C. E. WHITE.

DISK HARROW.

APPLICATION FILED JAN. 10, 1912.

1,289,989.

Patented Dec. 31, 1918.

3 SHEETS—SHEET 1.

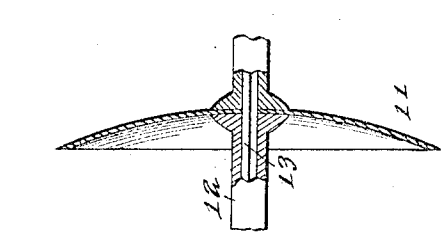


Fig. 3.

Fig. 1.

Fig. 2.

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3 SHEETS—SHEET 2.

Fig. 4.

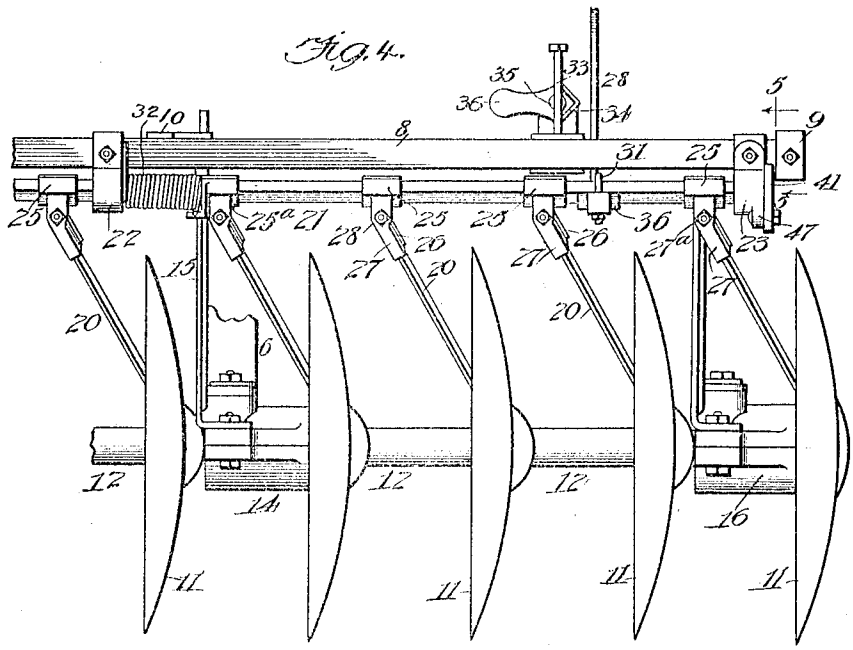


Fig. 5.

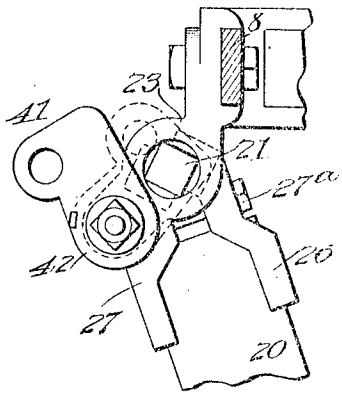


Fig. 6.

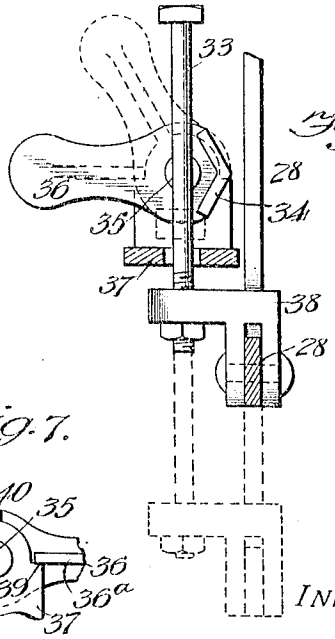


Fig. 7.

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3 SHEETS—SHEET 3.

Fig 9.

