Oct. 19, 1954 M. B. JEFFREYS 2,691,948

TRACTOR TRANSPLANTER

Filed June 21, 1949

3 Sheets-Sheet 1

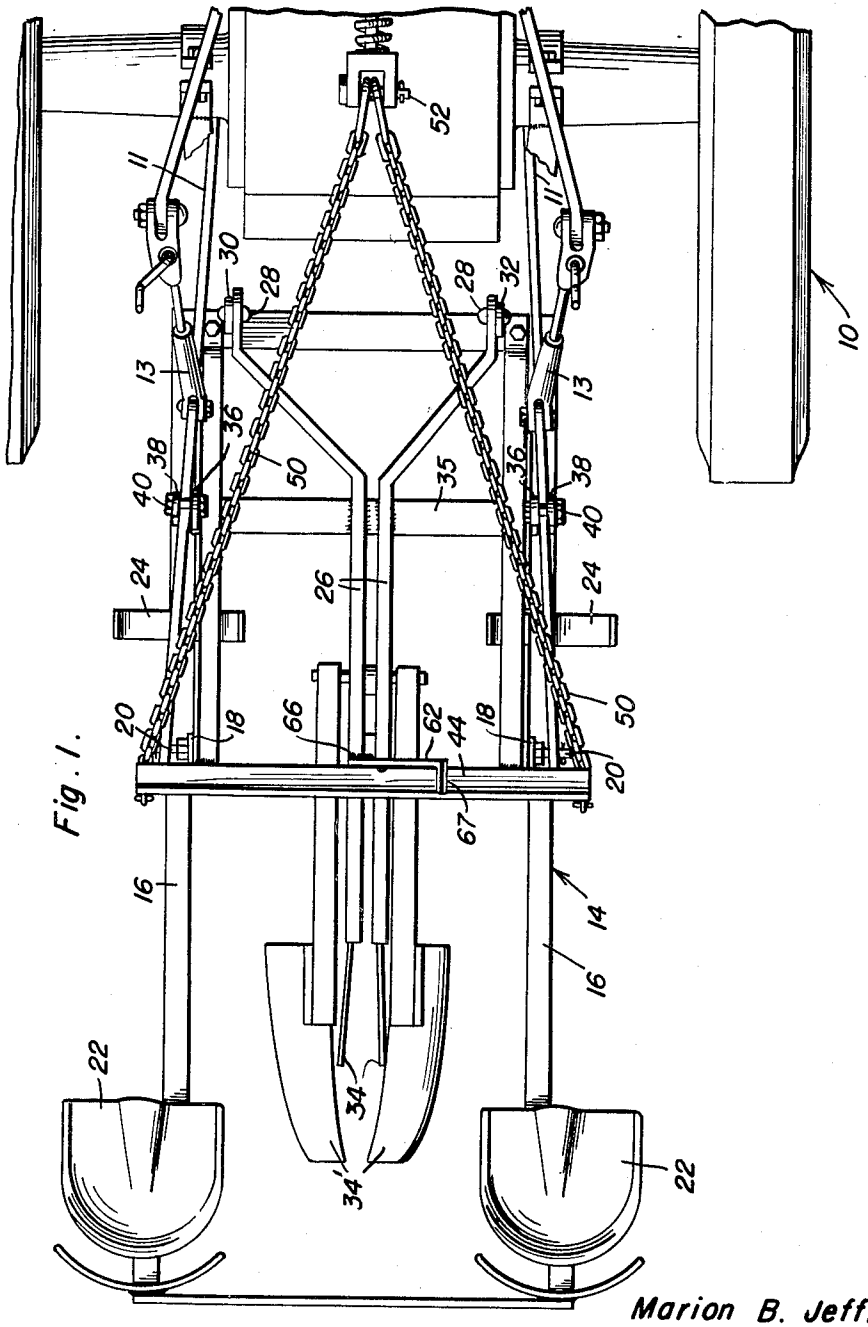


Fig. 1.

