(No Model.)

6 Sheets—Sheet 1.

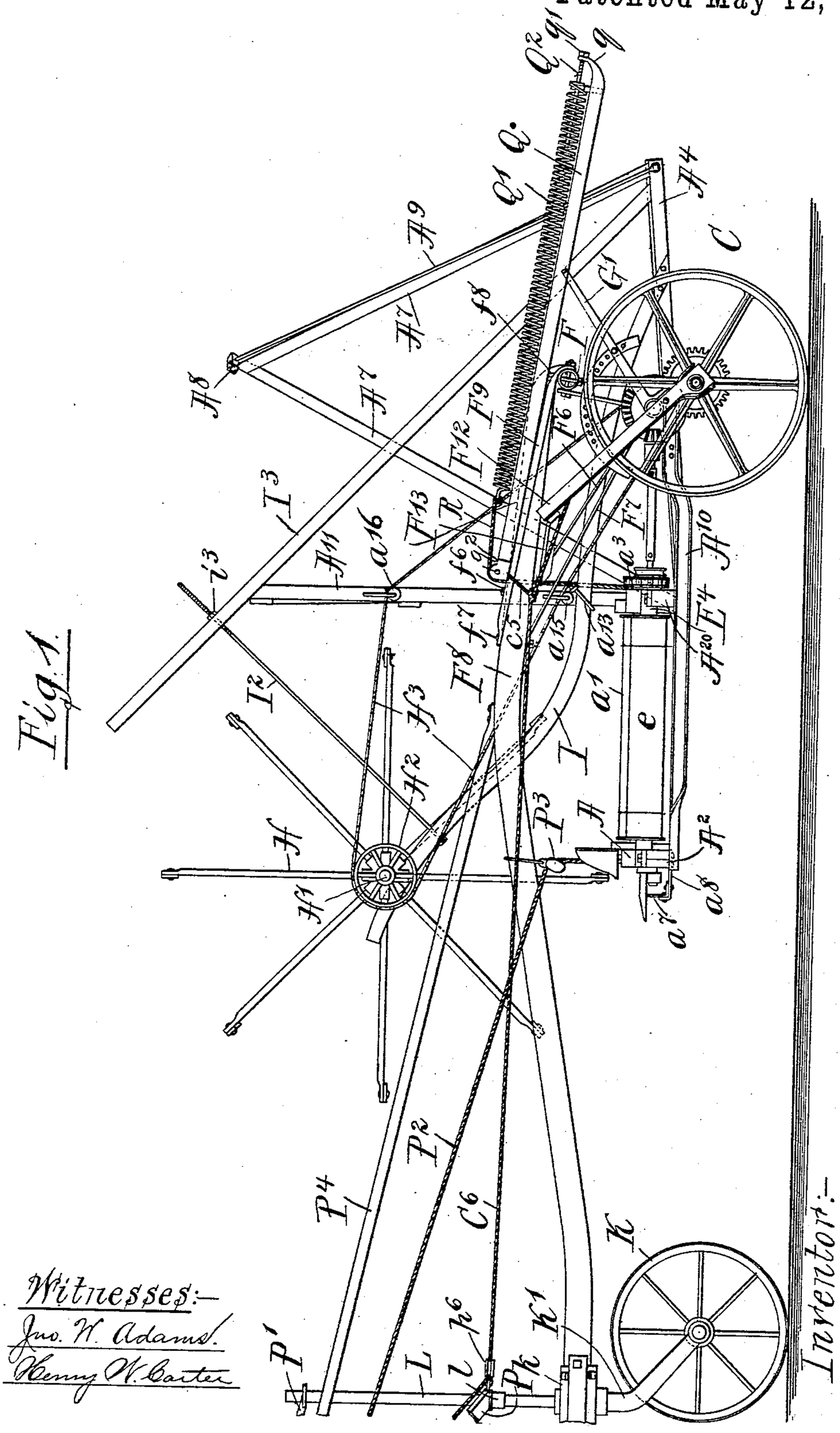
# H. C. BURMEISTER.

## HEADER.

No. 560,057.

Patented May 12, 1896.

Fig. 1.



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6 Sheets—Sheet 2.

# H. C. BURMEISTER.

## HEADER.

No. 560,057. Patented May 12, 1896.