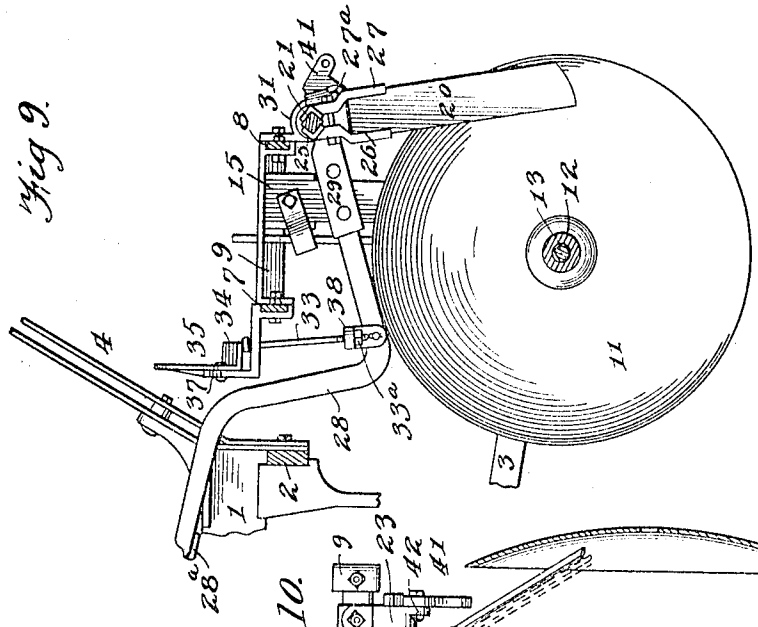


Fig. 10.

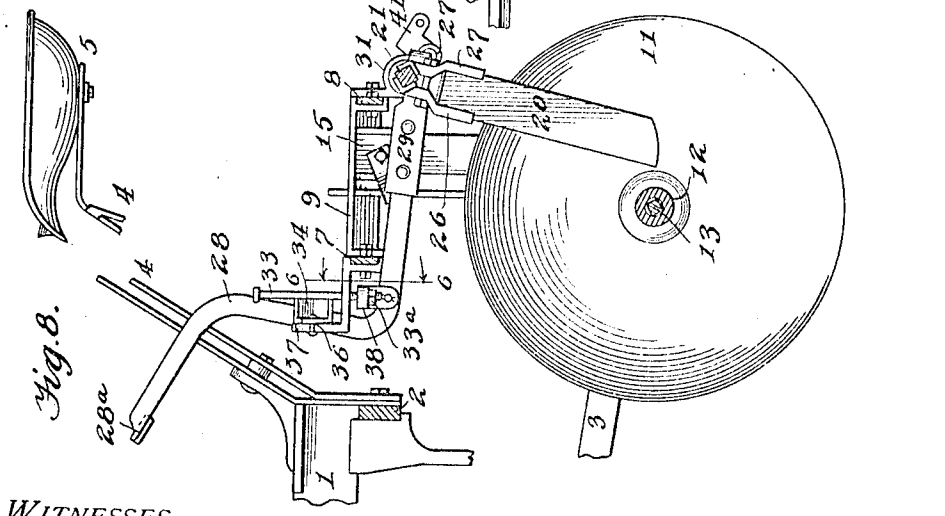


Fig. 8.

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UNITED STATES PATENT OFFICE.

CHARLES E. WHITE, OF MOLINE, ILLINOIS, ASSIGNOR TO DEERE & MANSUR CO., A CORPORATION OF ILLINOIS.

DISK HARROW.

1,289,989, Specification of Letters Patent. **Patented Dec. 31, 1918.**

Original application filed June 14, 1907, Serial No. 378,979. Divided and this application filed January 10, 1912. Serial No. 670,412.

To all whom it may concern:

Be it known that I, CHARLES E. WHITE, a citizen of the United States, residing at Moline, in the county of Rock Island and State of Illinois, have invented certain new and useful Improvements in Disk Harrows, of which the following is a specification, reference being had therein to the accompanying drawing.

The invention relates particularly to improvements in disk harrows, and the object of the invention is to provide improved means for mounting, moving and holding or locking the scraper devices which are used for cleaning the concave surfaces of the disks.

The manner of constructing and operating parts embodying my improvements will be readily understood from the description below, considered in connection with the drawings.

Figure 1 is a plan view of a disk harrow embodying my improvements.

Fig. 2 is a section of the rock shaft for the scrapers and showing part of the lever attached thereto.

Fig. 3 is a vertical section of one of the disks and the adjacent part of its shaft and thimbles.

Fig. 4 is a rear view of the inner part of one of the disk gangs on a larger scale.

Fig. 5 is a section taken on the line 5—5 of Fig. 4.

Fig. 6 is a section on the line 6—6 of Fig. 8.

Fig. 7 is a detail view of two parts shown in Fig. 6.

Fig. 8 is a section on the line 8—8 of Fig. 1.

