

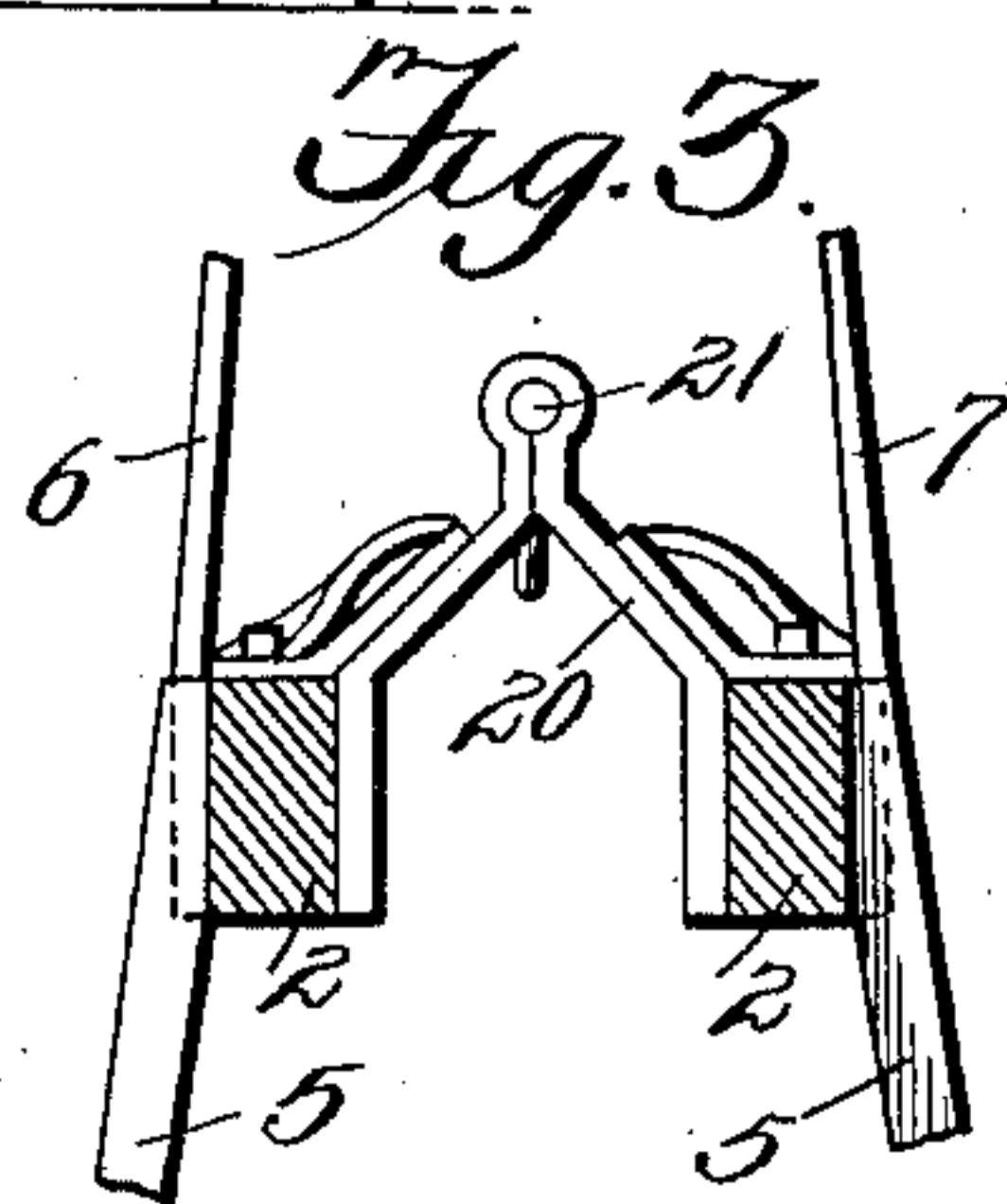
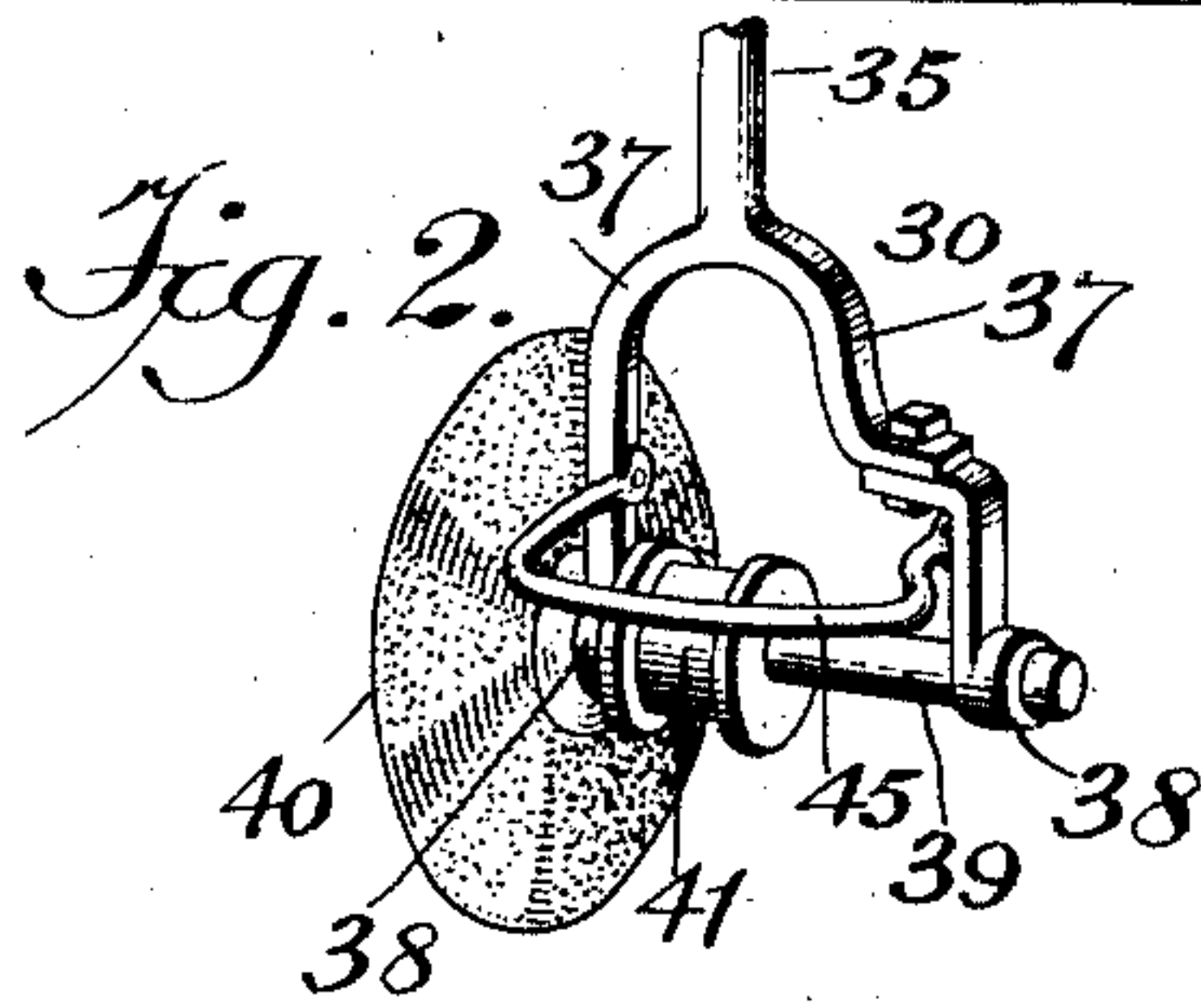
