

May 5, 1953

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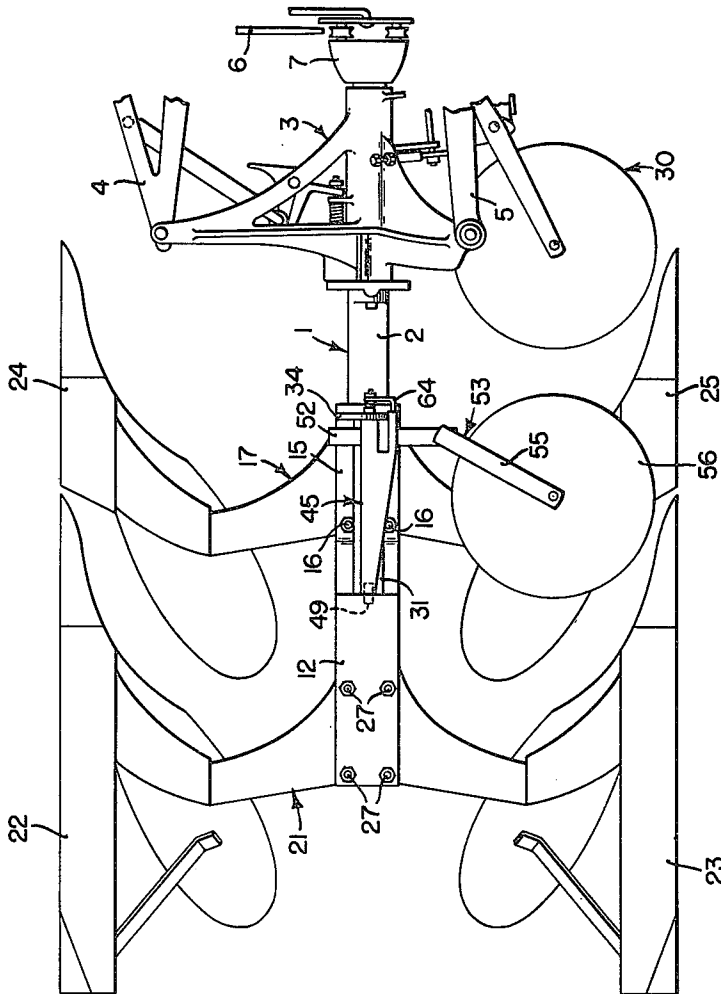
2,637,256

