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W. N. WHITELEY & W. BAYLEY.

HARVESTER.

No. 345,094. Patented July 6, 1886.

Fig. 11

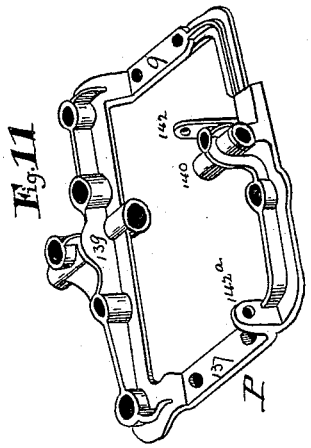


Fig. 14

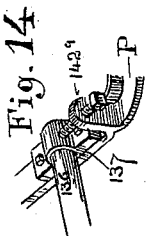
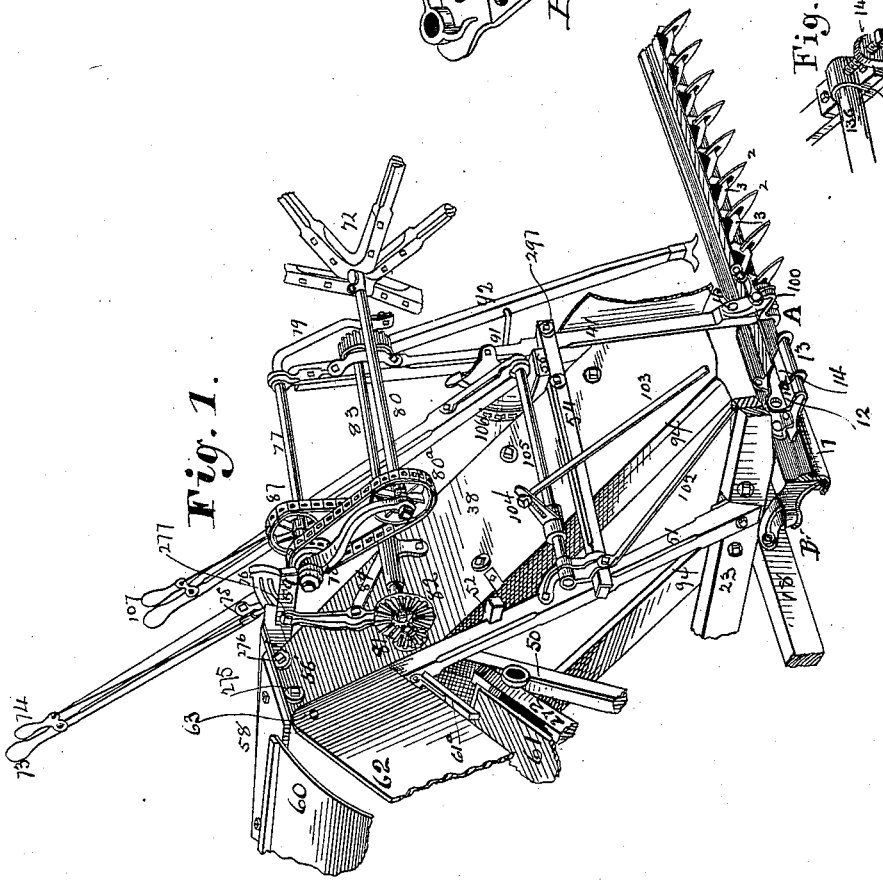


Fig. 1.



ATTEST:

J. C. Turner

E. C. Ford

INVENTOR:

Wm. N. Whiteley
Wm. Bayley
by their Atty
R. D. Smith

(No Model.) 4 Sheets—Sheet 2.

W. N. WHITELEY & W. BAYLEY.

HARVESTER.