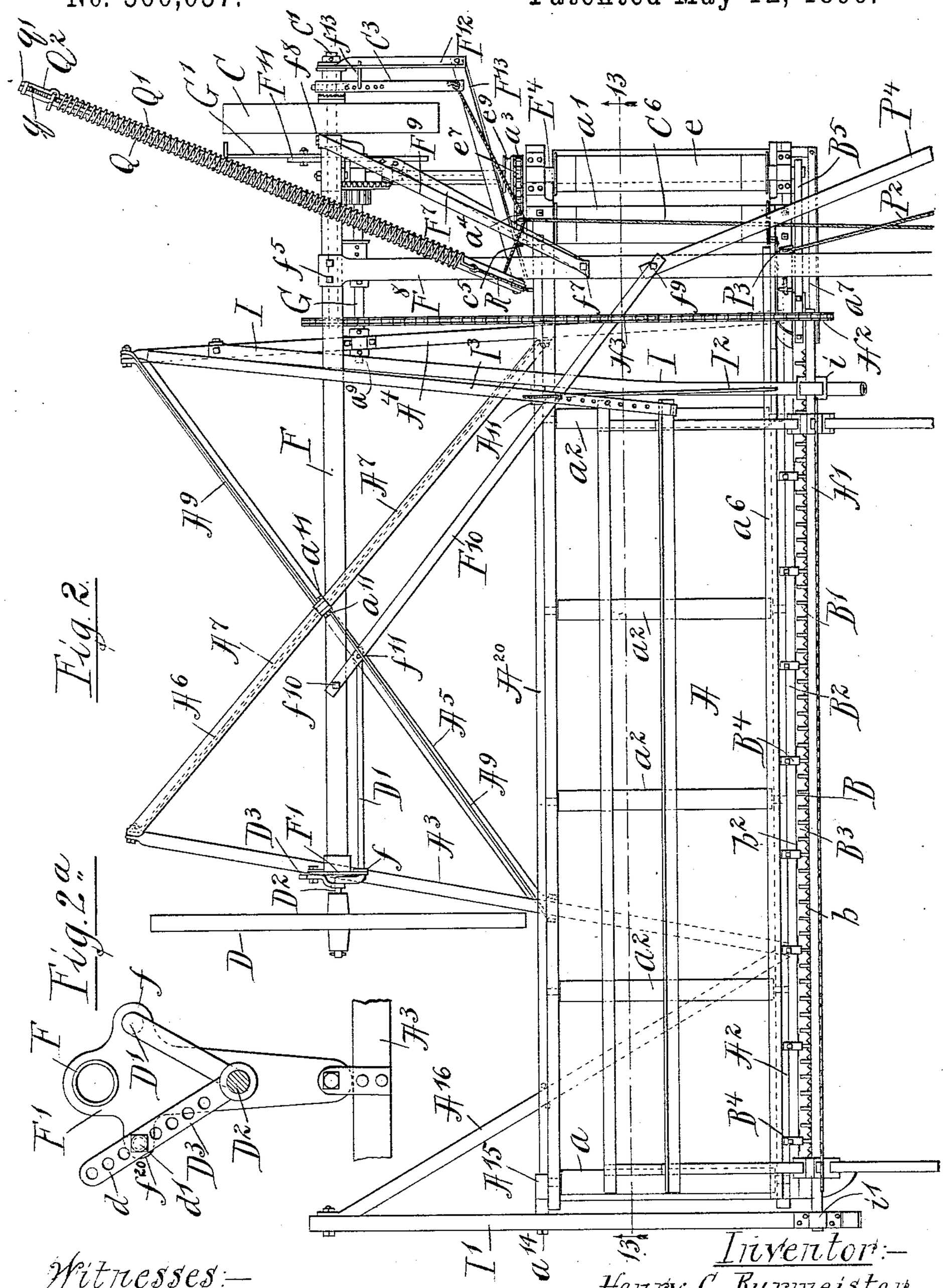

Fig. 2.



Fig. 2a.

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(No Model.) 6 Sheets—Sheet 3.

# H. C. BURMEISTER.

## HEADER.

No. 560,057. Patented May 12, 1896.

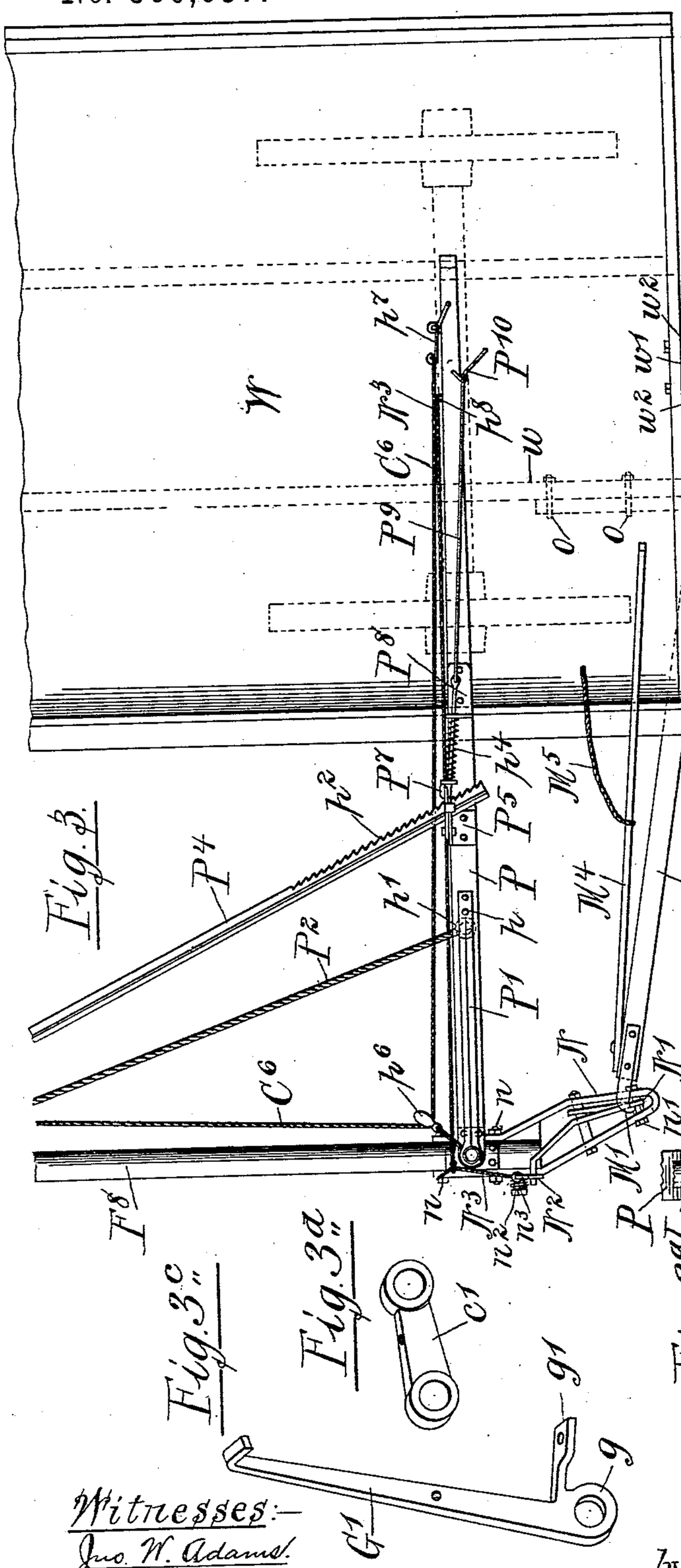

Fig. 3.

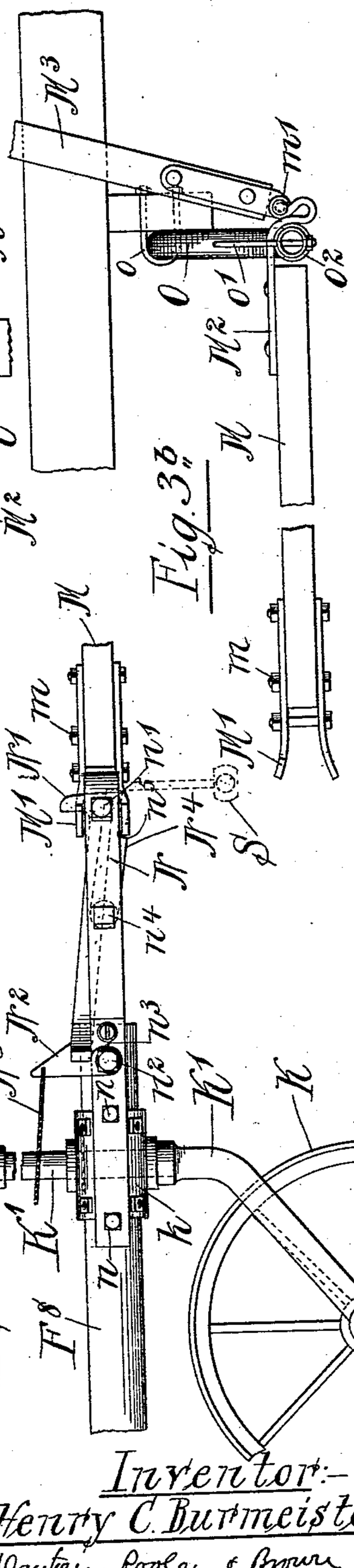

Fig. 3a.



