W. MOWRY.

PLOW.

APPLICATION FILED FEB. 24, 1913

1,134,149.

Patented Apr. 6, 1915.

3 SHEETS—SHEET 1.

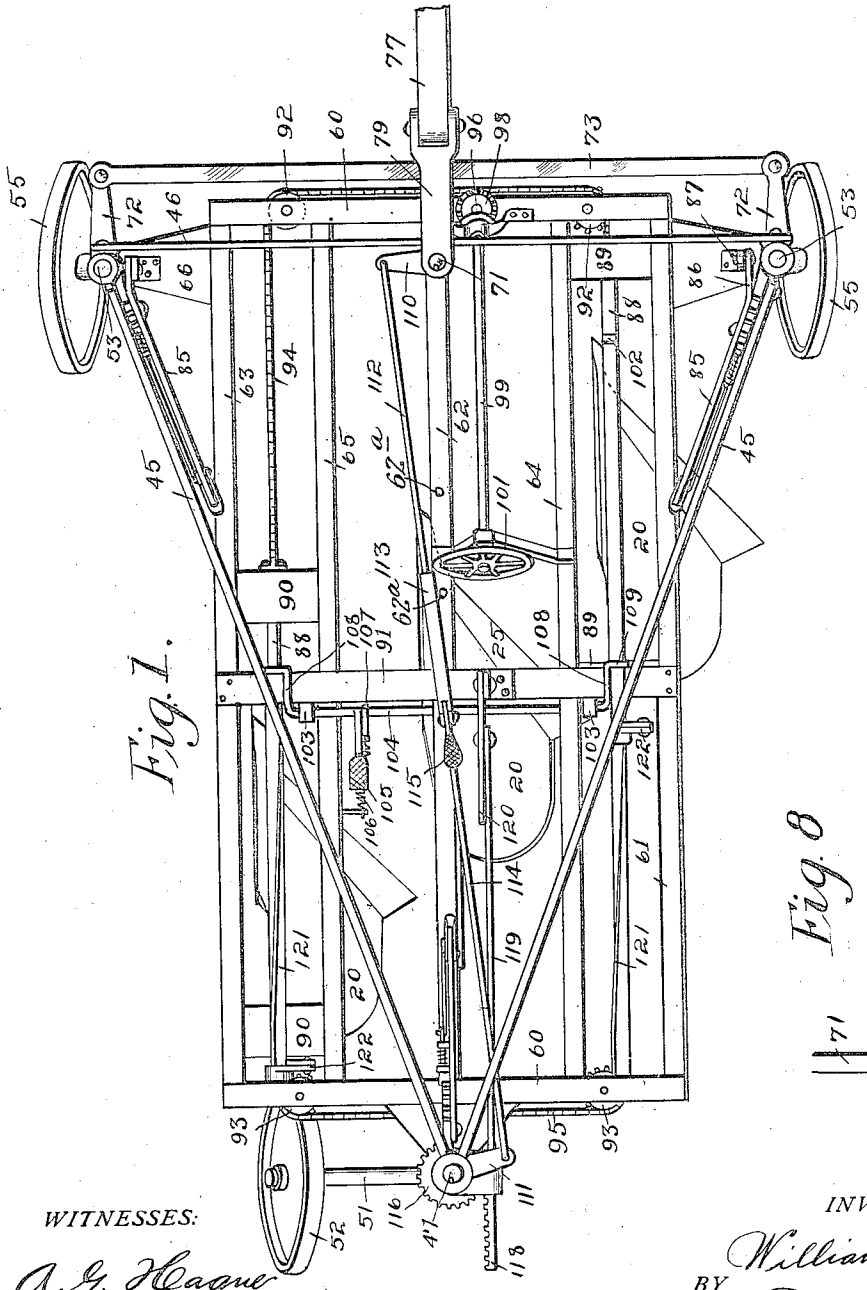


Fig. 1.

