(No Model.)

2 Sheets—Sheet 1.

D. HARPER.

DISK PULVERIZER.

No. 590,981. Patented Oct. 5, 1897.

Fig. 1.

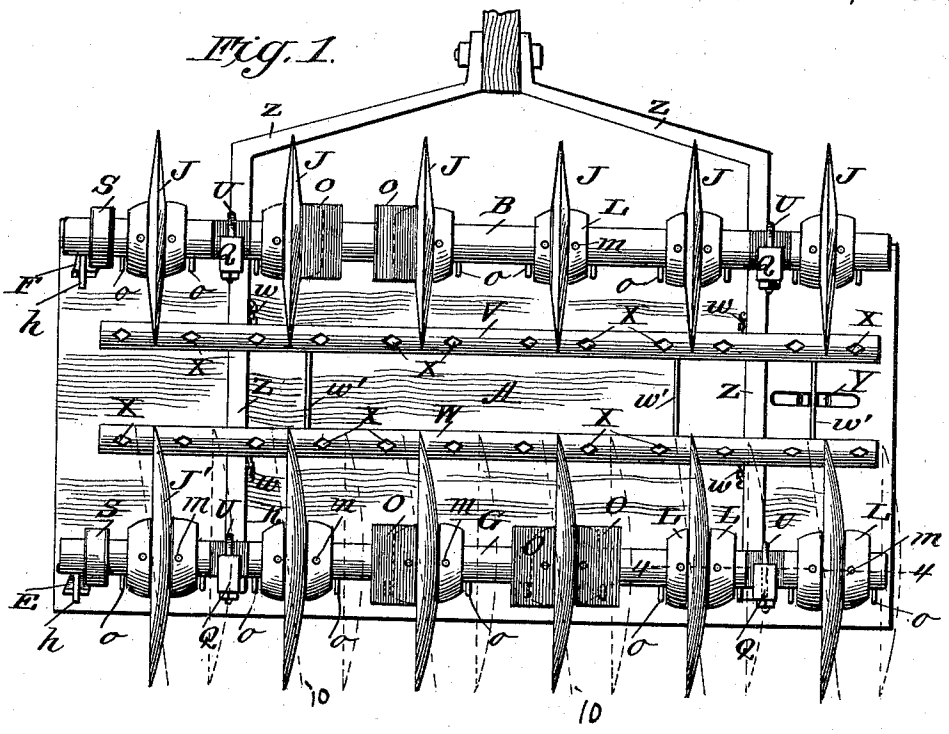
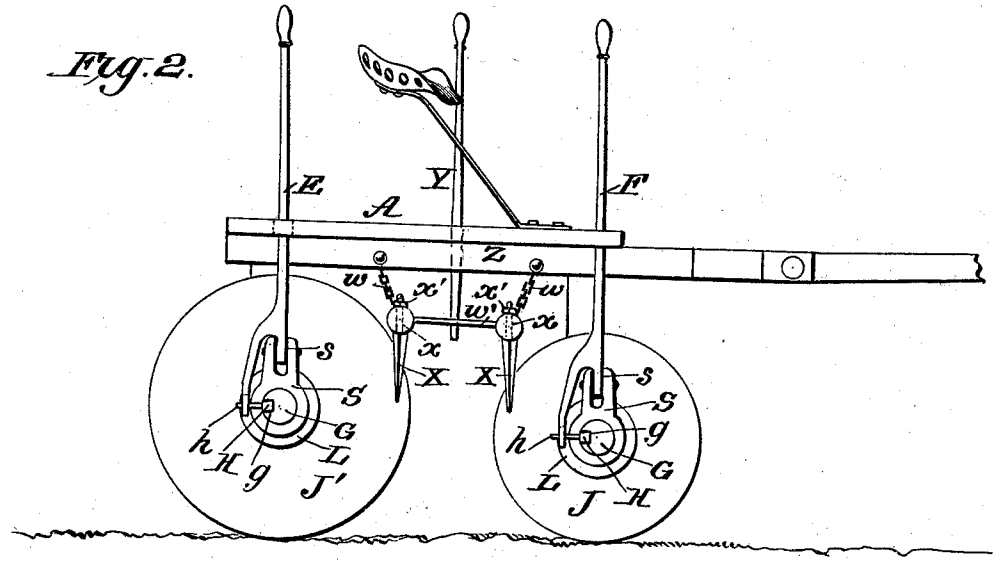


Fig. 2.



