

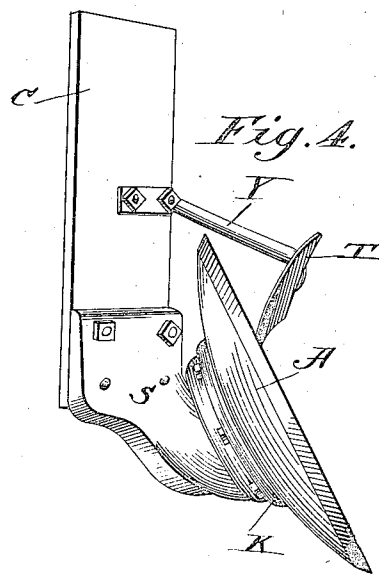
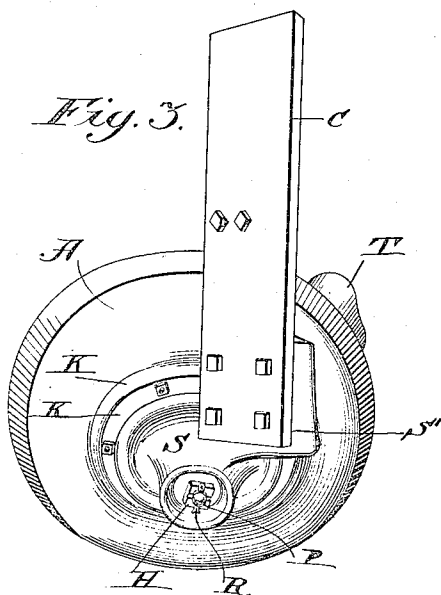
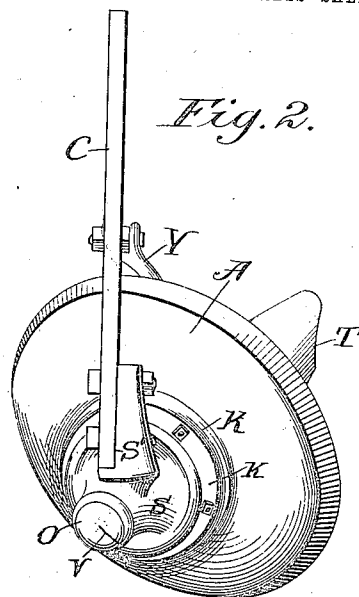
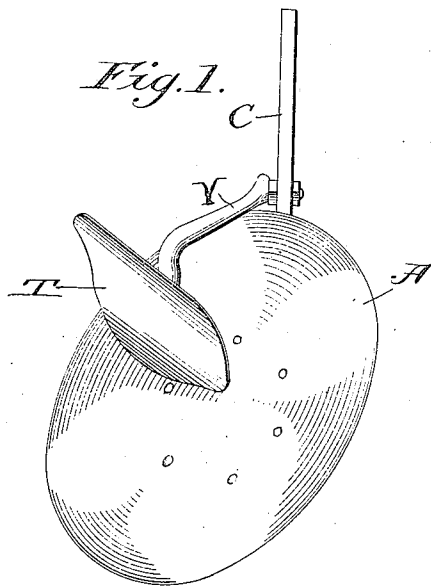
No. 816,543.

PATENTED MAR. 27, 1906.

E. C. ERB & A. L. POWLISON.  
ROTARY DISK PLOWING ATTACHMENT.

APPLICATION FILED FEB. 27, 1905.

3 SHEETS—SHEET 1.



Witnesses:

H. C. Barber  
Walter McHale

by

Inventors:  
Elias C. Erb,  
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D. N. Houston  
Attorney.

