

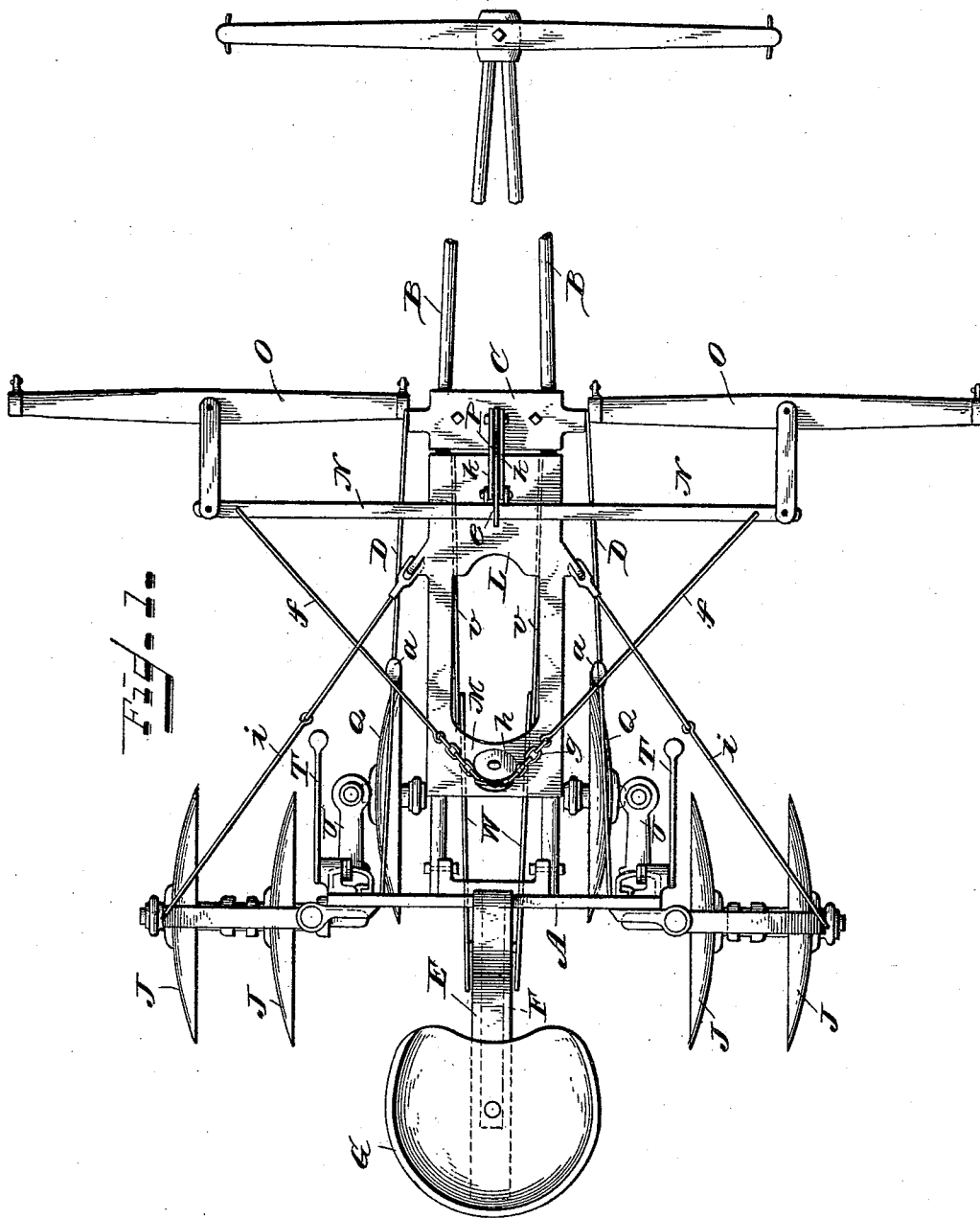
(No Model.)