REVERSIBLE COLTER FOR TWO-WAY FLOWS

Filed Oct. 7, 1950

3 Sheets-Sheet 1

FIG. 1



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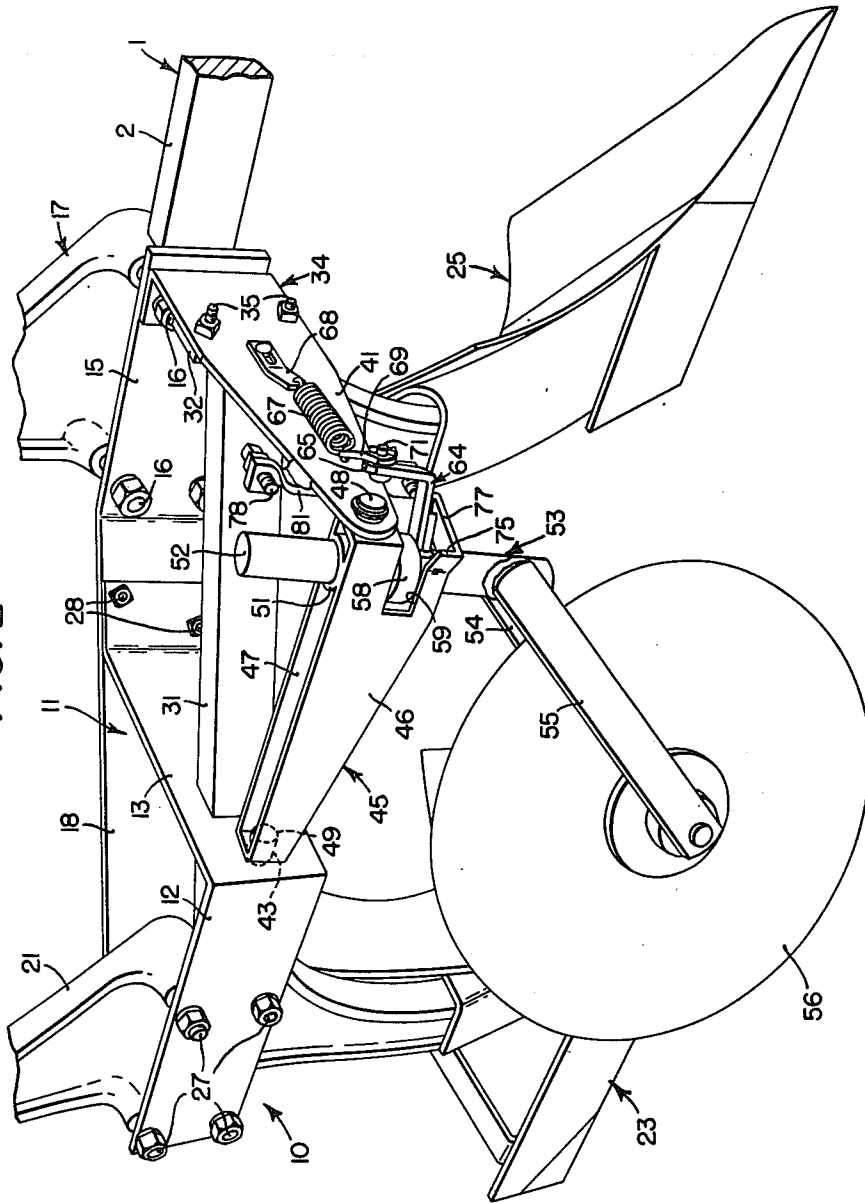
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3 Sheets-Sheet 2

FIG. 2



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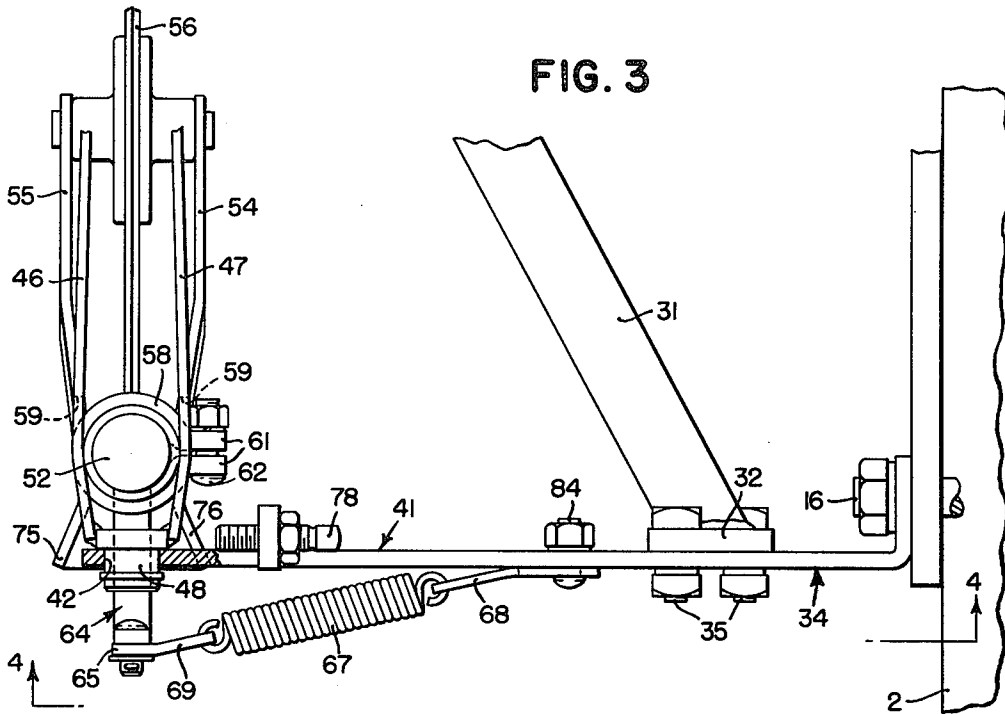