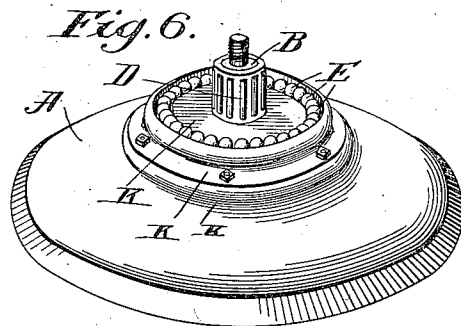
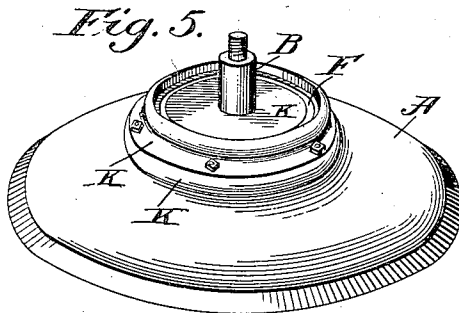
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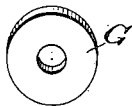
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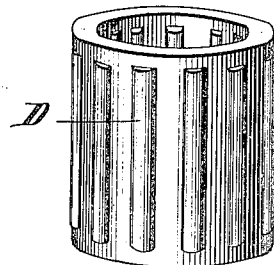
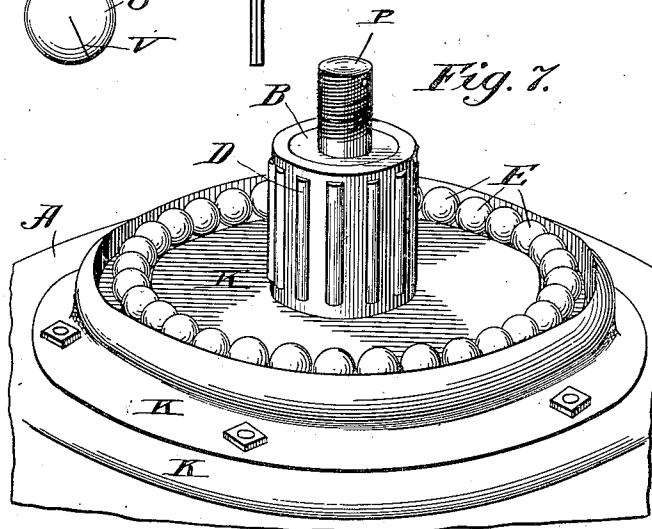
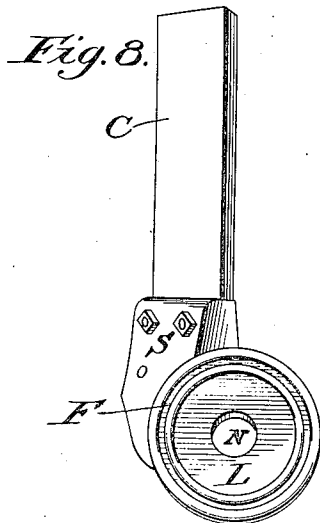
3 SHEETS—SHEET 2.



*Fig. 11. Fig. 10. Fig. 12.*



*Fig. 13.*



*Fig. 9.*

Witnesses:

