No. 799,676. PATENTED SEPT. 19, 1905.

L. E. ROBY & C. A. PATTISON.

GRAIN DRILL.

APPLICATION FILED NOV. 19, 1904.

2 SHEETS—SHEET 1.

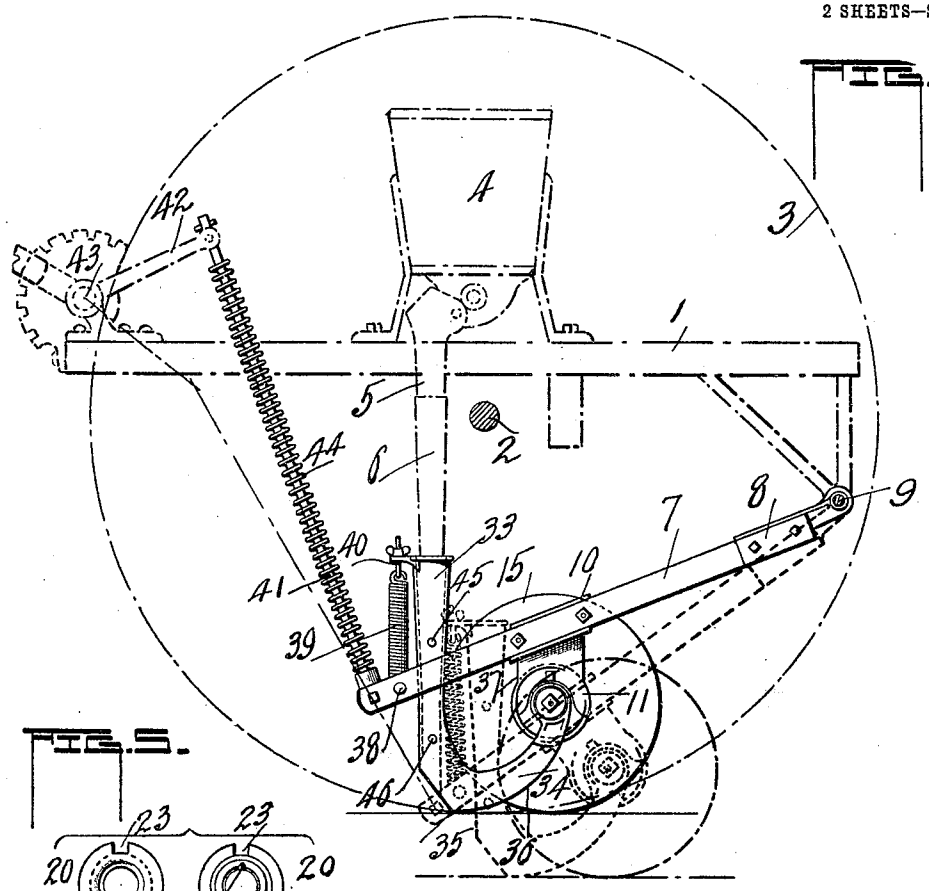


FIG. 5.

FIG. 3.

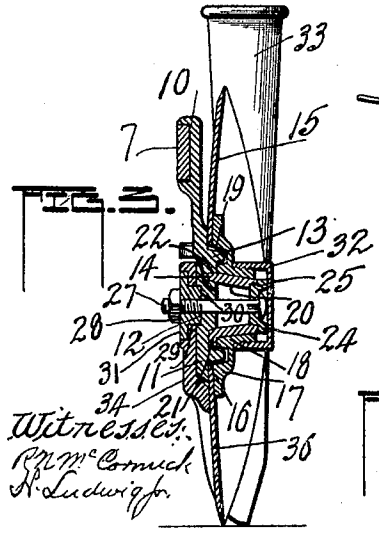
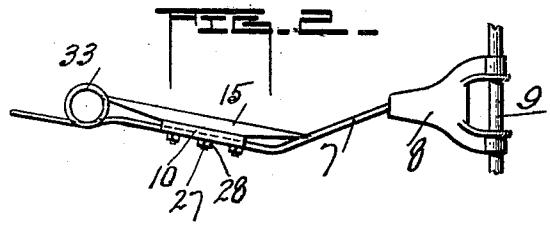


FIG. 2.