FIG. 3

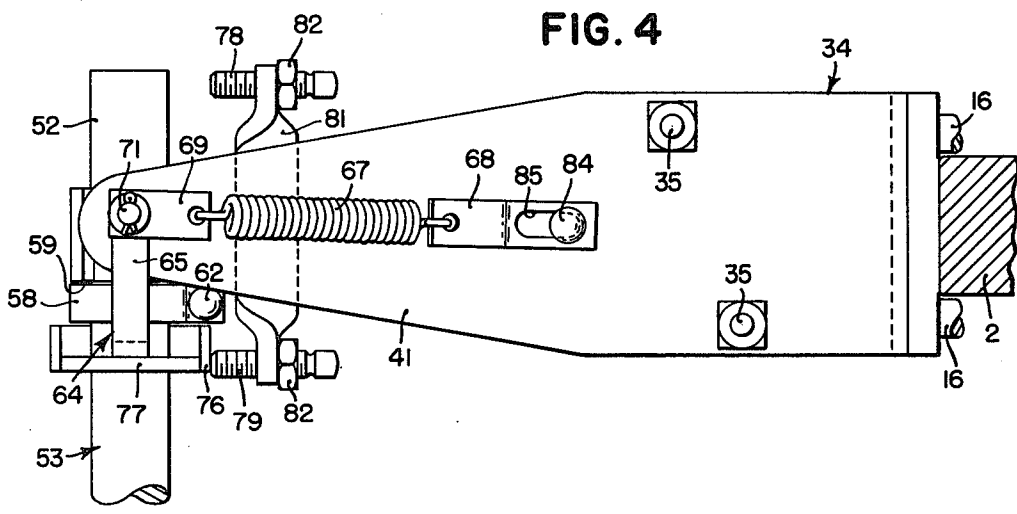


FIG. 4

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# UNITED STATES PATENT OFFICE

2,637,256

## REVERSIBLE COLTER FOR TWO-WAY PLOWS

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11 Claims. (Cl. 97—26)

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The present invention relates generally to agricultural implements and more particularly to two-way plows and the like.

The object and general nature of the present invention is the provision of a new and improved colter construction for two-way plows in which a single colter unit is automatically reversible when the plow frame is reversed or changed from right-hand plowing to left-hand plowing, or vice versa. More specifically, it is a feature of this invention to provide a colter construction including a pivoted colter frame which, carrying the colter unit, swings by gravity, relative to the plow frame, when the plows are reversed, thereby eliminating complicated operating mechanisms, latches and the like. An additional feature of this invention is the provision of a reversible colter construction which is simple and sturdy, and which is inexpensive to manufacture and assemble. Additionally, it is a feature of this invention to provide a colter construction for two-way plows in which a single colter is automatically reversible relative to the two-way plow means without any operating connections with the means or mechanisms which are utilized for reversing the plow structure. It is also a feature of the present invention to provide a new and improved colter construction in which the colter disk is automatically given a lead toward the associated plow bottom which, operating in conjunction with an adjustable stop or the like, serves to cause the colter to automatically move into the proper position relative to the associated plow bottom.

It is also a feature of this invention to provide an auxiliary attachment for one-bottom, two-way plows to convert the same into a two-bottom, two-way plow, the auxiliary attachment including its own automatically reversible colter construction whereby a single colter unit is automatically shifted, relative to the auxiliary plow bottoms, into operative position when the entire plow as a unit is reversed.

These and other objects and advantages of the present invention will be apparent to those skilled in the art after a consideration of the following detailed description, taken in conjunction with the accompanying drawings, in which:

Figure 1 is a side view of the major portion of a two-way plow of the tractor-carried type, in which the principles of the present invention have been incorporated, the plow shown in Figure 1 being adjusted or arranged so that the left-hand plow bottoms are in operating position.

