(No Model.) 4 Sheets—Sheet 1.

L. MILLER.

GRAIN BINDING HARVESTER.

No. 493,731. Patented Mar. 21, 1893.

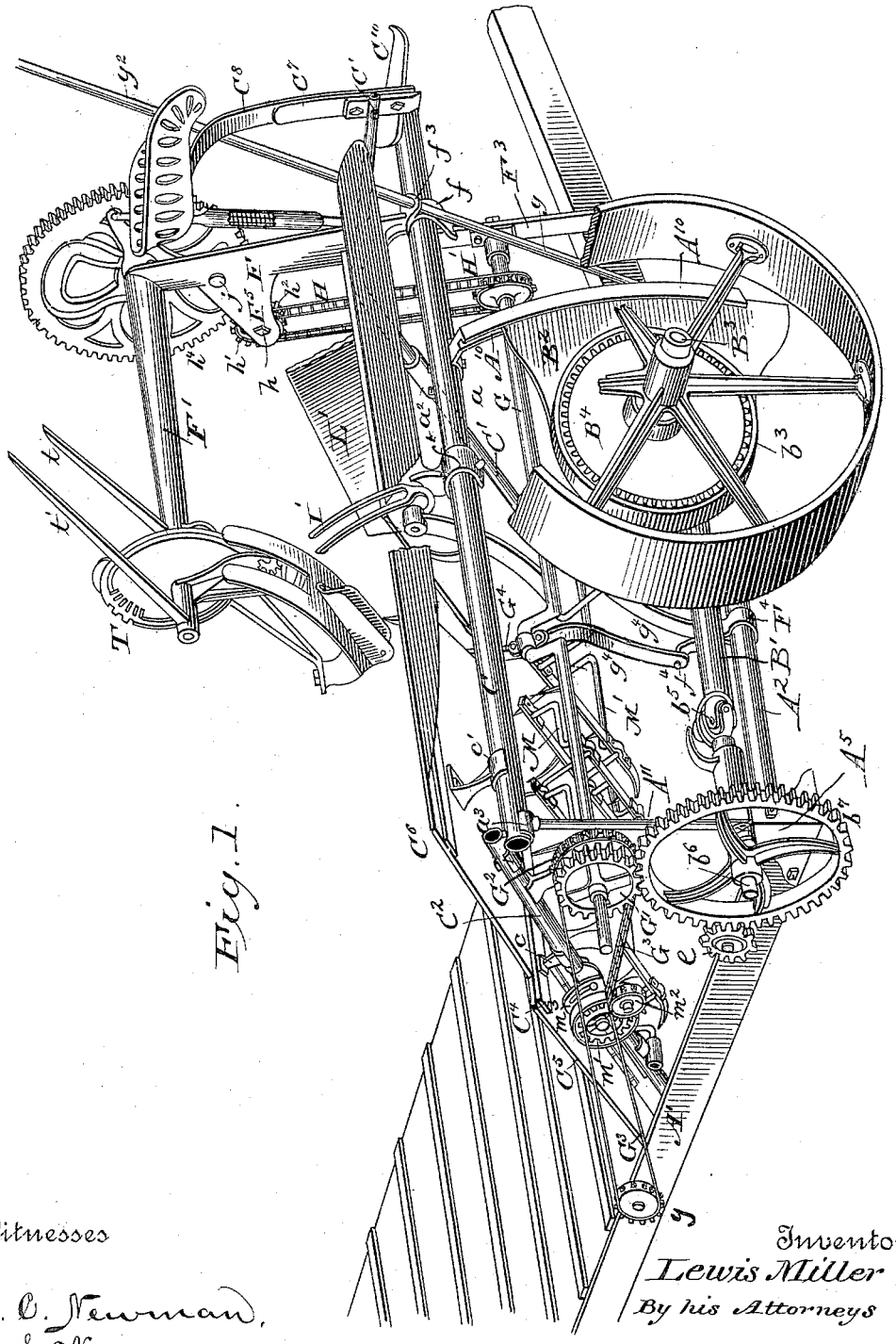

Fig. 1.

