(No Model.) 2 Sheets—Sheet 1.

F. R. PACKHAM.

DISK FURROW OPENER.

No. 578,941. Patented Mar. 16, 1897.

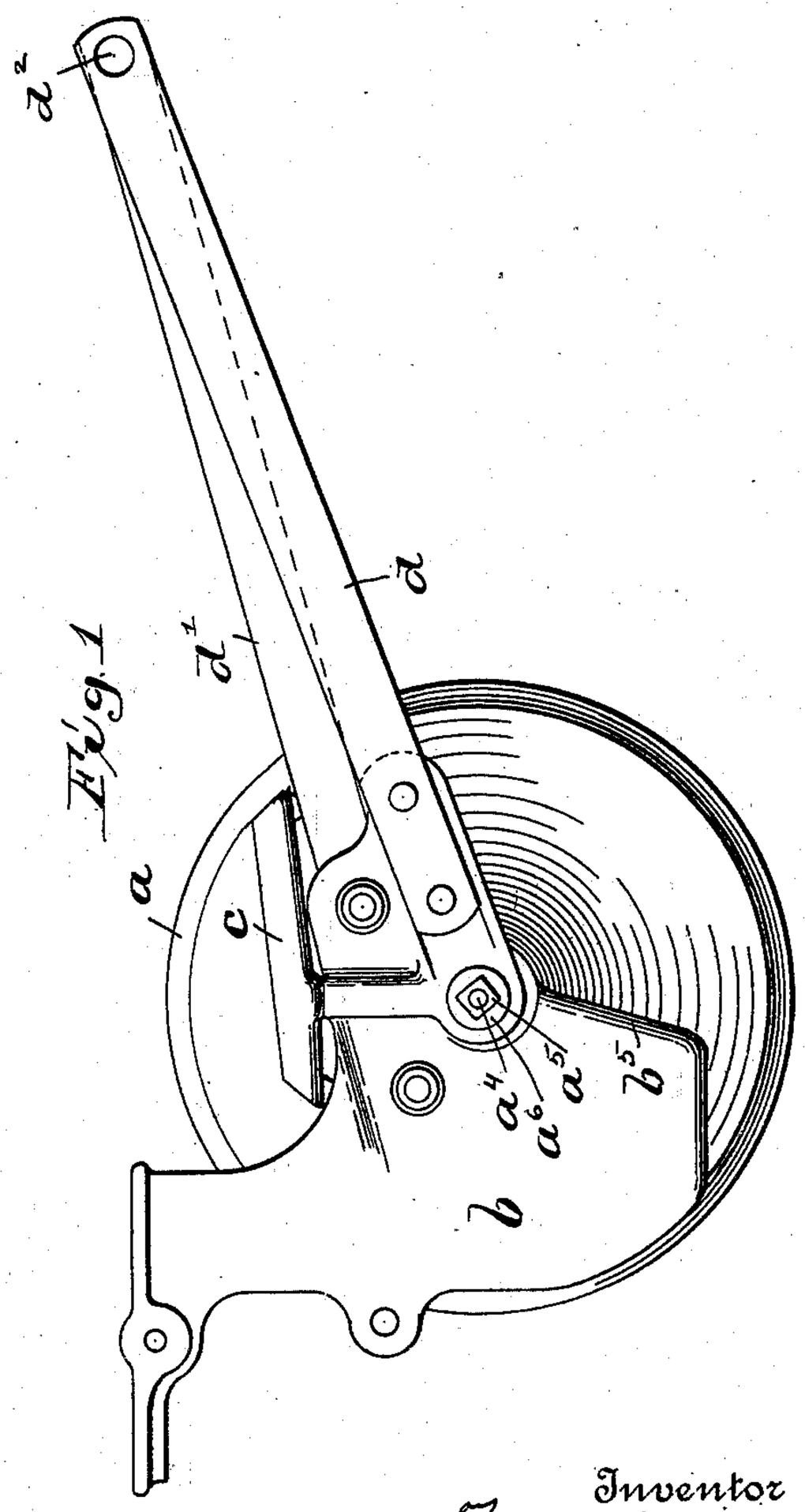

Fig. 1

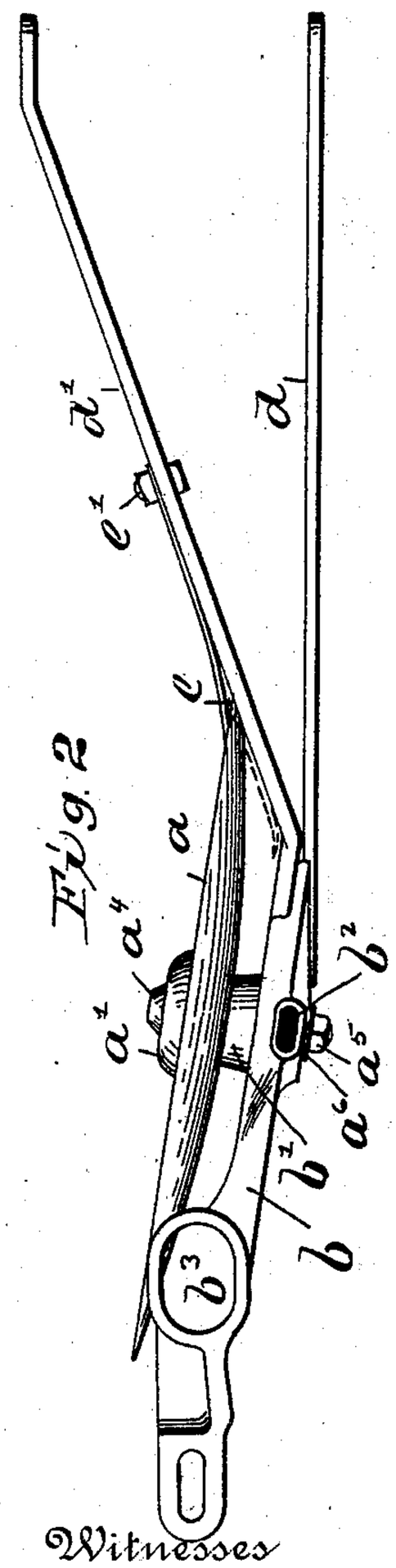

Fig. 2

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(No Model.)

2 Sheets—Sheet 2.

F. R. PACKHAM.

DISK FURROW OPENER.

No. 578,941. Patented Mar. 16, 1897.

