No. 677,564. Patented July 2, 1901.

H. E. DODSON & L. C. EVANS.

GRAIN DRILL.

(Application filed Mar. 23, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

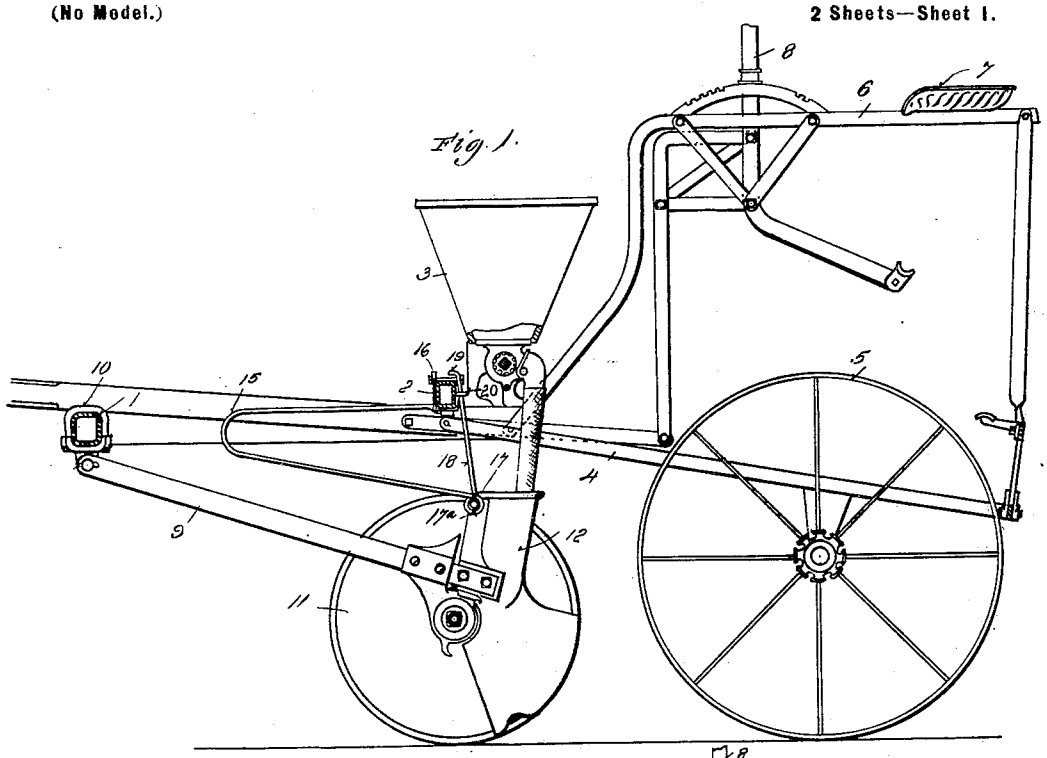
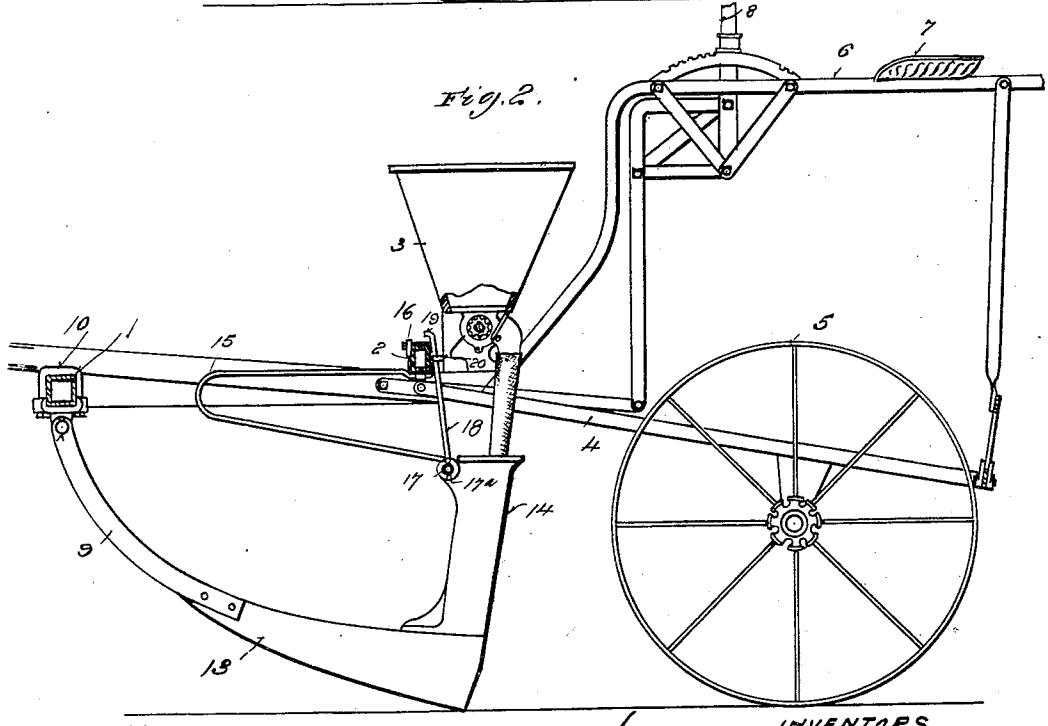