Witnesses

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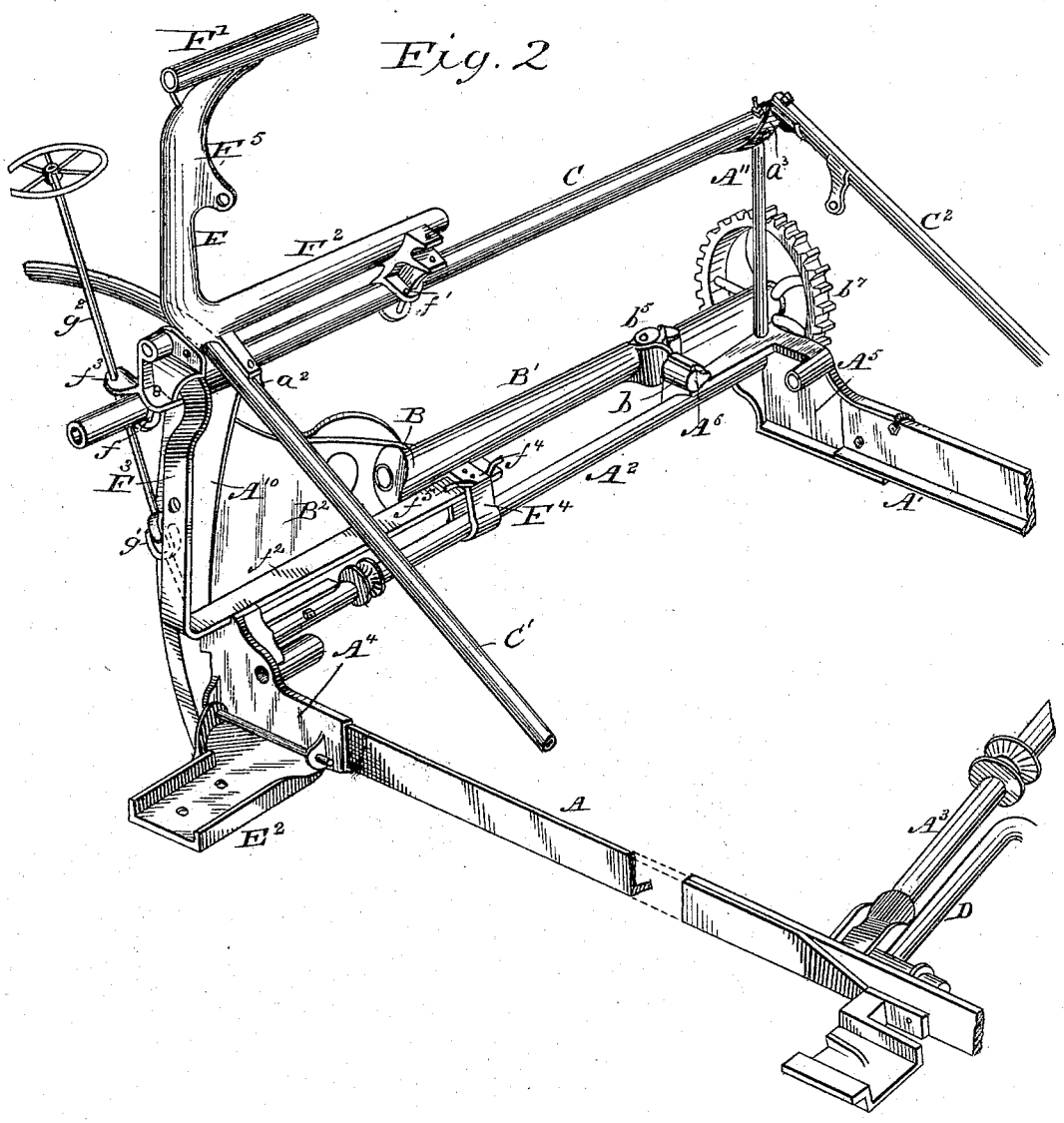
Fig. 2



Witnesses

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(No Model.) 4 Sheets—Sheet 3.

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GRAIN BINDING HARVESTER.

No. 493,731 Patented Mar. 21, 1893.

