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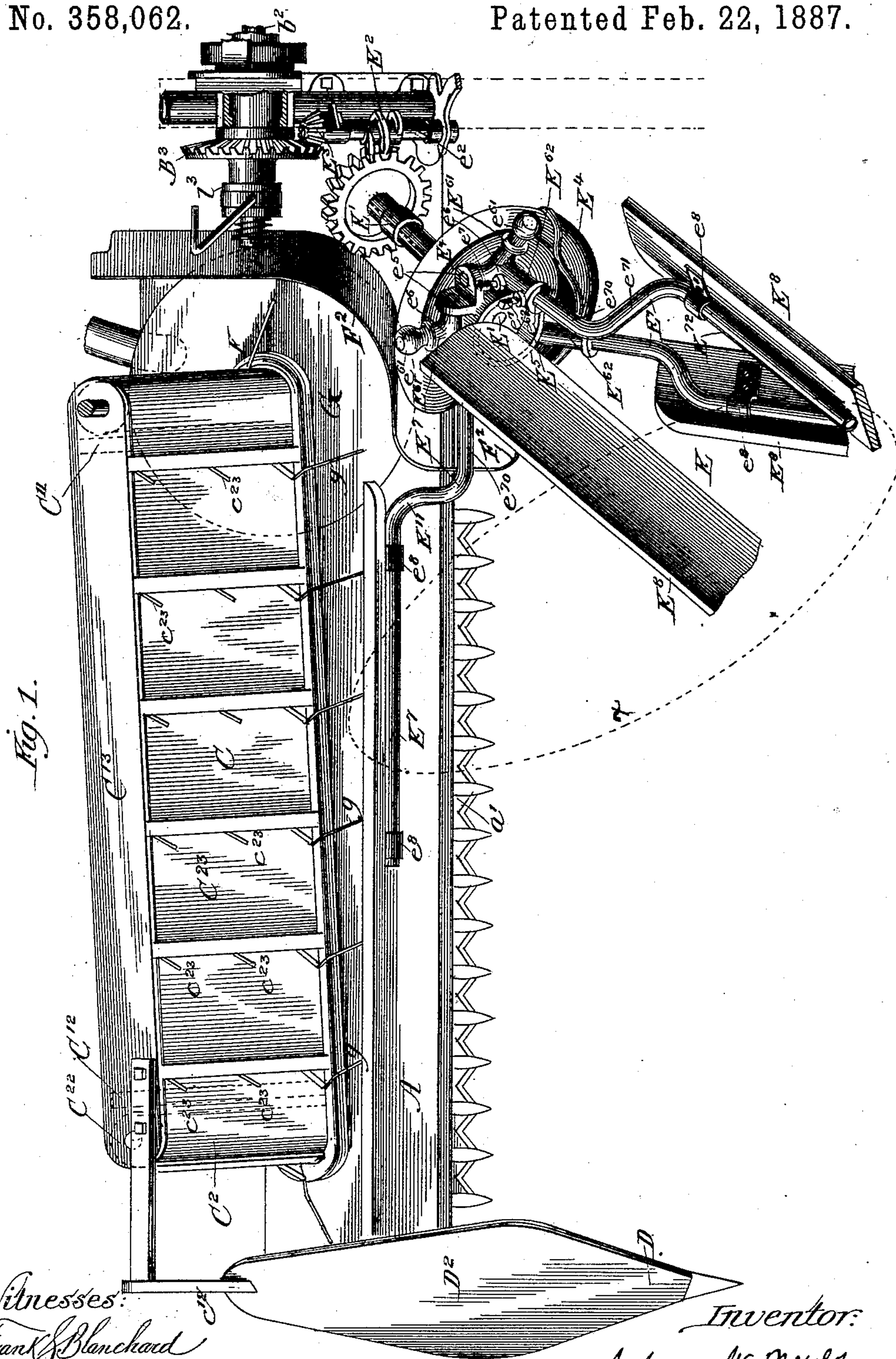
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LA VERNE W. NOYES.

GRAIN HARVESTER.

No. 358,062.

Patented Feb. 22, 1887.