Fig. 2.



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Fig. 3.

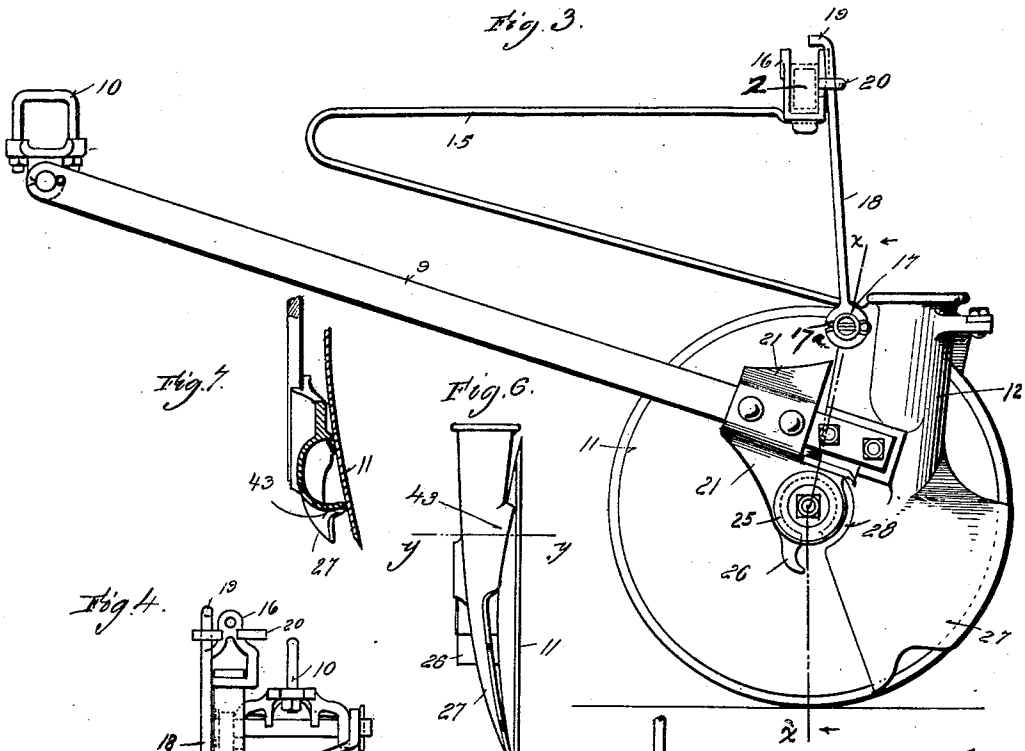


Fig. 4.

Fig. 6.

Fig. 4.

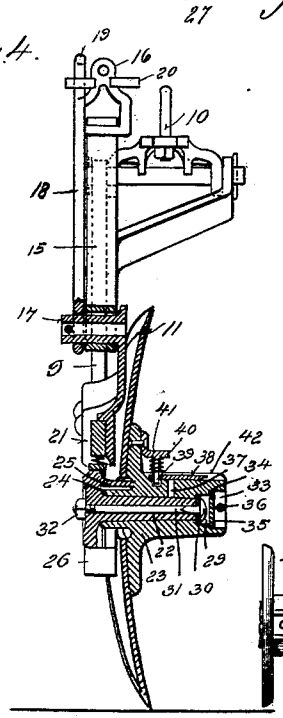


Fig. 5.