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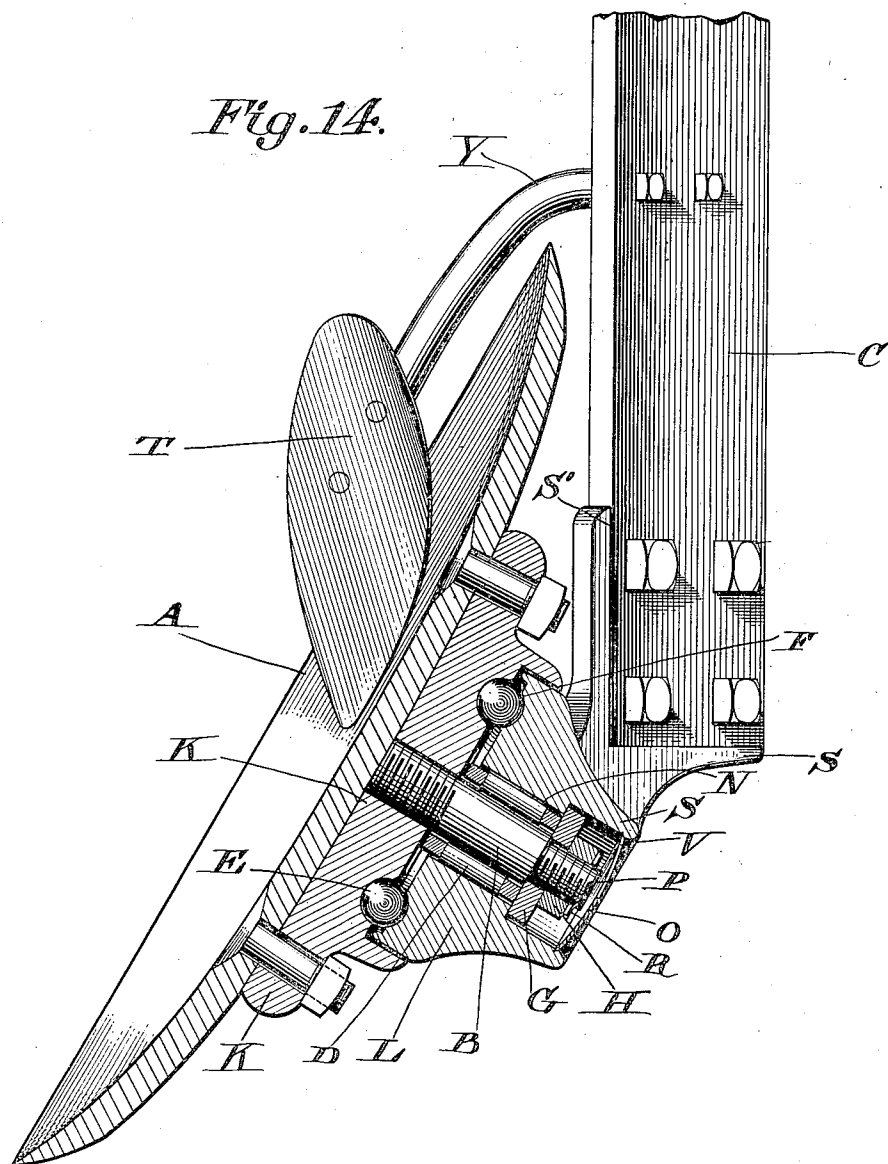
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3 SHEETS—SHEET 3.



Witnesses,  
*George*  
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*Inventors,*

*By - D. H. Horston*  
*attorney.*

# UNITED STATES PATENT OFFICE.

ELIAS C. ERB, OF HUNTER, AND ALLEN L. POWLISON, OF ERIE, NORTH DAKOTA, ASSIGNORS OF ONE-THIRD TO DAVID H. HUSTON, OF HUNTER, NORTH DAKOTA.

## ROTARY-DISK PLOWING ATTACHMENT.

No. 816,543.

Specification of Letters Patent.

Patented March 27, 1906.

Application filed February 27, 1905. Serial No. 247,545.

*To all whom it may concern:*

Be it known that we, ELIAS C. ERB, a resident of Hunter, and ALLEN L. POWLISON, a resident of Erie, in the county of Cass and State of North Dakota, citizens of the United States, have invented certain new and useful Improvements in Rotary-Disk Plowing Attachments, of which the following is a specification.

10 Our invention is related to grading and ditching machines and to plows, and has for its object the provision of a rotary-disk plowing attachment which is very durable and perfect working and not liable to wear to any  
15 great extent by friction.

Our invention consists in the novel features of construction and combination of parts, substantially as hereinafter more fully described and specified, and pointed out in the claims of this specification.

20 In the drawings forming part of this specification similar characters of reference denote similar parts in all of the illustrations.