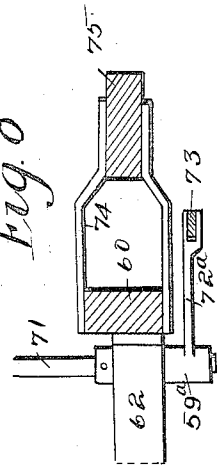


Fig. 8

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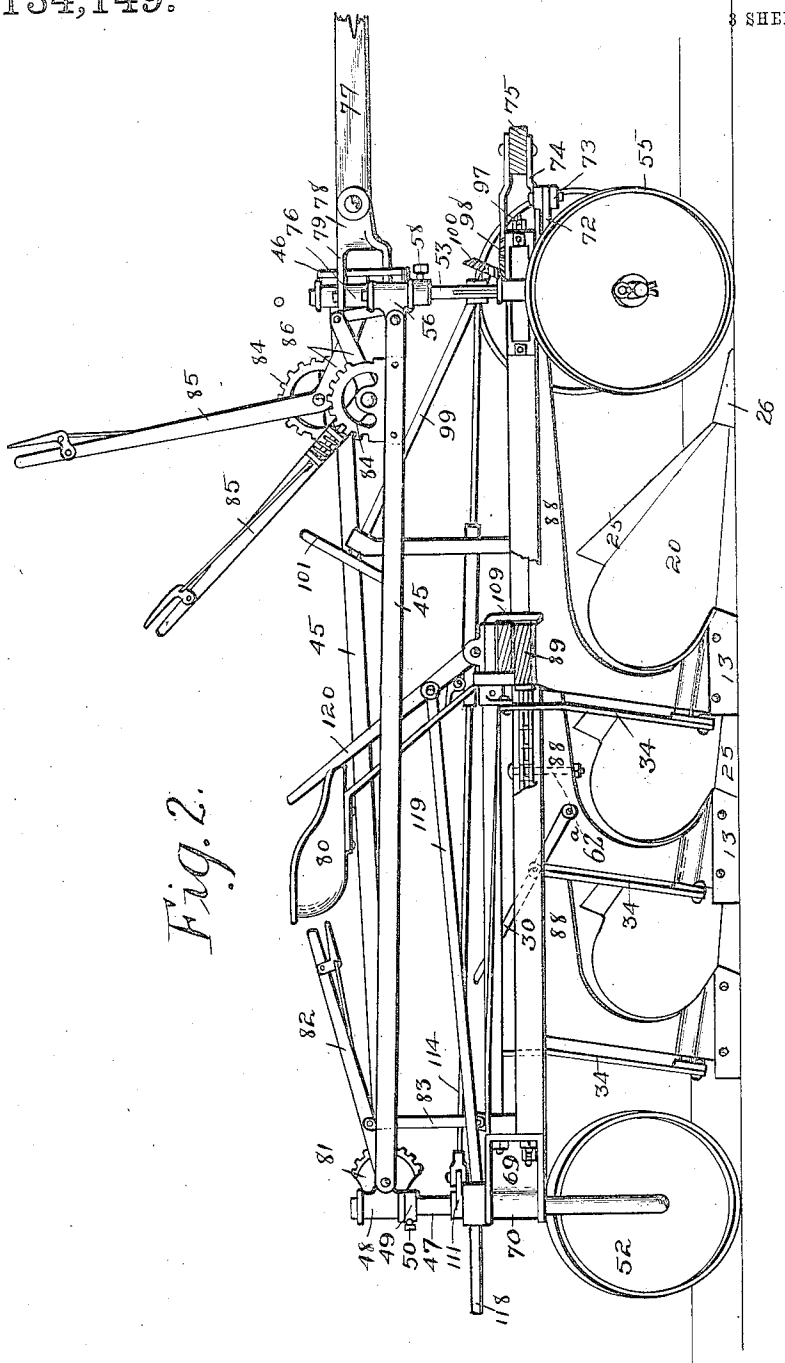


Fig. 2.

