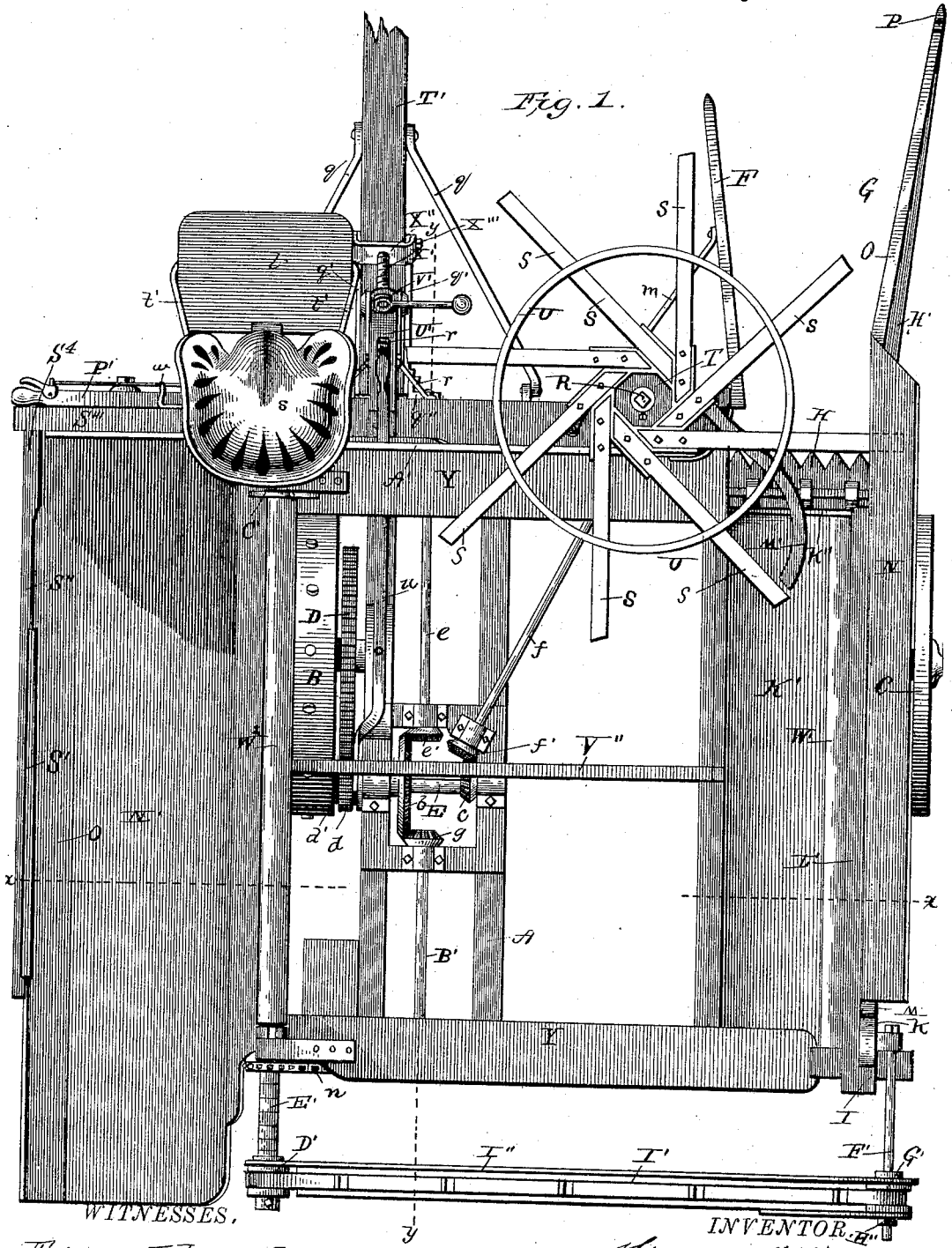
(No Model.) 4 Sheets—Sheet 1.

W. H. KARICOFE.

CORN HARVESTER.

No. 385,632. Patented July 3, 1888.

Fig. 1.



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(No Model.) 4 Sheets—Sheet 2.

