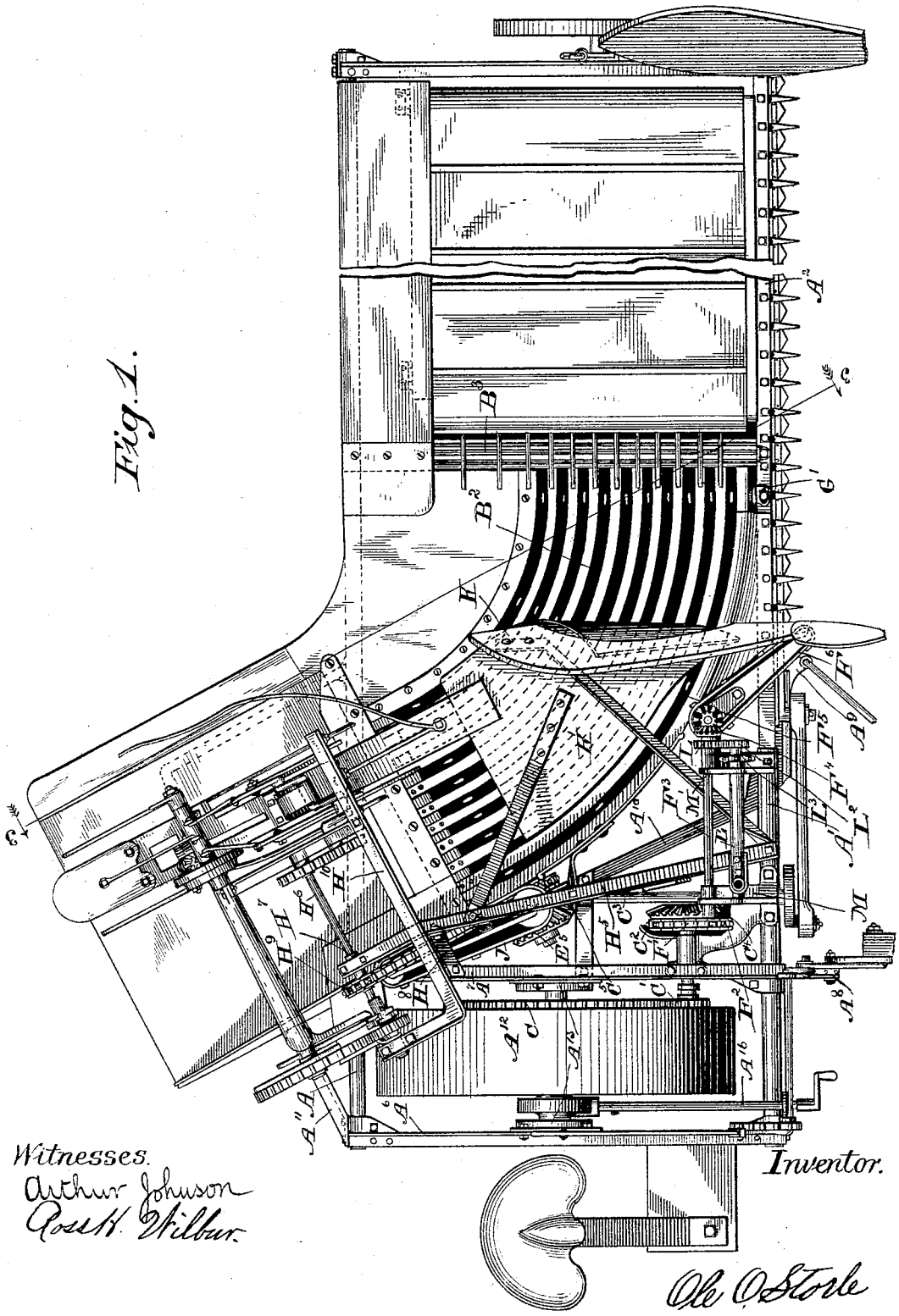
(No Model.) 4 Sheets—Sheet 1.

O. O. STORLE.

SELF BINDING HARVESTER.