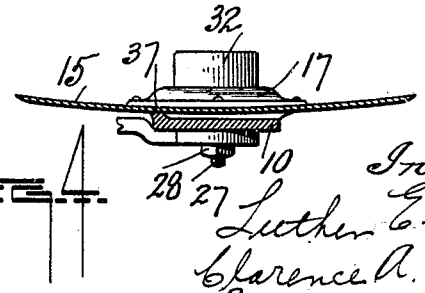


FIG. 4.

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By Chas. W. LaPorte Atty.

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2 SHEETS—SHEET 2.

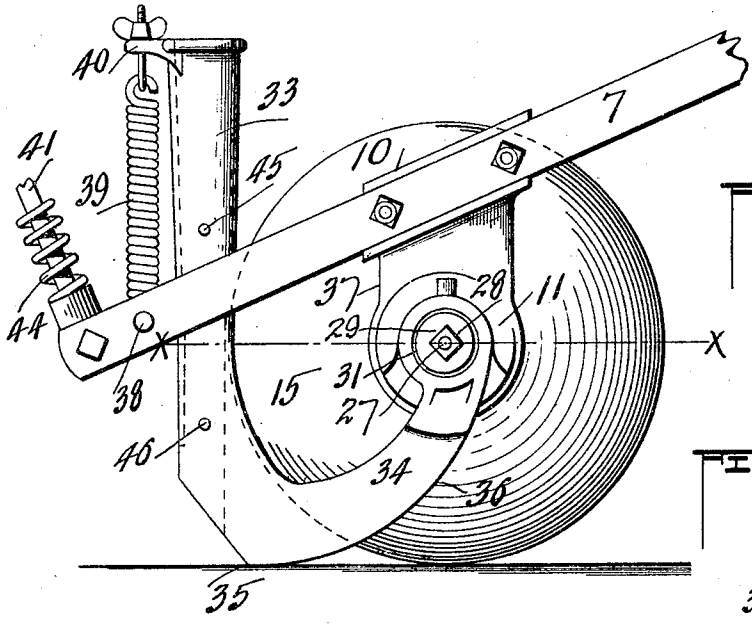


FIG. 1.

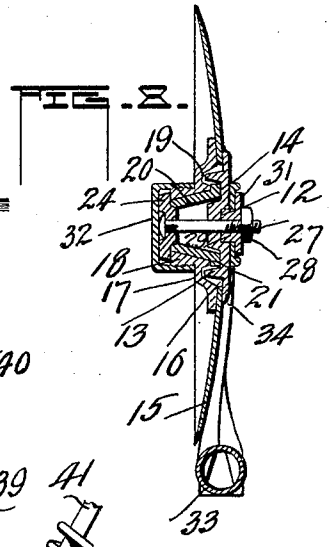


FIG. 2.

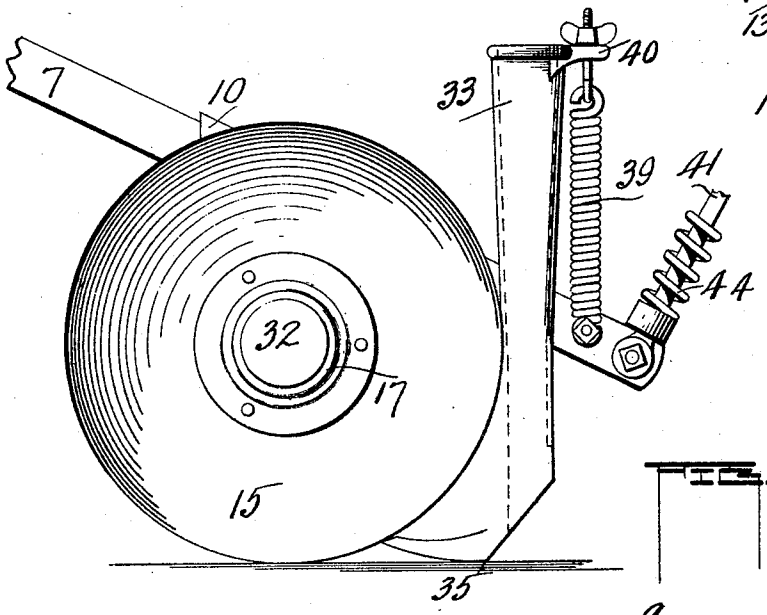


FIG. 3.