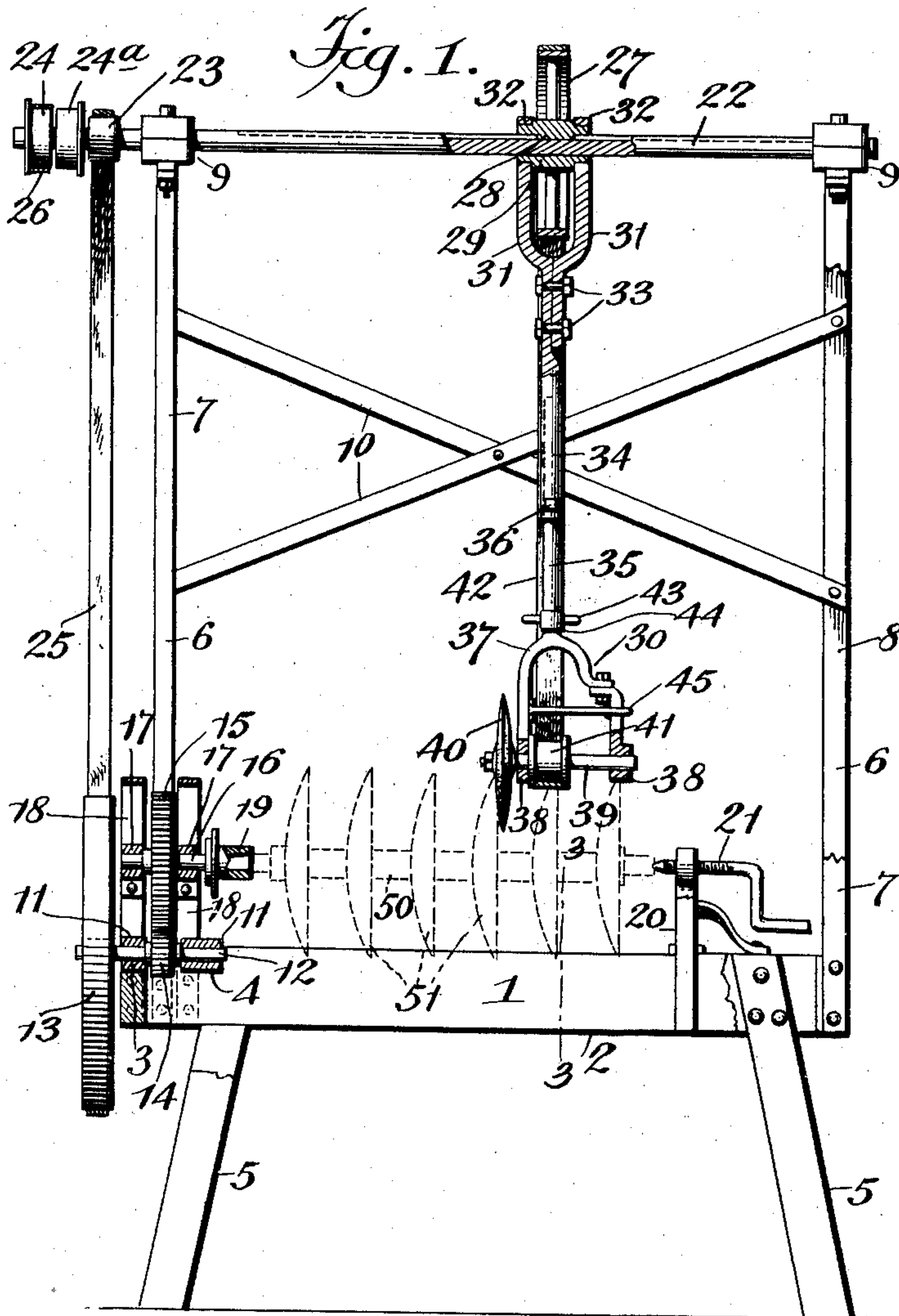
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PATENTED AUG. 18, 1903.

