H. E. PURDY & E. W. MILLER.

CORN HARVESTER.

APPLICATION FILED MAR. 13, 1909.

981,224. Patented Jan. 10, 1911.

2 SHEETS—SHEET 1.

Fig. 1.

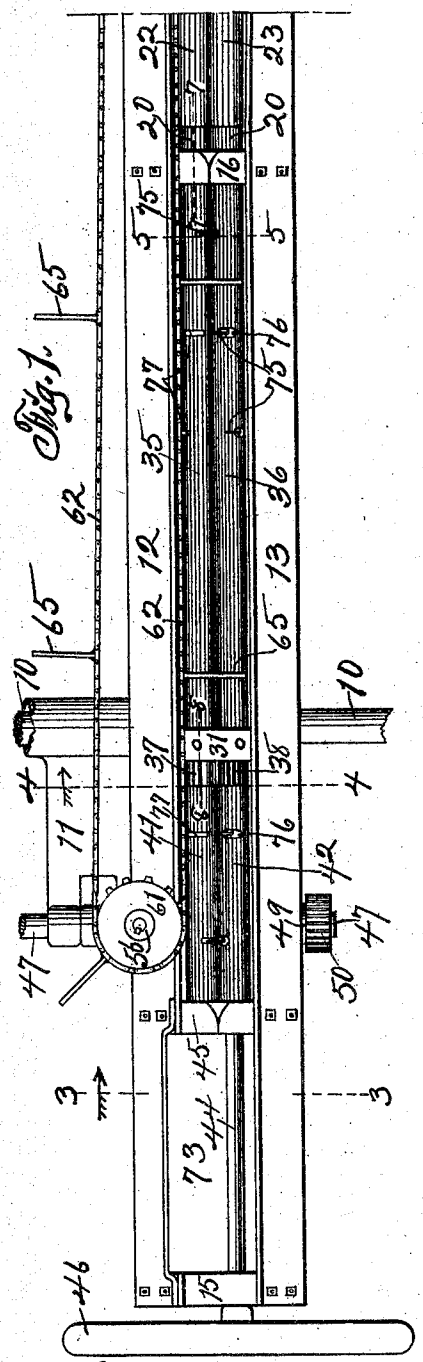

Fig. 2.

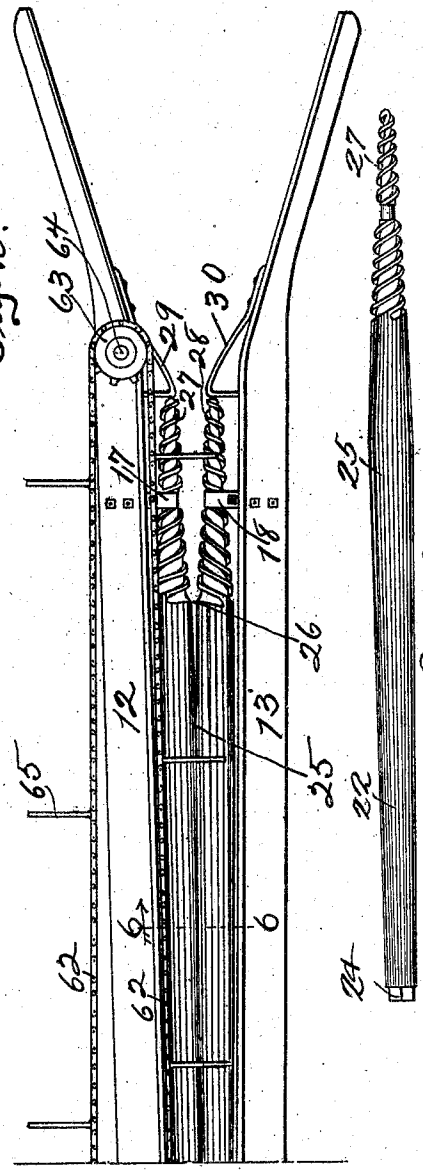

Fig. 3.

