Jan. 2, 1940. A. M. RANDALL 2,185,519

DISK SHARPENER

Filed March 28, 1938

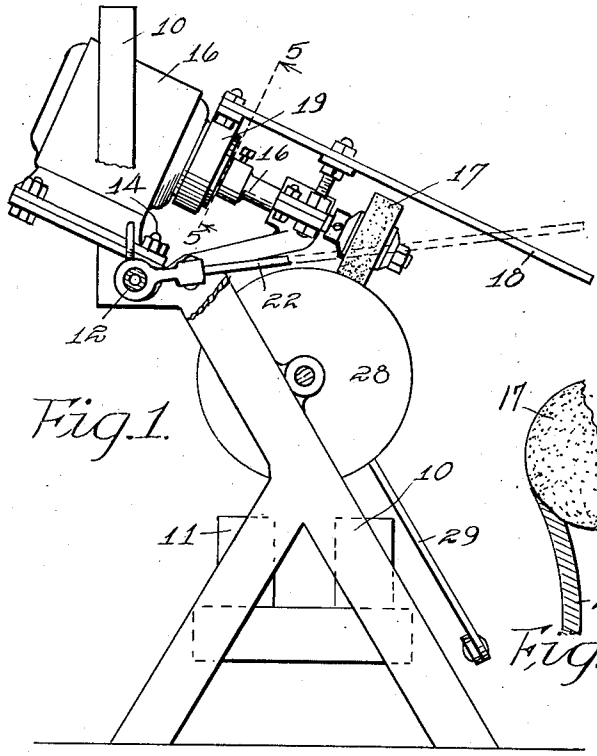


Fig. 1.

Fig. 6.

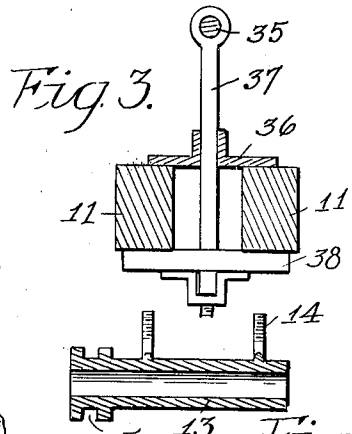


Fig. 3.

Fig. 4.

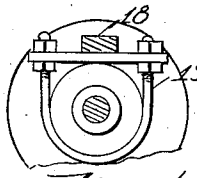


Fig. 5.

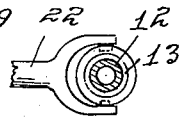


Fig. 7.

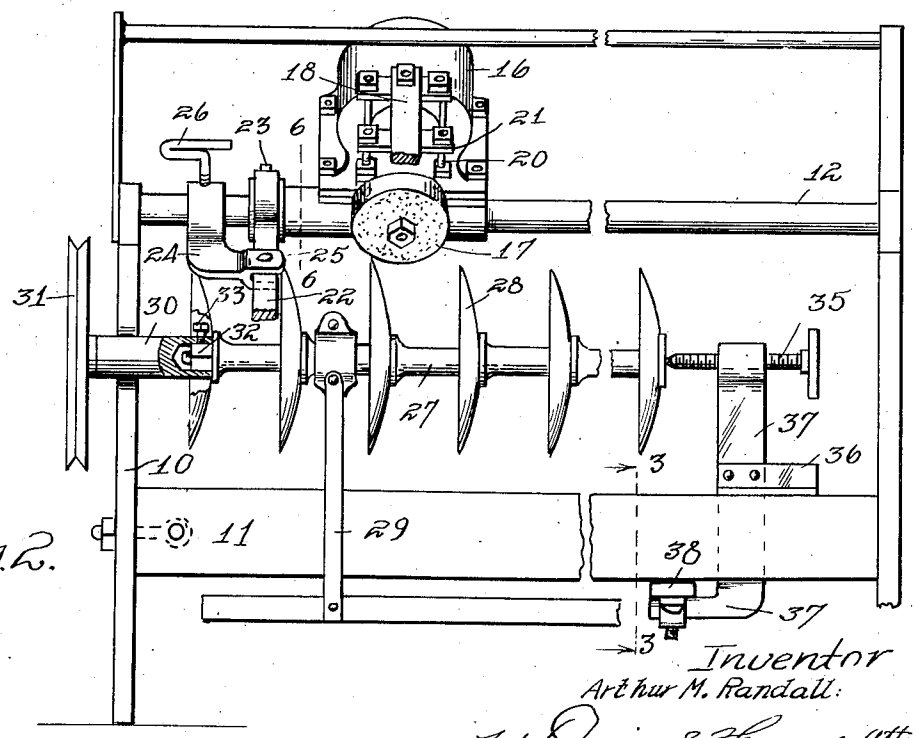


Fig. 2.