J. S. DONNELL.  
DISK SHARPENER.

APPLICATION FILED APR. 6, 1903.

NO MODEL.



Witnesses  
*E. J. Stewart*  
*Baxter Morton*

J. S. Donnell, Inventor,  
by *Chas. H. Co.*  
Attorneys



# UNITED STATES PATENT OFFICE.

JUNIUS S. DONNELL, OF FAIRFAX, MISSOURI, ASSIGNOR OF THREE-FOURTHS TO JONATHAN O. SMITH AND ARTHUR L. CARTER, OF FAIRFAX, MISSOURI.

## DISK-SHARPENER.

SPECIFICATION forming part of Letters Patent No. 736,829, dated August 18, 1903.

Application filed April 6, 1903. Serial No. 151,399. (No model.)

*To all whom it may concern:*

Be it known that I, JUNIUS S. DONNELL, a citizen of the United States, residing at Fairfax, in the county of Atchison and State of Missouri, have invented a new and useful Disk-Sharpener, of which the following is a specification.

This invention relates to disk-sharpeners.

The object of the invention is to provide a machine of simple construction by means of which the disks of harrows and other implements may be readily and rapidly sharpened.

The invention consists, generally speaking, in a suitable support whereon may be supported the disk-shaft of a harrow with the disks mounted thereon and means for rotating the shaft and grinding the disks as they are slowly rotated.

In describing the invention reference will be had to the accompanying drawings, forming a part of this specification, in which corresponding parts are designated by the same characters of reference throughout the several views in which they appear, it being understood that changes may be made in the form, proportions, and mode of assemblage of the elements exhibited without departing from the spirit of the invention or sacrificing any of the advantages thereof.

In the drawings, Figure 1 is a view, partly in side elevation and partly in section, of the disk-sharpener with a shaft supporting a gang of disks, indicated in position on the sharpener by dotted lines. Fig. 2 is a detail view in perspective of the sharpener-disk and the lower end of the frame in which it is supported. Fig. 3 is a view in vertical transverse section on the line 3 3 of Fig. 1 looking in the direction indicated by the arrow, parts being broken away to save space.

Referring to the drawings, 1 designates the bed of the machine, comprising two longitudinal members 2 and transverse members 3 and 4, the bed being supported upon legs 5, which are spread outward slightly at the bottoms. Extending from the bed of the machine at either end is a standard 6, comprising the straight member 7 and the bent member 8, both being preferably formed of iron and having the upper ends bent into a hori-

zontal plane, so as to form a support for bearing-blocks 9, which are securely fastened upon said standards by bolts, as shown. In order to give additional rigidity to the standards, diagonal braces 10 are placed between them and are secured to the bent members 8.

At one end of the bed of the machine, mounted on the transverse members 3 and 4 in bearing-blocks 11, is a short shaft 12, upon which are rigidly fastened a large pulley 13 and a small spur-gear 14. The gear 14 is in mesh with the larger gear 15, which is secured to a shaft 16, journaled in bearing-blocks 17, supported on standards 18, which rise a short distance above the bed at the end where the shaft 12 is located. At the end of the shaft 16 which is directed toward the other end of the machine is provided a chuck 19 of suitable form for engaging the end of a disk-shaft.

The longitudinal members 2 of the bed of the machine are spaced apart, as shown, and form guides for the longitudinally-adjustable support 20, having at the upper end a screw-threaded pointed rod 21, with the inoperative end formed into a crank for adjusting the same in the screw-threaded socket provided in the upper end of the support 20. By means of the chuck 19 and adjustable support 20, with its pointed rod 21, it is possible to support over the bed of the machine the shaft, upon which a gang of harrow-disks are clamped and to rotate the shaft and disks at any desired speed.

