(No Model.) 5 Sheets—Sheet 1.

# C. F. SEARCH.

## PLATFORM ADJUSTMENT FOR HARVESTERS.

No. 383,660. Patented May 29, 1888.

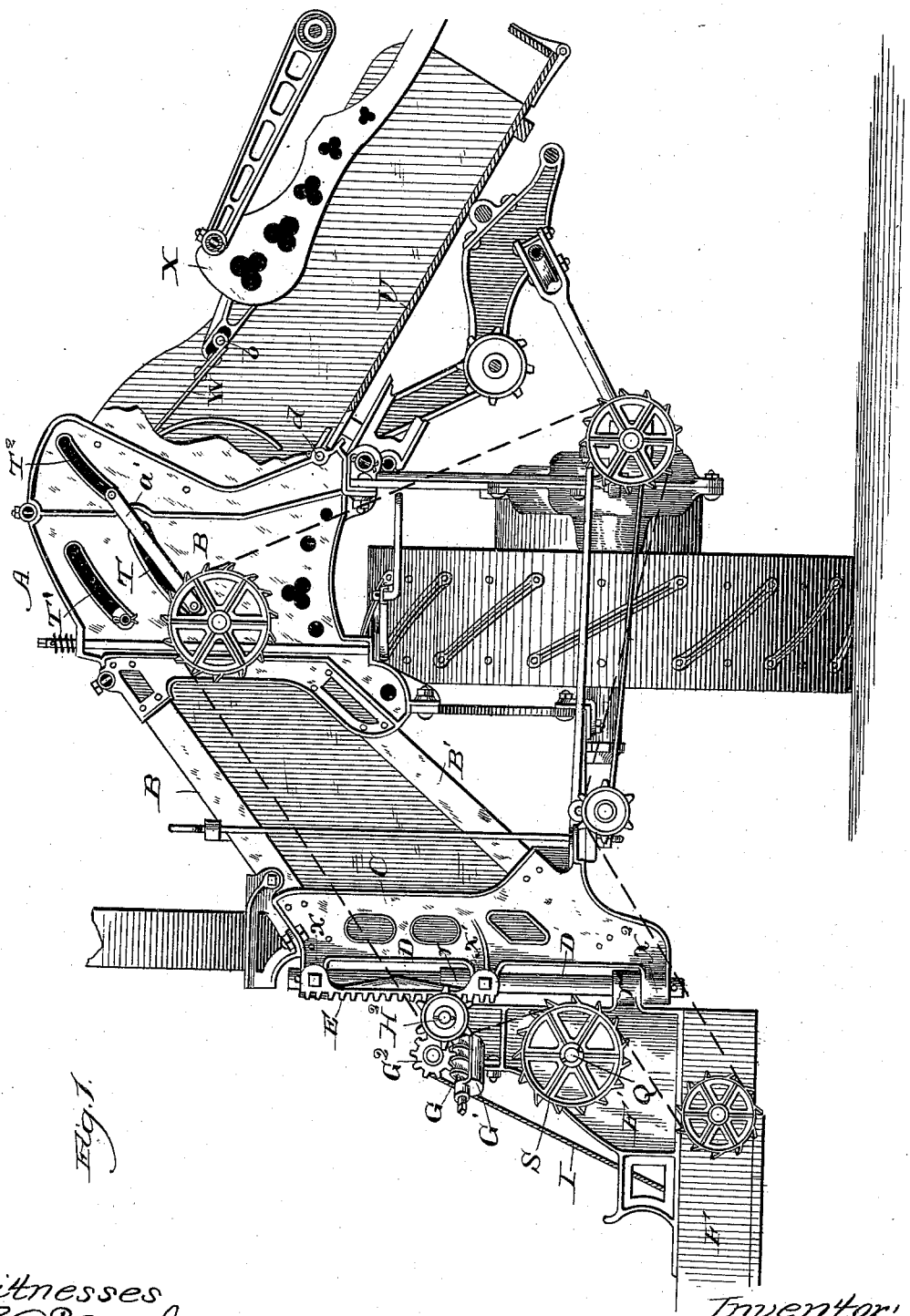


Fig. 1.

Witnesses
Chas. E. Gaylord,
Chas. E. Gorton,

Inventor,
Casper F. Search,
By Dyrenforth and Dyrenforth,
Attys.

(No Model.) 5 Sheets—Sheet 2.