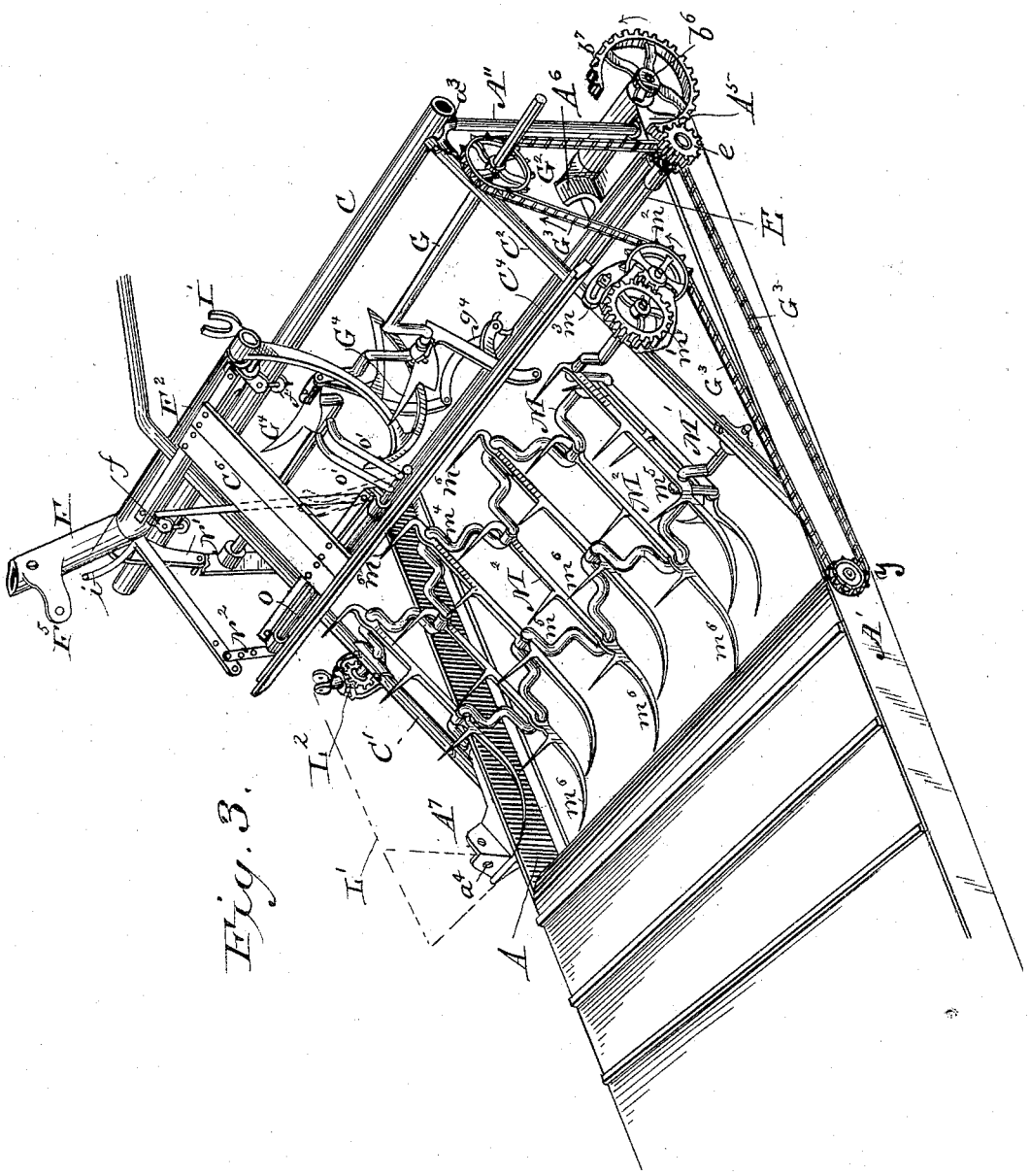

Fig. 3.

Witnesses

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(No Model.) 4 Sheets—Sheet 4.

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GRAIN BINDING HARVESTER.

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FIG. 4.

