

(No Model.)

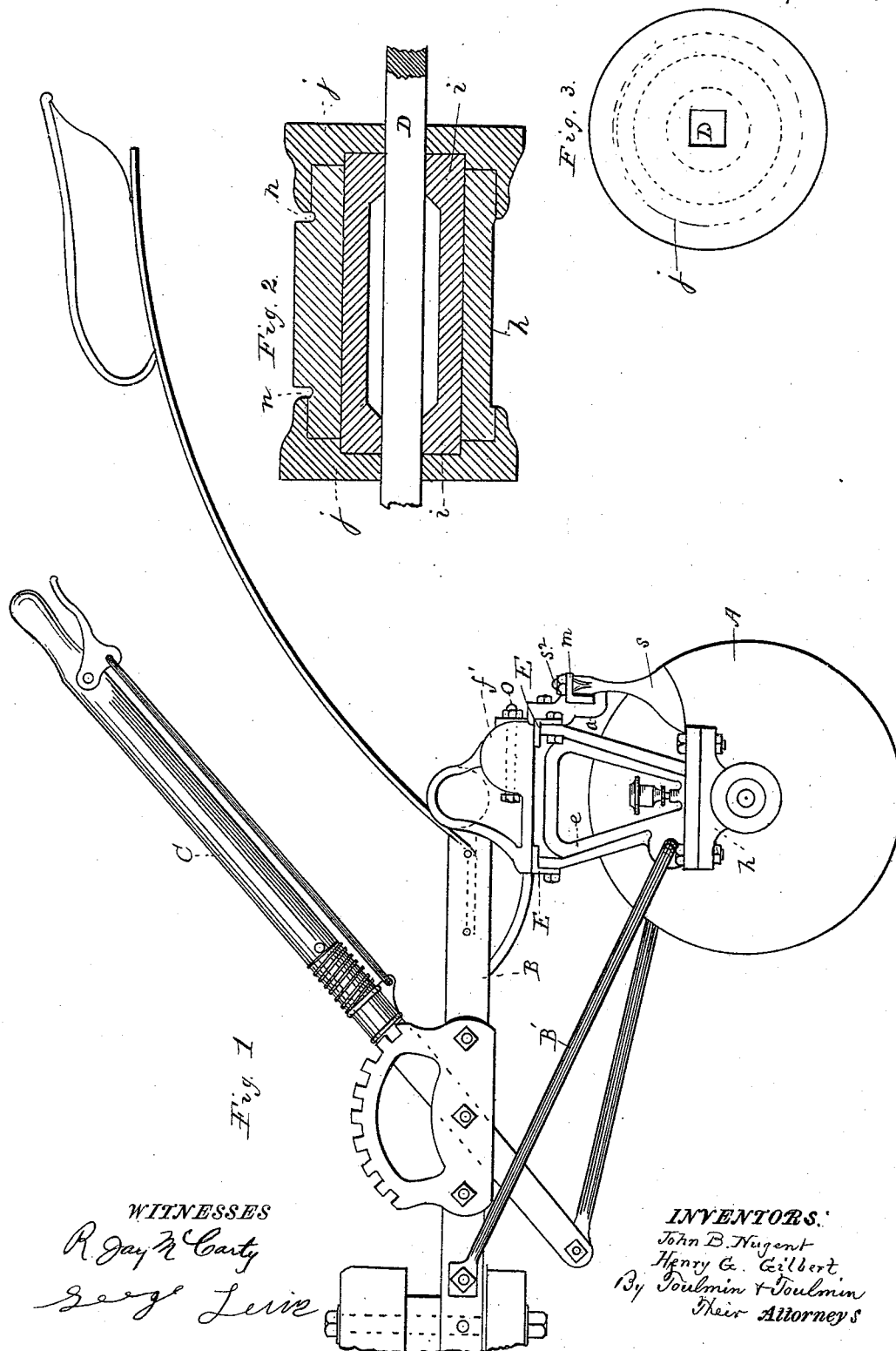
2 Sheets—Sheet 1.

