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MEANS ADJUSTABLY CONNECTING AN EARTH WORKING DISK TO A STANDARD

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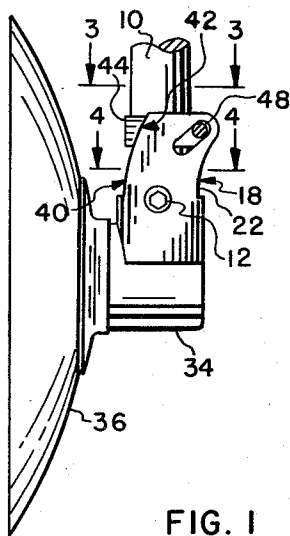


FIG. 1

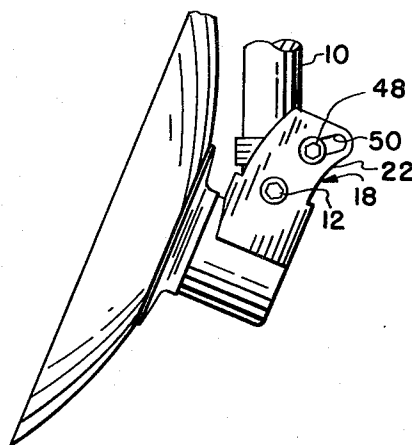


FIG. 2

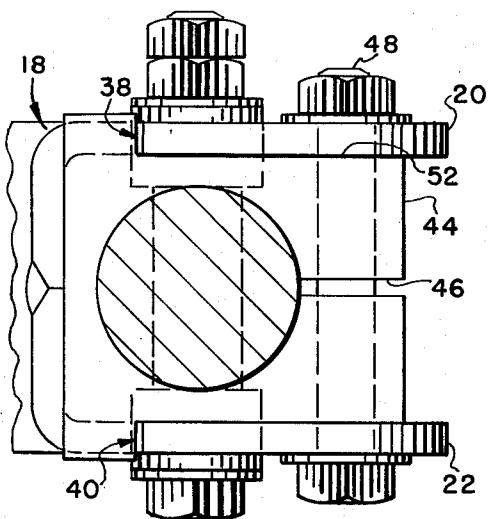


FIG. 3

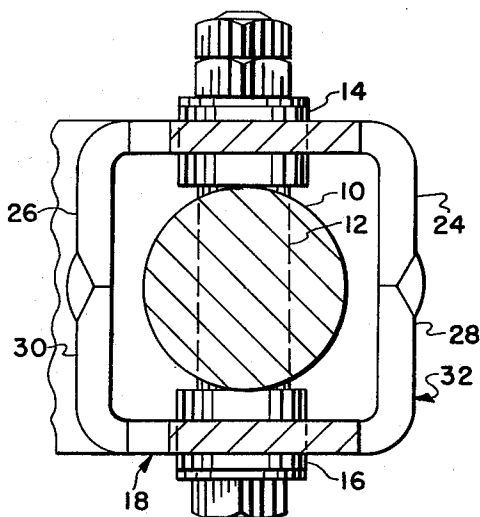


FIG. 4

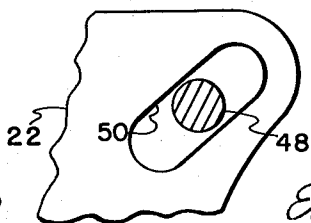


FIG. 5

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MEANS ADJUSTABLY CONNECTING AN EARTH WORKING DISK TO A STANDARD

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5 Claims. (Cl. 172-603)

The present invention relates to disk type implements and particularly to such implements used as plows. It relates especially to the type of disk plows on which a mobile frame carries a plurality of downwardly directed standards, to the lower end of each of which is attached a bearing housing carrying a plow disk. Such plows are often made reversible, the standards being nominally vertical, and it is desirable to have the bearing housings angularly adjustable on the lower ends of the standards, and this is true whether or not the plow is reversible. Plows of this nature tend to run to large sizes, and stresses developed become very high so that it is difficult to devise a clamp which will permit adjustment of the bearing housing relative to the standard, but which will also dependably maintain the adjusted angle in the face of the severe stresses involved. Ordinary clamps are likely to slip and if the force is applied to an adjusting bolt transversely of the length thereof, the bolt is likely to fail by shearing.

