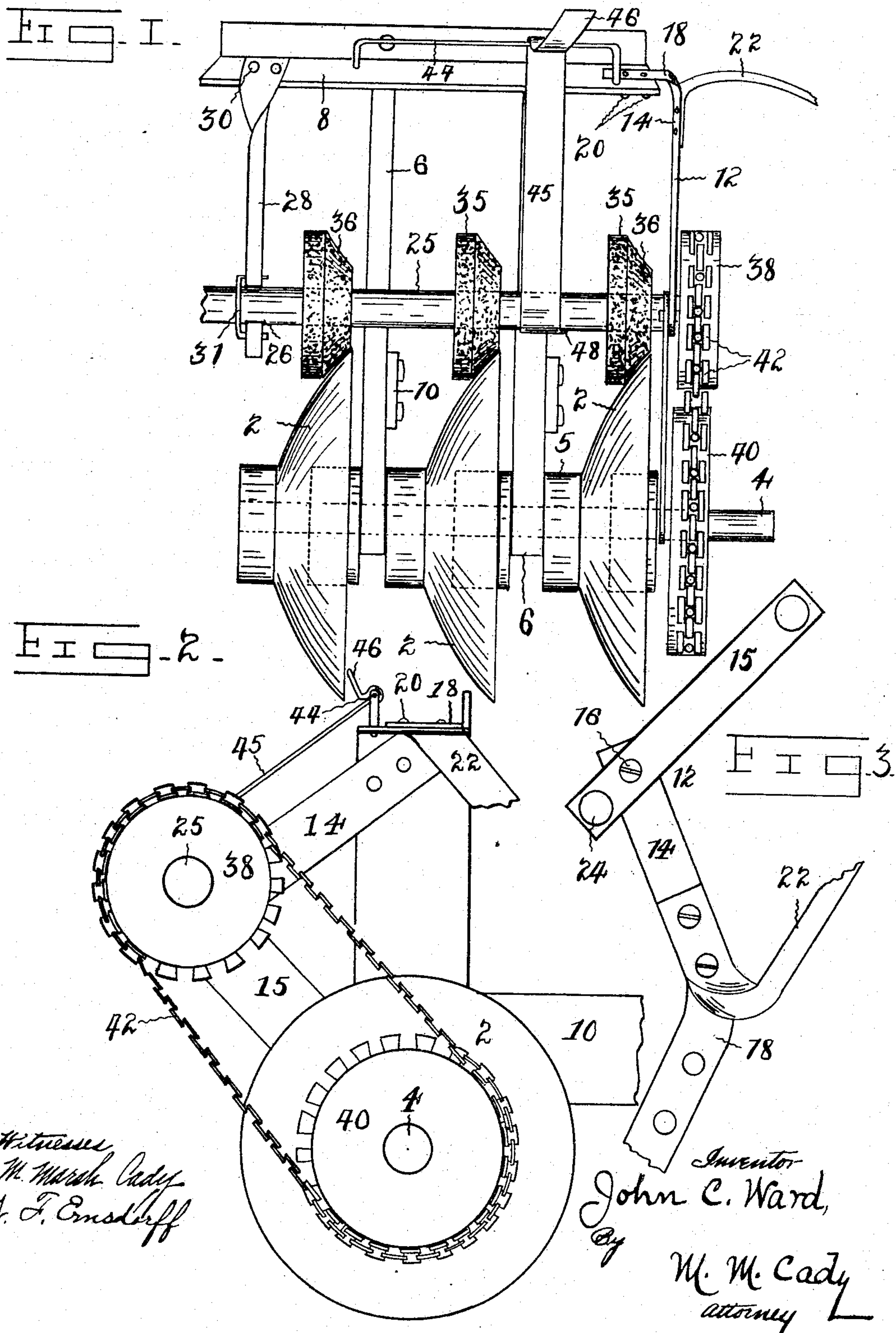


J. C. WARD.  
 PORTABLE AND DETACHABLE DISK GRINDER.  
 APPLICATION FILED AUG. 3, 1908.

939,115.

Patented Nov. 2, 1909.





# UNITED STATES PATENT OFFICE.

JOHN C. WARD, OF EPWORTH, IOWA.

PORTABLE AND DETACHABLE DISK-GRINDER.

939,115.

Specification of Letters Patent.

Patented Nov. 2, 1909.

Application filed August 3, 1908. Serial No. 446,652.

*To all whom it may concern:*

Be it known that I, JOHN C. WARD, a citizen of the United States, residing at Epworth, in the county of Dubuque and State of Iowa, have invented new and useful Improvements in Portable and Detachable Disk-Grinders, of which the following is a specification.

The object of my invention is to provide a portable grinding device which may be adapted to be attached to any disk machine and grind the disks while cultivating in the field and be operated by the power that operates the disk machine.

It consists in a grinder adapted to be removably secured to a disk machine in close proximity with the disks to be ground and connected to the source of power that propels the machine, and in means for bringing the grinder into engagement with and releasing it from grinding engagement with the disks to be ground.

The following specification, when taken in connection with the drawings accompanying the same and forming a part hereof, will point out in detail the manner of construction and mode of operation whereby I accomplish the ends sought to be obtained.

Figure 1 is a perspective view of part of a disk machine and the grinding device attached thereto. Fig. 2 shows an end elevation of the disk machine and part of the means whereby the grinder is attached. Fig. 3 shows a side view of one of the hangers.

