(No Model.) 5 Sheets—Sheet 1.

L. MILLER.

GRAIN BINDING HARVESTER.

No. 480,114. Patented Aug. 2, 1892.

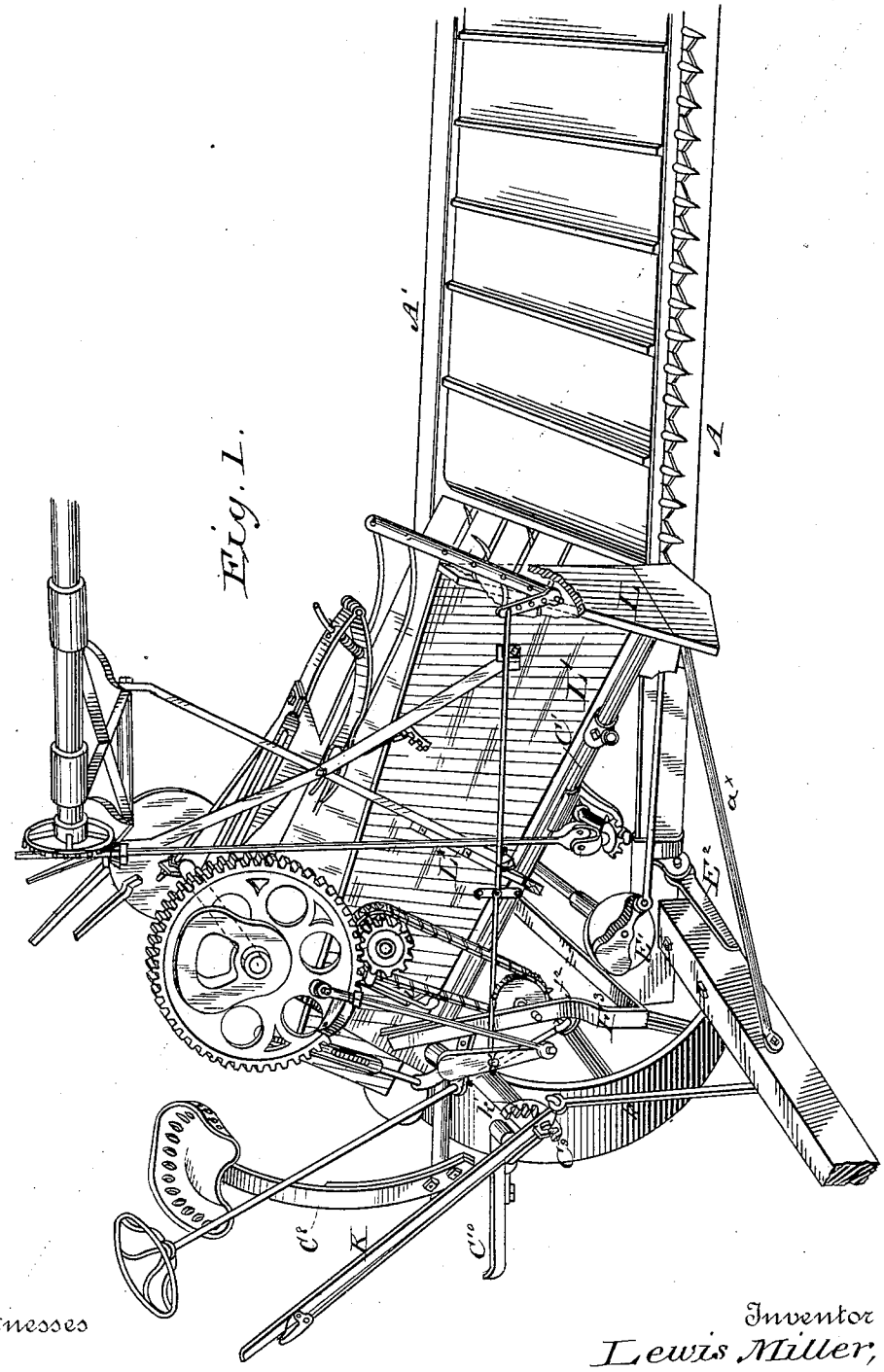

Fig. 1.

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(No Model.) 5 Sheets—Sheet 2.

L. MILLER.

GRAIN BINDING HARVESTER.