J. B. NUGENT & H. G. GILBERT.
HARROW.

HARROW.

No. 490,718.

Patented Jan. 31, 1893.



UNITED STATES PATENT OFFICE.

JOHN B. NUGENT AND HENRY G. GILBERT, OF DAYTON, OHIO, ASSIGNORS
TO THE McSHERRY MANUFACTURING COMPANY, OF SAME PLACE.

HARROW.

SPECIFICATION forming part of Letters Patent No. 480,718, dated January 31, 1893.

Application filed June 23, 1892. Serial No. 437,746. (No model.)

To all whom it may concern:

Be it known that we, JOHN B. NUGENT and HENRY G. GILBERT, citizens of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Rotary Disk Harrows or Cultivators, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in rotary harrows or cultivators.

The objects of our improvements are to connect the gangs of disks with the bars or frames thereof, in such a manner that the shafts which carry the revolving disks, may be easily adjusted from a straight line to an angle of sixteen degrees, with the frame, to conform to the nature of the soil being cultivated, and locked by means of a lever, detent, and rack; to provide means whereby the gangs may be placed at angles to each other; to obviate the necessity of confining the bearing and strain, to bolts or pins, when the gangs are adjusted at their various angles, and in operation; to provide means whereby the shaft bearings are protected from sand or dust; to provide scrapers and the connections thereof, to the gang frames in such a manner that they may adjust themselves, automatically, to the surfaces of the revolving disks.

To these ends our improvements have reference to a ball and socket joint which forms an equal bearing for the gangs, the ball of one section being held in the socket of the other section by means of a bolt; the gangs may be turned thereon by means of a drag rod connected by a hook and eye joint at one end, and pivoted to a lever at the other; have reference to a sand and dust-proof shaft box, having a suitably long bearing; have reference to a chambered sleeve inclosed by said box; have reference to a washer or dust-cap with cavities in the inner surface thereof, adapted to receive the respective ends of the said box and sleeve, and maintain the sleeve in rigid contact as the cap and sleeve are being revolved on the shaft. The edge or rim of the washer or dust cap is adapted to fit or extend over the ends of the box when

placed thereon thus forming a gutter or channel extending partially around the box; have reference to a sliding angle or scraper bar provided with slots, and pivoted longitudinally, to the rear of the gang frames; a spring and pedal attachment to effect a sliding movement of the bar, a series of scrapers adapted to rock and adjust themselves to the sides of the disks, the said scrapers being pivoted directly into the bar, and are thus prevented from working loose; and have reference to other points hereinafter described and claimed.

In the accompanying drawings on which like letters indicate corresponding parts, Figure 1. is a side elevation of the implement embodying our improvements. Fig. 2, an enlarged, detailed vertical longitudinal section of the bearings for the shafts of the disks. Fig. 3, an end view of the washer or dust cap showing in broken lines, the ends of the box and sleeve. Fig. 4, a view taken from the rear showing the whole of one of the gangs of disks, and one of the disks of the adjoining gang. Fig. 5, a plan view of the ball standard, showing the ball in section and bolt passing through, in broken lines. Fig. 6, a detailed sectional view of the ball, standard, socket and piece of pipe. Fig. 7, a detached plan view of the ball, socket and part of the pipe. Fig. 8, a plan view of the top of a scraper, and a piece of the angle bar in section. Fig. 9, a transverse sectional view of the angle or scraper bar, a scraper, and a disk. Fig. 10, an end elevation of the standard and ball, bolted to the shaft box, showing in dotted lines the socket and bolt.