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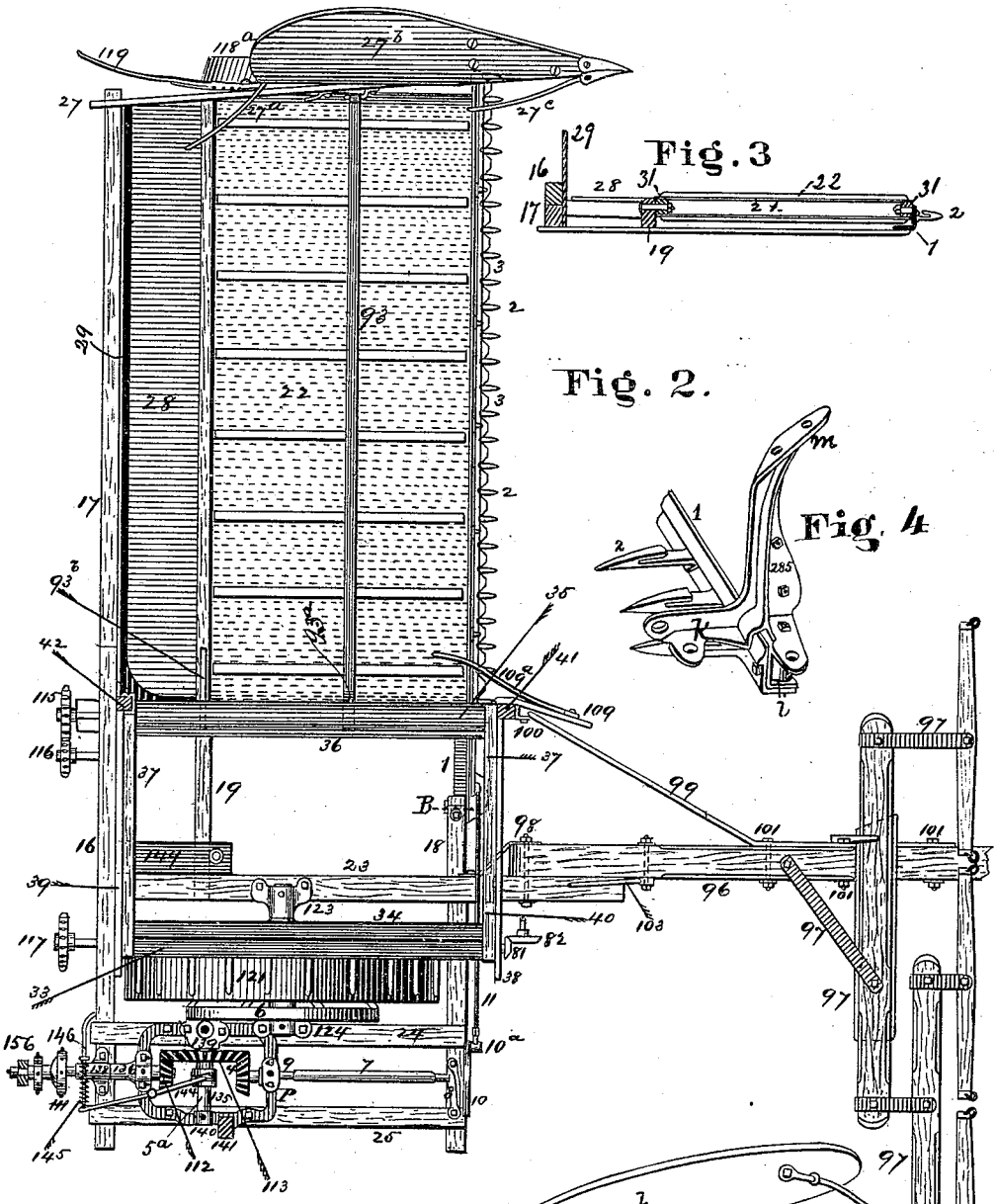

Fig. 2.