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2,185,519

DISK SHARPENER

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5 Claims. (Cl. 51—104)

The object of my invention is to provide a disk sharpener of simple, durable and inexpensive construction in which the cutting wheel and its driving motor are assembled in a single unit which is fixed to a sliding motor unit support which is also mounted for tilting movement and upon which the motor unit is substantially balanced and whereby an operator may conveniently and easily move the motor unit with one hand to control the vertical movement of the cutting wheel, and further to provide means including a lever to be grasped by the operator's other hand for conveniently and easily adjusting the motor unit horizontally and holding the cutting wheel against the disk to be sharpened by a yielding pressure controlled by the operator's hand so that the operator may easily and conveniently vary such pressure to meet changing conditions and whereby disks that are bent or distorted may be sharpened without damage to the disks.

In the accompanying drawing Figure 1 shows a side elevation of a disk sharpener embodying my invention;

Figure 2 shows the front elevation of same with a portion of the central part of the device broken away and the support for one end of the disk shaft being shown in section, the outer ends of both of the levers being broken away.

Figure 3 shows a detail vertical sectional view taken on the line 3—3 of Figure 2;

Figure 4 shows a vertical longitudinal view of the motor unit support;

Figure 5 shows a sectional view taken on the line 5—5 of Figure 1;

Figure 6 shows a sectional view taken on the line 6—6 of Figure 2; and

Figure 7 shows a detail view of the edge of the disk with the cutting wheel adjacent thereto to illustrate the hollow grinding effect of the cutting wheel.

Referring to the accompanying drawing I have used the reference numeral 10 to indicate frame uprights. Between the lower ends of the frame uprights are two spaced apart horizontal beams 11 fixed to the uprights. Near the upper end of the uprights is a horizontally arranged supporting bar 12 rounded in cross section.

Loosely mounted upon the supporting bar 12 is a motor unit support comprising a substantially cylindrical body portion 13 and two upright screw-threaded rods 14, and with a circular groove 15 near one end. This support is loosely mounted upon the supporting bar 12.

Mounted upon the motor unit support is a motor 16 which is held to the supporting member by the screw-threaded rods 14. Upon the shaft 16 of the motor is a connecting wheel 17 of ordinary construction. The motor unit is substantially balanced upon the supporting bar 12, and it is provided with a handle 18 which at its rear end is secured to the motor by means of a metal strap 19 passed around a portion of the motor and fixed to the handle. Near the central portion of the lever there are two bolts 20 and a cross member 21 is fixed to the handle and to the motor unit. By this means it is obvious that an operator grasping the forward end of the handle 18 may conveniently and easily tilt the motor on the supporting rod 12 up and down relative to the disks to be sharpened.

For the purpose of horizontally adjusting the motor unit I have provided a lever 22 having a forked rear end provided with pins 23 to enter the groove 15 and thereby pivotally and rotatably connect the lever with the motor unit support. I have also provided a lever fulcrum device, indicated generally by the numeral 24 and having a rounded opening at one end through which the supporting rod 12 is loosely and slidingly mounted. This fulcrum support extends laterally, as shown in Figure 2, and is connected by a fulcrum pin 25 with the lever 22. The operation of this part of the device is as follows. When the lever 22 is in the position shown in Figure 2, then the operator may, by grasping it, move it, for instance, toward the left, whereupon the forward portion of the fulcrum device will be moved toward the left and the fulcrum device will then be tilted relative to the supporting rod 12 and be frictionally held thereby in position so that a further movement of the lever 22 will result in moving the entire motor support toward the right, as shown in Figure 2.

I have shown a set-screw 26 for firmly gripping the fulcrum member to the rod 12. This, however, is not necessarily used in ordinary operations as I find in practice that an operator soon learns, by manipulation of the lever 22 only, to move the motor and its cutting disk horizontally to any desired position and to yieldingly hold the cutting wheel against the disk being sharpened, so that the operator may at all times determine by the amount of pressure he applies to the lever 22 just how much pressure will be applied by the cutting wheel to the disk being sharpened.

In some instances I have found that the disks are somewhat distorted in shape and not in accurate right-angled positions relative to the disk shaft. In such cases, if the cutting wheel were fixed in its position, then it would obviously dam-

age such disks. With my device, however, the operator may apply yielding pressure, holding the cutting wheel against the disk, and continue to apply the same pressure while moving the lever 22 toward the right or left to accommodate the cutting wheel to uneven surfaces of the disk, and I have found in practice that this feature of the invention is very advantageous.

I have indicated the disk shaft by the reference numeral 27 and the disks 28. A portion of the disk harrow frame 29 is shown attached to the disk shaft, and this may conveniently rest upon the beams 11.

