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J. S. DAVIS.

HARVESTER.

No. 384,025. Patented June 5, 1888.

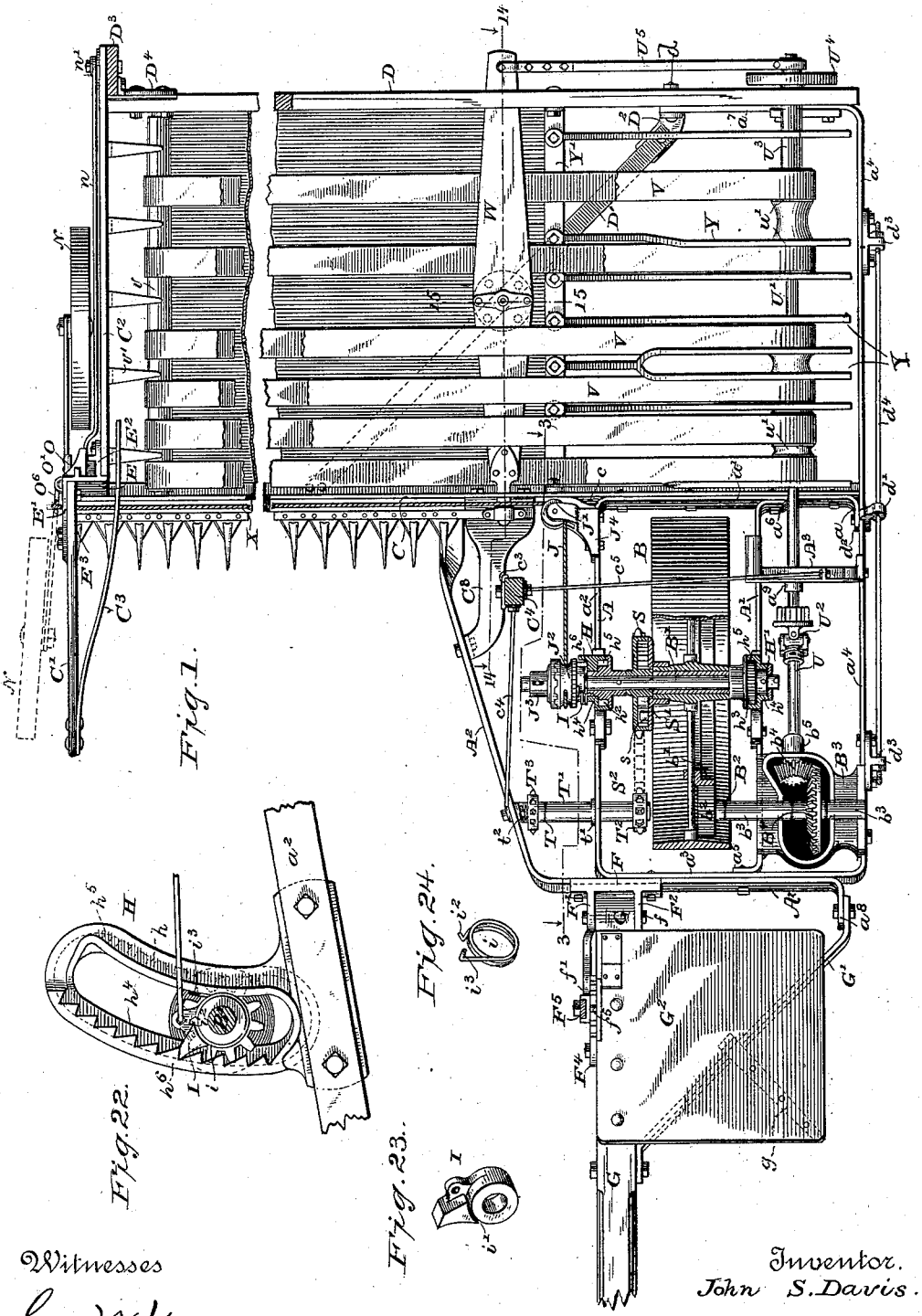

Fig. 1.

Fig. 22.

Fig. 24.

Fig. 23.

Witnesses

Geo. W. Young.

Hey. A. Lamb.

Inventor.

John S. Davis.

By his Attorneys

James and Franklin.

(No Model.) 4 Sheets—Sheet 2.

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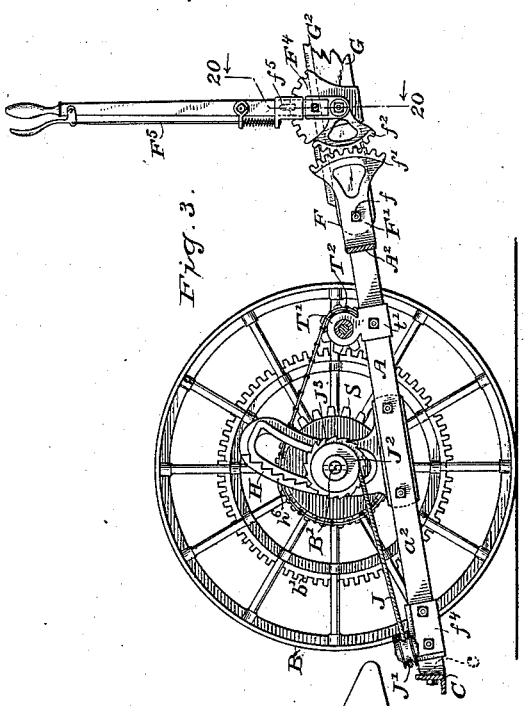

Fig. 3.