No. 493,530. Patented Mar. 14, 1893.

Fig. 1.



Witnesses.
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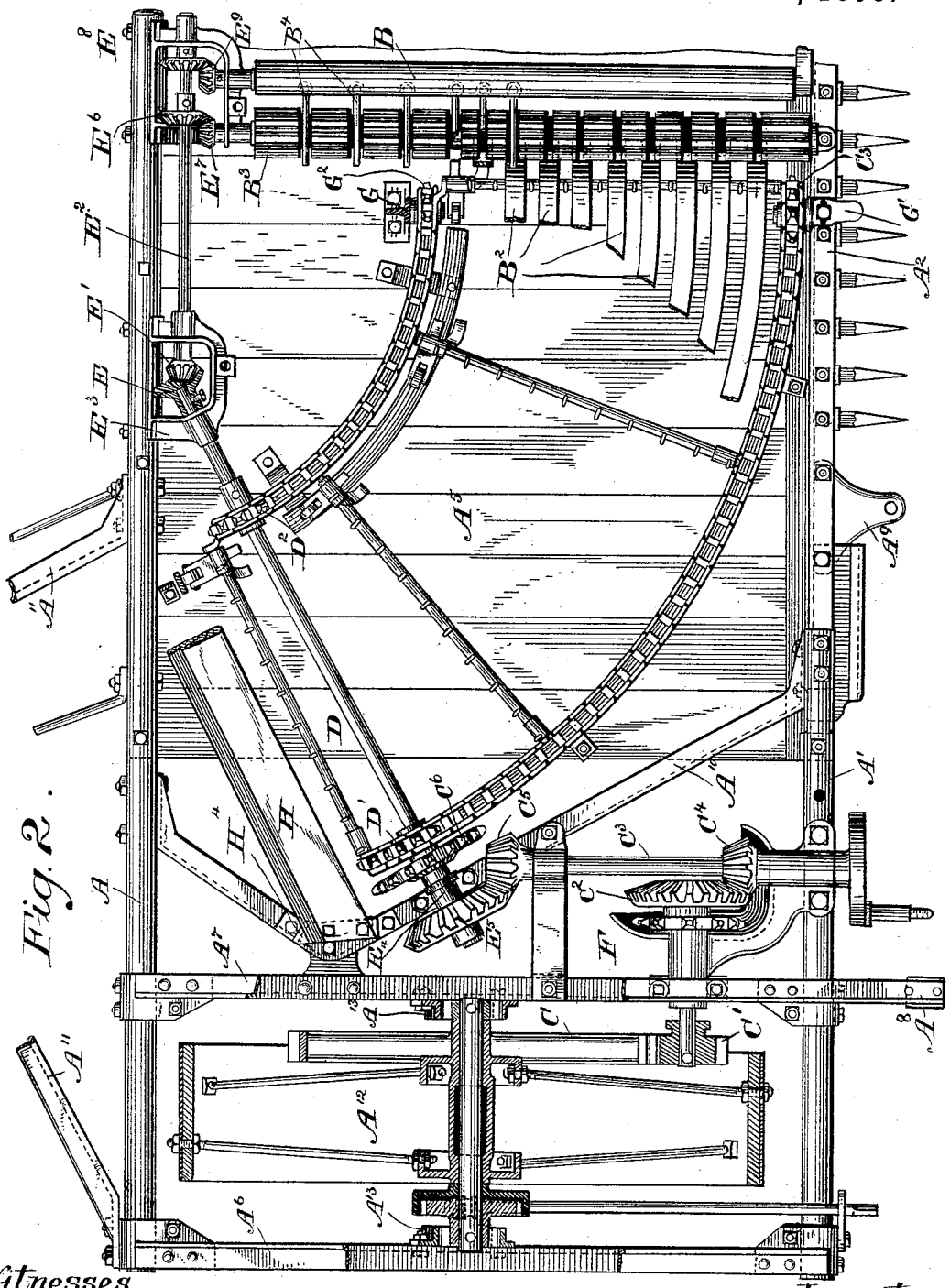

Fig. 2.

