

J. H. KING.
GRINDING MACHINE.

Patented Nov. 28, 1893.



WITNESSES:
H. C. Osborn.
Frank Watt.

UNITED STATES PATENT OFFICE.

JACOB H. KING, OF PIQUA, OHIO.

GRINDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 509,538, dated November 28, 1893.

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To all whom it may concern:

Be it known that I, JACOB H. KING, a citizen of the United States, residing at Piqua, in the county of Miami and State of Ohio, have invented certain new and useful Improvements in Grinding-Machines, of which the following is a specification.

My invention relates to portable grinding machines, and it especially relates to that class of grinding machines primarily intended for grinding sickle bars of harvesting machines, the constructions and arrangements of parts being such, however, that it may be readily used as a farm or household implement, for general grinding purposes.

The object of my invention is to produce a simple and useful grinding device adapted to be readily adjusted for grinding sickle bars of harvesting machines, so as to produce any desired bevel or angle or grinding without the necessity of swinging the grinding wheel or driving wheels out of vertical plane as hitherto, the parts being readily adjustable so as to be adapted to any work to be performed and the construction being such that the device may be readily mounted on a harvester or wagon wheel or other convenient point of attachment.

The mechanism embodying my invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the device complete, shown mounted on a wheel rim. Fig. 2 is a plan view and Fig. 3 an end elevation of the same. Fig. 4 is a transverse sectional view of the base supporting bracket and fixed support. Fig. 5 is a detail in section, showing the preferred mode of attaching the grinding wheel to its carrying shaft. Fig. 6 is a detail view of the removable guide or support removed.

Like parts are represented by similar letters of reference in the several views.

In the said drawings A A, represent the base or supporting beam, which is preferably made of wood, and perforated laterally to receive connecting rods $a a$, adapted to pass through said beam and formed with engaging hooks a' , at one end and screw-threaded at the opposite end and provided with nuts $a^2 a^2$, by means of which the said base or beam may be readily attached to the rim of a har-

vester wheel, as shown at B, or to any other suitable supporting device. Secured rigidly and centrally on the base A A, is a supporting bracket C, provided at one side with a cylindrical bearing or sleeve b , hanging over at the side of the base A, with its axis vertical and at right angles to the plane of said base. Adjacent to the sleeve b , and preferably formed as a part of the bracket C, is a fixed support b' , standing in central relation with the sleeve b . This support may be of any convenient form, but for practical purposes I find an elevated block b^2 , projecting horizontally toward the sleeve and provided, with an upwardly projecting lug b^3 , to be most convenient.

The grinding device proper consists essentially of a main standard D formed preferably of single casting, having at the top a laterally projecting stud c , whereon is journaled the main driving wheel c' , having peripheral teeth and operated by a crank c^2 . The standard is provided at a lower point with an integral elongated bearing or boss d , perforated horizontally for the reception of a countershaft d' , which carries at one end a pinion d^2 , meshing with the main driving gear c' and at the other the grinding wheel E, which may be of natural stone, emery or any other grinding medium, the ordinary emery wheel of commerce being preferably used. The lower end of the standard D, is reduced and formed into a cylindrical journal or pintle e , adapted to pass through and fit snugly in the sleeve or bearing b , of the supporting bracket C, in which it is adapted to be secured in different positions of vertical or axial adjustment by a set-screw e' , or other suitable fastening device.

Near each end of the base A A, I provide a series of vertical openings f , adapted to receive a removable guide or support g , preferably formed with a cylindrical stem g' , so as to swivel in the openings f , which are correspondingly formed.

In operating the device, for example in grinding a sickle bar, as shown at k , the sickle bar is placed upon the support b' , and the removable guide rest g , and tipped over slightly toward the face of the grinding wheel e , which is adjusted to the proper angle to secure the desired bevel or angle of grinding,

by turning the standard D, axially in the sleeve of its supporting bracket, as shown in Fig. 2. When properly arranged the wheel is revolved by turning the crank c^2 , with one hand, while the sickle bar is held in the proper position in the other hand. Or, if desired, one operator can hold the driving wheel and another operator can hold the sickle bar; but usually a single operator can do all the work.

The bar is moved along so as to bring the different knife sections into contact with the face of the wheel, thus grinding one edge of said knife sections, after which the standard supporting the grinding wheel is given a partial axial revolution so as to cause the grinding wheel to assume an angle in the opposite direction corresponding to the other edge of the knife sections. The operation is repeated until all the knife sections are ground on both edges, the sickle bar being shifted forward or backward as the case may be, to bring the respective sections in the proper relative position for grinding; the removable guide rest g , being shifted in the different holes f , of the base or to the ends of said base, as desired, to assist in supporting the knife or sickle in moving it backward or forward. On reaching the heel of the sickle or cutter where the knife back or supporting piece extends forward in such a manner as to prevent the grinding wheel readily entering the angle between the knife sections, the standard is elevated so that the grinding wheel may clear the knife back and still reach the edge of the knife section to be ground.