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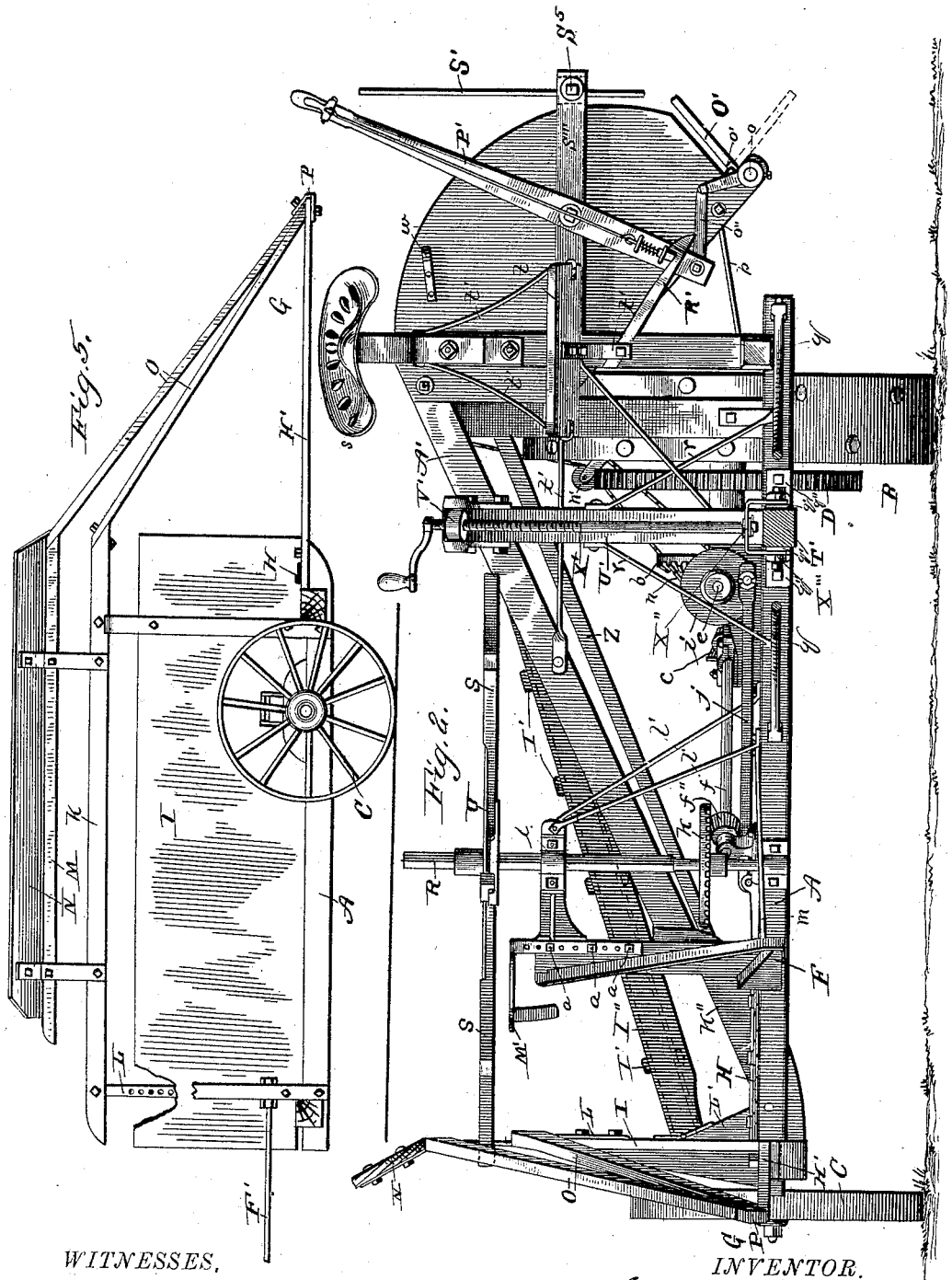

