No. 721,951. PATENTED MAR. 3, 1903.

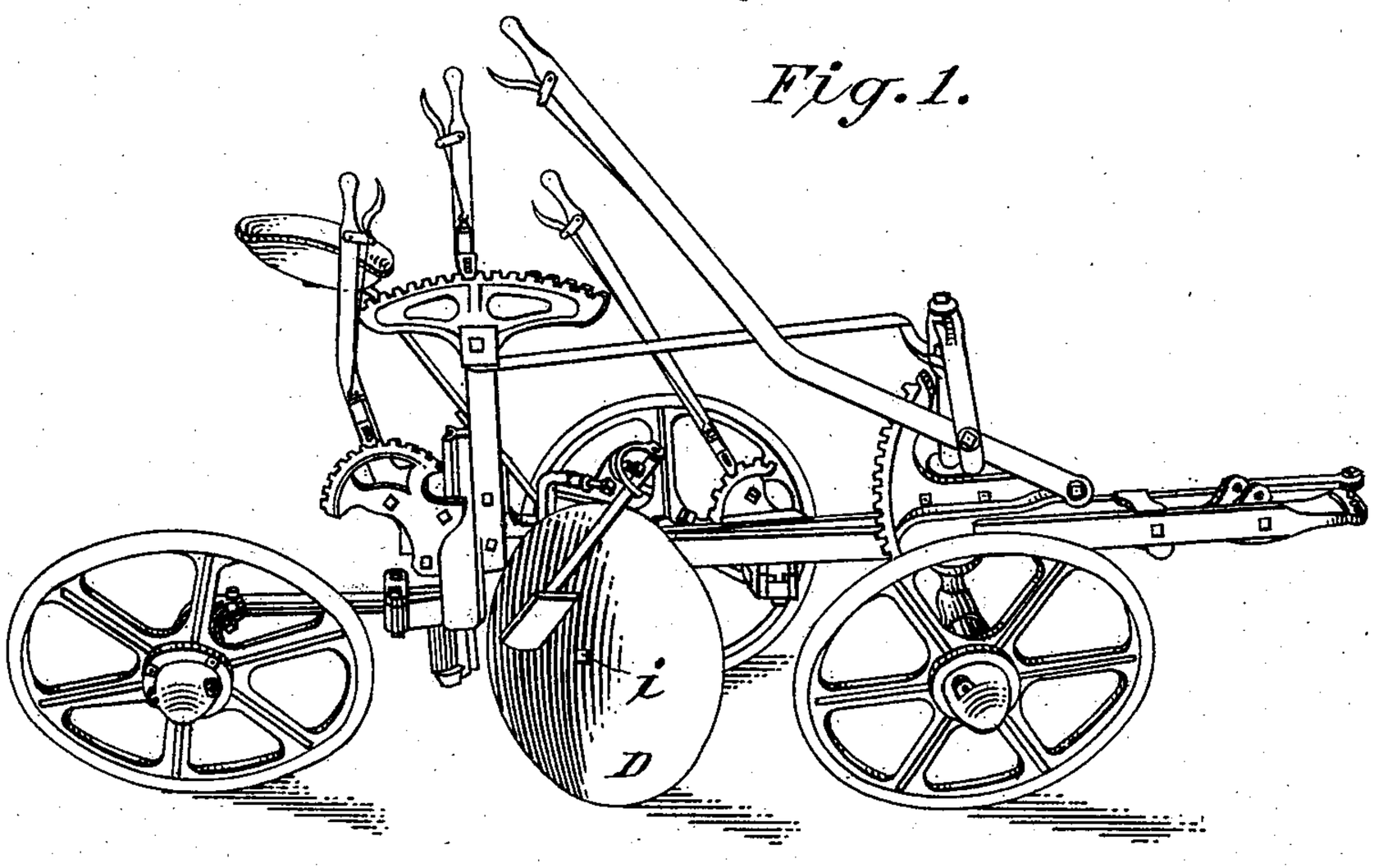
W. P. HENDON.

DISK BEARING FOR DISK PLOWS OR SIMILAR IMPLEMENTS.

APPLICATION FILED NOV. 9, 1899.