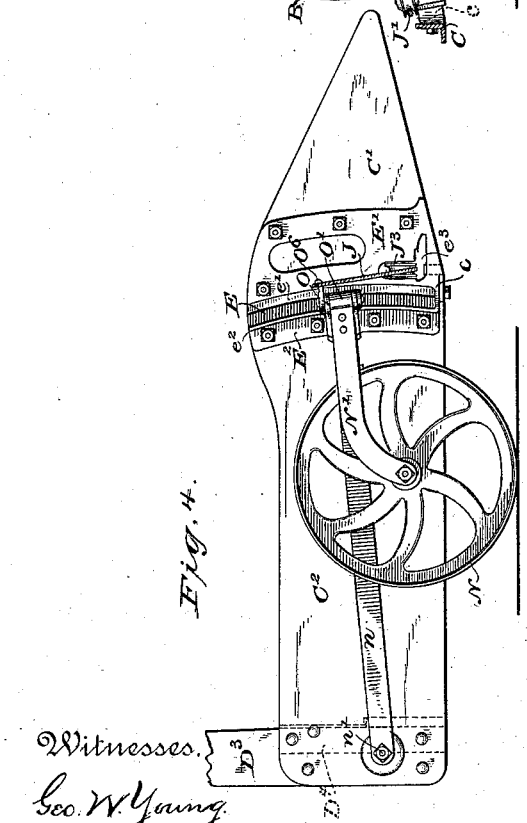

Fig. 4.

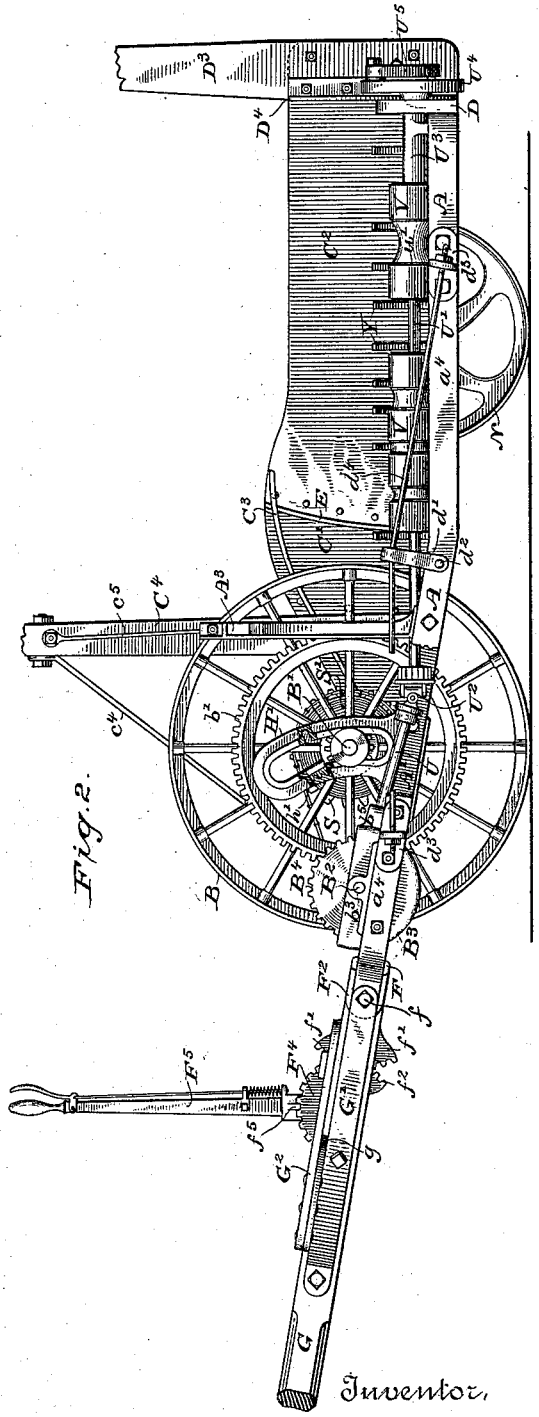

Fig. 2.

Witnesses.
Geo. W. Young.
Hey. A. Lamb.

Inventor,
John S. Davis,
By his Attorneys
Jaynes and Skinkle.

(No Model.) 4 Sheets—Sheet 3.

J. S. DAVIS.

HARVESTER.

No. 384,025. Patented June 5, 1888.

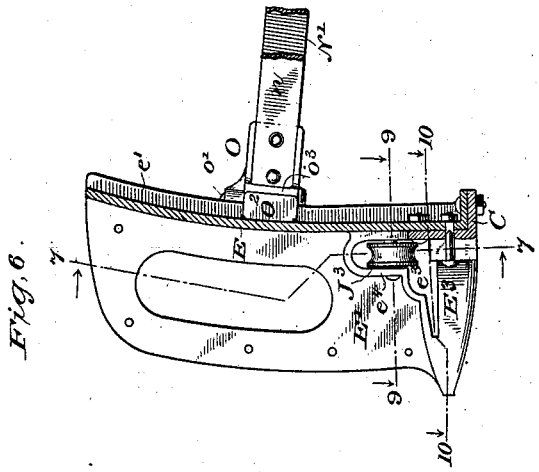

Fig. 6.

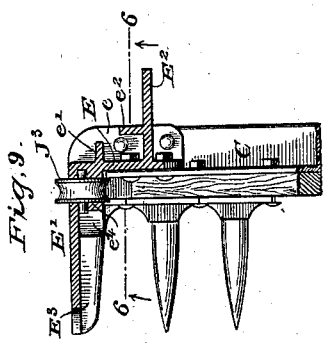

Fig. 9.

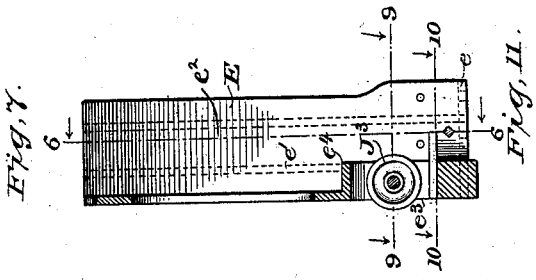

Fig. 7.

Fig. 11.

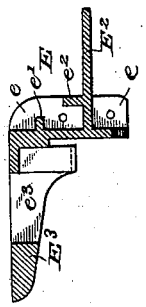

Fig. 10.

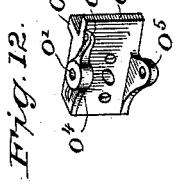

Fig. 12.

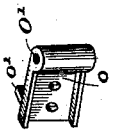

Fig. 13.

