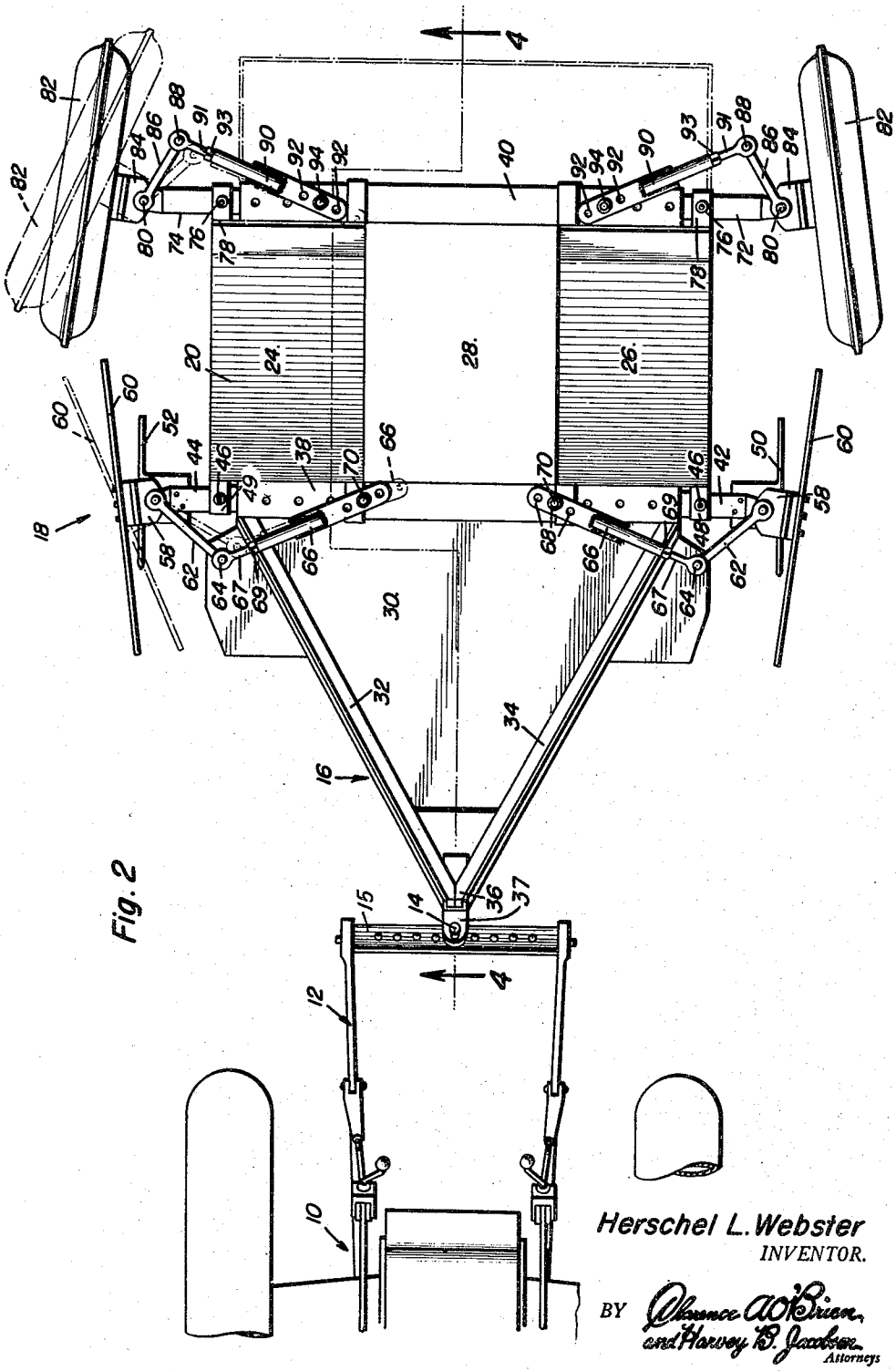


Fig. 2

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3 Sheets-Sheet 3

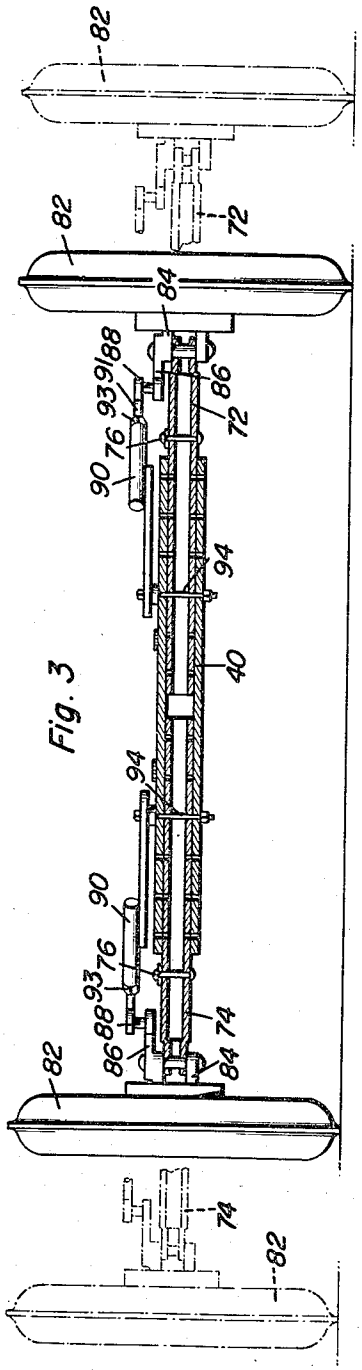


Fig. 3

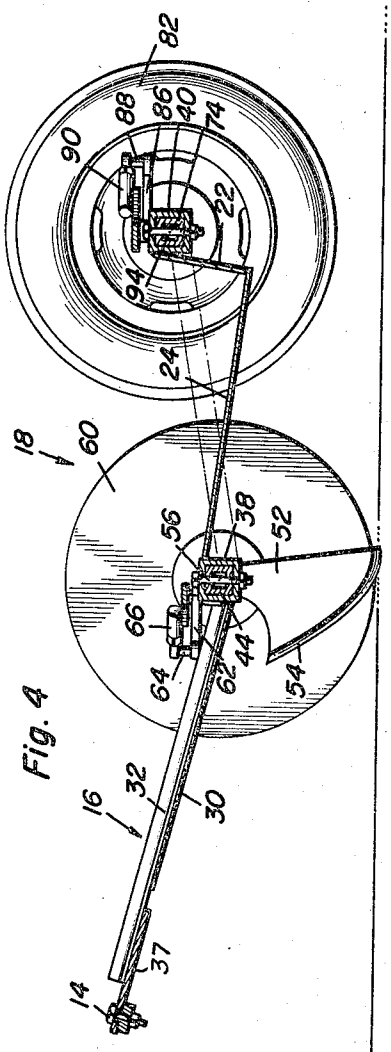


Fig. 4

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TRANSPLANTER

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5 Claims. (Cl. 111—3)

This invention relates generally to transplanter apparatus and is more particularly concerned with a novel transplanter incorporating a fixed and angularly related cutter blade for providing a planting furrow with a vertical side wall portion for orienting seedlings to be planted therein, and an angularly related trailing combined supporting and packing wheel defining a rolling track in opposition to that formed by the rolling cutter for packing soil toward the vertical side wall of the furrow formed by the fixed and rolling cutters.

A further object of invention in conformance with that set forth above is to provide a plural row transplanter including a pair of oppositely disposed fixed and angularly related cutter blades for providing a pair of planting furrows with vertical side wall portions for orienting seedlings to be planted therein, and angularly related trailing combined supporting and packing wheels defining a rolling track in opposition to that of the rolling cutters for packing soil toward the vertical side wall portions of the furrows formed by the fixed and rolling cutters.

A still further object of invention in conformance with that set forth above is to provide a transplanter apparatus of the character set forth, means for adjusting the cutter blade and packing wheels in transverse relationship relative to a drawn support frame, and means for adjusting the angular relationship of the rolling blade relative to the support frame and fixed blade, and for adjusting the packing and support wheel relative to the support frame and in opposite angular relationship to the adjustment of the rolling blade relative to the frame.

