F. H. KLENKE.

DISK SHARPENER.

APPLICATION FILED APR. 27, 1908.

939,713.

Patented Nov. 9, 1909.

2 SHEETS—SHEET 1.

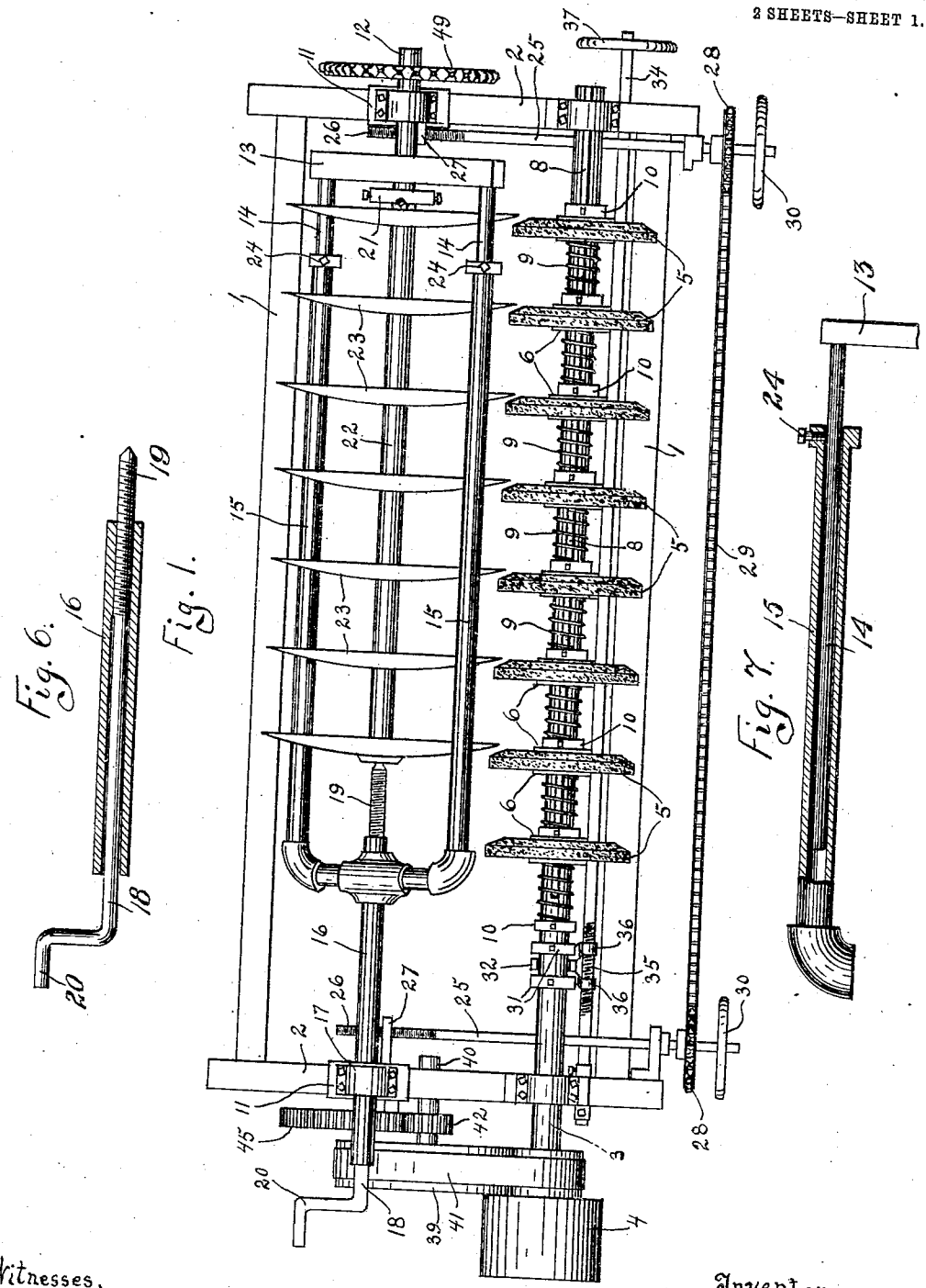

Fig. 1.

