

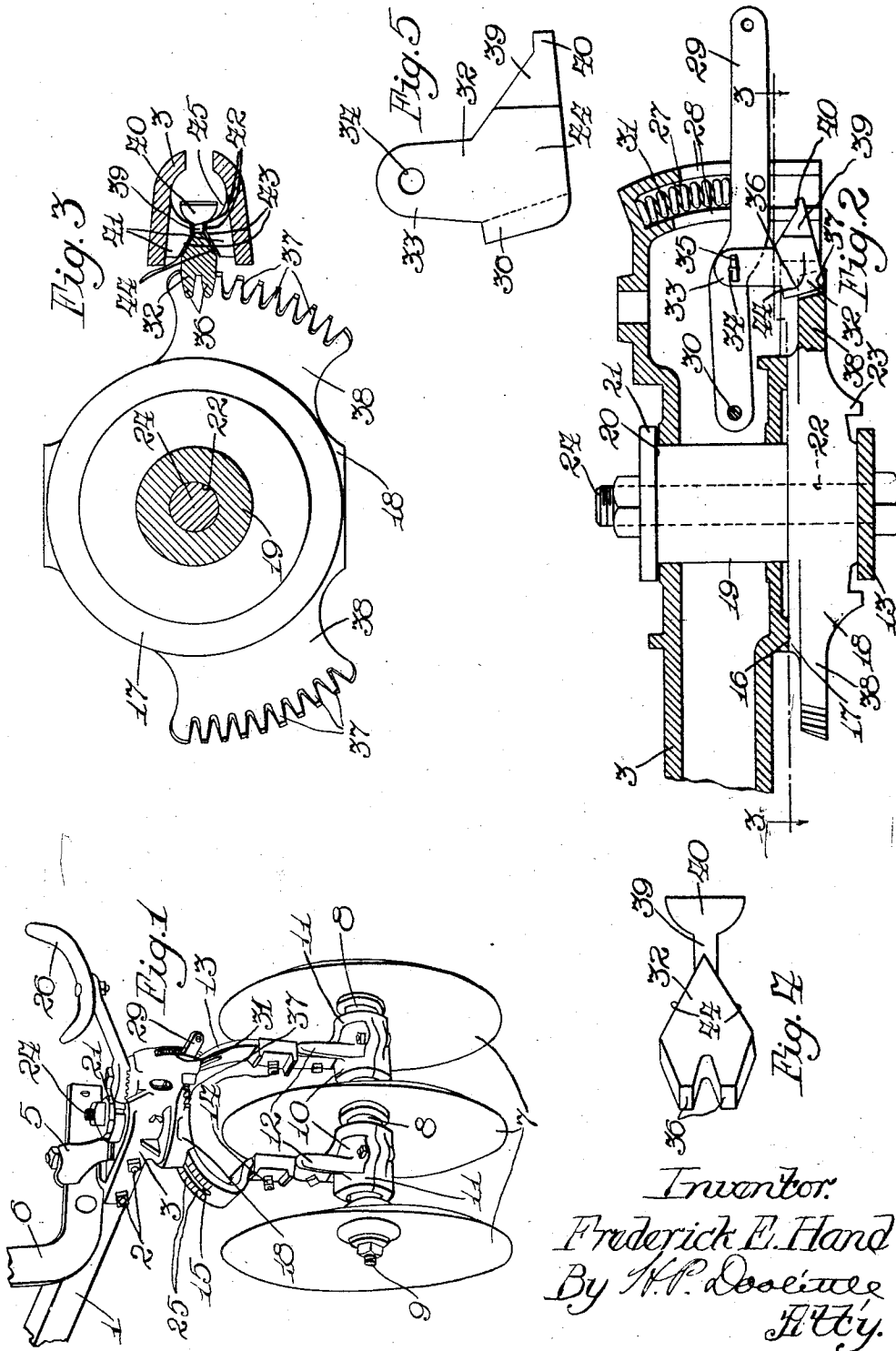
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DETENT MECHANISM FOR DISK CULTIVATORS

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UNITED STATES PATENT OFFICE

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DETENT MECHANISM FOR DISK CULTIVATORS

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This invention relates to an adjusting device for the gangs of a disk cultivator. More particularly, it relates to a detent or latch mechanism for locking a disk gang in position.