Witnesses:—
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UNITED STATES PATENT OFFICE.

LUTHER E. ROBY AND CLARENCE A. PATTISON, OF PEORIA, ILLINOIS.

GRAIN-DRILL.

No. 799,676. Specification of Letters Patent. Patented Sept. 19, 1905.

Application filed November 19, 1904. Serial No. 233,423.

To all whom it may concern:

Be it known that we, LUTHER E. ROBY and CLARENCE A. PATTISON, citizens of the United States, residing at Peoria, in the county of Peoria and State of Illinois, have invented certain new and useful Improvements in Grain-Drills; and we do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

This invention has reference to grain-drills, and relates particularly to a disk furrow-opener and a boot or conductor having a pivotal connection with the said disk.

The invention has for its further object the manner of mounting the disk or furrow-opener on the drag-bar and the boot or conductor on the disk, one object being to provide means for positively preventing the entrance of dirt or grit in the bearings thereof.

The invention consists of a disk furrow-opener supported in a suitable manner on a drag-bar, a conductor formed with a boot and having a shoe or arm, the forward portion of the said arm being pivotally attached to the bearing of the disk, the arrangement of the disk and boot being such that the arm of the boot connects with the bearing of the disk upon the convex face thereof.

The invention consists, further, in the provision of details more particularly set out in the following description, claimed in the appended claims, and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a supporting-frame and ground-wheels in dotted lines and showing the disk and boot supported by the frame with the disk and lower edge of the shoe or arm of the boot in working position on the surface of the soil. The view further illustrates in dotted lines the disk depressed a suitable distance in the ground and cutting a furrow in which follows the lowermost portion of the boot and shoe, the pivoting of the boot to the disk giving an independent movement to the boot, whereby the same will travel along the base of the furrow and always on a line with the lower cutting edge of the disk. Fig. 2 is a plan view of a drag-bar and disk and boot supported thereby. Fig. 3 is a vertical cross-section, enlarged, through the drag-bar, disk, and bearing therefor on the drag-bar and showing the pivotal connection between the bearing of the disk and shoe or arm of the boot. Fig. 4 is a transverse section, enlarged, through the bracket, forming a support for the disk and boot on the drag-bar, showing a scraping edge of the bracket on the convex side of the disk. Fig. 5 shows in detail two opposite end views of the tubular bearing member connected with the drag-bar. Fig. 6 is a side elevation, enlarged, of the devices shown in Fig. 1, omitting the supporting-frame and the connections from the drag-bar therewith. Fig. 7 is a view similar to that seen in Fig. 6, but looking at the opposite side of the device; and Fig. 8 is a cross-section taken on the line X X of Fig. 6.

It is our aim in the present invention to provide in combination with a disk furrow-opener and its support, the drag-bar, a grain-conductor which shall have a pivotal connection with the disk and its support to be independently movable or be governed by the rise and fall or raising or lowering of the disk and to follow in the wake of the disk and in the furrow made thereby to deposit seed and grain in the deepest cut portion of the said furrow. This may be accomplished in addition to the pivotal connection with the disk by permitting the boot to drop or follow the furrow-opener by its own weight and be raised through suitable engagement of the drag-bar with means attached to the boot, providing a pulling-spring which shall be attached to the drag-bar and to the boot, so that as the drag-bar is lowered to depress the disk into the ground the boot will oscillate on its pivot and be drawn down into the furrow cut by the disk.

In the drawings, 1 denotes by dotted lines the usual supporting-frame for grain-drills of the character specified herein, the same suitably carried by an axle 2, which is connected to the ground-wheels 3, also shown in dotted lines. The frame supports the ordinary seed-hopper 4, in which is carried suitable seed or grain feeding devices, (not shown,) and connected with said hopper and the devices specified is shown the grain-spout 5 and the feed-tube 6, all of which are shown in dotted lines. The parts of the frame-supports, wheels, and feed-spouts are shown in dotted lines, as they form no part of the invention herein, and any of the well-known devices of this character may be provided.

