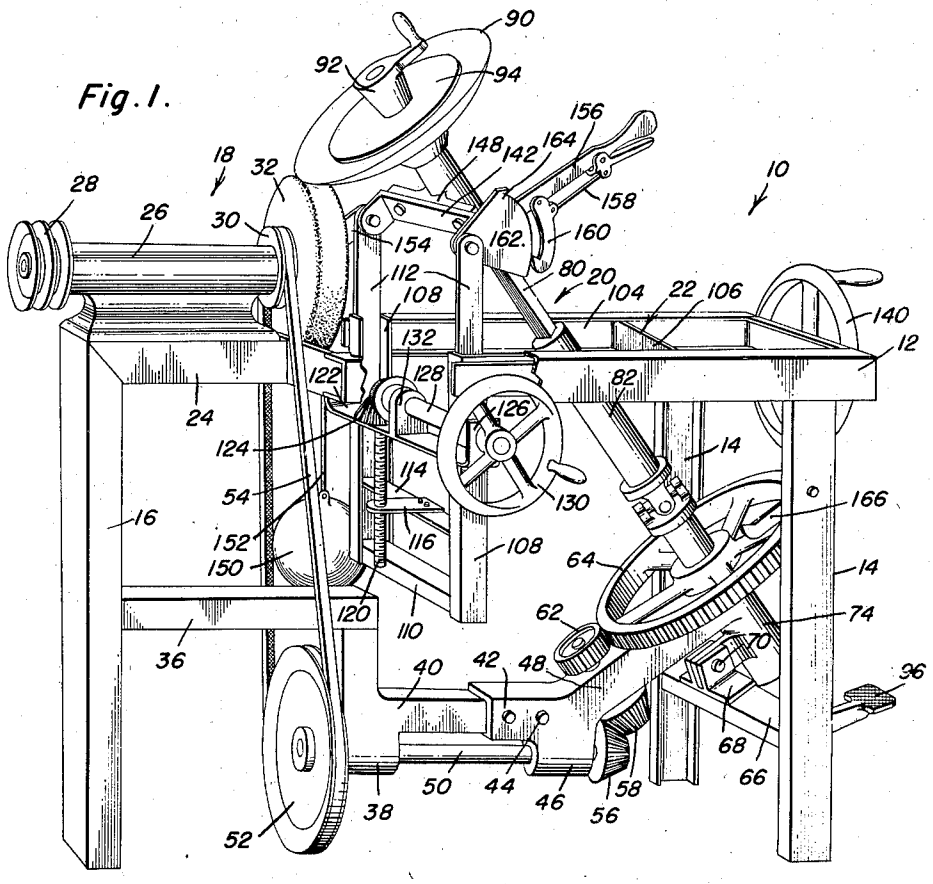
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DISK GRINDER

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Fig. 1.



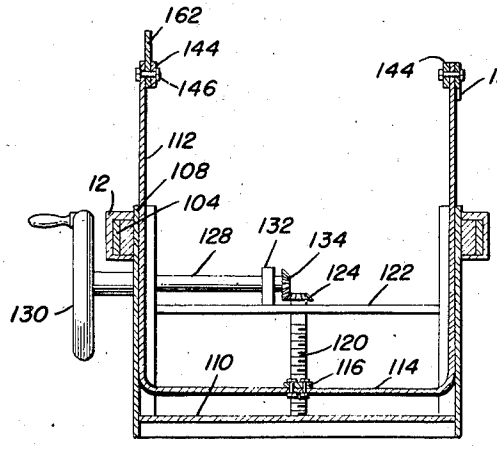


Fig. 2.

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Fig. 3.