Figure 1 represents a front view of our rotary-disk plowing attachment. Fig. 2 represents a rear view of our rotary-disk plowing attachment. Fig. 3 represents a perspective rear view of our rotary-disk plowing attachment. Fig. 4 represents a perspective side view of our rotary-disk plowing attachment. Fig. 5 represents a perspective rear view of our rotary plowing-disk, showing a central bearing-plate having a central axle, and the bearing-plate, showing the circular  
35 concave track for the bearing-balls to travel in. Fig. 6 represents a perspective rear view of our rotary plowing-disk, showing the bearing-balls placed in the concave track and the roller-bearing placed around the central axle. Fig. 7 represents a view the same as that shown in Fig. 6, but much enlarged and having a part of the plowing-disk cut away. Fig. 8 represents a front perspective view of our standard and bearing-support having a central  
45 box for the axle of our rotary plowing-disk and showing the circular concave track for the bearing-balls to travel in. Fig. 9 represents an enlarged perspective view of the roller-bearing. Fig. 10 represents a perspective view of the washer that is placed next to the outer end of the roller-bearing as seen in Fig. 14. Fig. 11 represents a perspective view of

the washer, the outer end of the axle, the key in the end of the axle, and the bur on the end of the axle, said bur having cross-slots for the  
55 key to slide in. Fig. 12 represents a rear view of the dust-excluding cap, the said cap being made of sheet metal and said cap being split radially from its center to its periphery, thus forming a spring-cap. Fig. 13 represents  
60 the key that is shown in position in Fig. 14. Fig. 14 represents a central sectional view through the plowing-disk and bearings of the plowing attachment and showing a perspective  
65 view of the socket edge and standard bolted into the socket and also showing a perspective view of the soil-turning moldboard-scraper having an arm attached to the standard.

In carrying out our invention the concave  
70 rotary disk A is axled in the box N of the bearing-support L, which bearing-support has a circular race or track F for bearing-balls to travel in, and said support L has an outer stem S and outside socket at S', to which  
75 socket is attached the standard C, the said standard having an arm Y, which arm Y supports a moldboard-scraper T, which said standard is to be secured to the beam of a grading and ditching machine or wagon-  
80 loading machine or plow.

The rotary plowing-disk A has attached a rear central plate K, having the axle B and circular race or track F for the bearing-balls to travel in, which axle B may be cast integral with the central plate or may be made  
85 of steel or wrought metal and inserted or screwed into a central hole in the central plate, and which axle B is surrounded by the roller-bearings D, and the circle of balls E  
90 are placed into the circular concave track F.

The bearing-support L is placed around the roller-bearing and against the circle of bearing-balls. The washer G is placed around the reduced and threaded end P of  
95 the axle B and against the end of the bearing part of the said axle. The bur H is secured on the threaded end of the axle B, and the said bur is held in proper adjustment by the key R. The concave dust-excluding spring-  
100 cap Q may be constructed of sheet metal and may be split radially from its center to its periphery to form a spring-cover, and the cover is sprung into its place, which place is slightly

undercut, so as to hold the said cover securely over the end of the axle and the bur and key that holds the bur from revolving on the axle, but allows the bur to revolve with the axle. Thus our rotary-disk plowing attachment is combined together for use on grading and ditching machines and wagon-loading machines and on plows. However, when our invention is used on plows for field-plowing then the standard, as herein shown, may be in some cases dispensed with and our rotary plowing attachment may be connected to the beam of a plow by a suitable arm connected to the outside of the bearing-support.

We claim—

1. In a rotary plowing attachment, a concave rotary plowing-disk, a plate secured thereto, an axle secured to the plate, a bearing-support having a boxing for said axle, antifriction devices between the axle and boxing, said bearing-support having a socket cast integral therewith, said socket having its plane positioned at an oblique double angle to the axis of the rotary plowing-disk, a standard, said socket adapted to receive the lower end of said standard, an arm connected approximately centrally to said standard, said standard carrying a moldboard-scraper, and said standard adapted to be connected to a grading, or ditching, or wagon-loading machine,

2. In a rotary-disk plowing attachment, a concave rotary plowing-disk, a bearing-plate connected centrally on the rear side of the said plowing-disk, said bearing-plate having a central aperture, an axle screwed into said aperture, a boxing for said axle, a standard connected to said boxing, an arm connected approximately centrally on said standard, and a moldboard-scraper connected to said arm.