A still further object of invention in conformance with that set forth above is to provide a transplanter apparatus of the character set forth a transplanter which is relatively economically and readily manufactured, highly utilitarian and efficient in use, and readily acceptable, easily maintained and serviced, requiring a minimum of experience for attaining the maximum results in use.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a side elevational view showing the novel transplanter apparatus as attached to a drawing vehicle, and showing in phantom lines the manner of adjusting the transplanter attachment by means of the power lift of the drawing vehicle;

Figure 2 is a top plan view of the transplanter attachment as attached to the drawing vehicle, showing in phantom lines the relative position of the rolling coulter blade relative to the combined packing and support wheel;

Figure 3 is a sectional view taken substantially on line 3—3 of Figure 1, showing in phantom lines the relative position of adjustment of the packing wheels transversely with respect to the support frame; and

Figure 4 is a sectional view taken substanttially on line 4—4 of Figure 2.

Indicated generally at 10 is the rear portion of a drawing vehicle, such as a tractor, which includes conventional power lift structure indicated at 12 of any suitable character to which is secured by means of a securing pin 14, for example, draft bar hitch means indicated generally at 16 of the novel transplanter assembly indicated generally at 18. It is to be understood that when the draft bar hitch means 16 of the transplanter assembly is raised into the phantom line position as seen in Figure 1, suitable lost motion will be provided between the connection of the draft bar hitch means 16 and the power lift of the drawing vehicle in order to prevent any binding therebetween, the adjustment seen in Figure 1 being for the purpose of adjusting rotary cutter blades of the transplanter assembly to a raised position whereby said assembly may be transported on the highway, for example, by means of combined packing and supporting wheels as will subsequently be described.

The transplanter assembly 18 includes a support frame 20 comprised of an elongated flat sheet of any suitable material which has a rear upwardly extending vertically disposed flange portion 22, a pair of oppositely disposed seat portions 24 and 26, see Figure 2, which have interposed therebetween a support portion 28 which may support thereon a basket of seedlings, or suitable source of water for watering seedlings being planted, this portion being readily accessible to men seated on portions 24 and 26 and planting in furrows to be subsequently described, the support frame including a forward support portion 30 which may support either a container for seedlings or a container of water for watering said seedlings, the portion 30 having secured thereto a pair of elongated converging channel elements 32 and 34 which intersect at 36 and are connected to a link 37 suitably secured by means of the fastener 14 to the draw bar 15 of the power lift of the drawing vehicle. The portion 30 of the support frame is secured to the portions 24, 26 and 28 by means of a forward tubular support element 38 which is suitably secured therebetween by means of welding, for example, and which extends throughout the width of said support frame. A rear tubular support element 40 is secured in transversely extending relationship to the frame by means of welding, for example, at the upper edge of the vertical flange portion 22. It will be noted that the tubular elements 38 and 40 are of rectangular configuration, however, they may also be circular, oval etc.

The support element 38 includes end portions terminating adjacent the sides of the support frame 20 and which end portions receive therein end portions of stub axles, or shafts 42 and 44 which are transversely adjustable within the tubular support element 38 relative to the support frame, and are retained in a relatively fixed position by means of suitable securing elements 46 which extend through said stub axles 42, 44 and tab portions 48 and 49 of the support frame which overlie said stub axles 42 and 44, respectively. The stub axles 42 and 44 have secured thereon fixed cutter blade elements 50 and 52 which extend relatively parallel to the side edge of the support frame 20 and parallel to the normal direction of travel of said frame when drawn by the vehicle 10, said cutter blades each including a forward cutting edge 54 which terminates downwardly and rearwardly. The stub axles 42 and 44 include thereon in suitable vertical aligned aperture portions vertical pivot shafts 56 pivotally supporting a coulter disk hub portion 58 which rotatably supports in any suitable manner a rotating flat coulter or cutting disk 60 which is adjustable in angular relationship relative to the support frame 20 and the fixed cutter blades 50 and 52 whereby the fixed cutter blades and coulter 60