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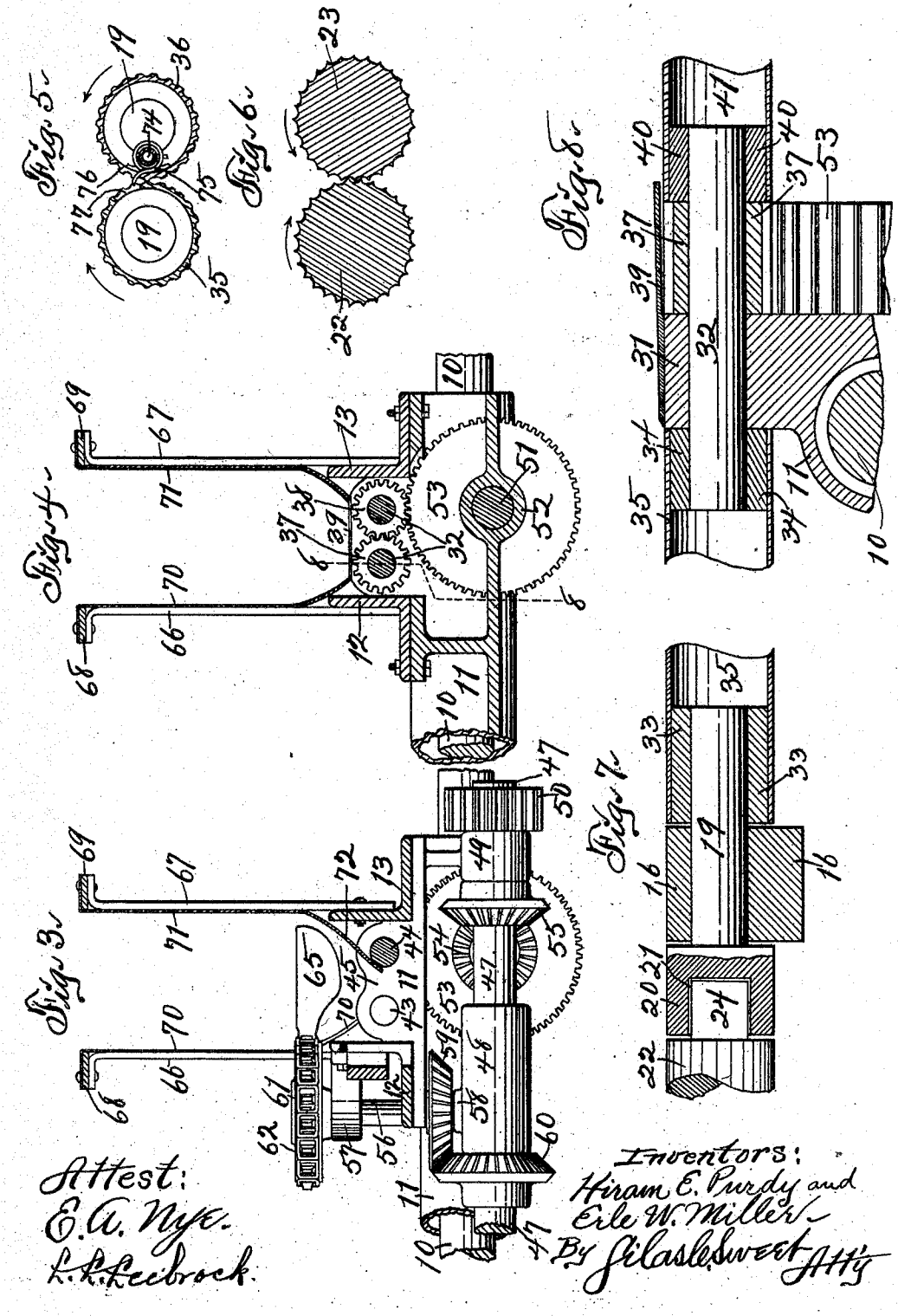
2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

HIRAM E. PURDY, OF ROCKWELL CITY, AND ERLE W. MILLER, OF DES MOINES, IOWA, ASSIGNORS OF FOUR-TENTHS TO SAID PURDY, TWO-TENTHS TO J. H. BRADT, ONE-TENTH TO T. W. McCREARY, ONE-TENTH TO E. Z. SMITH, ONE-TENTH TO A. F. DEAN, AND ONE-TENTH TO G. L. BROWER, ALL OF ROCKWELL CITY, IOWA.