Fig. 9 is a section similar to that of Fig. 8, but showing the scraper-supporting mechanism in the opposite position.

Fig. 10 is a rear view, parts being shown in vertical section, of the inner end of one of the gangs of disks, the parts shown being in position to have the scrapers engage with the disks.

The implement shown in the drawings is constructed with draft devices or a frame at A, having a wheel supporting frame or truck frame at B, and at the rear connected to the frame C, C for the disk gangs.

The draft devices comprise a tongue 1, a cross-bar 2, and rearwardly diverging drag-bars 3, 3. The cross-bar 2 has a somewhat elevated central part at the ends of which there are legs extending downward and the lower parts of these are turned backward, as at 6, for attachment to the gang boxes. The draft bars 3 are connected to the forward part of the tongue 1 and extend backward and outward somewhat, they at their rear ends being connected to the boxes of the gang-axles at the places where the ends of the cross-bars 2 are united therewith.

At the rear end of the tongue the seat 5 is supported by means of suitable bars 4 which extend upward and backward for carrying it.

Each gang frame comprises a front bar 7, a rear bar 8, and cross-bars 9, and intermediate cross-plates or bars at 10, these being arranged in approximately the same horizontal planes and being situated above the disks 11, 11. The disks are mounted upon an axle composed of the sleeve sections 12, 12 and the angular central rod or shaft 13 upon which the sleeve parts 12 are fitted, each of the disks 11, 11 being clamped between two of the sleeves or thimbles.

The shaft thus built up is mounted in a box 14 approximately near the center, longitudinally, there being also boxes 16 and 19 near the ends. The upper part of the frame is connected to the boxes by means of vertical standards 15.

The boxes at the inner ends of the gangs are flexibly connected to the links 17 which at their forward ends are joined to the levers 18, the latter being pivoted to the tongue and each being provided with a detent and segment. By means of the levers 18 the gangs may be adjusted to different angular positions relative to the lines of draft and, as the connections of the gangs with the ends 6 of the frame bar 2, with the rear ends of the frame bars 3 and with the bars 17, are somewhat loose, the ends of the gangs are free to rise and fall somewhat.

The scrapers for the disks are indicated by 20, 20. They are rigidly connected to a rock-shaft 21 mounted behind and a little below the frame parts 7, 8, 8 in bearings at 22, 23, 24, at the center and at the ends of the shaft. The scrapers can be of any suitable shape. As shown, they are elongated knife-like

parts indicated as aforesaid by 20, and each at the upper end is held in a clamp 25 which is adjustably secured to the rock shaft 21. These clamps consist of the two parts 26, 27 and the bolt 27ª, the parts 26, 27 being shaped at their upper ends to fit the shaft 21 and at their lower ends to fit the scraper bar. One of the clamps of each gang, indicated on the drawings by 25ª, has its part 27 formed with a lug or arm so that a spring 32 coiled around the rock shaft can engage with it and also with some stationary part, as, for instance, with the bar 8 of the frame, this spring acting both to tend to push the bar 21 longitudinally inward and also to rock it downward at its rear side.

The spring 32, as above remarked, tends normally to rock the shaft 21 in such way as to bring the lower ends of the scrapers toward the disk shafts; that is, bring them to the positions shown as occupied by the scraper 20 in Fig. 8. At such time the scrapers will be in position to clean the central parts of the disks. When it is desired to draw them away from the centers and have them so situated as to act upon the peripheral parts of the disks it is accomplished as follows: 28 indicates a lever which at its rear end is secured to a casting 29 having a socket part 30 which is clamped to the rock shaft 21 by means of stirrup bolt 31, see Fig. 2. This lever is shaped so as to extend from the rock shaft forward under the top bars of the gang frame, then upward to a position where it can be readily reached by the driver's foot, having at its front end a foot-rest 28ª. When the operator presses down upon this lever with his foot he rocks the shaft 21 and throws the scrapers 20 from their innermost to their outermost positions; and inasmuch as the scrapers are held in these outer positions during the greater part of the time of their use, I have combined with them a lock or stop which will hold them when so placed, but which can be at any time easily and quickly opened to permit them to return to the center. This lock comprises a pin or bolt 33 and an opposing vibratable stop 34. This bolt 33 is threaded through a shoulder bracket 38 which is secured to the foot lever 28, the bolt being adjustably secured in position by means of a lock nut 33ª. The bolt extends upward through a perforation in a casting 37 mounted upon the front frame bar 7 and upon which, at 35, the stop 34 is pivotally mounted. Said stop member is provided with a handle bar 36 which carries a flange or lug 36ª adapted to engage shoulders 39 and 40, on the bracket 37, to limit the movement of said stop member.