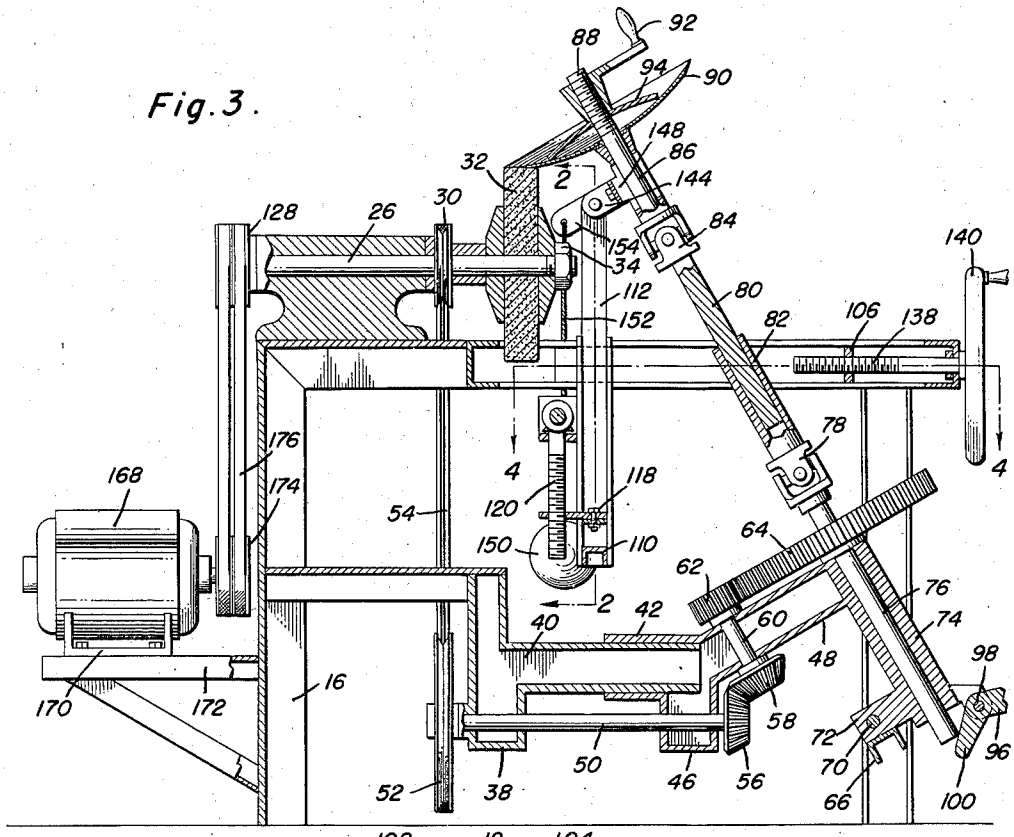
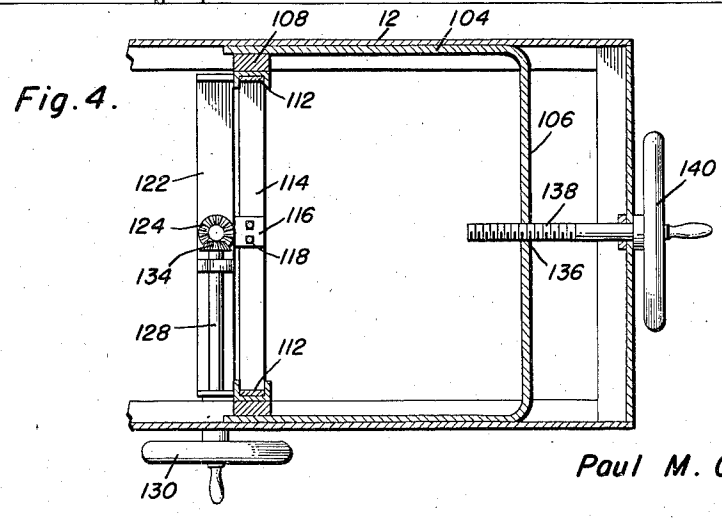


Fig. 4.



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DISK GRINDER

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7 Claims. (Cl. 51—106)

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This invention relates to improvements in grinding apparatus and the principal object is to provide a device capable of carrying out the desired purposes.