The principal object of the invention is to provide novel and improved means for securely locking a gang of a disk cultivator in any one of a plurality of positions.

Another object is to provide a latch or detent mechanism, which is positive in action and self-adjusting, to take care of any looseness or wear of the engaging parts.

Other objects will be apparent from the detailed description to follow.

In the drawings:

Figure 1 is a perspective view showing a disk gang and the beam of a cultivator to which it is attached by means embodying the invention;

Figure 2 is an enlarged cross section through the axis of adjustment of the gang with respect to the cross head to which it is attached;

Figure 3 is a section taken on the line 3-3 of Figure 2; and

Figures 4 and 5 are enlarged views of the latch member.

The cultivator beam 1 is clamped by bolts 2 to a casting 3, which forms a support and crosshead for the disk gang. A clamp 5 secures a cross-arch 6 to the casting 3.

The disk gang is of a conventional construction. The three disks 7 are spaced by spools 8 and the entire assembly is clamped together by a tie-rod 9. Bearing boxes 10 are mounted on each spacing spool. The upper half 11 of the bearing boxes is provided with an integral upward extension 12 to which an arched strap iron 13 is attached by bolts 14. The upper portion of the arch is arc-shaped and contains a slot 15 extending the entire distance of the upper portion of the arch.

The casting 3 has a horizontal, lower face portion 16 which is adapted to form a seat for the upper face 17 of a rotatable member 18 positioned below the casting. The member 18 has an integral shaft 19, which extends upwardly through the casting. At the upper

end the shaft is reduced in diameter to form a shoulder 20. A collar 21 is threaded on the end of the shaft against the shoulder 20. The length of the shaft up to the shoulder 20 is such that, when the collar 21 is secured tightly against the shoulder, the member 18 will be freely rotatable with respect to the casting 3.

A bore 22 extends centrally through the member 18 and the shaft 19. The lower face of the member 18 is suitably shaped and provided with extending lugs 23 for cooperatively engaging the upper portion of the arch 13. A bolt 24 extends upwardly through the slot 15 and through the bore 22 with the head of the bolt abutting the lower surface of the arched strap iron 13. The upper portion of the strap iron 13 is provided with a series of grooves 25 to assist in securing it in non-slipping engagement with the member 18. This construction provides a readable index for angular adjustment between the casting 18 and the arched portion of member 13.

The casting 3 extends rearwardly to form a support for the foot lever 26. The rearward extension also forms a housing for the detent or latch mechanism. The extension is hollow and flattened in cross section. A dead end bore 27 extends upwardly into the casting adjacent the end. Vertical slots 28 are cut through the walls of the bore to provide for sliding movement of a lever 29 extending forwardly into the housing formed by the hollow extension. The lever 29 is pivoted at its forward end on a pin 30 extending through the side walls of the casting. A compression spring 31 seated in the bore 27 engages the lever 29 and presses it resiliently downward.

A latch member 32 of a peculiar construction is pivotally attached to the lever 29. The latch member is provided with a pair of spaced, upwardly extending ears 33. The ears 33 are provided with aligned holes 34 therethrough for pivotally attaching it to the lever 29 by means of a pin 35 extending through the holes 34 and through a hole in the lever 29.

The lever 29 is offset downwardly inter-

mediate its ends, the offset being inside the hollow extension of the casting. The spring 31 seats on the lower portion of the lever, which extends downwardly through the slots 28. The latch member 32 is pivotally attached to the upper portion of the lever 29 adjacent the downwardly extending curve of the offset.

The latch member 32 is provided with two teeth 36 on its forward edge, similar to gear teeth. The teeth are adapted to mesh with similar teeth 37 provided on extensions 38 integral with the member 18. The teeth 37 are positioned on the extensions 38 concentrically with respect to the axis on which the member 18 is mounted.

The teeth 36 on the latch member and the mating teeth 37 are at an angle to the vertical with the line of contact slanting away from vertical at the top. It will also be noted that the pivot axis of the latch member 32 is radially spaced outwardly from the line of contact of the engaging teeth. The purpose of this particular relative arrangement will be explained in the description of the operation of the device.