When the foot lever is forced down to the position shown by dotted lines in Fig. 6, the handle 36 may be raised by the hand or the foot of the operator, thus bringing the stop 34 in position above the head of the stop bolt 33, and the parts are maintained in such position when the foot of the operator is removed from the lever 28 by the upward pressure of bolt 33 due to the spring 32. When it is desired to release lever 28, the operator depresses it slightly with his foot, thus allowing the stop member to fall under the action of gravity and free the bolt 33 for upward movement.

It will be seen that by adjusting the lock bolt 33 up or down in the bracket 38, the position at which the scraper can be held can be varied as required. Thus, when the bolt 33 is adjusted as shown in the drawings, the scrapers 20 are held by the lock in positions at the peripheries of the disks as shown in Fig. 9; but, by screwing the locking bolt 33 farther down in the bracket 38, and securing it in such adjusted position, the scrapers can be held by the lock in positions more or less inward radially from the peripheral parts of the disks. On the other hand, the lock can be made to hold the scrapers in positions farther outward radially than shown in Fig. 9 by adjusting the bolt 33 upward in the bracket 38. In either case, it will be seen that the locking bolt serves also to prevent the scrapers being carried outward beyond the desired position.

In some soils, and under certain conditions of many soils, it is desirable to be able to secure the scraper in a position intermediate the central part and the peripheral part of the disk, as where the soil is of such nature as to tend to adhere to the disks in large lumps or wet clods. Under such conditions the scraper, if held in the intermediate position, tends to remove these large accumulations both from the edge parts and from the central part, simultaneously. But in many instances, even where the soil is dry, it is necessary to have the scraper operating for long periods, in fact, continuously at the edge of the disk. For example, when the soil is dry and the surface is covered with quantities of straws, weeds, stalks or the like, these double up against the concave face and the convex face of the disk without being cut through and will rapidly form a mat of such nature as to deaden or dull the edge of the disk and prevent it from penetrating the ground; this being an experience met with in large territories, under almost any seasonal and soil conditions and met with in almost every territory when the season is such as to result in certain conditions of the soil (generally dry) and of the vegetation growth at the surface.

Under such circumstances I have found that the implement is greatly improved by being provided with parts as above described of such nature that the scraper can not only be brought to a position nearer the edge of the disk, but can be held there without requiring any attention from the opera-

tor or any exertion of his foot, for a long period, in some cases for an entire day's work.

Heretofore no disk harrows so far as I have knowledge were capable of these uses. In all of these implements the parts have been so arranged as to permit only a momentary use of the scraper at the peripheral part of the disk or else to require that the operator must give his attention to this matter and exert a prolonged foot action upon the scraper lever. With devices such as I have shown and described he can, without being diverted from his control of the team, throw the scrapers of the series to the point where they will act upon the periphery for a long period of time and cause them to be automatically locked there by a quick short action of the foot. In fields where wiry grass, tough straws, weeds or stalks are prevalent and widely distributed over the ground, the edges of the disks, even when newly sharpened, become rapidly matted in the way above described and although the disks may be cleaned they are again matted during a few feet of travel and the throwing of the scraper for brief periods out to the periphery of the disk and then backward to the axis becomes a tiresome matter and one interfering with perfect work with the implement. Nor does the driver, with my improved construction, have to exert discretion while at work as to how far outward he will throw the scrapers or as to the place at which he will lock them; for the adjustable stop serves to prevent him from throwing the scrapers beyond the edges of the disks as well as to determine where the scrapers will be stopped against return toward the axis of the disks; and, after ascertaining the conditions of the day as to the soil and the materials on the surface of the soil, he adjusts the stop device so that the scrapers will be stopped and perform their work at the very edges of the disks or at the proper points less distant radially from the axis of the disks, and thereafter can continue working under those conditions in the way above described.