Another object of the invention is to provide a device whereby the object being ground will bear against the grinding wheel of the apparatus at all times.

And another object of the invention is to provide means to shift the work holding means horizontally forward or backward.

And still another object of the invention is to provide means to raise or lower the work holding means.

A further object of the invention is to provide means capable of quickly disengaging the work from the grinding wheel for removal therefrom.

A still further object of the invention is to provide means to hold the work holding means in inoperative position.

And a still further object of the invention is to rotate the grinding wheel and work holder simultaneously to avoid damaging the object being sharpened.

And yet another object of the invention is to provide a device that is efficient, will not injure the work, capable of being manufactured inexpensively, is durable, compact in design, and can be adapted to any type of operating means.

With the above and other objects in view, the nature of which will more fully appear as the description proceeds, the invention consists in the novel construction, combination and arrangement of parts hereinafter more fully described and illustrated, and claimed, in which:

Figure 1 is a perspective view of the device of the invention, with certain parts broken away for illustration;

Figure 2 is a vertical sectional view taken on line 2—2 of Figure 3, with certain structure removed;

Figure 3 is a sectional view in elevation of the device of the invention, and

Figure 4 is a horizontal, sectional view taken on line 4—4 of Figure 3, with certain structure removed.

Corresponding and like parts are referred to in the following description and indicated in all of the views of the accompanying drawings.

Referring to the figures, the grinding or sharpening machine is generally shown at 10 and includes a frame 12, supports or standards 14, 16, grinding means 18 and a disk or work holder 20. The machine is especially adapted for grinding disks such as are used on farm machinery

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such as harrows, plows and the like, which have become dull and require sharpening. The machine preferably is operated at about 2500 R. P. M., but of course, any desired speed may be employed.

Frame 12 is rectangular in shape and is made of channel iron preferably, and retains therein for horizontal movement, a carriage 22, whose function will later be described. Integral with one end of frame 12 and in T relation thereto is a horizontal arm 24, supported by a single vertical standard 16. Mounted on arm 24 is the grinding means 18, which includes an arbor 26 and pulley means 28 and 30 on each end. An abrasive wheel 32, consisting of emery or other similar material, is mounted on one end of shaft 26 for positive engagement with a disk to be sharpened. Wheel 32 is secured to shaft 26 by suitable locking means 34.

Intermediate the length of standard 16, and parallel to arm 24, is a second transverse arm 36 from which a bearing 38 depends. Arm 36 also includes a transverse shaft 40 above bearing 38 which is telescopically received in a transverse sleeve member 42 and are securely bolted together at 44. Sleeve 42 includes a depending bearing 46 and upwardly inclined leg 48, which leg terminates near the lower end of work holder 20 as is clearly illustrated in Figures 1 and 3. Bearings 38 and 46 are spaced apart horizontally and rotary shaft 50 is journalled therethrough. Shaft 50 includes a large pulley 52 mounted thereon, over which a pulley belt 54 is trained, belt 54 being trained over pulley 30 at its other extreme. A bevel gear 56 is secured to the other extremity of shaft 50 and cooperates with a second bevel gear 58 mounted on shaft 60. Shaft 60 extends through leg 48 and contains a small gear wheel 62 on its other end. Gear 62 operatively engages with a large gear wheel 64, gear 64 being mounted on holder 20 for rotation of the disk which is being sharpened.

Standards 14, of which there are two disclosed, although any desired number may be used, are preferably of channel iron and contain a transverse bar 66 which acts as a brace for supports 14, as well as securing means for a pair of angle irons 68.

Angle irons 68 are secured, by suitable bolt means 70, or the like, an ear 72 extending at right angles from a hollow shaft 74. Shaft 74 slidably retains a rod member 76 extending therethrough and gear 64 is mounted on the outer end thereof. A universal joint 78 connects rod 76 with a second, rectangular rod 80, carried

in sleeve 82. Rod 80 includes a second universal joint 84 connecting with a rod 86 threaded on its free extremity at 88 to retain a disk 90 mounted thereon for sharpening, by any suitable means such as clamping handle 92 and clamp member 94. A foot pedal 96 is mounted at 98 for pivotal engagement of ear 100 with the lower extremity of rod 76, for a purpose that will shortly become apparent.