Fig. 3b.



Fig. 3c.



Fig. 3d.



Fig. 3e.



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(No Model.) 6 Sheets—Sheet 4.

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## HEADER.

No. 560,057. Patented May 12, 1896.

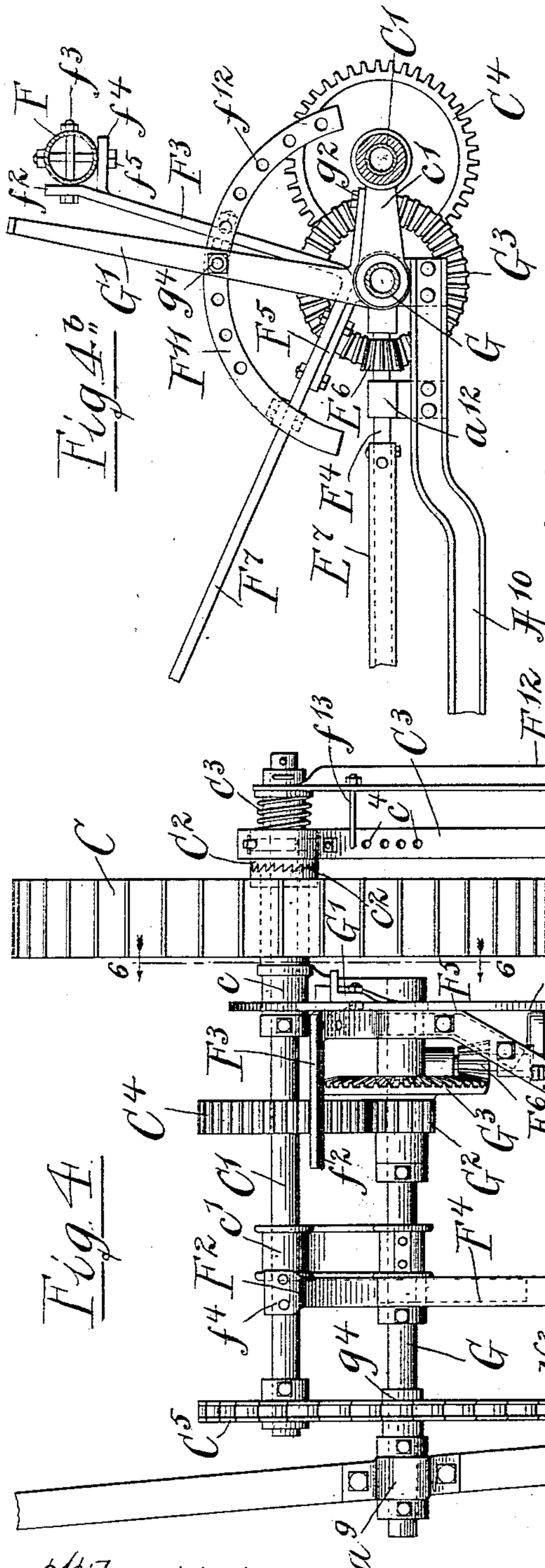

Fig. 4.

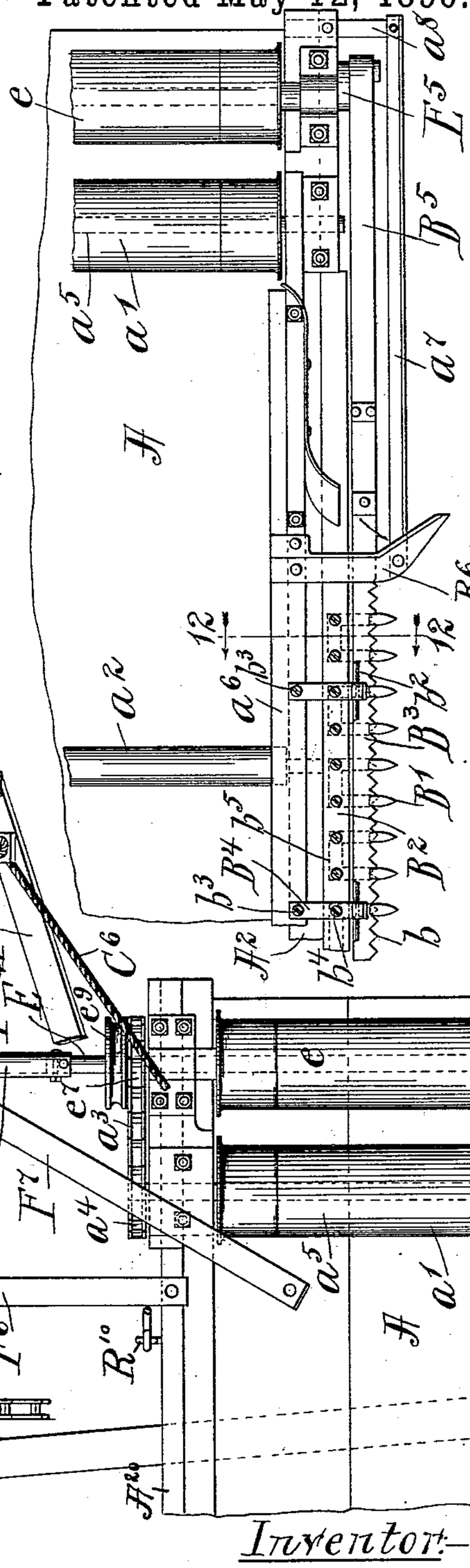

Fig. 4a.



Fig. 4b.

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(No Model.) 6 Sheets—Sheet 5.

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## HEADER.

No. 560,057. Patented May 12, 1896.

Fig. 5.