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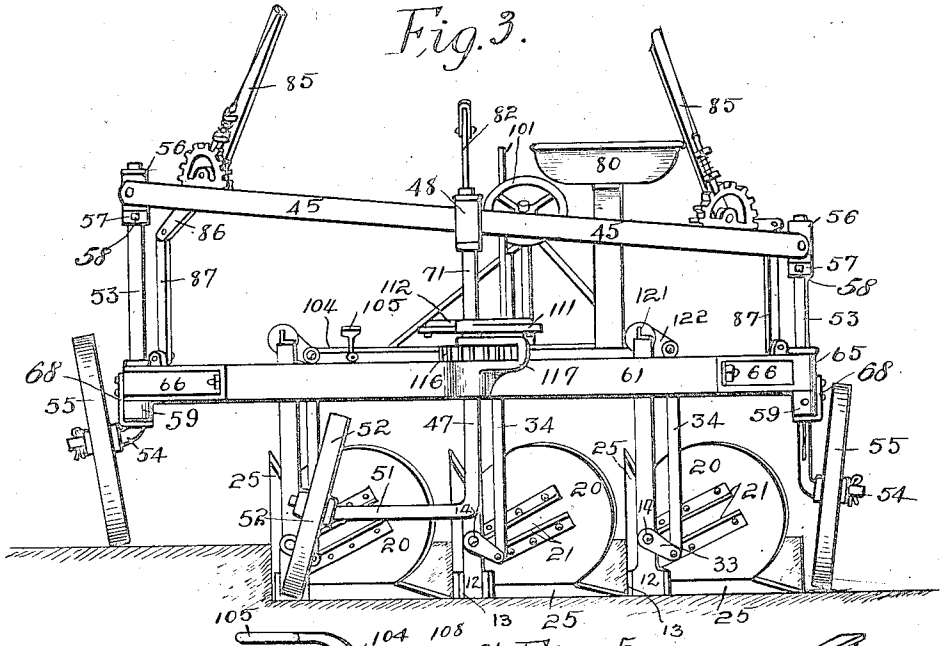
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3 SHEETS—SHEET 3.

Fig. 3.



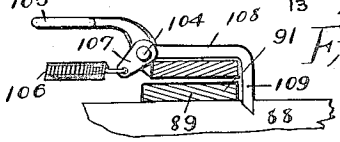


Fig. 5.

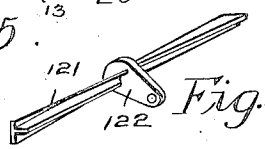


Fig. 7.

Fig. 4.

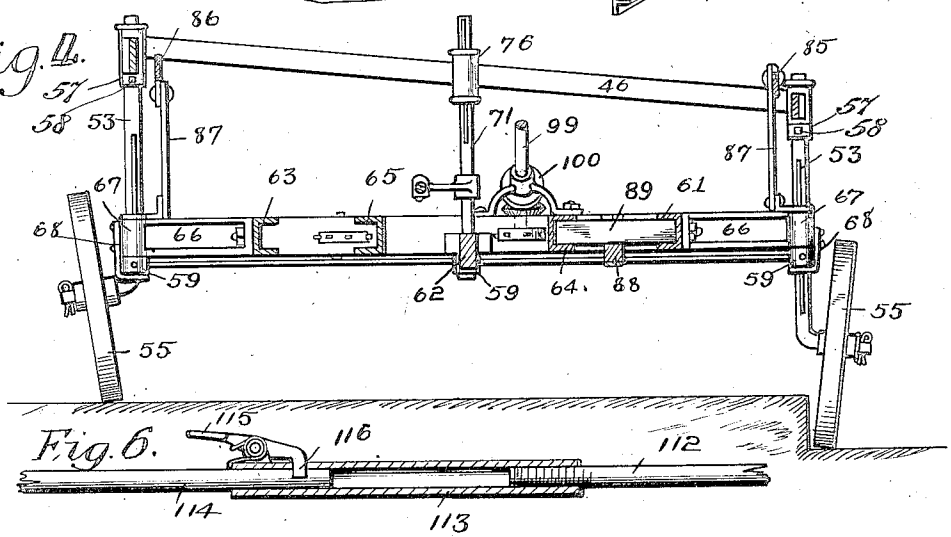


Fig. 6.

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1,134,149. Specification of Letters Patent. Patented Apr. 6, 1915.

Application filed February 24, 1913. Serial No. 751,147.