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(No Model.)

2 Sheets—Sheet 2.

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DISK PULVERIZER.

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Fig. 3.

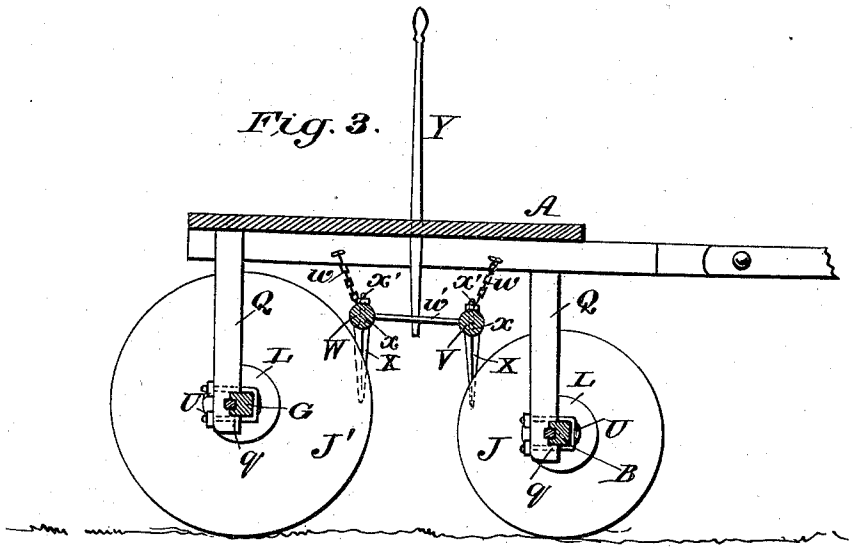


Fig. 4.

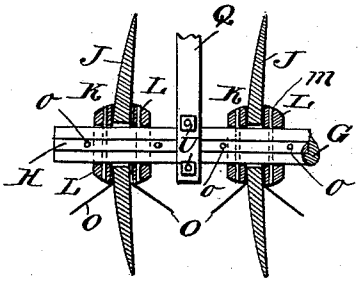


Fig. 5.

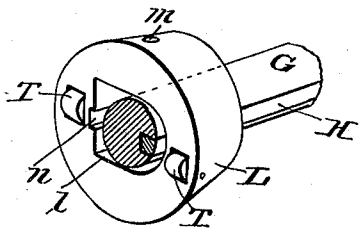
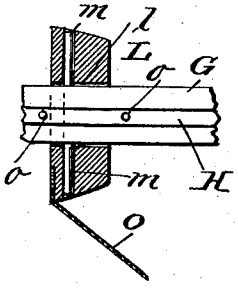
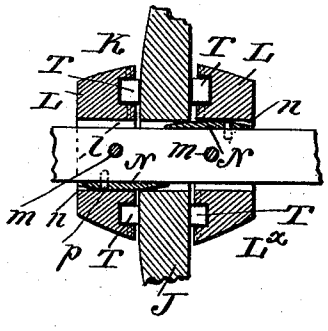


Fig. 7.

Fig. 6.





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UNITED STATES PATENT OFFICE.

DAVID HARPER, OF SCOTT COUNTY, ILLINOIS.

DISK PULVERIZER.

SPECIFICATION forming part of Letters Patent No. 590,981, dated October 5, 1897.

Application filed September 26, 1894. Renewed July 17, 1897. Serial No. 644,992. (No model.)