Fig. 6.

Fig. 7.

Witnesses.

Millard Haskell.

Isaac N. Martin

Inventor.

Fred H. Klenke,

By Walter N. Haskell,

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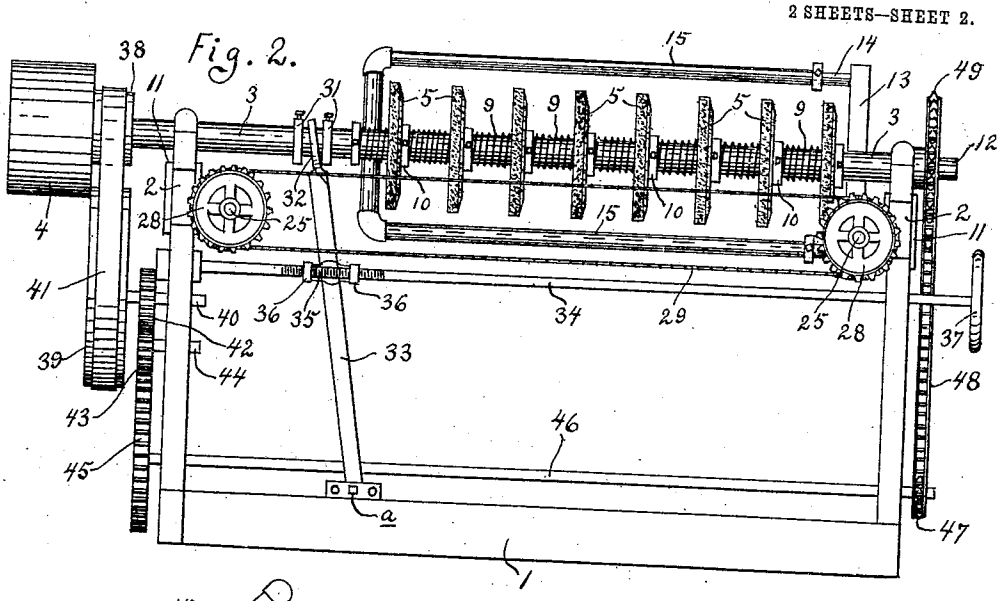
2 SHEETS—SHEET 2.

Fig. 2.



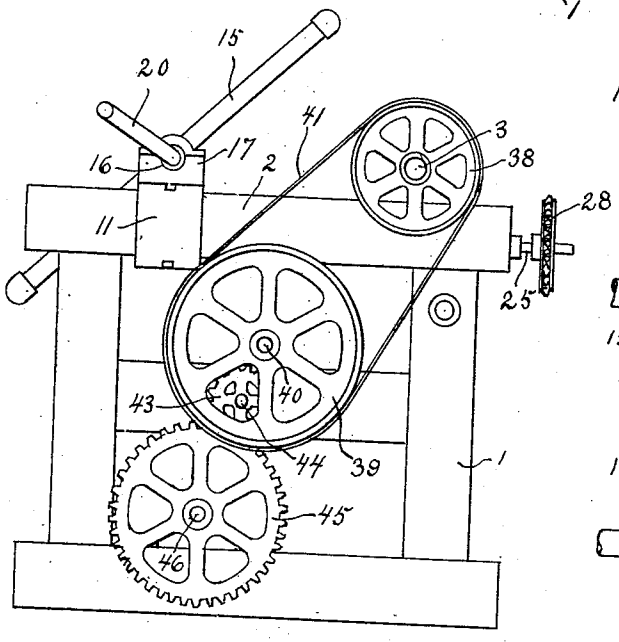
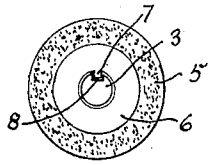


Fig. 3.