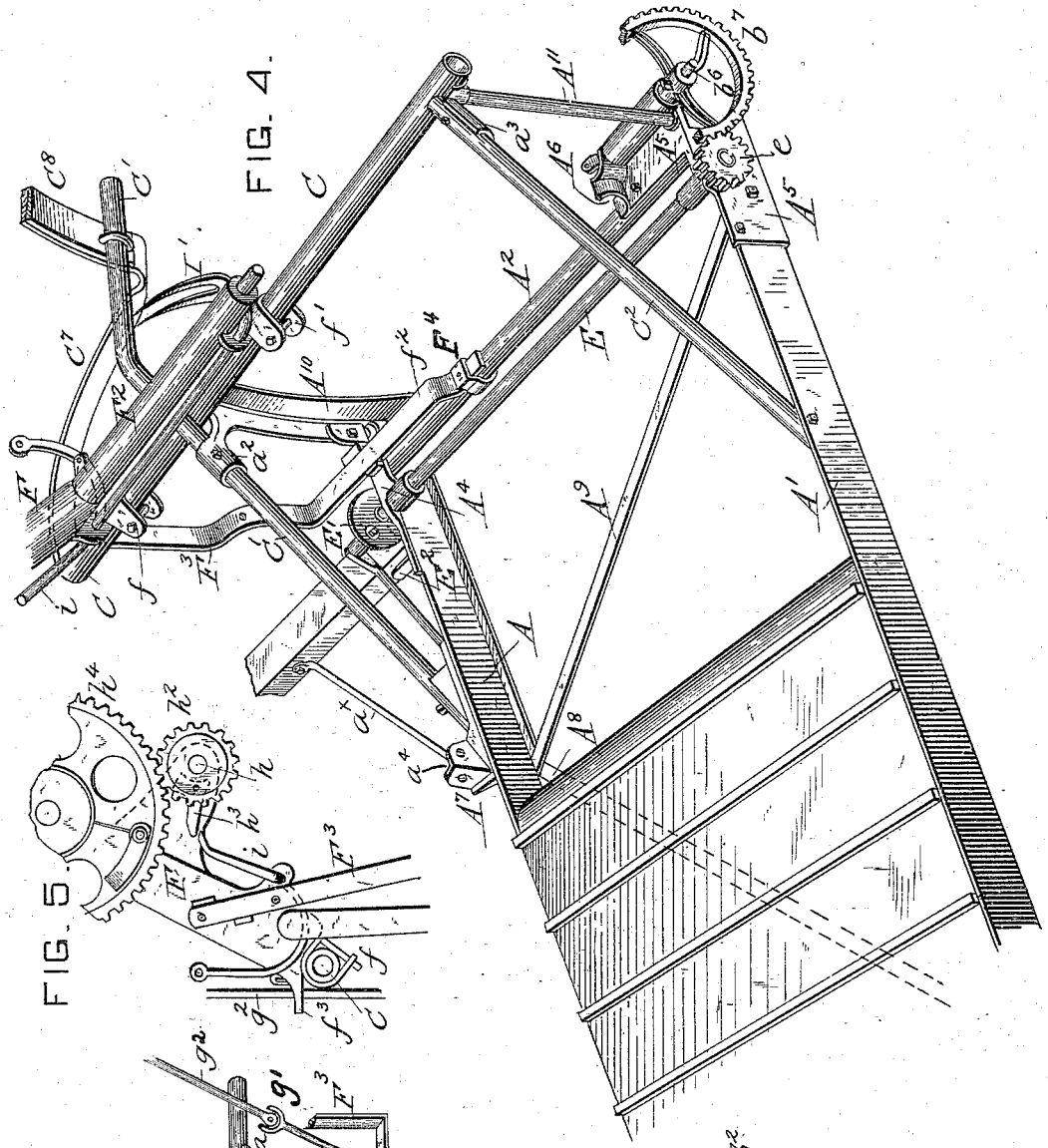


FIG. 5.

FIG. 6.

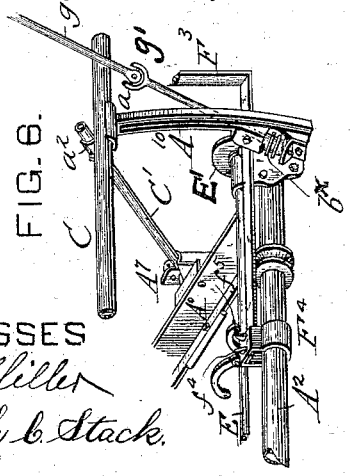
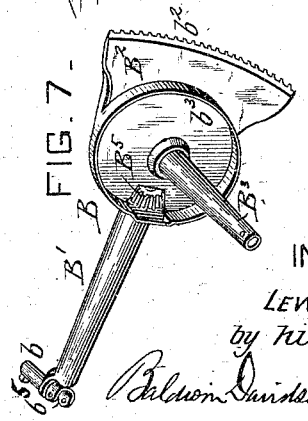


FIG. 7.



WITNESSES

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UNITED STATES PATENT OFFICE.

LEWIS MILLER, OF AKRON, OHIO.

GRAIN-BINDING HARVESTER.

SPECIFICATION forming part of Letters Patent No. 493,731, dated March 21, 1893.

Original application filed April 30, 1886, Serial No. 200,754. Divided and this application filed March 27, 1889. Renewed August 26, 1892. Serial No. 444,175. (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—while applicable to grain-binders generally—relates more especially to what is known as the "low-down" grain-binder; its object is so to reorganize the present grain-binding harvester, 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 is a view from the rear and stubble side of the machine, showing the frame work, gearing and binding mechanism. Fig. 2 is a view from the front and grain side, showing the frame work, binder-gear-standard, and adjusting and axle supporting devices, and gearing. Fig. 3 is a view from the rear and grain side, showing the frame work, pickers, cut-off, binder-arm, and gearing. Fig. 4 is a similar view with some of the parts removed. Fig. 5 is a detail view showing particularly how the tripping mechanism is supported on the frame. Fig. 6 is a detail view of one corner of the frame, showing certain parts not clearly shown in the other figures; and, Fig. 7 is a detail view of the drive wheel axle, and certain parts connected therewith.

This specification describes only the parts relating to the subject-matter herein claimed. Other parts of the machine are fully described and shown in other divisions of this application, and respectively filed and numbered as follows, viz: Serial No. 200,754, filed April 30, 1886, and Serial Nos. 305,753, 305,754, 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, preferably 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 with horizontal ledges—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 stubble, or drive-wheel end of the frame, are respectively provided with bearings or sleeves for a 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, is secured on the forward side of the front sill A, at or near the inner or stubble end of the cutting-apparatus, and platform-apron or carrier; this constitutes a support for the inner shoe and grain guide or deflector L′, and 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 $a^\times$, 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, (Fig. 4,) 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 A^9, 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 framework, against working-strains which, it will be seen, concentrate upon the junction-point of those braces with the front sill.

An inwardly-inclined, transverse socket or

sleeve a^2, on the upper end of a standard A^{10}, mounted on the inner front corner-piece A^4, 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}, above mentioned. The lower end of an inclined, transverse tubular binder-frame bar C^2, is secured to the rear transverse sill A', coincidently—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 plate a^3, secured to the upright A^{11}, and longitudinal bar C; thus constituting a strong, triangular frame for the support of the binding and other mechanisms, which I call, for convenience, the binder-frame, of which, it will be seen, the platform-frame forms the base, and an integral or firmly connected part. My improved organization, it will thus be seen, combines the main frame, the gearing-frame, the platform-frame, and the binder-frame all in one compact and light but rigid and strong frame; the advantages of which are obvious.