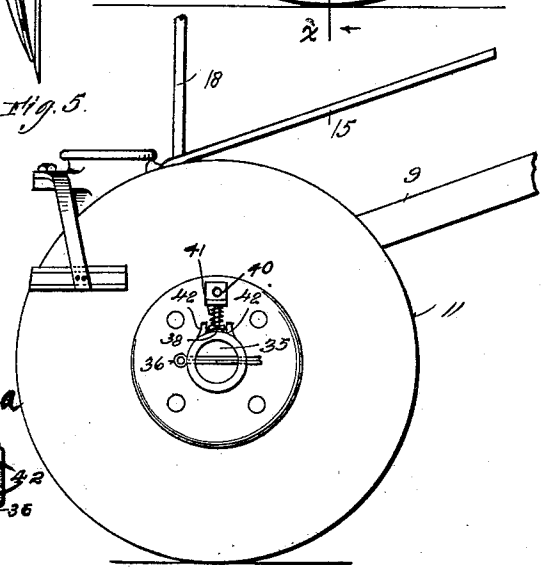
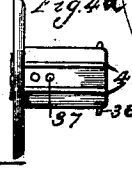


Fig. 4a.



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UNITED STATES PATENT OFFICE.

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GRAIN-DRILL.

SPECIFICATION forming part of Letters Patent No. 677,564, dated July 2, 1901.

Application filed March 23, 1901. Serial No. 52,531. (No model.)

To all whom it may concern:

Be it known that we, HARRY E. DODSON and LOUIS C. EVANS, citizens of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Grain-Drills, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to grain-drills, and more particularly to that class or drills in which the furrow-opening devices are carried by drag-bars pivoted at their forward ends and pressed downward at their rear ends by spring-pressure.

One object of the invention is to provide a simple and efficient spring device which while capable of wider application is more particularly adapted for use in press-drills of that class in which the weight is carried on the press-wheels and which will permit the location of the seedbox at a point so low as to facilitate the filling of the same.

Another object of the invention is to provide a drill wherein the character of the furrow-opening devices may be readily changed from disks to runners, and conversely, without affecting the spring devices or the other parts of the machine.

Other objects of the invention are to provide improved bearings and lubricating devices for the furrow-opening disks when these latter are employed and to further facilitate their operation by the prevention of clogging thereof.

To these and other ends the invention consists in certain novel features, which will now be described and then particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is side elevation, partly in section, of a drill embodying the invention in the form of a disk drill. Fig. 2 is a similar view of a shoe-drill. Fig. 3 is a side elevation of a disk furrow-opener and seed-depositor detached. Fig. 4 is a sectional view of the same, taken on the line $x\,x$ of Fig. 3 and looking in the direction of the arrows. Fig. 5 is a view of a portion of what is shown in Fig. 3 viewed from the opposite side. Fig. 6 is a rear elevation of the upper portion of the boot or seed-tube and disk. Fig. 7 is a plan section of the same, taken on the line $y\,y$ of Fig. 6; and Fig. 4^a is a detail plan view of the lubricating devices of the disk hub.

Referring to the said drawings, we have shown in Figs. 1 and 2 an illustration of a well-known type of press-drill, in which 1 represents the main frame, provided with a rear cross-bar 2 and carrying the seedbox 3. To the main frame are hinged press-wheel frames 4, in which are mounted the press-wheels 5, and on which is supported a seat-frame 6, carrying a longitudinally-adjustable seat 7. On the frame 6 is mounted a lever 8, suitably connected with the main frame, so as to raise and lower the same. These parts may be of any suitable construction.

A series of drag-bars 9 is employed, only one being shown, the construction and connections of all being similar. Each drag-bar is pivotally connected at its front end to a clip 10, removably and adjustably mounted on the cross-bar or front portion of the main frame. Each drag-bar carries at its rear end a furrow-opening and seed-depositing device, which in the construction shown in Fig. 1 comprises a a furrow-opening disk 11 and seed-tube or boot 12, constructed in the main substantially as set forth in Letters Patent No. 615,727, granted December 13, 1898, to Phineas P. Mast, assignor to P. P. Mast & Company, and Letters Patent No. 641,498, granted January 19, 1900, to Crain, Evans and Dodson, assignors to said P. P. Mast & Company. In the construction shown in Fig. 2 the drag-bar is provided at its rear end with a furrow-opening shoe or runner 13 and a seed-tube or boot 14.