Mounted to rotate in the bearing-blocks 9 at the top of standards 6 is a shaft 22, having at the end over the pulley 13 and chuck 19 driving-pulleys 23 and 24 and idle pulley 24<sup>a</sup> between them. A belt 25 passes over pulley 23 and large pulley 13, serving to transmit motion from shaft 22 to the short shaft 12, upon which pulley 13 is mounted. Pulley 24 carries a belt 26, through which power is transmitted from any suitable source to pulley 24 and shaft 22.

Between the bearing-blocks 9 shaft 22 is provided with a keyway throughout its length, and a pulley 27, having a key 28, engaging the keyway, is slidably mounted on the shaft between said blocks. Owing to this form of connection between the shaft and pulley the



pulley, may be placed at any point on the shaft between its bearings, but is always so associated with the shaft that it will rotate therewith. Suspended below shaft 22 is a frame 30, the upper end of which is composed of the bent members 31, each of which has at its upper end a collar 32, which encircles one end of the hub 29 of pulley 27 and is freely rotatable thereon.

The two members 31 are so formed that together they embrace the pulley 27 in the manner shown and are united beneath its periphery by means of bolts 33. One of the members 31 is extended downward a considerable distance below the point of union with its fellow and terminates in a tubular portion 34, which has slidably held within it a rod 35, which may be adjusted at any desired position by means of a clamping-screw 36, carried in the tubular portion 34. At the lower end of rod 35 and rigidly secured thereto is a fork 37, the prongs of which extend downward and terminate in eyes 38, which form bearings for a shaft 39, journaled therein. The shaft 39 has at one end a grinding-disk 40 of any suitable material, preferably thickest in the middle and having the sides meeting in an edge at the periphery. Also mounted on the shaft 39 between the prongs of fork 37 is a pulley 41, which, like the disk, is rigidly mounted on the shaft. A belt 42 passes over pulley 27 on shaft 22 and over pulley 41 on shaft 39 and serves to transmit motion to the last-named pulley and through it to the shaft and the grinding-disk.

To prevent the slipping of belt 42 from pulley 41, a guide-loop 43 is provided just above the fork 37, being secured in position upon the rod 35 by means of a clamping-collar 44, as shown. Attached to the fork 37 between its point of attachment to rod 35 and the eyes 38, in which the shaft 39 is journaled, is a handle 45, which forms means for guiding the movements of frame 30 and preventing the slipping of belt 42 off the pulley 41 and coming in contact with the grinding-disk.

The operation of the machine will be readily understood from the foregoing description and from an inspection of the drawings. The disk-shaft, (designated 50,) with a plurality of disks 51 securely clamped thereon in the usual way, is mounted in the machine with one end of the shaft gripped in the chuck 19 and the other supported by the engagement of pointed rod 21 with the end of the shaft. Motion is imparted to pulley 13 by means of the belt connecting it with shaft 22, and the gears 14 and 15 transmit the motion to shaft 16 and chuck 19, carried thereby, thus imparting rotation to shaft 50, upon which the harrow-disks are mounted. As will be seen from an inspection of the drawings, the size of the pulleys and gears concerned in producing rotation of the chuck 19 are such that the speed of the chuck 19 is very slow as compared with that of shaft 22, so that the rotation of disk-shaft 50 and the disks

mounted thereon will be slow. It is desirable that the shaft 50 be rotated at slow speed in order that sufficient time may be allowed for grinding each portion of every disk. The grinding member is rotated by means of pulley 27, pulley 41, mounted on shaft 39, and the belt 42, connecting the pulleys. As pulley 27 is of considerably larger diameter than pulley 42, the rate of rotation imparted to the grinding-disk will be rapid, as is necessary to secure effective action therefrom. The grinding-disk is ordinarily supported at the height indicated in the drawings, the shaft 39 being held at a slightly higher level than rod 21, which engages the end of disk-shaft 50. The inclination of the grinding-disk to the harrow-disks may be made as great or as small as is desired by means of the telescopic connection of rod 35 and tubular portion 34 of one of the members 31. The level of the shaft 39 may also be adjusted by means of the same connection to any desired height; but that illustrated is ordinarily found suitable, and it is seldom necessary to make any change in the level of shaft 39 other than that which occurs in swinging the frame 30 from its position immediately under pulley 27 to the position for grinding the harrow-disks. As the harrow-disks rotate slowly with the chuck 19, the operator has only to hold the grinding-disk in proper relation to a harrow-disk until the desired degree of sharpening of the harrow-disk has been accomplished, uniformity in grinding being secured by the uniform speed imparted to the harrow-disks by the chuck 19. After one disk has been ground the pulley 27, on the hub of which frame 30 is suspended, is shifted along the shaft 22 until the grinding-disk 40 is brought into proper relation with the next one of the harrow-disks 51, and the grinding operation is then repeated.