Horizontal carriage 22 is U-shaped, the parallel arms 104 being slidably retained within the flanges of frame 12 and transverse bar 106 joins the rear end of arms 104. A pair of flanged bars 108 (see Figures 1, 2 and 4) are secured in any preferred manner to the inner surfaces of arms 104 and depend perpendicularly therefrom, as is readily seen in the figures. A transverse supporting bar 110 is secured to the bottom of bars 108. Slidably retained within the flanges of bars 108 is a vertical, U-shaped carriage consisting of arms 112 joined at the lower ends by transverse bar 114. A looped bracket 116 is suitably mounted on bar 114 by bolts 118 to retain, for vertical movement therethrough, a threaded rod 120. Rod 120 extends through a U-shaped bracket 122 and terminates in a bevel gear 124. Ears 126 on brackets 122 are apertured to receive a shaft 128 upon which a hand wheel 130 is mounted, shaft 128 extending through a bearing 132 mounted on bracket 122 to include a bevel gear 134 which meshes with gear 124 of rod 120. Thus, it is readily apparent that on turning wheel 130, arms 112 are vertically adjusted by rotation of bevel gears 124, 134. Support bar 110 assumes the additional function therefore, of limiting downward movement of arms 112 by engagement with transverse bar 114.

In order to obtain horizontal movement as well, bar 106 (see Figure 4) is apertured at 136 to receive threaded rod 138. Rod 138 extends through frame 12 and terminates in a hand wheel 140, which, upon rotation, serves to move carriage 22 in a horizontal plane.

Referring to arms 112 again (see Figures 1 through 3), the upper free extremities thereof support a transverse bar 142, secured to arms 112 by means of a pair of flanges 144 through which suitable bolt or rivet means 146 extend. Bar 142 is riveted to a shorter complementary bar 148 integral on work holder 20 adjacent a disk 90. As is readily seen in Figure 1, a weight 150 is supported by a suitable wire or rope 152 from a horizontal ear 154 secured to one arm 112, in order to assure the abutment of disk 90 on emery wheel 32. A lever 156 includes a pawl 158 journalled to a latching finger 160 adapted to engage a quadrant segment 162 mounted on the other arm 112. The cam surface thereof is smooth except for an extending notch 164 at its upper end to limit movement of finger 160. Finger 160 is mounted to freely travel on the cam edge of quadrant 162, governed by the rotation of disk 90.

Foot pedal 96 serves to disengage the disk from the grinding wheel 32, when it is desired to change disks and still leave the machine in operation. Pedal 96 upon depression by the operator, engages the bottom of rod 76 to raise same and thus disengage large gear 64 from gear 62. A latch 166 (see Figure 1) holds gear 64 in raised position while the disk is changed. When work holder 20 is not operating, latch 160 hooks under the bottom of quadrant 162 to remain in fixed position. When a new disk is inserted, pedal 96 is released and the assembly dropped into operating position.

Referring to Figure 3, a motor 168 is shown mounted by suitable brackets 170 on a horizontal support 172 secured to standard 16. A pair of pulleys 174, supported on a suitable drive shaft, include belts 176 trained thereover and over pulleys 28 on arbor 26. Thus, as is readily apparent, motor 168 drives the grinding wheel as well as the work holding means so that emery wheel 72 rotates in a vertical plane while disk 90 rotates in an approximately horizontal plane.