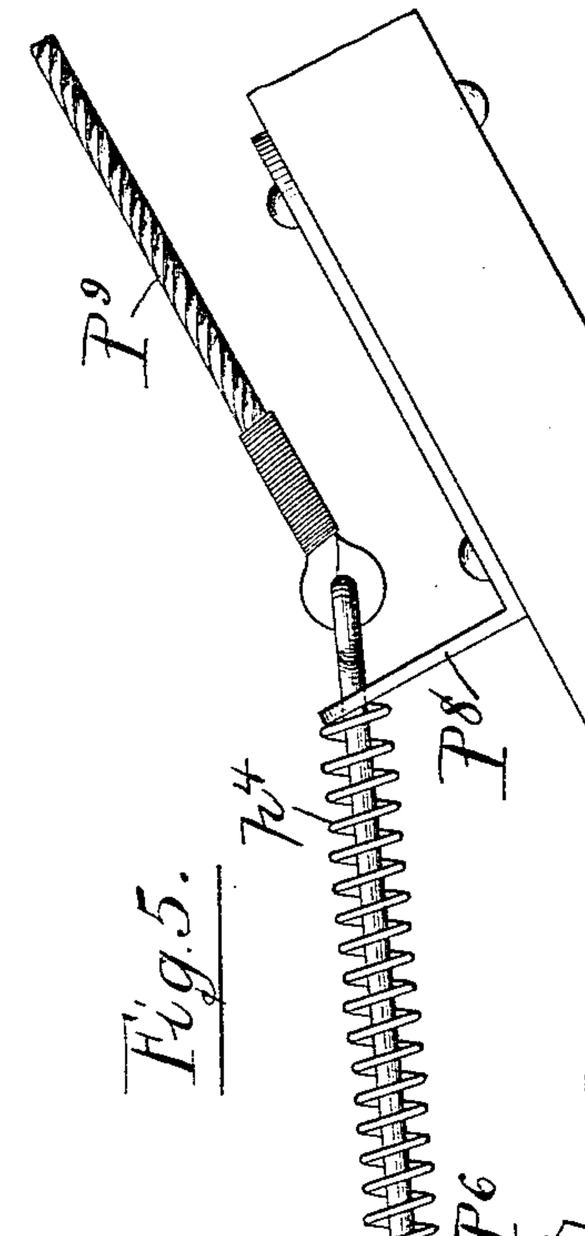


Fig. 5a.

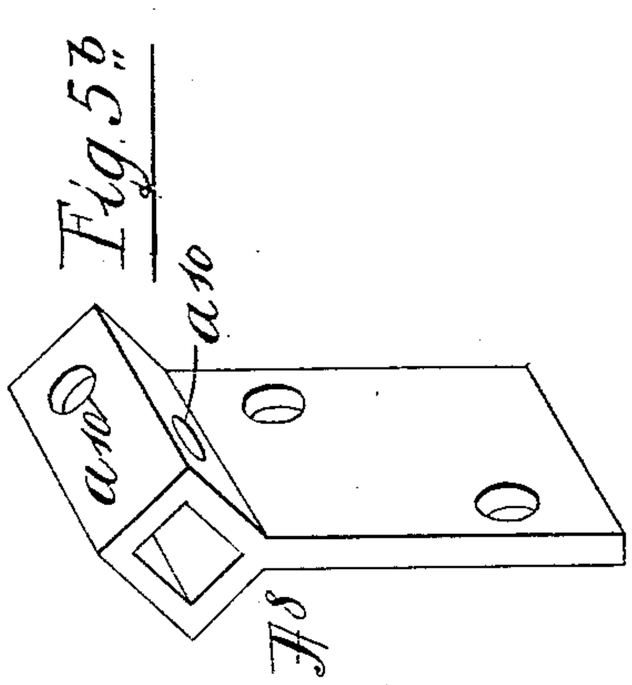


Fig. 5b.

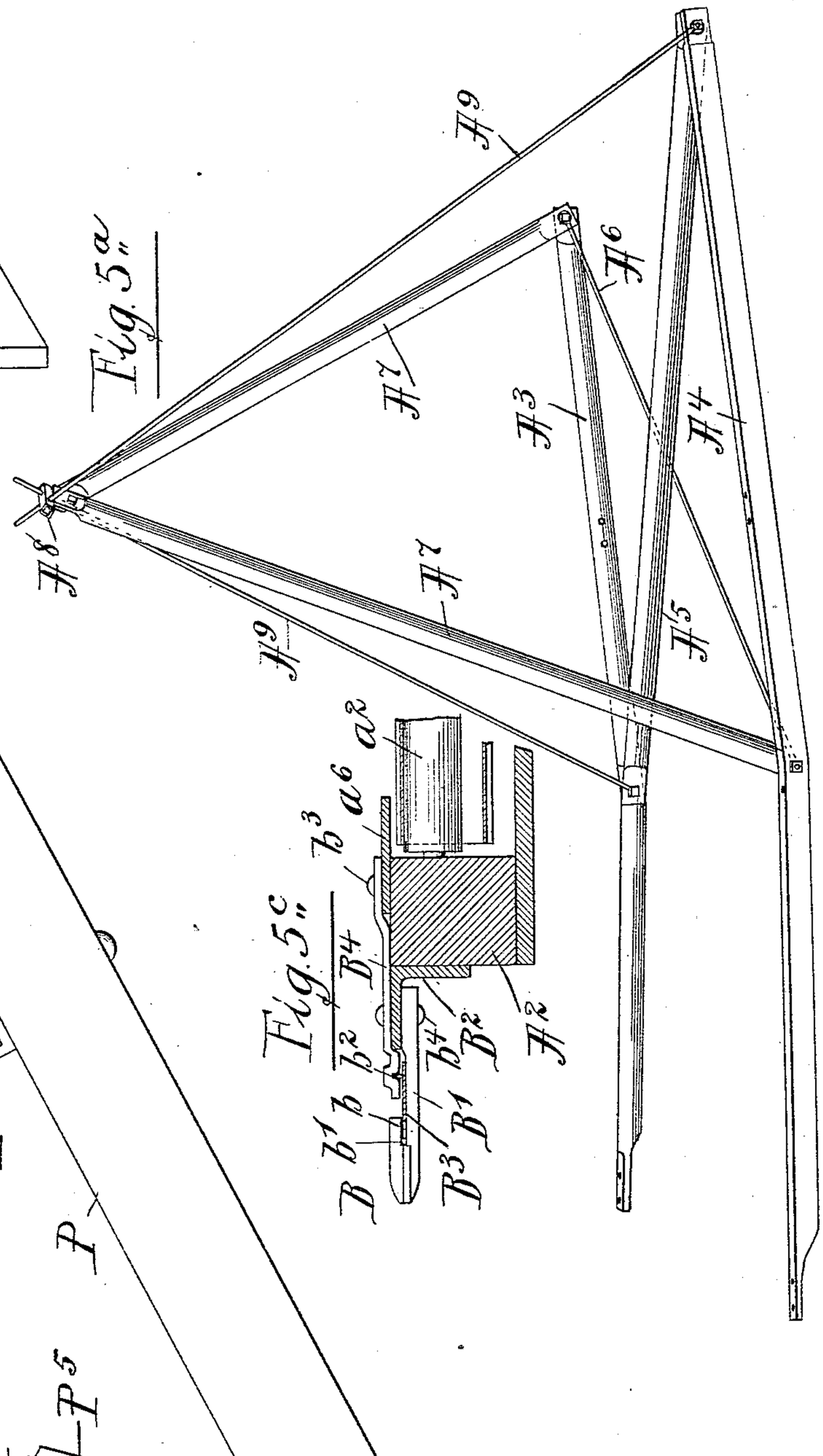


Fig. 5c.