CORN-HARVESTER.

981,224. Specification of Letters Patent. **Patented Jan. 10, 1911.**

Application filed March 13, 1909. Serial No. 483,616.

To all whom it may concern:

Be it known that we, HIRAM E. PURDY and ERLE W. MILLER, citizens of the United States, residing, respectively, at Rockwell City and Des Moines, in the counties of Calhoun and Polk and State of Iowa, have invented a new and useful Corn-Harvester, of which the following is a specification.

The object of this invention is to provide improved means for snapping and conveying corn.

A further object of this invention is to provide improved means for husking, conveying and delivering corn.

A further object of this invention is to provide improved means for husking corn.

A further object of this invention is to provide improved means for driving snapping devices, conveying devices and husking devices simultaneously.

Our invention consists in the construction, arrangement and combination of elements hereinafter set forth, pointed out in our claims and illustrated by the accompanying drawing, in which—

Figure 1 is a plan of a portion of the mechanism, side plates, frames for said plates and a covering plate being removed. Fig. 2 is a similar plan of the remainder of the mechanism. Fig. 3 is a cross-section on the indicated line 3—3 of Fig. 1. Fig. 4 is a cross-section on the indicated line 4—4 of Fig. 1. Fig. 5 is a cross section on the indicated line 5—5 of Fig. 1. Fig. 6 is a cross-section on the indicated line 6—6 of Fig. 2. Fig. 7 is a longitudinal section on the indicated line 7—7 of Fig. 1. Fig. 8 is a longitudinal section on the indicated line 8—8 of Fig. 4. Fig. 9 is a plan of one snapping roll detached from the remaining mechanism.

In the construction of the mechanism as shown, the numeral 10 designates a journal or pivot adapted to be suitably supported as illustrated in our companion application executed on even date herewith and pending concurrently in the Patent Office. A gear-frame 11, preferably made of metal by molding, is pivoted at one end on the journal 10 and extends rearward therefrom. The gear-frame may be oscillated on the journal 10 and serves to support the remaining mechanism hereinafter described. Angle-bars 12, 13 are fixed to and extend forward and rearward from the gear-frame 11 at right angles to the journal 10 and the length thereof in front of the gear-frame greatly exceeds the length at the rear of said frame. The angle-bars 12, 13 are spaced apart and have their ribs vertical and parallel with each other while their base flanges extend outwardly from the lower margins of the ribs. The base flanges of the angle-bars 12, 13 are bolted to the gear-frame 11 and also are bolted at their rear ends to a journal bearing 15 mounted between said bars. The base flanges of the angle-bars 12, 13 also are bolted to a journal bearing 16 connecting said bars at a point in advance of the journal 10, but said angle-bars are not connected at any point in advance of said journal bearing and dependence is made on the stiffness of the base flanges to prevent spreading of their forward ends. Journal bearings 17, 18 are fixed to and project inward from the forward end portions of the angle-bars 12, 13. Coupling shafts 19, one of which is shown in Fig. 7, are journaled side by side in the journal bearing 16 and are formed with heads 20 on their forward ends, each of which heads is formed with a socket 21 angular in cross-section.