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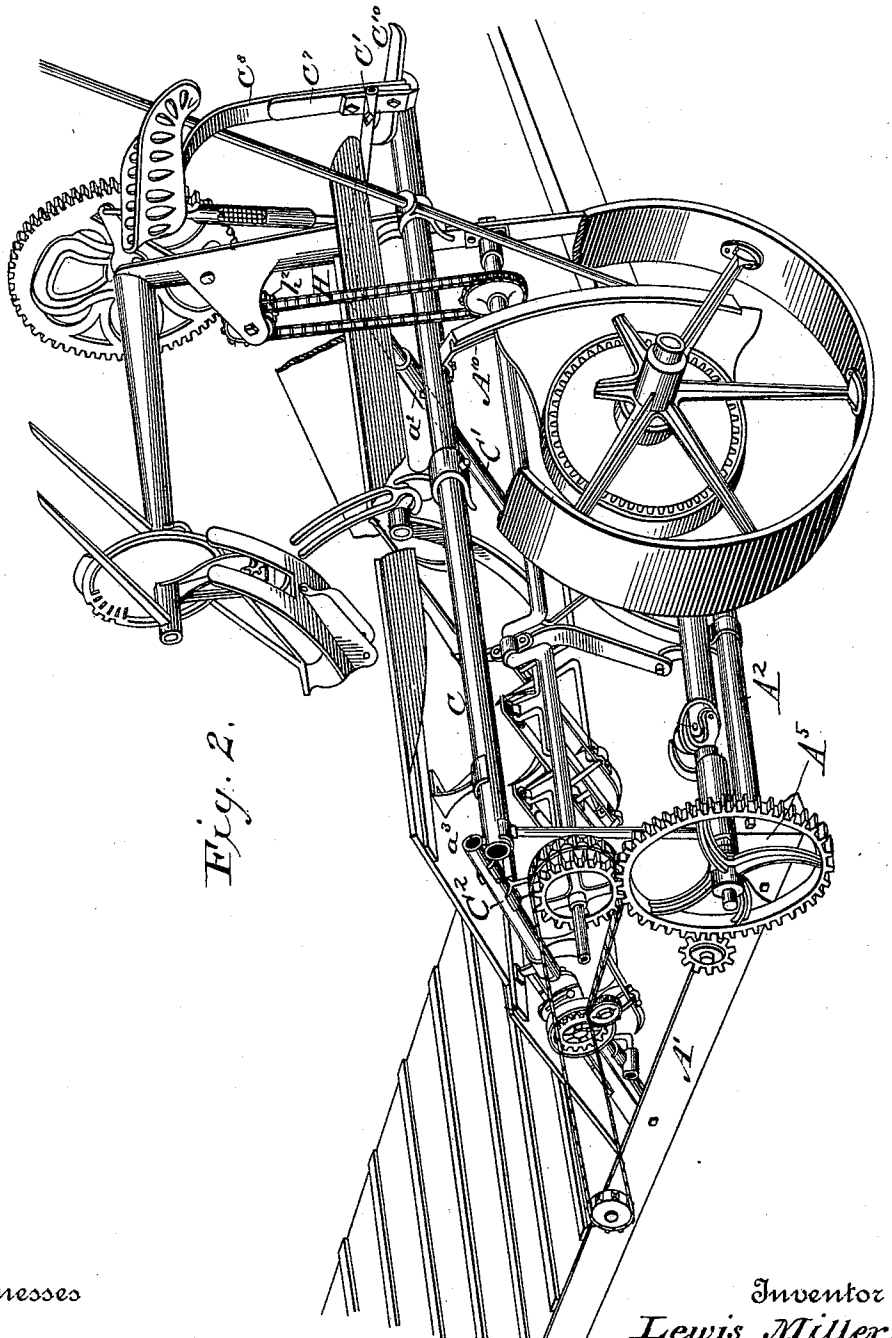

Fig. 2.

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(No Model.) 5 Sheets—Sheet 3.