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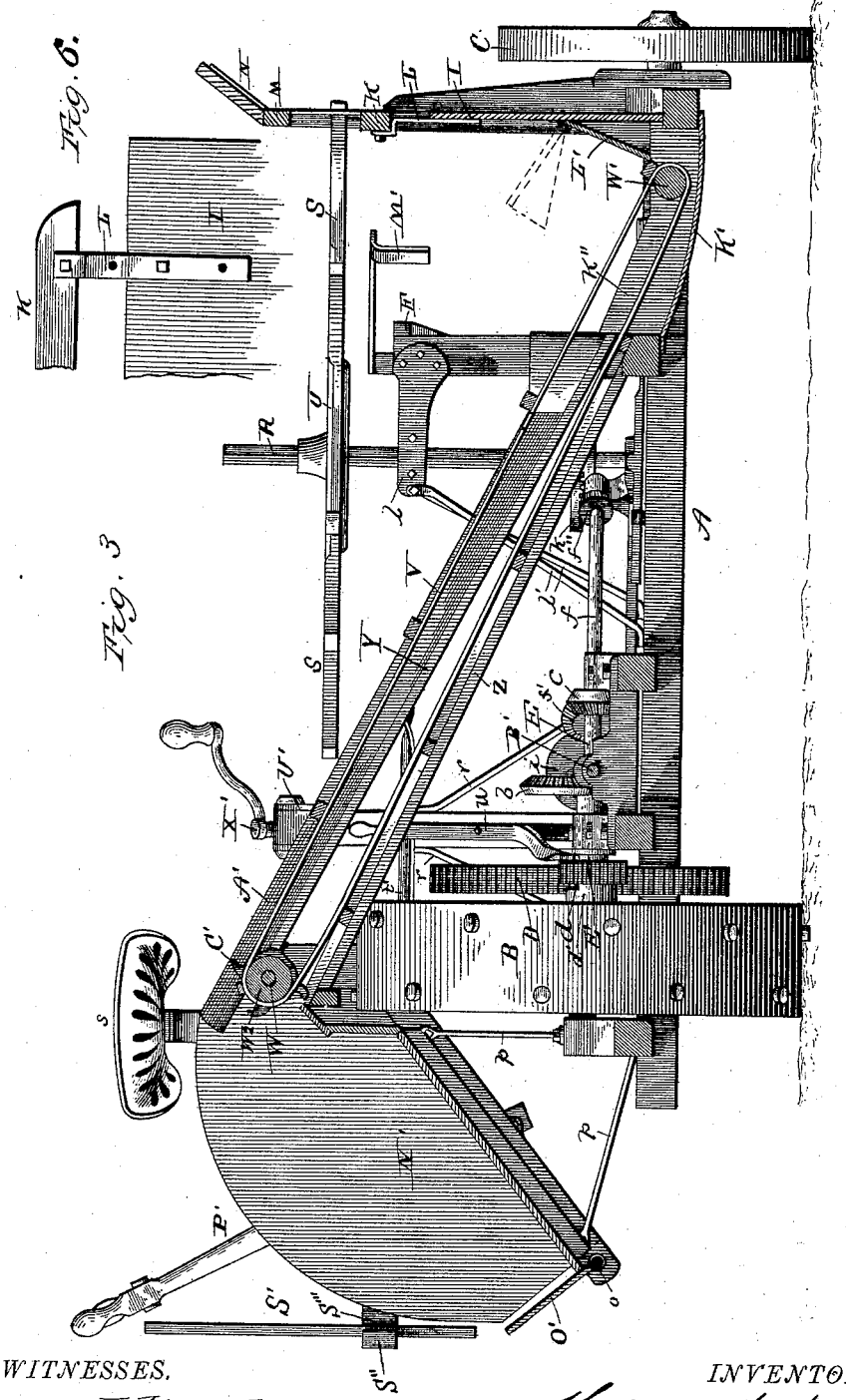
Fig. 3.