Snapping-rolls 22, 23 are arranged side by side and are formed with studs 24 on their rear ends, which studs are angular in cross-section and engage loosely in the sockets 21. The snapping rolls 22 23 taper slightly in both directions from points of largest diameter at 25, one end portion of each roll tapering more abruptly than the remainder. The most abruptly tapered end portions of the snapping rolls 22, 23 are journaled between their ends in the bearings 17, 18 and are formed with screws 27, 28, oppositely pitched, extending on opposite sides of said bearings. All of the peripheries of the snapping rolls 22, 23 at the rear of the screws 27, 28 are corrugated or fluted longitudinally. The loose connection between the studs 24 and socket heads 20 is in the nature of a universal joint to permit of rotation of the snapping rolls regardless of their tapering shape. The extreme forward end portions of the angle-bars 12, 13 diverge and form a fork or crotch adapted to engage and direct cornstalks and ears to the forward ends of the snapping rolls and deflectors 29,

30 are fixed to and extend inward therefrom across the points of the snapping rolls and serve to direct said stalks and ears to the space between the screws 27, 28. It is the function of the screws 27, 28 to feed the stalks and ears rearwardly and cause them to be engaged between the fluted or corrugated peripheries of the snapping rolls. A journal bearing 31 is formed on and rises from the gear-frame 11 between the angle-bars 12, 13 and coupling shafts 32 (one of which is shown in Fig. 8) are journaled side by side in said bearing. Collars 33 (Fig. 7) are fixed to the rear ends of the coupling shafts 19 and collars 34 (Fig. 8) are fixed to the forward ends of the coupling shafts 32. Husking rolls 35, 36 inclose at their ends and are fixed to the collars 33, 34 and approximately fill the space between the journal bearings 16 and 31 and extend across the space between the webs of the angle-bars 12, 13. Intermeshing gears 37, 38 are fixed to the coupling shafts 32 immediately at the rear of the journal bearing 31 and said gears are approximately the same diameter as the husking rolls 35, 36. A protecting plate 39 is fixed to the journal bearing 31 and extends rearward across the tops of the gears 37, 38 (Figs. 4 and 8). Collars 40 (Fig. 8) are mounted rigidly on rear end portions of the coupling shafts 32 and husking rolls 41, 42 inclose and are fixed at their forward ends to said collars. Similar collars and coupling shafts or pivots 43, 44 are employed to journal the rear ends of the husking rolls 41, 42 to a journal bearing 45, formed on and rising from the gear-frame 11 at the rear of the bearing 31. The coupling shaft 44 extends through and is journaled in the bearing 15 and is provided with a balance wheel or fly wheel 46 on its rear end. A driving shaft 47 is mounted for rotation in bearings 48, 49 formed on the gear-frame 11 and extends across and beneath the angle-bars 12, 13 and husking rolls 41, 42 at the rear of and parallel with the supporting journal 10.

The driving shaft may be rotated in any desired manner, such as by gearing to a pinion 50 on one end thereof, as further illustrated in our companion application above mentioned. A counter-shaft 51 is journaled in a bearing 52 formed in the frame 11 and is arranged parallel with and beneath the husking roll 42 and a pinion 53, rigidly mounted on one end thereof, meshes with the gear 38. The pinion 53 preferably is materially larger than the gear 38. A bevel gear 54 is rigidly mounted on the rear end portion of the counter-shaft 51 and meshes with a bevel gear 55 on the driving shaft 47. It will be observed that the husking rolls are driven by the intermeshing gears 37, 38, of like size, the pinion 53, the shaft 51, the bevel gears 54, 55 and the driving shaft 47 in sequence and, in turn, drive the snapping rolls through the connections described.