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(No Model.) 4 Sheets—Sheet 3.

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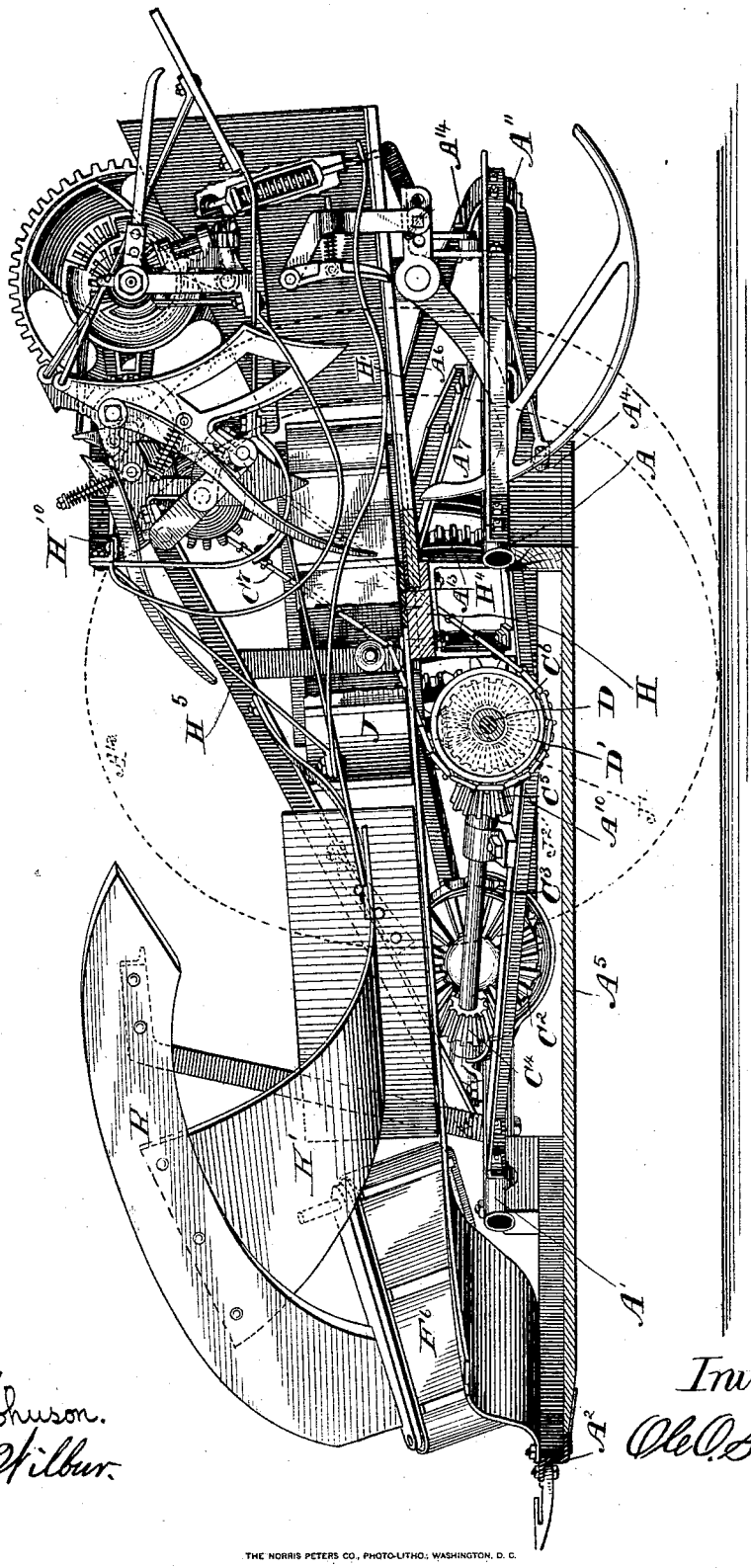

Fig. 3

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(No Model.) 4 Sheets—Sheet 4.