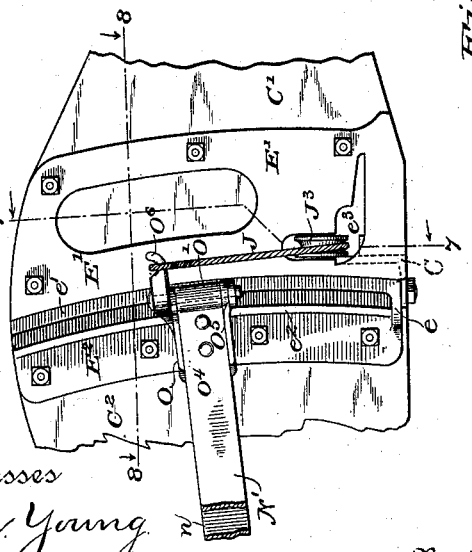

Fig. 5.

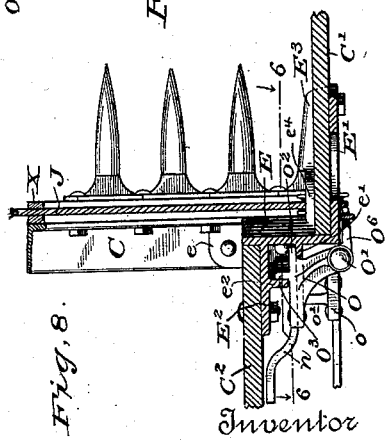

Fig. 8.

Witnesses
Geo. W. Young.
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(No Model.)

4 Sheets—Sheet 4.

J. S. DAVIS.

HARVESTER.

No. 384,025. Patented June 5, 1888.

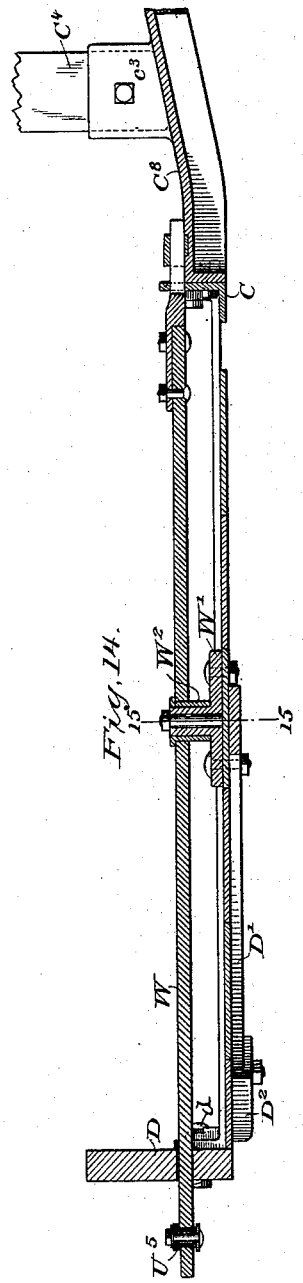

Fig. 14.

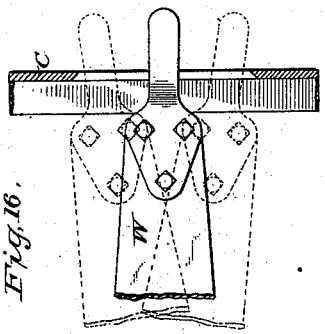

Fig. 16.

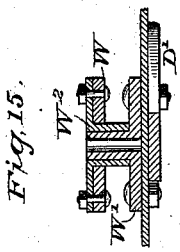

Fig. 15.

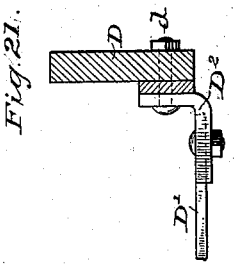

Fig. 21.

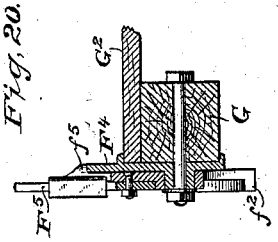

Fig. 20.

Fig. 17.

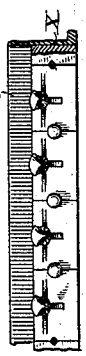

Fig. 18.

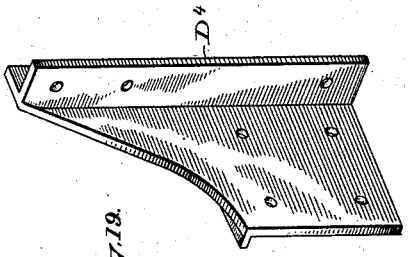

Fig. 19.

Witnesses.
Geo. W. Young.
Hy. A. Lamb.

Inventor.
John S. Davis.
By his Attorneys
Jannus and Skinkle.

UNITED STATES PATENT OFFICE.

JOHN S. DAVIS, OF TOLEDO, ASSIGNOR TO ADIEN E. SUMNER, OF CLEVELAND, OHIO.

HARVESTER.

SPECIFICATION forming part of Letters Patent No. 384,025, dated June 5, 1888.

Original application filed March 7, 1885, Serial No. 158,037. Divided and this application filed December 23, 1885. Serial No. 186,557. (No model.)

To all whom it may concern:

Be it known that I, JOHN S. DAVIS, a citizen of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have invented certain new and useful Improvements in Harvesters, of which the following is a description.

My invention has for its object the improvement of grain binding harvesters of the class known as "platform-binders," in which the grain is gaveled and bound on, or substantially on, the level of the platform in rear of the main wheel; and it relates to the general construction of the harvester-frame, with the view of making it light, strong, and compact, and adapted to carry and operate a binding mechanism to be suitably mounted thereon outside of the main wheel, (the said mechanism, however, being the subject of another application filed by me May 28, 1885, Serial No. 166,849;) to the method of supporting it on the axle of the main wheel on which it may be vertically adjusted or rocked; to supporting the grain end of the platform on a caster-wheel on which it may be vertically adjusted by the driver from his seat simultaneously with or independently of the vertical adjustment of the wheel-frame upon the axle of the driving-wheel, (these adjustments, however, and the means for effecting them constituting the subject of another application filed by me March 7, 1885, Serial No. 158,037, of which this application is Division B;) to the employment of a divider without gather or draft, and lying wholly outside of the track of the grain-wheel; to extending the cutter-bar through the divider and across the track of the grain-wheel; to driving the platform-belts and the sway-bar which moves the cutter by a single shaft, and to suitable mechanism for effecting these objects.