It will readily be seen that by means of a machine constructed as hereinbefore described it is possible to grind harrow-disks with great uniformity and with considerable rapidity, and, further, that it is unnecessary to remove the disks from their supporting-shaft, as is frequently done in order to sharpen them by hand or by the use of other means. It is also apparent that by means of the telescopic connection of the rod 35 with the tubular portion 34 of one of the members 31 the grinding-disk 40 may be so disposed with reference to each of the harrow-disks that it is possible to give to the harrow-disks an edge of any desired bevel.

Having thus described the construction and operation of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination in a disk-sharpener of means for supporting a shaft having a plurality of disks mounted thereon, a sliding and swinging frame, a rotatable grinding member mounted in said frame, and means for rotating said grinding member.



2. The combination in a disk-sharpener of a support for a shaft having a plurality of disks mounted thereon, means for rotating said shaft, a swinging frame, a rotatable grinding member mounted in said frame, and means for rotating said grinding member.

3. The combination in a disk-sharpener of a support for a shaft having a plurality of disks mounted thereon, a sliding and swinging frame having the lower end thereof swiveled, a grinding member rotatably mounted in the swiveled portion of said frame, and means for rotating said grinding member.

4. The combination in a disk-sharpener of a support for a shaft having a plurality of disks mounted thereon, means for rotating said shaft, a sliding and swinging frame, a grinding member rotatably mounted in said frame, and means for rotating said grinding member.

5. The combination in a disk-sharpener of a support for a shaft having a plurality of disks mounted thereon, means for rotating said shaft, a sliding and swinging frame having the lower end thereof swiveled, a grinding member rotatably mounted in said swiveled end of said frame, and means for rotating said grinding member.

6. The combination in a disk-sharpener of a bed having supports thereon for a shaft having a plurality of disks mounted thereon, standards rising from said bed, a shaft journaled in bearings upon said standards, a pulley keyed to said shaft, a frame journaled on the hub of said pulley and having a grinding member rotatably mounted therein, and means for rotating said grinding member.

7. The combination in a disk-sharpener of

a bed having a support for a disk-shaft provided thereon, standards extending upward from said bed, a shaft rotatably mounted in bearings provided on said standards, a pulley keyed to said shaft, a frame having a bifurcated upper end the members of which embrace said pulley and are journaled upon its hub, a shaft mounted in the lower end of said frame, a grinding member mounted on said shaft, a pulley mounted on said shaft, and connections between the pulley on the last-named shaft and the pulley on the first-named shaft.

8. The combination in a disk-sharpener of a bed, a chuck rotatably mounted at one end of said bed, a sliding support at the other end of said bed, gearing for driving said chuck at slow speed, standards extending upward from said bed, a shaft journaled in bearings provided on said standards, driving connection between said shaft and said gearing, a pulley slidably mounted on said shaft and keyed thereto, a swinging frame associated with said pulley, said frame being composed of upper and lower sections telescopically connected, a fork at the lower end of the lower section, a shaft mounted on said fork, a grinding member rigidly fastened to said shaft, a pulley also fastened to said shaft, and driving connection between the last-named pulley and the first-named pulley.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JUNIUS S. DONNELL.

Witnesses:

E. C. WHITFORD,  
N. F. DRAGOO.