Referring to the drawings, 2 designates the disks of a harrow which are secured to a rotating shaft 4 and separated from each other by collars 5. To the shaft 4 are pivoted the standards 6, which support the frame 8 of the disk machine, and to the standards are secured the stays 10. There is attached to the meeting ends of the two sections of the harrow frame 8, a hanger 12, shown in Fig. 3, which is made in two parts or members 14 and 15 and are pivoted together at an angle to each other by the pivot pin 16. The member 14 is bent at the top 18 and rigidly secured to the frame 8 by the bolts 20. To this member 14 is secured an arm 22 which is secured to the frame of the other section of the harrow. The member 15 is pivoted on the shaft 4. The member 14 is provided with an opening 24, which is a bearing for a shaft 25. The other end of this shaft finds a bearing in a curved re-

cess 26 in a flexible hanger 28 secured to the frame 8 by the bolts 30. For the purpose of retaining the shaft 25 in the bearings in the hanger 28 there is provided a hook 31 which passes over the top of the shaft and is adapted to engage the under side of the hanger and removably hold the shaft 25 in its bearing. Upon this shaft is slidably mounted an emery wheel or other grinder 35, by a key or set screw, which is beveled on one edge 36 to correspond with the bevel of the disk. At the outer end of the shaft 25 is rigidly mounted a sprocket wheel 38 and upon the shaft 4 is mounted a driving sprocket wheel 40. The sprocket wheels 38 and 40 are connected together by a sprocket chain 42.

To the top of the frame 8 is secured a bar 44 which extends nearly the length of the frame and is raised a short distance above the frame. To this is removably and slidably hung a lever 45, preferably made of spring steel, having a foot rest 46 and provided with a clasp 48 at the bottom and adapted to clasp the shaft 25. I have shown three of these grinders 35 secured upon the shaft 25 but there may be as many grinders as there are disks but preferably there would be but one grinding stone as after one disk has been ground the shaft 25 may be released from its engagement with the hanger 28 by releasing the hook 31 and raising the shaft 25 out of the opening or slot 26 in the hanger 28 and then releasing the key of the grinding stone and sliding the grinding stone along on the shaft 25 in position to grind the next contiguous disk.

The manner of operating my device is substantially as follows; the grinding stone 35 is moved along the shaft 25 into contact with the disk to be ground, and rigidly fixed in such position. The operator then places his foot on the foot rest 46 of the lever 45 and presses thereon, which brings, through its engagement with the shaft 25, the stone 35 into contact with the disk. Then the team is started up and the rotation of the shaft 4 rotates the sprocket wheel 40 and this rotates the sprocket wheel 38 by its connections by the sprocket chain 42 and this rotates the shaft 25 and the grinding stone 35.

If one disk only is ground at a time the lever 45 may be shifted along on the bar 44 so that the pressure will come on the shaft 25 close to the stone 35. The lever instead



of being operated by the foot may be set and removably secured to give a certain continued pressure on the shaft 25.

When it is desired to grind the disks upon the other section of the disk machine the sprocket wheel 38 is removed from the shaft 25 and the grinder is removed from the hangers and the hanger 12 is moved backward at its center on its pivot and the shaft 25 is inserted in the opening in the hanger and projects out and is brought into engagement with another hanger 28, secured at the outer end of the opposite section (not shown) and the disks on the other section of the harrow may then be ground in the same way that they were ground upon the first section.

It will be seen by this mode of construction and assembling that the disks of either section may be ground all together while the machine is in work harrowing or stirring the ground or they may be ground separately while the machine is in use and in this manner, the disks may all be kept sharp and in the best possible condition to do the best work and it is not necessary to remove the disks for sharpening or to take the machine to the factory or place of sharpening. It will also be seen that when the disks are properly sharpened then the shaft 25 with the grinder thereon may be readily removed and the sprocket chain and sprocket wheel 40 may be removed, also the foot lever, and not injure or disturb the working of any part of the disk machine.

It will be observed that there will be a double grinding of the disk one by the rotation of the grinder and the other by the rotation of the disk while pulverizing or stirring the soil, and both by the same motor power, and that power originally applied to the drive shaft of the disks and connected with the drive shaft of the grinder.

Having now described my invention what I claim is—

1. In a device of the character described, a flexible hanger and a rigid hanger secured

to the frame of a disk machine, a grinder shaft journaled in said hangers, a grinding means thereon, and means for swinging one end only of the grinder shaft to bring the grinding means into grinding contact with the disks, and means for operating the grinder shaft.

2. In a device of the character described, hangers secured to the frame of a disk machine, a grinder shaft, grinding means thereon, one end of the grinder shaft being journaled in one end of the hangers and swingable therewith, a plate pivoted to the other hanger, the other end of the grinder shaft being journaled to one end of the plate, and a disk shaft being journaled in the other end of the plate means for swinging one end only of the grinder shaft to bring the grinding means into grinding contact with the disks, and operating connection between the two shafts.

3. In a device of the character described, a flexible and a rigid hanger secured to the frame of a disk machine, a grinder shaft, grinding means thereon, one end of the grinder shaft being journaled in the flexible hanger, a plate pivoted to the rigid hanger, the other end of the grinder shaft being journaled in one end of the plate, and the other end of the plate having an opening to receive the disk shaft of the disk machine, gearing for connecting the grinder shaft and the disk shaft, a rod on the disk machine frame extending longitudinally of the grinder shaft, and flexible means slidable thereon for swinging one end of the grinder shaft and the flexible hanger to bring the grinding means into grinding contact with the disks.

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

JOHN C. WARD.

Witnesses:

M. M. CADY,

W. F. ERNSDORFF.