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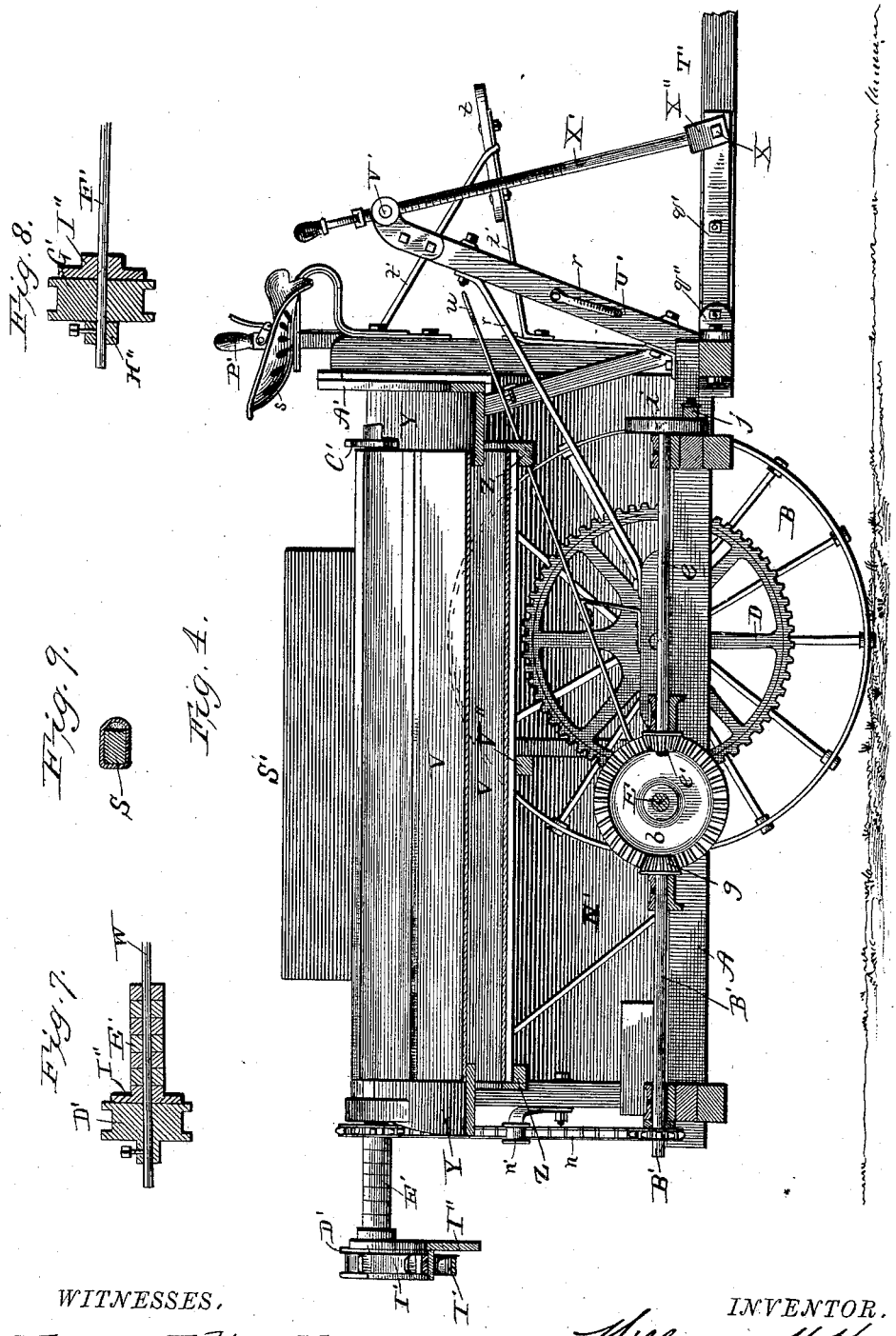

Fig. 8.

Fig. 9.

Fig. 4.

Fig. 7.

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UNITED STATES PATENT OFFICE.

WILLIAM H. KARICOFE, OF MARTINSBURG, WEST VIRGINIA.

CORN-HARVESTER.

SPECIFICATION forming part of Letters Patent No. 385,632, dated July 3, 1888.

Application filed November 18, 1887. Serial No. 255,657. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. KARICOFE, a citizen of the United States, residing at Martinsburg, in the county of Berkeley and State of West Virginia, have invented certain new and useful Improvements in Corn-Harvesters, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to that class of harvesting-machines known as "corn-harvesters," and of the type illustrated in Letters Patent granted to me June 15, 1886, No. 343,768; and its objects are, essentially, to improve the guides and the mechanism that directs the corn to the cutter, the mechanism for elevating and dumping the cut corn, and the parts connected therewith; and to this end the invention consists in certain arrangements of parts and constructions hereinafter described.