Provision is also made in the mechanism herein shown for holding all of the scrapers of a gang away from the disks. This is done by moving the rock-shaft 21 longitudinally outward far enough to release the scrapers and locking it against movement inward under the action of the spring 32. At 41 there is a rocking-plate. It is pivoted to an ear or projection 42 formed upon the bearing 23. When this plate 41 is turned back, as shown in Figs. 5 and 10, the rock-shaft 21 projects some distance through the bearing 23. When it is desired to hold the rock-shaft in its outermost position, it is forced outward either by hand or by depression of the foot lever 28, until its end lies in the bearing 23 and then the plate 41 is carried over and dropped into the position shown in Figs. 1 and 4, and by the dotted lines in Fig. 5, it thus serving as a stop to prevent the shaft from returning to its normal position; and when the shaft is thus held by the plate the scrapers, if in their normal position near the axis of the disks, are held out of contact with the disks; at the same time the scrapers are free to oscillate as before, under the action of foot lever 28 and spring 32, but they now swing in planes and out of contact with the disks until they approach the peripheral part thereof when they come into operative engagement. The value of this feature of my invention will be appreciated by those familiar with the wide variety of conditions under which such implements are worked. In wet sticky soil the constant operation of the scrapers in engagement with all parts of the disks from the axis to the periphery may be required, while in dry soil, they may be needed only at intervals. In the latter case the scrapers can be thrown off thus eliminating the wear and lightening the draft, and at the same time, the scrapers can instantly be thrown outward into engagement with the peripheral parts of the disk, such engagement being sufficient, in a soil of the character in question, to keep the disks clean. When the scrapers are thrown outward as last described, they can, if it be desired, be locked in the outer position by the lock 33, 34, thereby securing many of the advantages previously referred to as incident to such locking. In some cases it will be advantageous to have the scrapers locked off and be able to swing them into proximity to but not into contact with the peripheral parts of the disks. This can be accomplished by adjusting the scrapers 20 on their supporting shaft 21, it being necessary only to loosen the clamping bolts 27^a to make such adjustment. Also in working trashy soil, under some conditions, the swinging of the scrapers, when thrown off the disks, will be effective to clear the disks of roots or other trashy material.

In the present application I do not present claims involving the means for holding the scrapers away from the surfaces of the disks independently of the means for holding them at or near the peripheries of the disks, as this feature is claimed in my Patent No. 1,020,530, granted upon application, Serial No. 378,979, filed June 14, 1907, of which the present application is a division.

What I claim is:—

1. In a disk harrow, the combination of a main frame, a driver's seat on the main frame, a gang of disks connected to said frame, scrapers for the disks mounted to move back and forth from one position to another relative to the disks, means compris-

ing a spring for moving the scrapers in one direction, a foot lever within convenient reach of the foot of the operator in the seat for moving said scrapers in the opposite direction, and a lock for holding the lever against movement under the action of the spring, said lock being adapted to move to an inoperative position when the foot lever is moved slightly against the pressure of the spring.

2. In a disk harrow, the combination of a main frame, a driver's seat thereon, a gang of disks connected to the main frame, scrapers for the disks mounted to move back and forth from one position to another relative to the disks, means comprising a spring for moving the scrapers in one direction, a foot lever within convenient reach of the foot of the driver in the seat for moving said scrapers in the opposite direction, and a lock for holding the lever against movement under the action of the spring, said lock being adapted to be moved manually into operative position and to move automatically into inoperative position when the foot lever is pressed by the driver.

3. In a disk harrow, the combination of a main frame, a driver's seat thereon, a gang of disks connected to the main frame, scrapers for the disks mounted to move back and forth from one position to another relative to the disks, means comprising a spring for moving the scrapers in one direction, a foot lever within convenient reach of the foot of the driver in the seat for moving said scraper in the opposite direction, and a lock for holding the lever against movement under the action of the spring, said lock being adapted to move automatically into inoperative position when the foot lever is pressed by the driver.

4. In a disk harrow, the combination with a gang frame and a gang of disks mounted therein, of a series of scrapers adapted to have their operative parts movable forward and backward relative to the axis of the disks, a vertically vibrating lever for actuating the scrapers, a lock for holding the scrapers in their outermost positions adapted to move out of its locking position under the action of gravity, a seat for the driver, and means in reach of the driver's foot while he is in the seat for releasing the said lock, substantially as set forth.

5. In a disk harrow, the combination of a gang frame, a disk gang, scrapers mounted on the gang frame, a rock shaft for the scrapers, a lever connected to the rock shaft, a stop rod 33 carried by the lever, and a movable stop on the gang frame adapted to lock the stop rod, substantially as set forth.