4 Sheets—Sheet 1.

A. F. BROWN & W. R. KNAUB.
DISK CULTIVATOR.

No. 499,711.

Patented June 20, 1893.



Witnesses.
J. Thomson Cross
Edw. Hardinghaus

Inventors.
Arthur F. Brown
and William R. Knaub
by Chas. M. Beck
their Attorney.

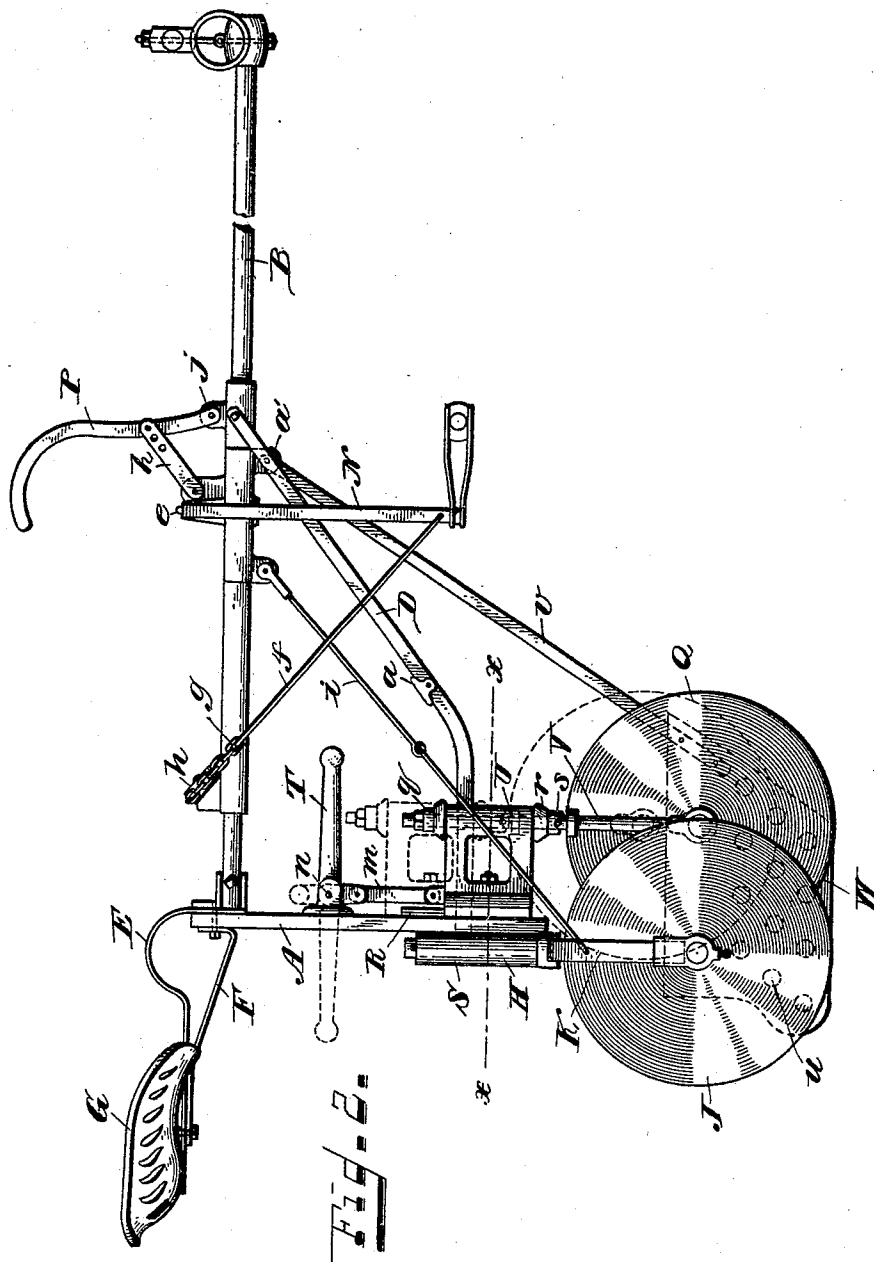
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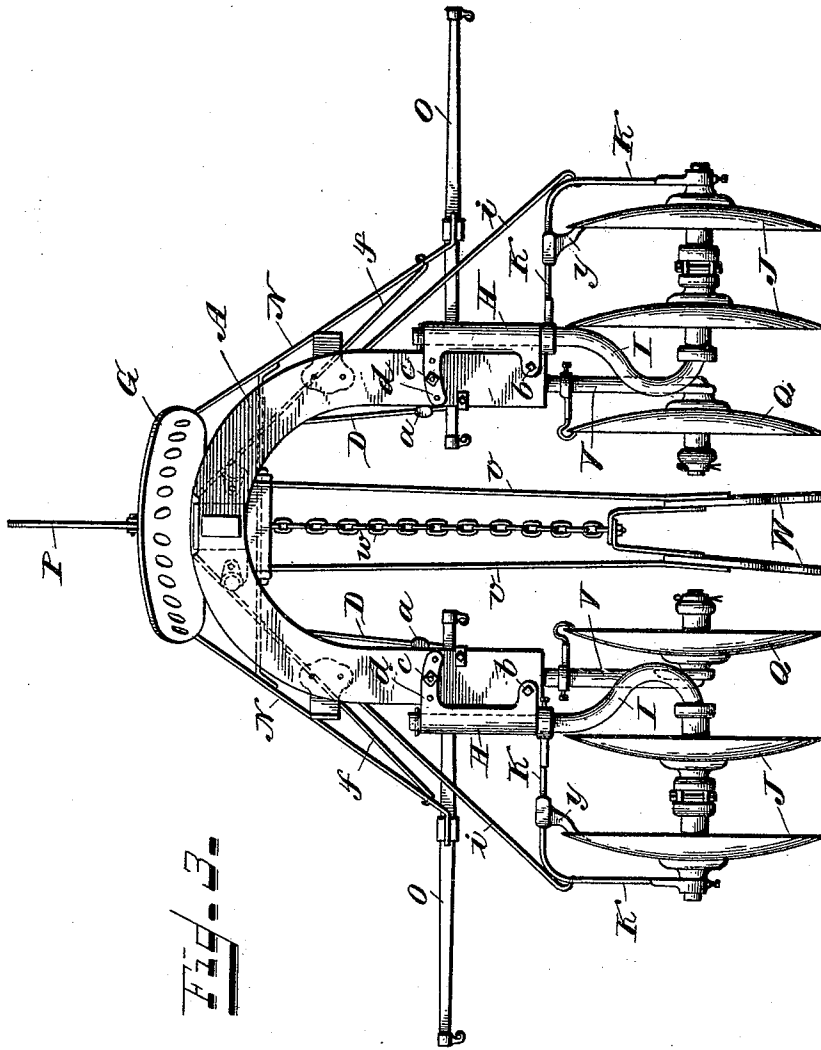
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A. F. BROWN & W. R. KNAUB.