# C. F. SEARCH.

## PLATFORM ADJUSTMENT FOR HARVESTERS.

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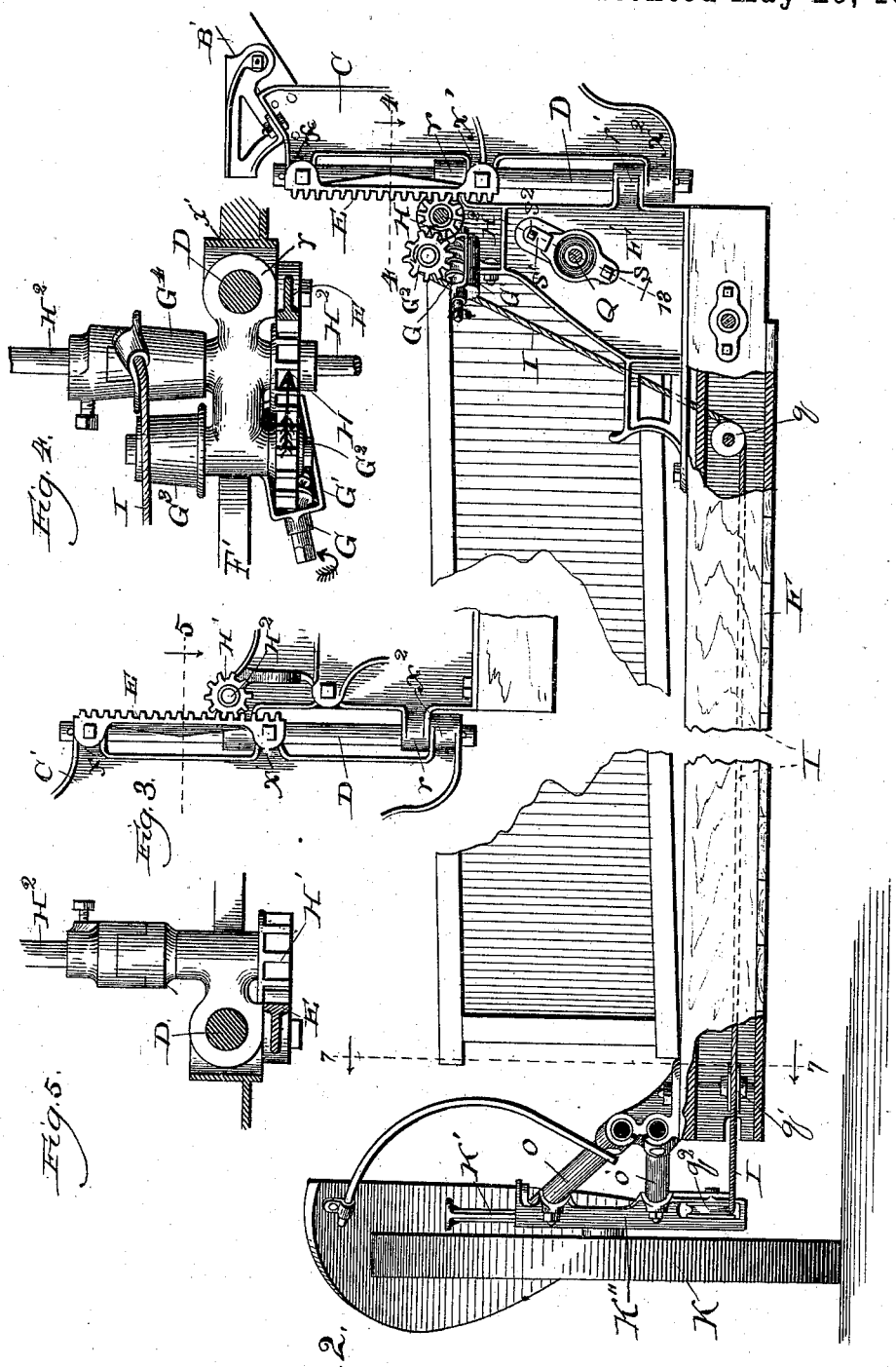

Witnesses:
Chas. E. Gaylord.
Chas. E. Gorton.

Inventor:
Casper F. Search,
By Dyrenforth & Dyrenforth.
Attys.

(No Model.) 5 Sheets—Sheet 3.