An outward projection or overhanging bracket on the rear corner-piece A^5, carries a sleeve or tubular bearing—rigid therewith—for a short secondary or counter shaft b^6, parallel with, but slightly above and outside of the longitudinal frame-tube A^2. A spur-wheel b^7, on the outer rear end of this shaft, drives a corresponding spur-pinion *e*, on the crank-shaft E, as well as a spur-gear G' on the packer-shaft through which I also drive the carriers—binding mechanism, pickers and reel. A tubular arm or sleeve B', is connected by a transverse pin *b*, on its rear end, with a transverse bearing-socket A^6, on the overhanging bracket of the corner-piece A^5. A spur or projection, at the inner end of the pivot-pin *b*, prevents lateral movement of this pivot-pin, in this bearing-socket, while permitting it to turn freely therein. A vertical plate B^2, constituting a forward extension or prolongation of the sleeve B', is slightly curved on its forward edge, and is movable vertically in an arc around the pivot *b*, in a vertical guide-way in the standard A^{10}, above mentioned, erected on an outward extension or overhanging bracket of the front corner-piece A^4. The inner front edge of the plate B^2, is slightly beveled and carries segment-teeth b^2 meshing with a worm-gear $b^\times$, turning in bearings on the corner-piece A^4, inside the vertical guide-way A^{10}: by which means the vertical relation of the axle-support and main-frame may be varied.

An axle B^3, formed upon or secured to the plate B^2, projects outwardly therefrom, concentrically with an annular flange b^3, which encircles a bevel-wheel B^4, on the driving-wheel, thus constituting a shield therefor. This bevel-wheel drives a corresponding pinion B^5 on the jointed movable portion of the bevel-wheel, secondary or countershaft, which turns in bearings in the sleeve B'. The pinion B^5, projects through or works in an opening in the plate. The rear end of the movable part, of the counter-shaft, is coupled to the fixed part, by a tumbling or universal joint b^5, coincident with the pivot *b*. By this means the axle-support and driving-gear, mounted therein, are free to move vertically, relatively to the frame, around the pivot *b*, without interference with the proper working of the mechanism secured on the frame, which maintains its uniform relation thereto. The front wall or face of the inner front corner-piece A^4, is also 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—as before remarked, 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; which thus serves to preserve the crank-wheel and its pitman connection from injury or obstruction.

The upper, longitudinal binder-frame bar C, and front, inclined, transverse binder-frame bar C', respectively extend longitudinally and laterally beyond the standard A^{10}, to which they are connected. These bars are also rigidly united by an angular or inclined brace C^7, Fig. 1—the rear, outer end of which extends above the transverse bar C', to support a driver's 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 C^{10}, is secured to the brace C^7.

The brackets *f*, *f'*, carry suitable bearings for a rock-shaft supporting and actuating the compressor, and binder-tripping devices. A vertically perforated horizontal flange or ear f^3, on the bracket *f*, receives a rod or shaft g^2, connected by a universal joint *g'*, with the adjusting-screw $b^\times$, which actuates the axle-support. The upper portion of this shaft being thus free to vibrate on its joint without interfering with its adjusting operation, is utilized by me as the means by which the binder-gear frame is adjusted longitudinally, on its supports, to suit the length of straw.

The loop F^4, connecting the lower part f^2, of the arm F^3, with the longitudinal frame-tube A^2, on which it slides, carries spurs f^4, f^5, to which the picker-links are pivoted, and consequently are adjusted backward or forward, simultaneously with the binder mechanism, to which this pendent-arm is connected as hereinafter explained.

A longitudinal bar C^4, secured to the front and rear inclined transverse binder frame-tubes C', C^2, about midway between the plat-

form-carrier and outside longitudinal frame-tube C, by suitable brackets or standards c,—or otherwise—supports the upper part of the fixed or lower portion C^5, of the inclined elevating-table the lower side thereof being supported upon the transverse sills A, A′, in any suitable manner, in position to receive the grain properly from the platform-carrier. The longitudinal supporting-bar C^4, extends above or beyond the upper edge of the fixed part C^5, of the table; or it may be rabetted—as shown in Fig. 3—to form a projecting ledge, on which the lower edge of the upper or longitudinally adjustable portion C^6, of the inclined elevating-table, rests and slides. The upper edge, of this portion of the binder-table, rests upon and is secured to suitable flanges on the brackets f, f', or on the lower arm F^2, of the binder-gear standard, in such manner as to be adjustable longitudinally with said standard. It may be further supported, at its rear end, by one or more pendent feet c', adapted to rest and slide on the bar C,—Fig. 1. By this construction and arrangement the upper portion of the inclined elevating-table, through slots in which the needle and packers move, is adapted to move with said parts, as they are moved backward and forward, and is thereby held in proper working relation thereto. I thus secure a horizontally and intermediately divided sectional or two part binder-table: the lower section being fixed close to the platform-apron or carrier: while the upper one is adjustable or movable with its co-operating mechanism.

The binder-gear standard or frame consists of an upright, tubular portion or standard F, having tubular arms or sleeves F′, F^2; projecting rearwardly and transversely therefrom, giving it the usual U-form, with one of the transverse arms constituting the base. The U-shaped, pendent brackets or clasps f, f', above referred to on the lower arm F′, clamp and slide upon the longitudinal binder-frame tube C, to render the binder-gear standard adjustable backward and forward thereon. This bar C, it will be observed, projects in advance of its supporting socket in the standard A^{10}, and the front bracket f, of the binder-gear standard, slides upon this extended portion. The front, inclined, transverse binder-frame tube C′, likewise extends beyond its supporting-standard A^{10}, and binder-frame bar C, above, in front of, and beyond or across the outer longitudinal plane of the driving-wheel, for a purpose above explained.