From the foregoing, the operation of the device is readily apparent. A disk to be sharpened is placed on rod 86 and secured thereon by handle 92 and clamp 94. In order to adjust the angle of the bevelled edge of the disk, wheel 130 is rotated to vertically raise or lower arms 112, as necessary. When the size of the disk is such that adjustment is necessary for contact with wheel 32, hand wheel 140 is rotated to move carriage 32 either to the left or right in a horizontal plane. Weight 150, assists in assuring positive contact at all times of disk 90 with emery wheel 32. When it is necessary to change the disks being ground, pedal 96 is depressed to raise gear 64 for disengagement with rotating gear 62. Upon insertion of a new disk, the assembly is retained to operative position, and after any necessary vertical or horizontal adjustments have been made, the grinding operation is repeated without the necessity for stopping motor 168. Gear 64 is locked by latch 166 while the disks are being changed and lever 156 is actuated into latching engagement with quadrant 162 when the disk carrier means is not operating.

It is to be understood that as many modifications of the embodiments above illustrated might be made without departing from the spirit or scope of the present invention, and it is intended that the above description, accompanying drawings and claims shall be interpreted as illustrative and not in a limiting sense.

Having described the invention what is claimed as new is:

1. In a disk grinding machine, in combination with a grinding wheel, a main support frame, disk holding means extending therethrough, and secured to said frame, means mounted on said frame and secured to said disk holding means for vertical adjustment thereof, means slidably mounted on said frame and secured to said disk holding means for horizontal adjustment, and means to simultaneously rotate said grinding wheel and disk holding means, said vertical adjusting means including a pair of oppositely disposed bars secured to said slidable means, a vertical U-shaped carriage slidably mounted within said bars and means to vertically move said carriage.

2. The combination of claim 1, wherein said last named means includes a pair of cooperating bevel gears mounted on said adjusting means and a hand wheel to operate said bevel gears.

3. In a disk grinding machine, in combination with a grinding wheel, a main support frame, disk holding means extending therethrough, and secured to said frame, means mounted on said frame and secured to said disk holding means for vertical adjustment thereof, means slidably mounted on said frame and secured to said disk holding means for horizontal adjustment, and means to simultaneously rotate said grinding wheel and disk holding means, said vertical adjusting means including a pair of oppositely disposed bars secured to said slidable means, a vertical U-shaped carriage slidably mounted

within said bars and means to vertically move said carriage, said last named means including an apertured loop bracket secured to said carriage, an apertured transverse bar, a threaded rod extending through said apertures and terminating in a bevel gear, a shaft mounted on said transverse bar and terminating in a bevel gear in engagement with said first bevel gear, and a hand wheel secured to said shaft to operate the adjusting means.

4. In a disk grinding machine, in combination with a grinding wheel, a main support frame, disk holding means extending therethrough and secured to said frame, means mounted on said frame and secured to said disk holding means for vertical adjustment thereof, means slidably mounted on said frame and secured to said disk holding means for horizontal adjustment, said vertical adjusting means including a vertical U-shaped carriage slidably secured to said horizontal adjusting means, means on said carriage to move same, means secured to said carriage to lock said disk holding means against rotation, and a weight secured to said carriage and depending therefrom to urge said holding means against said grinding wheel.

5. The combination of claim 4, wherein said locking means consists of a cam surfaced quadrant segment, a notch in the upper end of said cam, an actuating lever and a latching finger mounted on said lever and engaging said cam surface and adapted to be locked against movement.

6. In a disk grinding machine, in combination with a grinding wheel, a main support frame,

disk holding means extending therethrough, and secured to said frame, means mounted on said frame and secured to said disk holding means for vertical adjustment thereof, means slidably mounted on said frame and secured to said disk holding means for horizontal adjustment, and means to simultaneously rotate said grinding wheel and disk holding means, said disk holding means including a sleeve member secured to said support frame, a rod slidably retained by said sleeve, a large gear mounted on said sleeve, a plurality of gears secured to said frame and operated by said rotating means, one of said gears engaging said large gear, a disk on the other end of said holding means and engaging said grinding wheel, and means mounted on said support to move said large gear into inoperative position.

7. The combination of claim 6, wherein latching means is secured to said frame and engages said large gear to lock same when in inoperative position.

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