# C. F. SEARCH.

## PLATFORM ADJUSTMENT FOR HARVESTERS.

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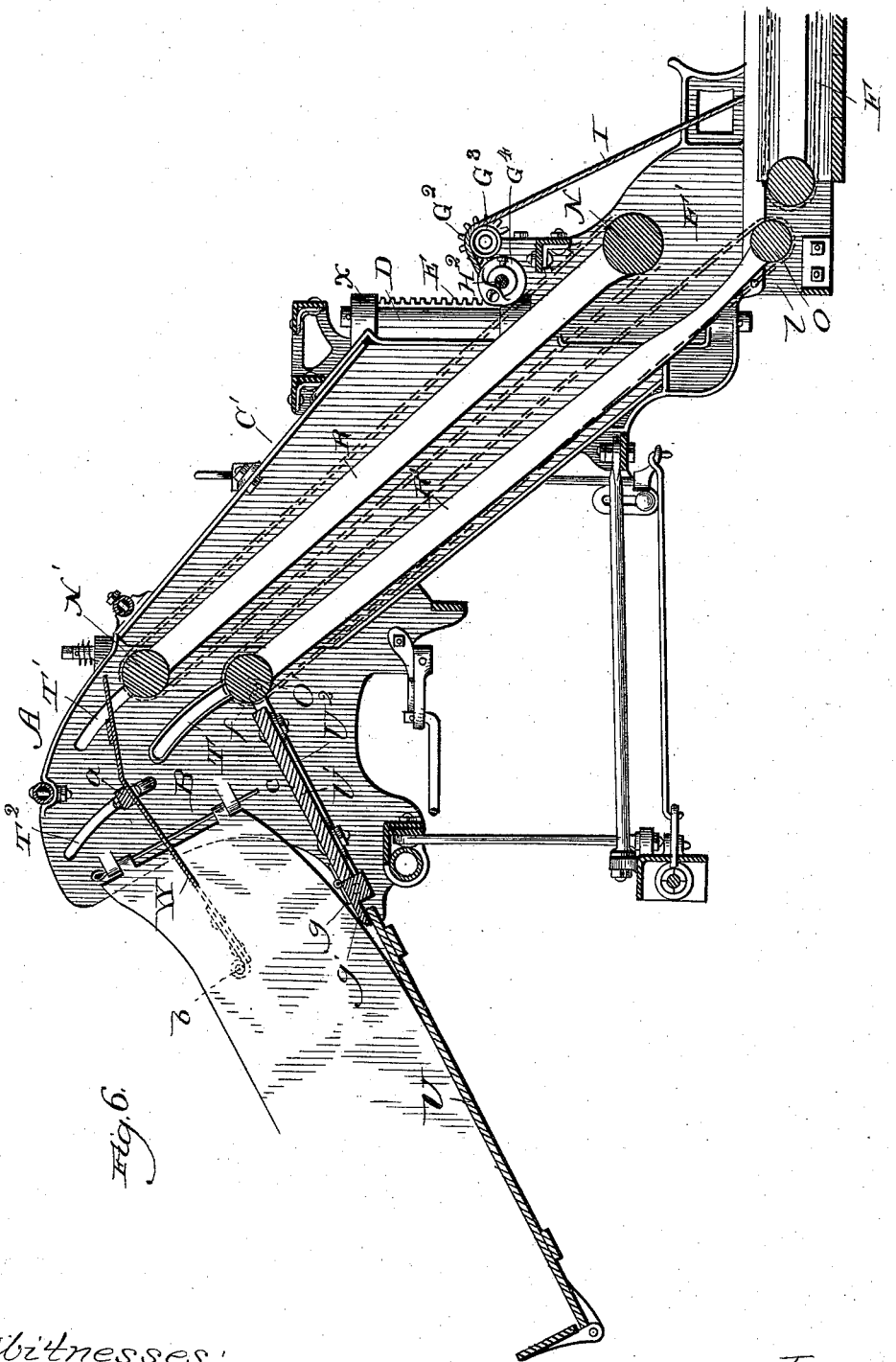


Fig. 6.

Witnesses:
Chas. E. Gaylord.
Chas. E. Gorton.

Inventor:
Casper F. Search,
By Dyrenforth & Dyrenforth.
Attys.

(No Model.) 5 Sheets—Sheet 4.

# C. F. SEARCH.

## PLATFORM ADJUSTMENT FOR HARVESTERS.

No. 383,660. Patented May 29, 1888.

Fig. 10.

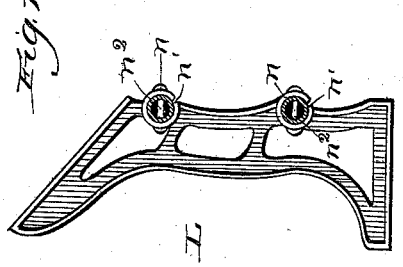


Fig. 7.