A vertical shaft 56 is journaled and stepped in bearings 57, 58 on the gear-frame immediately above the driving shaft 47 and on the opposite side of the husking roll 41 from the husking roll 42. A bevel gear 59, fixed to the lower end of the vertical shaft 56, meshes with a bevel gear 60 on the driving shaft 47. A sprocket wheel 61, fixed to the upper end of the shaft 56, is connected by a conveyer chain 62 to a sprocket wheel 63 suitably mounted on a pivot 64 rising from the forward end portion of the angle-bar 12. The conveyer chain 62 is provided with lugs 65 adapted to extend across the space between the ribs of the angle bars 12, 13 and travel, in rearward movement, directly above the snapping and husking rolls. It will be observed that the conveyer chain 62 is driven by a sprocket wheel 61, vertical shaft 56, gears 59, 60 and driving shaft 47 in sequence. Posts 66, 67 are fixed to and rise from the ribs of the angle-bars 12, 13 in parallel rows and the upper ends of said posts are connected longitudinally of the plates by bars 68, 69. Side plates 70, 71 are fixed to the bars 68, 69 and rows of posts 66, 67 respectively and form a housing or walls on opposite sides of and above the husking and snapping rolls. A lip 72 of the side plate 71 extends inward across that portion of the shaft 44 between the bearings 15 and 45 and directly opposite thereto the lower portion of the side plate 70 is cut away to form an opening 73 (Fig. 1) through which husked corn may fall, as further illustrated in our companion application above mentioned. Throughout the remainder of the length of the side plates 70, 71 the lower margins thereof extend inwardly (Fig. 4) and serve as a partial bottom or deflectors to direct ears of corn, having husks or partially denuded, toward the line of contact of snapping rolls and husking rolls. Tubes 74 are mounted within and longitudinally of the husking rolls 36 and 42 and are fixed to the inner surfaces thereof. Husking pins 75, each formed of a single length of spring wire, are mounted on the tubes 74. Slots 76 are formed in and circumferentially of the husking rolls 36 and 42 adjacent to the tubes 74 and one end portion of each husking pin is curved outwardly through one of said slots. The other end portion of each husking pin extends through its tube 74 and causes a connection thereto. Slots 77 are formed in and circumferentially of the husking rolls 35 and 41 opposite to the slots 76 so that in conjunctive rotation of the husking rolls the hooked end portions of the pins 75 may extend outward from the slots 76 and inward through the slots 77 at times.

In practical use the mechanism herein-

before described is carried through a cornfield preferably in inclined position so that the forward extremities of the angle-bars 12, 13 are in proximity to the ground, means for such carrying being described in our companion application above mentioned. The operative parts of this mechanism are driven by the primary shaft 47; the fork at the forward end directs corn stalks to position between the screws 27, 28; the screws feed said stalks between the abruptly tapered portions of the snapping rolls; the lugs 65 on the conveyer chain 62 hold the stalks in upright position; the fluted snapping rolls 22, 23, revolving as illustrated in Fig. 6, feed the stalks downwardly and pinch or snap off the ears of corn. The tendency is to draw the stem ends of the ears between the snapping rolls and generally the major portion of the husks are caught between said rolls before the ears are snapped off from the stems, thus partially, at least, denuding the ears. Then the ears fall upon the snapping rolls 22, 23 or the husking rolls 35, 36 and are carried rearward thereon by the lugs of the conveyer chain 62. The side plates 70, 71 retain the ears on the rolls and the inturned lower marginal portions of said plates direct the ears to the line of contact of the rolls. The projecting portions of the husking pins 75 engage whatever husks remain on the ears and pull them downward so that the fluted peripheries of the husking rolls may draw them away from the ears and discharge them downwardly. At the same time the ears are revolved by the action of the husking pins and are caused to present all of their surfaces to said pins and the husking rolls. The ears are moved downward by the lugs 65 over the journal bearing 45 and fall by gravity through the opening 73. An opening is formed in the side plate 70 above the drive shaft 47 so that the sprocket wheel 61 and conveyer chain 62 may operate through said plate and the forward portion of said chain extends through another opening in the forward end of the side plate. This mechanism may be oscillated and adjusted on the supporting journal 10 into level or inclined position, as to which reference is made to our companion application above mentioned.

We claim as our invention—

1. In a corn harvester, snapping rolls, each roll tapered in opposite directions from a point of largest diameter intermediate of its ends, the taper of one end portion being more abrupt than the taper of the remainder, both said rolls formed with opposing screws on the most abruptly tapered portions thereof, and also formed with longitudinally-fluted peripheries except across said screws.

2. In a corn harvester, a supporting bearing, a gear frame mounted for oscillation thereon, frame bars mounted on said gear frame and extending across said bearing and diverging at their forward ends, said frame bars spaced apart, journal bearings located between rear and intermediate portions of and connecting said frame bars, journal bearings located between and carried by forward end portions of said frame bars and spaced apart, snapping rolls journaled in the latter bearings and arranged between the forward end portions of said bars, husking rolls journaled in the first bearings and arranged between intermediate portions of said bars and connected to said snapping rolls, gearing between said gear frame and husking rolls, said husking rolls each formed in sections, and intermeshing gears interposed between and fixed to said sections.