O. O. STORLE.

SELF BINDING HARVESTER.

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Fig. 6.

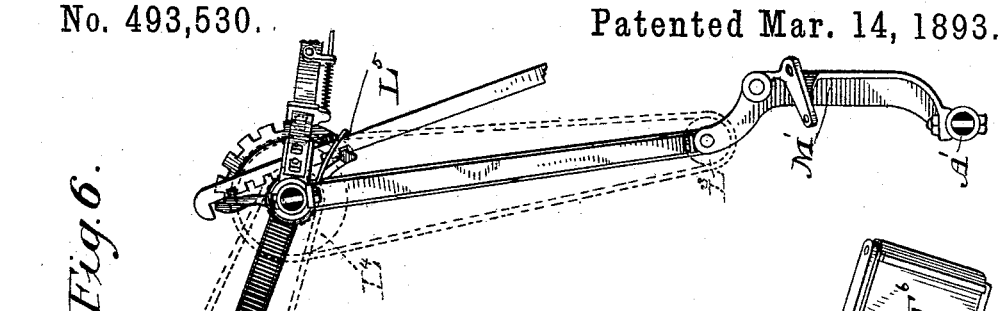


Fig. 5.

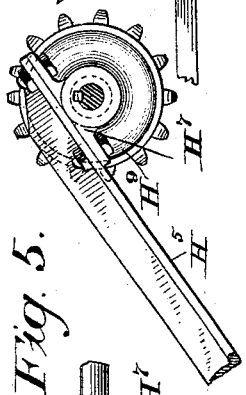


Fig. 7.

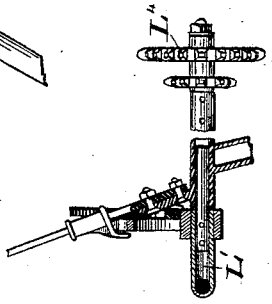


Fig. 8.

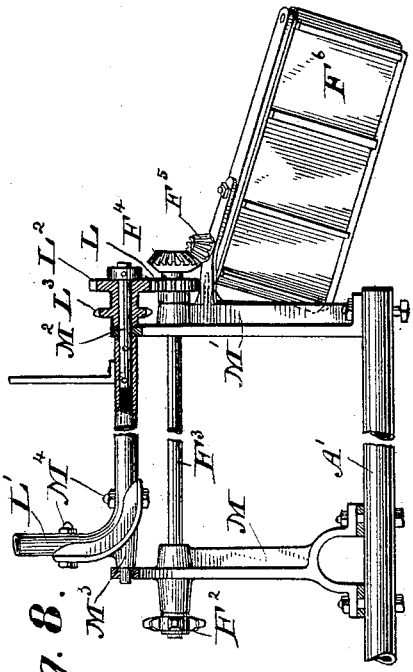
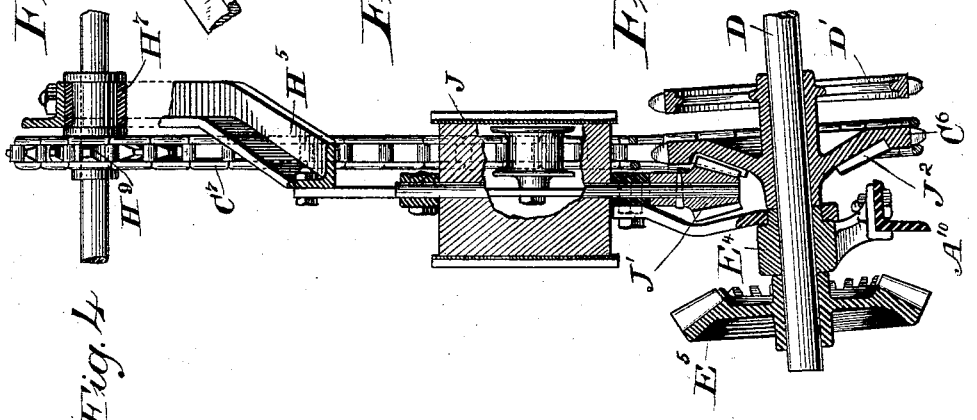


Fig. 4.