Witnesses:
Frank Blanchard
Chas. S. Burton

Inventor:
La Verne W. Noyes

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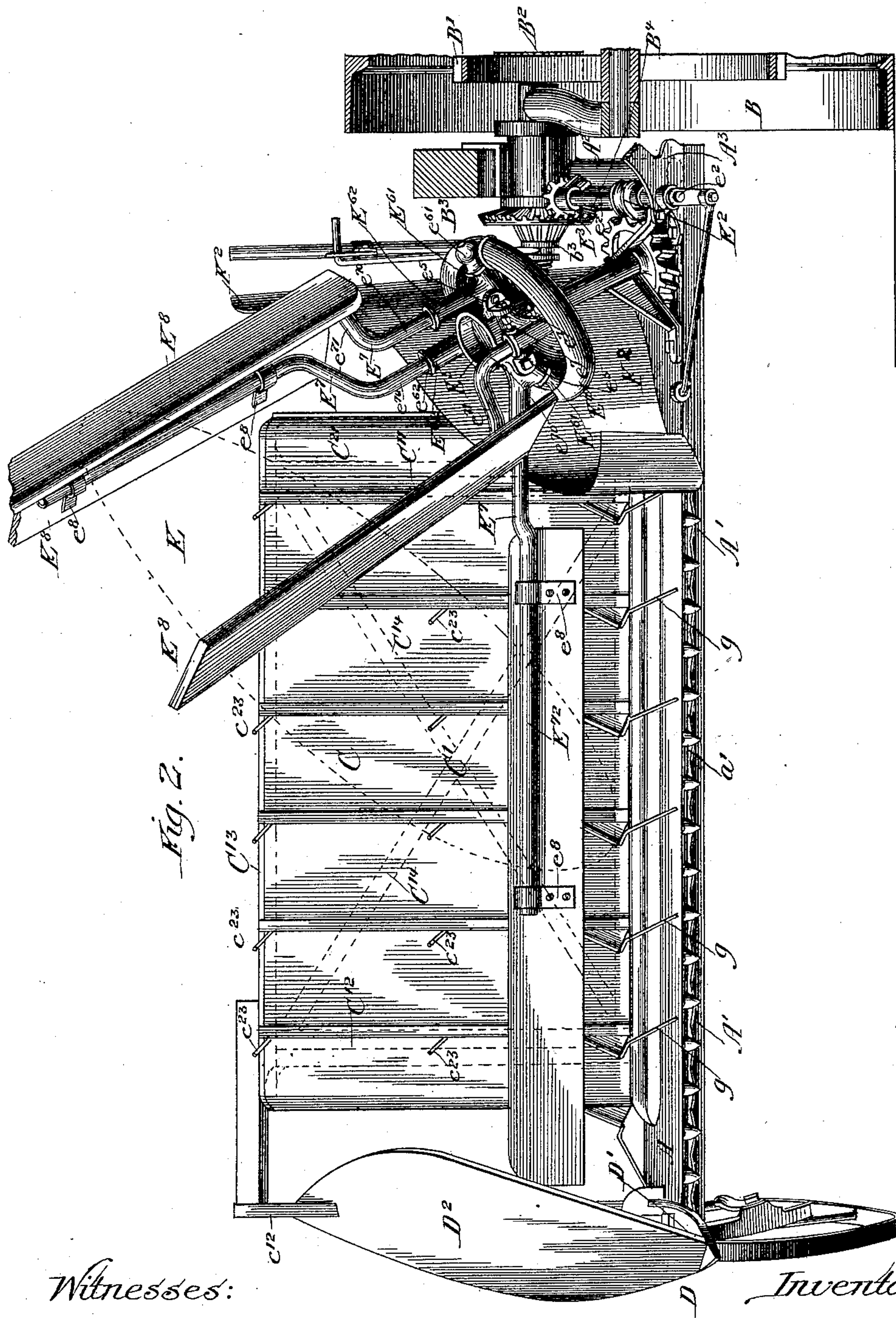
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Inventor:
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By Chas. S. Burton
Attorney