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(No Model.)

6 Sheets—Sheet 6.

# H. C. BURMEISTER.

## HEADER.

No. 560,057. Patented May 12, 1896.

Fig. 6.

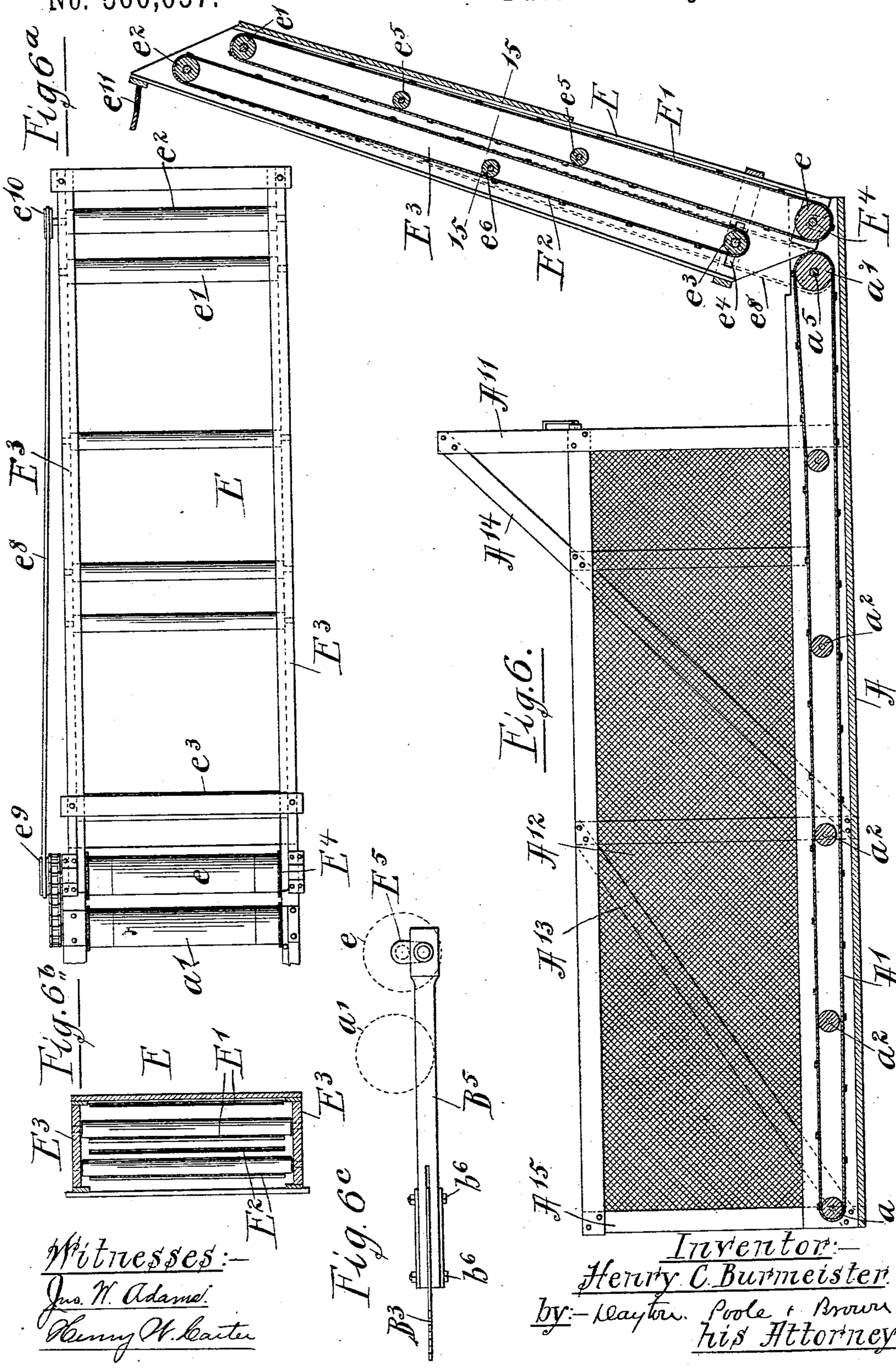


Fig. 6".

Fig. 6c

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# UNITED STATES PATENT OFFICE.

HENRY C. BURMEISTER, OF CLAFLIN, KANSAS.

## HEADER.

SPECIFICATION forming part of Letters Patent No. 560,057, dated May 12, 1896.

Application filed April 27, 1894. Renewed May 6, 1895. Serial No. 548,347. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY C. BURMEISTER, a resident of Claflin, county of Barton, State of Kansas, have invented certain new and useful Improvements in Headers, of which the following is hereby declared to be a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

The invention relates to that class of harvesting-machines known as "headers;" and it consists of certain improvements in structure, substantially as set forth by the description following, and more particularly pointed out by claims at the conclusion thereof.

In the drawings, Sheet I, Figure 1 is a view of the header in elevation at the inner or stubble side; Sheet II, Fig. 2, a plan view of the header; Fig. 2ª, a detail view of a hanger and its adjuncts at the grain-wheel support for the main frame; Sheet III, Fig. 3, a plan view at the forward end (not shown by Fig. 2) of the header-tongue, showing its adjuncts and its relation to the wagon-box, (dotted lines,) into which the cut grain is delivered by the elevator; Fig. 3ª, a detail side view at the forward end of the tongue with its reach-connector to the wagon; Fig. 3ᵇ, a detail plan view of the reach as sustained at the wagon-box; Fig. 3ᶜ, a perspective view of an adjusting-lever for the inner or stubble side of the main frame; Fig. 3ᵈ, a perspective view of the radius-link for said lever, Fig. 3ᶜ; Sheet IV, Fig. 4, an enlarged detail plan view of main or drive wheel and cutter-platform with intermediate parts at the stubble side of the machine; Fig. 4ª, a like view in continuation of Fig. 4 to display a portion of the front part of the cutter-platform; Fig. 4ᵇ, a detail sectional view at line 6 6 of Fig. 4; Sheet V, Fig. 5, a detail of the ratchet and catch mechanism at the shift-lever for the cutter-platform; Fig. 5ª, a perspective view of the skeleton truss for the cutter-platform; Fig. 5ᵇ, a perspective view of the union coupling at the apex of the skeleton truss; Fig. 5ᶜ, a detail section at line 12 12 of Fig. 4ª; Sheet VI, Fig. 6, a longitudinal section of the cutter-platform with its carrier and elevator aprons; Fig. 6ª, a detail plan of the elevator with its aprons removed; Fig. 6ᵇ, a cross-sectional view on line 15 15 of Fig. 6; Fig. 6ᶜ, a detail view of the pitman in front elevation, showing its connections with its drive-crank and with the sickle.