Witnesses.
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UNITED STATES PATENT OFFICE.

OLE O. STORLE, OF BURLINGTON, WISCONSIN, ASSIGNOR TO WILLIAM DEERING, OF CHICAGO, ILLINOIS.

SELF-BINDING HARVESTER.

SPECIFICATION forming part of Letters Patent No. 493,530, dated March 14, 1893.

Application filed January 3, 1890. Serial No. 335,766. (No model.)

To all whom it may concern:

Be it known that I, OLE O. STORLE, of Burlington, in the county of Racine and State of Wisconsin, have invented certain new and useful Improvements in Self-Binding Harvesters, of which the following is a full description, reference being had to the accompanying drawings.

The object of my invention is to improve the machine shown and described in applications for Letters Patent of the United States, as follows: Serial No. 184,893, filed December 7, 1885, Serial No. 203,258, filed May 25, 1886, Serial No. 213,191, filed September 10, 1886, and Serial No. 250,579, filed September 24, 1887.

In the previous applications referred to I have shown, described and claimed various constructions embodying the broad principle involved in the machine herein shown, and this application is mainly confined to improvements in details of construction, and I do not mean to claim in it anything therein contained.

In the drawings Figure 1 is a plan view of my machine, without the reel and some other parts that are not pertinent to this invention. Fig. 2 is a sectional plan view designed to show the structure of the frame work and arrangement of the gearing. Fig. 3 is a grain-side elevation of the machine, as if cut on the line 3—3 of Fig. 1. Figs. 4 and 5 are details showing the arrangement of the binder driving gearing. Fig. 6 shows the construction of the reel latching device. Fig. 7 is a detail illustrating the arrangement of certain of the parts of the reel controlling lever and fulcrum. Fig. 8 shows means whereby the butt-moving mechanism and reel are driven.

A is the rear sill of the main frame; A′, the front sill thereof. These I preferably make of gas pipe.

A^2 is a finger bar, bolted to the sill A′. Any suitable saddle piece may rest between these two parts at the point of the splicing. Beneath the rear gas pipe sill I place a wood piece A^4, and to this and the finger bar, is secured the bottom boards A^5.

A^6 and A^7 are trusses secured, front and rear, to the sill pipes A and A′. I allow the truss A^7 to extend forward of the front sill and pivot the tongue at A^8. The tongue is provided with a suitable brace connected to the frame at A^9.

A^{10} is a strong bar of metal secured to the front sill at its grain end; the said brace extending backward and stubbleward, and secured by a splice piece to the truss A^7 near the rear end. In order to form a better bracing for the platform, I preferably deflect the bar A^{10} stubbleward and rearward and secure it to the truss A^7 through the instrumentality of the casting A^{15}, thence turn it backward and grainward and secure it to the rear sill, A.

A^{11} is a strong bar of metal which is adapted to form a support or guide-way upon which the adjustable binder may travel. It is preferably secured to the stubble end of the rear sill, or other strong portion of the frame, and extends diagonally backward and grainward so far as to form a support and guide for the binding attachment, the latter being adapted to slide thereon. It is suddenly directed diagonally forward and secured to the rear sill, A, as shown in Figs. 1, 2 and 3.

A^{12} is the master wheel, and A^{13} and A^{13} are quadrants secured to the trusses A^6 and A^7. Into these quadrants mesh the pinions on the ends of the axle, and the axle is adapted to be rotated by a worm and screw, and by the shaft A^{16}. By rotation of this shaft the machine is raised or lowered at will.

B is the roller which supports the delivery end of the endless apron that forms the receiving platform, and from which said apron is driven.