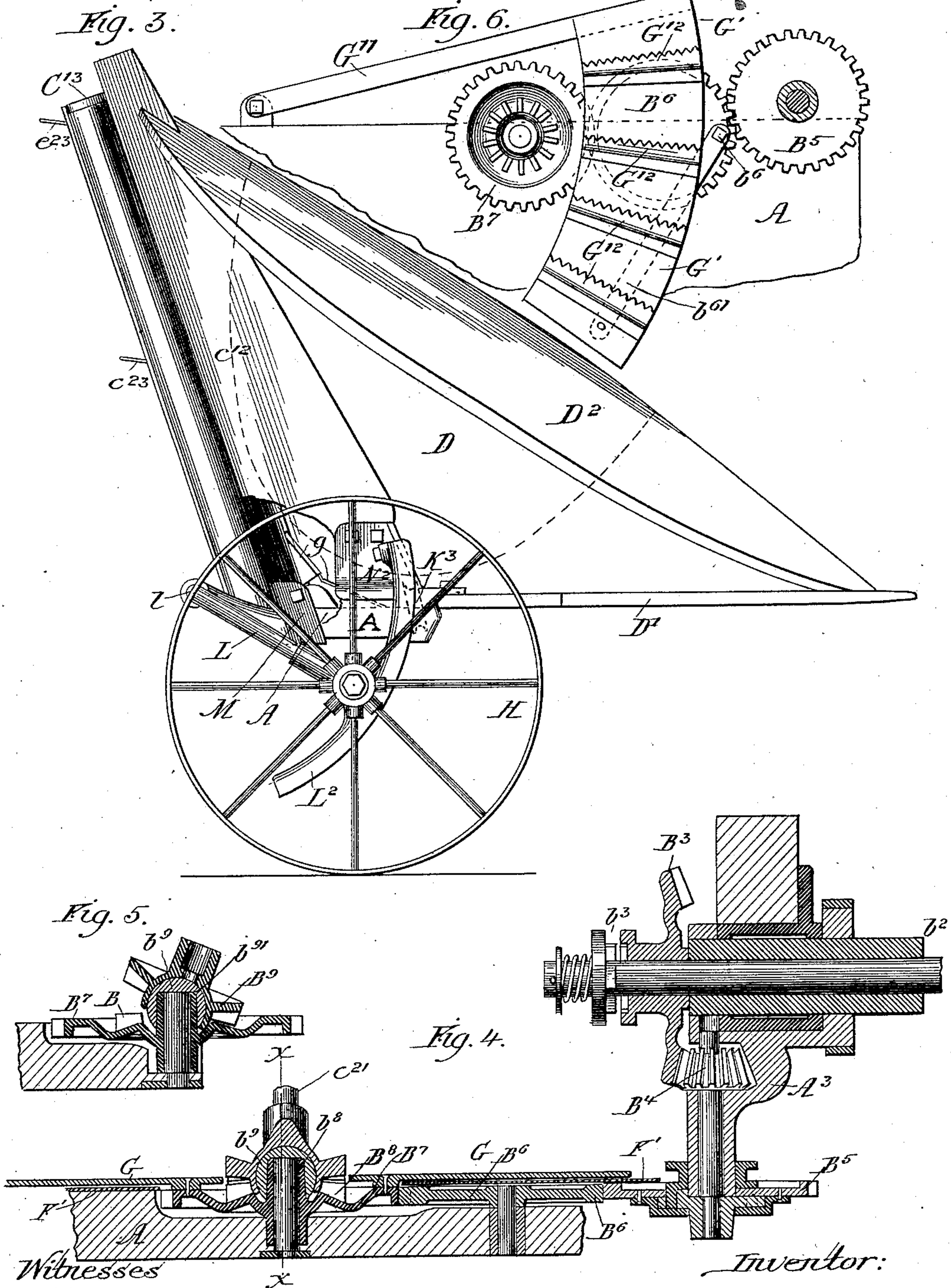
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Witnesses
Frank Blanchard
Edward Dwiggins Downe

Inventor:
La Verne W. Noyes.
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Attorney

UNITED STATES PATENT OFFICE.

LA VERNE W. NOYES, OF CHICAGO, ILLINOIS.

GRAIN-HARVESTER.

SPECIFICATION forming part of Letters Patent No. 358,062, dated February 22, 1887.

Application filed June 29, 1885. Serial No. 170,142. (No model.)

To all whom it may concern:

Be it known that I, LA VERNE W. NOYES, a citizen of the United States, and residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Grain-Harvesters, which are fully set out in the annexed and following specification.

The purpose of this invention is to provide means for gathering the grain that is cut by the sickle of a grain-harvester, and accumulating it upon the machine at the stubble end of the cut without allowing it to fall prostrate, but retaining it upright on end, and adapted to be delivered to an automatic binder and bound in that position.

It comprises, first, a horizontal ledge or platform immediately in the rear of the sickle, constituting a support for the butts of the severed grain, and an upright or slightly-inclined wall rising from the rear edge of the said horizontal ledge or platform and sustaining the grain upright; second, mechanism in the nature of a reel for delivering the grain at the instant it is severed by the sickle against the upright or inclined wall, and for retaining it against the same while it is conveyed transversely stubbleward; third, conveying mechanism operating upon or through said upright wall to move the grain transversely stubbleward; fourth, a suitable receptacle in which the grain may be accumulated on end at the stubbleward end of the transverse conveying mechanism; fifth, the mechanisms for transmitting power from the drive-wheel to the several parts above named.

