

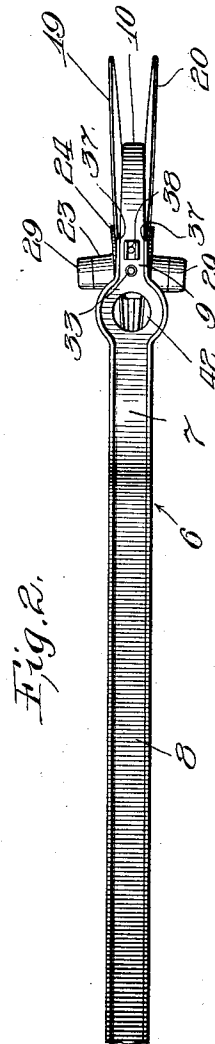
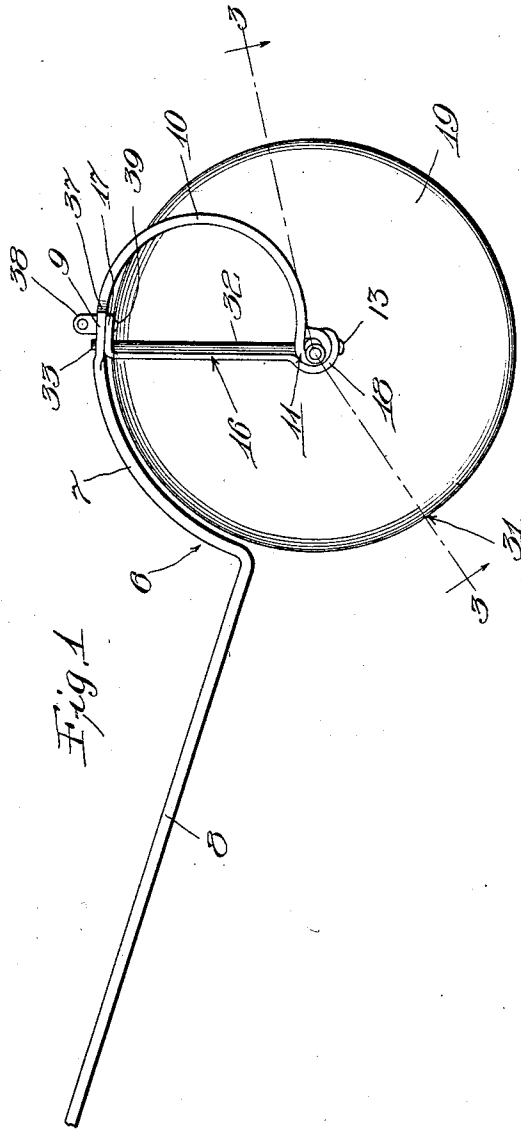
H. M. STAINFIELD & E. R. BEEMAN.
DISK ATTACHMENT.

APPLICATION FILED DEC. 29, 1911.

1,033,484.

Patented July 23, 1912.

2 SHEETS—SHEET 1.



Witnesses:

Harry S. Gaither
Ephraim Banning

Inventors.