B^2 is a quadrant platform, upon which that portion of the grain which is cut near the stubble end of the cutting apparatus falls. In order to deliver to this latter portion of the grain receiving platform, the grain received and delivered by the receiving platform proper, B, a roller B^3 is provided, fluted, so as to have an aggressive action upon the grain, and move it forward onto the curved platform. I provide supporting wires, B^4, and secure them to the bottom boards A^5, and allow them to extend so far forward as to guide the grain well beyond the roller. The particular office of these wires is to prevent the roller B^3 from carrying the grain down between it and the slats forming the curved

platform B^2. This curved platform is composed of flat bars of iron, and beneath it operate a band of rakes; the teeth of the rake heads being adapted to pass up through between the slats of the curved conveyer at the receiving end, and to draw out at the delivery end.

D is a shaft provided with sprocket wheels D′ and D^2. This shaft is supported in bearings E^3 and E^4; and, in order that it may be driven, a bevel wheel E^5 is keyed thereto, and adapted to mesh into the driving pinion C^5.

E′ is a bevel gear keyed upon the end of a shaft E^2 which has a bearing in the bracket E^3. This shaft is provided with a gear, E^6, which, through the pinion E^7 gives rotation to the stripping roller B^3; and is provided also with a gear E^8, which, through the instrumentality of the pinion E^9, gives rotation to the roller B.

C is the main driving gear secured to the supporting wheel, and adapted to mesh into the pinion C′, which gives rotation to the counter shaft, and, through the gear C^2 and the pinion C^4, gives movement to the shaft C^3.

C^6 is a sprocket wheel mounted upon the shaft D, by which the binder is driven. By reference to Fig. 2 it will be clearly understood how the rotations of the shaft are produced. By this arrangement of gearing I am enabled to drive the various parts requiring movement by the use of very little gearing.

F is a sprocket wheel from which power to drive the reel is derived.

G and G′ are studs upon which the idle sprocket wheels G^2 and G^3 rotate. The bracket which supports the stud G is bolted to the bottom board A^5, and has slotted holes whereby it may be adjusted. G′ is also slotted where attached to the finger bar. By the movement of these two brackets any slack in the chains due to wear may be taken up.

I mount my binder on the bar A^{11}, and, in order that it may move easily, provide the anti-friction rollers A^{14}.

H is a bar of wood at the delivery end of the curved conveyer. This forms a part of the receiving table of the binder. It is rabbetted so that the receiving end of the binder table H′ may slide therein.

To prevent the binder from moving from place, I permit a part of the bracket in which the roller A^{14} is secured to extend downward beside the track upon which the roller moves; and, to hold the receiving edge of the binder table, I secure above it a plate of metal, H^4.

H^5 is a long bar of metal secured to the front portion of the frame and extending upwardly and rearwardly to a point above the packer driving shaft H^6, where it is provided with a box, H^7. In order to support this bar thoroughly, I provide the strut H^8. Reference to Fig. 1 will show the position of the said shaft relative to this supporting bar. Upon the said packer driving shaft is the sprocket wheel, H^9. It is provided with a hub, which is adapted to rotate in the bearing H^7 and has flanges upon either side of the said bearing so that the wheel shall be held from moving. The packer shaft is feathered and the sprocket wheel key-wayed in such a way that when the wheel is rotated the shaft is compelled to follow the movement. This shaft revolves in bearings formed in the bracket H^{10}. Upon this bearing the breastplate and various portions of the binder shown in Fig. 1, but not necessary to describe, are mounted. It will be observed that if the binder is moved in the direction of the length of the grain delivered thereto, the packer driving shaft will slide through the sprocket wheel H^9 and be properly driven.

In order to control the movement of the grain and even up the butts of the swath before passing into the binder, I provide two substantially vertical endless canvases. The one, F^6, is located with its receiving end so as to form a sort of gathering device and start the straws cut at the stubble end of the cutting apparatus in the direction of delivery, and I preferably place this canvas so that it shall have a gathering action; that is to say, with its receiving end farther forward relative to the curve of movement of the butts of grain at the delivery end. In order to give this band rotation, I pass the chain F′ from the sprocket wheel F to the sprocket wheel F^2 upon the shaft F^3. Upon this shaft is also the bevel gear F^4, which is adapted to mesh into the pinion F^5 upon the driving drum of the endless canvas butting device, F^6. This butting device is placed at such an angle as to have a lifting action upon the butts.

