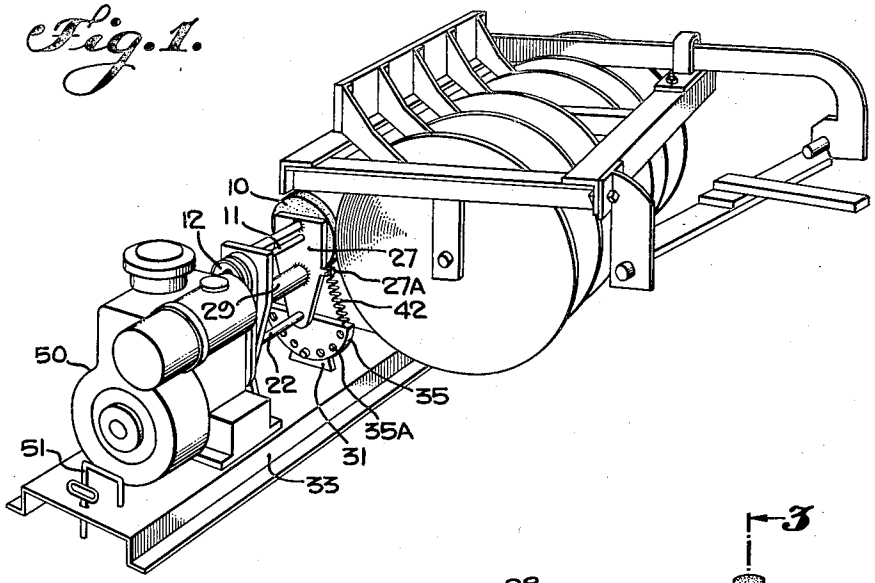
Oct. 30, 1951 A. B. SKROMME 2,573,501

PORTABLE AUTOMATIC-TENSION GRINDER

Filed March 11, 1950 2 SHEETS—SHEET 1

Fig. 1.



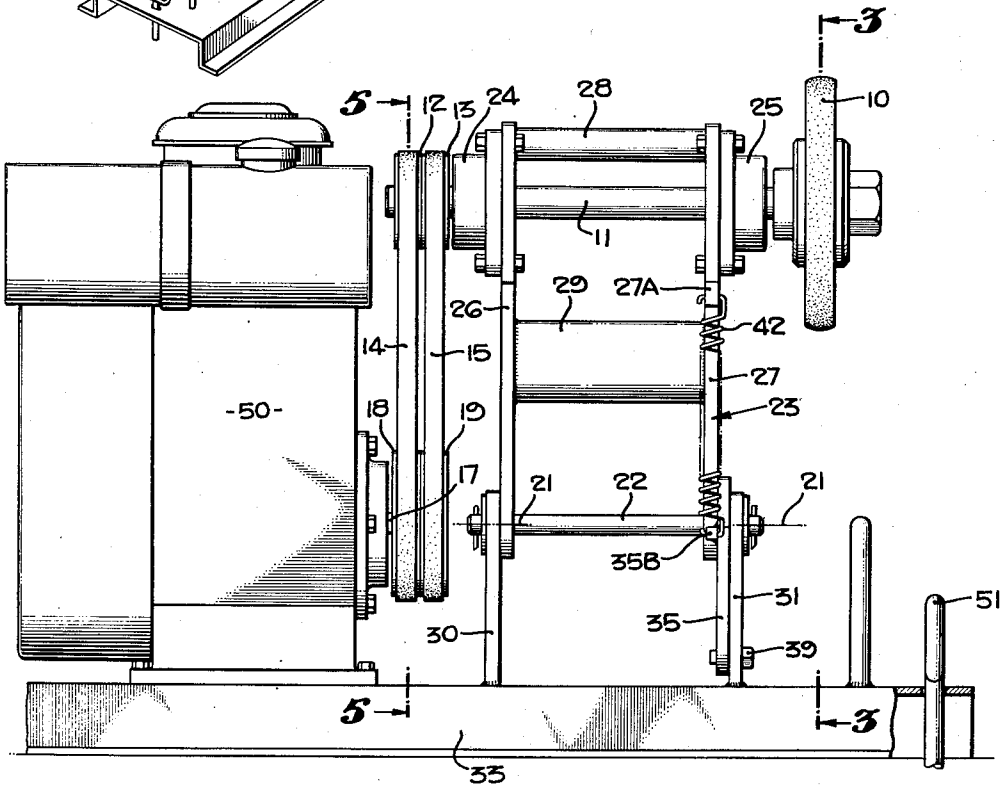


Fig. 2.