To all whom it may concern:

Be it known that I, WILLIAM MOWRY, a citizen of the United States, and resident of Marshalltown, in the county of Marshall and State of Iowa, have invented a certain new and useful Plow, of which the following is a specification.

The object of my invention is to provide a plow of the type in which the mold board and shares are reversible so that the plow may be used either as a right hand or left hand plow.

A further object is to provide a plow of the type mentioned of simple, durable and inexpensive construction, so built and arranged that the movable parts of the plow are firmly and securely mounted, and provided with mechanism whereby said movable parts may be easily and quickly moved from one position to another.

A further object is to provide in such a plow, simple and effective means for locking the movable parts of the plow at either limit of their movement.

A further object is to provide a frame mounted on wheels, and an additional frame mounted on said first frame, which second frame is so flexibly constructed and arranged that it may be raised or lowered with relation to the first frame, and so that parts of said second or flexible frame may be raised or lowered with relation to the other parts thereof.

A further object is to provide suitable mechanism for adjusting and controlling said flexible frame.

A further object is to provide a device including a plurality of reversible plows so mounted on the frame and provided with such controlling mechanism that the outer plows may be moved rearwardly and forwardly respectively so that the reversible plows may be suitably arranged in succession for right or left hand plowing in which device the controlling mechanism is readily accessible from the driver's seat.

A further object is to provide in such a plow a single rear wheel so mounted and constructed and controlled by such mechanism that it may be shifted so that it will always run in the last furrow.

A further object is to provide suitable means for moving said rear wheel in unison with the tongue, so that it will follow the furrow in turning the machine.

My invention consists in certain details, in the construction, combination and arrangement of the various parts of the device whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims and illustrated in the accompanying drawings, in which,

Figure 1 shows a top or plan view of a plow, embodying my invention, in which a plurality of reversible plows are mounted on a frame, parts being omitted for clearness. Fig. 2 shows a side elevation of the same. Fig. 3 shows a rear elevation of the same. Fig. 4 shows a transverse, vertical, sectional view of my improved plow frame taken on a line in front of the hand steering wheel. Figs. 5 and 6 show detail, sectional views of parts of the machine. Fig. 7 shows a perspective view of part of the reversing mechanism. Fig. 8 shows a detail, sectional view of the means for securing the tongue to the machine.

In the accompanying drawings, I have used the reference character 88 to indicate the beams of plows. Secured to the lower rear members of beams 88 are the forwardly extending members 12. On each side of each member 12 is a plate 13. Plates 13 are designed to serve as land sides depending upon the position of the reversible parts of the plow. Mounted in the rear lower portion of each beam 88 is a shaft 14 which extends forwardly and slightly downwardly to the forward end of the member 12 in which said shaft is rotatably mounted. Mounted on each shaft 14 is a mold board 20, curved in the ordinary way. Mold boards 20 are fixed to the shafts 14 by means of the brackets 21. At each side of each mold board 20 is a share 25 and at the front of each plow member is a sharp toe 26.

I preferably employ a plurality of reversible plows mounted upon a frame and provided with suitable mechanism, which will now be described.

I provide a triangular frame comprising side members 45 and the transverse member 46 which is at the forward end of the machine. The apex of the triangular frame is at the rear of the machine as shown in Fig. 1. At the rear of the machine I provide an upright shaft 47 having at its upper end a sleeve 48, in which said shaft rotates freely. Slidably mounted on the shaft 47 below the sleeve 48 is the collar 49 which may be fixed upon the shaft 47 in any position by means of the set screw 50. The rear ends of the