Fig. 4.



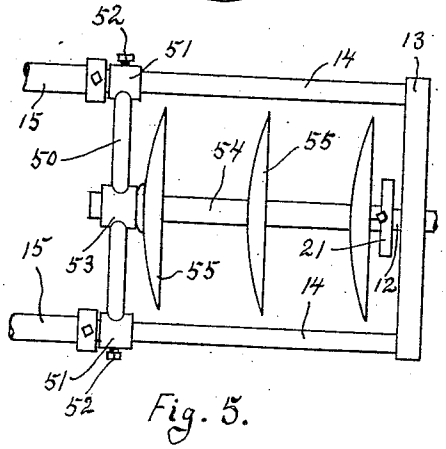


Fig. 5.

Witnesses

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UNITED STATES PATENT OFFICE.

FRED H. KLENKE, OF ASHTON, ILLINOIS.

DISK-SHARPENER.

939,713. Specification of Letters Patent. Patented Nov. 9, 1909.

Application filed April 27, 1908. Serial No. 429,414.

To all whom it may concern:

Be it known that I, FRED H. KLENKE, a citizen of the United States, residing at Ashton, in the county of Lee and State of Illinois, have invented certain new and useful Improvements in Disk-Sharpeners; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention has reference to machines for sharpening the disks of disk harrows and similar devices, and is specially adapted to sharpen all of the disks of a gang or section simultaneously. In order that this may be done successfully it is necessary to employ a plurality of grinding devices acting independently of each other, so as to allow for the variation in spacing which is frequently found in the disks of a section, and also for inequalities in the surfaces of the disks which are being ground.

My device comprises, in brief, a plurality of rotary grinders, independently supported in the machine, and possessing a limited amount of movement with reference to one another; also mechanism for supporting a gang of disks rotatably in the machine; means for moving the gang of disks laterally with reference to the grinders; and means for varying the position of the grinders longitudinally, with reference to the disks.

The particular construction and operation of parts in my device by means of which the above ends are attained will be more fully hereinafter described.

In the drawings: Figure 1 is a plan view of my invention, ready for operation. Fig. 2 is a side elevation thereof. Fig. 3 is an end view thereof. Fig. 4 is a detail, showing one of the grinders 5 and method of supporting same on the shaft 3. Fig. 5 is a detail, showing an attachment which can be used with the disk supporting frame. Fig. 6 is a longitudinal section through the pipe 16. Fig. 7 is a longitudinal section through one of the members 15.

Similar numbers refer to similar parts throughout the several figures.

1 represents the frame of the machine, having upper end pieces 2, supported upon which is a main shaft 3, to which movement is imparted through a pulley 4, attached to one end thereof. Supported on the shaft 3 is a plurality of spaced-apart rotary grinders 5, each held between a pair of circular plates 6, one of each of said pairs of plates being provided on its inner edge with a lug 7 extending into a channel 8 in the shaft 3. Rotation of the grinders independently of the shaft is thus prevented.

A plurality of extensile coiled springs 9 are held on the shaft 3, each interposed between one of the grinders 5 and a collar 10, fixed to the shaft. The collars 10 also serve to limit the longitudinal movement of the disks 5 in one direction.

Slidably supported upon the end pieces 2 of the frame is a pair of boxes 11, upon one of which is journaled a short shaft 12, upon which is loosely supported a cross-head 13, in the ends of which are held bars 14 of a telescopic frame, the movable parts 15 of such frame being fixed to a pipe 16, slidably mounted in a boxing 17, fixed on the opposite box 11. Extending through the pipe 16 is a shaft 18, having on its inner end a thread 19, engaging a similar interior thread in the end of the pipe 16. The outer end of the shaft 18 is provided with a crank 20, and between the inner end of such shaft and a chuck 21 on the inner end of the shaft 12 is held a shaft 22, upon which are held a gang of disks 23. The members 15 can be secured to the bars 14 at any desired point by means of screw-bolts 24.