The lower sleeve F^2, of the binder-gear standard or frame is provided with suitable bearings for the needle-shaft, and the upper sleeve, with bearings for the knotter-actuating shaft—or vice versa—one being above and the other below the binder-table, and the path of the grain.

The upper end of the upright part of the pendent bent-arm or angular-bar F^3, is secured to the binder-gear standard or the bracket f, thereof, and the front part of the lower horizontally-bent portion f^2, of said arm F^3, slides in a groove in the front corner-piece A^4, while its rear end carries a pendent loop or bracket F^4, embracing and sliding on the inner longitudinal frame-tube A^2, as above stated. This bent arm thus serves to uphold and brace the binder-gear standard and connected parts, either while working or while partaking of their adjustments; and also carries the pivots of the packer-links.

The packer-shaft G, which also constitutes the first or main driving-shaft of the binder-mechanism, is shown in Figs. 1 and 3, as supported at its forward end in a bearing in the upright part of the bent-arm F^3. Collars on this shaft, in front and rear of this arm—while leaving the shaft free to turn—cause it to move backward and forward with the arm, as the binder-gear standard is adjusted. This shaft G, is supported and adapted to slide at its rear end in a hanger connected with the rear, inclined, transverse binder-frame bar C^2, or the upright A^{11},—either or both—and may have either a pinion G′, and a sprocket-wheel G^2, feathered to it, as shown in Fig. 1, or the sprocket-wheel only, as shown in Fig. 3. In the former case it receives motion from the spur-gear b^7, on the counter-shaft with which the pinion G′, engages, and a driving-chain G^3, extending from the sprocket-wheel G^2, to a sprocket-wheel on the end of the inner roller of the platform-carrier, and over a sprocket-wheel on, or geared to the rear of the intermediate picker-shaft, drives the latter and said carrier.

In Fig. 3, the packer-shaft G, is shown as driven by a chain from a sprocket-wheel G^2, on the crank-shaft, said chain serving also to drive the platform-carrier (by means of a sprocket wheel G) and the picker-shaft, under the arrangement shown. The shaft G, is provided with suitable cranks for operating the packers G^4, which are of a well-known oscillating kind, and have their heel-ends connected by suitable links g^4, with the pivots or spurs f^4, and f^5, on the pendent-arm of the binder-gear standard, above referred to. The packer-shaft, it will be observed, under this organization, lies above and parallel with the crank-shaft, in the triangular space between the horizontal, the upright, and the inclined bars.

The picker-shaft M, is provided, on its rear end with a pinion m', which engages and receives motion from a pinion connected with a sprocket-wheel m^2, on a stud-shaft formed on a pendant, adjustable bracket m^3, suitably secured to the rear, inclined, transverse binder-frame bar C^2; said sprocket-wheel receiving motion from the driving-chain G^3. This shaft M, and a second one M′, parallel therewith, but lower and nearer the platform-carrier, are mounted in suitable pendent bearing-brackets on the bars C′, and C^2, and are each provided with a series of cranks m^4, m^5, set at different angles, those of one shaft agreeing with those of the other in the same

transverse, vertical plane—and are connected by picker-bars M^2, (Fig. 3,) having upwardly projecting teeth or fingers m^6, which, in the rotation of the cranks, are made to pass up through slots in the inclined table, for moving the grain upward on said table, in a manner that will be readily understood.

The reel driving mechanism L^2 is driven from one of the packer shafts, as shown in Fig. 3. A chain H, encircling a sprocket-wheel H′, on the driving—or packer—shaft G,—Fig. 1—drives a corresponding wheel h', on a stud-shaft h, on a bracket F^5, projecting inwardly from the upright arm F, of the binder-gear standard. The spur-pinion h^2, turns loosely on the stud-shaft h, in front of the sprocket-wheel h', that face of this latter wheel adjacent to the pinion, carries laterally projecting pins or spurs, engaging with a pawl on the corresponding face of the pinion, to cause both to rotate simultaneously. The pawl has a radially projecting arm h^3, (Fig. 5) against which the end of a stop or arm i, abuts at proper times to disengage the pawl from the sprocket-wheel h', and thus allow it to rotate without driving the pinion h^2, and dependent devices—in a manner well understood. This pinion h^2, drives a spur-gear h^4, fast on the forward end of the knotter-actuating shaft, and carrying a crank-pin which, through a connecting-rod and crank-arm N′, (Fig. 3) vibrates the needle-shaft in a well-known way. A crank-arm N^2, formed on the forward end of a rock-shaft O, (Fig. 3) carries cut-off fingers o', o', which, as the crank N′ is vibrated to raise the needle, are thrown upward through a slot or opening in the table from the inclined position they ordinarily occupy to the upright position in which they serve to guard the needle and protect it from the grain in a manner that will be readily understood.