7 denotes a drag-bar of suitable length connected with a head 8, which has a pivotal connection with a rod or spindle 9, suitably supported from the main frame 1. At a suitable point on the body of the drag-bar 7 is fixedly

attached a bracket or support 10, which depends from the said drag-bar and is provided with a disk-shaped portion 11, through which is an opening 12, and upon the rear face of the bracket and the disk portion thereof the same is provided with the annular ring 13, projecting laterally therefrom, with its inner and outer faces preferably tapered. That portion of the bracket or disk portion within the annular projected ring 13 is provided with the depressed annular groove 14.

The disk which has been referred to is indicated as 15 and is similar to disks used in machines of this character, having concave and convex faces and provided with the enlarged central opening 16, which is adapted to be slipped over the outside of the ring 13 when affixing the disk to the drag-bar. (See Fig. 3.) In mounting the disk attention is called to the fact that the convex face of the disk is placed in juxtaposition to the inner face of the bracket 10 of the drag-bar. To the inner or concave face of the disk is attached a casing 17, formed with the tubular extended portion 18, the outer periphery of which is threaded and the inner face suitably tapered. The outer face of the casing is provided with an annular depressed groove 19, which is adapted to slip over the annular ring 13 of the bracket and to revolve thereon. The bearing for the said disk and its casing 17 is a tubular member 20, having a tapered construction and provided with the outer annular flange 21, which is adapted to be seated in the annular groove 14 of the bracket and having a locked relation with the bracket by means of a lug or projection 22 on the bracket adapted to be seated in a notch 23, cut in the flange 21. The end of the tubular member 20 is closed by a cap-plate 24, having a beveled face engaging a corresponding beveled portion of the member and locked against rotation by means of a lip or lug 25, formed on the cap-plate and engaging a depression 26 in the matching edge of the member. The cap-plate and the member are secured to the bracket 10 by means of a bolt 27, passed through the cap-plate 24, the member, and the opening 12 in the bracket. A nut 28 is adapted to engage the end of the bolt for holding the same in place. The bolt and nut serve the further function of securing a collar 29 against the outer face of the bracket, as seen in Fig. 3, with the reduced portion of the collar bearing in a recessed portion 30 of the bracket, the collar being provided with a flange 31, leaving an open space between the flange of the collar and the face of the bracket for a purpose to be described. The cap-plate and the end of the bearing 20 are incased in a dust-proof cup 32, which has a screw connection with the threaded portion of the casing 18.

The boot or conductor to which attention has been called is indicated as 33, is provided with the inner tubular openings into which extends the tube 6, and by means of which seed or grain is directed from the hopper to the ground. The boot has attached thereto or cast integral therewith the forwardly and upwardly carried shoe or arm 34, the forward end of which is provided with an opening by means of which the shoe or arm is slipped onto the reduced portion of the collar 29 before the said collar is fixed into position, as seen in the figures, by the nut 28, the arm 34 where it connects with the collar filling the space between the flange of the collar and face of the bracket to turn on the collar, which it is apparent forms a pivot for the end of the said arm, the lower portion of the arm where it merges into the boot being provided with the point 35, which rides on the base of the furrow cut by the disk and insures that all grain or seed passed through the boot will lodge at this point. The arm 34 is carried upon the convex side of the disk and is provided with the scraping edge 36, engaging the face of the said disk. There is provided additional scraping means for the outer face of the said disk by curving the rear edge of the bracket 10 in against the disk, as at 37, more clearly seen in Fig. 4 of the drawings.

The drag-bar 7 extends beyond the bracket 10 and across the face of the disk and the boot 33, and to the bar at a point, preferably 38, is connected a pulling-spring 39, the upper end of which is adjustably connected to a bracket 40, secured to or forming a part of the upper end of the boot 33. There is further attached to the drag-bar and at or near the outer end thereof a rod 41, which at its upper end passes through the usual swivel-casting (not shown) carried by an arm 42, extending from and secured to a shaft 43, which is arranged to be rocked in its bearings for the purpose of raising or lowering the arm 42 for raising the disk 15 from the ground or depressing the same therein. It is apparent that if the arm 42 is lowered the drag-bar which is connected thereto and the disk supported by the drag-bar will be lowered somewhat, as shown in dotted lines in Fig. 1, governed by the swinging motion which is imparted to the arm 42.