The principal object of the invention is to provide an adjustable connection in a plow of the above type which will hold the disk rigidly in position against the large forces involved; which is easily adjusted to change the angle by merely loosening a clamping bolt; and in which the stresses are taken on relatively massive parts of the clamp, the bolt being at all times shielded or relieved from any shearing stress.

The manner in which this object is accomplished is set forth in the following specification and accompanying drawings in which:

FIGURE 1 is a side elevation of one of the standards used in a plow of the type described, showing an adjustable connection involving the invention;

FIG. 2 is a similar view with the parts in a different position;

FIG. 3 is a horizontal section on the line 3-3 of FIG. 1;

FIG. 4 is a horizontal section on the line 4-4 of FIG. 1;

FIG. 5 is a fragmentary enlargement of a portion of FIG. 1.

As seen in FIG. 1, the device comprises a standard 10, in the present instance in the form of a downwardly extending round steel or other metal rod. Rod 10 is ruggedly mounted in the above-mentioned mobile frame, not necessary to show or describe, to be translated in a direction generally to the left in FIG. 1, and it may be rotatable about its axis for reversing the plowing effect within the contemplation of the invention. Adjacent its lower end, standard 10 has a transverse pivot 12 fixed therein on which is pivoted by bushings 14 and 16 (see also FIG. 4), fixed in the sides thereof, a housing generally designated as 18.

Housing 18 comprises a pair of spaced side wings 20 and 22, bushings 14 and 16 being secured respectively in side wings 20 and 22 so that the wings may rock about pin 12. Wing 20 has tongues 24 and 26 bend about standard 10 to meet tongues 28 and 30 on wing 22. Tongues 24 and 28 are permanently united as by welding, as also are tongues 26 and 30 to result in a ring-like structure or section, generally designated as 32 surrounding standard 10, but with suitable clearances for a purpose which will appear.

A bearing housing of suitable or well-known type 34 is permanently united with side wings 20 and 22, and if desired with tongues 26 and 30 so that the angle of bearing housing 34 and a disk 36 pivotally mounted thereon will be determined by the position of housing 18 on pivot pin 12. Disk 36 engages the ground as the assemblage moves along, imposing a strong backward reaction against standard 10.

As will be apparent, such ground reactions in an implement of this type will tend very strongly to rotate housing 18 about pivot pin 12 in a counterclockwise direction, as seen in FIGS. 1 and 2, and it is this force which must be withstood by the clamping means.

Side wings 20 and 22 are provided, for this purpose, with cam surfaces 38 and 40 which face generally forwardly and extend upwardly and rearwardly. Cam surfaces 38 and 40 engage complementary cam surfaces as 42 on a collar 44 slidably disposed on standard 10, preferably upwardly of pivot pin 12, it being understood that a cam surface similar to 42 is disposed on collar 44 on the far side of standard 10.

The force tending to turn housing 18 in a counterclockwise direction will be resisted by contact of forwardly directed cam surfaces 38 and 40 with collar 44 and cam surfaces 38 and 40 are so disposed that the force applied to collar 44 will have a forwardly directed component, the upward component resulting from the slope of cam surfaces 38 and 40 being readily resisted by frictional engagement of collar 44 with standard 10.

It will be noted that all of the forces normally imposed on housing 18 will be in this same direction, both the ground reaction and the weight of disk 36 and bearing housing 34 tending to cause counterclockwise rotation of housing 18, as seen in FIGS. 1 and 2. And this is true with the exception of conditions of severe bouncing of the implement, for example in transport, or backing of the implement with the disks in the ground, which latter is abnormal, of course, and would be considered misuse of the device.