The accompanying drawings represent the application of my improvements to a harvester in the best form now known to me. Some of these improvements may, however, be used without the others and in machines differing in some respects from that shown, and hereinafter described, and the details of construction may be modified in various ways without departing from the spirit of my invention.

Figure 1 is a plan or top view of a harvester embodying my improvements, some of the parts being broken away and shown in section. Fig. 2 is a side elevation of the same as seen from the stubble side of the machine, some of the parts being broken away. Fig. 3 is an elevation of the wheel-frame and driving-wheel as seen from the grain side, being partly in section, on the line 3 3 of Fig. 1. Fig. 4 is a view in elevation of the grain end of the platform, showing the method of mounting the caster, grain-wheel, &c. Fig. 5 is a view in elevation, as seen from the grain side, of the casting or bracket which supports the divider and end board of the platform, and guides the head-block of the caster-wheel in the vertical adjustment of the end of the platform. Fig. 6 is an elevation of the same as seen from the opposite side to that shown in Fig. 5, and is partly in section on the lines 6 6 of Figs. 7, 8, and 9. Fig. 7 is an elevation in section on the lines 7 7 of Figs. 5 and 6. Fig. 8 is a horizontal section of the same on the line 8 8 of Fig. 5. Fig. 9 is a horizontal section on the lines 9 9 of Figs. 6 and 7. Fig. 10 is a similar section on the lines 10 10 of Figs. 6 and 7. Fig. 11 is a view of a short piece of the end of the finger-bar to which the bracket shown by the preceding figures is bolted, and it is placed directly under the position it would occupy in Fig. 7; in other words, if it were lifted until the bolt-holes shown in it registered with those shown in the bracket in Fig. 7, it would be in proper position to be bolted thereto. Fig. 12 is a perspective view of the bracket or caster head-block to which the caster-wheel is pivoted. Fig. 13 is a similar view of a casting to be riveted to the end of the caster-wheel arm and pivoted between the overhanging lugs on the head-block shown in Fig. 12. Fig. 14 is a vertical transverse section on the line 14 14 of Fig. 1, across the platform and through the longitudinal center of the sway-bar. Fig. 15 is a vertical transverse section on the line 15 15 of Figs. 1 and 14, of the sway-bar and its central pivoted support. Fig. 16 is a plan view of the front

end of the sway-bar, showing the upright face of the finger-beam in section through the slot in which the sway-bar vibrates. Fig. 17 is a vertical transverse section through the angle-iron finger-beam to show the manner of attaching the guard-fingers. Fig. 18 is a front elevation of a portion of the same with the fingers attached. Fig. 19 is a perspective view of the bracket-casting, which strengthens the rear grainward corner of the platform and braces the post which sustains the overhanging reel-support. Fig. 20 is a vertical transverse section on the line 20 20 of Fig. 3, through the tongue and bracket upon which the rocking lever is mounted. Fig. 21 is a sectional detail view showing the method of connecting the diagonal platform-brace to the rear sill of the platform. Fig. 22 is a view in elevation of the inner yoke and its racks by means of which the frame is adjusted vertically on the axle of the driving-wheel, is guided during the adjustment, and is firmly held at any desired elevation. Fig. 23 is a perspective view of the dog or pawl to be loosely mounted on the main axle and engage with the proper rack on the yoke to sustain the weight of the machine, as clearly shown by Fig. 22. Fig. 24 is a perspective view of a spiral spring which is wound about the hub of the sustaining-pawl and forces it into engagement with the rack of the yoke.

The wheel-frame A, which surrounds the driving-wheel B, is preferably composed of a piece of flat bar-iron suitably bent to form a rectangle, the space within which is divided by a longitudinal bar, A′, which forms part of the frame, bracing and strengthening it. Beginning at a point near the outer rear corner of the frame, the bar composing it is bent to form a foot, a, from which it proceeds across the back a' forward on the inner side, a^2, across the front a^3, and rearward on the outer side, a^4, to the foot a, to which it is secured by a bolt, as shown.

The brace-bar A′ is provided at each end with side foot projections, a^5 a^6, by which it is suitably secured to the front and back bars, a^3 a', of the frame A by bolts or rivets. The bar a^4 is slightly bent edgewise near the point where it is connected to the foot a, and from this bend it proceeds horizontally across the outer end of the platform to the rear sill thereof, where it is bent inwardly at a right angle and terminates in a foot, a^7, which is securely bolted to the rear sill, D, of the platform.

The finger-beam or front sill of the platform consists of a bar of angle-iron, C, the widest side of which forms the vertical front face of the beam, while the narrower portion extends rearwardly from its bottom to form its base. At a point near its juncture with the wheel-frame this bar is twisted, as shown at c, Figs. 1 and 3, to bring its front face to an angle that will conform to the angle of the wheel-frame, against the back bar, a', of which it lies and is securely bolted, as shown.

A brace bar, A^2, is secured flatwise beneath the bottom flange of the finger-beam at a point beyond the wheel-frame and about in line with the first guard-finger, beneath which it lies and about the point of which it is twisted, as shown in Fig. 1, to form a guard or shoe. From this twist the bar proceeds diagonally forward and up until it reaches a point in line with the front bar, a^2, of the wheel-frame, where it is bent and extends across the entire front of the frame, terminating in a forwardly-projecting foot, a^8, being securely fastened to the front bar, a^3, of the frame by several bolts, as shown.