NO MODEL. 3 SHEETS—SHEET 1.

Fig. 1.



Witnesses:
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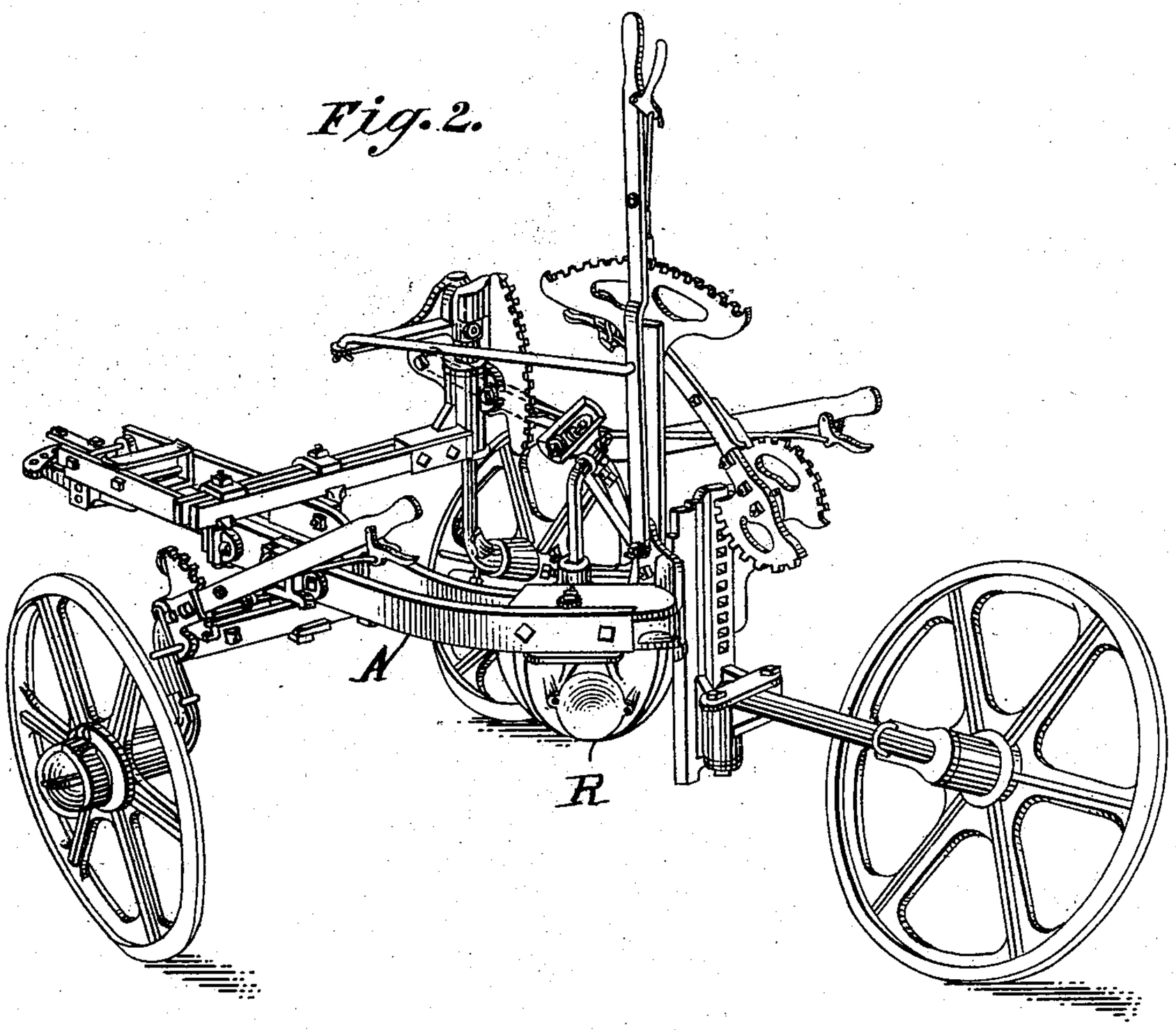
NO MODEL. 3 SHEETS—SHEET 2.

Fig. 2.



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NO MODEL. 3 SHEETS—SHEET 3.

