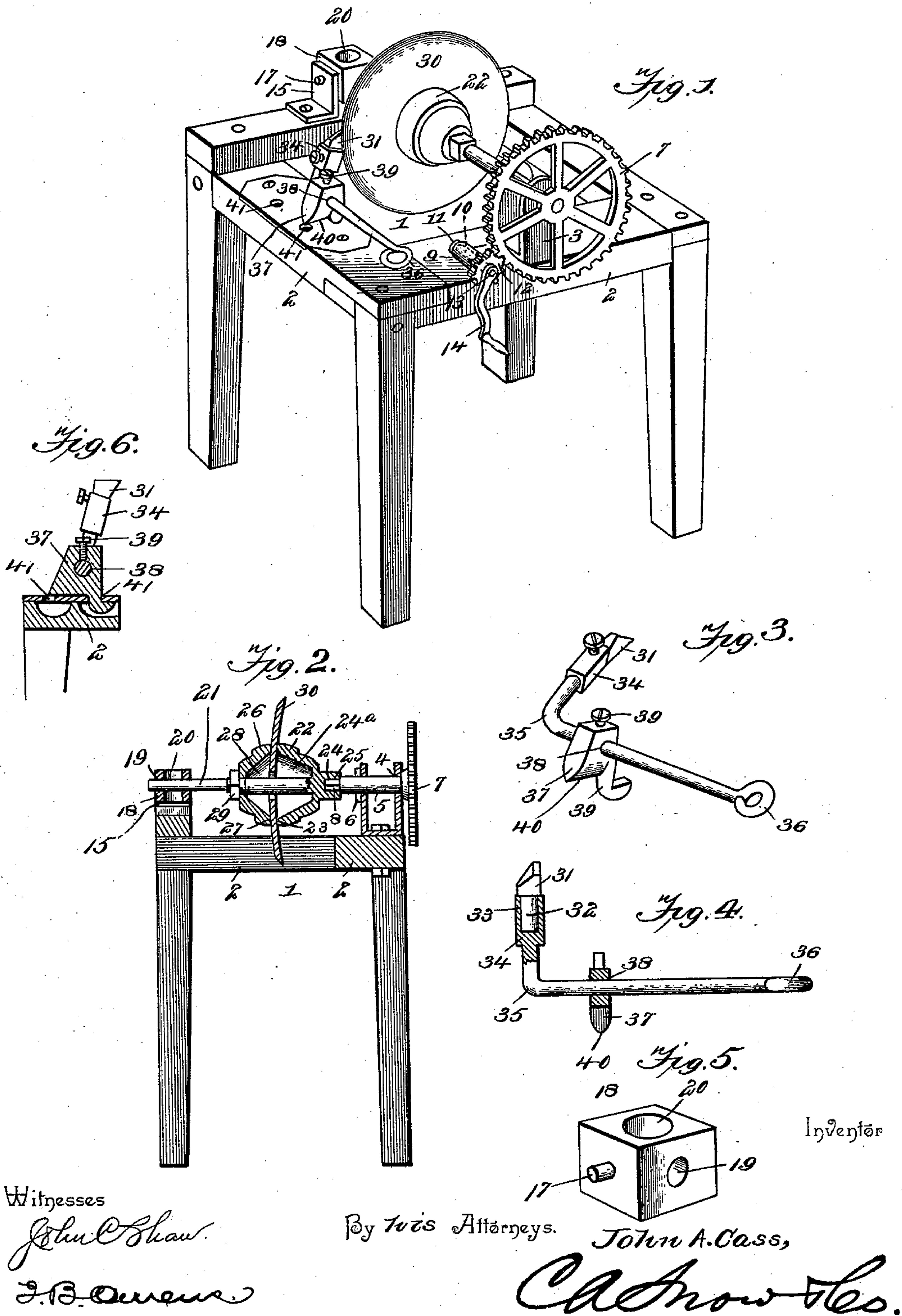


(No Model.)