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Figure 2 is an enlarged fragmentary perspective view of a portion of the plow shown in Figure 1 showing particularly the novel colter construction and auxiliary frame means, for converting a one-bottom, two-way plow into a two-bottom, two-way plow, of the present invention.

Figure 3 is a fragmentary plan view showing certain details of the colter construction in operating position for left-hand plowing.

Figure 4 is a front view of the colter construction shown in Figure 3, being a view taken generally along the line 4—4 of Figure 3.

Referring now to the drawings, particularly Figure 1, the principles of the present invention have been illustrated as incorporated in a two-way plow of the type shown in my copending application, Serial No. 605,256, filed July 16, 1945, now U. S. Patent 2,543,786, issued March 6, 1951, to which reference may be made if necessary. Briefly, the two-way plow shown in the above-mentioned co-pending patent comprises a plow frame 1, including a generally fore-and-aft extending beam 2, mounted for rocking movement about a generally fore-and-aft extending axis and supported for such rocking movement in a framework 3 which is connected to be supported and propelled by a farm tractor by upper and lower links 4 and 5, these links being also arranged to cooperate with lifting means (not shown) which raises and lowers the plow into and out of operating and transport positions. As more clearly disposed in the aforesaid patent, crank means 7 is fixed to the forward end of the beam 2 and the plow frame 1 is automatically reversed by the raising and lowering of the links 4 and 5 through mechanism which includes a reversing fork 6. The present invention is not particularly concerned with the details per se of the raising and lowering and reversing mechanisms, since such are shown and claimed in the above-identified patent. However, according to the principles of the present invention, means is provided for converting a two-way plow of the type shown in the above-mentioned patent into a two-bottom, two-way plow, and such means will now be described.

Referring first to Figure 2, the present invention contemplates an auxiliary frame 10 which is made up of a main bar 11 and two shorter bars 12 and 13, the main bar 11 including a forward section 15, which is apertured to receive the bolts 16, which, in the patented plow construction, secure the plow standard 17 to the main frame bar 2, and a generally diagonal, rearwardly extending bar section 18 which at its rear end is con-

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nected to a rear plow standard 21 that is constructed and arranged to carry, at its ends, right-hand and left-hand plow bottoms 22 and 23, as best shown in Figure 1. The standard 17 of the patented plow construction is similarly adapted to receive and support right- and left-hand plow bottoms 24 and 25. The plow standard 21 may be substantially identical with the plow standard 17, and having spaced apertures adapted to receive a set of attaching bolts which, in the case of the plow standard 21, are indicated in Figure 2 by the reference numeral 27. These bolts pass through apertures in the frame bar 12 of the auxiliary frame 10 and rigidly secure the auxiliary plow standard 21 in position, certain of the bolts 27 being extended through apertures in the rear end of the diagonal bar section 18. The left end of the frame bar 13 is bolted, as at 28, to the diagonal bar section 18, and the forward end of the main bar section 15 and the lateral bar 13 is reinforced by an auxiliary beam 31 which, at its forward end, carries a plate 32 welded thereto, the rear end of the auxiliary beam 31 being extended into and secured to the plow standard 21 in substantially the same way that the rear end of the main plow beam 2 is received by and fixed to the plow standard 17 of the patented one-bottom, two-way plow construction. A bracket 34 is apertured to receive a pair of bolts 35, which connect the plate 32 to the bracket 34, the inner end of the bracket 34 being turned rearwardly and apertured to receive the forward pair of bolts 16 that fix the plow standard 17 to the rear end of the plow beam 2. Thus, whenever it is desired to convert the one-bottom, two-way patented plow into a two-bottom, two-way plow, all that it is necessary to do is to remove the nuts from the bolts 16 and install the auxiliary frame 10 and the associated plow standard 21 and plow bottoms 22 and 23, both sets of plow bottoms then being reversible from one position to the other by a reversal of the main plow beam or frame 1.

The patented one-bottom, two-way plow includes an automatically reversible single colter construction indicated generally by the reference numeral 30 which cooperates with the forward bottoms 24 and 25, but when the auxiliary frame 10 and associated plow bottoms 22 and 23 are added to the plow 1, it is necessary to provide an auxiliary colter construction to cooperate with the plow bottoms 22 and 23. Such colter construction will now be described.