Fig. 3.

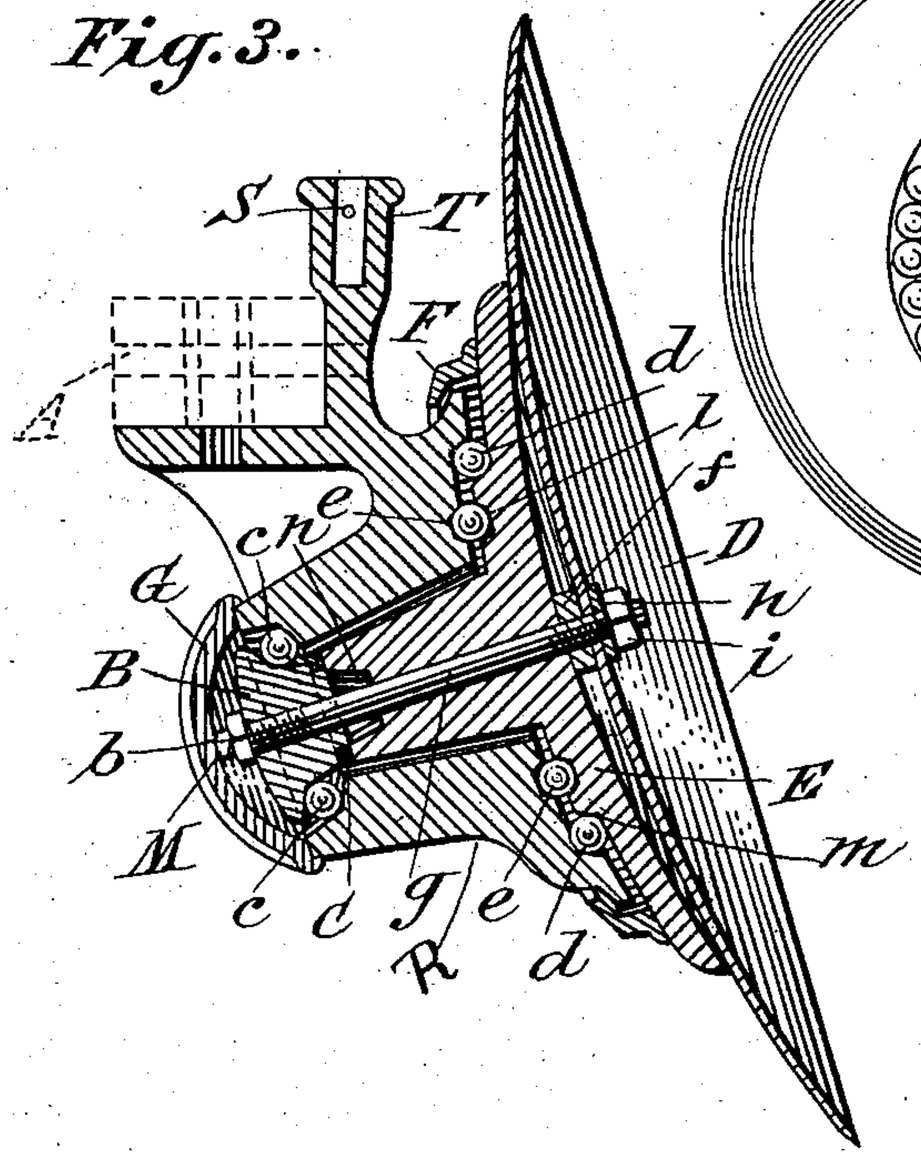
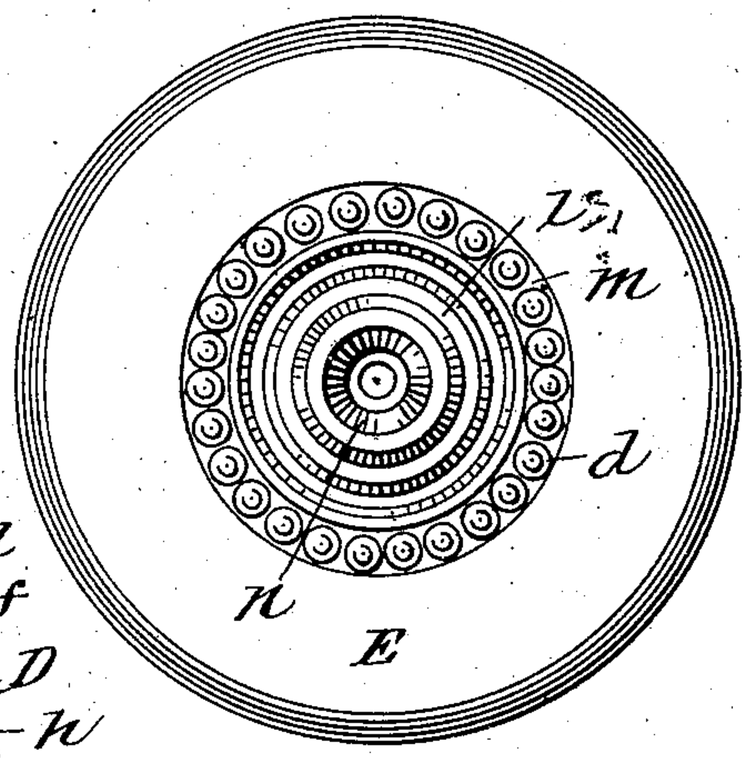