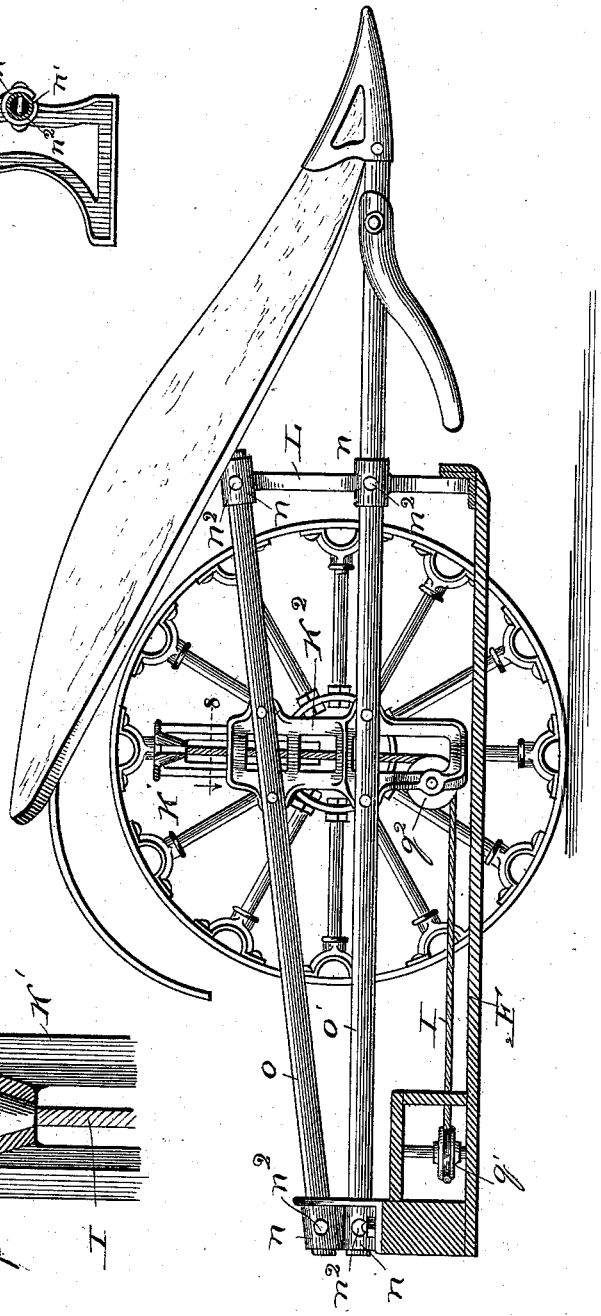


Fig. 8.

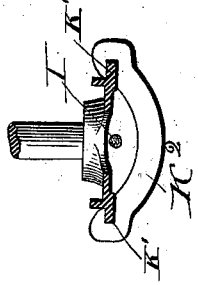
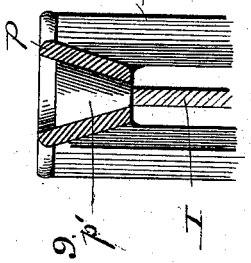


Fig. 9.



Witnesses:
Chas. E. Gaylord.
Chas. E. Gotton.

Inventor:
Casper F. Search,
By Dyrenforth & Dyrenforth.
Att'ys.

(No Model.) 5 Sheets—Sheet 5.

# C. F. SEARCH.

## PLATFORM ADJUSTMENT FOR HARVESTERS.

No. 383,660. Patented May 29, 1888.

Fig. 11.

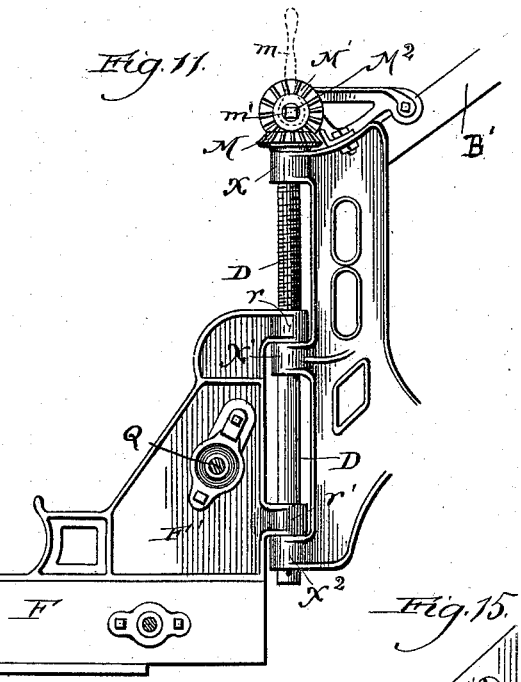



Fig. 12.

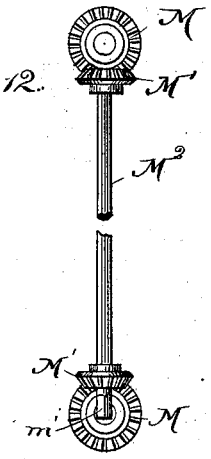



Fig. 13.

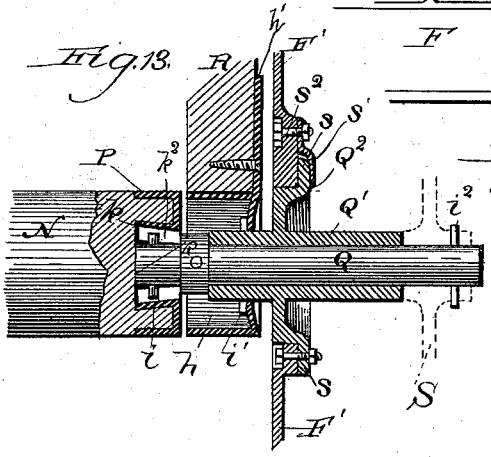



Fig. 14.

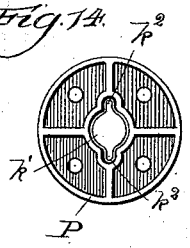



Fig. 15.

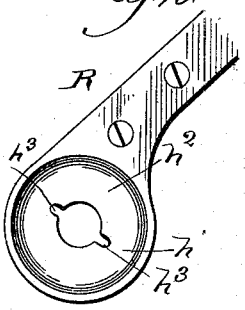



Fig. 16.