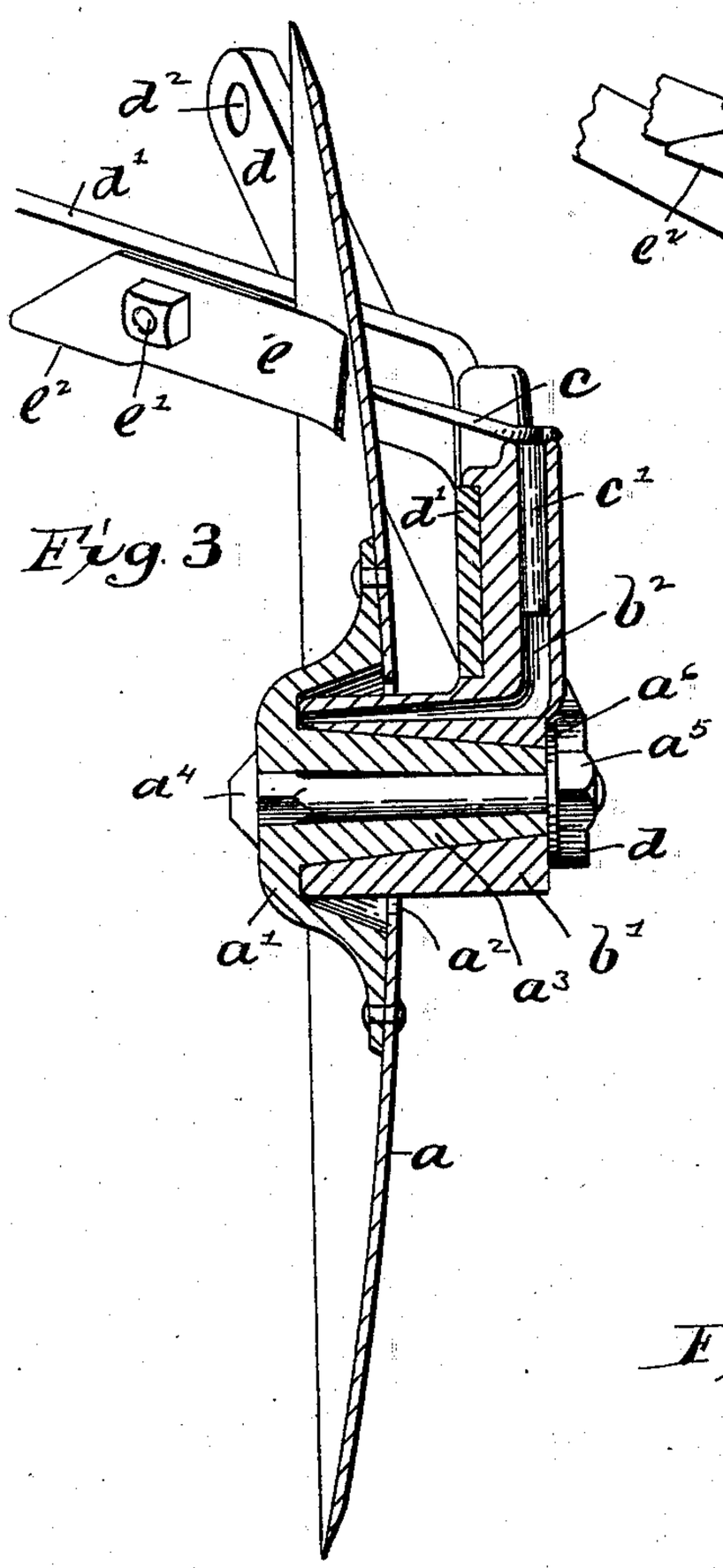


Fig. 3

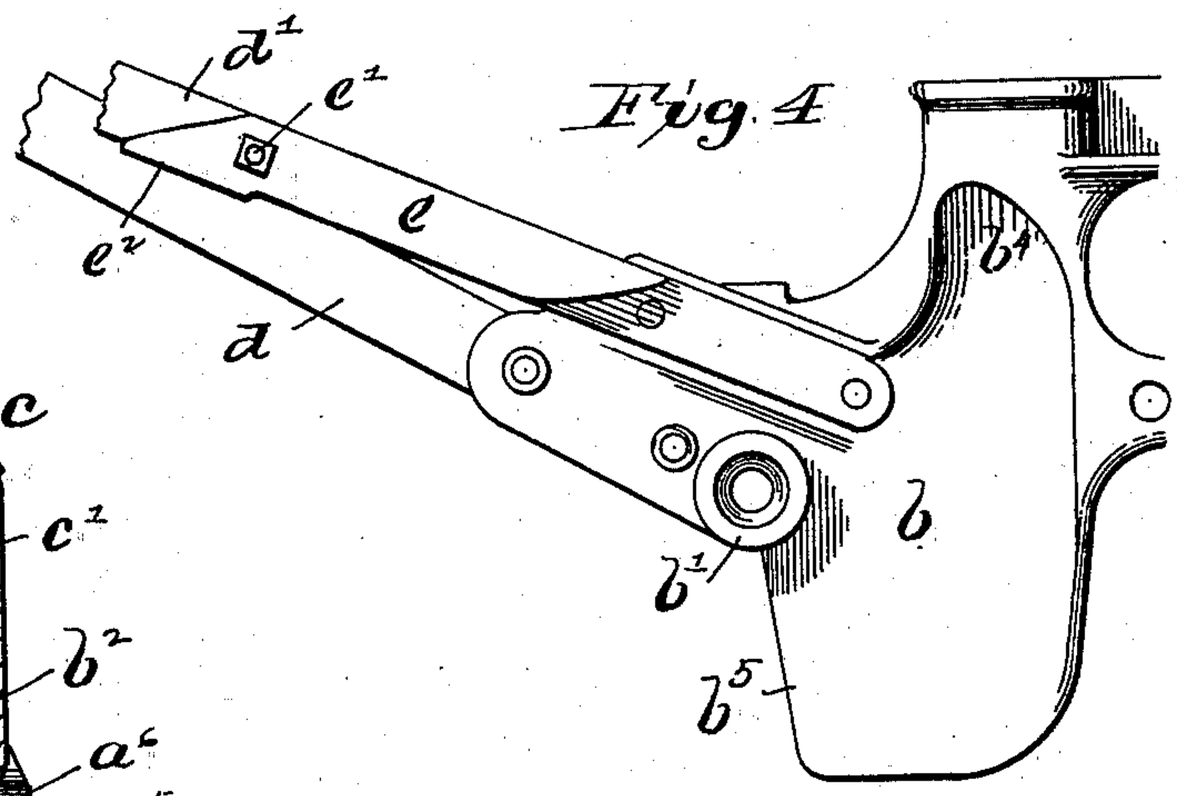


Fig. 4

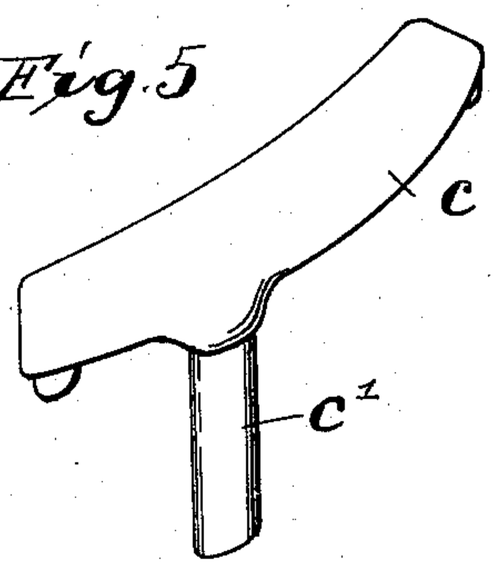
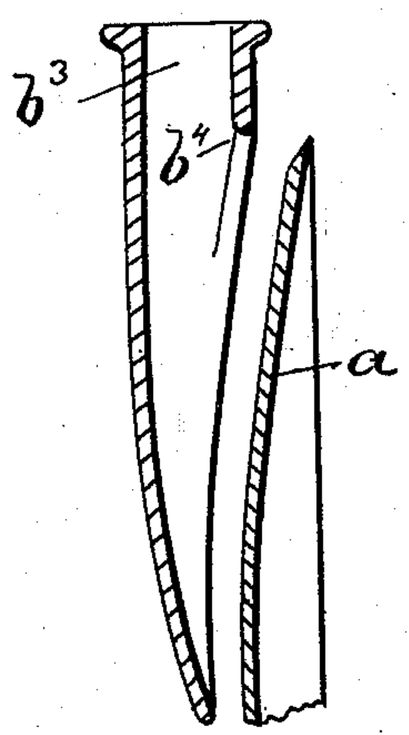


Fig. 5

Fig 6.



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UNITED STATES PATENT OFFICE.

FRANK R. PACKHAM, OF SPRINGFIELD, OHIO, ASSIGNOR TO THE SUPERIOR DRILL COMPANY, OF SAME PLACE.

DISK FURROW-OPENER.

SPECIFICATION forming part of Letters Patent No. 578,941, dated March 16, 1897.

Application filed September 5, 1896. Serial No. 604,947. (No model.)

To all whom it may concern:

Be it known that I, FRANK R. PACKHAM, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Disk Furrow-Openers, of which the following is a specification.

My invention relates to improvements in disk furrow-openers adapted for use with seeding implements, disk harrows, and similar devices; and my invention consists in the constructions and combinations of parts hereinafter described, and set forth in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a device embodying my invention. Fig. 2 is a plan view of the same with the cover or shield removed. Fig. 3 is a sectional view through the disk and its support. Fig. 4 is a side elevation of the furrow-opener support and its connections. Fig. 5 is a detail view of a cover or shield used in connection with the support and disk, and Fig. 6 is a sectional view through the disk and the seed-conduit.

Like parts are represented by similar letters of reference in the several views.