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Filed March 11, 1950 2 SHEETS—SHEET 2

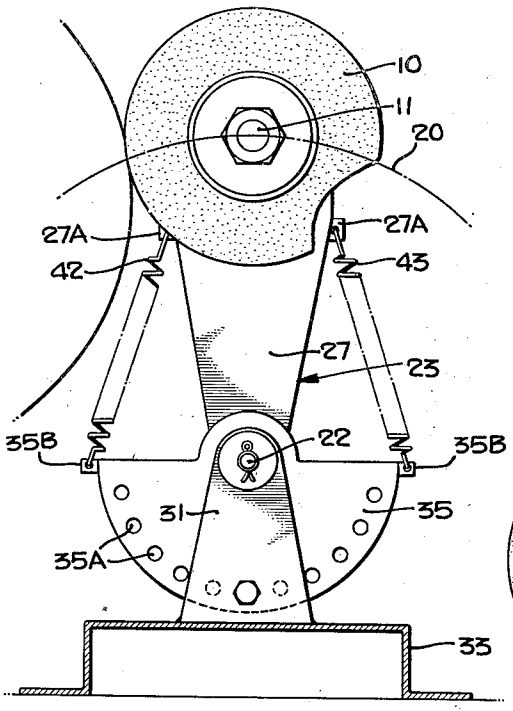
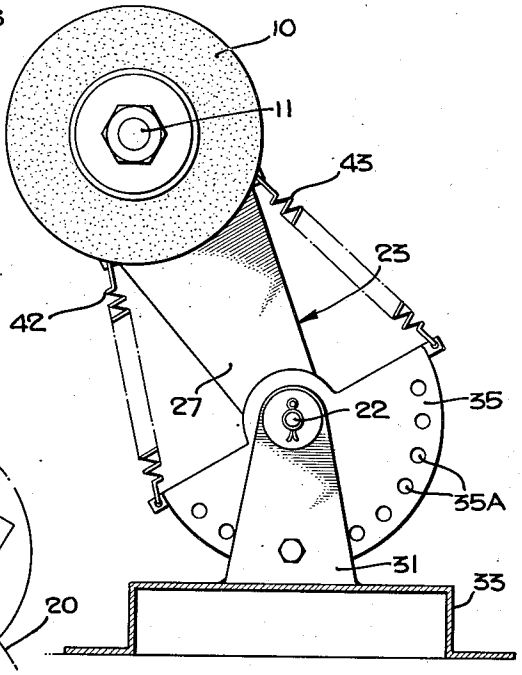


Fig. 3.

Fig. 4.



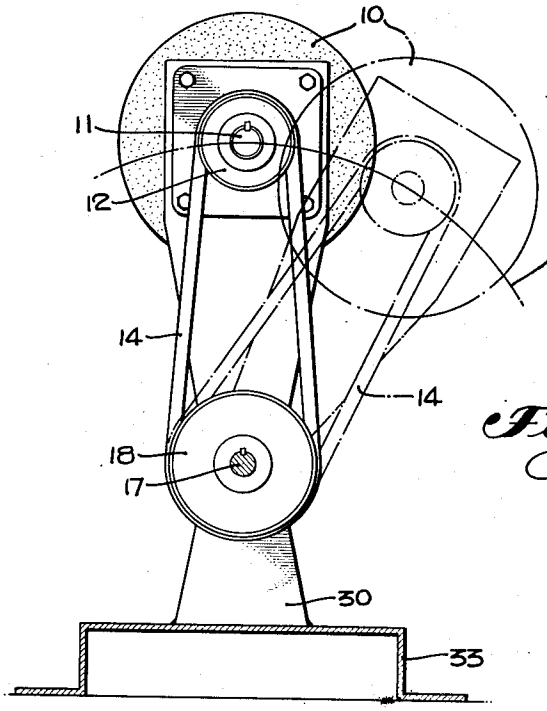


Fig. 5.

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UNITED STATES PATENT OFFICE

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PORTABLE AUTOMATIC-TENSION GRINDER

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Application March 11, 1950, Serial No. 149,185

4 Claims. (Cl. 51—166)

1

The present invention relates to a portable grinder intended for use in sharpening agricultural instruments such as, for example, disk harrows, disk plows, and the like which may or may not be conveniently moved to a shop.