6. The combination of a disk, a frame or carrier therefor, a scraper movable transversely to the axis of the disk, a lever for swinging the scraper, and means for holding the scraper in operative position adjacent the periphery of the disk comprising a part mounted on the frame and a coöperating part mounted on the lever, one of said parts being mounted adjustably, whereby the position in which the scraper is held can be varied.

7. In a disk harrow, the combination of a frame, a disk carried thereby, a swinging scraper for the disk, means comprising a spring for swinging the scraper toward the axis of the disk, a lever for swinging the scraper from the axis to the periphery of the disk, and a lock for the lever to hold the scraper at the periphery of the disk against the action of the spring, said lock being adapted to be held in operative position by the pressure of the spring and to automatically move to inoperative position when relieved from said pressure.

8. In a disk harrow, the combination of a frame, a disk carried thereby, a swinging scraper for the disk, means comprising a spring for swinging the scraper toward the axis of the disk, a lever for swinging the scraper from the axis to the periphery of the disk, and a lock for the lever to hold the scraper at the periphery of the disk against the action of the spring, said lock being adapted to be moved manually into operative position, to be held in operative position by the pressure of the spring and to be moved by gravity to an inoperative position when relieved from the pressure of the spring.

9. In a disk harrow, the combination of a frame, a disk carried thereby, a swinging scraper for the disk, means comprising a spring for swinging the scraper toward the axis of the disk, a lever for swinging the scraper from the axis to the periphery of the disk, and a lock for the lever to hold the scraper at the periphery of the disk against the action of the spring, said lock being adapted to be held in operative position by the pressure of the spring.

10. In a disk harrow, the combination of a main or draft frame, a gang of disks connected to said frame, swinging scrapers for said disks, means comprising a spring for moving the scrapers from the peripheries to the center parts of the disks, a driver's seat, a foot lever disposed so as to be conveniently pressed by the foot of a driver in the seat and adapted to swing the scrapers outward to the peripheries of the disks against the action of the spring, and a lock for the foot lever to hold the scrapers at the peripheries of the disks, said lock being adapted to be held in operative position by the pressure of the spring and to automatically move to an inoperative position when relieved from the pressure of the spring by a slight movement of the foot lever in opposition to said spring.

11. The combination of a disk, the frame

or carrier therefor, a scraper on the carrier having its operative part movable transversely of the axis of the disk, means for normally positively holding the operative part of the scraper away from the surface of the disk in a position near the axis of the disk, means whereby the scraper can, at will be moved away from the said position to an outer position, means for pressing the scraper when in the last said position against the concave surface of the edge part of the disk, a lock for automatically holding the scraper in the last said position whereby the disk edge can be kept continuously clear of material adapted to form adhering mats at the edge circle.

12. The combination with the disk and the frame therefor, of a scraper having its operative part movable toward and from the axis of the disk, means for supporting and guiding the scraper to cause its operative part to move in a definite path so as to contact only with the peripheral part of the disk and move free of contact with the central part of the disk, and a lock for automatically and optionally holding the scraper in contact with the concave surface of the edge part of the disk.

13. The combination of a disk, a frame or carrier therefor, a scraper movable transversely to the axis of the disk and movable automatically toward and manually from the disk face, means for automatically and optionally holding the scraper out of contact with the disk face while near the axis of the disk, and a lock for holding the scraper in contact with the concave surface of the edge part of the disk.

14. In a disk harrow, the combination with a gang frame and a gang of disks carried thereby, of scrapers for the disks, a movable carrier for the scrapers adapted to oscillate them between the central parts of the disks and the peripheral parts thereof, a spring tending to hold the scrapers in their innermost position, means for moving the scrapers outward in opposition to the spring, and a lock for holding the scrapers in their outer operative position, said lock being held in operative position by the said spring.

15. In a disk harrow, the combination with a gang frame and a gang of disks carried thereby, of scrapers for the disks, a movable carrier for the scrapers adapted to oscillate them between the central parts of the disks and the peripheral parts thereof, a spring tending to hold the scrapers in their innermost position, means for moving the scrapers outward in opposition to the spring, and a lock for holding the scrapers in their outer operative position, the lock being held in operative position by the said spring and being adapted to move automatically to inoperative position when relieved of the pressure of said spring.

In testimony whereof I affix my signature, in presence of two witnesses.

CHARLES E. WHITE.

Witnesses:
ROBERT M. ADAMS,
OSCAR F. LUNDAHL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."