The lowering of the drag-bar 7 through the spring 39 will draw the boot downwardly, which being pivoted to the disk will drop into the position seen in dotted lines, Fig. 1. By the pivoting of the arm or shoe of the boot to the disk the said boot is adapted to rise and fall independently of the said disk or with the same and in working position remains with its lowermost portion traveling in the wake of the disk and on a level with the lowermost cutting edge of the said disk.

The rod 41, as usual in mechanisms of this kind, carries a spring 44, capable of being acted upon by the arm 42 for exerting more or less pressure upon the disk in the ground. We have provided for doing away with the

use of the spring, if desired, by securing two pins or studs to the boot (indicated as 45 and 46) above and below the drag-bar. (See Fig. 1.) In this way when the disk is depressed into the ground it is adapted that the boot and shoe of their own weight will drop to the position seen in Fig. 1, the pin 46 serving as an engaging point for the drag-bar when raising the disk and the pin 45 serving as an engaging point for the drag-bar when the disk is depressed should the boot and shoe fail to correspond, all of which it is believed will be understood.

From the foregoing description of the device it is believed the arrangement, construction, and operation of the devices will be fully understood. It is well, however, to call attention to the salient features of the device, also to have it understood what modifications and changes are contemplated in the construction. The "shoe" or "arm" of the boot, as the same has been termed, is in reality a furrow-opener acting supplementary to the cutting edge of the disk to provide for and to make way for the lowermost portion of the boot in depositing the seed or grain in the furrow. By pivoting the shoe to the center of the disk the boot travels behind the cutting edge thereof and is independently movable, so that in following the irregularities of the ground the disk and shoe or boot may rise and fall independently of each other and without disturbing the other. Were the shoe and boot fixedly attached to the disk or its support it would act in unison with the rise or fall of the disk and the functions here attainable be destroyed.

We wish it understood that while we have shown one form of spring other and various forms may be used with as good results, and under certain conditions it may be advisable to make some suitable change. This is also true of the disk which we have described and shown as a concavo-convex disk. Other forms may be substituted with as good results, and while we have shown the boot pivotally attached through its shoe with the disk we have anticipated that the connection may be made in various ways and leaving the shoe free to travel behind the disk or, if desired, omit the disk and substitute some other form of furrow-opener and pivot the shoe to an oscillating support, such as the drag-bar or equivalent member, and we do not wish to be confined to the details as herein set forth, but to include such other modifications and equivalents as shall come within the scope of the claims.

Having thus fully described our invention, what we claim, and desire to secure by Letters Patent of the United States, is—

1. In a grain-drill, the combination of a drag-bar, a disk suitably supported by said bar, a grain-boot provided with an arm having a pivotal connection with the bearing of the disk and a spring connected at one end with the drag-bar and the opposite end with the boot, substantially as specified.

2. In a grain-drill, the combination of a support, a furrow-opener attached thereto, means for raising and lowering the support and thereby the furrow-opener, and a grain-conductor pivotally attached to the said support, whereby said conductor is adapted to have an oscillatory movement independent of the furrow-opener or its support.

3. In a grain-drill, the combination of a support, a disk furrow-opener revolubly attached to the support, means for raising or lowering the support and thereby the disk, a grain-conductor having an arm pivotally attached to the said support diametric with the axis of the said disk whereby said conductor is adapted to have an oscillatory movement independent of the said disk or its support.

4. In a grain-drill, the combination of a support, a disk revolubly mounted on the said support, a grain-conductor having a pivotal connection with the disk and support, the connection of the disk and conductor being such as to adapt the disk or conductor to rise or fall independently of each other.

5. In a grain-conductor, the combination of a support, a disk revolubly mounted on the support, a grain-conductor pivoted to the support to have movement independent of the disk and its support, and a yielding connection between said support and the conductor.

6. In a grain-drill, the combination of a support, a disk revolubly mounted on the support, a grain-conductor pivotally attached to the support, with its pivotal point diametric with the axis of the disk, the said disk and conductor adapted to have independent vertical movement, mechanism for raising or lowering the support and disk, and means to facilitate the raising or lowering of the conductor by the support at a given point in the movement of raising or lowering the latter.