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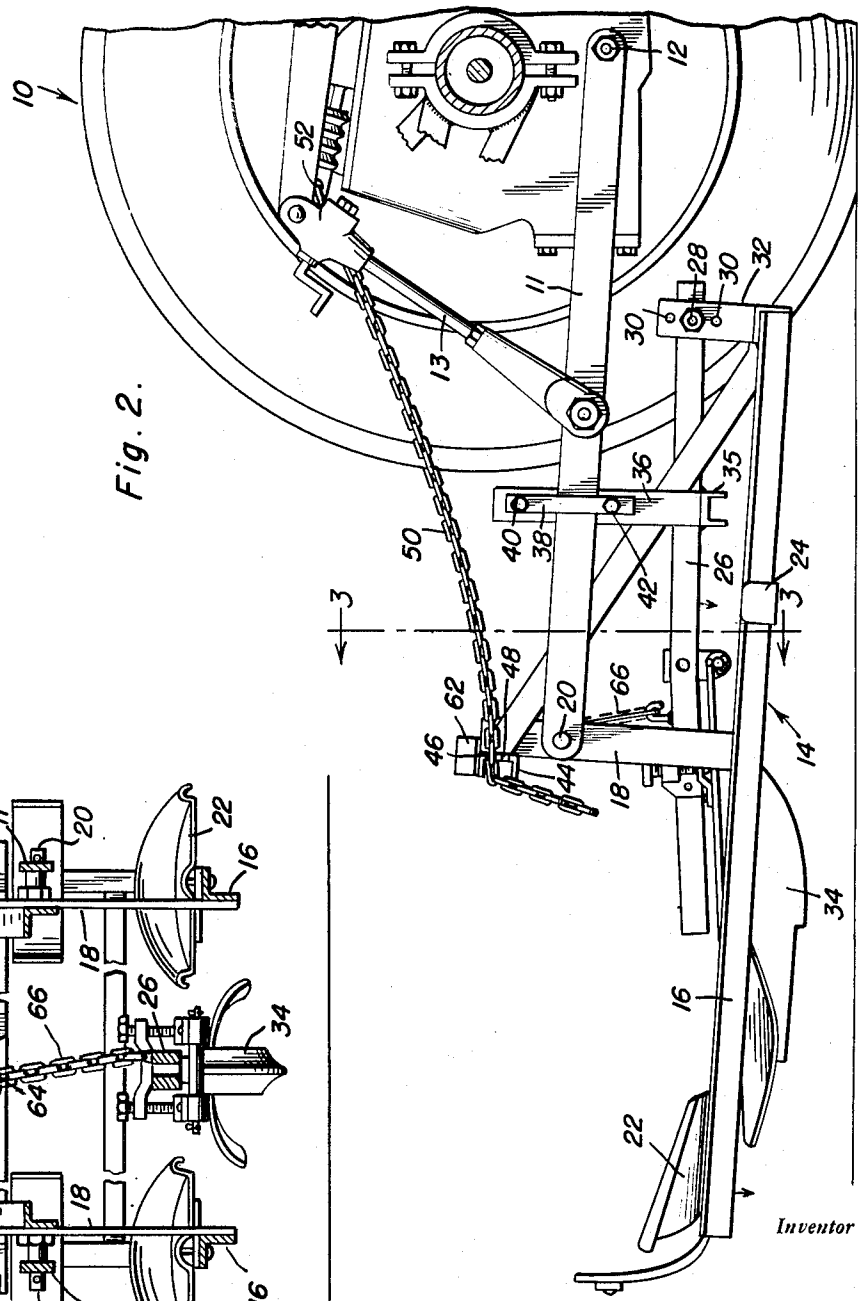


Fig. 2.

Fig. 3.

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Fig. 4.

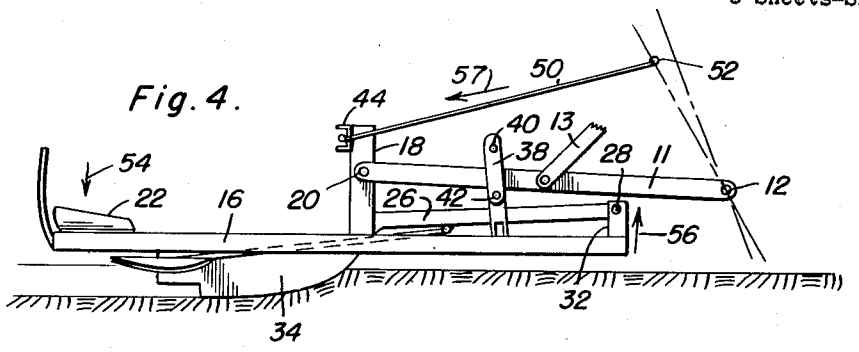


Fig. 5.