Rotatably mounted upon one of the uprights 10 is a shaft 30 to which a belt wheel 31 is fixed. This shaft has a socket at one end to receive a squared nut 32 on the end of the disk shaft, and is provided with a set screw 33 for holding the nut in position. At the other end the disk shaft is supported by a lever 34. This lever has a screw-threaded rod 35 at its upper end to engage and rotatably support the adjacent end of the disk shaft. This lever 34 projects down between the beams 11 and is provided above the beams with a fulcrum member 36 extended horizontally and resting upon the beams 11. The end of the lever which projects down between the beams has a laterally extended portion at 37, and fixed to this portion 37 is a friction plate 38 designed to engage the lower surface of the beams 11. With this construction the said lever may freely be moved longitudinally of the beams to accommodate disk shafts of different lengths. When the disks are placed in position the lever is moved to position adjacent one end of the disk shaft, and then as the screw 35 is tightened, the lever 34 will be tilted toward the right, as shown in Figure 2, with the fulcrum device resting upon the top of the beams 11, and this will move the friction plate 38 upwardly into firm contact with the under surfaces of the beams 11, and in this way the lever will be clamped to the beams in the desired position.

In practical use it will be seen that with my improvement an entire unit of the disk cultivator, including its frame, may readily and easily be placed in position and clamped and slowly rotated by power applied through the pulley 31. Then the motor may be started and the operator may, with one hand applied to the lever 18, conveniently and easily control the up and down tilting movements of the cutter wheel, and with the other hand grasping the lever 22 he may horizontally adjust the position of the cutter wheel relative to the disks and may apply any desired amount of yielding pressure to the cutting disks that may be necessary to meet the requirements of necessary use.

I claim as my invention:

1. A disk sharpener, comprising a frame, a horizontally arranged supporting bar in the frame, a motor unit support slidingly and tiltingly mounted on said bar, a motor unit, comprising a motor and a cutting wheel fixed to the motor shaft, said motor unit being fixed to the motor unit support, a handle fixed to the motor unit for tilting it, a lever pivotally and rotatably connected to the motor unit support, and a fulcrum device for said lever, loosely and slidably mounted upon said supporting bar for gripping said supporting bar when the lever is in certain positions, and for sliding with the lever when the lever is in other positions whereby power may be applied directly to the bar for moving the motor unit relative to said bar.

2. In a disk sharpener, the combination of a frame having two parallel spaced apart horizontal beams, a lever extended vertically between the beams and having its lower end extended horizontally and inwardly beneath the under surfaces of the beams, a fulcrum plate fixed to the outer edge of the lever to engage the top surfaces of the beams, a friction plate applied to the lower end of the lever to engage the under surfaces of the beams, a screw seated in the upper end of the lever to engage and rotatably support a disk shaft, means for engaging and rotatably supporting the other end of a disk shaft, and means for rotating a disk shaft.

3. In a disk sharpener the combination of a frame having two parallel spaced apart horizontal beams, frame uprights at each end for supporting said beams, a shaft rotatably mounted on one of said uprights and parallel with and above one end of said beams, a lever mounted vertically between the other ends of said beams and having its lower end extended horizontally and inwardly beneath the under surfaces of said beams, a fulcrum plate fixed to said vertical lever to engage the top surfaces of said beams, a friction plate applied to the inwardly extending portion of the lower end of said vertical lever to engage the under surfaces of said beams, a screw seated in the upper end of the vertical lever and in alinement with said rotatably mounted shaft wherein a disk shaft may be mounted to and between the inner end of said shaft and said screw with the disk shaft supported immediately above said beams whereby the said beams may serve as a rest for the disk when disconnected from the disk shaft supports.

4. A disk sharpener comprising a frame, means for rotatably supporting a disk shaft in said frame, a supporting bar in said frame substantially parallel with said disk shaft, a sleeve slidably and pivotally mounted on said bar, a prime mover support carried by said sleeve, including a bearing, a prime mover carried by said support, a shaft rotatably mounted in said bearing having one end connected to the drive shaft of said prime mover, a grinder fixed to the outer end of said shaft, a fulcrum arm slidably mounted on said bar, means for locking said arm to said bar, a lever pivoted to said arm having one end pivoted to said sleeve for moving said sleeve longitudinally of said bar, and a lever fixed to said prime mover for tilting said prime mover and the grinder carried thereby.

5. A disk sharpener, comprising a frame, means for rotatably supporting a disk shaft in said frame, a supporting bar in said frame substantially parallel with said disk shaft, a sleeve slidably and pivotally mounted on said bar, a prime mover support carried by said sleeve, a prime mover including a grinder carried by said prime mover support, a fulcrum arm slidably mounted on said bar, means for locking said arm to said bar, a lever pivoted to said arm having one end pivoted to said sleeve for moving said sleeve longitudinally of said bar and a lever fixed to said prime mover for tilting said prime mover and the grinder carried thereby.

ARTHUR M. RANDALL.