The bracket 34 is extended, as at 41, to provide an apertured section 42 which is in axial alinement with an aperture 43 (Figure 2) formed in the outer portion of the frame bar 13. A colter frame 45 comprising a pair of laterally spaced, generally fore-and-aft extending bars 46 and 47 and a pair of front and rear studs 48 and 49, is mounted for rocking movement in the apertures 42 and 43. The forward portion of the frame 45 carries a vertical sleeve section 51 in which the vertical portion 52 of a colter shank 53 is disposed for swinging movement about a generally vertical axis. The lower portion of the colter shank 53 includes a pair of laterally spaced, generally rearwardly and downwardly extending bars 54 and 55 that, at their lower ends carry suitable bearing means on which a rolling colter disk 56 is mounted for rotation, generally in trailing relation with respect to the vertical axis defined by the upper section 52 of the colter shank 53. Fixed to the colter shank section 52 is a clamp collar 58 that is disposed in slots 59 formed in the for-

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ward ends of the colter frame plates 46 and 47, the colter clamp 58 including apertured ears 61 and a clamping bolt 62 which, when tightened, fixedly connects the clamp 58 to the colter shank section 52. The clamping bolt 62 may be loosened to permit raising or lowering the colter shank 53 relative to the clamping collar 59. An arm 64 is secured, as by welding, to the clamp 58 and includes an upwardly extending apertured section 65 that is disposed ahead of and in substantial alinement with the stud 58 of the colter frame 45, and a spring 67 is anchored at its inner end, as by a clip 68, to the bracket 34, and, at its other end is connected by a clip 69 to the arm 64, the clip 69 being apertured to receive a pivot pin 71 that extends through the aperture in the arm extension 65 and through an aperture in the clamp 69, the pivot pin 71 having a loose fit in the associated parts.

The lower forward portions of the colter frame plates 46 and 47 are formed with forwardly flaring portions 75 and 76 that are connected by a short bar section 77. The forwardly flaring portions 75 and 76 serve as stops for cooperation with the arm 64 that is fixed to the colter shank 53. These colter frame sections 75 and 76 are also adapted to cooperate with a pair of stops in the form of cap screws 78 and 79 carried by the upper and lower portions of a bracket 81 that is welded to the outer end portion 41 of the bracket 34. Lock nuts 82 serve to fix the cap screws 78 and 79 in any desired position of adjustment. The clip 68 is fixed to the bracket 34 by a bolt 84, and the position of the clip 68 may be adjusted relative to the bracket 34 by virtue of a slot 85 formed in the clip 68 to receive the bolt 84.

As mentioned above, by connecting the auxiliary frame 10, together with the auxiliary standard 21 and auxiliary plow bottoms 22 and 23, to the beam 2 of the one-bottom, two-way plow 1, the latter may be converted easily and conveniently into a two-bottom, two way plow. Also, the colter construction described above is connectible to and disconnectible from the plow 1 with the auxiliary attachment frame 10. The colter construction, which forms the principal portion of the present invention, does not require any connection with the operating mechanism of the plow 1 but is automatically reversible, relative to the auxiliary frame 10, whenever the plows are reversed, as by swinging the main plow beam 2 about its axis in the frame structure 3.

As will best be seen from Figure 2, the tension of the spring 67 acts through the arm 64 to swing the colter shank 53 into a position to give the colter disk 56 a lead toward the associated plow bottom 23. As a result of this arrangement, as soon as the plow 23 and the colter disk 53 start to enter the ground, the colter disk 56 is caused, by virtue of its lead toward the associated plow bottom, to swing laterally inwardly and into a substantially directly rearwardly trailing relation, substantially into the position shown in Figure 3, the frame 45 swinging about the fore-and-aft extending axis defined by the studs 48 and 49 and, simultaneously therewith, the colter shank 53 swinging about its vertical axis as defined by the vertical section 52 until the associated colter frame section 76 comes into engagement with the associated stop member 79, as shown in Figure 4. Since the spring 67 is connected, through the pivot 71, with the arm 64 substantially in line with the axis of swinging of the colter frame 45, any tension in the spring

67, caused by the colter disk being swung into a rearwardly trailing relation, does appreciably affect the position of the colter frame 45.