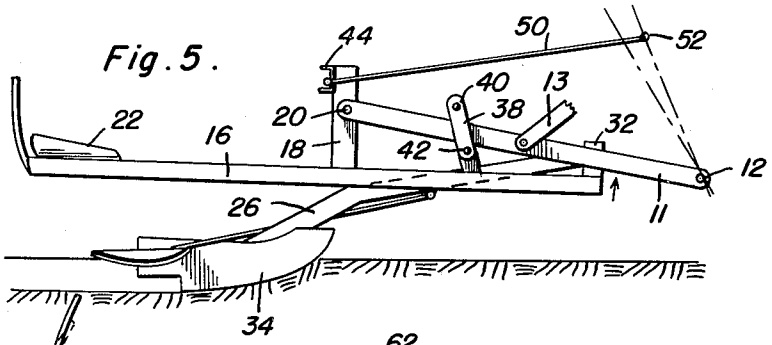


Fig. 6.

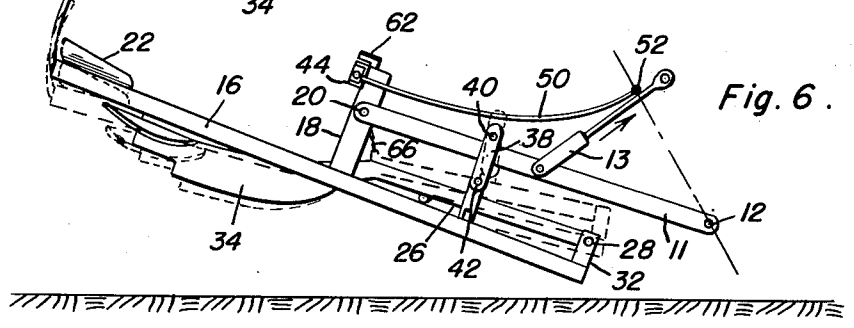
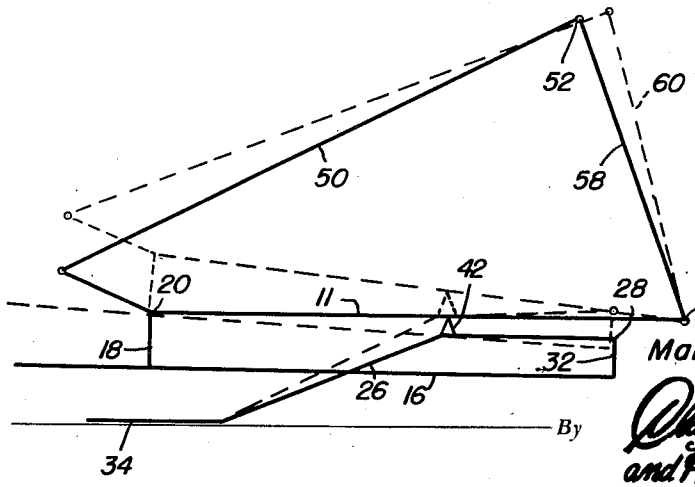


Fig. 7.



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TRACTOR TRANSPLANTER

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Application June 21, 1949, Serial No. 100,410

2 Claims. (Cl. 111—62)

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This invention relates to new and useful improvements and structural refinements in transplanting implements, more particularly, transplanting implements which are attachable to and motivated by a tractor, and the principal object of the invention is to assure efficient, expeditious and convenient performance of the transplanting operation by maintaining the ground engaging shoe of the transplanter at an even depth in the earth regardless of any rising and falling movement of the tractor and transplanter as caused by irregularities of the ground, and regardless of the condition of the soil which may otherwise cause the shoe of the transplanter to rise or fall when hard or soft spots in the ground are encountered.