In connection with each drag-bar is employed a spring 15, one end of which is connected with the main frame, while the other end is connected with the rear end of the drag-bar. This connection between the spring and drag-bar may be either direct or indirect, and in the present instance we have shown an indirect connection, as hereinafter set forth, the spring being secured, as a matter of convenience, to the boot or seed-tube, which is itself secured in turn to the drag-bar. Each spring is of approximately U shape, extending first forward, then downward, and then rearward.

In the preferred form of construction the rear end of the upper arm of the spring is adjustably and detachably secured to the cross-bar 2 of the main frame by means of a clip 16, while the rear end of the lower arm of the spring is pivotally connected with the seed-tube or boot by means of a projection or trunnion 17 thereon. It will be observed that the front end of the spring is unattached and free to move vertically, so that advantage is taken of the resiliency of both arms of the spring, and its action is more uniform and its efficiency greater. Moreover, while a spring of great simplicity and durability is thus obtained the space between the drag-bars and frame is reduced to a minimum, and the frame and seedbox are thus correspondingly lowered, facilitating the filling of the box and access to its interior.

In connection with each drag-bar and its spring there is employed a stop device for limiting the downward motion of said parts and insuring the lifting thereof from the ground when the main frame is raised for that purpose. This device in its preferred form consists of a rod 18, pivoted at its lower end on the projection or trunnion 17 and provided at its upper end with a projection 19, which is adapted to engage with the top of the cross-bar 2 or some other suitable part, and thus prevent further separation of the main frame and drag-bar. In order to guide the upper end of the rod 18, the clip 16 is provided with a loop or eye 20, through which said rod slides.

It will be understood, of course, that in a drill of the character described when the main frame is lowered or raised by the lever 8 in the usual manner the furrow-opening devices will be correspondingly lowered or raised, being held to their work in the soil with a yielding pressure by means of the springs 15.

It will be observed that the drill may be readily changed from a disk drill, as shown in Fig. 1, to a shoe or runner drill, as shown in Fig. 2, by simply disconnecting the drag-bars, which are provided with the disks, and substituting therefor other drag-bars provided with runners, as shown in Fig. 2. A change from a shoe-drill to a disk drill may be made in the same manner by a simple change of drag-bars. In order to facilitate this interchangeability, it will be noted that in each type of drag-bar the trunnion 17 is located in the same position relatively to the frame of the machine and that the spring 15 and rod 18 are each provided with an eye adapted to slip over the trunnion, this latter being provided with a cotter-pin 17^a or other suitable means for detachably securing said eyes in position on the trunnion. By reason of this construction the machine may be quickly transformed into either a disk or a runner drill without involving the necessity of removing the springs from the machine or in any way adjusting them.

By the term "U-shaped" as applied to the spring 15 we mean to be understood as including a spring comprising two substantially parallel or slightly-diverging arms united at one end and separated at the other whether constructed in one or more pieces and without reference to the particular shape of the part connecting the united ends of the arms of the spring.

Referring now more particularly to that portion of the invention which relates to the disk-drill construction and which is shown more particularly in Figs. 3 to 6, inclusive, it will be observed that this part of the device is constructed, as already stated, in general conformity with Letters Patent Nos. 615,727 and 641,498, above specified. The clip 21 is provided with a trunnion 22 to receive the disk 11, and said disk is provided with a hub 23, fitting on said trunnion and having an extension 24 beyond its rear or inner face, over which extends a sleeve 25 from the clip 21. This sleeve is open or cut away at the bottom, as shown in Fig. 4 and as indicated in dotted lines in Fig. 3, to provide a discharge for any material which may work in between the hub extension 24 and sleeve 25, and the clip 21 is provided with a downwardly-extending guard or shield 26 at the front edge of said opening, which serves not only to prevent the soil from entering said opening, but also to protect the upper front edge of the wing or shield 27, so that this latter does not require to be fitted tightly against the sleeve 25, but may stand away from the same, leaving a space between them, as indicated at 28. The hub 23 extends some distance beyond the end of the trunnion 22 on the outer or front side of the disk and is provided with a recess 29 to receive a washer 30, which is held against the end of the trunnion 22 by the head of the bolt 31, which passes through said trunnion and which is provided with a securing-nut 32 on its other end, said washer serving to retain the disk on the trunnion, as in Patent No. 615,727, hereinbefore referred to. The outer portion of the recess 29 is enlarged, as indicated at 33, or otherwise constructed to provide a shoulder 34, against which bears a disk 35, which closes the outer end of the hub-recess, so as to prevent the entrance of dirt, &c., and which is held in place by a cotter-pin 36, passing through the projecting end of the hub, or in any other suitable manner. This forms a simple and efficient protection for the exposed end of the hub-opening.