Collar 44 has a slot 46 FIG. 3, and may be compressed about standard 10 by means of a bolt 48. Tightening bolt 48, as will be apparent, will spring or distort or compress collar 44 about standard 10 so that it will grip the latter with a very rigid frictional engagement.

Bolt 48 also extends through slots as 50, FIGS. 2 and 5, in side wings 20 and 22, and thereby springs or compresses side wings 20 and 22 firmly against notched side portions 52 of collar 44. This locks side wings 20 and 22 solidly in contact with collar 44, while collar 44 is solidly clamped to standard 10, and the friction grip is so strong that no amount of force on disk 46 will cause any displacement of collar 44, or housing 18.

As stated, the force is resisted entirely or substantially entirely by contact of cam surfaces 38 and 40 on housing 18 with cam surfaces 42 on collar 44, the resultant force on collar 44 being predominantly forward so that the friction grip of collar 44 on standard 10 will readily resist any resultant upward component.

Slots 50 are angled so that bolt 48, or more properly, side wings 38 and 40 may shift in the necessary direction when the bolt is loosened and when collar 44 is shifted up or down standard 10 in contact with cam surfaces 38 and 40, and slots 50 are made generous enough so that bolt 48 is spaced slightly from the faces of slots 50 as seen in FIG. 5, whenever cam surfaces 38, 40, and 42 are in contact with each other. This insures that the very substantial force to be resisted by this clamping arrangement will be taken directly on collar 44, and thence on standard 10, and not on bolt 48. The forces developed might easily become sufficient to shear a reasonably sized bolt positioned at the point disclosed, if

it were subjected to such force in shear, but in view of the described character of slot 50, bolt 48 is never subjected to a shearing stress, but is subject to straight tension in its function of clamping side wings 20 and 22 to collar 44, and clamping the latter about standard 10.

The generous clearance between tongues 26 and 30 and standard 10 provides for substantial backward tilting of housing 18 without interference from standard 10, as shown in FIG. 2.

Modifications of the above described structure will doubtless occur to those skilled in the art, for example, side wings might be cast or otherwise formed integrally with a ring portion similar to 32, taking the place of tongues 24, 26, 28 and 30. The construction would otherwise be similar to that hereinbefore disclosed, and would operate in an identical manner.

Further variations on the structure will doubtless occur to those skilled in the art and the invention is not to be taken as limited to the exact construction described, or in fact in any manner, except as defined in the following claims.

What is claimed as new and desired to be secured by Letters Patent of the United States is:

1. An adjustable disk mounting for use in a disk implement of the type including a mobile frame, an upright standard fixed in relation to the frame, and a ground working disk carried on the standard and propelled by movement of the frame and standard, a housing to which said disk is journaled, a pivot on said standard transverse to the axis thereof, said housing being mounted on said pivot for rocking movement in an upwardly directed plane, an upwardly inclined cam surface on said housing spaced from said pivot, a collar slidable on said standard in a region spaced from said pivot and providing a cam surface engaged with the cam surface on said housing in position to prevent rocking movement of said housing in one direction, and means for securing said collar in position to maintain said housing in a desired angular position, and said securing means being constituted to hold said collar in another position on said standard in which it will maintain said housing in a different desired position.
2. An adjustable disk mounting for use in a disk implement of the type including a mobile frame, an upright standard fixed in relation to the frame, and a ground working disk carried on the standard and propelled by movement of the frame and standard, a housing to which said disk is journaled, a pivot on said standard transverse to the axis thereof, said housing being mounted on said pivot for rocking movement in a plane parallel to said standard, a forwardly directed, upwardly and rearwardly inclined cam surface on said housing above said pivot, a collar slidable on said standard above said housing, said collar providing a cam surface engaged with the cam surface on said housing in position to prevent rocking movement of said housing in one direction and means for clamping said collar in desired positions on said standard.
3. An adjustable disk mounting for use in a disk implement of the type including a mobile frame and a plurality of tillage disks designed to be drawn through the soil by reason of movement of said mobile frame, and means connecting each of said disks with said frame comprising a bearing housing on the disk, a downwardly directed standard on the frame, a transverse pivot means on the standard adjacent the lower end thereof, side wings, one on each side of the standard, extending