In forming my improved disk-support and furrow-opener I have sought to produce a furrow-opener which shall be free and unencumbered on one side, while at the same time a firm and rigid bearing will be secured for the disk, which shall be entirely on one side of the working line or line of working strain. I have also had in view the making of a furrow-opener in which the supports and the attaching parts shall be in such a position as to leave an unobstructed front to the disk opener from the center or a point slightly above the center of said disk. I have also had in view the construction of the attachments in the nature of drag-bars which shall produce a rigid connection to the support by the peculiar angular relations of the parts of said attachment which brace the support and the furrow-opener, at the same time permitting the device to be pivoted in line with similar devices. I have also had in view the further object of simplifying the construction of devices of this character while increasing their effectiveness.

In the drawings, *a* represents a furrow-opening disk, which is formed concave in the usual way. At the center of this disk and on the concave side I place a cup-shaped bearing-support a', which is riveted or otherwise secured around an opening a^2 in the center of the disk. This bearing-support a' is provided with a tapered spindle or trunnion a^3, which extends from the center of the cup-shaped support and through the opening a^2. This trunnion a^2 is preferably hollow to receive a bolt or other fastening device a^4, which extends through the same. The tapered trunnion a^3 is fitted into a corresponding bearing b' on the furrow-opener support b. This bearing b' is extended through the central opening a^2 in the disk and into the cup-shaped bearing-support a', so that the end of the bearing comes substantially in line with the line of the outer edge of the disk, so that the bearing strain on the disk in use comes somewhere between the ends of the bearing b' instead of completely beyond one end, as is the case when the disk is entirely overhung from a support which is wholly on one side of the disk.

Inasmuch as when in use the disk is placed at an angle to the line of draft, the strain tends to press the disk against the end of the bearing b'; but to prevent the disk from coming off in other conditions of use or in transportation the bolt a^4 is preferably employed, extending through the trunnion a^3 and provided with a nut a^5 and washer a^6, which bears against the opposite end of the bearing b'. To provide for lubricating this trunnion a^3 and the bearing b', I have formed in the support b and in said bearing b' an L-shaped opening or channel b^2, which extends from the top of the support to a point at the end of the bearing b', where it engages with the bearing-support a', so that the lubricant is conducted to a point within the cup-shaped support and from whence it readily finds its way to all the bearing-surfaces in contact.

In forming the parts with as little expense in metal as possible and still securing the proper strength it is difficult to form the support so as to conform in all respects to the disk *a*, and a certain amount of space is left between the support and the disk at the rear of the disk which sometimes becomes trouble-

some from clods or other obstructions which are brought up by the disks and dropped into the space behind the same. To overcome this difficulty, I have formed a beveled cover or shield *c*, having a stem *c'*, and I make this cover form the double purpose of a shield to protect the space between the back of the disk and its support and also as a cover for the lubricating-channel b^2 by fitting the stem *c'* into the top of said channel, the stem being adapted to fit loosely therein, so that by raising the cover or shield *c* from the channel the proper opening for the lubricant is disclosed.

In order to keep the front of the disk (especially that portion of it below the center line) unobstructed, it is desirable that the attachments for the disk-support be wholly above the center of the disk. It is also essential, however, to secure the proper rigidity against side draft that at least two points of attachment be secured at a distance apart, but upon the same horizontal line, so that while the disk is braced laterally it will be free to rise and fall vertically. To accomplish this, I provide the drag-bars *d* and *d'*, each of which extends upwardly at an angle (but not the same angle) from the disk-support to a common line of attachment. The bar *d* is secured at one end to the outside of the disk-support *b* and is extended substantially in a straight line from the center of the bearing *b'* to the center of the line of attachment for said drag-bar, the rear end thereof being attached in front of said bearing. The drag-bar *d'*, however, is extended to a point back of and above the bearing *b* and is connected to the disk-support at a point behind the journal of said disk, preferably with a point of attachment also in front of said journal. This drag-bar *d'* is extended forwardly, thence laterally across the line of said disk, and thence forwardly again, so as to cross the line of attachment in the same horizontal plane with the bar *d*, both bars being perforated with openings d^2 on the same line by which they are pivoted to the frame or other portion of the machine to which they are to be applied. This peculiar construction and arrangement of the drag-bars it will be seen forms an exceedingly strong and rigid connection for the disk-support, which is braced both in a lateral as well as vertical direction.