frame members 45 are pivoted to the sleeve 48 to permit pivotal movement of said frame members in vertical planes. The lower end of the shaft 47 is provided with the right angled horizontal extension 51, the outer end of which is preferably slightly upturned to provide a spindle for the rear wheel 52. The wheel 52 is designed to travel in the last furrow as hereinafter more fully set forth, and on account of the construction of the spindle is always inclined upwardly and slightly toward the middle of the machine. This construction is adopted so that the wheel 52 will lean away from the plowed land as shown in Fig. 3. At the forward end of each frame 45 at each corner thereof is an upright shaft 53, having at its lower end an extension 54 extending outwardly and preferably slightly downwardly as shown in Fig. 3. The extensions 54 form spindles for the front wheels 55 on which the main frame is supported. On the upper ends of the shafts 53 are sleeves 56 in which the shafts 53 rotate freely. On each shaft 53 below sleeve 56 is a collar 57 which may be fixed in any position on the shaft 53 by means of a set screw 58. The frame members 45 are pivoted to the sleeve 56 to permit said frame members a certain degree of pivotal movement in vertical planes. The transverse frame member 46 is pivoted at its ends to the sleeves 56 to permit similarly pivotal movement. Near the lower ends of the shafts 53 I provide collars 59 slidably but non rotatably mounted on said shafts. A second frame comprises transverse end members 60, side members 61 and 63, middle member 62 and spaced intermediate longitudinal members 64 and 65, members 64 and 61 being preferably formed of channel bars opening toward each other and the members 65 and 63 are made of similarly arranged channel bars as shown in section in Fig. 4.

Extending laterally from the forward end of the second frame are laterally extending arms 66, having at their outer ends sleeves 67, slidably mounted on the shafts 53, on the sleeves 67 are secured downwardly extending arms 68 for supporting the collars 59 and causing them to move upwardly or downwardly with the sleeves 67. Extending rearwardly from the rear transverse frame member 60 is a bracket 69 on which is formed a sleeve 70 in which the shaft 47 is rotatably mounted. Rotatably mounted in the longitudinal member 62 at the forward end thereof is an upright shaft 71. Fixed on the lower end thereof is the collar 59^a. Formed on and extending forwardly from the collar 59^a is an arm 72^a which is pivoted at its forward end to the transverse bar 73. Formed on and extending forwardly from the collars 59 are arms 72, which are pivoted at their forward ends to the bar 73. Secured to the forward transverse member 60, are forwardly extending brackets 74 being shown in Figs. 2 and 8, each of which is pivoted at its forward end to a transverse draw bar 75 to which the double trees or evener bars may be secured. Slidably mounted on the upper end of the shaft 71 is a sleeve 76 which is pivoted to the transverse member 46 of the flexible frame. I provide a tongue 77 the rear end of which is pivoted to swing vertically in a bracket 78 having rearwardly extending bifurcated arms 79 spaced from each other in a vertical plane, which are slidably but non rotatably mounted on the shaft 71 above and below the sleeve 76. Suitably supported on the second frame is a driver's seat 80.

The second frame is designed to be maintained in a substantial level position and to carry the plows. For sliding the second frame upwardly or downwardly on the shafts 47 and 53 and thereby maintaining it in a level position regardless of whether or not one of the wheels 53 and the wheel 52 are traveling in the furrow, I have provided the following mechanism. Fixed on the sleeve 48 is a sector 81. Pivoted to the sleeve 48 is a lever 82 provided with the ordinary spring actuated pawl for coacting with said sector. Pivoted to said lever 82 and to the rear transverse member 60 is a link 83. It will be seen that by lowering or raising the lever 82 the rear portion of plow carrying frame may be raised or lowered on the shaft 47. Mounted on the frame members 45 are sectors 84. Pivotally supported on the frame member 85, adjacent to sectors 74 are bell crank levers. One arm 85 of each bell crank lever is extended to form a lever arm on which is mounted an ordinary spring actuated pawl, designed to coact with the adjacent sector 84. The other arm 86 of each bell crank lever is pivoted to the link 87, the lower end of which is in turn pivoted to a lug extending upwardly from the arms 66. It will therefore be seen that by raising or lowering the levers 85 respectively either side of the forward end of the plow carrying frame may be raised or lowered with relation to one of the shafts 53.

Where the plurality of reverse plows are used in connection with the frames as hereinbefore described the plows are built as above described. Slidably mounted between the members 61 and 64 are blocks 89 to which the beams 88 are secured. Slidably mounted between the members 63 and 65 are similar blocks 90. I have provided an intermediate transverse member 91 connecting member 63 and 61.