A flat brace-bar, D′, is bolted to the under side of the finger-beam, about midway of its length, and extends stubbleward back diagonally beneath the bottom of the platform to a point near its outer corner, where it terminates in a casting, D^2, having an upwardly-projecting foot, by which it is secured to the rear sill, D, by a bolt, d, which passes through the casting, the foot a^7 of the rearward extension of the bar a^4, and the rear sill, as shown in Figs. 1, 14, and 21. This brace greatly strengthens the platform against the strains and backward thrusts met by it at the divider end, and also helps to sustain such of the bottom boards as may rest upon it. A cast-metal bracket, E, of peculiar shape, is securely bolted to the grain end of the finger-beam by four bolts, two of which pass through the bottom flange of the beam and a corresponding foot, e', at the bottom of the casting, while the other two pass through the front upright portion of the finger-beam and the vertical face of the casting. This casting consists of a central upright portion or breast, E, which has at its outer edge a forwardly-projecting flange, E′, to which the divider-board C′ is attached, and at or near its inner edge a rearwardly-projecting flange, E^2, to which the end board C^2 of the platform is securely bolted, as shown. At the inner rear corner of the platform the end board projects beyond the rear sill, as shown in Figs. 1, 2, and 4, and the vertical post D^3, which carries the overhanging support for the inner or grainward end of the reel-shaft, is securely bolted to this projecting portion of the end board.

A bracket or casting, D^4, (shown detached in Fig. 19,) is securely bolted to the post D^3 and to the rear sill, D, of the platform, and assists in forming a very strong and rigid connection at this corner. To prevent the rear side of the platform from drooping or sagging under the weight of the binding mechanism before mentioned, which I propose to mount thereon near the outer or stubbleward end, or from springing under the strains and jars to which it may be subjected in going over rough ground, I truss-brace the bar a^4. A strut, d', having an overhanging lip or ledge which rests upon the bar a^4, is secured to it by the bolt d^2, which unites the bar to the foot a. At proper distances along the bar a^4, one on each side of this strut, are bolted castings d^3, having projecting lugs or ears which stand at an angle to their bases and are perforated for the passage

of a tie or truss rod, d^4. This rod lies in a suitable recess or aperture at the top of the strut d', is screw-threaded at each end, and provided with adjusting-nuts which bear upon the outer faces of the projecting lugs on castings d^3 and impart any desired tension to the rod.

To facilitate shipping the machines for transportation and to enable them to be packed in less space, the rearward extension of the bar a^4, crossing the platform, may be made of a separate piece and rigidly bolted to the wheel-frame when the machine is assembled or put together.

A shoe or casting, C^8, is securely bolted to the front face of the finger-bar between the wheel-frame and the brace-bar A^2, but nearer the latter, to which it is also bolted at its front end, being suitably shaped and flanged for this purpose. (See Figs. 1 and 14.) This casting serves to support and guide the heel of the cutter-bar, and at a suitable point in advance of the finger-beam it is provided with a socket, c^3, in which the foot of the reel-post C^4 is bolted. This reel-post is braced in its upright position by brace-rods c^4 c^5, the former being bolted to the brace-bar A^2 and the latter to a casting, A^3, which is part of the binder-frame before referred to, and is mentioned and shown in this application because it affords a convenient point of attachment for the brace-rod c^5, and a bearing for the shaft which drives the carrier-belts and sway-bar, to be hereinafter described.

The casting A^3 is bolted by its downwardly-projecting feet to the bars a^4 and A′ of the wheel-frame, and helps to stiffen and strengthen it at this point. It will be seen that the wheel-frame and platform, as thus described, are rigidly united and constitute a very strong and light structure well adapted for the purpose for which it is designed. It is supported by and capable of vertical adjustment upon a large driving-wheel located within the wheel-frame A and a castering grain-wheel at the inner or grain end of the platform, proper mechanism for effecting the adjustments of the ends being within the reach and under control of the driver in his seat, as fully set forth in my application Serial No. 158,037, filed March 7, 1885, of which this is division B. Attached to the front bar of the wheel-frame at a point best adapted to correct side draft, &c., is a bracket, F, provided with forwardly-projecting ears or lugs F′ F^2, between which the heel of the tongue G is pivoted on a bolt, f. A brace-bar, G′, is secured to the tongue at a proper distance in advance of its heel-connection, and extends diagonally backward to the outer or stubble front corner of the wheel-frame, where it is pivotally connected to the forwardly-projecting foot a^3 of the brace-bar A^2, before described. This pivot is in axial line with the pivot-bolt f at the heel of the tongue, so that the frame and tongue may be freely rocked without clamping. A foot-board, G^2, is bolted to the top of the tongue and extends across the front of the machine, being supported by an angle-bracket, g, which is bolted to the brace-bar G′. The lug F′ of the bracket F extends forward farther than the lug F^2 and terminates in a segmental gear-rack, f'.

A bracket, F^4, is bolted to the side of the tongue at a proper distance in advance of this rack, and has pivoted upon it a hand-lever, F^5, which is provided at its lower end with a segmental rack, f^2, meshing with the fixed rack f' on the lug F′. The bracket F^4 has notches along its upper edge, into which a sliding detent, f^5, on the hand-lever drops to lock the lever in its adjusted position. By means of this lever and the segmental racks, as just described, the relative angles of the tongue and the wheel-frame may be altered at pleasure, the wheel-frame rocking upon its supporting-shaft, and thereby to a certain extent raising or lowering the cutter-bar and changing the angle at which it is presented to the work.

As before stated, the space within the wheel-frame is divided longitudinally by the brace-bar A′, and in the larger of the two spaces thus formed is placed the driving-wheel B, bushed with steel and loosely mounted upon its shaft B′, so as to revolve freely thereon.

A spur wheel or ring, b', is cast upon or fastened to the spokes of the driving-wheel in any suitable manner and meshes with a spur-pinion, b^2, on a driving shaft, B^2, which transmits motion to the harvesting and binding mechanisms. This shaft is supported in overhanging sleeve-bearings b^3 of a bracket, B^3, having downwardly-projecting flanges securely bolted to the frame-bars A′ a^4, and is recessed to form the lower half of a box or gear casing, in which a beveled wheel and pinion, B^4 b^4, work.