The letter, A, indicates one of the gangs of disks, that may be connected with an intermediate tongue or draft connection, B, by joints, pivots or any of the well known means of effecting such connection, that will permit the gangs to vibrate freely, to conform to the character of the ground over which they are passing, and readily yield to the adjusting mechanism when required, the movement of each gang being independent of the other; the gang frames in the present instance, are shown as connected with the tongue or draft frame by a brace B'. An adjustment of the gangs is effected by a lever, C, provided with a

ratchet and detent of well known construction, within reach of the driver. The disks may be of any of the usual forms of construction; they are shown in the present instance in concavo-convex form, which is deemed most desirable, and are mounted on a through axle or shaft, D, carrying interjacent thimbles, *d*. The axle or shaft, D, is secured to the gang bars or frames, E, by standards *e*, and *e'*, bolted through the flanges of the shaft box, *h*; at the upper portion of the standard, *e*, and forming an integral part thereof is a ball, *f*, and socket *f'*, sleeved or collared at one end, to a gas pipe, *f''*, on this socket-joint, the gangs turn, thus confining all the bearing and friction thereto. The box, *h*, is preferably constructed with a long bearing. The part (*i*) is sleeved on the shaft, and inclosed by the box, all of which make an exceptionally strong bearing, and is adapted to fit the ends of the dust box. When the box, *h*, is mounted on the shaft D, and the revolving mechanism made compact by the nut, *l*, the washer *j*, bears rigidly against the sleeve, *i* and together with said sleeve is rotated by the shaft.

The letter, *n*, indicates a gutter or channel at each of the ends of the box, *h*, extending partially around its upper outward surface, the gutter is formed by the beveled edge of the washer *j*, meeting the channel, *n*, by this means the sand or dust drifts into the gutter and falls to the ground, thus preventing it from entering the bearings of the shaft, a very important feature of our improvements and to which we desire to lay broad claim.

As shown in Fig. 5, the ball bearing section of the socket-joint consists of a hollowed internal or shell structure, a bolt, *o*, passes through as shown in broken lines, and serves to keep the socket from slipping off. The apertures through the socket joint being large enough to allow the bolt room to work loosely when the cap *f'* is required to oscillate by the movement of the gangs, the bearing being entirely on the ball.

At the rear of the gang bars E, and attached thereto by means of brackets, *a*, is a longitudinal angle or scraper bar, *m*, adapted to slide back and forth by means of a spring *t*, and pedal *t'*, to this angle bar is pivoted a series of disk scrapers, *s*, the cast iron boss, *s'*, is journaled in the bar, *m*, and thereby allowed to swing freely on its axis, and a nut screwed on to the threaded portion of the shank, *s*², which shank is constructed of wrought iron, the object of the nut is to prevent the disk scraper, *s*, from dropping from its place in the angle or scraper bar. The upper portion of the scraper, *s*, is provided with a rounded surface, adapted to rest against the rear of the scraper bar, as shown in Fig. 8. This gives the scraper a rocking or vibratory motion, when brought in contact with the rotating disk. By connecting the scrapers to the bar in this manner, they are prevented from frequent breaking; when

the disks are brought to an adjustment necessary to meet any conditions of the soil, the scrapers oscillate and adjust themselves to meet the pressure.

Having described our invention, what we claim and desire to secure by Letters-Patent is.

1. In a disk harrow or cultivator, the combination with disk gangs and frames, of a shaft or axle box composed of one casting, and the part (*i*) sleeved on the shaft and inclosed by said box, the ends thereof extending beyond the ends of the box, a washer with recesses adapted to receive the respective ends of the sleeve and the box, and bear rigidly against the former, said washer provided also with an inwardly projecting beveled rim, which, when placed on the end of the box, forms therewith, a groove, extending partially around the upper circumference of said box, substantially as herein described.

2. In a rotary disk harrow or cultivator, the combination of disk, gangs of frames or bars, and of a dust-proof axle or shaft box, cast in one piece, having a standard forming an integral part thereof, a gutter or dust channel extending partially around the upper surface of the said box adapted to be increased in depth by the insertion on the ends of the said box, of a washer or dust cap having a slanting edge, the said washer adapted to bear rigidly against a chambered sleeve inclosed by said box, and press rigidly against the same, substantially as herein described.