Harry M. Stainfield
Edwin R. Beeman

By *Banning & Banning*
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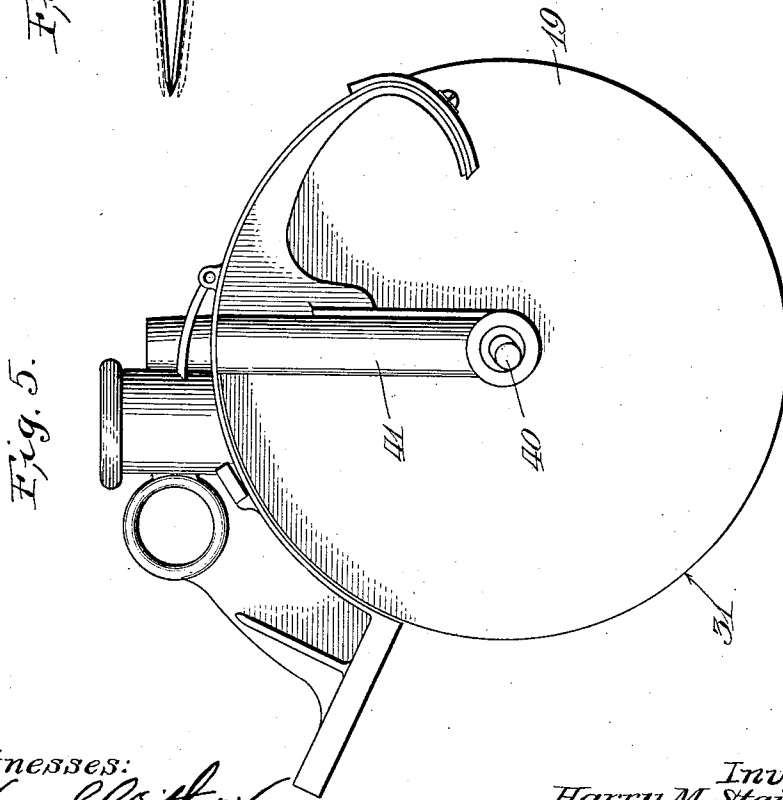
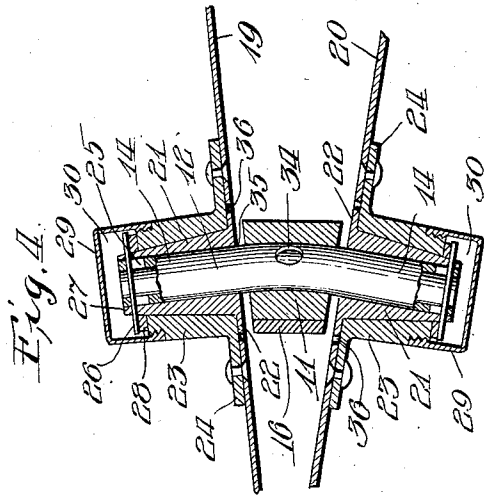
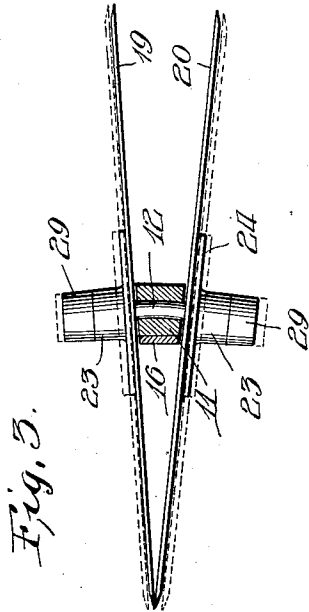
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UNITED STATES PATENT OFFICE.

HARRY M. STAINFIELD, OF ST. LOUIS PARK, AND EDWIN R. BEEMAN, OF MINNEAPOLIS, MINNESOTA, ASSIGNORS TO THE MONITOR DRILL COMPANY, OF MINNEAPOLIS, MINNESOTA, A CORPORATION OF MINNESOTA.

DISK ATTACHMENT.

1,033,484.

Specification of Letters Patent.

Patented July 23, 1912.

Application filed December 29, 1911. Serial No. 668,481.

To all whom it may concern:

Be it known that we, HARRY M. STAINFIELD and EDWIN R. BEEMAN, both citizens of the United States, and residing at St. Louis Park, in the county of Hennepin and State of Minnesota, and at Minneapolis, also in the county of Hennepin and State of Minnesota, respectively, have invented certain new and useful Improvements in Disk Attachments, of which the following is a specification.

The present invention relates particularly to the boot of the attachment, to the manner of supporting the disks on the same, and to the means for lubricating the disks both for rotation and for lateral or sidewise movement, so that in double disk attachments constructed according to our invention, the disks will properly approach each other as they wear in diameter, and so that they will properly coast with each other, regardless of irregularities in their contour, thus insuring that they will maintain contact at the proper point for opening the furrow at all times.