Fig. 6.



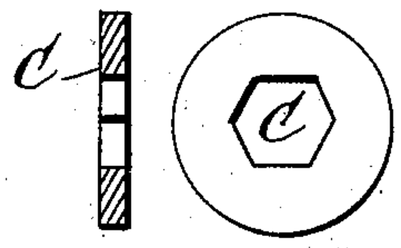


Fig. 7.

Fig. 4.

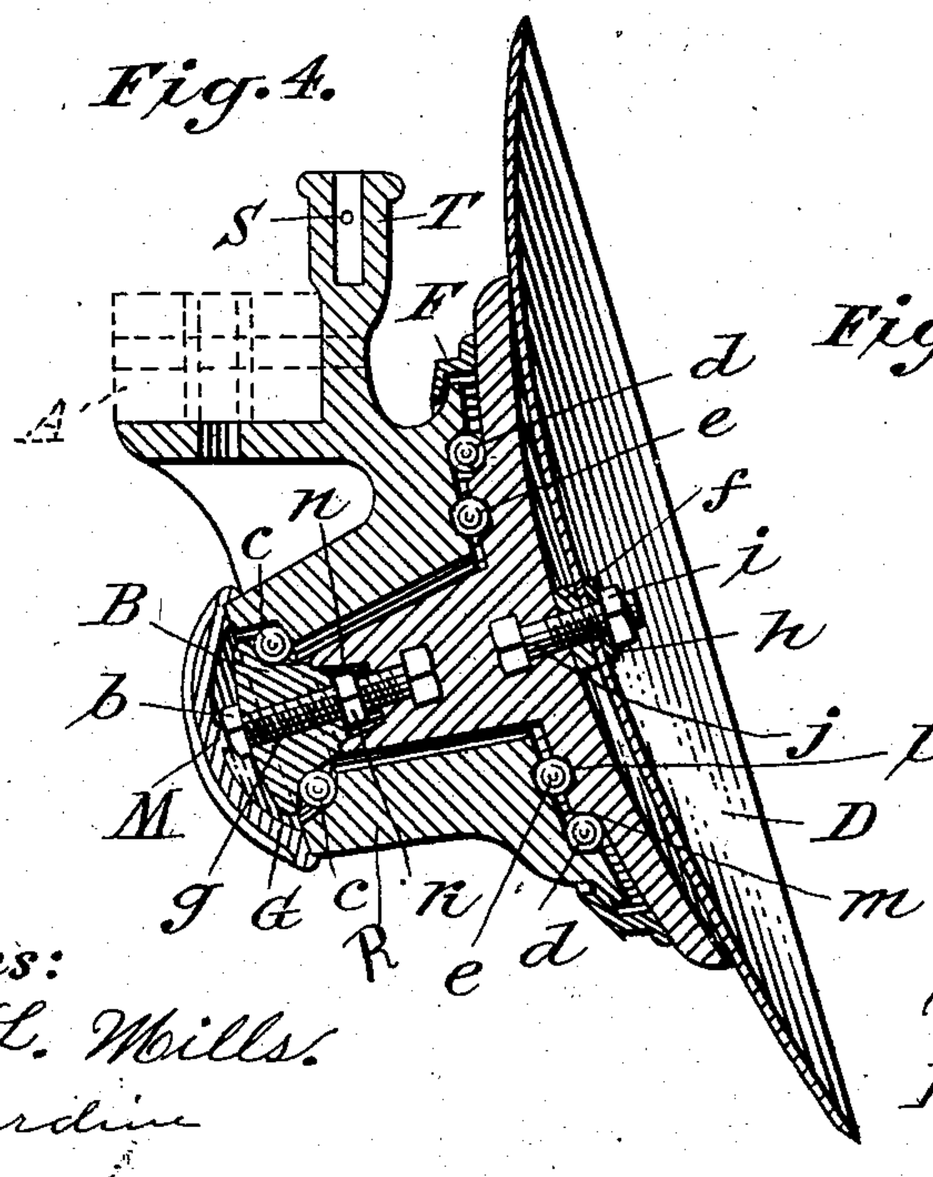


Fig. 5.

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UNITED STATES PATENT OFFICE.

WALTER PRESTON HENDON, OF DALLAS, TEXAS, ASSIGNOR TO E. BEMENT'S SONS, OF LANSING, MICHIGAN, A CORPORATION OF MICHIGAN.

DISK-BEARING FOR DISK PLOWS OR SIMILAR IMPLEMENTS.

SPECIFICATION forming part of Letters Patent No. 721,951, dated March 3, 1903.

Application filed November 9, 1899. Serial No. 736,341. (No model.)

To all whom it may concern:

Be it known that I, WALTER PRESTON HENDON, a citizen of the United States, residing at Dallas, in the county of Dallas and State of Texas, have invented a new and useful Improvement in Disk-Bearings for Disk Plows or Similar Implements, of which the following is a specification.

My invention relates to that form of plows and similar implements in which a revolving disk is used to form the furrow; and the objects of my improvement are to provide a secure substantial bearing which will resist the side strain of cutting the ground, be capable of ready adjustment, and permit the utmost freedom of revolution. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is an elevation of the machine from the right-hand side looking toward the front, showing the disk in position. Fig. 2 is an elevation from the left-hand side looking toward the front, showing the hub of the disk-bearing with the cap that covers it. Figs. 3 and 4 are vertical sections of the entire bearing with disk attached, showing two modified forms of construction. Fig. 5 is an elevation and section of the adjustable cone. Fig. 6 is a view from the rear of the disk-back, showing a modified form of construction in which only one row of balls is used on the face of the disk-box. Fig. 7 is the washer used for the adjustment of the cone B with the form of the device shown in Fig. 3.