Attached to the adjacent bars A′ a^2 of the wheel-frame, at each side of the driving-wheel, are curved upright yokes H H′, provided with segmental gear-racks h h' on their inner front faces. The main shaft B′ passes through these yokes and has keyed to it spur-pinions h^2 h^3, which take into the racks and when revolved raise or lower the frame on the shaft, the proper relation of all the parts being maintained during such adjustments by the yokes which embrace the hubs of the pinions, holding them in gear with the racks and preventing any but the proper vertical movement of the frame. These yokes are curved to a radius struck from the center of the driving-shaft B^2, in order to maintain the proper relationship between the spur-wheel b' and the pinion b^2 throughout the range of vertical adjustment of the frame. The yokes terminate at their lower ends in broad flanges or base-plates, which extend along the adjacent bars A′ a^2 and are securely bolted thereto. Overhanging ledges at the tops and bottoms of the base-plates closely embrace the frame-bars and aid the bolts in making firm connections. Each yoke is formed with two distinct recesses

or tracks within it, the outer and narrower one, h^4, which constitutes the slot proper, being of a width to snugly embrace the hub of the pinion which projects through it, while the inner and wider one, h^5, which is provided on its front face with the gear-teeth, is of such a width as to receive the geared portion of the pinion which engages with the rack and permits it to revolve freely in its up and down movements. The pinions are provided on their inner faces with flanges which project beyond the ends of the teeth and bear against the adjacent faces of the yokes and hold the shaft against endwise movement through them. In addition to the two tracks or recesses just described, the yoke H is provided on its outer side with the projecting flange h^6, having a series of ratchet-teeth on its front face, which are engaged by a spring-pawl, I, loosely mounted on the shaft and sustaining the frame at any elevation to which it may be adjusted. The pawl is held into engagement with the rack by a spring, i, the nose of the pawl being partially undercut around the hub to form a recess, i', in which the spring lies. The spring is provided at one end with a hook, i^2, which catches over the overhanging ledge of the recess. It is then wound twice around the hub and terminates in a projecting arm, i^3, which extends at right angles to the coil and bears against the face of the slot h^4 in the yoke, slipping up and down thereon as the machine is adjusted on the shaft, as will be seen by Fig. 22.

The grain end of the platform is vertically adjustable on the grain-wheel which supports it, said adjustment being maintained and brought within the reach and control of the driver in his seat by a wire rope or other suitable flexible connection, J, extending along the front of the finger-beam around a guide-sheave, J′, to a winding-drum, J^2, on the main shaft. The drum is loosely mounted upon the shaft beside the yoke H, and may be locked to it by means of a sliding clutch, J^3; or, when released by the clutch, it may be revolved independently of the shaft by means fully described in my before-mentioned application, Serial No. 158,037. On account of the grain-wheel which supports that end of the platform being so far to the rear of the axial line of the main wheel, it must be castered to prevent cramping when the machine is turning. In going about, the machine turns upon the main wheel as a pivot, or with it, the grain end of the platform swinging backward, and a grain-wheel mounted upon a fixed axle or stud not in line with the main wheel will be dragged sidewise over the ground, while a castering-wheel will be swung round to the position shown by dotted lines in Fig. 1, its axial line radiating from the center of the main wheel, as shown.

The caster-wheel N is supported on a stud-axle on the inner side of the free end of an arm, N′, pivoted at O′ in a caster head-block, O, which is attached to the front end of a radius-bar, n, pivoted at n', near the rear extremity of the end board of the platform, as clearly shown in Figs. 1 and 4.

The breast or central portion of the casting E is curved to a radius struck from the pivotal point n' of the radius-bar, and has a correspondingly-curved rib, e', projecting rearwardly from its rear face and extending its length from top to bottom. From the portion E^2 of the casting projects a rib, e^2, which stands at right angles to the rib e', and is curved to correspond therewith. The radius-bar n extends forward from its pivotal point lying in close proximity to the end board until it reaches a point in line with the front of the grain-wheel, where it is offset or bent away from the grain-board and terminates in a socket or recess on the inner face of the head-block O, to which it is suitably secured by bolts or rivets.

A projecting flange, O^2, on the front of the head-block lies inside of the rib e' on the bracket E, while the inner face of the head-block bears lightly against the edge of the rib e^2. Another flange, O^3, projecting from the inner face of the head-block at right angles to O^2, bears lightly against the front face of the rib e^2 and serves to relieve the pivot of the radius-bar from excessive backward thrusts and strains. These ribs form a guideway for the head-block, permitting it to vibrate freely up and down, but preventing side motion or the twisting of the radius-bar while the caster-wheel is swinging around to the dotted position shown in Fig. 1.

Lugs or ears O^4 O^5 extend outwardly and forward from the top and bottom edges of the head-block and terminate in bosses through which the pivot-pin O′ passes. The upper one of these lugs is ribbed to give it greater strength, and has projecting from its front face a hooked spur, O^6, to which the wire rope J is attached. The arm N′, upon which the caster-wheel is mounted, is of wrought-iron and terminates at its front end in a casting, o, to which it is securely riveted. This casting lies between the ears O^4 O^5 of the head-block, and is pivoted upon the pin O′. A lug, o', projects from its inner face and contacts with the head-block to prevent the wheel from rubbing against the radius-bar.

The wire rope J extends from the drum J^2 under the immediate control of the driver, when in his seat, around the guide-sheave J′, mounted in a suitable bracket, j^4, securely bolted to the side bar, a^2, of the main wheel-frame near the finger-beam. From this sheave the rope extends along the front of the finger-beam, resting upon a wooden bar interposed between the guide-fingers and the iron beam. At the grain end of the platform the rope passes around a small guide-sheave, J^3, suitably supported in the casting or bracket-flange E′, and up to the head-block, engaging the forwardly-projecting hooked spur O^6 thereon by a loop at its end. As will be obvious, the weight of the end of the platform is sus-

tained by the wire rope and guide-sheave J^3 and its elevation from the ground determined by the amount of cord paid out or wound upon the drum J^2.

The flange E′ of the bracket which supports the divider C′ is perforated at its bottom, as at e^3, for the passage of the cutter-bar at the extremity of its outward stroke, and in an upward extension of this perforation is mounted the guide-sheave J^3. A strengthening-rib, e^4, on the inner face of the flange follows the irregularities of the aperture and affords a bearing for the pivot of the guide-sheave. The bracket is suitably thickened and shaped on its inner face near the bottom to form the end guard-finger, E^3, of the series, and to properly guide and support the cutter-bar at the extremity of its stroke.