In the ordinary style of header now in familiar use the horses are hitched at the sides of a long pole or tongue, which extends back from the main frame or from the cross-axle at the two side wheels and upon which the main frame is hung. As distinguished from this type of "rear-push" machine, the present invention is of the "front-draft" kind, wherein the tongue projects forward and constitutes practically a rigid part or continuation of the main frame. A leader-wheel set in advance near the forward end of the pole acts in conjunction with the two rear wheels, located at opposite sides of the frame proper, to support the burden of such rigid frame. The weight of the frame, together with that of the cutter-platform tilting thereon, is thus brought chiefly between and is distributed at three carrying-points, whereby the draft becomes materially less.

The main frame of the machine to sustain the cutter-platform and its adjuncts presents (when viewed from above) somewhat of an L form in general plan. The cross-bar or backbone F, Fig. 2, of stout tubing constitutes one of the L members, and from this, near the stubble side, projects forward the other member, which is the tubular tongue F⁸. The draft-tongue F⁸ and backbone F are stoutly fastened at their joint by bolts $f^5$, while diagonal braces F⁹ F¹⁰, secured separately along the tongue by bolts $f^7$ $f^9$, extend thence in opposite directions and fasten to the cross-bar F by bolts $f^8$ $f^{10}$ to firmly stay the tongue and to enable the draft to be more evenly distributed therefrom at several points along the bar F. At its front the L-frame is carried pivotally on the stem L of the forked caster-shank K′, Figs. 1 and 3ª, the lower terminal of which shank affords the axle for the leader-wheel K. The draft-hitch for the machine being immediately in advance of the leader-wheel, (see S, dotted lines, Fig. 3ª,) it is plain that the caster-shank compels the wheel to respond promptly and to effect an easy turn of the machine within narrow range, following closely in the track of the draft-animals. At the rear the L-frame, Fig. 2, is mounted upon drive-wheel C and grain-wheel D, located near opposite ends of cross-

bar F. From said cross-bar on the outer or grain-wheel end depends the rigid hanger F′, Fig. 2ª, which by its ear *f* pivotally engages with the radius-arm D′, bent in crank form and at its lower terminal affording a spindle $D^2$ for the grain-wheel D. The upper crank member of radius-arm D′ projects, Fig. 2, toward the inner or stubble side of the machine, in general direction parallel with the backbone F, and finds a convenient journal-bearing at its terminal in a box-clip $f^{11}$ on diagonal brace $F^{10}$. It thus appears that grain-wheel D at its spindle $D^2$ carries the radius-arm D′, which in turn supports the backbone F of the main frame through the medium of hanger F′ and what is in effect a companion hanger—viz., diagonal brace $F^{10}$, (with its box $f^{11}$)—projecting from the backbone. The elongated axial crank member of radius-arm D′ pivotally seats itself in hangers F′ and $F^{10}$ $f^{11}$, so that the radius-arm D′ can be swung up or down (to adjust the height of the main frame) about spindle $D^2$ of grain-wheel D as a center. Lock-link $D^3$, set loosely on spindle $D^2$, engages by its bolt *d′* with bracket $f^{20}$, here shown, Fig. 2ª, in piece with hanger F′, to hold the main frame in rigid position as the same is set with reference to spindle $D^2$.

On the inner or stubble side the main drive-wheel C, by its long axle C′, affords pivotal support for the radius-links *c c′*, Figs. 4, 4ᵇ, and 3ᵈ, which extend thence forward and sustain between them the revolving counter-shaft G in position parallel with drive-axle C′. Aside from its function as a driver for the cutter and apron mechanism, as presently described, the counter-shaft G may be viewed as an elongated crank extension of links *c c′* and as such acts to loosely receive and sustain the eye-loops at the lower ends or apexes of the companion V-brackets $F^2$ $F^3$, Figs. 1, 4, and 4ᵇ. At the rear upper ends said parallel brackets $F^2$ $F^3$ are fastened to the backbone F, the terminal $f^4$ of bracket $F^2$ being bent back to a horizontal, so as to seat the cross-bar F and be secured by the same bolts $f^5$ which hold tongue $F^8$ thereto, while the corresponding terminal $f^2$ of the other bracket $F^3$ is bent laterally toward the grain or outer side of the machine and furnishes a broad bearing, to which the backbone F is fastened by bolts $f^3$, Fig. 4ᵇ. The front members $F^6$ $F^7$ of the V-brackets $F^2$ $F^3$ are extended to aline with tongue $F^8$ and are united thereto by bolts $f^6$ $f^7$, Figs. 1 and 4. The same bolt $f^7$ for bracket member $F^7$, Figs. 1, 2, and 4, serves, as already detailed, to unite diagonal brace $F^9$ with the tongue $F^8$, while bolt $f^6$ serves in like fashion to join the tongue to the forward end of an angular brace $F^{13}$ $F^{12}$, Figs. 1, 2, and 4, which extends laterally back and by its rear terminal seats upon the end of main axle C′ at the inner or stubble side of the machine. An adjusting-lever G′, Fig. 3ᶜ, by its box-hole *g*, journals upon counter-shaft G, Figs. 1 and 4ᵇ, at the side of radius-link *c′*, to which it is bolted. Lever G′ can be set at will by bolt $g^4$ in any one of the series of holes $f^{12}$ on arc-plate $F^{11}$, secured, as appears, Fig. 4ᵇ, to the members of V-bracket $F^3$ $F^7$.

By the construction detailed it is plain that the main frame, at the stubble side, is supported from axle C′ through radius-links *c c′* and their counter-shaft G, upon which shaft journals the companion V-brackets $F^2$ $F^3$, dependent from the backbone F. The main frame can thus be raised or lowered at will by means of adjusting-lever G′, the supporting-links *c c′*, with their counter-shaft G, moving radially about axle C′ as a center to raise or lower V-brackets $F^2$ $F^3$ and backbone F, while the remote extremities of the main frame ease slightly at the wheel-mounts D and K. If the radius-links *c c′* when at a horizontal be deemed to stand in normal relation or height for the main frame, it is clear that the vertical shift of the frame up or down can be effected in maximum by departure of links *c c′* from the horizontal within the limits of the sweep of adjusting-lever G along its lock-rack $F^{11}$. Manifestly the drive-wheel C is thus rendered much smaller in diameter, and by consequence in weight, than if attempt were made by arc-irons or like expedient at the axle of the wheel C to directly sustain and shift the main frame from that part. The adjustment here proposed by radius-links *c c′*, together with the corresponding radius-arm D′ $D^2$ at the grain-wheel side, permit the main frame to be quickly shifted up or down while the drive mechanisms for the cutter, the reel, and the carrier-aprons are retained intact without the slightest displacement in operative relation, as will presently appear.