In conventional transplanters the shoe was maintained in engagement with the ground by resilient means, but since the effectiveness of such means was limited and irregular, the shoe was not always maintained at constant depth and in proper engagement with the ground. The instant invention seeks to eliminate this disadvantage by embodying in a transplanter means for maintaining the shoe in engagement with the ground by a positive weight of the person or persons attending the transplanter, and an important feature of the invention involves the provision of means for adjusting or varying the distribution of the attendant's weight so that a predetermined portion thereof is applied to the transplanter shoe while the remaining portion thereof is transmitted to and supported by the tractor.

Some of the advantages of the invention lie in its simplicity of construction, in its convenient operation, in its adaptability for use in association with tractors of different types, and in its adaptability to economical manufacture.

With the above more important objects in view and such other objects and features as may become apparent as this specification proceeds, the invention consists essentially of the construction and arrangement of parts as shown in the accompanying drawings in which:

Figure 1 is a top plan view of the invention associated with a rear portion of a tractor;

Figure 2 is a side elevational view thereof, one of the tractor wheels being removed so as to reveal the invention;

Figure 3 is a cross-sectional view taken substantially in the plane of the line 3—3 in Figure 2 looking in the direction of the arrows;

Figures 4, 5 and 6 are diagrammatic side elevational views showing different operating positions of the invention, and

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Figure 7 is a diagram of the forces acting in the invention.

Like characters of reference are used to designate like parts in the specification and throughout the several views.

Referring now to the accompanying drawings in detail, the general reference character 10 designates a conventional tractor provided at the rear end thereof with a liftable and lowerable carrier for implements which is of a conventional construction and includes, inter alia, a pair of lift arms 11 pivoted to the tractor as at 12 and actuated by hydraulically controlled links 13.

The invention resides in the provision of a transplanter designated generally by the reference character 14, the same consisting of an elongated frame 16 equipped intermediate its ends with upstanding side pieces 18 which are pivotally connected by means of suitable pins 20 to rear ends of the lift arms 11, as is best shown in Figure 2.

As will be clearly apparent, the frame 16 extends forwardly and rearwardly of the pivots 20 and the rear end portion of the frame is provided with a pair of transversely spaced seats 22 to accommodate the attendants of the transplanter. If desired, suitable foot rests 24 may be provided on the frame forwardly of the seats 22.

The transplanter also includes a pair of support members 26, extending longitudinally of the frame 16, which are pivotally connected at their forward ends to the frame, these pivotal connections being adjustable and being facilitated by the provision of pivot bolts 28 which are selectively receivable in a plurality of vertically spaced apertures 30 provided in brackets 32 with which the forward end portion of the frame 16 is equipped.

The rear portion of each member 26 carries a conventional ground engaging transplanter shoe designated by the reference character 34, this shoe being of the type commonly used with transplanters and being intended, of course, to form a furrow in the ground in which small plants may be deposited and subsequently covered by soil gathered by covering means 34' associated with the shoe, as will be clearly apparent.

A transverse support member 35 is rigidly secured to the members 26 at points intermediate the pivots 20 and 28. Rigidly secured to the support member and extending upwardly from ends thereof are brackets 36 having attached thereto a pair of straps 38 which are disposed in spaced relation from the brackets so as to form slots in which portions of the lift arms 11 are slidable. The bolts by which the straps 38 are secured to

the brackets **36** are indicated at **40, 42**, and are best shown in Figure 2.

A cross-piece **44** is secured to the upper ends of the side-pieces **18** and is provided in the end portions thereof with pairs of vertically spaced notches **46, 48**, it being noted that these notches are located at different distances from the pivots **20**. End portions of a pair of chains **50** may be anchored selectively in the notches **46, 48**, these chains being connected to a common draft pin **52** of the tractor **10**.

The operation of the invention will be best understood by referring to the accompanying Figures 4–7, inclusive, wherein Figure 4 illustrates the device in operation with the transplanter shoes traveling at a predetermined depth through the ground. This depth is set by means of the links **13** which support the arms **11** to vary the heights of the pivots **20**, and downward pressure in the form of operators' weights on seats **22** (see arrow **54** in Figure 4) tends to swing the frame **16** about the pivots **20** as at **56**. Upward movement of the forward end of the frame **16** results in upward movement of the forward ends of the members **26** with the result that the bolts **42** engage the arms **11** and urge the transplanter shoes downwardly into the earth. Penetration of the transplanter shoes may be limited by transmitting portions of the operators' weights to the draft pin **52** through the use of the chains **50** as at **57**.