As shown by the several figures of the drawings, the divider C′ stands directly forward from its point of attachment to the bracket-flange E′ at a right angle to the cutter-bar, and is without draft or gather, and the grain-wheel tracks inside of the line of the divider and behind the breast or main portion of the bracket E, which forms an offset between the end board, C^2, and the divider. The cutter-bar extends across this breast, passing through the divider at the extremity of its stroke and cutting the grain in front of the grain-wheel. By this construction I am enabled to dispense with the gather or draft of the divider necessary in machines which employ a grain-wheel tracking outside of the line of cut, but which is always detrimental, owing to the fact that by contacting with the grain close to the ground it sometimes bends it in to such an extent that it lies along the finger-bar and is cut diagonally instead of squarely across the straw, and leaves the stubble much longer at this point than elsewhere along the cutter-bar, which stubble is recut by the heel end of the bar at the next passage of the machine, or if bent too much, as frequently happens, with excessive gather of the divider, it is depressed below the finger-bar and not cut at all. A further objection consists in bunching or accumulating an excessive amount of straw between the last two guard-fingers, for all that which is gathered in by the divider, as well as that which normally stands in the path of the space of these fingers, must be cut at this point, making the work to be performed by the cutter-bar heaviest at its extremity, and necessitating the use of a stiffer bar than would otherwise be necessary, or of additional guards to hold it down to its work. It will thus be seen that under my construction the grain which comes within the point of the divider is presented to the knives or cutters at practically its natural angle and in proper quantity to make a smooth cut and leave an even stubble.

A deflector-bar, C^3, attached to the point of the divider, is used to slightly bend in the heads of the grain and prevent its lodging against the offset or breast formed by the main portion E of the bracket; but this acts upon the grain at such a height that it does not materially alter its angle.

The reel is driven by a sprocket-wheel, S, loosely mounted upon the main shaft B′. The annular flange composing the rim of this wheel has sprocket-teeth cast on its periphery and ratchet-teeth on its inner surface. A circular plate or disk, S′, covers the open face of the sprocket-wheel, and is secured to the hub of the driving-wheel by having its boss shrunk or keyed thereon, and carries upon its inner face a spring-pawl, *s*, which engages the ratchet on the inner face of the rim of the sprocket-wheel, driving it when the machine is going forward, slipping past it when the machine is backing, or being thrown out of engagement with it altogether when it is desired to stop reeling. This clutch corresponds in its essential features and method of operation with those fully shown and set forth in the several Letters Patent of the United States granted to me January, 30, 1883, No. 271,430; February 13, 1883, No. 272,377, and April 3, 1883, No. 275,330, and does not therefore need elaborate description here to make it plain.

A counter-shaft, T, is supported in axial line with the driving-shaft B^2 by an overhanging sleeve or bracket, T′, bolted to the frame-bar a^2 by its downwardly-projecting foot t', and the brace-bar A^2 by a suitable extension and foot, t^2, the bolt which passes through the latter connection also serving to hold the brace-rod c^4 of the reel-post C^4. Upon each end of the shaft T, where it projects beyond the sleeve, are mounted pinions T^2 T^3, the former being connected to the sprocket-wheel S by a driving-chain, S^2, and the latter to a sprocket-wheel, on the end of the reel-shaft. The shaft T being in axial line with the driving-shaft B^2, about which the main axle B′ moves during the vertical adjustments of the frame, the distance between the sprocket-wheel S and T^2 will not vary during these adjustments and will not therefore necessitate any variation in the length of the driving-chain S^2.

A bevel-wheel, B^4, which may be provided with a backing-ratchet like that described for the reel, is secured on the driving-shaft B^2 in the recess of its supporting-bracket B^3 and meshes with a bevel-pinion, b^4, on the end of the forward section, U, on the line-shaft U′, which extends to the rear of the platform. The shaft-section U is suitable journaled in a boss, b^5, on the bracket B^3, and extends at an angle back and down until it reaches the plane of the line-shaft U′, to which it is united by a universal coupling-joint, U^2, as shown in Figs. 1 and 2. The line-shaft is journaled near its front and in a bearing, a^9, formed in the binder-frame casting A^3, from which it extends back across the platform in a plane parallel thereto, and is journaled at its rear end in a box or bearing, U^3, projecting through and bolted to the rear sill of the platform. The spur-pinion from which the lugs forming part of the

universal joint U^2 project belongs more particularly to the binding mechanism before referred to, and is only shown here because of its connection with this joint. At suitable intervals along the shaft U′, between the front and rear sills of the platform, are rollers *u′*, around which the carrier-belts V pass, and by which they are driven. The rear end of the shaft U′ projects through the journal U^3 and has secured to it a crank plate or disk, U^4, the wrist-pin of which is connected by a pitman, U^5, to the end of the sway-bar W. This bar is pivoted to the platform about midway of its length, and extends through a slot of sufficient length to permit its vibration in the rear sill, the projecting end being connected to the pitman U^5.

The sway-bar W consists of a thin flat bar of wood pivoted about midway of its length on a bracket, W′, bolted to the bottom of the platform. This bracket consists of an upright cylindrical boss having a flange or base-plate secured by four bolts to the bottom of the platform, two of the bolts passing through the diagonal brace-bar D′, which lies beneath the center of the bracket W′, as shown. A tubular cylinder, W^2, passes through an aperture in the sway-bar and fits snugly over the upright boss of the bracket W′. It has a flange at its upper end, which rests upon the top of the sway-bar and is bolted thereto. At its front end the sway-bar terminates inside of the angle-iron finger-bar, and is provided with a metallic end piece, which is securely bolted to it and projects through a slot in the finger-bar, and is suitably connected to the cutter-bar. As will be seen by Fig. 16, this slot is of a length slightly greater than is necessary for the play of the bar within it, and its ends are beveled to form sharp edges which prevent the accumulation and packing of grass, straw, &c., between the ends of the slot and the sway-bar, a difficulty frequently experienced where the sway-bar plays through a square-ended slot, and causes no little annoyance by impeding or even stopping the sway-bar near the end of its stroke, compelling the farmer to stop his machine and remove the collection thus formed.