Fig. 4

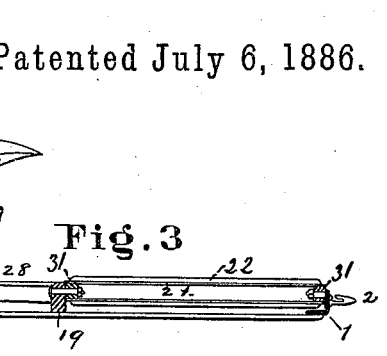

Fig. 3

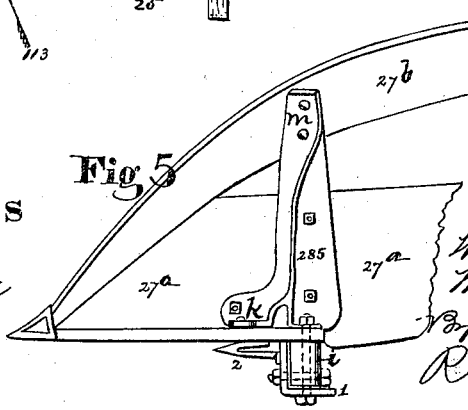

Fig. 5

Witnesses

J. C. Turner

C. Clarence Poole

Inventors

W. N. Whiteley

Wm Bayley

By their atty

R. D. Smith

(No Model.) 4 Sheets—Sheet 3.

W. N. WHITELEY & W. BAYLEY.

HARVESTER.

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Fig. 10.

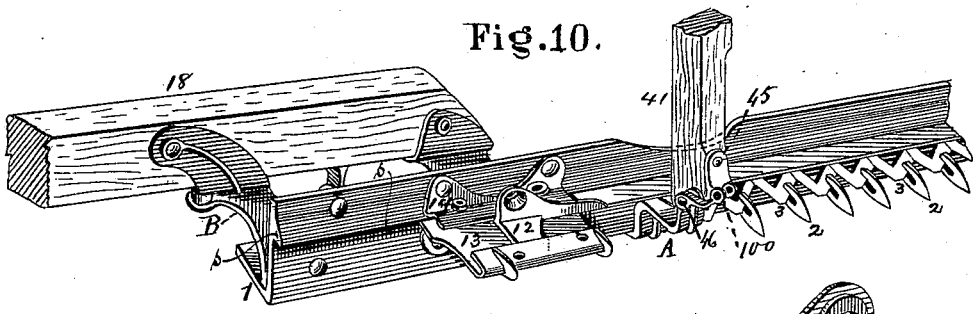


Fig. 9.

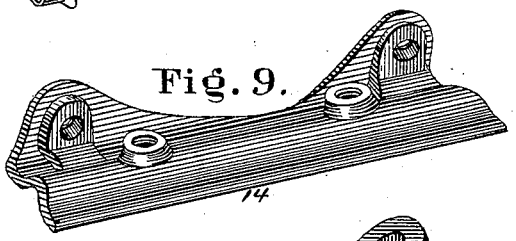
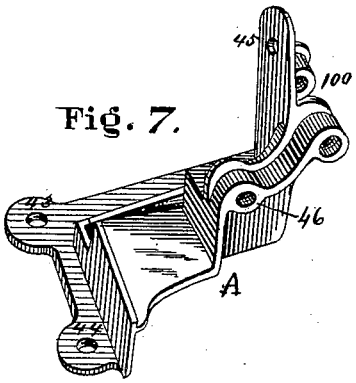


Fig. 7.