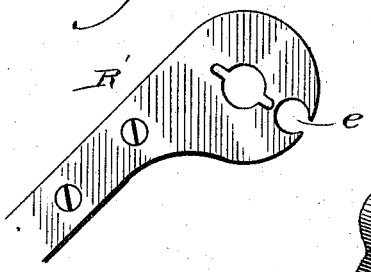
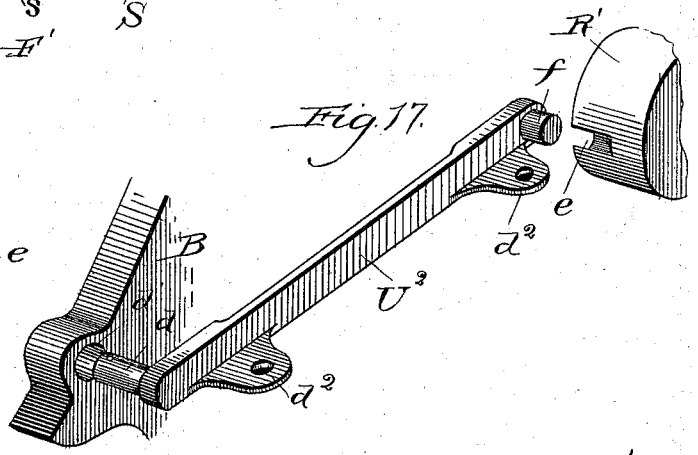



Fig. 17.




Witnesses:
Chas. E. Gaylord.
Chas. E. Gorton.

Inventor:
Casper F. Search,
By Dyrenforth & Dyrenforth.
Attys

# UNITED STATES PATENT OFFICE.

CASPER F. SEARCH, OF WINONA, MINNESOTA, ASSIGNOR TO THE WINONA HARVESTER WORKS, OF SAME PLACE.

## PLATFORM ADJUSTMENT FOR HARVESTERS.

SPECIFICATION forming part of Letters Patent No. 383,660, dated May 29, 1888.

Application filed September 20, 1887. Serial No. 250,189. (No model.)

*To all whom it may concern:*

Be it known that I, CASPER F. SEARCH, a citizen of the United States, residing at Winona, in the county of Winona and State of Minnesota, have invented a new and useful Improvement in Platform Adjustments for Harvesters, of which the following is a specification.

My object is to provide a construction of harvesting-machine whereby the platform may be raised and lowered independently of the main frame.

In elevating-harvesters the construction whereby my aforesaid object is attained requires the provision of means for simultaneously raising or lowering the rollers and apron of the elevator with the platform, and it is desirable to change the pitch of the grain-receiving board or deck and grain-shield with the raising and lowering of the platform. I provide means for accomplishing these purposes.

In the drawings, Figure 1 shows the rear end of my improved machine in broken elevation, illustrating as the principal feature, so far as my present application is concerned, mechanism for raising and lowering the grain-platform. Fig. 2 shows the platform in broken sectional rear end elevation provided with my improved means for raising and lowering it. Fig. 3 is an elevation of a fragment of the platform raising and lowering mechanism at the front end of the machine. Fig. 4 is a section taken on the line 4 of Fig. 2, and viewed in the direction of the arrow; Fig. 5, a section taken on the line 5 of Fig. 3, and viewed in the direction of the arrow; Fig. 6, a transverse section in elevation of my improved machine, showing from the front a portion of the grain-platform and the mechanism for raising and lowering it, together with the elevator, grain-receiving board, and grain-shield; Fig. 7, a section taken on the line 7 7 of Fig. 2, and viewed in the direction of the arrows; Fig. 8, a section taken on the line 8 of Fig. 7, and viewed in the direction of the arrow; Fig. 9, an enlarged sectional elevation of a detail; Fig. 10, a side elevation of a bracket, showing in section improved means for joining parts together; Fig. 11, a broken portion of the machine in elevation, showing the preferred mechanism for raising and lowering the platform; Fig. 12, a broken plan view of the beveled gear portion of the mechanism shown in Fig. 11; Fig. 13, an enlarged section taken on the line 13 of Fig. 2, and viewed in the direction of the arrow; and Figs. 14, 15, 16, and 17, views of different details.

A is the combined main wheel and elevator-frame of the machine, the side plates, B, of which are the only parts particularly adapted to perform functions in connection with improvements forming the subject of the present application, and are therefore the only parts thereof herein described in detail, the main frame forming the subject of a separate concurrent application for Letters Patent of the United States, Serial No. 250,188, filed September 20, 1887.

The side plates, B, may have extension-bars B′, as clearly shown in Fig. 1, to the lower ends of which metal plates C and C′ are firmly secured. These plates C and C′ are provided with bearings $x$, $x'$, and $x^2$ on their vertical inner edges, containing vertical guide-rods D, and upon the sides of the bearings $x$ and $x'$ are secured vertical racks E.

F is the grain-platform, having secured to it at opposite sides of the end nearest the main frame A vertical brackets F′, provided on their outer vertical edges with perforated lugs or bearings $r$ and $r'$, surrounding the vertical guide-rods D, whereby the platform is connected with the main frame in a manner to permit it to be moved vertically thereon.

G is a worm supported in a bearing, G′, secured to the bracket F′ at the rear side of the machine and in mesh with a pinion, $G^2$, supported above it, and carrying on its shaft, to the forward side of the bearing of the latter, a guide spool, $G^3$. (See Fig. 4.) H is a similar pinion supported on a shaft, $H^2$, (which has bearing in the brackets F′,) between the pinion $G^2$ and rack E, to engage with the said rack and pinion, the shaft $H^2$, which carries the said pinion H, extending across the machine to the rack E at the forward side thereof, where it carries a similar pinion, H′, (see Fig. 3,) in mesh with the last-named rack, and on the shaft $H^2$, in line with the spool $G^3$, is a

similar spool, $G^4$. The spools $G^3$ and $G^4$ taper, as shown in Fig. 4, and are mounted to cause the tapered ends to extend in opposite directions.