3. In a rotary-disk plowing attachment, a concave rotary plowing-disk, a bearing-plate connected centrally to the rear side of said rotary plowing-disk, a central axle projecting rearwardly from said bearing-plate, a roller-bearing placed around said axle, a bearing-support carrying a boxing for the roller-bearing axle, said bearing-plate and bearing-support having circular concave ball-races opposite each other, a series of bearing-balls placed in said ball-races, means for retaining the said bearing-support in proper adjustment to the said central axle, a standard connected to the said bearing-support, and an arm carrying a moldboard-scraper.

4. In a rotary-disk plowing attachment, a concave rotary plowing-disk, a bearing-plate centrally connected to the disk, an axle screwed into said plate and projecting rearwardly, a roller-bearing placed around said axle, a supporting-boxing for said axle, a standard connected to said supporting-boxing, and said attachment having an arm carrying a moldboard-scraper.

5. In a rotary-disk plow attachment, a concave rotary plowing-disk, a bearing-plate connected centrally to the rear side of the said rotary plowing-disk, said bearing-plate having a central aperture, an axle screwed into said central aperture and said axle rearwardly projecting from said central aperture in said bearing-plate, a bearing-support surrounding said axle, and a standard connected to said bearing-support at an oblique double angle to the axis of the rotary plow-disk.

6. In a rotary-disk plowing attachment, a concave rotary plowing-disk, an axle, a roller-bearing around said axle, a supporting-boxing for said axle, a standard connected at an oblique double angle to the said supporting-boxing, an arm connected approximately centrally on said standard, and said standard carrying a moldboard-scraper adapted to turn earth from the rotary plowing-disk.

7. In a rotary-disk plowing attachment, a concave rotary plowing-disk, a bearing-plate connected centrally to the rear side of the said plowing-disk, said bearing-plate having a central aperture, an axle fixedly inserted in said aperture and projecting centrally at the rear side of the said bearing-plate, a bearing-support around said axle, and ball-bearings placed between said bearing-plate and said bearing-support.

8. A rotary-disk plowing attachment having a metal bearing-support, said bearing-support having a concave rotary plowing-disk axled thereon, a bearing-plate having a central aperture, an axle screwed into said aperture, a standard connected to the bearing-support at an oblique double angle to the axis of the rotary plowing-disk, an arm connected approximately centrally to the standard, the arm carrying a moldboard-scraper, and said standard constructed and adapted to be connected to machines for grading, ditching, and wagon-loading.

9. In a rotary-disk plowing attachment, a concave rotary plowing-disk, a bearing-plate connected centrally to the rear side of the said plowing-disk, said bearing-plate having a central aperture, an axle screwed into said aperture and projecting centrally at the rear side of the said bearing-plate, and a roller-bearing placed around said axle.

10. In a rotary-disk plowing attachment, a concave rotary plowing-disk, a bearing-plate connected centrally to the rear side of the said plowing-disk, a metal axle fixedly inserted and projecting centrally at the rear side of the said bearing-plate, a bearing-support, a standard connected to said bearing-support, an arm connected approximately centrally on said standard, and said arm carrying a moldboard-scraper adapted to turn earth from the rotary plowing-disk.

11. In a rotary-disk plowing attachment, a concave rotary plowing-disk, a bearing-plate connected centrally to the rear side of the

said plowing-disk, said bearing-plate having a central aperture, a metal axle screwed into said aperture, the inner end of said metal axle reaching through the bearing-plate to the rear side of the concave plowing-disk and projecting centrally at the rear side of the said bearing-plate.