3. In a rotating harrow or cultivator, the combination with a frame, a shaft box and standard composed of a single casting, having a bearing of suitable length, a sleeve having a chambered interior adapted to be sleeved on the shaft, and inclosed by the box, the ends of said sleeve extending beyond the ends of the box, a dust cap or washer adapted to fit on the ends of the said box and form a channel on the upper surface of the box into which sand may be thrown as the shaft sleeve and washer are rotated by the driving mechanism.

4. In a rotary disk harrow or cultivator, the combination with a carrying frame and gangs, an equal-bearing ball and socket joint, the ball and standard being of a single casting, the cap being secured thereto by means of a bolt, the said bolt having sufficient room to swivel or adjust itself by construction of elliptical-shaped apertures in the ball and cap and the chambered interior of the ball.

5. In a disk harrow, the combination with the gangs of disks, and the shaft supporting them, and the sleeve (*i*) on said shaft, and the box inclosing said sleeve, and provided with lateral flanges, and the washer (*j*); of the standard (*e*) bolted to the flanges of the box, and having a semi-spherical shell on the upper end, forming an integral part of the standard, and the cap (*f'*) connected with said shell by a transverse bolt passing through

elliptical-shaped apertures in said shell and cap, whereby a universal joint is formed above the gang frames, as herein described.

6. In a disk harrow or cultivator the combination of the frame of the machine, of the standards attached thereto, with the bearings of the disk shaft, consisting of a box inclosing a sleeve adapted to revolve freely therein, the said bar having dust channels on its upper side and a cap at each end, the rim of said cap extending to the edge of said channel, for the purposes herein set forth.

7. In a disk harrow, the combination of the cross-beam, and the socket thereof, having cap f' , with the standard (e) having a semi-spherical shell, and the shaft box having flanges to which said standard is bolted. The cap f' and shell held in socket by a transverse bolt passing through oblong apertures therein, by means of which the bearing of the gangs is distributed among points, on a plane with the axes of the disks on the one hand, and above the gangs on the other, substantially as herein set forth.

8. In a disk harrow, the cross-beam attached to the gangs by means of a socket-joint consisting of the cap (f') and semi-spherical shell (f), the latter being an integral part of the standard (e) which standard is bolted to the flanges of the shaft box, the said socket-joint formed on a plane above the periphery of the disks by means of a transverse bolt passing through elliptical apertures in the cap and shell, and means for angling the gangs, as herein described and for the purposes set forth.

9. In a rotating disk harrow, the combina-

tion with the disks, of a series of individual scrapers provided each with the boss (s') and shank (s^2), said shank adapted to receive a nut whereby it is secured vertically, in an aperture in the lateral extension of the horizontal bar (m) and means for adjusting said bar to conform to the different angles taken by the disks, substantially as herein described.

10. In a disk harrow, the combination with a series of scrapers journaled in the lateral extension of the horizontal bar (m), the pivotal point of said scraper, being above the periphery of the disks, said scrapers adapted by means of the boss (s') to receive a vibratory motion against the downwardly extending part of the scraper bar (m) and thereby the scraper adjusts itself to the face of the disk, substantially as herein described.

11. In a disk harrow, the combination, with the disks of a series of individual scrapers pivoted directly in a horizontal scraper bar (m) at a point above the periphery of the disks, whereby the scrapers are permitted to rock or vibrate freely by means of the boss (s') bearing against the downward extending part of said bar, and means of adjusting the bar (m) in a manner to bring the scrapers in and out of contact with the disks, substantially as herein shown and described.

In testimony whereof we affix our signatures in presence of two witnesses.

JOHN B. NUGENT.
HENRY G. GILBERT.

Witnesses:

R. JAY McCARTY,
HARVEY CONOVER, Jr.