I is a strong wire cable secured at one end to the spool $G^4$, and extending therefrom over the spool $G^3$ to the rear side of the platform F, at the outer end of which it passes through a closed compartment at the rear side of the platform, as shown in Fig. 2, over pulleys $q$ and $q'$, journaled on the platform in the compartment toward the grain-wheel K, which is loose upon its axle. The axle of the grain-wheel K is provided with a casting, K′, rigidly secured thereon, (see Fig. 8,) to extend vertically upward from it, and provided in its upper end with a flaring socket, $p$. A casting, $K^2$, is provided with guide-recesses in opposite sides to permit it to slide upon the lateral edges of the casting K′, and serves as a bearing for the diverging hollow rods or pipes $o$ and $o'$, secured at their converging ends to the rear corner of the platform toward the left side of the latter, (see Figs. 2 and 7,) and extending toward their diverging extremities through a bracket, L, having sockets $n$ in its edge to receive them. (See Fig. 10.) The sockets $n$ are split longitudinally near their lower sides, as shown at $n'$, and are of a diameter to afford a snug fit to the hollow rods $o$ and $o'$, whereby, when the latter are inserted into them, bolts $n^2$, passed through the sockets and hollow rods, will, when tightened, clamp the former around the latter, thus forming simple and firm joints. This same construction of joint may be used at the converging ends of the hollow rods $o$ and $o'$ and in various other parts of the machine.

The cable I extends from the pulleys $q$ and $q'$ around a vertical pulley, $q^2$, supported on the bracket $K^2$ near the lower end of the latter, and thence vertically into the socket $p$ of the casting K′, where it is provided with a button, $p'$, fitting the socket, and which prevents its withdrawal in a downward direction.

From the foregoing description it will readily be seen that by turning the worm G to the right the pinions H and H′ rise in the racks E, thereby winding the cable upon the spool $G^4$ and raising the platform simultaneously and equally at both ends, since the shortening of the cable and strain upon the button $p'$ also raise the casting $K^2$, to which the farther end of the platform is secured, as described. Turning of the worm in the opposite direction obviously lowers the platform throughout.

While the mechanism thus described for raising and lowering the platform performs its function in a satisfactory manner, I prefer to use the mechanism for the purpose illustrated in Figs. 11 and 12 of the drawings, wherein the cable, racks, and worm, and other minor parts co-operating with these, are dispensed with. This construction is simpler than that described, but does not, like the latter, serve to raise and lower the platform at both ends. However, this is not necessary, as it is an easy matter to raise and lower the farther end by usual means provided for the purpose in the class of machines generally to which my improvement relates. Owing to the common form of device for thus adjusting the platform upon the grain-wheel, I have not shown it in the drawings in connection with the construction for raising and lowering the end nearest the main frame, of which the following is a description:

The upper portions of the vertical guide-rods D are threaded, as shown, toward their upper ends, and are rotatory in their bearings, and the annular lugs or bearings $r$ on the upper ends of the brackets F′ are internally threaded. Horizontal beveled gear-wheels M surmount the rotatory threaded rods D, and mesh with vertical beveled gear-wheels M′, rigidly secured on opposite ends of a shaft, $M^2$, supported to extend across the main frame A, above the wheels M. A crank, $m$, applied to the square end $m'$ of the shaft $M^2$, serves to rotate the latter, and, through the gear-wheels M′, the gear-wheels M, whereby the shafts D are rotated, and, owing to the threads in the bearings $r$, raise or lower the adjacent end of the platform, depending upon the direction in which the shaft $M^2$ is turned. The opposite end of the platform may be similarly adjusted by means of the ordinary mechanism hereinbefore referred to as being provided for the purpose, or need not be disturbed. By thus providing means for permitting the adjustment of the platform at either end independent of the other, one end may be raised higher than the other to adapt the machine to cut grain on sloping planes, as on the sides of hills, without producing a tendency in the machine to capsize.

N, Fig. 6, is the lower roller for the upper apron of the elevator, journaled at opposite ends in opposite brackets F′. (See Fig. 6.) To afford readily-removable bearings for the roller N, I have provided the constructions shown in Figs. 13 to 15, inclusive. At each end of the roller N it is hollowed out centrally by a circular opening, $k$, tapering toward the outer ends of the roller, having on two opposite sides recesses corresponding with those shown in Fig. 14, and hereinafter described; and a metal cap, P, fits over each opening $k$, and is provided with a circular tapering opening, $k'$, having recesses $k^2$ in opposite sides, the said opening and recesses coinciding with those in the ends of the roller. A large circular opening is provided in each bracket F′, through each of which a shaft, Q, provided with a pin, $i$, near its inner end, extends into the adjacent opening $k$, and the pins afford lugs to engage with the roller to turn it; and a box or sleeve, Q′, having a flange, $Q^2$, and lugs $i'$ on opposite sides extends through each of the said openings in the bracket F′ around the shaft Q, and the flanges $Q^{2*}$ fit in the openings in the plates F′.