Referring to the drawings, Figure 1 is a plan view of the improved machine, the elevating-apron being removed; Fig. 2, a front view; Fig. 3, a section on the line *x x*, Fig. 1, looking forward; Fig. 4, a section on the line *y y*, Fig. 1; Fig. 5, a side elevation of the grain side of the machine, showing the guard and adjacent parts; Fig. 6, a detail view of a part of the adjusting mechanism of the guard looking from the inner side; Figs. 7 and 8, sectional detail views of the supports for the auxiliary belt for carrying and supporting the heads of the corn; and Fig. 9, a detail sectional view of one of the reel-arms, showing the cushion thereon.

In the drawings, A is the main frame of the machine, of suitable form and strength for the purpose of supporting the various mechanisms hereinafter referred to.

The frame is supported on a main wheel, B, and grain-wheel C. The axle of the wheel B carries a gear-wheel D, which engages a pinion, *d*, on a shaft, E, the latter being provided with bevel gear-wheels *b* and *c*, from which power is transmitted to the mowing parts of the machine.

The corn to be cut is directed by guides F G to the cutter H, which may be of any suitable construction, and driven by gear or other connections to the shaft E. The cutter H in the present machine is reciprocated by means of a shaft, *e*, provided on one end with a small bevel gear-wheel, *e'*, which meshes with the large bevel gear-wheel *b*, and on the other end with a disk-wheel, *i*, provided with a wrist-pin. The pitman-rod *j* connects the cutter H with the wrist-pin on the disk-wheel. The guides F and G are wider apart at the front ends than at the rear ends, so as to gather the corn and direct it to the cutter, and the guide F is preferably braced by a rod, *m*, bolted to the frame of the machine.

The guide F may be of any suitable construction, while the guide G, as shown, consists of a timber, H', projecting outward and forward from the front of the machine on the grain side, and diverging strips O, upwardly and rearwardly inclined from the front end of timber H'. The grain side of the machine is provided with an upright board, I, a strip, K, supported on and above the board I by other strips, L, vertically adjustable on the said board, and a strip, M, parallel to and a short distance above the strip K and attached thereto, and having an extension, N, projecting outward at an angle thereto. The strips K and M form a guard for preventing the cut stalks from falling off of the machine on the grain side. The inclined strips O connect the forward ends of the strips K and M with the front end of the timber H', to which the said strips are joined by any suitable flexible connection, though preferably by a malleable-iron strap, P, which permits of the vertical adjustment of the strips K and M.

At the stubbleward end of the cutter is journaled an upright shaft, R, rotated by suitable connections with the shaft E and carrying a reel formed of arms S, arranged tangentially on a hub, T, and connected and braced by a ring, U. In the present machine the reel-shaft is rotated by means of a shaft, *f*, provided on one end with a bevel gear-wheel, *f'*, which meshes with the wheel *c*, and on the other end with a bevel-wheel, *f''*, which engages with and rotates a bevel gear-wheel, *k*, secured on the vertical reel-shaft. This vertical reel-shaft is stepped in a suitable bearing on the frame of the machine, and is journaled in a bearing on a horizontal arm, *l*, supported on a portion of the frame of the machine a short distance below the reel, the arm *l* being

braced by two inclined brace-rods, *l' l'*, bolted to it and the frame A.

The arms S are so arranged that they will each be parallel with the cutter when directly over the same, and are of such length that they will extend between the strips K and M when near the said cutter. The arms being usually constructed of wood, are liable to injure green crops having soft stalks; and for such work I cover the operating portions of the said arms with some material—as rubber, cloth, or the like—which will act as a cushion and engage the stalks without bruising them, as shown in Fig. 9.

The machine is provided with an elevating-apron, V, supported and driven by a roller, W^2, on a shaft, W, at the upper end, and supported by a roller, W', at the lower end. This apron V is prevented from sagging too far when weighted with the cut corn by guide-boards Y for the upper section or part, and shouldered guide-boards Z and strip V'' for the lower section or part, the shoulders on the boards Z preventing lateral movement of the apron.

Adjacent to the front guide-board, Y, is a butt-board, A', for preventing the cut stalks from moving toward the front of the machine. The apron is operated by a chain, *n*, extending from a sprocket-wheel on the shaft W to a sprocket-wheel on a shaft, B', driven by the shaft E, through the medium of the gear-wheels *b* and *g*, and the said shaft W carries a toothed wheel or wheels, C', adjacent to the front edge of the apron, to throw or carry the butt-ends of the stalks beyond the upper end of the apron, and thereby prevent them from sliding down the inclined surface of the said apron. The chain *n* is kept taut by means of a suitable belt-tightener, *n'*, bolted to a convenient portion of the machine-frame.