Similar letters refer to similar parts throughout the several views.

A, Fig. 2, represents the framework of the machine, to which the disk-box R is attached in the manner shown by the dotted lines in Figs. 3 and 4, the angle formed by the frame-bars A being such with the line of motion of the machine as to place the disk-cone at the best angle for effective work. This disk-box contains a rearwardly-extending hub in which is formed a ball-race *c*, in which revolve steel balls of the usual construction. One or more similar ball-races *d* and *e* are formed on the face of this disk-box, being located at the greatest possible distance from the center of revolution of the disk-back E.

The disk-back E is formed with two portions, one corresponding substantially with the curvature of the disk, the other fitting loosely the interior of the rearwardly-extending hub in the disk-box. The back side of the disk-back conforms in curvature and angle to the front of the disk-box and has formed in it one or more ball-races, two being shown in Figs. 3 and 4 and one in Fig. 6, corresponding to the ball-races on the front of the disk-box. In the rear end of the conical or axle portion of the disk-back, which extends back into the recess in the disk-box, is a socket or depression *n*, which is preferably of a polygonal shape and adapted to receive the polygonal extremity of the adjusting-cone B. The object of this is to force the adjusting-cone, with the ball-race formed in it, to revolve with the disk-back and disk. This depression, however, is deeper than the length of the polygonal portion of the adjusting-cone B to permit adjustment in the manner hereinafter set forth.