J is another butting canvas adapted to rotate at such a rate of speed as to act quickly upon the butts of the grain, and should they lag while passing on to the binder table they will be thrown forward. In order to give rotation to this endless canvas, J, I provide the shaft of its driving drum with a pinion, J′, shown in section in Fig. 4; the latter adapted to mesh into the gear J^2 on the side of the sprocket wheel C^6. The delivery end of this butt-advancing canvas, J, passes around a roller, as usual in such devices. The binder driving chain C^7, passes from the sprocket wheel C^6, up through the space within which the endless canvas, J, moves, and around the sprocket wheel H^9 on the packer driving shaft. By this arrangement I am enabled to drive the binder directly from the shaft D, which gives rotation to the curved conveying chains, and also to drive the butting canvas J and binding devices as well.

K is a rearward extension of the stubble-side gathering board, and to this I secure the metallic piece, K′, which passes downward and curves grainward so as to form a cover over the curved conveyer.

In order to give my reel rotation, I mount the gear L near the grain end of the shaft F^3; and, upon the stud coincident with the axis of the fore and aft movement of the reel bracket L′, I mount the gear L^2. Connected

thereto is the sprocket wheel L^3, and from it passes a chain upward to the wheel L^4 of the reel bracket. The reel is pivoted in brackets M and M′, upon pivots M^2 and M^3. Pivot M^3 is saddled to the foot of the reel post, L′, and there secured by means of bolts, M^4 and M^4. In putting the reel in place it is but necessary to remove the saddle piece forming the pivot M^3 from the reel post and pass M^2 through the support in M′, place the pivot M^3 into the bearing in M, and replace the bolts M^4.

I have shown in Fig. 6 a wire spring attached to the upper end of the reel post, passing downward and over the latch rod, L^5. This spring is to prevent the latter from jarring out, and I introduce the figure here only to show how the difficulty of displacement may be obviated.

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

1. In a grain harvesting and binding machine, the combination with the main-frame, of the main wheel, the main driving-shaft C^3, extending in a fore and aft direction and driven from the main-wheel, the oblique conveyer-driving shaft D, driven from the main driving-shaft, the transverse shaft E^2, driven from the conveyer driving-shaft, and the conveyer shaft B and its apron driven from the shaft E^2, substantially as described.

2. The combination and arrangement of the driving sprocket wheel C^6, the binder driving sprocket wheel H^9, the driving chain C^7, and the butt-adjusting canvas J, the said chain arranged to pass up between the two parallel sides of the said butt-adjusting canvas, substantially as described.

3. In a harvester and binder the combination with the conveying mechanism arranged to carry the cut grain to the binder, of two endless butting aprons, one in advance of the other, and independent driving mechanism for said aprons whereby the said aprons are adapted to be driven at different rates of speed.

4. In a grain harvesting and binding machine, the combination of the receiving platform and the curved conveying mechanism acting to carry the cut grain to the binder, with the divider extending rearward over the curved conveyer, the sheet K′, overlying said conveyer, and the butting mechanism J.

5. In a grain harvesting and binding machine, the combination with the curved conveyer adapted to carry the cut grain from the receiving platform to the binder, of the two butting aprons located at the outer edge of said conveyer at its receiving and delivery ends respectively.

6. In a harvesting and binding machine the combination with the receiving platform and the conveyer thereon, of the curved conveyer arranged between the first named conveyer and the binding mechanism to deliver the grain to the latter, and two butting-aprons located at the outer edge of said conveyer, one in advance of the other, to act successively on the advancing grain.

7. In a grain harvesting machine, the combination with the front sill, of the standards M M′ rising therefrom, the butting apron F^6, sustained at the side thereof, the driving-shaft journaled in said standards and arranged to operate the butting apron, the reel standard L′, journaled in the first named standards above the driving shaft, the reel at its upper end, the reel driving pinion L^2, driven from the driving-shaft, and the sprocket wheel and chain arranged to transmit motion to the reel.

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