The shaft W is extended rearward beyond the body of the machine and there carries a pulley, D', between which and the body of the machine the said shaft is provided with one or more washers, E', which regulate the position of the said pulley and permit its adjustment to or from the machine.

At a point adjacent to but above the roller W' is a rod or bar, F', extending rearwardly from the machine and carrying a loose pulley, G', held thereon by a set-collar, H''. The pulleys G' and D' support an auxiliary belt, I', provided with lugs and designed to receive and carry upward the heads of such stalks as may be too long for the apron. To support the auxiliary belt I' and prevent it from sagging while it is traveling upward and carrying the heads of the cornstalks, is a rigid inclined frame, I'', which is loosely supported upon the shaft W and the rod F', and held thereon by the pulleys D' and G', as shown in Fig. 1.

Under the lower end of the apron and extending from the cutter to the rear of the machine is a guard-plate, K', which prevents the stubble from interfering in any manner with the said apron. Hinged to the inner side of the board I, and above the lower end of the apron, is a guard, L', which prevents the stalks from falling below the end of the apron and thereby clogging the same, but which may be raised (see dotted lines, Fig. 3) to permit the removal of the lower roller and apron. Supported on a suitable part of the frame and below the reel, but over the cutter and the lower end of the apron, is an arm, M', preferably adjustable vertically and curving rearward and toward the board I, and then rearward and away from the said board for a short distance, and finally abruptly downwardly. As shown in Fig. 2 of the drawings, this arm M' is secured to a vertical post of the frame of the machine by means of bolts *d*, the arm being provided with a number of bolt-apertures to enable it to be adjusted vertically thereon.

Adjacent to the upper end of the apron is an inclined receiver, N', provided at its lower end with a pivoted gate, O', which normally supports the contents of the said receiver. The gate O', as shown most clearly in Fig. 2, is secured on a rock-shaft, *o*, journaled in a convenient portion of the machine-frame, and the forward end of this rock-shaft is provided with a rigid arm, *o'*, which is connected to the lower end of a pivoted lever, P', by means of a link, *o''*. By means of this lever P' it is obvious that the gate O' may be released to dump the cut corn collected in the inclined receiver whenever the same becomes full. This lever P' is held in its normal position—that is, with the gate closed—by means of a catch, R', bolted to the frame-work of the machine, the catch being engaged by an ordinary spring-bolt on the lever and operated from the handle thereof. The inclined receiver N' is braced by brace-rods *p* bolted to the machine-frame.

S' is a wind-guard at the side of the receiver, over the gate O', to prevent the wind from acting on the stalks as they enter the receiver and when therein. This wind-guard is supported by an arm, S'', bolted securely to a beam, S''', of the frame of the machine by means of a bolt, S^5, this bolt passing through the beam S''' and into the enlarged forward end, S^4, of the arm S''.

It is often desirable to adjust the guides and the cutter relatively to the ground, and to do this I have devised a means that is both simple and readily operated.

To the front of the frame I pivot the pole T', and over the same place a rigidly-fixed standard, U', the upper end of which carries a pivoted threaded eye, V'. Connected to the pole and passing through the eye V' is a threaded rod, X', provided at the upper end with a manipulating-handle. This screw-threaded rod X' is swiveled to a yoke or clevis, X'', which embraces and is pivotally connected to the pole by a transverse bolt, X''', which passes horizontally through the pole.

It is evident that as the rod is turned the

front of the machine will be raised or lowered, as the main and grain wheels act as fulcrum for the frame and the horses' necks as fulcrum for the pole.

The pole T' is braced laterally by means of diagonal brace-rods *q*, which are bolted rigidly to the pole at their forward ends and are pivotally secured to the front beam of the frame at their rear ends.

The letter *q'* designates two plates bolted upon opposite sides of the pole at its rear end, these plates affording a firm and durable bearing for the horizontal bolt which pivots the pole to the frame, this pivotal bolt passing through ears or brackets *q''* upon the frame and the rear ends of the said plates *q'* and the rear end of the pole.