The adjusting-cone B is constructed with ball-races similar to the ball-races *c*, and its extremity is formed into a polygonal projection fitting loosely the corresponding recess *n* in the disk-back, but not extending to the bottom of the said recess. In the form of my device which I at present prefer washers C, Figs. 3 and 7, are inserted between the cone B and the disk-back. These washers have a polygonal opening formed to fit the projection on the cone B and are preferably extremely thin, so that one or more of them may be added or removed for the purpose of adjustment of the cone B.

The cone B, disk D, and disk-back E are firmly drawn together by the bolt *g*, a sufficient number of the washers C being introduced between the cone B and the disk-back to permit perfect freedom of revolution without injurious side or end play. A modified form of adjustment is shown in Fig. 4. In this form of the device the disk is held in position by the bolt *j* and nut *i*, the bolt being cast or otherwise securely fastened in the disk-back. The adjusting-cone B is retained in position by the bolt *g*, which is also cast or otherwise firmly secured in the disk-back, and the adjustment is effected by means of the two nuts *b* and *k*, which hold the cone

firmly grasped between them, the adjustment being effected by moving the two nuts, the greater portion of the polygonal projection on the extremity of the cone B being removed to permit this adjustment.

A dust-ring F is attached to the disk-back, as shown in Figs. 3 and 4, its inner edge lapping over the outer circumference of the disk-box for the purpose of excluding the dust from the ball-races *d* and *e*. This ring is removably secured in any preferred way, so that it can readily be removed when it is necessary to take the bearing apart. A dust-cap G is also removably secured to the rearwardly-projecting portion of the disk-box in any preferred manner—as, for instance, by screws covering the cone B and excluding the dust from the ball-races *c*. A small stud M is formed on the inner side of this dust-cap, the purpose of which is to prevent the nut *b* from becoming unscrewed and releasing the cone B when the machine is in operation.

The operation of the device is as follows: It will be seen by reference to Fig. 2 that the disk stands at a considerable angle with the direction of motion of the machine. This is necessary in order to properly turn the furrow. This position of the disk, however, it will be seen, creates an enormous side strain upon the bearing or axle upon which the disk revolves—a difficulty which has made other bearings of which I am aware of short duration and inefficient in their operation, causing them in a comparatively short time to permit the disk to shift its position, thereby increasing the draft and producing inefficient and inferior work. These difficulties are overcome in my device, first, by the employment of as many ball-races as may be desired or necessary to resist the pressure of the soil and secure durability located on the face of the disk-box and at the greatest possible distance from the center of revolution of the disk, in combination with a row of balls located in any portion of the disk-back, extending to any distance back from the disk that may be necessary to give the required stability to the device. It will be readily seen that by this construction a greatly-increased distance between the ball-races is secured, with a corresponding increase of stability and durability in the operation of the device, coupled with the utmost freedom of revolution, and consequently light draft.

I claim—

1. In a disk-bearing for disk plows and similar implements, a bearing-box having an extended bearing-face substantially at right angles to the axis of said box, a disk-back having an axle portion extending into said bearing-box and having an extended bearing-face substantially at right angles to the axis of said box, a ball-race formed between said box and back bearing-faces and remote from said axle, and balls in said race, substantially as described.

2. In a disk-bearing for disk plows and similar implements, the combination of a bearing-box having a ball-race formed at each end thereof, a disk-back having a race formed therein complementary to the race in one end of the bearing-box, a cone adjustably secured to said disk-back and having a ball-race complementary to the race in the other end of the bearing-box, and balls in said races, substantially as described.

3. In a disk-bearing for disk plows and similar implements, in combination with a disk-back, a rear adjusting-cone and washers and means for retaining said cone and washers in position, a disk-box having a rearwardly-extending projection, with a ball-race formed at its extremity and a bearing-face substantially at right angles to the axis of revolution of the disk, said face having a ball-race formed thereon.

4. In a disk-bearing for disk plows and similar implements, in combination with a disk-back, a rear adjusting-cone and washers and means for retaining said cone and washers in position, a disk-box having a rearwardly-extending projection, with a ball-race formed at its extremity and a bearing-face substantially at right angles to the axis of revolution of the disk, said face having bali-races formed thereon.