R is a canvas-guide bar, preferably of wood,

for the upper apron, one of which guides is provided at each side of the apron, as usual, and they are secured to the journal-bearings of the roller N of course in a manner to permit the roller to rotate. At the ends of the said roller the lower ends of the canvas-guides are of peculiar construction, involving each a hollow head, $h$, covered on the outer side by a metal cap, $h'$, having a central circular opening, $h^2$, with opposite recesses $h^3$. The canvas-guides R surround at their hollow heads $h$ and rest upon, through their caps $h'$, the boxes Q′ between the ends of the roller N and the inner sides of the adjacent brackets F′; and, to enter the heads, the lugs $i'$ on the boxes are brought in line with the recesses $h^3$, to admit the boxes when the latter are turned around to lock them in position. The shaft Q is provided at its outer end with a pin, $i^2$, which is passed through the hub of the sprocket-wheel S, to cause the latter to rotate the shaft. The flanges $Q^2$ on the boxes Q′ are flanged, as shown at $s$, through which flanges $s$ at their lower ends the boxes are bolted to the brackets F′, while at their upper ends they are held in place by lips $s'$, pivotally secured to the brackets F′ by means of bolts $s^2$. I thus afford a bearing of metal for each end of the roller N, and means whereby the roller may readily be released, since, to release it, it is but necessary to turn a lip, $s'$, to one side, remove the nut from the bolt which holds the box at its flange $s$ near the lower end thereof, then turn the box Q′ to bring the lugs $i'$ in line with the recesses $h^3$, which permits the box to be withdrawn, and with it the shaft Q, thus releasing the roller N and canvas-guides R. The outwardly-tapering openings in the ends of the roller and caps (which openings, of course, flare inwardly) afford gradually enlarging sockets for the ends of the shafts Q which enter them, whereby the shafts are held at the reduced ends of the openings, and are allowed some play toward the extremities within the tapering openings. Thus the joints of the journal-bearings, when they are connected with the roller, are flexible in contradistinction to the rigid bearings in other machines, and avoid cramping of the bearings if the ends of the roller shall be or become out of line. As hereinbefore stated, a canvas-guide, R, is provided at each end of the roller N, and a canvas-guide, R′, is provided at each end of the roller O, forming the lower roller for the lower elevator-apron, which has its bearings in extensions $l$ from opposite sides of the platform at the end adjacent to the main frame.

The plates B of the main frame are each provided with curved slots T, T′, and $T^2$, the two first named in each plate affording elongated receptacles for the journals of the opposite ends of the rollers N′ and O′, constituting, respectively, the upper rollers for the upper and lower elevator-aprons, and the slot $T^2$ serves a purpose hereinafter described. The pairs of canvas-guides R and R′ are attached to the bearings of the rollers N′ and O′, respectively, (of course in a manner to avoid interference with the rotation of the rollers, as aforesaid,) the guides R′ and ends of the roller O′, to which they are connected, being provided with a construction similar to that already described, and shown in Figs. 13, 14, and 15.

U is the deck of the machine. At the upper end of the deck is a wooden bar, $g$, provided with an outward-extending lip, $g'$, (see Fig. 6,) which projects over the upper edge of the deck with which it is in contact.

U′ is the grain-receiving board, comprising metal side bars, $U^2$, having pins $d'$ at their lower ends, (see Fig. 1,) which extend through openings $d'$ in the respective plates B, and have secured to them a wooden plate, $e$, bolted to the ears $d^2$, and having hinged at its outer end, as shown, the bar $g$, which it supports. The opposite ends of the side bars, $U^2$, on the opposite sides of the pins $d$, are provided with pins $f$, which fit into circular recesses $e$ in the heads of the canvas-guides R′, Fig. 17. The grain-receiving board thus affords practically a flexible portion of the deck.

The grain-shield W is hinged at its outer end to a rod, $b$, secured to the breast-plate X of the knotter mechanism, as shown in Fig. 1, and extends therefrom over the roller N′. In line with the slots $T^2$ in opposite side plates, B, of the main frame is a cleat or bar, $a$, secured transversely to the grain shield and provided with reduced ends, which extend into the curved slots $T^2$ and afford bearings thereon for the grain-shield. Outside of the side plates, B, (see Fig. 1,) the ends of the cleat $a$ are pivotally connected with the adjacent bearing-boxes of the roller O′ by means of links $a'$.

When the platform is raised or lowered, it obviously moves with it the rollers N and O, and, through the canvas-guide bars R and R′, the rollers N′ and O′ in the slots T and T′, to raise or lower the elevator-apron simultaneously and equally with the platform. Movement of the rollers N′ and O′ tilts the grain-receiving board U′ and grain-shield W in parallel directions, thereby, in raising the platform, producing a steep fall for the grain, which is very desirable for long grain, and a more gradual fall for shorter grain, and also permitting the rise of the parts U′ and W without producing spaces at their upper extremities through which the grain might escape.