As shown in drawings I have provided 3 reversible plows mounted upon the plow carrying frame. The middle plow is approximately located in the middle of the frame by bolts 62^a as shown in Figs. 1 and 2 with the beam 88 secured to the longitudi-

nal member 62. The beam of the right hand reversible plow is secured to the blocks 89 and the beam of the left hand plow is secured to the blocks 90. It will already be understood that where plows are used in gangs they are arranged in succession, each plow being in the rear of the one preceding it and also spaced apart therefrom laterally as shown in Fig. 1. In order to use reversible plows of the type herein set forth, in gangs it is necessary to change the position of some of the plows in relation to the frame by moving them rearwardly or forwardly. The plows are arranged to throw the furrow to the right and the right hand plow is arranged in front and the left hand plow in the rear. When the end of the field is reached and it is desired to turn directly back without going around the land and the plows are reversed, it is necessary to shift the positions of the right and the left hands of the plows so that the left hand plow will be in front of the middle plow and spaced apart therefrom upon the left side thereof, and the right hand plow will be in the rear of the middle plow and on the right side thereof.

For shifting the position of the right and left hand plows as just described I have provided the following mechanism. Mounted in the plow carrying frame at the forward end thereof between the members 61 and 64 and between the members 65 and 63 are sprocket wheels 92 mounted upon said frame. Mounted upon said frame in relation similar to the position at the rear end of the frame are sprockets 93. Secured to the block 89 at the forward end of the beam 88 of the right hand plow is a sprocket chain 94 which is extended around the sprockets 92 and is secured to the block 90 at the forward end of the beam 88 of the left hand plow. A similar sprocket chain 95 is secured to the rearward of the blocks 89 and 90 and extends around the sprockets 93. For operating the sprocket chains and the blocks 89 and 90 and thereby shifting the position of the right and left hand plows, I have provided the following means: Mounted in the forward transverse members 60 is a short upright shaft 96 on which is a sprocket 97 shown in Figs. 7 and 9 in mesh in the sprocket chain 94. Upon the upper end of the shaft 96 is fixed a beveled gear 98. Rotatably mounted in suitable bearings and extending upwardly and rearwardly from the forward end of the machine is a shaft 99, on the lower end of which is a beveled gear 100 in mesh with the beveled gear 98. On the upper end of the shaft 99 is a hand wheel 101. For locking the beams 88 of the right and left hand plows in either of their shifted positions I have provided the following means: In the upper surfaces of said beams 88 near the forward and near the rearward ends thereof I have provided notches 102. Rotatably mounted in suitable bearings 103 preferably on the transverse member 91 is a shaft 104 on which is a foot lever 105 which is yieldingly held at the upward position of its movement by means of a contractible coiled spring 106 which is secured to the link 107 mounted on the shaft 104 and to the plow carrying frame as shown in Fig. 1. At each end of the shaft 104 is a forwardly extending arm 108 on the forward end of which is a downwardly extending catch device 109 clearly shown in Fig. 5. The portion 108 normally rests upon the transverse member 91 as shown in Figs. 1 and 5. When the beams 88 are moved to position with one of the notches 102 below the catch device 109 and the lever 105 is released said catch device will enter said notches and hold said beams against rearward movement.

It will be noted that the tongue 77 is fixed to the bracket 78 so that when said tongue is turned in turning the machine the shaft 71 will be slightly rotated. The rotation of the shaft 71 through the collars 59, the arms 72 and the cross bar 73 causes the wheels 55 to turn laterally with the tongue for turning the machine. In order to turn the wheel 52 at the same time and also for swinging the wheel 52 around from its position as shown in Fig. 1 with the extension 51 extending laterally toward the left side of the machine at right angles to the shaft 47 to position where said extension extends in the opposite direction I have provided the following means: Fixed upon the shaft 71 is an arm 110 arranged at right angles to the longitudinal axis of the machine. Fixed to the shaft 47 is a similar arm 111 which extends away from the shaft 47 at an acute angle from the longitudinal axis of the machine so that the distance between the ends of the arms 110 and 111 will be the same regardless of the position of the wheel 52. Pivoted to the arm 110 is a link 112 which extends rearwardly into the machine and is received in the sleeve 113. Pivoted to the arm 111 is a forwardly extending link 114 the forward end of which is telescopically received in the sleeve 113. Suitably mounted on the sleeve 113 in the position where it is convenient of access is a spring controlled foot lever 115 having a catch device 116 formed on one end and designed to be received in suitable notches in the sleeve 113 and link 114 whereby said sleeve and said link may be locked together as shown in Fig. 6.