The standard D, it will be observed, by its construction and the manner of attachment to its supporting bracket, has a radial or axial adjustment around an entire circle as well as a vertical adjustment, thus permitting the grinding wheel to be brought into any desired position for grinding, either angular or straight, with reference to the guides or supports, yet the several wheels always remain in partial planes which are truly vertical.

In Fig. 5 I have shown my preferred mode of constructing and mounting the grinding wheel E. The counter-shaft or arbor d' , is screw-threaded at its outer end and provided with a collar d^3 , connected rigidly thereto; and having a flat outer face a socket piece h , of suitable metal with radial prongs is seated in a central aperture of the grinding wheel and secured therein preferably by the use of some soft metal, melted, poured and hardened around the socket piece, as shown at h' , this being accomplished with lead, Babbitt metal, brimstone or any other suitable metal or composition capable of holding the block or socket piece permanently in the wheel, or, if desired, the block or socket piece may be formed in the wheel, when the same is made of emery or other similar composition, so as to be located permanently therein. This block or socket piece is internally screw-threaded to correspond with the screw-thread-

ed end of the shaft, and is screwed thereon until it seats firmly against the flat outer face of the collar d^3 , the shaft terminating just short of the outer face of the grinding wheel, so that nothing projects beyond the plane of its face to interfere with its grinding action.

It will be understood that the device may be secured in any position of adjustment in which it may be set for use, so that when once adjusted it constitutes a perfectly rigid and vertical frame, wherein not only is the operation convenient but accidental displacement of the apparatus from its adjusted position is unlikely to occur.

It is obvious that the relative sizes of the gears may be changed to vary the speed, or any other driving connection, such as a belt or chain, may be employed instead of the gears, or where a high speed is not desired a crank may be used at the free end of the counter-shaft, the other driving gearing being omitted. It is also obvious that the standard D can be made of a single casting more cheaply and with less liability of breakage than where the standard had a pivoted pendant arm as hitherto. I also consider the location of the driving wheel above the counter-shaft as quite an advantage in a machine of this character, the reason being that the base is usually clamped upon a harvester wheel which is of small diameter and whose top is not far from the ground, and unless the driving wheel and its crank are held at some height by the standard the operator who turns such crank c^2 will have to stoop considerably to do so.

Having thus described my invention, I claim—

1. In a portable grinding apparatus, the combination with a base provided with suitable attachments for detachably connecting it with the rim of a wheel, said base having a series of vertical holes through its body near each end, a bracket rigidly secured upon said base between its ends and having a sleeve, a fixed support rising from said bracket, and a removable support having a forked upper end and a cylindrical stem adapted to be removably seated in any of said vertical holes through the base; of a standard fitting in said sleeve with vertical and axial adjustments, a horizontal shaft journaled through said standard, a grinding wheel on said shaft and rotating between said standard and the fixed support, and means for rotating said shaft from its other end, as and for the purpose set forth.

2. In a portable grinding apparatus, the combination with a base provided with suitable attachments for detachably connecting it with the rim of a wheel, a bracket rigidly secured upon the upper face of said base between its ends and having a cylindrical sleeve hanging over one side of the base, a set screw through the outer side of said sleeve, a fixed support rising from said bracket opposite said

sleeve, and a removable support having a stem adapted to be adjustably and detachably connected with either end of the base; of a standard comprising a single casting whose lower cylindrical end fits in said sleeve with vertical and axial adjustments, a horizontal shaft journaled through said standard, a grinding wheel on one end of said shaft and rotating in a vertical plane between said standard and the fixed support, and means for rotating said shaft, as and for the purpose set forth.

3. In a portable grinding apparatus, the combination with a base having a series of vertical holes through its body near each end, a bracket rigidly secured upon said base between its ends and having a cylindrical sleeve, a fixed support rising from said bracket and having near its upper end a horizontal block projecting toward said sleeve and an upwardly projecting lug, and a removable support having a forked upper end and a cylindrical stem adapted to be removably seated and to turn axially in any of said vertical holes through the base; of a standard fitting in said sleeve with vertical and axial adjustments, a horizontal shaft journaled through said standard, a grinding wheel on said shaft

and rotating in a vertical plane between said standard and the fixed support, and means for rotating said shaft, as and for the purpose set forth.

4. In a portable grinding apparatus, the combination with a base, a bracket rigidly secured upon the center of said base between its ends and having a cylindrical sleeve, a fixed support rising from said bracket and having near its upper end a horizontal block projecting toward said sleeve, and an upwardly projecting lug in rear of the block and a removable support adapted to be detachably and adjustably connected with either end of the base; of a standard fitting said sleeve with vertical and axial adjustments, a horizontal shaft journaled through said standard, a grinding wheel on one end of said shaft and rotating in a vertical plane between said standard and the fixed support, and means for rotating said shaft from its other end, as and for the purpose set forth.

In testimony whereof I have hereunto set my hand this 15th day of August, A. D. 1892.

JACOB H. KING.

Witnesses:

S. S. MCKINNEY,
P. A. WILLIAMSON.