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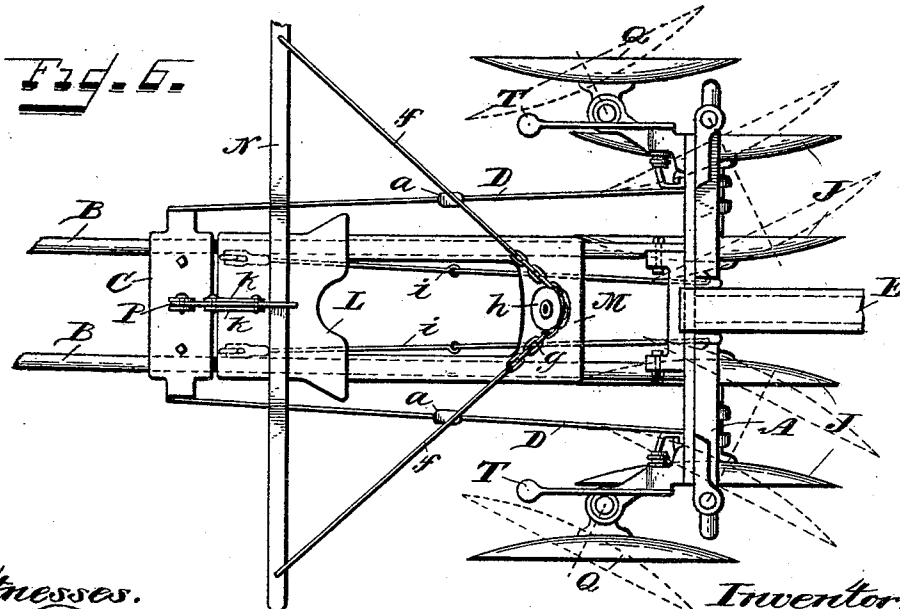
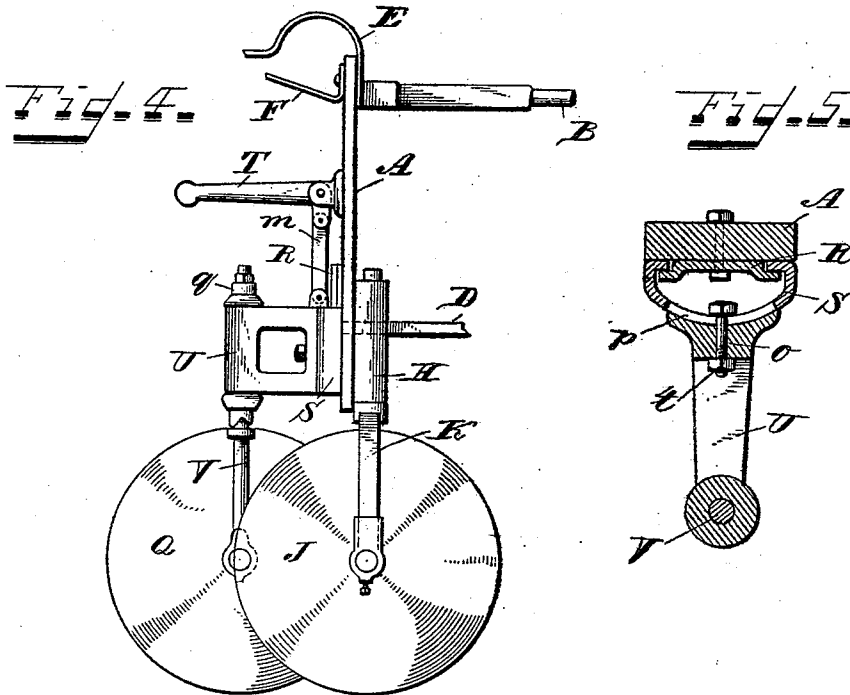
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4 Sheets—Sheet 4.