form a furrow with a vertically extending wall when the frame 20 is moved by the drawing vehicle. The vertically extending wall portion of the furrow permits the person sitting on seating portions 24 and 26 to readily orient a seedling within the furrow and place the same in substantially vertically extending supported position aljacent the vertical side wall portion of the furrow formed. A lever element 62 is integrally secured to the hub portions 58 of the coulter disk, and is pivotally secured at 64 to a lever element 66 having a plurality of aperture portions 68 therein through which may extend a securing bolt element 70, see Figure 3, whereby the relative positioning of the securing bolt 70 in the aperture 68 and a plurality of aligned apertures extending through tubular support element 38 and the stub axles 42 and 44 results in the adjustment of the angularity of the coulter disk 60 relative to the fixed blades 50 and 52 and the side edges of the support frame 20. The lever element 66 includes an internally threaded tubular element having an externally threaded bolt element 67 threadedly retained therein a relatively fixed position with respect to the tubular element by means of a suitable lock nut 69 engageable with the tubular element. The pivotal connection at 64 incorporates a readily removable pivot pin of any suitable character whereby said pin may be removed and the bolt 67 may be rotated within the tubular element to adjust the angularity of the coulter disk to a finer degree than that permitted by means of the apertures 68 and the securing bolt 70. Although the angular adjustment of the coulter disk 60 has been referred to relative to Figure 3, it is to be understood that the packing and support wheels to be subsequently described are adjusted in the same manner as the previously described coulter disks 60.

The tubular support element 40 supports on opposite end portions adjacent the sides of the support frame 20 stub axles, or shafts 72 and 74 which are adjustably retained therein by means of suitable fastening elements 76 which extend through the stub axles and overlying tab portions 78 of the support frame 20, see Figure 2. The stub axles 72 and 74 include on outer end portions thereof vertically disposed pivot pin portions 80 which extend through suitable aperture portions contained in the stub axle portions which pivotally support vertically pivotal support and packing wheels 82 which include suitably apertured hub portions 84 permitting the rotation of the wheels 82 and the adjustment about the vertical pivot pin portions 80 whereby the support and packing wheels may be adjusted into substantially parallel alignment with the normal direction of travel of the support frame 20 for transporting the same on the roads, etc., or the packing wheels 82 may be adjusted when being used for packing purposes, see Figure 2, in an opposite angular relationship relative to the angularity of the cutting disk or coulter 60 whereby after a seedling has been placed in the furrow adjacent the side wall portion thereof the packing wheel will pack soil in a direction opposite to the formed side wall portion the soil being packed against the seedling and retaining it in a supported position against the relatively firm side wall portion of the furrow formed. Thus it may be said that the rolling path of the packing wheels 82 is in substantial alignment but in angular opposition to that of the rotating, cutting disks or coulter 60 and the furrow formed thereby in cooperation with the fixed cutter blades 50 and 52. The hub portions 84 of the packing wheels 82 have integrally secured thereto and rotatable therewith lever elements 86 which are pivotally connected at 88 to lever assemblies 90 having a plurality of apertures 92 extending therethrough, said apertures 92 receiving a suitable connecting pin element 94 securing the lever elements 90 in pairs of aligned aperture portions extending through the stub axles 72 and 74, respectively, and the elongated support element 40, see Figure 3. Thus both the rotating coulter blade assembly 60 and packing wheels 82 may be adjusted in opposite relative angularity with respect to the frame 20, and may also be adjusted transversely with respect to the side edge of the frame 20 for the purpose of defining larger or smaller furrows, and for properly aligning the trailing, tracking relationship of the packing wheels relative to the furrow being formed by the fixed cutter blades and rotating coulter disk.

It is to be understood that the lever element 90 incorporates a tubular element including a threaded bolt element 91 and a lock nut 93 which function in the same manner as previously described relative to the lever element 66, bolt element 67 and lock nut 69 whereby a finer degree of adjustment of the packing wheels 82 may be obtained.