For turning the wheel 52 from one position to the other as hereinbefore mentioned I have provided the following means: Mounted on the shaft 47 is a gear wheel 116. Mounted upon the plow carrying frame is a guide device 117 carrying a rack bar 118 the teeth of which are in mesh with the

teeth of the gear 116. Connected with the rack bar is a forwardly extending link 119 controlled by a lever 120 which may be mounted upon the frame member 91. The middle plow is reversed in the following manner: Pivoted to the rear end of the beam 88 of the middle plow is a lever 30. Fixed on the rear end of each shaft 14 is a lever 33. Pivoted to the levers 33 are upwardly extending links 34. The link 34 of the middle plow is pivoted at its upper end to the lever 30. I have provided for automatically reversing the right and left hand plows when their positions are shifted in the following manner: I provide T bars 121 mounted on the plow carrying frame. Suitably mounted upon said T bars are arms 122 to one end of which is pivoted the link 34ª. The T bars 121 are twisted as shown in Fig. 7 in such a manner that when the right and left hand plows are shifted the arms 122 will be so moved as to cause the reversing of said plows.

In practicable operation of the plow shown in the drawings it has been improved by arranging the parts so that the plow carrying frame may always be substantially level for that reason I have slidably mounted it upon the shafts 53 and 47. In this connection it may be noted that the gear 116 and the arm 111 are capable of slidable but not of rotary movement with relation to the shaft 47. Assuming that above frames are in substantially level positions and that the wheel 55 and the wheel 52 on one side of the machine are then to travel on lower ground than the other wheel 55, then the lever 85 is used to raise the corner of the plow carrying frame which is low to the proper level. The lever 82 may be used to raise the rear end of said frame. When one corner of the plow carrying frame is raised at the forward end with relation to one of the shafts 53 the result in the case assumed is that the plow carrying frame remains level while one corner of the triangular frame is lower than the rest of said frame as shown in Figs. 2, 3 and 4. Assuming that the plows are set for turning a furrow to the right then when the end of the field is reached the machine may be turned around, the plow carrying frame adjusted and the plows shifted and reversed. When the machine turns and the tongue 77 is turned to an acute angle with relation to the longitudinal axes of the machine, thereby slightly rotating shaft 71, the rotation of the shaft 71 through collars 59 and arms 72 and the cross bars 73 causes the shafts 53 to rotate slightly thereby turning the wheels 55 laterally for making the turn. The rotation of the shaft 71 through the arms 110 and 111 and the mechanism connecting them causes a slight rotation of the shaft 47 for turning the wheel 52 to proper position for making the turn. When the turn has been made the foot lever 115 may be depressed and the lever 120 operated to reverse the position of the wheel 52. The hand wheel 101 may then be turned for sliding the left hand plow forwardly and the right hand plow rearwardly. As said plows move respectively forwardly and rearwardly the movement of the arm 122 of the twisted T bars 121 will cause the mold boards and shares of said plows to be reversed. The foot lever 105 may be depressed during the operation of the hand wheel 101 and released when the shift of the plows is completed thereby permitting the device 109 to enter the notches in the plow beams and securely lock the plows against rearward movement. The middle plow may be reversed by the operation of the lever 30. The tongue is attached to the upper end of the shaft 71 for the reason that such an arrangement makes it easier to turn the machine.

The advantages of my improved plow are numerous.

With a device of this type, the plow may be used for throwing the dirt in either direction and the land may be plowed from one end of the plowed ground to the other instead of plowing around a "land" in the ordinary way. By using a plow of this type the double furrow which is ordinarily produced can be avoided.