The cutter-platform, which is pivoted to rock freely from the main or sustaining frame, has for its foundation a skeleton truss, Fig. 5ª, constructed as follows: Attached to the lower end of the hanger F′ at the outer end of the cross-bar F is a forwardly-extending tubular beam $A^3$, the front end of which is rigidly bolted to the under side of the platform A. A similar forwardly-extending flanged or L beam $A^4$ is hung from the outer end of the counter-shaft G by means of a bearing $a^9$ engaging said shaft, the front end of said beam $A^4$ being also rigidly bolted to the under side of the platform A. For the purpose of maintaining said beams $A^3$ and $A^4$ in their correct position relatively to each other I have provided a tubular brace $A^5$, bolted to the beam $A^3$ about midway of the length thereof and bolted to the extreme rear end of the beam $A^4$. A tie-rod $A^6$ is also bolted to the beam $A^3$ about midway of its length and to the beam $A^3$ at the extreme rear end thereof, said tie-rod and strut crossing each other in the form of an X. From the ends of the tie-rods $A^6$ rigid tubular struts $A^7$ extend upwardly to an apex, where they are bolted to the opposite sides of a union coupling $A^8$, and from the ends of the brace $A^5$ tie-rods $A^9$ extend upwardly to the apex of the struts $A^7$ and pass through suitable apertures $a^{10}$ in said

casting $A^8$. Adjusting-nuts $a^{11}$ on the ends of said tie-rods $A^9$ permit the tension thereof to be varied as desired and enable the brace-work thus formed to be tightened up to any desired degree. The skeleton truss is sustained, as appears, by pivot at foot of hanger F′ on the grain side, Fig. 2ª, and on the stubble side by box $a^9$ near the outer terminal of counter-shaft G, Fig. 4. Supplemental to the skeleton truss there is a metal beam $A^{10}$, Figs. 1 and 4ᵇ, which journals upon the shaft G near its inner or stubble end and extends thence forward beneath the transverse sills $A^{20}$ $A^2$ of the cutter-platform to strengthen and support said platform at the part adjacent the elevator. The front ends of the truss-beams $A^3$ $A^4$ are flattened, while the same end of the companion L-beam $A^{10}$ is given a quarter-turn, so that these several parts at juncture with forward sill $A^2$ project but slightly beneath the sill, in better avoidance of minor obstacles.

A designates the grain-platform, provided along its front edge with the usual reciprocatory cutting apparatus B. The platform A is made in the form of a shallow trough, within which is provided the usual carrier-apron A′, passing over rollers $a$ and $a'$ at each end of the platform and having its upper side further supported by intermediate rollers $a^2$, said rollers being placed so as to bring the top surface of the carrier slightly below the plane of the cutting apparatus throughout the length of the latter. At one end of the platform A and the carrier A′ is provided an elevator E of a usual type, comprising two carrier-belts E′ and $E^2$, arranged with their adjacent faces in close proximity to each other and adapted to seize and carry up between them the grain delivered to them by the horizontal carriers A′. The lower elevator-belt E′ passes around suitable rollers $e$ and $e'$, extending between the side boards $E^3$ of the elevator at the bottom and top thereof, the lower roller $e$ being journaled closely adjacent to and in substantially the same horizontal plane with the roller $a'$ of the horizontal carrier A′. The upper elevator-belt $E^2$ passes over rollers $e^2$ and $e^3$ at the top and bottom of the elevator, the lower rollers $e^3$ being adjustably journaled within slots $e^4$ in the side boards $E^3$ in order that the belt $E^2$ may be adjusted toward or away from the belt E′, as desired. The upper surface of the belt E′ is kept from sagging away from the belt $E^2$ by intermediate rollers $e^5$, and the upper surface of said carrier-belt $E^2$ is likewise supported intermediately by a similar roller $e^6$. The lower surface of the latter carrier tends naturally to sag against the adjacent surface of the lower belt $E^2$, but is left free to yield away from the same when forced back by the intervening mass of passing grain. (See Fig. 6.) As herein shown, all the carrier-belts are actuated from the lower roller $e$ of the belt E′, the shaft $E^4$ of said roller $e$ being extended back and driven from the driving-wheel C by suitable connections hereinafter described. A sprocket-chain $a^3$, connecting sprocket-pulleys $e^7$ and $a^4$, mounted, respectively, on said shaft $E^4$ and on the shaft $a^5$ of the roller $a'$ drives the horizontal carrier A′. (See Fig. 4.) The upper carrier $E^2$ is actuated by a belt $e^8$, connecting a pulley $e^9$ on the shaft $E^4$ with a pulley $e^{10}$ on the shaft of the upper roller $e^2$, which is extended through the adjacent side board $E^3$ of the elevator for this purpose. (See Figs. 6 and 6ª.) The elevator E inclines upwardly and outwardly and is made of sufficient length to discharge its contents into a neighboring wagon-box, as will hereinafter be explained. For the purpose of adjusting the elevator with relation to the wagon it is herein shown pivoted at its lower end upon the shaft $E^4$ of the lower roller $e$, its inclination being adjusted, as desired, by means of a rope $e^{11}$, secured to the upper end of the elevator-frame and to any suitably-fixed part of the header-frame and the length of which may be varied as desired.

The cutting apparatus B is of a usual type, comprising guard-fingers B′, bolted to an angle-iron $B^2$, projecting from the front edge of the platform A, and a reciprocatory sickle $B^3$, resting on said guard-fingers B′ with its teeth $b$ passing through slots $b'$ in said guard-fingers. As a means of guiding the sickle $B^3$ the rear edge thereof is turned up at intervals to form vertical guide-flanges $b^2$ of a length equal to or greater than the distance the sickle moves, said guide-flanges $b^2$ being received within guide-slots provided in the lower face of forwardly-projecting strips $B^4$, bolted to the top of the angle-iron $B^2$ at the proper intervals to engage said flanges $b^2$. Directly behind the cutting apparatus a horizontal strap $a^6$, secured to the top of the front sill $A^2$ of the platform A, projects rearwardly over the top surface of the horizontal carrier A′ and serves to prevent the grain falling into the crack between the edge of the carrier and the rear face of said sill $A^2$. The straps $B^4$ are in this instance extended back to overlap the plate $a^6$ and have their rear ends secured by bolts $b^3$, passing through the plate $a^6$ into the front sill $A^2$ of the platform. They are secured at their front ends by bolts $b^4$, passing through the angle-iron $B^2$ and adjacent guard-fingers B′, and consequently, in addition to furnishing a guide for the sickle $B^3$, serve to more securely bind the cutting apparatus to the platform. The guard-fingers B′ are in this instance shown provided in pairs, connected by an integral cross-bar $b^5$ at their rear ends, as appears by dotted lines in Fig. 5.