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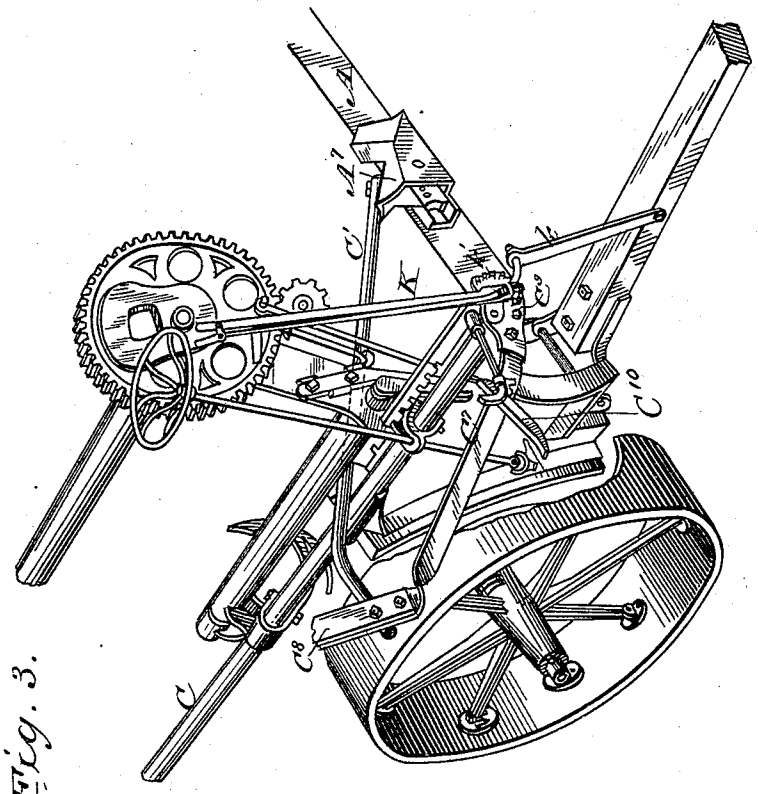

Fig. 3.

Witnesses

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GRAIN BINDING HARVESTER.

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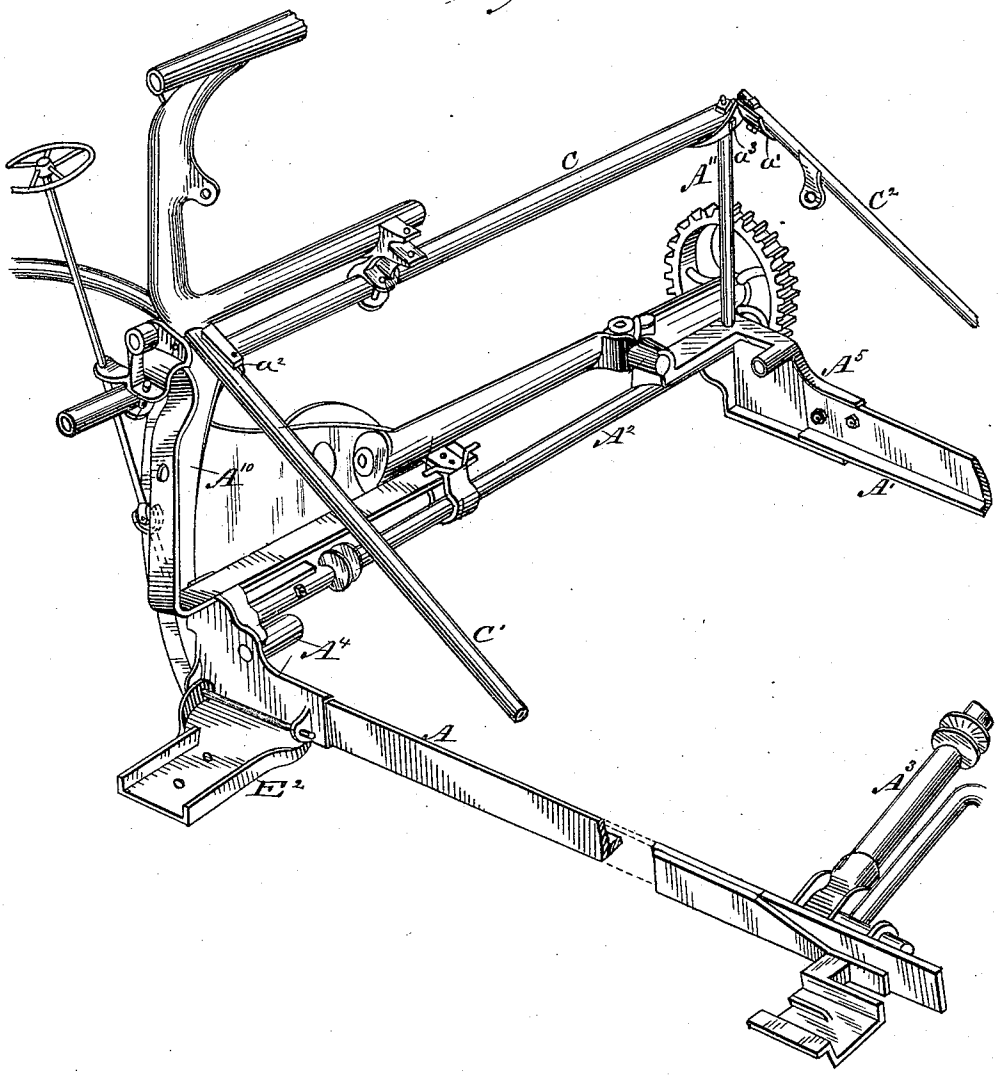
Fig. 4.