The usual cam-gear-wheel T, is shown on the knotter-actuating shaft, near its rear end, as provided with an arm t, which assists in the discharge of the bundles. A second arm t', is secured to the rear end of the knotter-actuating shaft, arranged in the same plane with the arm t, and rotating with the shaft. It is made longer than the arm t, and is arranged in close proximity to the path in which the needle and cut-off work, and the end is adapted to enter the space between said cut off and needle, and, while the cut-off is still holding back the incoming grain, removes the bundle in connection with the arm t, and thus completes the separation between the bundle and the loose grain.

The compressor, I′ is mounted on a rock-shaft constituting a part of the trip-mechanism; and consequently co-operates with the discharge-arms, by getting out of the way at the proper moment to allow the grain to pass over it.

The operation of the mechanism will readily be comprehended from the foregoing description.

What I claim herein as of my own invention is—

1. The combination, substantially as hereinbefore set forth, of the combined main and binder-frame; and the longitudinally intermediately divided binder-table; the lower section of which is secured upon the frame in fixed relation to the platform-carrier; while its upper portion is movable with the binding-mechanism.

2. The combination, substantially as hereinbefore set forth, of the combined main and binder-frame; a platform-carrier; a driving-wheel outside the frame; a binder-gear standard intermediate of the wheel and carrier; and an intermediately divided binder-table, the lower section of which is fixed close to the carrier; while the upper section is attached to and adjustable with the binder-gear standard.

3. The combination, substantially as hereinbefore set forth, of a platform-frame; a longitudinal binder-frame-bar thereon; a binder-gear standard adjustable thereon; inclined lateral bracing binder-frame bars or tubes; an intermediate longitudinal supporting-bar; and a divided binder-table having a fixed section supported by said bar; and a movable section supported by said bar at one end and by the binder-gear standard at the other.

4. The combination, substantially as hereinbefore set forth, of a combined main and binding-frame; a driving-wheel on the stubble-side of the frame; packing and binding-mechanisms adjustable on the frame; a platform-carrier, oscillating picker and a slotted sectional elevating binder-table horizontally and intermediately divided into a lower slotted fixed section through which the pickers work and an upper one adjustable with the binding-mechanism and packer.

5. The combination, substantially as hereinbefore set forth, of a combined main and binder-frame; a platform-carrier; an intermediately and horizontally divided sectional elevating binder-table; pickers working up through the slots in the lower fixed portion of the table, and packers and a binder-arm working up through slots in its adjustable portion.

6. The combination, substantially as hereinbefore set forth, of the combined main and binder-frame; a binder-gear standard adjustable thereon; gathering-mechanism; a divided binder-table having a fixed section in connection with which the gathering-mechanism works; and an adjustable or shifting part co-operating with oscillating-packers, and a vibrating needle.

7. The combination, substantially as hereinbefore set forth, of a platform-carrier; an inclined elevating sectional slotted binder-table horizontally and intermediately divided, to which the grain is delivered directly by the carrier; pickers working up through the fixed portion of the table, and packers, and a needle working up through and adjustable with the movable section thereof.

8. The combination, substantially as hereinbefore set forth, of the combined main and binder-frame; the binder-gear standard adjustable on the upper longitudinal binder-frame tube; the pendent arm of the binder-gear standard; supporting clasps on said arm embracing the inner longitudinal frame-bar; and pivots for the packer-links carried by said pendent arm.

9. The combination, substantially as hereinbefore set forth, of the combined main and binder-frame; the binder-gear standard adjustable thereon; its pendent arm; the packer-shaft having a bearing therein; and packers pivoted thereto; in such manner as to be movable longitudinally with the binder-gear standard.

10. The combination substantially as hereinbefore set forth, of a platform-frame; a triangular binder-frame of which the platform-frame constitutes the base; a driving-wheel outside these frames; a longitudinal driving-shaft intermediate of the frames and driving-wheel; a longitudinal packer-shaft, and a parallel picker-shaft both inclosed by the triangular-frame, and both driven from the driving-shaft.

11. The combination, substantially as hereinbefore set forth, of a platform-frame; a triangular binder-frame of which the platform-frame constitutes the base; a driving-wheel outside the frames; a longitudinal driving-shaft intermediate of the frames, and driving-wheel; a longitudinal packer-shaft driven thereby; a picker-shaft; a platform-carrier; and gearing driving both from the packer-shaft; both the packer and picker-shafts being mounted in and inclosed by the binder-frame.

12. The combination, substantially as hereinbefore set forth, of a platform-frame; a triangular binder-frame of which the platform-frame constitutes the base; a driving-wheel outside the frame; a longitudinal driving-shaft intermediate of the frames and wheel; a crank-shaft; a packer-shaft and a picker-shaft; all longitudinal and inclosed in the binder-frame, and gearing driving them from the driving-shaft.

13. The combination, substantially as hereinbefore set forth, of a platform-frame; a triangular binder-frame of which the platform-frame constitutes the base; an outside driving-wheel; gearing actuating a longitudinal driving-shaft intermediate of the wheel and frame; a longitudinal packer-shaft inside the frame; driven thereby through interposed gearing, and sliding endwise through its driving gear; a binder-gear standard adjustable longitudinally on the frame; binder-mechanism and its actuating-gearing carried by said standard; and sprocket-wheel and chain-gearing driving the binding-mechanism directly from the packer-shaft; without interference with the adjustment of the binder.