By means of the frames which have been herein described a plurality of my reversible plows may be mounted for use in a "gang." In using a plurality of reversible plows a number of difficulties must be met and it has been my purpose to solve these difficulties by the construction herein set forth. It is necessary that the frame for carrying the plow should be substantially level. This I have accomplished by mounting said frame upon upright shafts. In addition to these I have provided a flexible frame for carrying the levers and furnishing bearings for the upper ends of said shafts. The result is a very strong rigid machine. I have provided the rear wheel, so mounted that it may travel in the furrow in either position of the reversible plows and have provided suitable mechanism for changing the position of said rear wheel.

In a machine of this kind it is necessary that part of the plows be shifted as herein before set forth, and I have provided simple, inexpensive and effective mechanism for accomplishing said shift. In connection with said means I have provided means for reversing the two out side plows by the same operation which shifts their position. I have provided simple and effective means for turning the wheels laterally when the machine is turned around, which means include mechanism for causing the rear wheel to turn laterally in unison with the front wheels. All of the controlling mechanism is

within ready access from the driver's seat when the device is ready for use.

It will be readily seen that with slight modifications any ordinary number of plows may be used although for purpose of an illustration I have shown three such plows.

I desire that it be understood also that many variations may be made in the details of the construction of my machine and that it is my purpose to cover by this application for patent any variation of said construction which may come within the scope of the appended claims.

It will be understood that different forms of reversible plows may be used with my frame and shifting and reversing mechanism but I have described a reversible plow with sufficient fullness to illustrate in this application a complete machine.

By the use of the term shifting in the following claims I mean the forward and the rearward movement of the plows with the relation to the frames as hereinbefore set forth.

I claim as my invention:

1. In a device of the class described, a frame, a number of sliding plow beams thereon capable of forward and rearward movement relative to said frame, a central plow beam fixed to the frame, a reversible plow for each of said plow beams, means for shifting the position of the sliding plow beams, and means for automatically reversing the plows on said sliding beams as they are shifted.

2. In a device of the class described, a frame, a number of sliding plow beams thereon capable of forward and rearward movement relative to said frame, a shaft pivotally mounted in each of said beams, a reversible plow secured to each of said shafts, an arm secured to one end of each of said shafts, a twisted bar mounted longitudinally on said frame above and parallel with each of said sliding beams, a second arm slidingly mounted on each of said twisted bars and capable of being moved forwardly and rearwardly as said beams are shifted to a forward or rearward position, and a link connecting the free ends of the first and second arms to cause said plows to be automatically reversed as said beams are operated.

3. In a device of the class described, a frame, longitudinal guide members thereon, a number of plow beams having slide blocks mounted in said guides, a chain connecting the forward ends of said slide blocks, a second chain connecting the rear end of said slide blocks, and pulleys on the frame for said chains, an inclined shaft, a hand wheel thereon, a vertical shaft on the forward end of said frame, beveled gears connecting the lower end of said inclined shaft and the upper end of said vertical shaft, a sprocket wheel on the lower end of said vertical shaft operatively connected with said first chain, a shaft pivotally mounted in each of said beams, a reversible plow secured to each of said shafts, an arm secured to one end of each of said shafts, a twisted bar mounted longitudinally on said frame above and parallel with each of said sliding means, a second arm slidingly mounted on each of said twisted bars and capable of being moved forwardly and rearwardly as said beams are shifted to a forward or rearward position, and a link connecting the free ends of the first and second arms to cause said plows to be automatically reversed as said beams are operated.

4. In a device of the class described, a frame, longitudinal guide members thereon, a number of plow beams having slide blocks mounted in said guides, a chain connecting the forward ends of said blocks, a second chain connecting the rear ends of said blocks, and pulleys on the frame for said chains, an inclined shaft, a hand wheel thereon, a vertical shaft in the forward end of said frame, beveled gears connecting the lower end of said inclined shaft with the upper end of said vertical shaft, a sprocket chain on the lower end of said vertical shaft operatively connected with said first chain, a central plow beam fixed to the frame, a reversible plow for each of said plow beams, means for shifting the position of the sliding plow beams, and means for automatically reversing the plows on said sliding beams as they are shifted.

Des Moines, Ia., February 11, 1913.

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Witnesses:

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