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UNITED STATES PATENT OFFICE.

ARTHUR F. BROWN AND WILLIAM R. KNAUB, OF DAYTON, OHIO, ASSIGNORS
TO THE STODDARD MANUFACTURING COMPANY, OF SAME PLACE.

DISK CULTIVATOR.

SPECIFICATION forming part of Letters Patent No. 499,711, dated June 20, 1893.

Application filed May 7, 1892. Serial No. 432,141. (No model.)

To all whom it may concern:

Be it known that we, ARTHUR F. BROWN and WILLIAM R. KNAUB, both citizens of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have jointly invented certain new and useful Improvements in Disk Cultivators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

Our invention relates to that class of disk cultivators known as straddle-row cultivators adapted to cultivate corn from the time the plants are first up until they reach a considerable height, and it has for its object the improved construction of such cultivators whereby their capabilities, adjustments, and efficiency are largely increased.

The novelty of our invention will be hereinafter set forth and specifically pointed out in the claims.

In the accompanying drawings:—Figure 1, Sheet 1, is a plan view of a cultivator embodying our invention. Fig. 2, Sheet 2, is a side elevation of the same. Fig. 3, Sheet 3, is a rear elevation of the same. Fig. 4, Sheet 4, is a side elevation of the rear of the machine in a modified arrangement. Fig. 5, Sheet 4, is an enlarged sectional detail through the dotted line *xx* of Fig. 2. Fig. 6, Sheet 4, is a plan view showing the arrangement of the disk for an out-throw of the soil.

The same letters of reference are used to indicate identical parts in all the figures.

The main frame of the machine, as seen in Figs. 1, 2 and 3, is composed of the vertical arch-plate A, of metal, to which at the top are rigidly secured two tubular metal bars B extending forward and parallel to each other for some distance and then converging and united at their forward ends to constitute the pole. Just at the point where the bars B begin to converge they are united by a cross-piece C rigidly secured thereon and from which brace bars D extend down and back and are secured to the arch plate A near its lower end on each side. These bars D are provided with foot rests *a* for the driver's feet.

E F are bars secured to the top of the arch plate and extending rearwardly therefrom to afford a support for the driver's seat G.

Pivoted as at *b*, Fig. 3, on the rear side of the arch-plate near its bottom and on each side is a bearing sleeve H normally standing vertical and secured by a bolt *c* extending through one of a series of holes in a plate *d* projecting from the upper end of the sleeve and through the arch-plate. Journalled in each sleeve H is a round standard I which extends down and is bent first inward and then outward horizontally to form the axle for each disk gang, on which axle are mounted, in this instance two, concavo-convex disks J properly spaced and free to revolve on the axle. Fast upon each standard I just below the sleeve H is a bar K which extends out over the disks J and has its end bent down and secured to the outer projecting end of the axle, which bar constitutes a combined gang bar and standard for the outer end of the gang.

Encompassing the bars B just behind the cross piece C is a slide L with rear extensions and a rear cross-piece M which moves with the slide L upon the bars B. The double tree N is pivoted by a bolt *e* upon the slide L and extends downward on each side thereof and has secured at its ends, in any suitable manner, the single trees O. To relieve the bolt *e* of part of the draft strain we employ rods *f* secured at their forward ends to the double tree near its ends and at their rear upper ends to a chain *g* taut around a sheave *h* pivoted at the proper angle upon the cross-piece M. In this manner the draft strain is thrown mainly upon the cross-piece M and bars B at a point nearly over the cutting disks while the chain and sheave permit the usual vibrations of the double tree. The outer ends of the bars K are connected to the slide L by rods *i*. As shown in Figs. 1 and 2, the rods *i* are of such length that, when the slide L is forward and arrested by the cross-piece C, the disks J of each gang are in a straight line, and it will be observed that the draft is directly upon the gangs, through the medium of the double tree, slide and rods *i* and not upon the pole. To angle the gangs rearward

we employ a lever P pivoted as at *j* upon the cross-piece C and having pivoted to it a link *k* whose rear end is pivoted, as at *l*, upon the slide. The driver by pulling back the lever P causes the slide L and cross-piece M to slip back upon the bars B and the resistance of the earth at once throws the gangs back to an angling position, as will be readily understood. When so thrown back the link *k* and lever P are toggle-locked so that the gangs will not resume their straight line position again until the lever P is thrown forward by the driver.