lengthwise thereof and secured on said transverse pivot, each having at its lower portion a finger portion transverse to said standard, each of said fingers

bending around said standard and being permanently united with a portion of the opposite wing to form a ring-like part encircling said standard in the region of said pivot, said ring-like part being permanently united with said bearing housing, said wings each providing a forwardly directed, upwardly and rearwardly inclined cam surface spaced above said pivot, a

collar slidable on said standard above said wings, said collar providing a cam surface engaged with the cam surfaces on said wings in position to prevent rocking movement of said side wings in the direction in which they are urged by ground reaction against said disk, a

bolt extending through said wings and said collar, to be tightened to clamp said wings to said collar and said collar to said standard, said wings providing slots for said bolt,

angled in relation to said standard in a direction such that said bolt when loose is substantially free in said slots during simultaneous up-and-down movement of said collar and rocking movement of said wings, when said cam surfaces on said wings, and said cam surfaces on said collar are in contact with each other.

4. An adjustable disk mounting for use in a disk implement of the type including a mobile frame and a plurality of tillage disks designed to be drawn through the soil by reason of movement of said mobile frame, and means connecting each of said disks with said frame comprising a

bearing housing on the disk, a downwardly directed standard on the frame, a transverse pivot means on the standard adjacent the lower end thereof,

side wings, one on each side of the standard, extending lengthwise thereof and secured on said transverse pivot, each having at its lower portion a finger portion transverse to said standard, each of said fingers

bending around said standard and being permanently united with a finger portion of the opposite wing to form a

ring-like part encircling said standard in the region of said pivot, said ring-like part being rigidly united with said bearing housing, said wings each providing a forwardly directed,

upwardly and rearwardly inclined cam surface spaced above said pivot, a split

collar slidable on said standard above said wings, said collar providing a cam surface engaged with the cam surfaces on said wings in position to prevent rocking movement of said side wings in the direction in which they are urged by ground reaction against said disks, a bolt extending through said wings and said collar, to be tightened to clamp said wings to said collar and said collar to said standard, said wings providing slots for said bolt,

angled in relation to said standard in a direction such that said bolt is substantially free in said slots during simultaneous up-and-down movement of said collar and rocking movement of said wings when said cam surfaces on said wings, and said cam surface on said collar are in contact with each other.

5. An adjustable disk mounting for use in a disk implement of the type including a mobile frame and a plurality of tillage disks designed to be drawn through the soil by reason of movement of said mobile frame, and means connecting each of said disks with said frame comprising a

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bearing housing on the disk, a downwardly directed standard on the frame, a transverse pivot means on the standard adjacent the lower end thereof, a ring portion encircling said standard in the region of said pivot means and permanently united with said bearing housing, and pivotally secured to said standard on said transverse pivot means, side wings, fixed relatively to said ring portion, one on each side of said standard, extending lengthwise thereof upwardly of said pivot means, said wings providing forwardly directed, upwardly and rearwardly inclined cam surfaces, a collar slidable on said standard in a region above said wings, said collar providing a cam surface engaged with the cam surfaces on said wings in position to prevent rocking movement of said side wings in the direction in which they are urged by ground reaction against said disk, a bolt extending through said wings and said collar, to be tightened to clamp said wings to said collar and

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said collar to said standard, said wings providing slots for said bolt, angled in relation to said standard in a direction such that said bolt when loosened is substantially free in said slots during simultaneous up-and-down movement of said collar and rocking movement of said wings, when said cam surfaces on said wings, and said cam surface on said collar are in contact with each other.

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