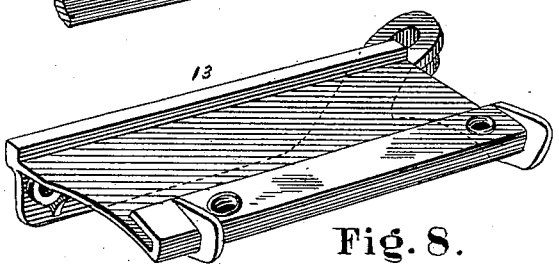
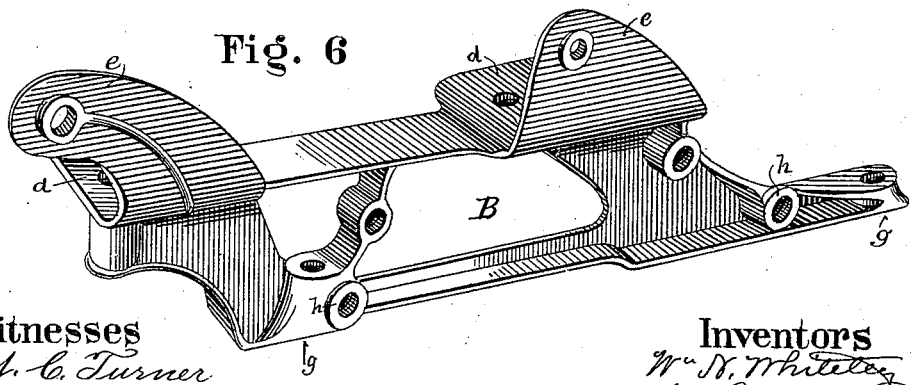


Fig. 8.

Fig. 6



Witnesses
J. C. Turner
C. Clarence Poole

Inventors
Wm N. Whiteley
Wm Bayley
By their attys
R. D. O. Smith

(No Model.) 4 Sheets—Sheet 4.

W. N. WHITELEY & W. BAYLEY.

HARVESTER.

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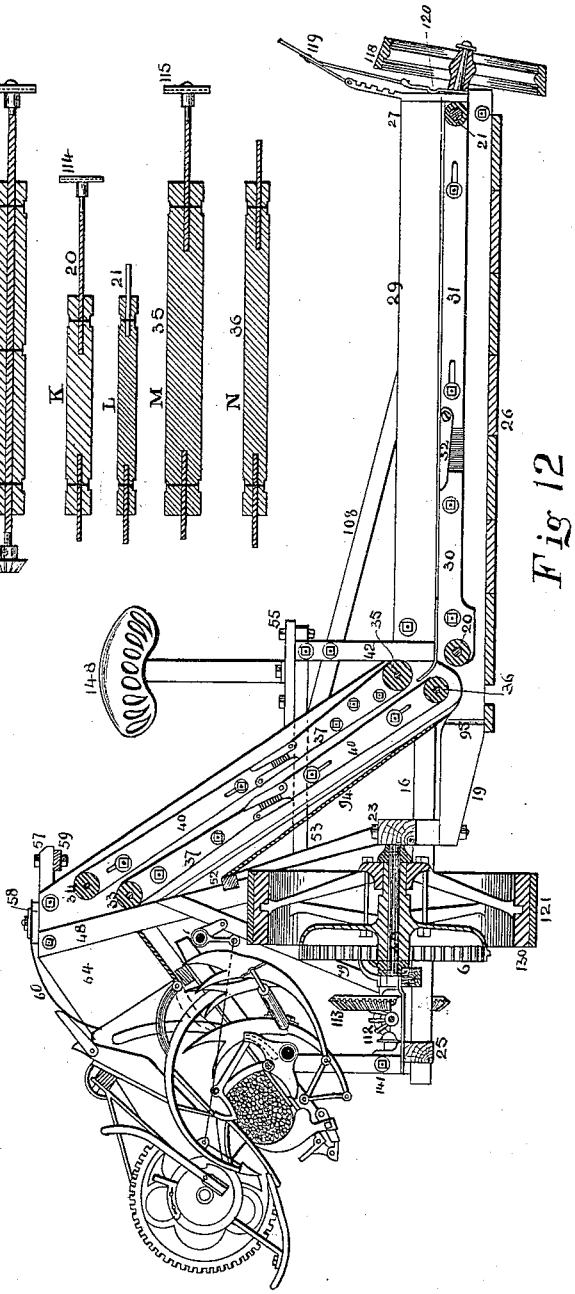
Fig. 13.

Fig 12



Witnesses:

J. B. McGirr.

E. C. Ford

Inventor.

Wm N. Whiteley

Wm Bayley

By their attys

R. D. C. Smith

UNITED STATES PATENT OFFICE.