When the main frame of the plow is reversed, as by swinging the frame about its fore-and-aft extending axis to bring the other bottoms into operating position, the colter and colter frame 45 swing relative to the plow frame under the action of gravity, since the colter disk 56 and major portion of the colter shank 53 lie below the axis defined by the studs 48 and 49. As a result of this arrangement, the colter disk 55 remains in contact with the ground, unless the plows are raised into their transport position, and is therefore ready to cooperate with the other plow bottom. In its other position relative to the frame 10, the colter frame 45 swings toward the other stop member 78, the lower flared portion 75 of the colter frame 45 then contacting the stop member 78 to determine the position of the colter frame relative to the plow bottom now in operating position. If desired, the connection between the spring 67 and the arm 64 may be made at a point slightly above the axis of swinging of the colter frame 45 in the auxiliary plow frame 10, this being the construction illustrated in Figure 4. This arrangement has the advantage that the tension in the spring 67 has a slight tendency to swing the colter disk 56 outwardly away from the associated plow bottom but not with sufficient force to affect the inward swinging of the colter 56 when it is in the ground. However, with the tendency to swing outwardly, as just mentioned, the colter disk 56 and associated parts remain in depending relation as the plow frame 10 is reversed, the spring 67 thus ensuring that there will be no appreciable tendency for the colter 56 to swing with the plow frame 10, rather than remaining in the lowermost position in readiness to cooperate with the other plow bottom. When the plow frame is reversed, carrying with it the bracket 34 and the spring 67, the latter acts in each position to swing the arm 64 so as to impart an inward lead to the colter disk 56, thus causing it to swing inwardly toward the associated plow bottom.

While I have shown and described above the preferred structure in which the principles of the present invention have been incorporated, it is to be understood that my invention is not to be limited to the particular details shown and described above, but that, in fact, widely different means may be employed in the practice of the broader aspects of my invention.

What I claim, and desire to secure by Letters Patent is:

1. In a plow having a plow bottom and a frame on which said plow bottom is mounted, the improvement comprising a colter including a colter disk and a generally vertically extending shank to the lower end of which said disk is rotatably connected, a colter frame in which the upper end of said colter shank is journaled for rocking movement about a generally vertical axis, means connecting said colter frame with said plow frame for movement relative to the latter about a generally horizontal axis, spring means acting against said colter shank for swinging the latter about said vertical axis so as to tend to cause the colter to have a lead toward the associated plow bottom, and adjustable means carried by said plow frame for limiting the inward swinging of said colter frame and shank about said horizontal axis.

2. In a plow including a frame and a plow bottom carried thereby, a colter construction comprising a colter frame, means for connecting said colter frame with the plow frame for relatively free swinging movement relative to the latter about a generally fore-and-aft extending horizontal axis through substantially 180°, a colter disk, a colter shank on which said disk is rotatably mounted, said shank including a vertically extending portion, means for connecting the vertical portion of said colter shank with said colter frame for accommodating rotation of said colter shank relative to said colter frame about a generally vertical axis, said colter shank being constructed so that the colter disk occupies a trailing position relative to the vertical axis defined by said colter shank, and means for limiting the movement of said colter frame about said horizontal axis at each end of said substantially 180° movement.

3. A colter support for an implement including a frame and a plow bottom carried thereby, said colter support comprising a pair of brackets attachable to said frame in generally fore-and-aft spaced relation, a colter frame adapted to be pivotally mounted on said brackets for lateral swinging about a generally horizontal fore-and-aft extending axis, a colter disk, a colter shank rotatably receiving said colter disk and mounted for rocking movement about a generally vertical axis in said colter frame, and spring means acting between said colter shank and one of said brackets for yieldably swinging said colter shank and said colter frame into a given position relative to said plow frame means.