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(No Model.) 5 Sheets—Sheet 5.

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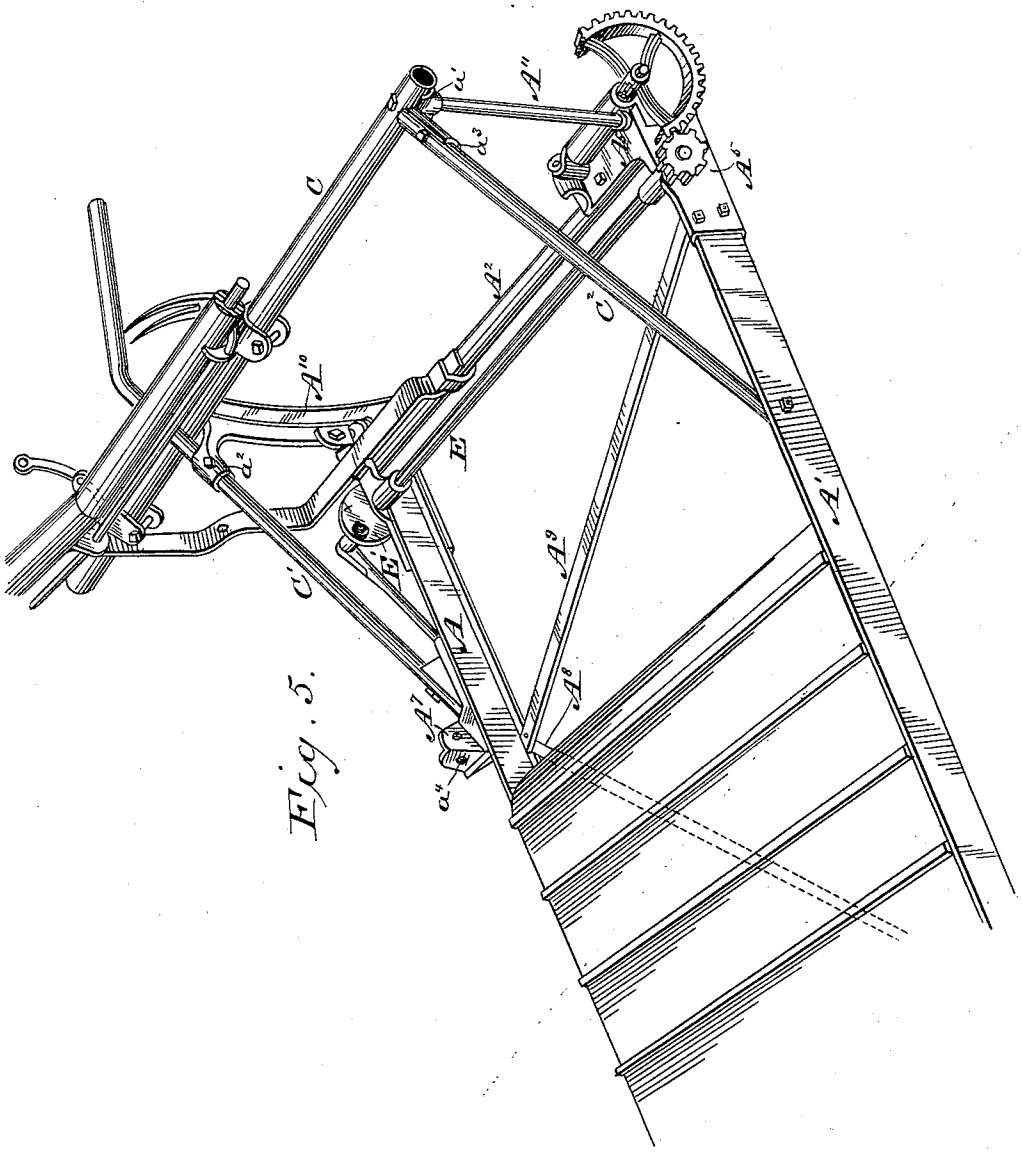

Fig. 5.