The machine so far described would make an efficient cultivator, and to reverse the gangs to get a throw-out cultivator it is only necessary to uncouple the rear ends of the rods *i* and swing the gangs bodily around on the vertical standards I and recouple the rods *i* to the then adjacent ends of the gangs in the same holes in which they were before coupled. By removing the bolts *c* and tilting the sleeves H on their pivots *b* the gangs can be tilted vertically in either direction and relocked to suit the requirements of the work to be done. To further increase the efficiency of the cultivator, however, we provide two independent inner disks Q whose axes are out of line with and preferably in advance of the axes of the gangs and which have four adjustments; namely, an in and out adjustment to bring their cutting edges nearer to or farther from the row of plants, a vertical adjustment to regulate the depth of their cut so as not to injure the roots of the plants, a bodily vertical throw to take them entirely out of action or to bring them into action and an angling adjustment, and these things we accomplish in the following manner: On the front of each side of the arch is a flanged way R with which engages a vertical slide S, Figs. 1, 2 and 5, coupled by a pivoted link *m* to a bell-crank lever T pivoted as at *n* to a bracket on the arch. The short arm of the lever T, engaging the bracket to which it is pivoted, serves as a stop to limit the throw of the lever from a horizontal position of its long arm forward to a similar position backward. The fronts of the slides S are rounded and upon each is fitted the concaved rear side of a bracket U which is locked in place by a bolt *o* projecting through a horizontal slot *p* in the slide and through a perforation in the rear wall of the bracket. The forward end of the bracket has a vertical bore in which is fitted a standard V having at its lower end a horizontal spindle upon which the disks Q are respectively journaled. The upper ends of the standards V are threaded to receive conically recessed nuts *q* which engage cone bosses on the bracket while just under the bracket of each standard is fitted a conically recessed washer *r* having notches of varying depth on its lower side engaging a pin *s* inserted through the standard. The upper recessed end of the washer *r* likewise engages a conical boss on the bracket. It will be seen

from this construction that to accomplish the in and out adjustment of the disks Q it is only necessary to loosen the nut *t* of the bolt *o* and to swing the bracket in or out as indicated by the dotted lines Fig. 5 and to tighten the nut after adjustment to clamp the parts. So, also, to effect the vertical adjustment it is only necessary to unscrew the nut *q* and turn the washer *r* around. Then after sliding the standard up or down as desired the pin is re-engaged in the proper notch in the washer and the nut *q* is screwed down to reclamp the parts. To effect the angling it is only necessary to loosen the screw *q* and to turn the standard in its bearing in the bracket and then reclamp it by tightening up the screw again. To effect the bodily throw it is only necessary to turn over the lever T as seen by the dotted lines in Fig. 2, when the slide S is raised carrying with it the bracket, standard, and disk Q. This the driver can do instantly with his foot without getting off his seat on the machine, as for instance when he wants to turn the machine around or for other purposes. In a like manner he can lower the parts by throwing the lever T back again to the position of the solid lines, Fig. 2, and it will be noticed that when in this position the link *m* and bell-crank are toggle-locked to hold the disks Q down to their work.

In Fig. 4 we have shown the positions of the gangs and inner disks reversed, that is to say, the brackets with the inner disks and other attachments are on the rear side of the arch plate, while the gang sleeves H are upon the front side of the arch. The only effect of this is to bring the inner disks in the rear instead of in front of the lines of the gangs.

Again, in Fig. 6 we have shown the cultivator arranged to throw the earth outward. Here the disks J are swung around on their standards I and the rods *i* re-engaged to the adjacent ends of the bars K, as before described, while the forward ends of the rods *i* are connected to the lugs *a'*, see Fig. 2, to which the draw rods *v* for the guards W are attached when in use. The brackets U are set outward as shown and the disks Q are reversed and given any degree of angling desired.

The remaining feature of our invention consists in providing rows of perforations *u*, Fig. 2, in the usual guards W which are drawn by the bars *v* in front and suspended by the chain *w* in the rear. By means of these perforations some of the earth thrown against the guards is sifted through these perforations around the bases of the plants, which is often desirable.

Any suitable scrapers as *y* may be provided for all of the disks.

Having thus fully described our invention, we claim—

1. In a disk cultivator, an inner disk carried by a bearing on a slide having vertical play, in combination with a lever for raising, lowering and locking said slide.

2. In a disk cultivator, the combination with a bodily adjustable disk gang, of an independent inner disk revoluble on an axis adjustable, toward or from the row of plants, and in a horizontal plane to change the angle of the disk.