12. In a rotary-disk plowing attachment, a concave rotary plowing-disk, a bearing-plate having a central aperture, an axle screwed into said central aperture, and projecting rearwardly therefrom, a bearing-support having a standard-socket formed integral with the said bearing-support, the said bearing-support having the socket-surface positioned at an oblique double angle to the front surface of the said bearing-support, a standard connected at said socket to the said bearing-support, an arm carrying a moldboard-scraper, and said arm connected approximately centrally on the said standard.

13. In a rotary-disk plowing attachment, a concave rotary plowing-disk, a bearing-plate connected centrally to the rear side of the said rotary plowing-disk, said bearing-plate having a circular concave track adapted for bearing-balls to travel in, a series of bearing-balls placed in said circular concave track, a central axle connected to the center of the said bearing-plate, a roller-bearing placed surrounding the said central axle, a bearing-support surrounding the said central axle, said bearing-support having a circular concave track adapted for bearing-balls to travel in, a bur on the rear end of the said central axle, means for locking said bur, a standard, and the said bearing-support having an arm adapted to connect with the beam of a plow.

14. In a rotary-disk plowing attachment, a concave rotary plowing-disk, a bearing-plate connected centrally to the rear side of the said plowing-disk, said bearing-plate having a central aperture, a metal axle fixedly inserted into the said central aperture of the bearing-plate, the inner end of said metal axle reaching through the bearing-plate to the rear side of the concave plowing-disk, said metal axle projecting centrally at the rear side of the said bearing-plate, a metal support having a boxing for the said axle to rotate in, a standard connected to said support, said standard connected to the support at an oblique double angle to the axis of the rotary plowing-disk, and said attachment constructed and adapted to be used in combination with and as a part of a grading, or ditching, or wagon-loading machine.

15. In a rotary-disk plowing attachment, a concave rotary plowing-disk, a bearing-plate connected centrally to the rear side of the rotary plowing-disk, a central axle screwed centrally into the said bearing-plate, a bearing-support surrounding the said central axle, a bur on the rear end of the said central axle, means for locking said bur, a standard,

and said bearing-support connected to said standard at an angle to the axis of the said concave rotary plowing-disk.

16. In a rotary-disk plowing attachment, a concave rotary plowing-disk, a bearing-plate connected centrally to the rear side of the said plowing-disk, an axle inserted through said bearing-plate and projecting centrally at the rear side of the said bearing-plate, a bearing-support surrounding the central axle, means for retaining the said axle in proper adjustment to the bearing-support, a standard, an arm connected approximately centrally to said standard, said arm carrying a moldboard-scraper, said standard having its surface connected to the bearing-support at an oblique double angle to the axis of the rotary plowing-disk.

17. In a rotary-disk plowing attachment, a concave rotary plowing-disk, a bearing-plate connected centrally to the rear side of the rotary plowing-disk, a central axle on the bearing-plate, a bearing-support surrounding the said central axle, a bur on the rear end of the said central axle, said bur having a slot, said axle having a hole through its rear end, a key placed through said hole, said key inserted in the slot in said bur, a standard, said bearing-support connected to the lower end of the standard, an arm connected approximately centrally on the said standard, and said arm carrying a moldboard-scraper adjusted to turn earth from the said rotary plowing-disk.

18. In a rotary-disk plowing attachment, a concave rotary plowing-disk, a bearing-plate connected to the rear side of the rotary plowing-disk, a central axle connected centrally to the said bearing-plate, a bearing-support surrounding the said central axle, a washer placed around the rear end of the central axle, a bur on the rear end of the central axle, said bur having a slot, said axle having a hole through its rear end, a key placed through said hole, said key inserted in the slot in said bur, a standard, and said bearing-support connected to the lower end of the said standard, an arm connected approximately centrally on the said standard, and said arm carrying a moldboard-scraper adjusted to turn earth from the said rotary plowing-disk.