In the drawings, Figure 1 is a plan. Fig. 2 is a front elevation. Fig. 3 is an inner side elevation. Fig. 4 is a transverse vertical section of the gearing which drives the conveyer. Fig. 5 is a vertical section through the line x , Fig. 4. Fig. 6 is a detail plan of an alternative form of butt-carrier.

A is a plank, which constitutes the grain-supporting ledge or platform. To its front edge is secured the finger-bar A' , in which the sickle a' has its bearing, in the usual manner. To the grain end of said plank A is secured the grain-wheel-bearing bracket A^2 , and to its stubble end is secured the bracket A^3 , which has the bearings for the gearing.

B is the drive-wheel. B' is the main driving-gear run thereon.

B^2 is the main driving-pinion; b^2 , its shaft. B^3 is a bevel-gear on said shaft, and clutched thereto by the clutch b^3 .

B^4 is a bevel gear-wheel, driven by the bevel gear-wheel B^3 and driving the train consisting of the gear-wheel B^5 , which is fixed on or clutched to the shaft of the bevel gear-wheel B^4 , the intermediate gear-wheel, B^6 , and the gear-wheel B^7 , which has formed as integral with it the bevel gear rim or wheel B^8 , and is provided with the central stud or spindle, b^8 , upon which is upheld the globe or ball b^9 , to form the pivot of the ball-and-socket joint, the other member of which is hereinafter described.

C is the upright wall, against which the cut grain is lodged by the reel. It comprises the frame C' , consisting of the end posts, C^{11} , c^{11} , and C^{12} , the upper bar, C^{13} , and suitable diagonal braces, C^{14} , and the endless apron C^2 , consisting of the driving-roller C^{21} , the idle-roller C^{22} , and the endless toothed belt C^{23} . The frame C' is rigidly secured to the plank A. The roller C^{22} is journaled in the upper bar, C^{13} , and at the lower end its shaft c^{21} , has rigid with it the bevel gear-wheel B^9 , which faces the bevel gear-wheel B^8 and meshes therewith, and is driven thereby, being supported in position and retained in mesh by the ball b^9 , protruding into the cavity b^{21} in the gear B^9 , which thus constitutes the remaining member of the ball-and-socket joint above mentioned. The roller C^{22} is likewise journaled in the upper bar, C^{13} , and has its lower end suitably supported and journaled in a box on the plank A.

D is the divider, consisting of the lower bar, D' , secured to the plank A, and the upper bar, D^2 , extended up from the forward part of the lower bar and joined to the post c^{12} near its upper end, thus, in addition to its function as a divider, serving as a diagonal brace to secure the wall C and the lower bar, D' , of the divider in proper relation to each other. The bar D^2 is made to stand inclined, with its upper edge stubbleward, to adapt it to co-operate with the reel, in a manner and for a purpose hereinafter set forth.

E is the reel. Its shaft E' is journaled in the bracket or main frame A^3 in position ex-

tending obliquely upward, forward, and grainward, being actuated in that position by the endless screw E^2 on the shaft e^2 , which also is journaled in the bracket A^3 and actuated by the bevel gear-wheel B^3 , which engages and drives the bevel gear-wheel E^3 on said shaft e^2 .

To the upper inner bearing of the reel-shaft E' is secured the cam E^4 , of a familiar construction employed in reel-rakes, and to the protruding end of said shaft E' is secured the collar E^5 , having the ears e^5 e^5 , between which the reel-clips E^6 are pivoted. Said clips have the arms E^{61} and E^{62} , forming an angle, and are pivoted near the said angle to the collar E^5 between the ears e^5 . The arms E^{61} have the cam-roll e^{61} , adapted to the cam E^4 , and the arms E^{62} have the socket e^{62} to receive the reel-arm E^7 , which are secured in said sockets by the set-screws e^7 . Said arms and sockets are cylindrical, for a purpose hereinafter stated.

To the arms E^7 , respectively, are secured the reel-bats E^8 . Said arms E^7 are preferably shaped as illustrated, extending from the socket e^{62} a short distance, e^{70} , in the direction of said socket, then a short distance, e^{71} , at about a right angle to said direction, and then the remainder, E^{72} , of their length in a direction about parallel with the first portion. The bats E^8 are secured on the outer portion, and are adapted to be set at any desired angle thereon, for a purpose hereinafter explained.