5. In a disk-bearing for disk plows and similar implements the combination of a bearing-box, a disk-back having an axle projection in said box, a cone secured to said axle projection, a plurality of concentric ball-races formed between one end of the bearing-box and the disk-back, a ball-race formed between said cone and the other end of said bearing-box, and balls in said races, substantially described.

6. In a disk-bearing for disk plows and similar implements in combination with a rear adjusting-cone having a polygonal projection and a suitable disk-box, a disk-back having a bearing-face substantially at right angles to the axis of revolution of the disk, ball-races formed on the posterior side of said bearing-face and a rearwardly-extending axis projection having a polygonal recess at its extremity adapted to receive the projection on said cone, and means for securing said back and cone together.

7. In a disk-bearing for disk plows and similar implements in combination an adjusting rear cone and washers, a disk-back and means for securing said cone, disk-back and washers together.

8. In a disk-bearing for disk plows and similar implements in combination a disk-back having a rearwardly-extending hub portion, an adjusting-cone having a ball-race formed therein and an adjusting-bolt and lock-nuts for adjustably securing said cone in position.

9. In a disk-bearing for disk plows and similar implements in combination with a disk-box and disk-back having suitable ball-races formed therein and a polygonal recess in the

axle portion of the said disk-back of an adjusting-cone having a polygonal extremity formed to fit the said recess.

10. In a disk-bearing for disk plows and similar implements in combination with a disk-box and disk-back having suitable ball-races formed therein and a polygonal recess in the axle portion of the said disk-back of an adjusting-cone having a polygonal extremity formed to fit the said recess and adjusting-washers adapted to the polygonal projection on said cone.

11. In a disk-bearing for disk plows and similar implements in combination with a disk-box, adjusting-cone and means for securing said cone in position, a dust-cap having a stud or projection on its inner surface, substantially as described.

12. In a disk-bearing for disk plows and similar implements a disk-back having a face portion conforming substantially in shape to the disk attached thereto, with suitable ball-races formed on the rear surface of said disk-back, a rearwardly-extending axle portion adapted to receive an adjusting-cone at its extremity and an adjusting-cone adjustably attached thereto.

13. In a disk-bearing for disk plows and similar implements a disk-back having a face portion conforming substantially in shape to the disk attached thereto, with suitable ball-races formed on the rear surface of said disk-back, a rearwardly-extending axle portion adapted to receive an adjusting-cone at its extremity, an adjusting-cone adapted to be attached thereto and means for adjustably securing said cone in position.

14. In a disk-bearing for disk plows and similar implements a disk-back having a face portion conforming substantially in shape to the disk attached thereto, with suitable ball-races formed on the rear surface of said disk-back, a rearwardly-extending axis portion adapted to receive an adjusting-cone at its extremity, an adjusting-cone adapted to be attached thereto, adjusting-washers and means for securing said cone and washers in position.

15. In a disk-bearing for disk plows and similar implements, a disk-back having an axle portion, and an extended bearing-face, a bearing-box into which said axle portion extends, said box having a bearing-face substantially conforming to the bearing-face of the disk-back, a ball-race formed between said box bearing-face and said disk-back bearing-face and remote from said axle portion, and balls in said race, substantially as described.

16. In combination with the disk-supporting standard having a tubular shell and a disk journaled thereon, an annular raceway surrounding the hub of the disk at a point considerably removed from said hub, between its bearings within said shell and the circumference of the disk, a correspondingly-shaped raceway confronting the former and revolving with the disk, and an annular series of antifriction devices rotatably fitted between said raceways, substantially as described.

17. An antifriction-bearing for rotary disk plows, comprising a suitable standard having a socket-bearing for the hub of the disk, and a circular race-plate thereon having an annular raceway faced toward the disk, a casting or bracket having a disk secured thereto and provided with a tubular boss forming the hub of the disk rotatably secured within said socket-bearing and with an annular raceway confronting said first-mentioned raceway, and an annular series of antifriction devices interposed between said confronting raceways in contact therewith at diametrically opposite points, substantially as described.

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