WILLIAM N. WHITELEY AND WILLIAM BAYLEY, OF SPRINGFIELD, OHIO.

HARVESTER.

SPECIFICATION forming part of Letters Patent No. 345,094, dated July 6, 1886.

Original application filed January 30, 1882, Serial No. 51,562. Divided and this application filed May 23, 1882. Serial No. 62,197. (No model.) Patented in Canada March 24, 1882, No. 14,483.

To all whom it may concern:

Be it known that we, WILLIAM N. WHITELEY and WILLIAM BAYLEY, of Springfield, in the county of Clark and State of Ohio, have invented a new and useful Improvement in Harvesters; and we do hereby declare that the following is a full and accurate description of the same.

This invention forms a part of that for which our application for Letters Patent was filed on the 30th of January, 1882, Serial No. 51,562, and has been separated therefrom. This specification therefore includes matters originally shown and described in said application; but the portion intended to be claimed herein has exclusive reference to the main frame of the harvester.

This invention therefore consists, first, in a depending bracket to connect the finger-beam with the wooden stringer of the frame, setting said finger-beam off from the stringer a certain distance; second, in an elevated shoe for the attachment of the foot of a post of the elevator-frame; third, in an angle finger-beam and a guide-bracket for the heel of the cutter-bar; fourth, in a combination journal-box casting, whereby the bearings for the main pinion-shaft and the inner bearings for the counter-shafts which drive the cutters, the apron, and the binder are held in unchangeable relation; fifth, in a stationary grain-board over the apron with a curved bridge at its inner end; sixth, in bridge-pieces to span the space between the conveyer and elevator aprons; seventh, in the mode of attaching the outer grain-board.

That others may fully understand our improvement we will more particularly describe it, having reference to the accompanying drawings, wherein—

Figure 1 is a perspective view from the front inner side, part being broken away. Fig. 2 is a plan of our machine with the elevator-belts removed, Fig. 3 is a transverse vertical section through the cutting apparatus and conveyer. Fig. 4 is a perspective view of the grain-board bracket. Fig. 5 is a side elevation of the same with the grain-board in position. Fig. 6 is a perspective view of the finger-beam bracket detached. Fig. 7 is a similar view of the reel-post bracket. Fig. 8 is a similar view of the cutter-bar bracket detached. Fig. 9 is a similar view of the cap for the cutter-bar bracket. Fig. 10 is a perspective view showing the brackets above named in position. Fig. 11 is a perspective view of the combination box-casting. Fig. 12 is a vertical longitudinal section of the harvester. Fig. 13 represents longitudinal sections of rollers for the conveyer and elevator belts. Fig. 14 is a perspective view of a part of the frame, showing the adjuster for the pipe-box.

The general arrangement of the framing of the machine, in combination with the angle finger-beam, is such as to permit of a direct connection between the crank-shaft and sickle cross-head without the use of universal joints, and without a probability of imperfect alignment of the parts. By this same arrangement of parts we are enabled to locate our pitman 11 and cross-head 12 entirely on the outside of the machine, where they can be readily reached for any purpose. The cross-head 12 works in a slide-bracket, 13, in which it is retained by the cap-plate 14, said bracket and cap-plate both being firmly riveted to the finger-beam 1 in the manner clearly shown in the drawings.

The main frame of the harvester is constructed with longitudinal stringers 16 and 17 on the rear side of the machine, and on the front side with the stringer 18 and an angle steel finger-beam, 1, said beam 1 and stringer 18 being united by an intermediate bracket, B, which is provided with a bearing-surface, *d*, and lug-flange *e*, to rest against the bottom and front side of said stringer, respectively, and permit the employment of both horizontal and vertical bolts to unite them. The bracket B projects forward and downward, and is at its forward extremity provided with bearing-surfaces *g h*, to seat the angle-beam 1 and receive bolts to secure the same to said bracket.