14. The combination, substantially as hereinbefore set forth, of a platform-frame; a triangular binder-frame of which it constitutes the base; an outside driving-wheel; a longitudinal driving-shaft intermediate of the wheel and frame; and longitudinal shafts—inside—the frame respectively driven by said shaft, and in turn driving the cutters, the reel, the platform apron, the pickers, the packers, and the binding mechanism.

15. The combination, substantially as hereinbefore set forth, of a combined main and binder-frame; a binder-gear standard adjustable thereon; a pendent arm or support adjustable with the standard; a longitudinal packer-shaft mounted at one end in the pendent arm; and passing through its bearing at the other; to permit of the longitudinal adjustment of the binder-gear standard without interference with its actuating-mechanism.

16. The combination, substantially as hereinbefore set forth, of the front and rear transverse frame-bars or sills; the inner longitudinal frame-bar or tube; the connecting corner pieces; the supporting-standards thereon; the longitudinal supporting-bar or binder-frame-tube; the inclined transverse bracing binder-frame-tubes, connecting the sills directly with the longitudinal binder-frame-tube; the binder-gear standard; slide-clasps connecting the lower subtending-arm or sleeve of the binder-gear standard and binder-frame-tube; the bent-arm or angular bracing-bar depending from the binder-gear standard; its longitudinal subtending-arm; the slide-clasp connecting this arm with the lower inner longitudinal frame-tube; and the guide-groove on the inner front corner-piece, in which the arm slides.

17. The combination, substantially as hereinbefore set forth, of the transverse sills; the inner longitudinal frame-bar; the connecting corner-pieces; the standards thereon; the longitudinal binder-frame supporting-tube; the binder-gear standard; its slide-clasps; the lug on its front slide-clasp; the pivoted axle-support; its guide and teeth; the worm-screw; and the combined shaft and lever, actuating the worm-screw and axle-supporting devices, which lever passes through the lug and constitutes the binder-gear frame-adjusting mechanism.

18. The combination, substantially as hereinbefore set forth, of the front and rear transverse sills; the inner longitudinal frame-bar or tube; the inner front corner-piece connecting them; the binder-frame; the binder-gear standard supported thereon; a pendent-arm or downward extension from the binder-gear standard; and a guide-groove in the corner-piece in which the bent arm traverses.

19. The combination, substantially as hereinbefore set forth, of the combined main and binder-frame; the binder-gear standard; the clasp-brackets connecting the binder-gear standard and the longitudinal binder-frame bar or tube on which it slides; the bracing and latterly-supporting pendent-arm carried by the binder-gear standard; its guide-groove

in the corner-piece; and the loop-bracket of the pendent-arm, sliding on the inner longitudinal frame-bar.

20. The combination, substantially as hereinbefore set forth, of a combined main and binder-frame; a binder-gear standard, which slides on one of the bars thereof; an adjustable axle-support; and a combined shaft and lever, which—as a shaft—revolves a gear to adjust the axle-support, and which—as a lever—also shifts the binding-mechanism, said lever being provided with an intermediate joint, and passing through an ear on the binder-gear standard, for these purposes.

21. The combination, substantially as hereinbefore set forth, of the combined main and binder-frame; the binder-gear standard; the driver's seat; the adjustable axle-support; its actuating-gear and the combined shaft and lever, having an intermediate joint, and passing through an ear on the binder-gear standard, which shifts the binder and adjusts the cutting-apparatus—each independently of the other—at the will of the driver.

22. The combination, substantially as hereinbefore set forth, of an intermediately horizontally divided sectional slotted binder-table; pickers or gatherers working through the slots of the fixed section of the table; and packers, cut-off fingers, and a binder-arm working in the slots of the movable section.

23. The combination, substantially as hereinbefore set forth, of a platform-frame, a binder-frame of which the platform-frame constitutes the base, an outside driving-wheel, a longitudinal driving-shaft intermediate of the wheel and frame, and longitudinal shafts inside the frame, driven from said shaft.

24. The combination, substantially as hereinbefore set forth, of a combined main and binder frame, a binder-gear standard, which slides on one of the bars thereof, an adjustable axle-support, and a combined shaft and lever, which, as a shaft, revolves a gear to adjust the axle-support, and which, as a lever, also shifts the binding mechanism, said lever being provided with an intermediate joint, and being operatively connected with the binder-gear standard.

25. The combination, substantially as hereinbefore set forth, of the combined main and binder frame, the binder-gear standard, the driver's seat, the adjustable axle-support, its actuating gear, and the combined shaft and lever, having an intermediate joint, and operatively connected with the binder-gear standard, which shifts the binder-gear standard, and adjusts the cutting apparatus, each independently of the other, at the will of the driver.

In testimony whereof I have hereunto subscribed my name.

LEWIS MILLER.

Witnesses:
O. L. SADLER,
W. K. MEANS.