To all whom it may concern:

Be it known that I, DAVID HARPER, residing in the county of Scott (post-office Neelyville, Morgan county) and State of Illinois, have invented a new and Improved Disk Pulverizer, of which the following is a specification.

My invention is an improvement in the class of soil cutters and pulverizers whose chief distinguishing feature is a series of rotary disks or circular cutters adapted to be shifted and set at different angles both vertically and horizontally.

The invention is embodied in the construction and combination of parts hereinafter set forth.

In the accompanying drawings, Figure 1 is an inverted plan view of my improved pulverizer. Fig. 2 is an end view of the same. Fig. 3 is a transverse section of the same, taken on the line 3 3, Fig. 1. Fig. 4 is a partial longitudinal section thereof on the line 4 4, Fig. 1. Fig. 5 is a detail perspective view of one of the cuff or disk holding and adjusting members. Fig. 6 is a longitudinal section on the line 6 6, Fig. 5, and Fig. 7 is a transverse section thereof.

In its practical construction my improved pulverizing-machine comprises a main frame or platform A, mounted on a pair of axles B and G, arranged one in front of the other, on each of which is mounted a series of rotatable disks or pulverizers, the series of disks on each axle being adapted to be moved to an adjusted position in unison, the series on one axle, however, being held for movement independent of the series on the opposing axle.

In the drawings, C indicates the front disks, and D the rear disks, and E and F the respective operating-levers therefor, which extend up through the platform A and within convenient reach of the driver's seat.

As the detailed construction, arrangement, and operation of both sets of pulverizing-disks are alike, a detailed description of one set will suffice for both.

G indicates an axle, the diameter of which may vary according to the size and weight of machine desired, and such axle is formed with a longitudinal groove *g*, in which is held to slide a bar H, provided at one end with a finger *h*, projected at right angles therefrom, for a purpose presently explained.

J J indicate the roller-disks or cutter-blades, which are placed on the axle and spaced apart as may be required, such disks being preferably one-half an inch thick at the hub and made tapering toward their periphery to form a knife or cutting edge. It should be stated at this point that to the more effectually turn the dirt the rear cutter-disks have one face slightly dished or concaved, as shown, and such disks are also preferably two or more inches in diameter than the front disks, whereby when the cutters are arranged in the same line, as shown in Fig. 1, the front cutters will serve to split the ground and the back cutters go deeper and turn over and smooth the ground.

Each of the disks has its hub-aperture made slightly larger than the diameter of the axle, whereby it is capable of being set diagonally and moved crosswise or awry thereon, as indicated by dotted lines 10 in Fig. 1, when the rear disks are used to turn the earth. To hold such disks to their adjusted positions, cuff-like members K, such as shown in detail in Figs. 5, 6, and 7, are employed, each of which consists of a semihub-like section L, apertured at *l* to receive the axle G, which aperture in one direction (the horizontal) is made wider than the diameter of the axle, whereby such cuff member is adapted to rock horizontally on such axle, it being held thereon from longitudinal movement by a pin *m*, which passes through it and the axle and forms also the pivot-pin for such cuff member.

One side of the elongated portion of the cuff-opening is cut square, (see Fig. 7,) and in such squared portion is formed a way *n*, in which is fitted a wedge member N, made thick at the center and thin at each edge, and such wedge is held from movement on the axle by the pin *p*, which passes through the cuff member and the wedge member.

The cuff members in each pair (one pair being provided for each disk) are set with the squared end of their elongated portions disposed oppositely, so that the wedge members of the cuff members will project at opposite sides of the axle.