In addition to the above, which form the outside longitudinal framing of the harvester, we use an intermediate longitudinal stringer, 19, that assists in the support of the conveyer-rollers 20 21 and conveyer-belt 22. The outer

stringers are tied together by means of cross-ties 23, 24, and 25 on the stubble side of the machine, and by the platform-flooring 26 and grain-wheel divider-board 27 on the grain side of the machine.

Between the longitudinal stringers 16 and 17 and the intermediate stringer, 19, we provide a hinged grain-support, 28. This support is hinged to the stringer 19, and may be tilted and then retained at any angle up to a right angle. One of the objects of this grain-support is to check the progress of the heads of the grain and prevent their traveling faster than the butts. In very short grain it may be raised to a vertical position and take the place of the weather-board 29.

The driving-roller 20 of the conveyer is journaled in two fixed pieces of timber, 30, one of which is securely attached to the finger-beam 1 and the other to the intermediate stringer, 19. The driven roller 21 of said conveyer is journaled in two movable pieces, 31, one of which slides upon bolts and thimbles fixed to the angle finger-beam 1, and the other upon bolts and thimbles attached to the intermediate stringer, 19. The pieces 31 are forced away from the pieces 30 by spiral springs 32, by which means the conveyer-belt 22 is kept taut when from any cause it becomes expanded, and they may be brought together by the contraction of the belt overcoming the resistance of the springs.

The elevator-rollers 33, 34, 35, and 36 are journaled in the same manner as those of the conveyer, the stationary parts 37 being made fast to the front and rear elevator-sides 38 and 39, and the movable parts 40 sliding upon bolts and thimbles made fast to said sides.

The elevator-frame is constructed by erecting uprights 41 and 42, with the part 41 secured at its lower end to an elevated shoe, A, that is riveted to the angle finger-beam 1 by means of bolts which pass through perforations 43 and 44. To this shoe is secured the upright 41 by bolts passing through perforations 45 and 46. The upright 42 is secured to the stringer 16 and weather-board 29 by means of a metal piece. Inclined braces 48 and 49 are raised from the stringers 16 and 17 on the rear side of the machine, and corresponding braces, 50 and 51, are erected on the front of the machine from the stringer 18 and cross-tie 23 The inclined braces 48 and 51 are tied together by a transverse cross tie, 52, and braces 53 and 54 join them with the uprights 41 and 42, that are tied transversely by the seat-board 55. These combined braces and cross-ties form a frame to which the elevator-sides 38 and 39 are attached. To the upper ends of the sides 38 and 39 we secure battens 56 and 57, to which the top covering, 58, and cross-tie 59 are secured.

To the covering 58 we attach a curved piece of flexible sheet metal, 60, that serves to properly deflect the grain from the end of the elevator to the binding-table 61, and to the side 38 of the elevator we pivot a butt-board, 62, by means of a bolt and thimble, 63, upon which said butt-board may be tilted out of the way of the binding-table when from any cause said binding-table has to be removed. This butt-board serves to prevent the butts of the grain from projecting past the binding-table and helps to even the ends of the sheaves.

By the use of a piece of strap-iron, 93, hinged to the grain-board 27, and curved at its free end 93^a, and the shorter strap, 93^b, to project up into the mouth of the elevator, we are enabled not only to check the heads of grain for the purpose of keeping it straight, but to bridge over the gap at the intersection of the conveyer and elevator belts, and thereby obtain a proper transfer of grain from the conveyer to the elevator without loss of grain. The back of the lower elevator-belt is supported by three strips, 94, two of which are secured to the sides of the elevator, and the other and middle one to the cross-ties 52 and 95.

The draft-pole 96 and three-horse evener 97 are secured to the elevator-frame by means of a bolt and strap, 98, passing through and attached to the cross-tie 23, and by a brace-rod, 99, pivoted at one end to a jaw, 100, in the shoe A, as shown in the drawings, and securely bolted at the other end to the side of the pole by means of three bolts, 101. The projecting end of the cross-tie 23 is re-enforced by a brace-rod, 102, which connects it with the braces 51 and 54 of the elevator-frame.