7. In a grain-drill, the combination of a support, a disk revolubly mounted on the support, a boot having an arm extension pivotally attached at its forward end to the support, to adapt the independent raising and lowering of the disk and boot, and the arm of the said boot having a scraping edge contacting with the disk intermediate the lower end of the boot and center of the disk.

8. In a grain-drill, the combination of a drag-bar, a disk, a bracket attached to the bar and serving as a mounting for the disk, the said bracket provided with a scraping portion engaging the face of the disk, a grain-boot, an arm extending from the boot pivotally connected with the bracket, the connection between boot and bracket adapting the same to have vertical movement independent of each other, and the arm of the boot having a scraping portion engaging the face of the disk.

9. In a grain-drill, the combination of a

drag-bar, a disk revolubly supported by the said bar, means for raising or lowering the bar and thereby the disk, a grain-boot having a pivotal connection with the bearing of the disk and bar, and by such connection adapted to have vertical movement independent of the disk, and means on the boot adapted to be engaged by the drag-bar to facilitate in raising the disk and boot, in the manner specified.

10. In a grain-drill, the combination of a drag-bar, a disk revolubly journaled on said bar, a grain-boot provided with an arm having a pivotal connection with the bearing of the disk and bar, to facilitate the independent rising and falling of disk and boot, a spring connected at one end with the bar and its opposite end with the boot, and means connected with the bar for raising the same, and thereby the disk and boot.

11. In a grain-drill, the combination of a disk, a bracket upon which the disk is mounted, a grain-boot provided with an arm extending forwardly and upwardly and at its upper end pivotally connected with the bearing of the disk, a drag-bar secured to the bracket and extending rearwardly across the face of the disk and corresponding face of the boot, and a spring connected at one end to the boot and the opposite end to the free end of the drag-bar.

12. In a grain-drill, the combination of a drag-bar, a bracket attached to and depending from the said bar, an annular ring on the said bracket, a casing revolubly mounted on said ring, a member having a locked relation with the bracket and forming a bearing for said casing, a grain-boot provided with an arm adapted to have a pivotal connection at its forward end with the bracket, means for fixing the relative positions of the member and casing, also securing the arm to the bracket, and a dust-proof cup engaging the end of the casing.

13. In a grain-drill, the combination of a support, a disk mounted to revolve on said support, a grain-boot having a forwardly-extended furrow-opener adapted to travel in the wake of the cutting edge of the disk, means for pivotally connecting the furrow-opener to the said support adapting the boot to rise and fall independently of the said disk, and means for raising or lowering the disk and boot in unison.

14. In a grain-drill, the combination of a pivoted support, means for raising or lowering the support, and a grain-boot pivotally attached to the support and adapted to rise and fall independent of said support.

15. In a grain-drill, the combination of a pivoted support, means for raising or lowering the support, a grain-boot provided with an extension pivoted to the support and the boot proper adapted to rise and fall independent of the support, and a yielding connection between support and boot.

16. In a grain-drill, the combination of a pivoted support, a grain-boot provided with an arm pivoted to the support adapting the boot to have vertical movement independent of the support, means for raising and lowering the support, and means attached to the boot adapted in the raising or depressing of the support to be engaged by the said support to facilitate in raising or depressing the said boot.

17. In a grain-drill, the combination of a pivoted drag-bar, a disk revolubly mounted on said bar, a grain-boot adapted to have movement independent of the disk and provided with an arm pivoted to the bearing of the said disk, a yielding connection between the boot and drag-bar, a rod attached to the rear free end of the said bar, and means attached to said bar for raising and lowering the same, and thereby the drag-bar, disk and boot.

18. In a grain-drill, the combination of a support, a disk mounted to revolve on said support, a grain-boot having a forwardly-extended furrow-opener adapted to travel in the wake of the cutting edge of the disk, and at its forward end pivoted to the support of said disk.

19. In a grain-drill, the combination of a support, a concavo-convex disk mounted to revolve on said support, a grain-boot having a forwardly-extended furrow-opener adapted to travel in the wake of the cutting edge of the disk, said furrow-opener extending upwardly adjacent to the convex face of the disk and at its forward end pivotally attached to the support diametric with the axis of the disk.

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

LUTHER E. ROBY.
CLARENCE A. PATTISON.

Witnesses:
CHAS. W. LA PORTE,
ROBERT N. MCCORMICK.