F is the grain-receptacle. It consists of the space bounded by the delivery end of the conveyor, the floor-sheet F' at the bottom, and the vertical sheath F^2 , curved or deflected from the front around the stubble or drive wheel side and shielding the gearing from the straw.

To the gear-wheel B^7 is secured the flange G , which revolves close above the plank A and floor-sheet F' , and assists in carrying the grain around the end of the conveyor. A substitute for this flange is the reciprocating ribbed horizontal plate G' , actuated by the crank-pin b^6 on the intermediate gear-wheel, B^6 , and the link b^{61} , secured to said crank-pin and to the said plate G' . Said plate may be guided in direct bearings, or, as illustrated, provided with a rigid arm, G^{11} , and pivoted to the conveyor-frame at a suitable point to guide its motion in the desired direction. Its ribs are preferably serrated blades G^{12} , secured upon its upper surface and inclining rearward, and thereby adapted to carry the grain in their rearward movement and to withdraw forward under the grain without actuating it.

The endless-belt conveyor C^{23} is provided with suitable grain-carrying teeth, c^{23} , which may be either fixed or trip teeth. At the lower edge the belt C^{23} is provided with butt-carrying teeth g , preferably longer than the other teeth, c^{23} . They may also be made to slope downward toward the plank A , which they overhang, approximately inclosing a triangle between themselves, the plank, and the canvas belt, and by their greater length than the teeth c^{23} giving the butts of the grain a

more positive movement, and compensating for the detaining effect of the friction of said butts upon the fixed plank floor or platform A . Since the grain tends to accumulate toward the stubble end of the platform or ledge A , the wall C is preferably joined thereto along an oblique line, making said ledge in front of the said wall slightly wider at the stubble end than at the grain end.

The operation of the above-described mechanisms will for the most part be obvious, but may be more fully understood from the following:

The reel-bats, receiving their direction by the guiding action of the cam E^4 , follow a course which may be understood by comparison of Figs. 1, 2, and 3, wherein the dotted lines $x x x$ indicate the projection upon the plane of view of the path of a point in said reel-bats. Said course may be described thus: The bat enters the standing grain with a downward and rearward movement, the direction of the bat being inclined upward from heel to point. It swings downward and rearward and becomes about horizontal as it passes over the sickle, and thence moves upward and slightly rearward, following the slope of the wall C , the point rising faster than the heel, so that it stands sloping obliquely upward to the point somewhat above the middle of the height of the wall C . It diverges from it rapidly, swinging back over its course, or forward with reference to the travel of the machine, and reaches its initial position. As it sweeps downward toward the sickle the point of the bat passes under the overhanging inclined upper bar, D' , of the divider D , and thus gathers with certainty all the grain inclosed by the divider, and is prevented from gathering any grain not so inclosed. As the bat passes over the sickle it forces the grain severed thereby directly back against the wall C , where it is laid between the carrying-teeth of the endless conveyor, and by them retained in its approximately vertical position while being carried on end toward the receptacle F . The bat, by continuing its course upward from the sickle in direction approximately parallel with the wall C , assists in retaining the grain thereon, and the bats are so arranged that before one has withdrawn from the vicinity of the wall another has passed the sickle and is rising in front of the said wall, so that the grain never escapes from their detaining pressure. When the grain is light the bats may be advantageously adjusted, so that they will pass closer to the sickle and to the conveyor C^2 . This adjustment is effected by turning the reel-arms E^7 in their sockets e^{62} to cause the portion E^{72} to stand lower and farther back in that part of its course wherein it approaches the sickle and conveyor. A further adjustment to adapt the bat to strike the grain at the best angle, and also to affect its distance from the sickle, is effected by turning the bat on the arms E^7 , and in order to allow this adjustment the bats