3. In a disk cultivator, the combination with a bodily adjustable disk gang, of an independent inner disk revoluble on an axis adjustable, toward or from the row of plants, vertically to regulate the depth of the cut, and in a horizontal plane to change the angle of the disk.

4. In a disk cultivator, the combination with a disk gang, of an inner disk carried by a bearing on a slide having vertical play and a lever for raising, lowering, and locking said slide.

5. In a disk cultivator, the combination, of a backwardly and forwardly movable double tree, means for locking the same in its adjusted positions, pivoted disk gangs connected to the double tree, and inner disks revoluble on axes adjustable toward and from each other, substantially as described.

6. In a disk cultivator, the combination, of a backwardly and forwardly movable double tree, means for locking the same in its adjusted positions, pivoted disk gangs connected to the double tree, and inner disks revoluble on axes adjustable toward and from each other and in horizontal planes to change the angles of said inner disks, substantially as described.

7. In a disk cultivator, the combination, of a backwardly and forwardly movable double tree, means for locking the same in its adjusted positions, pivoted disk gangs connected to the double tree, and inner disks revoluble on axes adjustable, toward and from each other, and vertically to regulate the depth of the cut, substantially as described.

8. In a disk cultivator, the combination, of a backwardly and forwardly movable double tree, means for locking the same in its adjusted positions pivoted disk gangs connected to the double tree, and inner disks revoluble on axes adjustable, toward and from each other, vertically to regulate the depth of the cut, and in horizontal planes to change the angles of the inner disks, substantially as described.

9. In a disk cultivator, the combination, of a backwardly and forwardly movable double tree, means for locking the same in its adjusted positions, pivoted disk gangs connected to the double tree, and inner disks carried by bearings on slides having vertical play, and levers for raising, lowering and locking said slides, substantially as described.

10. In a disk cultivator, the combination, of disk gangs, means for angling the same, and inner disks revoluble on axes adjustable toward and from each other.

11. In a disk cultivator, the combination, of disk gangs, means for angling the same,

and inner disks carried on axes adjustable, toward and from each other, and vertically to regulate the depth of cut.

12. In a disk cultivator, the combination, of disk gangs, means for angling the same, and inner disks carried on axes adjustable, toward and from each other, and in horizontal planes to change the angles of the inner disks.

13. In a disk cultivator, the combination, of disk gangs, means for angling the same, and inner disks carried on axes adjustable, toward and from each other, vertically to regulate the depth of cut, and in horizontal planes to change the angles of the inner disks.

14. In a disk cultivator, the combination, of disk gangs means for angling the same, inner disks carried by bearings on slides having vertical play, and levers for raising, lowering and locking said slides.

15. In a disk cultivator, the combination, of disk gangs, means for angling the same, and inner disks having four independent adjustments, viz., toward and from each other, angling, vertical to regulate the depth of cut, and vertical to bring them into or take them out of action.

16. In a disk cultivator, the combination of the arch A, the parallel and convergent bars B secured thereto and forming the pole, the slide L thereon having the double tree N pivoted thereto, a forward stop for the slide, the pivoted disk gangs connected to the double tree, and the lever P for operating the slide, substantially as described.

17. In a disk cultivator, the combination, of the arch A, the parallel and convergent bars B secured thereto and forming the pole, the slide L thereon having the double tree N pivoted thereto, a forward stop for the slide, the sheave h connected to the bars B and movable with the slide, the rods f and chain g passed around said sheave, the pivoted disk gangs connected to the double tree, and the lever P for operating the slide, substantially as described.

18. In a disk cultivator, the combination of the bearing S, the bracket U adjustable thereon the standard V journaled through said bracket and adjustable therein by means of the pin s, washer r, and nut q, and the disk Q carried by said standard, substantially as described.

19. In a disk cultivator, the combination of the way R, the slide S thereon carrying the bracket U and disk Q, the lever T and link m, substantially as described.

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