J. A. CASS.
HARROW DISK SHARPENER.

No. 528,922.

Patented Nov. 13, 1894.



UNITED STATES PATENT OFFICE.

JOHN A. CASS, OF IPAVA, ILLINOIS, ASSIGNOR OF ONE-HALF TO NOAH HALL,
OF SAME PLACE.

HARROW-DISK SHARPENER.

SPECIFICATION forming part of Letters Patent No. 528,922, dated November 13, 1894.

Application filed May 28, 1894. Serial No. 512,762. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. CASS, a citizen of the United States, residing at Ipava, in the county of Fulton and State of Illinois, have invented a new and useful Harrow-Disk Sharpener, of which the following is a specification.

The invention relates to an improvement in devices for sharpening the disks of harrows or colters, and it consists of an improvement over prior devices wherein the disk is mounted upon a revoluble shaft and made to rotate therewith, its edge being subjected to the action of a stationary cutting tool.

In the drawings: Figure 1 represents a perspective view of my complete machine, showing it in the act of sharpening a harrow disk. Fig. 2, a longitudinal section taken through the disk-shaft and showing a disk placed thereon; Fig. 3, an enlarged detail, in perspective, of the knife and its holder; Fig. 4, a detail section, taken longitudinally through the knife-holder and extending into the knife; Fig. 5, a sectional view illustrating, in detail, the operation of the box for mounting the disk carrying shaft; Fig. 6, a detail section of the knife-supporting bar.

The reference numeral 1 indicates the frame of my machine, and this frame consists of the vertical legs rigidly joined at their upper ends to the horizontally-extending bars 2, which are four in number and extend from the upper end of each leg to the corresponding end of the contiguous leg. Rigidly secured to one of the bars 2, and projecting upwardly therefrom, is the bracket bearing 3, consisting of two parallel plates, preferably formed integral with each other, and bent at their base, whereby they may be secured in place. Formed in the upper ends of the bearing-plates 3 are the transversely-aligned openings 4, in which the revoluble shaft 5 is mounted and held incapable of longitudinal movement by means of the pin 6 and spur-gear 7.

The pin 6 passes through the shaft directly adjacent to the inner bearing-plate, while the gear 7 is fixed to the opposite end of the shaft and directly adjacent to the remaining bearing-plate. Thus it will be seen that the shaft 5, while capable of free rotary movement, is incapable of longitudinal movement in its

bearings. The inner end of the shaft 5 is extended a slight distance beyond the adjacent bearing-plate and is provided at such end with the squared and reduced portion 8, which has for its purpose a use that will be hereinafter described.

Rigidly secured to one of the bars 2, and directly adjacent to the bearing-plates 3, is the box 9, which is formed, preferably, of a stout sheet of metal bent to comprise a horizontal base-portion for permitting it to be secured to the frame, and a cylindrical box-portion adapted for the reception of its shaft.

10 indicates the shaft, which it is the purpose of the box 9 to mount, and this shaft is provided at its inner end with an enlargement or head 11, by which outward movement of the shaft is prevented, while the remaining or outer end of the shaft has fixed thereto the pinion-gear 12. This gear operates to perform the double purpose of holding the shaft 10 in place, and of meshing with the gear 7 so as to impart a rotary movement thereto. A small portion of the shaft 10 is extended beyond the gear 12, and is there provided with a square portion 13, adapted for the reception of the crank-arm 14, which is fixed thereto and designed to permit the imparting of a rotary movement to the shaft 10. Thus it will be seen that the rotations of the shaft 10 will be followed by a corresponding movement of the shaft 5, owing to the gearing between the two.