The lubricating device carried by the disk is in its general construction similar to that set forth in Patent No. 641,498, already mentioned. It comprises a lubricating-opening 37 in the hub, and a cover 38, pivotally mounted on a pin 39, supported by the hub and a bracket 40, a spring 41 being coiled on the pin above the cover to hold the latter down in place. In practice it has been found, however, that with the construction set forth in said earlier patent, in which the cover is retained in position by having its bifurcated or slotted end embrace a pin or stud on the

extremity of the hub, the projections thus formed on the end of the cover are apt to engage with standing cornstalks or other obstructions, throwing open the cover and exposing the oil-hole to dirt. To prevent this the present construction has been devised, in which the hub is provided with two longitudinal parallel ribs 42, between which the cover lies and is held by the spring 41 when in a closed position, said ribs extending upward along the side edges of and to or beyond the end of the cover and effectually preventing the dislodgment of the same in the manner above set forth.

In practice it has been found that in muddy soil that portion of the disk in the rear of the wing is apt to accumulate and carry upward with it on its rear or inner face mud in sufficient quantities to at times clog the seed-tube or boot and prevent the discharge of the grain through the same. In order to prevent this, the tubular portion of the boot, which is cut away on the side adjacent to the disk in the usual manner to permit the parts to be brought more closely together, is provided at its rear lower portion with a transverse part 43, which extends across the rear of the space between the tube and disk and which is made to conform to and lie against the rear or inner surface of the disk, thereby forming a guard and scraper, which prevents the mud carried up by the disk from entering the space between the seed-tube and the disk in front of said guard and scraper. By this means clogging of the seed-tube at this point is effectually prevented.

By the term "rear or inner side" employed in the description and claims hereof we intend to indicate that side of the disk which, owing to its angling position to the line of draft, is turned slightly toward the rear of the machine and is adjacent to the drag-bar, while by the term "outer or front side" as applied to the disk we intend to indicate that side which faces the front of the machine and which is farthest from the drag-bar. In the present instance the former side of the disk is convex, while the latter side is concave.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a grain-drill, the combination, with a main frame and a drag-bar pivoted thereto at its forward end and carrying a furrow-opener, of a U-shaped spring having its ends connected to the frame and drag-bar respectively, substantially as described.

2. In a grain-drill, the combination, with a main frame and a drag-bar pivoted thereto at its forward end and carrying a furrow-opener, of a U-shaped spring having its ends connected to the frame and drag-bar, respectively, and its intermediate portion free, substantially as described.

3. In a grain-drill, the combination, with a main frame and a drag-bar pivoted thereto at its forward end and carrying a furrow-opener, of a U-shaped spring having the end of its upper arm secured to the frame and the end of its lower arm pivotally connected with the drag-bar, substantially as described.

4. In a grain-drill, the combination, with a main frame and a drag-bar pivoted thereto at its forward end and carrying a furrow-opener, of a U-shaped spring having the end of its upper arm secured to the frame and the end of its lower arm pivotally connected with the drag-bar, and its intermediate portion free, substantially as described.

5. In a grain-drill, the combination, with a main frame and a drag-bar pivoted thereto at its forward end and carrying a furrow-opener, of a U-shaped spring having the rear end of its upper arm secured to the frame and the rear end of its lower arm pivotally connected with the drag-bar near the rear end thereof, the remaining portion of said spring extending forward from its points of connection and being free and unrestrained, substantially as described.

6. In a grain-drill, the combination, with a main frame and a drag-bar pivoted thereto at its forward end and carrying a furrow-opener, of a U-shaped spring having its ends connected to the frame and drag-bar, respectively, and a stop to limit the separation of the bar and frame, substantially as described.

7. In a grain-drill, the combination, with a main frame and a drag-bar pivoted thereto at its forward end and carrying a furrow-opener, of a U-shaped spring having its ends connected to the frame and drag-bar, respectively, and a stop-rod connected with the drag-bar and adapted to engage the frame to limit the separation of the bar and frame, substantially as described.