The disk-support *b* is preferably provided with the usual conduit b^3, but I preferably form this conduit open on one side, as shown at b^4, to a point substantially in line with the edge of the disk and form the side of this opening to correspond to the convex side of the disk which joins the same and substantially closes the conduit to a point below the center thereof, the bearing-support being extended below the disk-bearing to form a shield or deflector b^5 to protect the grain discharged through the conduit.

It will be seen from the constructions above described that I produce a furrow-opener which is extremely simple in construction and in which the bearing is located within the line of strain, while one side of the disk and all the front below the center line thereof are left free and unencumbered.

It should be noted that the cup-shaped support is formed on the outside with an ogee curve which joins the disk in such a manner that the earth which is turned up by said disk is thrown outwardly, and thus partly turned over, in case it is brought up to the center.

Means are also provided for cleaning the disk in operation when working in such soil as would require such cleaning. To accomplish this, I attach to the drag-bar *d'* a thin metal plate or bar *e*, of resilient material, secured to said bar by a single fastening-bolt or similar fastener *e'*. This bar *e* is provided at one end with a laterally-projecting ledge or flange e^2, which projects under the drag-bar *d'* and prevents the plate or bar *e* from turning in one direction on its pivoted connection *e'*. The bar *e*, as before stated, is made of thin resilient material and is adapted to be held by its resiliency in contact with the concave surface of the disk, and thus scrape therefrom any substance which may adhere thereto, the rotation of the disk tending to keep the scraper always in its position with the flange e^2 in contact with the lower edge of the bar *d'*. If the scraper is not required, however, it may be raised up on its pivotal connection, so as to pass the disk, and then be moved downwardly behind the disk, as shown in dotted lines in Fig. 2, and thus be out of the way when not required.

Having thus described my invention, I claim—

1. A concave disk, as described, having a central opening, and a cup-shaped bearing-support secured about said opening, said bearing-support having a trunnion or journal which extends through said central opening, in combination with a bearing-support having a bearing to fit said trunnion and also adapted to extend through the opening in said disk and in the opposite direction, substantially as and for the purpose specified.

2. A concave disk having a central opening, and a cup-shaped bearing-support connected to said disk on the concave side with a trunnion extending through said opening, a bearing-support having a projecting bearing to fit over said trunnion and adapted to extend through the opening in said disk into said cup-shaped support, and means for connecting said disk through said trunnion to said bearing-support, substantially as specified.

3. The combination with a concave disk and its bearing-support, of drag-bars connected to said support upon opposite sides thereof but on the same side of said disk, said drag-bars being connected at different vertical angles to said support and projecting at different lateral angles to a common line of attachment, substantially as specified.

4. The combination with a furrow-opening

disk and its support, of the drag-bars connected to said support, one of said drag-bars being extended forwardly and upwardly in a line behind said disk, and the other drag-bar being extended forwardly and laterally as well as upwardly at a different vertical as well as lateral angle to the other bar, both of said bars having a common line of attachment, substantially as specified.

5. The combination with the concave disk, the cup-shaped bearing-support, the conical trunnion on said bearing-support extending through said disk, the projecting bearing on the disk-support extending into said cup-shaped bearing-support, a lubricating-channel extending from the top of said support, thence laterally through said bearing into the cup-shaped bearing-support, substantially as specified.

6. The combination with the disk and disk-support, of the lubricating-channel formed in said disk-support, and a cover or shield having a stem adapted to fit in said channel so as to form a cover for said channel and a support for said shield, substantially as specified.

7. The combination with the concave disk and its drag-bars, of a pivoted scraper pivoted to one of said drag-bars and formed of resilient material, the angle of said scraper and drag-bar being such that the scraper may be placed either behind or in front of said disk, substantially as specified.

8. The combination with the concave disk and the support therefor, of the conduit in said disk-support, said conduit being formed with one side open on a line substantially coincident with the side of said disk which is adapted to fit the same, substantially as specified.

In testimony whereof I have hereunto set my hand this 20th day of August, A. D. 1896.

FRANK R. PACKHAM.

Witnesses:

RICHD. H. RODGERS,

CHAS. I. WELCH.