Rigidly fixed to, and arising vertically from, the beam 2, which is opposite the bar having the bearing 3, are the bearing-plates 15, which are two in number and which are provided with the longitudinally-aligned openings 16, which are adapted, respectively, for the reception of the trunnions 17 of the box 18. The trunnions 17 are revolubly mounted in their respective openings 16, so that the box 18 will be similarly mounted. Formed in the box 18, and extending at right angles to the longitudinal line of the trunnions 17 are the two openings 19 and 20. These openings extend at right angles to each other and through the box. The opening 19 is smaller than the opening 20 and is adapted for the reception of one end of the shaft 21. The shaft 21 has rigidly secured thereto, or

formed integral therewith, preferably the latter, the cup-shaped head or washer 22, which is formed with an edge 23, having the cavity 24^a extending into the washer or head 5 and toward the adjacent end of the shaft. Formed on the end of the washer or head 22, and axially coincident with the shaft 21, is the knob 24, which is provided with the longitudinal recess 25, square in cross-section and 10 adapted for the reception of the squared end 8 of the shaft 5 aforesaid. By these means the two shafts, 21 and 5, are connected so as to be incapable of independent rotary movement, and the end of the knob 24 is formed 15 so that it will fit snugly against the shoulder of the shaft 5, such shoulder being formed by the squared end 8.

Mounted upon the shaft 23, and of a size and shape similar to that of the head 22, is 20 the removable washer or head 26, which is capable of free movement on the shaft 21, and which is provided with the plain edge 27 and cavity 28, similar to the corresponding parts of the head 22. The two edges of the heads 25 22 and 26 are capable of engaging each other and of fitting snugly in place. 29 indicates a nut which operates on the shaft 21, and which is adapted to bind against the removable head 26 and by that means to clamp such 30 head against its companion, the shaft 21 being, of course, screw-threaded to permit such operation. The two heads or washers, 22 and 26, are adapted to bind against either side of the disk to be sharpened, shown at 30 in the 35 drawings, and by such means to rigidly affix the disk to the shaft 21. The purpose of the cavities 28 and 24^a is to provide a place capable of receiving the usual flanges or hubs of the disks, so that any form of disk may be 40 clamped between the heads with ease, it being understood that the plain edges of the washers or heads will project over the hubs and engage the plain surface of the disk.

31 indicates the sharpening knife, which is 45 formed with an enlarged head on which the knife-edge is located, and with a round and reduced shank-portion 32, which is adapted to revolvably fit within the corresponding opening 33 of the enlarged end 34 of the knife-handle. The knife-handle consists of a bar 50 or rod of iron, preferably cast, and formed with the bend 35 therein, which places the two portions of the rod at approximately right angles to each other, and the bend is formed 55 at such a point on the rod that one end or portion will be shorter than the other. It is upon this end, the short one, that this enlargement 34 is formed, while the remaining or long portion has the hand-bail or grip 36 formed 60 integral therewith, and by which the handle is gripped and manipulated.

Located upon the longer arm or portion of the handle of the knife is the fulcrum-block 37, which is formed of cast metal and which 65 is provided with an opening 38, adapted to receive the handle, a set-screw 39 being provided by which the block may be secured at

any point along the handle. The block 37 is provided with the downwardly and outwardly extending finger or fulcrum proper 39, and 70 with the edge 40, located adjacent thereto and in longitudinal alignment therewith. The finger 39 is adapted to fit in one of the openings 41 of the plate 42, which is rigidly secured to one of the beams 2 of the frame. 75 The plate 42 is formed with two lines of openings 41 therein, and these openings are each adapted for the reception of the finger 39, according to the position which it is desired that such finger assume. Thus, by changing the 80 opening in which the finger is arranged the relative position of the fulcrum-block 37 may be regulated.

The knife 31 is formed with its edge oblique or diagonal, calculating from the horizontal 85 line of the beams 2, so that the edge of the disk 30 will be engaged therewith, thereby resulting in a shear cut, as distinguished from a square cut. The purpose of the shear cut is to dispense with the vibration or trembling 90 attending a square cut, and to insure the easy and thoroughly effective operation of the knife.