By holding the disks loosely on the axle and

providing cuff members and wedge devices, as described and shown, it will be manifestly clear that should the cuff members be adjusted (in the manner hereinafter described) to set the disks crosswise on the axle, in the direction indicated by the arrow in Fig. 1, the wedge member in the cuff member $L^{\times}$ will fill in the space between the hub of the disk and the axle at the front and back and form, as it were, a solid bearing at such points therefor and prevent the axle and hub from wearing away unevenly. When turned in an opposite direction, crosswise, it is obvious that the wedge in the opposite cuff member will serve a like function, but when the disks or blades are set straight on the axle the tapered inner ends of the wedges will fit in at opposite sides (front and back) of the axle and take up the loose space between the hubs of the disks and the axle at the front and back and in consequence make a true bearing for such disks.

It will be noticed by reference to Fig. 1 that the slide-bar on both the axles has a series of pins *o o* projected out, which are adapted to engage the said cuff members and move them to their desired adjustments as the bar is reciprocated.

As hereinbefore stated, the bar H has a projecting finger *h*. To this finger is connected the forked end of the lever E, which has a pivotal connection with the slotted projection *s* of a keeper S, secured on the outer end of the axle G.

From the foregoing it will be readily seen that by shifting the lever E all the disks on the shaft G can be set crosswise to the right or left and held to such position by the usual pawl and rack devices on the lever or by other means, the same adjustments for the disks $C^{\times}$ on the axle C being effected by lever F. To reduce friction and to make the disks run true and easy, the inner or bearing faces of all the cuff members have friction-rollers T, as shown.

The axles are supported in hangers Q, secured on the under face of platform A, and such hangers have socket-like ends *q q*, which fit over the axles (see Fig. 3) and to which they are secured by the clips and bolt-and-nut devices U. By supporting the axles in this manner they can be adjusted longitudinally, so as to bring the disks on the back axle at points intermediate the front disks and thereby practically make a double-cutting disk pulverizer, if desired.

V W denote two bars placed one, V, to the rear upper edge of the front row of disks and the other, W, to the front upper edge of the rear disks, which bars are supported on flexible hangers *w w*, secured to the platform, as shown, and such bars are connected to be moved together by the rods *w' w'*.

X X indicate a series of scraper-teeth having screw-shanks *x x*, which pass through the bars and are secured thereto by the nuts *x'*. Such teeth it will be seen straddle the edges of the disks and are adapted to be moved in contact therewith by a lever Y, which connects with one of the rods *w'*, as shown.

Z indicates the yoke-like members, secured to the under side of the platform, the front end of which forms a bearing for the draft-pole.

On each of the cuff members is supported on the under side a fender O, which keeps the dirt as it is thrown up from entering between the cuffs and the axle.

By constructing a pulverizer as above described, and shown in the drawings, the same will leave the ground in a proper condition for the harrow after the first cut.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination with the main frame including the non-rotatable axle, said axle having a longitudinal groove, and disk members held to rotate on the axle, and capable of being swung crosswise thereon, of cuff-like members, held on the axle to rock thereon and in engagement with the hub portions of the disks, and a bar held to slide in the groove in reverse directions, having fingers adapted to engage the cuff members and lever mechanism on the platform connected to such bar all arranged substantially as shown and described.

2. The combination with the main frame, the axle and the disks held to rotate thereon and having apertures larger than the axle diameter, whereby they are capable of being swung laterally at an angle to the axle, of the cuff members pivotally held on the axle, to rock horizontally and to engage the hub portions of the disks, and wedge members on the axle arranged to fit the elongated portions of the disk-apertures and form a bearing therefor when said disks are shifted laterally and means for rocking the cuff members all substantially as shown and described.

3. In a disk pulverizing machine as described, the combination with the axle and the disks held to rotate on the axle and loosely fitted thereon, whereby they can be swung diagonally on the axle, of cuff members having their apertures elongated in a horizontal direction, pivotally connected to the axle to rock in a horizontal direction thereon, wedge members secured to such cuff members, adapted to project into the elongated portions of the disk-apertures when the cuff members are rocked, and a shifting bar held to engage such cuff members and mechanism for reciprocating such bar all arranged substantially as and for the purposes described.

DAVID HARPER.

Witnesses:
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JOHN GUNNELS.