The invention relates particularly to double disk attachments, although, as will presently appear, certain features of the invention might be applied with equal advantage to single disk constructions.

The main objects of our invention are to provide a boot for disk attachments of such form that it can be easily and satisfactorily pressed out from wrought iron or steel, thus greatly reducing the cost of manufacture, lightening the attachment, and providing an attachment which possesses other desirable features; at the same time to construct the boot in such way as to combine a maximum of stiffness and strength with lightness of construction; to accomplish the aforementioned results by economically distributing the stresses in the boot; to provide a novel form of hub construction for carrying the disks which construction will permit the disks to rotate, and will also permit them to move directly toward and from each other in service to maintain their edges together at all times at the proper point; and to provide a lubricating system for the disks such that they will always be properly lubricated both for rotation and for lateral movement toward and from each other.

Other objects and uses will appear from a

detailed description of the invention which consists in the features of construction and combination of parts hereinafter described and claimed.

In the drawings, Figure 1 shows a side elevation of the preferred form of attachment, the inner disk being removed from the same, to show more clearly the preferred form of the boot and associated mechanism; Fig. 2 shows a top view of the attachment of Fig. 1; Fig. 3 shows a section taken on the line 3—3 of Fig. 1, looking in the direction of the arrows; Fig. 4 shows an enlarged detail of the hub and axle construction; and Fig. 5 shows a side view of a modified form of boot to which the hub and axle constructions hereinafter disclosed are attached.

As previously stated, our invention relates particularly to the form of the boot of the attachment, to the form of the disk supports, and to the lubricating system. In order to successfully construct the boot of an implement of this kind from pressed or wrought metal, it should be of simple construction so that it can be easily worked with dies or like tools. At the same time, the boot must be properly formed to secure the necessary strength and rigidity, in order to withstand the stresses which will come upon it in service.

In Figs. 1 and 2, we show more particularly the preferred form of boot. In this case, the boot 6 comprises an arched portion 7, the forward end of which constitutes or is attached to a drawbar 8. It will be understood, of course, that the drawbar may be either longer or shorter than that illustrated in Fig. 1, as desired. The arched portion 7 conforms in a general way to the contour of the periphery of the disk. It continues over to some point 9 where the boot bends inwardly to provide the portion 10, such bend being preferably on the arc of a circle. The inner end 11 carries the axle or other device which serves to support the disks.

An axle 12 is carried by the lower end 11 of the boot. To accomplish this result, said end is twisted or wrapped around the central part of the axle, and will serve to retain the same from rotation by reason of the tight grip thus effected, and by means of a rivet or other device 13, should the same be desired. Now the end portions 14 of the axle are bent at an angle to each other, as

shown in Fig. 4, and said bent portions lie substantially in the direction of the dotted lines 3 of Fig. 1. The purpose of this construction will presently appear.

5 If desired, a reinforcing member 16 may be provided, the same having its upper end 17 bent over and firmly attached to the boot preferably at the point 9, having its lower end 18 wrapped around the end portion 11 of the boot, thereby to firmly support said end portion and, consequently, the axle with respect to the upper portion 9 of the boot.

10 The disks are designated 19 and 20. A hub 21 is slidably mounted on each end 14 of the axle. Each hub has its inner end suitably formed to provide a flange 22, the purpose of which will presently appear. A cap 23 is rotatably mounted on each hub, and it being provided with a flange 24 to which the corresponding disk may be riveted, the disk being provided with a central hole, of such size as to freely accommodate the corresponding flange 22, so that the cap can seat directly against the hub.

25 As previously stated, each hub is slidably mounted on its end of the axle. It preferably cannot rotate on the same. To accomplish these results, each end of the axle is formed with an elongated slot 25, of suitable size to accommodate a pin 26, which pin passes through the end portion 27 of the hub. Thus, the hub is prevented from rotating on the axle, but can slide back and forth. A washer or the like 28 may be placed between the ends of the pin and the face of the cap, thereby preventing the cap and disk from pulling away from the hub, but permitting the cap to rotate with its disk while the hub does not rotate. A closure 29 is carried by the cap, and completely incloses the washer, pin, end of the cap, end of the hub, and end of the axle. It is of sufficient size, however, to afford a space 30 which may accommodate a certain amount of lubricant.