Witnesses

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UNITED STATES PATENT OFFICE.

LEWIS MILLER, OF AKRON, OHIO.

GRAIN-BINDING HARVESTER.

SPECIFICATION forming part of Letters Patent No. 480,114, dated August 2, 1892.

Original application filed April 30, 1886. Serial No. 200,754. Divided and this application filed April 2, 1889. Serial No. 305,754. (No model.) Patented in England December 22, 1888, No. 18,739.

To all whom it may concern:

Be it known that I, LEWIS MILLER, a citizen of the United States, residing at Akron, in the county of Summit and State of Ohio, have invented certain new and useful Improvements in Grain-Binding Harvesters, (for which I have received Letters Patent in Great Britain, No. 18,739, dated December 22, 1888,) of which the following is a specification.

My invention more especially relates to what is known as the "low-down" grain-binding harvester. Its object is so to reorganize it as to secure a strong, simple, compact, and effective light-weight machine, which ends I attain by the novel organization of instrumentalities hereinafter described.

The subject-matter claimed is hereinafter specifically designated in the claims at the close of the specification.

The accompanying drawings represent so much of a low-down grain-binding harvester embodying all my present improvements as is necessary to illustrate the subject-matter herein claimed.

Except as hereinafter indicated the views are all perspectives.

Figure 1 represents the machine as seen from the front and grain side, showing its general organization; Fig. 2, a view from the rear and stubble side of the machine, showing the framework, gearing, and binding mechism; Fig. 3, a view from the front and stubble side thereof with portions of the mechanism removed, showing the framework and binding mechanism; Fig. 4, a view from the front and grain side, showing the framework, binder-gear standard, adjusting and axle-supporting devices, and gearing; Fig. 5, a view from the rear and grain side, showing the frame and gearing.

The subject-matter herein claimed relating mainly to the construction of the combined main and binder frame and its adjustments, it is deemed unnecessary here to describe in detail the construction of the other parts of the machine, more especially as they are fully described and shown in other divisions of this application, respectively serially numbered and filed as follows, viz: 200,754, filed April 30, 1886; 304,945, filed March 27, 1889, and 305,753, 305,755, and 305,756, respectively filed April 2, 1889.

The front and rear transverse frame-bars or sills A A′ are shown as made of angle iron or bars having horizontal flanges at their lower sides or edges turned inwardly toward each other. Longitudinal frame bars or tubes A^2 A^3 are firmly secured to these sills at their points of intersection by means of socketed angular braces or corner-pieces A^4 A^5, bolted to the sills, in which sockets the tubes are inserted. These corner-pieces, it will be observed, are composed of vertical walls and horizontal edges as well as sockets in contradistinction to the angular ferrules or tubes sometimes used in harvester-frames. The front and rear corner-pieces A^4 A^5 at the inner stubble or drive-wheel end or side of the frame are respectively provided with bearings or sleeves for the crank-shaft E, which lies close to and parallel with but slightly above and inside of the longitudinal frame-tube A^2. An angular box-bracket A^7, secured on the forward side of the front transverse frame bar or sill A at or near the inner or stubble end of the cutting apparatus and platform apron or carrier, constitutes a support for the inner shoe, grain-guard, and deflector; a guard for the heel end of the knife and the end of the pitman connected therewith; a point of attachment for the lower end of the front inclined transverse tubular bar C′ of the triangular binder-frame which supports the elevating table and binder, as hereinafter explained, and as a point of attachment a^4 for the oblique pivoted draft rod or brace $a^\times$, connecting the tongue and frame and supporting them against working strains due to the side draft, &c. The forward ends of two diagonal braces A^8 A^9 are secured to this bracket or to the sill near thereto. These braces diverge backwardly until they intersect the rear transverse sill, the inner brace being secured to the inner rear corner-piece A^5 on the drive-wheel side of the frame, while the other is connected with the corresponding grain side corner-piece, thus serving materially to stiffen not only the front sill A, but the entire platform-frame, against working strains, which it will be seen concentrate upon the junction-point of these braces with the front sill. An inwardly-inclined transverse socket or sleeve a^2 on the upper end of the standard A^{10} receives the upper portion of the front inclined