3. In a corn harvester, a supporting bearing, a gear frame mounted for oscillation thereon, frame bars mounted on said gear frame and extending across said bearing and diverging at their forward ends, said frame bars spaced apart, journal bearings located between rear and intermediate portions of and connecting said frame bars, journal bearings located between and carried by forward end portions of said frame bars and spaced apart, snapping rolls journaled at their forward ends in the latter bearings between the forward end portions of said bars, husking rolls journaled in the first journal bearings and arranged between intermediate portions of said bars and connected to said snapping rolls, gearing between said gear frame and husking rolls, said husking rolls each formed in sections, and intermeshing gears interposed between and fixed to said sections, together with side plates rising from said frame bars, one of said plates being cut away at its bottom at the rear of the husking rolls.

4. In a corn harvester, a supporting bearing, a gear frame mounted for oscillation thereon, frame bars mounted on said gear frame and extending across said bearing and diverging at their forward ends, said frame bars spaced apart, journal bearings located between rear and intermediate portions of and connecting said frame bars, journal bearings located between and carried by forward end portions of said frame bars and spaced apart, snapping rolls journaled at their forward ends in the latter bearings between the forward end portions of said bars, husking rolls journaled in the first bearings and arranged between intermediate portions of said bars and connected to said snapping rolls, gearing between said gear frame and husking rolls, said husking rolls each formed in sections, and intermeshing gears interposed between and fixed to said sections, together with side plates rising from said frame bars, one of said plates

cut away at its bottom at the rear of the husking rolls, the bottom portions of said plates bent inward toward the line of contact of the rolls.

5. In a corn harvester, a gear-frame, frame bars mounted thereon, rolls formed in sections journaled between said frame bars, intermeshing gears interposed between and fixed to the sections of said rolls, a longitudinal shaft on said gear-frame, a pinion on said shaft meshing with one of said intermeshing gears, a transverse drive-shaft, bevel gear connections between said shafts and means for rotating said drive shaft, together with a vertical shaft on said gear-frame, a sprocket wheel on the upper end of said vertical shaft, bevel gear connections between the drive-shaft and vertical shaft, a sprocket wheel on the forward end portion of one of said frame bars, a conveyer chain on said sprocket wheels and lugs on said chain adapted to extend across said rolls.

6. In a corn harvester, a gear-frame, frame bars mounted thereon, rolls formed in sections journaled between said frame bars, intermeshing gears interposed between and fixed to the sections of said rolls, a longitudinal shaft on said gear frame, a pinion on said shaft meshing with one of said intermeshing gears, a transverse drive-shaft, bevel gear connections between said shafts, and means for rotating said drive shaft, together with a vertical shaft on said gear-frame, a sprocket wheel on the upper end of said vertical shaft, bevel gear connections between the drive-shaft and vertical shaft, a sprocket wheel on the forward end portion of one of said frame bars, a conveyer chain on said sprocket wheels and lugs on said chain adapted to extend across said rolls, shafts fixed to and alining with said rolls, one of said shafts projecting beyond the other and outside said frame, and a fly wheel on the extremity of the longer shaft.

7. In a corn harvester, a supporting frame, snapping and husking rolls mounted in alinement on said frame and of a combined length less than the length of the frame, side plates rising from said frame, lower margins of said plates bent inward above said rolls, a portion of the lower margin of one plate extended to form a lip, the other plate being cut away at its lower margin opposite said lip, and conveyer devices mounted for travel longitudinally of and above said rolls.

8. In a corn harvester, a snapping roll tapering slightly throughout a major portion of its length and tapering more abruptly throughout a minor portion of its length and fluted longitudinally of its periphery through both tapers, said roll also formed with a tapering screw on its smaller end, said screw formed with a reduced journal near its center.

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Witnesses:
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