Radially outward from the teeth 36 the latch member 32 is restricted in cross section to form a neck portion 39 and an enlarged portion 40 integrally attached to the portion 39. A pair of lugs 41 extending inwardly from the opposite sides of the casting extension are shaped to form a guide for the latch member 32. The lugs have central portions 42 substantially parallel for being slidably engaged by the neck portion 39 of the latch member. Forwardly from the parallel portions 42 the lugs extend angularly outward, forming bearing faces 43, which are slidably engaged by similar faces 44 formed on the latch member 32. Rearwardly, the lugs 41 have circular faces 45 which are slidably engaged by the enlargement 40 on the latch member, which has similarly shaped engaging surfaces.

In the operation of the device, the disk gangs are tilted about a horizontal axis for proper adjustment by loosening the bolt 24 and sliding the arch 13 with respect to the member 18. For adjustment of the gangs about a vertical axis, the latch mechanism is employed.

The extensions 38 on the member 18 are angularly positioned with respect to the axis of the disks, so as to secure the desirable range of adjustment with the disk set to throw soil either way. To change the angularity of the disk about its vertical axis, the lever 29 is raised lifting the latch member 32 with its teeth 36 out of engagement with the teeth 37. The gang may then be adjusted within the angular distance occupied by the teeth 37, or rotated approximately 180 degrees to set the disks for throwing soil in the opposite direction.

The lever 29 is released when the gangs have been turned to the desired angular position. The spring 31 pushes the lever downwardly and pushes the latch member into engagement. Due to the particular pivot point of the latch member on the lever 29, the pressure exerted by the spring 31 and applied at the point 35 is directed on a line radially outward from the line of contact of the teeth 36 and 37. The angular shape of the teeth and of the engaging faces 43 and 44 opposite the teeth have a wedging action, the member 32 being pushed downwardly until it is in close engagement with the lugs 41 and the teeth 37. Any wear or looseness from any other cause is compensated for by the particular construction and action of the latch member.

Although applicant has illustrated a preferred embodiment of his device, it is to be understood that he claims as his invention all modifications of the same falling within the scope of the appended claims.

What is claimed is:

1. A detent mechanism adapted to lock a rotatable member in position comprising a supporting member, a member mounted for rotation with respect to said member, a latch member mounted for reciprocation with respect to the rotatable member, substantially vertical guide means for said latch on the supporting member, teeth carried by the latch member and the rotatable member and adapted to cooperatively engage, said teeth being positioned with their line of contact at an angle to the movement of the latch member whereby the engagement takes place with a wedge action, and means for operating said latch member.
2. A device as set forth in claim 1 in which a lever pivoted on the supporting member and to the latch member provides a means for reciprocating said latch member.
3. In a cultivator having a disk gang pivotally mounted on a crosshead for rotation on a vertical axis with respect thereto, a detent mechanism for holding said gang in a plurality of angular positions comprising a series of circumferentially arranged engaging teeth carried by a member rotatable with the gang, a lever pivotally mounted on the crosshead on a horizontal axis above the rotatable member, a latch pivoted to the lever and depending downwardly therefrom, engaging teeth on said latch member adjacent the teeth on the rotatable member and adapted to mate with said teeth, a substantially vertical guide for the latch member on the side opposite the teeth, and means for resiliently pressing the lever downwardly whereby the latch is held in engagement.
4. In a cultivator having a draft beam, a crosshead rigidly attached to said beam, a disk gang pivotally mounted on the crosshead for rotation on a vertical axis with respect thereto, a detent mechanism for lock-

ing said gang in a plurality of angular positions comprising a member rotatable with the gang, circumferentially arranged engaging teeth carried by said member, a lever pivotally mounted on the crosshead on a horizontal axis, a latch member pivoted to said lever and depending downwardly therefrom, engaging teeth on said latch member shaped to cooperatively engage the teeth on the rotatable member, the lines of contact of said teeth being angular with respect to vertical and sloping away from vertical at the top, whereby a wedging action is obtained, a vertical guide for the latch member adapted to prevent radial displacement of the member relative to the rotatable member, said guide being constructed to provide for limited horizontal rotation of the latch member to secure positive full line engagement of the teeth, and means for pressing resiliently downward against the supporting lever.

In testimony whereof I affix my signature.

FREDERICK E. HAND.