Instead of fastening the guard-fingers directly against the upright face of the angle-iron bar C, I interpose between them a wooden bar, X, against which the fingers are fastened, as shown in Figs. 17 and 18. When the teeth are fastened directly to the angle-iron, nice fitting is required between their base or supporting-flanges and the face of the bar, and even with that they are liable to work loose. By interposing the wooden bar, as I do, between the fingers and the iron beam and passing the clamping-bolts which hold the fingers through the wooden bar and the angle-iron, slight irregularities in the supporting-flanges of the fingers or in the face of the angle-iron will be pressed into the wood, and will, if anything, add to the firmness with which the teeth are held. I am thus enabled to dispense with the nice workmanship heretofore considered necessary in fitting the guard-fingers to the beam.

The wire rope J, by means of which the driver adjusts the grain end of the platform, passes along the front of the platform lying on the bar X, which not extending to the top of the iron finger-beam C, leaves a corner or recess in which the rope lies out of the way of all the working parts.

The carrier-belts V extend the entire length of the platform and pass around a guide-roller, *v*, at its grain end, which may be made adjustable to tighten the belts by any of the well-known belt-tightening mechanisms—such, for instance, as those shown and fully described in Letters Patent of the United States, granted to me January 10, 1883, No. 252,081, and September 26, 1883, No. 282,580. Guard-fingers *v′*, attached to the end board of the platform, extend over the space between the roller *v* and the end board and prevent the grain from falling through it. These fingers, or their equivalents, are such as are shown in my Patent No. 285,580 just referred to. Flat bars of iron, Y′, extend across and are secured to the front and rear sills by bolts passing through the sills and upturned foot on the ends of the bars. Those bars support the bottom boards of the platform and help to stiffen the frame. The clearer-fingers Y are bolted to the outer one of these bars below the belts, between which they rise at any easy angle until they reach such an altitude above the belts as will insure the grain being lifted above and out of the influence of the carrier-belts, from which point they extend to the outer edge of the platform in a plane parallel to the top of the belts. These clearer-fingers, however, form part of the binding mechanism before referred to, and they will be more fully shown and described in an application for a patent thereon.

I have described and shown in the accompanying drawings several features of my invention which go to make up a complete harvester, but which form no part of this application and are not herein claimed, as they will constitute or form part of the subject-matter for other divisions of applications No. 158,037, filed March 7, 1885.

What I claim, and desire to secure by Letters Patent, is—

1. The combination, with the wheel-frame of a harvester rectangular in shape and braced by a longitudinal bar which divides the frame into two compartments, of the driving-wheel and its axle which carries the frame, located in the inner compartment, and the gearing and shafts for transmitting power to the harvesting mechanism, located in the outer one, substantially as hereinbefore described.

2. The wheel-frame of a harvester surrounding the driving-wheel and supported by its axle, located in front of the outer end of the platform and rigidly connected thereto, the frame being composed of a continuous piece

which forms its four sides, and extends across the end of the platform to the rear sill thereof, to which it is secured, substantially as hereinbefore described.

3. The combination, in the wheel-frame of a harvester, located in front of the outer end of the platform and rigidly connected thereto, of the outer side bar of the frame extending across the end of the platform to the rear sill to which it is secured, with a truss-brace on the extension-bar, substantially as and for the purpose hereinbefore set forth.

4. The combination of the wheel-frame of a harvester and a finger-beam attached to the frame, with a brace-bar extending diagonally from the front of the frame to the finger-beam to which it is attached, and twisted at its lower end to form a guard or shoe which shields the outer or first guard-finger on the beam, substantially as hereinbefore set forth.

5. The combination of the wheel-frame of a harvester having its outer side bar extending across the end of the platform and secured to the rear sill thereof, and a finger-beam rigidly attached to the rear bar of the wheel-frame, with a brace-bar attached to the finger-beam and extending diagonally across the platform to a point near its outer rear corner, where it is attached to the rear sill near the end of the extension-bar, substantially as hereinbefore set forth.

6. The combination of the wheel-frame of a harvester, located at the outer front corner of the platform and rigidly connected thereto, with a truss-brace on the outer side bar of the frame and platform and a diagonal brace across the bottom of the platform to stiffen the structure both vertically and laterally, respectively, substantially as hereinbefore set forth.

7. The combination of the wheel-frame, a tongue pivoted to the frame at its inner front corner, a diagonal brace-bar attached to the tongue and pivoted to the outer front corner of the frame in line with the tongue-pivot, and a foot-board attached to the tongue and extending across the front of the wheel-frame, and also attached to the brace-bar to strengthen the structure, substantially as hereinbefore set forth.

8. A bracket or standard attached to the end of the finger-beam, having a rear flange at its inner end, to which the end board of the platform is attached, and a front flange at its outer edge to which the divider is attached, and constituting an offset or breast between the end board and the divider, substantially as hereinbefore set forth.

9. The combination of a finger-beam, the guard-fingers offset therefrom by an interposed bar, and a rod or flexible connection through which the adjustment of the grain-wheel is effected, lying on the interposed bar in front of the finger-beam, substantially as hereinbefore set forth.

10. The combination of a wheel-frame divided longitudinally by a brace-bar, a bracket or casting located in the outer division of the frame and bolted to the adjacent bars, a counter-shaft mounted in sleeve-bearings in the bracket and provided at its inner projecting end with a spur-pinion, a driving-wheel upon the axle of which the frame is supported, located in the inner division of the frame, a spur-gear carried by the driving-wheel engaging the pinion, and a bevel gear-wheel on the counter-shaft working in a recessed gear-box in the bracket, and engaging a bevel-pinion on the end of a line driving-shaft, also journaled in a sleeve-bearing on the bracket, substantially as hereinbefore set forth.

11. The combination of a harvester-platform, a sway-bar extending across the platform, a pivot-stand for the sway-bar bolted to the bottom of the platform, and a diagonal brace-bar between the front and rear sills of the platform, passing beneath the pivot-stand and united to it by bolts, substantially as hereinbefore set forth.

In testimony whereof I hereto affix my signature in presence of two witnesses.

JOHN S. DAVIS.

Witnesses:
J. H. SOUTHARD,
CARRIE T. SOUTHARD.