4. A colter support for an implement including a frame and a plow bottom carried thereby, said colter support comprising a pair of brackets attachable to said frame in generally fore-and-aft spaced relation, a colter frame adapted to be pivotally mounted on said brackets for lateral swinging about a generally horizontal fore-and-aft extending axis, a colter disk, a colter shank rotatably receiving said colter disk and mounted for rocking movement about a generally vertical axis in said colter frame, an arm fixed to said colter shank at a point below the axis of rocking movement of said colter frame, spring means acting between the outer end of said arm and one of said brackets for swinging said colter disk and said shank relative to said colter frame, means for limiting the movement of said arm relative to said colter frame, and means for limiting the rocking of said colter frame relative to one of said brackets.

5. The invention set forth in claim 4, further characterized by said last mentioned motion-limiting means comprising an arm on one of said brackets, a part adjustably carried by said last mentioned arm and cooperating abutment means on said colter frame.

6. A two-way plow comprising frame means, a pair of generally oppositely disposed plow bottoms carried by said frame means in generally fixed relation with respect thereto, means for swinging said frame means about a generally horizontal fore-and-aft extending axis so as to swing one of said plow bottoms into an operating position and the other plow bottom into a transport position, a colter frame support carried by said frame means adjacent said plow bottoms, a colter frame pivotally mounted in said support and swingable about a generally fore-and-aft extending axis, a ground-engaging colter carried by said colter frame in a position generally below

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said fore-and-aft extending colter frame axis, whereby said colter remains substantially in its ground-engaging position when the plow frame means is swung from one position to another to reverse the plow bottoms, means acting against said colter for imparting thereto a lead toward the plow bottom in operating position, and means acting against said colter frame for limiting the laterally inward swinging of the colter relative to the associated plow bottom.

7. In a two-way plow including frame means and a pair of generally oppositely mounted plow bottoms, said frame means being mounted for rotation about a generally fore-and-aft extending horizontal axis so as to swing said plow bottoms between operating and non-operating positions, bracket means attachable to said frame means, a colter support carried by said bracket means for rotation about a generally fore-and-aft extending horizontal axis, and a ground-engaging colter carried by said colter frame in such a position that the colter swings by gravity, relative to the plow frame, when the latter is reversed, so as to remain in operative ground-engaging position when the plow bottoms are reversed by swinging the plow frame about its fore-and-aft extending axis.

8. In a two-way plow including frame means and a pair of oppositely mounted plow bottoms carried thereby, said frame means being mounted for rotation about a generally fore-and-aft extending horizontal axis, a colter construction comprising bracket means attachable to said plow frame, a colter frame rotatably mounted on said bracket means for movement relative to the frame means about a generally fore-and-aft extending horizontal axis, means on said bracket means for limiting the swinging movement of said colter frame about its axis relative to said bracket means, a colter, a colter shank pivotally mounted in said colter frame for movement relative thereto about a vertical axis, stop means limiting the movement of said colter shank, and spring means acting between said bracket means and said colter shank for swinging the latter so

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as to impart thereto a lead tending to cause the colter to run toward the adjacent plow bottom.

9. The invention set forth in claim 8, further characterized by an arm fixed to said colter shank and extending forwardly therefrom, and a spring connected at one end with said arm and at the other end with said adjacent portion of said bracket means.

10. The invention set forth in claim 9, further characterized by said spring being connected with said arm substantially on the axis of swinging of said colter frame in said bracket means, said spring connection being established by means rotatable relative to the associated arm, whereby the swinging of the colter under the action of gravity when the plow frame is reversed is substantially unhampered by the action of the spring against the associated arm.

11. In a one-bottom, two-way plow, auxiliary frame means attachable to said one-bottom, two-way plow, a pair of oppositely disposed plow bottoms fixed to said auxiliary frame and cooperating with the plows of said one-bottom, two-way plow to transform the latter into a two-bottom, two-way plow, a bracket carried by said auxiliary frame, a colter frame rotatably mounted in said bracket for movement relative thereto to about a generally fore-and-aft extending axis, and a colter unit carried by said colter frame and swingable with the latter relative to said auxiliary frame into a position adjacent one or the other of said auxiliary plow bottoms.

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