transverse tubular binder-frame bar C′ above mentioned. An upright post A^{11}, mounted on the inner rear corner piece A^5, supports the rear end of a longitudinal tubular binder-frame bar C, the forward end of which is supported by the standard A^{10}. The lower end of an inclined transverse tubular binder-frame bar C^2 is secured to the rear transverse frame bar or sill A′, coincident or in line longitudinally with the bracket A^7 of the front sill or the point of attachment of the front bar C′, while its upper end is secured in a socket a' on a plate a^3, secured on the upright A^{11} and longitudinal bar C, thus constituting a strong triangular frame for the support of the binding and other mechanism, which I call for convenience the "binder-frame."

My improved invention, it will be seen, combines the main frame, the platform-frame, and the binder-frame all in one compact and light, but rigid and strong frame, the advantages of which organization are obvious.

The front wall or face of the inner forward corner-piece A^4 is provided with vertical ears or lugs, to which the rear end of a tongue plate or socket E^2 is hinged by a transverse horizontal pivot-pin.

The crank-shaft E, driven by a spur-pinion on its rear end, extends through its bearing-sleeves on the corner-pieces and carries a crank-wheel E′ on its forward end, arranged directly in front of the corner-piece A^4 and over the expanded rear part of the tongue-plate E^2, hinged to the corner-piece, thus serving to preserve the crank-wheel and its pitman connection from injury or obstruction. (See Fig. 1.)

The outer upper longitudinal binder-frame bar C and front inclined transverse binder-frame bar C′ extend both longitudinally and laterally beyond the standard A^{10}, to which they are respectively connected. These bars are also rigidly united by an angular or inclined brace C^7, Fig. 3, the rear outer end of which extends above the transverse bars C′ to support a seat-standard C^8, which may be secured to it by the same bolts which connect the brace C^7 and bar C′ or in other suitable ways. The driver's foot-board or support C^{10} is secured to the brace C^7 in any suitable manner. The front inner end of the brace C^7 at the point where it is secured to the forward end of the longitudinal bar C is expanded or widened or has a plate C^9 secured to it and extends inward beyond the bar C, as shown. A lever K is mounted on a pivot projecting longitudinally forward from this plate, the inner edge of which is curved and carries on its front face a toothed rack or segment k', also curved in an arc of a circle of which the pivot of lever K is the center. The lever K is connected by a link k with the hinged pole or tongue, and its upper end, which extends within reach of the driver in his seat, is provided with a thumb-lever for operating a latch adapted to engage the rack k' for holding the lever K at any desired adjustment. By vibrating the lever laterally the driver can rock the machine on its carrying-wheels for raising and depressing the cutting apparatus in a manner that will be readily understood.

The angle-iron bracket A^7, forming the support for the tongue-brace $a^\times$ and inclined transverse bar C′, as described, has also secured to it through upright flanges a^4 the grain-deflector L and a guard-board L′, the latter extending up the inclined elevating-table at its forward edge and having its upper end secured to and supported by an angle-iron or strap $L^\times$, Fig. 1, secured to the front inclined transverse bar C′ or to a fixed part of the inclined elevating-table, such as the longitudinal frame-bar C, so as to be stationary therewith.

Having thus fully described the construction, organization, and operation of my improved low-down grain-binding harvester, what I claim herein as new and of my own invention is—

1. The combination, substantially as hereinbefore set forth, of the transverse sills, the longitudinal frame-bars, the connecting corner-pieces, the standards mounted, respectively, on the inner, front, and rear corner-pieces, the longitudinal supporting-bar or upper binder-frame tube of the binder-gear frame mounted thereon, and the inclined transverse bracing binder-frame tubes respectively connecting the front and rear sills directly with the longitudinal supporting-bar.

2. The combination, substantially as hereinbefore set forth, of the transverse sills, the longitudinal frame-bars, the connecting corner-pieces, the diagonal braces connecting the sills and rear corner-pieces, the box-bracket on the front sill at the point of intersection of the braces, the standards on the inner corner-pieces, the longitudinal supporting-bar or upper frame-tube supported by said standards, and the inclined transverse bracing-frame bar or bars respectively connecting the front and rear sills with the longitudinal supporting-bar.