40 It will now be evident that each disk, cap and closure may freely rotate on the corresponding hub, and that the hub, cap, disk, and closure may slide back and forth with respect to the axle, thereby permitting the disks to accommodate themselves bodily back and forth with respect to each other to keep their edges always in contact at the proper point.

55 It was previously stated that the end portions of the axle should occupy an angle with respect to each other and that these end portions should lie in a plane substantially as shown by the forward dotted line 3 of Fig. 1. By thus forming the axle, the disks will be brought together substantially at the point 31, and will be maintained in contact substantially at the same point as they wear in diameter, and as they adjust themselves back and forth according to ir-

regularities in their contour or for other reasons.

Now means should be provided for lubricating the disks both for rotation and for bodily back and forth movement. In the present disclosure, these means are as follows: The axle is made hollow, its ends opening into the spaces 30, which are provided by the closures 29. A pipe or the like 32 has its upper end 33 protruded through the boot, and has its lower end extended through the lower end 11 of the boot, and entered into a hole 34 in the axle. By introducing the lubricant into this pipe, it will find its way into the hollow axle, and will thence pass in both directions to the spaces 30. Thereupon, it will find its way between the axle and each hub, thus to lubricate for bodily back and forth movement, and it will find its way between each hub and the corresponding cap, thereby to lubricate for the rotation of each disk. Moreover, the only points at which dust and dirt could enter between the moving surfaces would be the points 35 and 36, which are both adjacent the lower end of the boot. However, the lubricant is constantly working toward these points, and, therefore, it would be practically impossible for the dust and dirt to force its way backward against the outflowing lubricant. The pipe 32, axle, and spaces 30, provide a sufficient volume to accommodate enough lubricant to last for a considerable time. A cork or other suitable closure may be placed in the top of the pipe to prevent the access of dust and dirt at this point.

It is preferred that the rear portion 10 of the boot should be sufficiently narrow to provide a clearance between its edges and the faces of the disks. To this end, the boot is shouldered at the points 37, as shown in Figs. 1 and 2.

A pressure device attachment 38 is attached to the boot at any suitable point. In the particular construction illustrated, it is placed adjacent the reinforcing member 16, so that the pressure will be transmitted straight down to the axle, and a single rivet 39 serves to connect the reinforcing member and pressure device attachment to the boot. It will, of course, be understood that we are in no wise limited to a construction in which this pressure device attachment is placed at this particular point.

Now one of the features of our invention, of course, is the arrangement of the axle, and disk supports, and the means which we have provided for lubricating the disks for both rotation and back and forth movement. In Fig. 5, we show the hub arrangement of this invention as applied to a boot of somewhat different construction, to show that we do not limit ourselves to any particular form of boot, when we are using our hub

construction and lubricating system. In this case, the axle 40 may be carried by the lower end of a standard 41, and the lubricant may be transmitted directly through this standard to the interior of the axle.

A grain spout, or other device, if used, may be passed down through the boot through a hole 42 in advance of the reinforcing member 16. By making the reinforcing member of a width substantially equal to the clearance between the disks, this reinforcing member will also serve to prevent the grain from falling backwardly where it might strike the disks as they move upwardly in their rotation. Thus, the reinforcing member can be made to perform a double function. It will be understood that no means are herein disclosed for automatically throwing the disks bodily toward each other. However, it is found by test that the pressure of the earth on the faces of the disks will accomplish this result, and that the disks will force together almost as soon as they start to move forward in the ground.

It is preferred, as illustrated in Figs. 1 and 2, to make the forward portion of the boot of channel-shaped cross-section. By this means a maximum of strength is provided in those portions which are subjected to the greatest stress, and this maximum strength is combined with a minimum of weight and, therefore, a minimum of cost for the material. It will also be noted that by providing the flange on each hub, the amount of inward movement of the corresponding cap is limited so that the cap will engage the flange before it jams on the hub. In this way any danger of jamming and consequent preventing of disk rotation, is obviated.