In the use of my invention, the disk to be sharpened is first secured upon the shaft 21, 95 and this is done by disengaging such shaft with the shaft 5, and subsequently withdrawing the shaft 21 from the box 18. It will now be possible to remove the nut 29, so that the head 26 may be taken off of the shaft. It will 100 now be possible to place the disk upon the shaft 21, as upon its usual axle. When this has been done the head 26 should be returned to its position and made to bind against the side of the disk by means of the nut 29, as ex- 105 plained. The shaft 21 should now be replaced, so that its left-hand end will be arranged in the box 18, and so that the knob 24 will receive the reduced and squared end 8 of the shaft 5. By this means the disk is 110 mounted upon the shaft 21, and owing to the connections of such shaft it will be possible to impart thereto a continuous rotary movement. To adjust the cutter or knife, the fulcrum-block 37 should be placed upon the 115 plate 42, and its finger 39 seated in one of the openings 41, such opening being determined by the position which it is desired to have the cutter assume. The edge 40 of the fulcrum-block is made to bear upon the upper surface 120 of the plate 42 and to bind therewith, whereby the knife is given a firm seat. The knife proper, 31, is next adjusted on its shank 32, so as to determine the degree of slant which it is desired to give the edge of the disk. The 125 knife should now be moved into engagement with the edge of the disk, and on that side which is adjacent to the box 18, so that the disk and the shaft 21 will be pressed toward the shaft 5, and the connection between the 130 two shafts thereby insured.

After the adjustment of the parts has been attained, the shaft 10 should be started to revolving, by means of the shafts attached

thereto, whereupon the disk 30 will move similarly, thereby causing its edge to engage the knife 31 with a sliding contact. This will result in a filing or cutting away of the disk, or in its sharpening.

The knife 31 is kept in engagement with the disk by pressure applied to the bail 36, so as to swing the handle of the knife on the fulcrum 37, and consequently in engagement with the disk.

Having described my invention, what I claim is—

1. In a harrow disk sharpener, the combination of a frame or table, a shaft revolubly mounted thereon, a bearing on the table or frame and revoluble at an axis at right angles to the longitudinal disposition of the said shaft, a second shaft having one end removably connected to the first shaft and having its remaining end journaled in the said box, clamps on the second shaft, said clamps being capable of securing a harrow disk thereto, and a knife fixed to the frame or table and capable of engaging the edge of the harrow disk, substantially as described.

2. In a harrow disk sharpener, the combination of a frame or table, a driven shaft revolubly mounted thereon, a box fixed to the frame or table and capable of revolution on an axis at right angles to the longitudinal disposition of the said driven shaft, a second shaft having one end connected to the driven shaft and the remaining end journaled in the revoluble box aforesaid, a flange fixed rigidly to the second shaft, and a second flange or head slidably mounted on the second shaft and provided with means for securing it at various points thereof, and a cutter fixed to the frame or table and capable of engaging the

edge of the harrow disk, substantially as described.

3. In a harrow disk sharpener, the combination of a driven shaft capable of having the disk fixed thereto, a frame or table upon which the said shaft is mounted, said table having a series of perforations therein, a block provided with a downwardly and forwardly extending stud capable of fitting within the respective perforations, a bar bent at right angles and passed through said block, one end of the bar being provided with a socket, and a knife located within said socket and capable of engaging and sharpening the edge of the harrow disk, substantially as described.

4. In a harrow disk sharpener, the combination with a frame or table, a sharpening knife thereon, a driven shaft mounted on the frame or table and incapable of being removed therefrom, the said driven shaft having one end squared, a box mounted so as to be capable of revolving on an axis at right angles to the longitudinal disposition of the driven shaft, said box being provided with an opening or bearing, a removable shaft provided at one end with a socket capable of receiving the squared end of the driven shaft, and having adjacent to said socket a flange or head fixed to the shaft, and a movable flange or head on the shaft and provided with means for securing it against the fixed flange or head, substantially as described.

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

JOHN A. CASS.

Witnesses:

W. A. BABCOCK,
JOHN N. McLAREN.