The angular disposition of cutting edge 54 of the fixed cutter blades 50 and 52 will permit ready formation of the previously mentioned vertical side wall portion of the furrow to be formed, as well as preventing the accumulation of debris on said blades.

Although there has been disclosed and described a transplanting assembly which provides dual relative parallel furrows whereby the apparatus may be used by two men sitting on portions 24 and 26, it is apparent that the relationship of the coulter disk and fixed cutter blade and the packing wheel may be provided on a support frame whereby a single row of seedlings is being planted.

Various positional directional terms such as "front," "rear," "side," etc., are utilized herein to have only a relative connotation to aid in describing the device and are not intended to require any particular orientation with respect to any external elements.

What is claimed as new is as follows:

1. A transplanter assembly for setting seedlings comprising a support frame having draft bar means securable to a vertically adjustable power lift of a drawing vehicle, a pair of oppositely disposed transversely adjustable stub shafts carried on said frame, fixed cutter blades secured to each stub shaft normal thereto in substantially parallel relaionship to the normal direction of travel of said frame, a vertical pivot axis hub portion on the outer end portion of each of said stub shafts, a flat adjustable rotatable coulter blade disk operatively secured on the vertical pivot axis hub portion of each of said stub shafts, adjusting means on said frame operatively connected to each of said coulter blade disks adjustably positioning each of the coulter blade disks angularly relative to the fixed cutter blades in the normal direction of travel of said frame for providing a furrow with a substantially vertical side wall portion, a second pair of transversely adjustable stub shafts carried on said frame in rearwardly disposed relationship to said first pair of said stub shafts, a vertical pivot axis hub portion on the outer end portion of each of said second stub shafts, a combined packing and supporting wheel carried on the vertical pivot axis hub portion of each of said second pair of stub shafts in rearwardly spaced relationship from each of said coulter blade disks and in alignment with the furrow formed, and adjusting means on said frame operatively connected to each of said packing and support wheels adjustably positioning said wheels at an angular relationship relative to the normal direction of travel of said frame in opposite angular relationship relative to the angular relationship of the coulter disk blades, the rolling track of the packing and support wheels being in alignment and in opposition to the rolling track of said coulter blade disks for packing soil toward the vertical side wall portions of the furrows formed thereby.

2. A transplanter assembly as set forth in claim 1 wherein the fixed cutter blades each include a forward cutting edge terminating downwardly and rearwardly.

3. A transplanter assembly as set forth in claim 1 wherein the support frame includes forward and rear transverse tubular support elements having open ends adjacent opposite side edge portions of the support frame, said first and second pairs of stub axles having end

portions adjustably retained in the ends of the tubular support elements.

4. In a transplanter assembly for setting seedlings comprising a support frame having a draft bar means securable to a vertically adjustable power lift of a drawing vehicle, a flat rotatable coulter blade disk supported on a vertical pivot axis hub portion on said frame, adjusting means on said frame operatively connected to said coulter blade disk adjustably positioning the coulter disk at an angle relative to the normal direction of travel of said frame, a fixed cutter blade supported on the frame adjacent the coulter blade in a position relatively parallel to the normal direction of travel of said frame, said fixed blade and said rotatable coulter blade disk defining a furrow with a substantially vertical side wall portion, a combined packing and support wheel supported on a vertical pivot axis hub portion of said frame in rearward spaced relationship to said blades in alignment with the furrow formed thereby permitting seedlings to be placed between the blades in substantially vertically supported relationship to the vertical side wall portions of the furrow formed, and adjusting means carried on said frame operatively connected between said packing and support wheel and frame adjustably positioning said wheel at an angular relationship relative to the normal direction of travel of the frame in an opposite angular relationship relative to the angular relationship of the coulter blade disk, the rolling track of the packing and support wheel being in trailing alignment in opposition to the angular rolling track of the coulter blade disk for packing soil toward the vertical side wall portion of the furrow formed by the cutter blades.

5. A transplanter assembly as set forth in claim 4 wherein the fixed cutter blades each include a forward cutting edge terminating downwardly and rearwardly from the normal direction of travel of said frame.

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