Supported transversely near the inner ends of the frame is a pair of rods 25, provided on their inner ends with threads 26, engaging threaded perforations in ears 27, fixed to the boxes 11. Near the outer ends of the rods 25 are secured a pair of sprocket wheels 28, connected by a sprocket-chain 29, and each of said rods is provided with a hand-wheel 30. By the operation of the sprocket-wheels 28 the rods 25 are rotated, resulting in the movement of the boxes 11 upon the end-pieces 2 in one direction or the other.

Fixed on the shaft 3 is a pair of collars 31, between which is held a fork 32 on the upper end of a lever 33, fulcrumed on the frame, as at *a*. Supported in the frame is a hand-shaft 34, provided with a thread 35, engaging similar threads in perforations in ears 36, loosely connected with the lever 33. By the rotation of the shaft 34 the lever 33 may be moved in one direction or the other,

causing the longitudinal movement of the shaft 3 in the same direction. The shaft 34 is provided at its outer end with a hand-wheel 37, by which it may be operated.

Movement is imparted to the shaft 12 by the following means. Fixed on the shaft 3 is a pulley 38, from which movement is communicated to a pulley 39 on a shaft 40 by means of a belt 41. On the shaft 40 is a pinion gear wheel 42, meshing with an idler pinion 43 on a shaft 44, journaled in the frame. The pinion 43 engages a gear-wheel 45 on a shaft 46 supported on the lower cross-pieces of the frame, and provided on its opposite end with a sprocket wheel 47, connected by a sprocket chain 48 with a sprocket-wheel 49 on the outer end of the shaft 12. By this means rotation is imparted to the shaft 12 and disks 23 at a greatly reduced speed, and in a direction similar to the rotation of the shaft 3.

The operation of the device is as follows: The telescopic frame for the support of the disks is first adjusted to suit the length of the section of disks to be sharpened, after which the disks are supported therein, as shown in Fig. 1. The rods 25 are then operated to move the disks into proximity to the grinders 5, in position to grind the edge of the disks on the convex faces thereof. To facilitate the grinding operation, the engaging edges of the grinders are preferably dressed, or beveled, to conform to the shape of the disk. When the disks are in position the shaft 34 is operated to move the shaft 3, and bring all of the grinders which have corresponding disks into engagement with such disks. As the work progresses the disks are given further movement in the direction of the grinders, resulting in a grinding or polishing of a portion of the disk surface farther away from the edge. The springs 9 permit a limited amount of movement to the grinders away from the collar 10, allowing for any inequalities on the surface of the disks, or variation in the spacing thereof. The shaft 3 is rotated with considerable rapidity, and by reason of the shafts 3 and 12 rotating in the same direction the edges of the disks have a movement contrary to that of the grinders 5, but move more slowly than such grinders, as before stated. When the disks have been sufficiently sharpened the grinders are again moved away therefrom, and the disk gang moved outwardly to the side of the machine to be removed.

Referring to Fig. 5,—a cross-bar 50 is adapted to be supported on the bars 14 by means of sleeves 51 and set-screws 52 therein. Centrally of the bar 50 is a boxing 53 in which is held one end of a short shaft 54, supporting a limited number of disks 55, the other end of said shaft being held in the chuck 21, and adapted to be rotated thereby. This device is designed to be used in sharpening a small gang of disks, such as are sometimes used with cultivators, and which could not be conveniently supported in the telescopic frame. To place it in position the parts 14 and 15 are separated and the sleeves 51 slipped upon the bars 14 and secured in the desired position, after which the tubes 15 are replaced, and secured in place.

It is obvious that the purpose of the telescopic frame is to permit the support of disk-gangs having varying numbers of disks, the frame being lengthened or shortened as may be required, and a sufficient number of grinders being provided to sharpen simultaneously all of the disks of the largest sized gangs.

If it is desired to adjust either end of the frame 15 independently of the other, this can be accomplished by slipping the chain 29 off of one of the wheels 28 and operating either of the rods 25 independently.