It is desirable to be able to sharpen tools in the field without the necessity of returning them or parts of them to a shop. The present invention contemplates the provision of a portable grinder which may be conveniently transported where needed in the field to sharpen tools such as disk harrows, disk plows and the like in a simple, expeditious manner requiring relatively few operating personnel.

An object of the present invention, therefore, is to provide an improved portable grinder for accomplishing these purposes and desideratum.

Another object of the present invention is to provide an improved portable grinder of this character which may be used to sharpen tools such as disk harrows, disk plows and similar tools in the field without the necessity of removing any element from such tool.

Another object of the present invention is to provide a machine of this character which is self-adjustable to the particular tool being sharpened even though such tool may not run true in its bearing support and have uneven surfaces thereon.

Another object of the present invention is to provide an improved portable grinder of this character which requires no special means to turn the disk harrow or disk plow as it is being sharpened, the present grinder producing sufficient friction with the disk harrow or disk plow to turn the same.

Another object of the present invention is to provide an improved portable grinder of this character, the abrasive member of which may be adjusted in a plurality of mean positions from which it is pressed against the tool to be sharpened with a substantially constant uniform force in all adjusted positions.

Another object of the present invention is to provide an improved grinder of this character, the abrading element of which may be moved to different adjusted positions without disassembling the driving connection between the grinding wheel and the prime mover driving the same.

The features of the present invention which are believed to be novel are set forth with particularity in the appended claims. This invention itself, both as to its organization and manner of operation, together with further objects and advantages thereof, may be best understood by reference to the following description taken in connection with the accompanying drawings in which:

Figure 1 is a perspective view showing a grinder incorporating features of the present invention

2

mounted in operative grinding relationship with respect to the disks of a disk harrow,

Figure 2 is a view in side elevation of the grinder shown in Figure 1,

Figure 3 is a view taken in the direction indicated by the lines 3—3 in Figure 2,

Figure 4 is a view similar to Figure 3, but shows the rotating abrasive member mounted in a different adjusted position, and

Figure 5 is a sectional view taken substantially on the line 5—5 of Figure 2.

The portable grinder has as its abrading member a rotatable grinding stone 10 releasably attached to one end of the drive shaft 11, the other end of the drive shaft 11 having mounted thereon a pair of pulleys 12, 13 over which corresponding driving belts 14, 15 pass. The driving belts 14, 15, in turn, are driven upon rotation of the horizontal motor shaft 17, upon which are mounted the driving pulleys 18, 19, over which the belts 14, 15, respectively, pass.

In accordance with an important feature of the present invention, the drive shaft 11 and grinding wheel 10 are movable as a unit along the arc of a circle 20 (Figure 3), the center of which lies on a prolongation of the axis of the motor shaft 17, which axis is represented by the line 21 in Figure 2. This line 21 corresponds, as described below, to the axis of the supporting shaft 22. The shaft 22 forms a part of a frame 23 which at its upper end has affixed thereto the spaced bearings 24, 25, in which the drive shaft 11 is free to rotate.

More specifically, the bearing members 24, 25 are affixed to the outside surfaces of the vertical supporting plates 26, 27, which are maintained in parallel spaced relationship by spacers 28, 29 and shaft 22, having their opposite ends, for example, welded to the inside surfaces of plates 26, 27, but with the ends of such shaft 22 extending sufficiently outwardly to pass through cooperating bearing apertures in the spaced upstanding bracket members 30, 31, having their lower ends welded to the base plate 33.

As indicated above, the axis of shaft 22 corresponds to the prolongation of the rotational axis of the motor shaft 17 as represented by the line 21. It is thus clear that the supporting frame 23, carrying the rotatable drive shaft 11, may be swung in the arc of a circle having as its center a point on the line 21. By providing this structure, the grinding wheel 10 may be swung to different adjusted positions while maintaining a power drive from the motor shaft 17 to the drive shaft 11.

In order to maintain such frame 23 and drive shaft 11 in a predetermined position, an arcuate shaped plate 35 is pivotally mounted on shaft 22 with a plurality of adjustment apertures 35A, wherein each of which apertures are movable into

registry with an aperture in the bracket **31**, whereby a locking pin **39** may be inserted through any particular pair of aligned apertures.

Prestressed tension springs **42**, **43** have their opposite ends respectively attached to apertured ears **27A**, **35B** extending from the plates **27** and **35**, to thereby maintain the grinding wheel **10** in a resiliently supported position. Each one of these springs **42**, **43** tends to rotate the grinding wheel in opposite directions, but the tendency of one is overcome by the force exerted by the other so that, in effect, the grinding wheel may be termed as being "resiliently" or "floatingly" supported.