By means of a rod, 103, permanently pivoted at one end to the pivoted draft-pole 96, and at the other end adjustably attached to a lever-arm, 104, that is fast to the rock-shaft 105, which is journaled at one end in a bracket attached to the braces 51 and 54, and at the other end in the toothed sector-piece 106, that is fastened to the seat-board 55 and upright 41, we are enabled to tilt the cutting apparatus to suit the varying condition of the grain, through the agency of a lever, 107, fastened to the rock-shaft 105 and engaging with the toothed sector 106.

A brace, 108, rigidly connects the grain-wheel end of the conveyer-platform with the elevator-frame. As the machine advances into the grain the grain to be cut is properly divided from that which is to remain for subsequent operations and gathered by a divider and gatherer, 27, with its grain-boards 27^a and 27^b, and by a gatherer, 109, and its grain-rod 109^a. The finger-beam 1 is provided with a longitudinal rib, *s*, presenting on its lower surface a square shoulder or re-entering angle to receive and determine the alignment of the fingers 2 2 and the bracket 13. Said rib also strengthens the attachment of the fingers by providing them with additional bearing-surfaces. Said beam 1, with its attached guard-fingers, projects through and past the divider and gatherer boards 27 at the outer end and 109 at the inner end.

We mount the harvester above described upon two traveling wheels, known, respectively, as a "master-wheel" and a "grain-

wheel." The grain-wheel 118ª is vertically adjustable by means of a sliding plate, 120, to which it is journaled, said plate moving in grooves formed in a plate attached to the divider-board 27ª, and the sliding plate can be moved up or down in the grooved plate through the agency of a lever, 119, said lever being constructed and operated in substantially the same manner as the lever 107, which adjusts the height of the cutting apparatus. The canvas elevator-belts are stretched over the driving and driven rollers 33 to 36, inclusive, the driving-rollers being of greater diameter than the driven, for the purpose of obtaining as great a driving-surface as practical without taking up too much room, and in the case of the lower roller, 35, of the upper elevator, to provide a greater operating-surface at the entrance to the elevator; besides which, the grain in entering the mouth of the elevator will press the belt tight against the driving-roller 35, and thereby augment its driving capacity. We locate the driving-roller 33 of the lower belt at the top of the elevator, and the driving-roller 35 of the upper or compression belt at the bottom of the same, and communicate motion to them and to the driving-roller 20 of the conveyer by means of an endless chain passing over sprocket-wheels fixed to the rear ends of the shafts of said rollers, which chain receives motion from the sprocket-wheel 111, on a shaft bearing the bevel-pinion 112, that is actuated by the same bevel-wheel, 113, that drives the pinion 4 of the crank-shaft which drives the sickle 3. By said chain motion is communicated to the roller 20, through the agency of a sprocket-wheel, 114, to the roller 35 by means of a sprocket-wheel, 115, an idler sprocket-wheel, 116, being used to give greater bearing-surface to the chain as it passes over the sprocket-wheel 115, and to the roller 33 by means of the sprocket-wheel 117. A smooth-surfaced adjustable idler is used to tighten the endless chain after it has been slipped over the various sprocket-wheels above described.