The fixed standard U' is braced by means of inclined brace-rods *r*, bolted to it and the frame of the machine.

The letter *s* designates the driver's seat, which is secured on the front of the machine, and *t* designates the foot-rest, which is braced and supported by means of brace-rods *t'*.

The letter *u* designates the usual pivoted clutch-lever, employed to throw the pinion *d* into and out of engagement with the usual clutch-wheel, *d'*, on the shaft E.

The letter *w* designates a stop bolted to the front of the inclined receiver N', for the purpose of limiting the movement of the lever P'.

K'' designates an inclined board resting edgewise on the guard-plate K', immediately in the rear of the cutter, this board serving to prevent the cut stalks from interfering with the lower portion or ply of the apron.

When the machine is in operation in the field, the corn is directed by the guides F and G to the cutter, the arms of the reel acting to keep the said stalks upright and aid in forcing them against the said cutter and onto the apron when cut.

By arranging the arms of the reel tangentially to the hub, so that they are parallel to the cutter when above it, the stalks are presented to the cutter in a perfectly vertical position at the same time, and I find that the operation of this part of the machine is much improved over that of a machine using a reel with arms otherwise disposed.

It will be noticed that the reel-arms extend through the space between the strips K and M, which arrangement prevents the stalks from engaging between the said strips and the ends of the reel-arms, as they are liable to do when the arms are shorter. When the stalks are cut, the reel forces the upper parts to the rear, so that the stalks will fall on the apron.

To prevent the stalks from being thrown diagonally on the apron by the reel or otherwise, the arm M' is provided and serves to crowd them toward the board I, and so that they will fall at right angles to the apron. As some stalks are longer than the apron, their heads or upper ends will fall on the auxiliary belt to the rear thereof, and the entire stalk will be maintained in proper position while being carried upward.

It will be noticed that the lower end of the belt is higher than the lower end of the apron, (see Fig. 2,) so that the stubble, which will be more or less bent when passing under the machine, will not engage the ends of the longer stalks, as the stubble straightens after passing the end of the guard-plate K'.

The strips K and M and the guide G serve to direct the stalks to the apron and cutter, respectively, while the extension N serves to prevent the uncut stalks on the grain side from approaching closely enough to engage the cut stalks as they fall toward the apron. After being cut the stalks are elevated over the main wheel and to the receiver, from which latter they may be dumped from time to time.

The invention is not confined to the exact construction and arrangement of parts shown, as the same may be changed without departing from the spirit of the said invention.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a corn harvester, the combination, of the frame of the machine suitably mounted, the cutter, the vertical reel-shaft, the hub upon this reel-shaft, and the reel-arms secured tangentially upon this hub, the said vertical reel-shaft being journaled in the frame of the machine at one end of the cutter and forward of the same a distance equal to the radius of the hub, whereby when the reel-shaft is revolved the reel-arms on the hub will assume a position parallel to the cutter when over it, substantially as described.

2. In a corn-harvester, the combination of the frame suitably mounted, the cutter, the reel, the board I on the grainward side of the machine, the strips K and M, located one above the other vertically over the grain-board I and adjustably supported thereon, the guide G, comprising the horizontal timber H', extending forward from the front end of the grainward side of the frame, and the strips O, secured to the forward end of the timber H' and inclined upwardly and rearwardly therefrom, and connected, respectively, to the forward ends of the said strips K and M, substantially as described.

3. In a corn harvester, the combination, with the frame suitably mounted, of the cutter, the reel, an upwardly-inclined elevating-apron to the rear of the reel, and the upwardly-inclined auxiliary belt I' to the rear of the elevating-apron and adapted to carry the heads of the cut corn, the lower end of this auxiliary belt being raised above the lower end of the elevating-apron, whereby the stubble is prevented from engaging the heads of the cut corn, substantially as described.

4. The combination, in a corn-harvester, of the frame suitably mounted, the cutter, the reel, the upwardly-inclined elevating-apron to

the rear of the reel, and the upwardly-inclined auxiliary belt I', located to the rear of the elevating-apron and adapted to carry the heads of the cut corn, the said auxiliary belt being adjustable toward and from the rear edge of the elevating-apron, substantially as described.