The motor shaft **17** may be the output shaft of any suitable prime mover **50**, such as a gasoline engine or, in some instances, an electric motor which is mounted on the base plate **33** for convenient transportation in the field.

In operation, assuming that the disks of a disk plow are to be sharpened, as indicated in Figure 1, the plow is raised so that the disks are free from the ground and free to rotate in their bearings. The operator then sets the grinding wheel up against the disk. After the proper position has been reached, he anchors the base plate **33** to the ground by driving pins or stakes **51** into the ground, such pins or stakes passing through apertures in the base plate **33**, as indicated in Figures 1 and 2. By using these pins **51** the machine is prevented from vibrating away from the disk. The pin or bolt **39** is removed and the plate **35** is swung to a position wherein the grinding wheel **10** engages the disk with a desired predetermined force which is determined by the tension in springs **42**, **43**. After this adjustment is made, the bolt **39** is inserted through the aligned apertures in bracket **31** and plate **35** to maintain the plate **35** stationary.

The grinding wheel **10** is thus resiliently supported in a floating condition wherein the grinding wheel **10** resiliently presses the disk so as to follow undulations and uneven portions in the periphery of the disk, as well as to continually engage the disk even though the disk does not run true in its bearing support. It is evident that when and as the grinding wheel **10** rotates, the frictional forces developed between the wheel and the disk causes the wheel also to rotate, and in practice the speed of rotation of the disk may be controlled by the operator pressing the sole of his shoe against the disk to impart a frictional drag. In effect, if there are nicks in the disk which must be smoothed down, this can be done easily by rocking the disk back and forth while the grinding wheel sharpens it.

While the particular embodiments of the present invention have been shown and described, it will be obvious to those skilled in the art that changes and modifications may be made without departing from this invention in its broader aspects and, therefore, the aim in the appended claims is to cover all such changes and modifications as fall within the true spirit and scope of this invention.

I claim:

1. In a machine of the character described, a base plate, a prime mover mounted on the base plate, said prime mover having an output shaft extending generally horizontally, a driving pulley mounted on said shaft, a frame, a drive shaft rotatably supported on said frame, a grinding wheel mounted on said drive shaft, means pivotally mounting said frame on said base plate about an axis which corresponds to the prolongation of the rotational axis of said driving pulley, a driven pulley mounted on said drive shaft, a flexible belt passing over said driving pulley and said driven pulley, an adjustably positioned plate pivotally mounted about said rotational axis, and a pair of springs connected between said frame and said plate.

2. In a machine of the character described, a base plate, a prime mover mounted on said base plate with the axis of its output shaft extending generally horizontally, a driving pulley mounted on said shaft, a pair of upstanding bracket members supported on said base member, an axle supported on said bracket members with the axis of said axle on a prolongation of said axis of said output shaft, a frame mounted on said axle, a drive shaft rotatably supported on said frame, said drive shaft having mounted thereon a grinding wheel, said drive shaft having mounted thereon a driven pulley, a flexible belt passing over said driving pulley and said driven pulley, an arcuate shaped plate rotatably supported on said axle, said arcuate plate having a plurality of adjustment apertures each registrable with an aperture at one of said bracket members, a pin insertable through aligned apertures in said one bracket member and said arcuate plate, and a pair of prestressed tension springs each acting between said arcuate plate and said frame with each tending to rotate said frame in opposite directions.

3. In a machine of the character described, a base plate, a driving shaft rotatably supported on said base plate, prime mover means driving said driving shaft, a driving pulley mounted on said shaft, a frame, a driven shaft rotatably supported on said frame, a grinding wheel mounted on said driven shaft, means pivotally mounting said frame on said base plate about an axis which corresponds to the prolongation of the rotational axis of said driven shaft, belt means passing over said driving pulley and said driven pulley, an adjustably positioned member pivotally mounted about said rotational axis, and a pair of springs connected between said frame and said member.

4. In a machine of the character described, a base plate, a driving shaft rotatably mounted on said base plate, a frame, a driven shaft rotatably supported on said frame, a grinding wheel mounted on said driven shaft, means pivotally mounting said frame on said base plate about an axis which corresponds to the prolongation of the rotational axis of said driving shaft, flexible means interconnecting said driving shaft with said driven shaft, an adjustably positioned member pivotally mounted about said rotational axis, and a pair of springs connected between said frame and said member.

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