What I claim as my invention, and desire to secure by Letters Patent of the United States, is:

1. In a device of the class named, a rotatably mounted shaft, and plurality of spaced apart rotary grinders slidably mounted thereon; a plurality of collars, fixed to said shaft, and limiting the movement of said grinders in one direction; and a plurality of springs interposed between said collars and grinders, and permitting a limited movement in the opposite direction, substantially as described.

2. In a device of the class named, a rotatably mounted shaft; a plurality of spaced-apart rotary grinders slidably mounted thereon; and a plurality of springs, interposed between said grinders, so as to permit a limited movement of said grinders longitudinally of said shaft, in one direction thereon, substantially as shown and set forth.

3. In a device of the class named, a rotatably mounted shaft; a plurality of spaced-apart rotary grinders slidably mounted thereon; means for permitting a limited movement of said grinders upon such shaft in one direction; and means of longitudinal adjustment of said shaft, substantially as shown and described.

4. In a device of the class named, a telescopic frame, suitably supported in the machine; means for rotatably supporting a gang of disks within said frame; and means for lateral adjustment of said frame, substantially as set forth.

5. In a device of the class named, a rotatably mounted shaft; a plurality of spaced-apart rotary grinders slidably mounted thereon; means for limiting the movement of said grinders in one direction upon said shaft; means for rotatably supporting a gang of disks in said device; and means for moving such gang of disks into engagement

with said grinders, and out of engagement therewith, as desired, substantially as shown and for the purpose named.

6. In a device of the class named, a rotatably mounted shaft; a plurality of spaced-apart rotary grinders slidably mounted on said shaft, and held from movement in one direction thereon; means for limiting the movement of said grinders in the opposite direction on said shaft; means of longitudinal adjustment of said shaft; means for rotatably supporting a gang of disks in said device; and means for moving such gang of disks into engagement with said grinders, and out of engagement therewith, as desired, substantially as and for the purpose mentioned.

7. A disk-sharpener, comprising a frame; a shaft, rotatably mounted thereon; means for longitudinal adjustment of said shaft; a plurality of rotary grinders, slidably mounted on said shaft, and provided on one side with beveled grinding faces; means for permitting a limited movement of said grinders, in one direction, longitudinally of said shaft; mechanism for supporting a gang of disks rotatably in said machine; means for adjusting said disks laterally with reference to said grinders; and means for rotating said disks at a moderate rate of speed, substantially as shown and described.

8. A disk-sharpener, comprising a frame 1, having upper end-pieces 2; a pair of boxes 11, slidably mounted on the end-pieces 2; a telescopic frame, supported on the boxes 11; mechanism for supporting a gang of disks rotatably in said frame; mechanism for simultaneously adjusting the position of the boxes 11, longitudinally of their supports; a rotary shaft 3, supported on the frame 1; a plurality of rotary grinders 5, slidably supported on the shaft 3 and provided on one side with beveled grinding faces; a plurality of springs 9, interposed between the grinders 5 and collars 10, fixed on the shaft 3; means of adjustment of the shaft 3 longitudinally, to bring the grinding faces of the wheels 5 against the faces of the disks; and means for rotating the gang of disks at a moderate rate of speed, substantially as shown and set forth.

9. In a device of the class named, the combination, with the frame 1 and end-pieces 2 thereof, of a pair of boxes 11, slidably mounted on said pieces 2; a shaft 12, journaled on one of the boxes 11, and provided on its inner end with a chuck 21; a pipe 16, slidably supported on the other box 11; a shaft 18, adjustably held in the pipe 16; bars 14, supported from the shaft 12; members 15, secured to the pipe 16, and slidably supported on the bars 14; means for rotating the shaft 12; and means for adjusting the plates 11 longitudinally of the end-pieces 2, substantially as set forth.

In testimony whereof, I affix my signature, in presence of two witnesses.

FRED H. KLENKE.

Witnesses:
THOS. CURRY,
ALONZO FELL.