3. The combination, substantially as hereinbefore set forth, of the transverse sills, the longitudinal frame-bars, the connecting corner-pieces, the standards thereon, the longitudinal supporting-bar or upper frame-tube mounted thereon and extending beyond its forward supporting-standard, the forward inclined transverse frame-bar connecting the front sill and longitudinal supporting-bar and extending beyond the forward supporting-standard, the inclined brace C^7, connecting the forward end of the upper longitudinal frame-tube and the outer end of the forward inclined transverse frame-bar, and the driver's-seat-supporting standard carried by said brace.

4. The combination, substantially as hereinbefore set forth, of the transverse sills, the inner longitudinal frame-bar, the connecting corner-pieces, the standards mounted on the

inner corner-pieces, the forwardly-extended longitudinal supporting frame-tube mounted on said standards, the forward inclined bracing binder-frame bar extending outward beyond the intersecting longitudinal frame-tube, the inclined brace connecting the projecting ends of these tubes, and the driver's-seat-supporting standard and the driver's foot-board both mounted on the brace so as to bring them above, in front, and outside of the longitudinal plane of the driving-wheel.

5. The combination, substantially as hereinbefore set forth, of the transverse sills, the longitudinal frame-bars, the corner-pieces, the standards, the upper longitudinal frame-tube, the inclined transverse forward binder-frame tube, the inclined brace connecting the projecting ends of these tubes, the rack thereon, the adjusting-lever, and the link connecting the lever and tongue.

6. The combination, substantially as hereinbefore set forth, of the transverse sills, the longitudinal frame-bars, the connecting corner-pieces, the standards, the longitudinal frame-tube, the forward transverse inclined intersecting bracing binder-frame tube, the brace connecting the projecting ends of these tubes, the rack and adjusting-lever thereon, the tongue pivoted on the frame, the box-bracket on the front sill, the pivoted draft-rod connecting the box-bracket and tongue, and the link connecting the tongue and adjusting-lever.

7. The combination, substantially as hereinbefore set forth, of the front sill, the box-bracket thereon, the forward inclined transverse bracing binder-frame tube, the longitudinal supporting-frame tube intersecting it, the deflector, and the fender or guide-board secured to the box-bracket, and inclined transverse binder-frame tube.

8. An angular box-bracket constructed substantially as hereinbefore set forth, secured to the front transverse frame-bar or sill near the heel end of the cutting apparatus and constituting a guard and guide for the heel end of the knife and the pitman, a support for the inner shoe and grain guard or deflector, a point of attachment for the draft-rod connected with the tongue, and a support for the front bar of the binder-frame.

9. A corner-piece constructed substantially as hereinbefore set forth, secured to the inner front corner of the frame and constituting a support for the inner longitudinal and front transverse frame-bars, the binder-frame, the axle-support, binder-gear standard, gearing, adjusting devices, shafts, and tongue-plate.

10. The inner rear corner-piece constructed substantially as hereinbefore set forth, constituting a support for the inner longitudinal and rear transverse frame-bars, binder-frame, axle-support, shafts, and gearing.

11. The combination, substantially as hereinbefore set forth, of the transverse sills, the inner longitudinal frame bar or tube, the interposed socketed angular corner-pieces, the crank-shaft journaled therein, and standards mounted thereon supporting the longitudinal binder-frame support on which the binder-gear standard is adjustable.

12. The combination, substantially as hereinbefore set forth, of the combined main and binder frame, the inclined brace-bar C^7, and the driver's seat and the tilting lever mounted thereon.

13. The combination, substantially as hereinbefore set forth, of the platform-frame, the binder-frame, a binder-gear standard adjustable therein, the inclined transverse brace-bar C^7 and a lever mounted on said bar, a tongue hinged to the platform-frame, and a link connecting the tongue and lever to tilt or rock the machine on its supporting-wheels.

14. The combination, substantially as hereinbefore set forth, of the front sill, a shoe thereon which supports the inside deflector or nose-piece and the butt guide-board, and a transverse inclined bracing frame-tube, the lower end of which is attached to the shoe, while the upper end is connected with the upright standard which supports the upper longitudinal binder-frame tube near its point of intersection with said transverse inclined bracing frame-tube.

In testimony whereof I have hereunto subscribed my name.

LEWIS MILLER.

Witnesses:
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