may be secured to said arms by clips e^8 , which encircle said arms, and may be clamped thereon by suitable clamp-screws. The grain thus laid upon the conveyer is carried thereby standing on end, the butts resting on the ledge A. At the delivery end of the conveyer the carrying-teeth c^{23} withdraw from the grain as the endless belt passes around the carrying roller. The sheath F^2 of the receptacle F checks the stubbleward movement and impetus of the grain, which is thereby deflected toward the rear, and having passed beyond the supporting-wall C , and having a slight rearward inclination, the grain tends to fall rearward, so that the heads would lean against the rear wall of the receptacle, or fall through its rift and lie prostrate. To prevent this, and to keep the grain upright in the receptacle, the butt-carrier G or G' is provided and adapted, as described, to take the butts of the grain at the instant the carrying-teeth of the upright conveyer lose their grasp upon it, or, in case the revolving disk G is employed, to receive the butts before the grain passes off from the wall C , and positively advance the butts around the end of the conveyer and rearward toward the rear of the receptacle, thus forestalling any tendency of the grain to fall, and keeping the butts as far advanced as the heads. This device, whether in the form of the rotating or the reciprocating plate, is named the "butt-carrier," and may be employed whatever the direction of movement to be given to the grain, whether rearward, as illustrated, or in a different direction, as might be desirable in certain forms of construction.

I claim—

1. In combination with the ledge or platform, the upwardly-extended and horizontally-operating conveyer, and a grain supporting and moving device underneath the butt-ends of the grain at the base of the conveyer operating horizontally around its delivery end from front to rear, substantially as set forth.

2. In combination with the ledge or platform, the upwardly-extended and horizontally-operating conveyer, and a butt supporting and moving device independent of the conveyer operating at its base around its delivery end from front to rear, substantially as set forth.

3. In a grain-harvester, in combination with the sickle and the reel, a grain-conveying mechanism extending upwardly in the rear of the sickle and operating horizontally toward the stubble end of the cut, a ledge at the foot of said conveyer between the same and the sickle, and a horizontally-rotating disk level with said ledge at the stubble end of the horizontal course of the conveyer to carry the grain on end around the end of the conveyer, substantially as set forth.

4. In a grain-harvester, in combination with the sickle and the reel, the upwardly-extended and horizontally-operating grain-conveyer in the rear of the sickle, the butt-supporting ledge between the sickle and the conveyer, the

horizontal butt-moving carrier at the base of the conveyer at its stubble end, and the grain-receptacle adapted to receive the grain on end from the conveyer, substantially as set forth.

5. In a grain-harvester, in combination with the sickle and the reel, the butt-supporting ledge in the rear of the sickle, the upwardly-extended and horizontally-operating grain-conveyer in the rear of said ledge and provided with the butt-carrying fingers near its base and overhanging said ledge, and the horizontal butt-carrier at the base of said conveyer, at the stubble end of its course, substantially as and for the purpose set forth.

6. In combination with the upwardly-extended and horizontally-operating grain-conveyer, the grain-receptacle at its delivery end open toward said conveyer and having the upright bounding wall commencing in front of the conveyer grainward from its delivery end and extending thence stubbleward and curving rearward across the path of delivery of the conveyer, substantially as set forth.

7. In combination with the ledge or platform, an upwardly-extended and horizontally-operating conveyer carrying the grain on end toward the drive-wheel, a grain-receptacle at the delivery end of the conveyer having an upright bounding wall commencing in front of the conveyer grainward from its delivery end and extending thence toward the drive-wheel and curving rearward between the drive-wheel and the delivery end of the conveyer, substantially as set forth.

8. In combination with the ledge or platform, the reel, located and operating substantially as described, and with the upwardly-extended and horizontally-operating conveyer carrying the grain standing on end toward the drive-wheel, the upright sheath located between the reel-actuating mechanism and the conveyer, commencing in front of the latter near the delivery end and extending thence toward the drive-wheel and curving rearward between the delivery end of the conveyer and the drive-wheel, substantially as set forth.

9. In combination with the upwardly-extended and horizontally-operating conveyer and the cutter at the base and in front thereof, the reel-bats and mechanism which causes them to move rearward until past the vertical line of the cutter-bar, and then rise along the face of the conveyer, and then retire forward, whereby the grain is kept against the conveyer after being severed from the stubble.

10. In combination with the rearwardly-inclined conveyer and the cutter at the base and in front of it, the reel-bats and mechanism which moves them rearward over the cutter-bar, upward in the direction of the inclined conveyer to hold the cut grain thereon, substantially as set forth.

11. In combination with the upwardly-extended conveyer, the grain-supporting ledge at its base in front of it, and the cutter at the

forward edge of the ledge, the reel-bats and
mechanism which moves them rearward past
the vertical plane of the cutter and over the
ledge and then up along the face of the con-
5 veyer, substantially as set forth.

In testimony whereof I have hereunto set
my hand, in the presence of two witnesses, at

Chicago, Illinois, this 24th day of June, A. D.
1885.

LA VERNE W. NOYES.

Attest:

CHAS. S. BURTON,
C. H. THORPE.