19. In a rotary-disk plowing attachment, a concave rotary plowing-disk, a bearing-plate connected to the rear side of the said rotary plowing-disk, said bearing-plate having a circular concave track adapted for bearing-balls to travel in, a series of bearing-balls placed in the said circular concave track, a central axle connected centrally to the said bearing-plate, a roller-bearing placed surrounding the said central axle, a bearing-support surrounding the central axle, said bearing-support having a circular concave track adapted for bearing-balls to travel in, a bur on the rear end of the central axle, said bur

having a slot, said axle having a hole through its rear end, a key placed through said hole, said key inserted in the slot in said bur, and the bearing-support having an arm adapted to connect with the beam of a plow.

20. In a rotary-disk plowing attachment, a concave rotary plowing-disk, a central bearing-plate connected to the rear side of the said rotary plowing-disk, said bearing-plate having a circular concave track, adapted for bearing-balls to travel in, a series of bearing-balls placed in the said circular concave track, a central axle connected centrally to the said bearing-plate, a roller-bearing placed surrounding the said central axle, a bearing-support surrounding the central axle, said bearing-support having a circular concave track adapted for bearing-balls to travel in, a bur on the rear end of the central axle, said bur having a slot, said axle having a hole through its rear end, a key placed through said hole, said key inserted in a slot in said bur, a standard, and the bearing-support connected to the lower end of the standard.

21. In a rotary-disk plowing attachment, a concave rotary plowing-disk, a central bearing-plate connected to the rear side of the said rotary plowing-disk, a central axle connected centrally to the said bearing-plate, a roller-bearing placed surrounding the said central axle, a bearing-support surrounding the said central axle, a bur on the rear end of the said central axle, said bur having a slot, said axle having a hole through its rear end, a key placed in said hole, said key inserted in the slot in said bur, a standard, and said bearing-support connected to the lower end of the said standard.

22. In a rotary-disk plowing attachment, a concave rotary plowing-disk, a central bearing-plate connected to the rear side of the said rotary plowing-disk, said central bearing-plate having a circular concave track adapted for bearing-balls to travel in, a series of bearing-balls placed in the said circular concave track, a central axle connected centrally to the said bearing-plate, a bearing-support surrounding the said central axle, said bearing-support having a circular concave track adapted for said bearing-balls to travel in, a bur on the rear end of the said central axle, said bur having a slot, said axle having a hole through its rear end, a key placed through

said hole, said key inserted in the slot in said bur, a standard, and the bearing-support connected to the lower end of the said standard.

23. In a rotary-disk plowing attachment, a rotary plowing-disk, a central bearing-plate bolted to the rear side of the said rotary plowing-disk, a central axle connected centrally to the said bearing-plate, a bearing-support surrounding the said central axle, a washer placed around the rear end of the central axle, a bur screwed onto the rear end of the said central axle, said bur having a slot, said axle having a hole through its rear end, a key placed through said hole, said key inserted in the slot in said bur, a dust-excluding cap placed over the bur and rear end of the central axle, a standard, said bearing-support connected to the lower end of the said standard, an arm connected approximately centrally on the said standard, and said arm carrying a mold-board-scraper adjusted to turn earth from the said rotary plowing-disk.

24. In a rotary-disk plowing attachment, a concave rotary plowing-disk, a central bearing-plate connected to the rear side of the said rotary disk, said central bearing-plate having a circular concave track adapted for bearing-balls to travel in, a series of bearing-balls placed in the said circular concave track, a central axle connected centrally to the said bearing-plate, a roller-bearing placed surrounding the said central axle, a bearing-support surrounding the said central axle, said bearing-support having a circular concave track adapted for said bearing-balls to travel in, a washer placed around the rear end of the said central axle, a bur on the rear end of the said central axle, said bur having a slot, said axle having a hole through its rear end, a key placed through said hole, said key inserted in the slot in said bur, a dust-excluding cap placed over the bur and the rear end of the said central axle, a standard, and the bearing-support connected to the lower end of the said standard.

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

ELIAS C. ERB.  
ALLEN L. POWLISON.

Witnesses:

H. C. BARBER,  
WALTER MCGEE.