Upon the cross-ties 24 and 25 we securely affix a combination journal frame or casting, P, for an enlarged view of which see Fig. 11. This casting carries the bearings of the shafts of the pinions 112 and 4, and the shaft 5ª of the pinion, which engages the gear-wheel 6 on the main drive-wheel. The shaft 5ª also carries the bevel-wheel 113 and the clutch 135 for throwing the whole harvesting and binding machinery in and out of gear. The shaft of the pinion 112, which shaft also carries the sprocket-wheel 111, for driving the conveyer and elevator, and the sprocket-wheel 156, for driving the binding mechanism, is journaled in a pipe-box, 136, secured at one end to the frame P at 137, and at the other end to the stringer 16 at 138. The shaft 5ª is journaled in the boxes 139 and 140, forming a part of said journal-box frame. The rear end of the sickle-driving crank-shaft is journaled in a box secured to said casting P at 9. To a vertical lug, 142, of this journal-box frame we also secure the lower end of an upright, 141, for supporting the outer side of the binder-table 61. The pinion 112 and its bearings are subjected to very hard service, and it is desirable from time to time to compensate for wear by slight adjustment of the pinion-shaft toward the gear-wheel 113. Therefore the bolts which secure the box 136 to the frame P are somewhat loose. A vertical projection, 142ª, cast upon said combination-frame, is fitted with a set-screw bearing against said box, whereby we are enabled to adjust and retain the bevel-pinion 112 to its place. The clutch 135 is controlled by a lever, 144, pivoted to said combination-frame, and provided with a spring, 145, that holds said clutch in gear, and by the use of a draw-rod, 146, provided with an offset to catch on the top of a guide, we are enabled to hold said clutch out of gear when it becomes desirable to do so. The end of the draw-rod 146 is bent at right angles to form a handle for the convenience of the operator, who is within easy reach of it from the spring-seat 148, that is bolted to the plank 55. We also secure the tool-box 149 to the cross-tie 23, with its rear end abutting against the inside of the stringer 16. The bracket 285 is provided with a foot, *i*, which fits the angle of the beam 1 at the rear, and admits both horizontal and vertical bolts through said beam and foot to render its attachment secure. The end of the finger-beam therefore extends to the outer edge of said bracket. There is also a forwardly-extending projecting foot, *k*, and at the top an inclined head-plate, *m*, to which the divider-boards 27ª and 27ᵇ are respectively bolted.

The main drive-wheel shown in the drawings forms the subject of our Patent No. 279,061, June 5, 1883.

The reel and butt-rake are described and claimed in our Patent No. 306,448, October 14, 1884, and the binding mechanism and butter are described and claimed in our application, Serial No. 51,562, above referred to; therefore these devices are not herein claimed.

Having thus described a combined harvesting and binding machine with our improvements attached thereto, what we claim as new, and desire to secure by Letters Patent, is—

1. In combination with the stringer 18 of the main frame and the angle finger-beam 1, the depending bracket B, as shown and described, rigidly connected to said stringer and finger-beam, whereby the finger-beam 1 is brought closer to the ground without increasing the depth of the stringer below the axis of the master-wheel.

2. The combination of the angle finger-beam 1, the upright 41, forming part of the elevator-frame that projects forward to the finger-beam, and the elevated shoe A, secured to and projecting outwardly from said finger-beam, substantially as and for the purpose set forth.

3. The combination, substantially as de-

scribed, of an angle-iron finger-beam, 1, provided with a longitudinal shoulder or rib, *s*, a guide-bracket, 13, and guard-fingers 2, securely attached to said finger-beam, and shouldering under and against said rib *s*, whereby the relative position and alignment of said bracket and fingers are fixed, the cap 14, also securely fastened to the finger-beam, the sliding cross-head 12, and the sickle 3, attached thereto.

4. The combination of the main frame, main wheel, and train of gearing driven thereby, frame P, substantially as described, provided with parts 9 and 137, for the attachment of the counter-shaft boxes, bearings 139 and 140, the pinion-shaft, the lug 142, for the attachment of an upright or standard, and the lug 142^a, adapted to receive a set-screw, constructed and arranged as and for the purpose set forth.

5. The combination of the angle-iron finger-beam 1, provided with the longitudinal shoulder or rib *s*, the bracket 285, adapted to fit the re-entering angle under said rib, and provided with a hole for a vertical bolt, and a hole for a horizontal bolt, to make rigid connection with said finger-beam, and divider-board 27^a 27^b, secured to said bracket.

W. N. WHITELEY,
WILLIAM BAYLEY.

Witnesses:
F. B. FURNISS,
W. T. STILWELL.