We claim:

1. In an attachment of the class described, the combination of a hollow axle member, a hub slidably mounted on one end of the same, a bearing member rotatably mounted on the hub, and an inclosing member on the bearing member inclosing the hub and the axle member to retain lubricant therein, to lubricate the slidable mounting of the hub, and to lubricate the rotatable mounting of the bearing member, substantially as described.

2. In an attachment of the class described, the combination of an axle member, a hub slidably mounted on one end of the same, a bearing member rotatably mounted on the hub, and an inclosing member on the bearing member inclosing the hub and the axle member to retain lubricant therein, to lubricate the slidable mounting of the hub, and to lubricate the rotatable mounting of the bearing member, substantially as described.

3. In a disk attachment, the combination of a hollow axle member, a flanged hub

slidably mounted on each end of the same, a bearing rotatably mounted on each hub, a disk secured to each bearing member, an inclosing cap on each bearing member to inclose the adjacent open end of the axle member, substantially as described.

4. In a disk attachment, the combination of a hollow axle member, a flanged hub slidably mounted on each end of the same, a bearing member rotatably mounted on each hub and adapted to engage the flange thereof, a disk secured to each bearing member, and an inclosing cap on the bearing member, substantially as described.

5. In a disk attachment, the combination of an axle member, having a slotted transverse opening near its end, a hub slidably mounted on the axle member, a pin extended through the hub and through the slotted opening, and a bearing member rotatably mounted on the hub, substantially as described.

6. In a disk mounting, the combination of an axle member, having a transverse slotted opening adjacent one end, a flanged hub slidably mounted on the axle member, a bearing member rotatably mounted on the hub, a disk secured to the bearing member, and a retaining pin extended through the hub and through the slot of the axle member to retain the hub against rotation, and to limit its sliding movement, and to retain the bearing member on the hub, substantially as described.

7. In a disk attachment, the combination of a boot, an axle member carried by the same, and having its end portions extending at an angle to each other, a hub slidably mounted on each end of the axle member, a bearing member rotatably mounted on each hub, and a disk carried by each bearing member, substantially as described.

8. In a disk attachment, the combination of a supporting member, an axle member secured to the same, and having its end portions extending at an angle to each other, a flanged hub slidably mounted on each end of the axle member, a bearing rotatably mounted on each hub, a disk secured to each bearing member, and means for retaining the hubs in position on the axle member and the bearings in position on the hubs, substantially as described.

9. In a disk attachment, the combination of a supporting member, an axial member carried by the same and having its end portions extending at an angle to each other, a hub slidably mounted on each end of the axial member, a bearing member rotatably mounted on each hub, and means for retaining the hubs in position on the axial member and means for retaining the bearing members in position on the hubs, substantially as described.

10. In a disk attachment, the combination

of a supporting member, an axial member carried by the same, a hub slidably mounted on each end of the axial member, means for retaining each hub against rotation on the axial member and for limiting its sliding movement thereon, a bearing member rotatably mounted on each hub, and means for retaining each bearing member in position on its hub, substantially as described.

10 11. In a disk attachment, the combination of a supporting member, an axial member carried thereby, a hub slidably mounted on each end of the axial member, a bearing member rotatably mounted on each hub, and

15 a pin extended through each hub and through the corresponding end of the axial member and having its end portions extending into the path of the corresponding bearing member, to thereby retain said hub member against rotation and to retain the corresponding bearing member in position on the hub, substantially as described.

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12. In a disk attachment, the combination of a supporting member, an axial member carried thereby, there being an elongated perforation extending through each end of the axial member, a hub slidably mounted on each end of the axial member, a bearing member rotatably mounted on each hub, and a pin extended through each hub and through the corresponding elongated perforation, and having its end portions overlying the end of the corresponding bearing member to thereby retain the corresponding hub against rotation on the axial member and to retain the corresponding bearing member on its hub, substantially as described.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