Inasmuch as the weight transmitted to the transplanter shoes depends directly upon the weight transmitted by the chains, it will be seen that the weight transmitted to the transplanter shoes may remain constant for different operators by varying the positions of the chains.

Assuming now that the front wheels of the tractor, for example, run over low ground. Such occurrence would, in conventional practice, cause the transplanter shoes to use out of the ground or travel at an insufficient depth. On the other hand, when the invention is used, forward declination of the tractor will shift an imaginary axis **58** which passes through the points **12** and **52** (Figure 7) to a position indicated by **60**. This results in the upward pivoting of arms **11** about points **12** due to the tension of chains **50**. Upward pivoting of arms **11** in turn results in the use of pivots **20** and the lifting of the entire frame **16**.

Upward movement of frame **16** results in the attempted upward movement of members **26** relative to arms **11**. However, inasmuch as bolts **42** bear against the arms **11**, the rear ends of the members are pivoted downwardly with respect to both the arms **11** and the frame **16**. Due to the relative proportions of the arms **11**, the frame **16**, and the members **26**, the transplanter shoes move downwardly relative to the frame the distance as the frame moves upwardly so as to maintain constant penetration of the transplanter shoes.

When the front wheels of the tractor travel over a rise in the ground, it will be understood that the axis **58** will have its upper end tilted rearwardly. This will result in the lowering of the pivots **20** and the bodily lowering of the entire frame **16**. This will cause bolts **42** to attempt to move away from the arms **11**. However, upward thrust on the transplanter shoes **34** by the ground will retain the bolts **42** in engagement with the arms **11** with the transplanter shoes moving upwardly relative to the frame **16**. Inasmuch as upward movement of the transplanter shoes relative to the frame is equal to downward movement of the frame, the penetrating of the transplanter shoes will remain constant.

When the invention is being transported on the tractor, or while turning sharp corners, the entire carrier and transplanter attachment may be lifted from the ground by actuating the links **13**. However, to prevent the shoe **34** dragging on the ground, a bell crank **62** is attached by a pivot **64** to the cross-piece **44** and connected by a chain **66** to the member **26** (see Figure 3). This chain is attached to an anchor **65** on one limb of the crank, while the other limb of the crank is provided with a stop **67**, engageable with the cross piece **44**. When the crank **62** is swung so that the anchor **65** is disposed between the stop **67** and the pivot **64**, the chain **66** will sustain the member **26** against dropping relative to the frame **16**.

It is believed that the advantages and use of the invention will be clearly apparent from the foregoing disclosure and accordingly, further description thereof at this point is deemed unnecessary.

While in the foregoing there has been shown and described the preferred embodiment of this invention, it is to be understood that minor changes in the details of construction, combination and arrangement of parts may be resorted to without departing from the spirit and scope of the invention as claimed.

Having described the invention, what is claimed as new is:

1. In combination with a tractor having a pair of rearwardly extending lift arms, a transplanter comprising an elongated frame provided intermediate its ends with upwardly extending side pieces, means pivotally connecting said side pieces to said arms for swinging movement of said frame about a transverse horizontal axis, said frame having a rear portion provided with a seat, a support member pivoted to the front portion of said frame and extending rearwardly therefrom, a ground engaging shoe mounted at the rear end of said member, a pair of upstanding brackets mounted on an intermediate portion of said member, each of said brackets having parts providing a vertical slot slidably receiving one of said arms, fulcrum elements provided on said brackets at the lower ends of said slots and engaging the lower edges of said arms, for transmitting downward pressure on said seat to said shoe, and releasable interconnecting means between said frame and said support member for sustaining said support member against downward swinging movement relative to said frame.

2. The device as defined in claim 1 wherein said interconnecting means comprise a cross piece mounted at the upper ends of said side pieces, a pivot on said cross piece, a bellcrank mounted on said pivot and including a first limb and a second limb, an anchor provided on the first limb, a flexible element extending from said anchor to said support member, and a stop provided on the second limb and engageable with said cross piece when said crank is in a position wherein said anchor is disposed between said pivot and the stop.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,886,457	Winkley	Nov. 8, 1932
2,336,410	McKay	Dec. 7, 1943
2,475,078	Cherry	July 5, 1949