The reel is not shown in the drawings, as it involves no novel features of construction. It must, however, be supported on the grain-platform to be raised and lowered with the latter.

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

1. In an elevating harvesting-machine, the combination, with the combined main wheel and elevator-frame, of an elevator, a grain-platform adjustable to be raised or lowered independently of the combined main wheel and elevator-frame, the lower rollers of the elevator being mounted on the grain-platform and movable with the latter, and the upper

rollers being mounted in elongated bearings in the combined main wheel and elevator-frame and movable with the grain-platform, and a pivotal grain-receiving board to receive the grain as it is discharged from the elevator, connected with the elevator, to be raised and lowered with the latter to different angles, substantially as described.

2. In an elevating harvesting-machine, the combination, with the combined main wheel and elevator-frame, of an elevator, a grain-platform adjustable to be raised or lowered independently of the combined main wheel and elevator-frame, the lower rollers of the elevator being mounted on the grain-platform and movable with the latter, and the upper rollers being mounted in elongated bearings in the combined main wheel and elevator-frame and movable with the grain-platform, a pivotal grain-receiving board to receive the grain as it is discharged from the elevator, and a pivotal grain-shield overlying the grain-receiving board, both being connected to the upper rollers of the elevator and movable up or down as the latter are moved, substantially as described.

3. In an elevating harvesting-machine, the combination, with the elevator-frame, of an apron-roller having outwardly-tapering laterally-recessed openings in its opposite ends, and journals extending into the said openings and provided with lugs to engage with the recesses therein, and having bearing in the elevator-frame, substantially as described.

4. In an elevating harvesting-machine, the combination, with the elevator-frame, of an apron-roller journaled in removable metal journal-bearings in said frame and having removable journals extending into the ends of the roller, substantially as described.

5. In an elevating harvesting machine, the combination, with the combined main wheel and elevator-frame, and elevator aprons and rollers, of an apron-roller having a laterally-recessed tapering opening, *k*, in each end, caps P, having laterally-recessed tapering openings *k'*, and secured upon the ends of the roller, canvas guide bars having hollow heads *h*, and plates *h'*, provided with laterally-recessed openings $h^2$, shafts Q, having pins *i* near their inner ends and inserted through openings in the side of the elevator-frame into opposite ends of the roller, and flanged boxes Q', surrounding the shafts and secured to the sides of the frame of the elevator, substantially as described.

6. In an elevating harvesting-machine, the combination of a combined main wheel and elevator-frame, A, having slots T and T' in the upper end of its sides, a grain-platform connected with the combined main wheel and elevator-frame, and adjustable thereon, to be raised or lowered, and an elevator having apron-rollers N O bearing on the platform, apron-rollers N' O', supported in the slots T T', and canvas-guide bars R and R' on the inner sides of the frame of the elevator connected at opposite ends, respectively, with the rollers N N' and O O', and an upper and lower apron traveling over said rollers, substantially as described.

7. In an elevating harvesting-machine, the combination of a combined main wheel and elevator-frame, A, having curved slots T, T', and $T^2$ in the upper ends of its sides, a grain-platform connected with the said frame, and adjustable thereon, to be raised or lowered, an elevator having its lower and upper apron rollers connected by apron-guide bars and supported respectively on the grain-platform and in the slots T and T', a pivotal grain-receiving board, U', pivoted on its opposite sides near its lower edge to the sides of the elevator-frame near one end and axially connected with the upper heads of the lower apron-guide bars at its upper edge, and a pivotal grain-shield, W, hinged at its outer end, having lateral bearings near its middle extending into the slots $T^2$, and pivotally connected near its opposite sides and near its middle portion with the upper-apron roller, O', of the lower apron, by links *a'*, substantially as described.

8. In an elevating harvesting-machine, the combination, with the elevator apron and rollers, adjustable to be raised or lowered independently of the combined main wheel and elevator-frame, and with said elevator-frame, of a pivotal grain-receiving board, U', to receive the grain discharged from the elevator, substantially as described.

9. In an elevating harvesting-machine, the combination, with the elevator rollers, apron, and canvas-guide bars, adjustable to be raised or lowered in the elevator-frame independently of the combined main wheel and elevator-frame, and with said elevator-frame, of a pivotal grain-receiving board, U', comprising side plates, $U^2$, journaled near their lower ends at the sides of the main wheel and elevator-frame, and near their upper ends at the sides into the upper heads of the lower-apron canvas-guide bars, and a board, *c*, secured to the side plates, $U^2$, and having hinged to its lower end a bar, *g*, substantially as described.

10. In an elevating harvesting-machine, the combination, with the elevator, the rollers, apron, and guide-bars thereof, being adjustable to be raised or lowered independently of the main frame, of a pivotal grain-receiving board, U', to receive the discharged grain from the elevator-apron, and a pivotal grain-shield, W, to direct the discharged grain to the receiving-board, both connected with the elevator, to be moved in parallel planes by the raising or lowering movements of the elevator rollers, apron, and guide-bars, substantially as described.

CASPER F. SEARCH.

In presence of—
J. W. DYRENFORTH,
GEORGE C. COOK.