8. In a grain-drill, the combination, with a main frame and a drag-bar pivoted thereto at its forward end and carrying a furrow-opener, of a U-shaped spring having the end of its upper arm secured to the frame and the end of its lower arm pivotally connected with the drag-bar, a stop-rod also pivotally connected with the drag-bar and adapted to engage the frame to limit the separation of the bar and frame, and a guide carried by the frame through which the upper end of said rod passes, substantially as described.

9. In a press-drill of the character described, the combination, with a main frame, a press-wheel frame pivotally connected therewith at the rear, and means for raising and lowering said main frame, of a seedbox mounted on said main frame, drag-bars pivoted to said main frame and provided with furrow-opening and seed-depositing devices, and U-shaped springs interposed between the main frame and each drag-bar, each spring having its ends respectively connected with said main frame and the corresponding drag-bar, substantially as described.

10. In a grain-drill, the combination, with a main frame, of U-shaped springs, each having the end of its upper arm secured to said

frame and the end of its lower arm adapted for connection with a drag-bar, and interchangeable disk and runner drag-bars, each adapted for detachable pivotal connection at its front end with the frame, and provided at its rear with a connection to receive and detachably hold the end of the lower arm of the corresponding spring, substantially as described.

11. In a grain-drill, the combination, with a main frame, of U-shaped springs, each having the end of its upper arm secured to said frame and the end of its lower arm provided with an eye, and interchangeable disk and runner drag-bars, each adapted for detachable pivotal connection at its front end with the frame and provided at its rear with a trunnion or projection to receive the eye on the end of the lower arm of the corresponding spring, and with means for detachably securing said eye on said trunnion, substantially as described.

12. In a grain-drill, the combination, with a main frame, and interchangeable detachably-pivoted drag-bars provided respectively with runners and disks, of U-shaped springs, each secured at one end to the frame and provided at the other end with an eye, corresponding stop-rods having eyes at their lower ends and adapted to engage the frame at their limit of downward motion, said frame being provided with guides for said rods, each drag-bar being provided with a similarly-located trunnion or projection to receive the eyes of the corresponding spring and stop-rod, and with means for detachably securing them on said trunnion, substantially as described.

13. In a grain-drill furrow-opener, a disk having a hub provided with an extension on its rear or inner side, in combination with a support having a trunnion entering said hub, a sleeve surrounding said hub extension at its top and sides and open at the bottom, and a downwardly-extending shield at the front edge of said bottom opening, substantially as described.

14. In a grain-drill furrow-opener, the combination, with a drag-bar, of a disk having a hub provided with an extension on its rear or inner side, a support consisting of a clip secured to the drag-bar and having a trunnion entering said hub, a sleeve surrounding said hub extension at its top and sides and open at the bottom, and a downwardly-extending shield at the front edge of said bottom opening, and a seed-tube having a plate part with an extension or wing, and separately secured to said drag-bar in the rear of said clip and its downwardly-extending shield, substantially as described.

15. In a grain-drill furrow-opener, the combination, with a support having a trunnion and a securing-bolt passing through the same, of a disk having a hub to fit said trunnion, said hub extending beyond said trunnion and bolt and being provided in said extension with a shouldered recess, a removable disk fitting against said shoulder in said recess, and a removable securing device, such as a cotter-pin, substantially as described.

16. In a grain-drill furrow-opener, the combination, with a disk having a hub provided with an oil-hole, of a pin carried by said hub, an oil-hole cover pivoted and slidable on said pin, and a spring to normally depress said cover, said hub being provided with parallel ribs or shoulders to embrace said cover at the sides thereof when closed, substantially as described.

17. In a grain-drill furrow-opener, the combination, with a disk having a hub provided with an oil-hole, of a pin carried by said hub, an oil-hole cover pivoted and slidable on said pin, and a spring to normally depress said cover, said hub being provided with parallel ribs or shoulders extending longitudinally of said hub beyond the end of said cover and embracing said cover on each side when closed, substantially as described.

18. In a grain-drill furrow-opener, the combination, with a furrow-opening disk, of a boot arranged adjacent to the rear face of the disk back of the center thereof and comprising a lower or shield portion standing clear of the disk at its rear edge, and an upper tubular portion cut away at the side adjacent to the disk to accommodate the same and provided with a transverse extension at its rear having an edge conforming to the shape of the adjacent portion of the disk and lying close to the same, whereby said extension forms a guard and scraper to prevent clogging of the seed-tube by the soil carried up by the disk, substantially as described.

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

HARRY E. DODSON.
LOUIS C. EVANS.

Witnesses:
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E. O. HAGAN.