5. In a corn-harvester, the combination of the frame, the cutter, the reel, the upwardly-inclined elevating-apron located to the rear of the reel, the shaft W and rod F', projecting from the rear end of the frame, the shaft W being approximately in line with the upper end of the elevating-apron, the pulleys D' and G' upon this shaft and rod, respectively, and the upwardly-inclined auxiliary belt I', traveling upon the pulleys G' and D', and the removable washers upon the shaft W, interposed between the pulley D' thereon and the end of the machine, whereby the auxiliary belt may be adjusted to or from the elevating apron, substantially as described.

6. In a corn-harvester, the combination of the frame, the cutter, the board I, located on the grainward side of the machine, the vertical reel-shaft located at one end of the cutter and a distance forward of the same equal to the radius of the hub upon the reel-shaft, the hub upon the reel-shaft, the reel-arms secured tangentially upon this hub, whereby they assume a position parallel to the cutter when over it, and the arm M', secured upon the frame under the reel and extending rearwardly therefrom and curving toward the said board I, then away from it, and then abruptly downward toward the apron, and the elevating-apron, substantially as described.

7. In a corn-harvester, the combination of the frame, the inclined elevating-apron, an inclined receiver adjacent to the upper end of the apron, a gate, O', secured upon a rock-shaft journaled at the lower end of the receiver, a rigid arm, *o'*, upon the forward end of this rock-shaft, a pivoted lever, P', connected to arm *o'* by means of a link, whereby the cut corn may be released from the inclined receiver by throwing down the gate, a catch for holding the lever P' in its normal position, and a wind-guard at one side of the inclined receiver and over the free edge of the gate, substantially as described.

8. In a corn-harvester, the combination of the frame, the cutter, the vertical reel-shaft located at one end of the cutter, the hub secured upon the reel-shaft, the reel arms secured tangentially upon the said hub, the arm M', secured to the frame beneath the reel and extending rearwardly therefrom and convex toward the grainward side of the machine and terminating with an abrupt downward extension, the grain-board I, the upwardly-inclined elevating-apron, the strips K and M, located one above the other vertically over the grain-board I and adjustably supported thereon, the guide G, comprising the timber H', projecting forward from the front end of the machine, the strips O O, attached to the forward end of the timber H', extending upwardly and rearwardly therefrom and connected to the forward ends of the strips K and M, the metallic strap P, connecting the forward ends of the timber H' and strips O O, the arms of the said reel extending between the said strips K and M, as and for the purpose described.

9. In a corn harvester, the combination of the frame, the cutter, the reel adjacent thereto, the elevating-apron, the grain-board I, the strips K and M, located one above the other vertically over the grain board I, vertical strips L, adjustably secured to board I, for adjustably supporting the strips K and M, the guide F and the guide G, comprising the timber H', projecting from the front end of the grainward side of the machine, the upwardly-inclined strips O O, connecting the forward end of the timber H' to the forward ends of the adjustable strips K and M, and the metallic strap P, connecting the forward ends of the timber H' and strips O O, substantially as described.

10. In a corn harvester, the combination of the frame, the cutter, the reel adjacent thereto, the elevating-apron, the grain board I, the strips K and M, located one above the other vertically over the grain-board and adjustably supported thereon, the guard extension N, secured upon the upper edge of the strip M and inclined upwardly and outwardly toward the grainward side of the machine, and the forwardly-projecting guides F and G, the latter comprising the timber H', projecting from the grainward side of the front end of the machine, and the inclined strips O O, connecting the forward end of the timber H' with the forward ends of the strips K and M, substantially as described.

11. In a corn harvester, the combination of the frame, the reel, the cutter, the apron-roller W', the upper apron-roller, W^2, the shaft W, extended out rearwardly from the frame, the inclined apron traveling upon the said rollers, the rod F', secured rigidly to the frame of the machine and extending rearwardly therefrom, the pulleys upon the extension of the shaft W and rod F', the auxiliary belt I', traveling upon the said pulleys and moving in unison with the apron, and the frame I'', supporting the auxiliary belt, this frame being loosely supported upon the extension of the shaft W and the rod F', substantially as described.

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

WM. H. KARICOFE.

Witnesses:
CHAS. D. DAVIS,
H. J. ENNIS.