The cutting apparatus B does not extend the full length of the platform A, but terminates some distance from the foot of the elevator E, and the sickle $B^3$ is shown, Figs. 4ª and 6ᶜ, reciprocated by a pitman $B^5$ from a crank $E^5$ on the forward end of the roller-shaft $E^4$. The pitman $B^5$ is shown rigidly connected with the end of the sickle $B^3$, so that the flexibility

of said sickle being depended upon to permit the required oscillatory motion of the pitman. Such connection is in this instance provided by slotting the end of the pitman, as shown in Fig. 6ᵉ, inserting the end of the sickle in the slot and passing rivets or bolts through the parts to secure them rigidly together. An enlarged guard-finger $B^6$ of a usual type is provided at the inner end of the cutting apparatus to direct the grain toward the sickle, and the pitman $B^5$ is herein shown protected by a horizontal angle-bar $a^7$, bolted to said finger $B^6$ at one end and at its other end to a short arm $a^8$, which projects from the front of the platform at the inner end thereof. The drive-wheel C is in this instance loosely mounted on the shaft C′, Fig. 4, and is connected therewith by a usual backing-ratchet, comprising a sleeve $C^2$, provided with ratchet-teeth $c^2$, engaging similar teeth of the hub of the driving-wheel C. Said sleeve $C^2$ is normally held in an engagement with the hub by means of a coil-spring $c^3$ and is adapted to be thrown out of engagement therewith, when desired, by means of a lever $C^3$. For pivotally supporting this lever an angle-bar $F^{12}$, Figs. 2 and 4, is sleeved on the inner end of the shaft C′ and extends forwardly and upwardly therefrom to engage a rigid bar $F^{13}$, bolted to the tongue $F^8$. Near its lower end said bar $F^{12}$ is provided with a projecting pivot-pin $f^{13}$, adapted to engage any one of the series of openings $c^4$ in said lever $C^3$.

The connections hereinbefore referred to for driving the roller-shaft $E^4$ comprise a spur-gear $C^4$, rigidly secured to the shaft C′ and engaging a spur-pinion $G^2$, loosely mounted on the shaft G. A bevel-gear $G^3$ is rigidly connected with the pinion $G^2$, to turn therewith, and engages a beveled pinion $E^6$, rigidly secured to the inner end of the shaft $E^4$. The rear end of the shaft $E^4$ is supported adjacent to the pinion $E^6$ within a bearing $a^{12}$, provided on the forwardly-extending beam $A^{10}$, Figs. 1 and 4ᵇ, which is loosely sleeved to the shaft G at its rear end, and the forward end of which is rigidly bolted to the under side of the inner end of the platform A. The shaft $E^4$ is herein shown provided between the platform A and the pinion $G^4$ with a tumbling shaft-section $E^7$ of any suitable type, by reason of which any distortion of the parts occasioned by the racking of the frame will not interfere with the operation of the machine.

For the purpose of supporting a usual grain-reel H in a horizontal position above the cutting apparatus B at the front edge of the platform A devices are provided as follows: $A^{11}$ designates a standard, Figs. 1, 2, and 6, rising from the rear edge of the platform at a point directly behind the large grain-finger $B^6$, said standard in this instance forming the inner support of a vertical framework $A^{12}$, arranged along the rear edge of the platform and adapted to be covered with wire-cloth or canvas to serve as a screen in preventing the grain from falling off the rear edge of the platform. The screen-frame is herein shown strengthened by suitable braces $A^{13}$ and $A^{14}$, the latter of which extends upwardly and inwardly to the upper end of the standard $A^{11}$ and secures the same against lateral deflection. I designates an upwardly-inclined tubular arm (herein shown of curved shape) which is attached at its rear end near the rear end of truss-beam $A^4$, and is further supported about midway of its length by an adjustable clip $a^{13}$, passing around the standard $A^{11}$ and securely clamping the arm I to said standard. At its upper and forward end said bar I supports a bearing $i$, within which the inner end of the shaft H′ of the reel H is revolubly mounted. At its outer end said reel-shaft is supported in a bearing $i'$, Fig. 2, provided on the upper and forward end of the upwardly-inclined arm I′, which is secured about midway of its length to the outer standard $A^{15}$, Figs. 2 and 6, of the screenwork $A^{12}$ by means of a suitable bolt $a^{14}$, and the rear end of which is bolted to the rear end of an outwardly-inclined tubular bar $A^{16}$, securely bolted to the under side of the platform A and meeting the front edge thereof at a common point with the truss-beam $A^3$. Vertical adjustment of the reel is afforded at its inner end by means of a tie-rod $I^2$, engaging the arm I near its outer end and adjustably connecting it with an inclined bar $I^3$, Figs. 1 and 2, which is supported at its upper end by resting on the top of the standard $A^{11}$ and at its lower end is secured to the beam $A^4$ at the rear end thereof. An adjusting-nut $i^2$ on the tie-rod $I^2$ may be screwed up to raise or lower the reel, as desired, the clip $a^{13}$ being loosened sufficiently to permit the desired adjustment and being afterward tightened again. Vertical adjustment of the reel at its outer end is effected by means of a series of holes (not shown) in the standard $A^{15}$, with any one of which the bolt $a^{14}$ is adapted to be engaged. At its extreme inner end the shaft of the reel H is provided with a sprocket-pulley $H^2$, Fig. 1, which is connected by a sprocket-chain $H^3$ with a driving-sprocket $C^5$ on the outer end of the main driving-shaft C′, Figs. 2 and 4. Idle guide rollers or pulleys $a^{14}$ and $a^{15}$, Fig 1, mounted on the standard $A^{11}$, prevent the chain from striking any intervening portions of the framework, and an idle-roller $g^4$, Fig. 4, on the shaft G prevents the said chain from rubbing on said shaft when the relative adjustment of the parts is such as to bring the chain in contact with the said roller $g^4$.

The tongue $F^8$ of the header extends forward a considerable distance in front of the platform A and is provided at its forward end, Fig. 3ᵃ, with a supporting-wheel K. Said wheel K is journaled between the forked lower ends of a vertical pivot-shaft K′, which are bent rearwardly in order that the wheel may caster or swing freely in any direction according with the direction of pull on the tongue. The pivot-shaft K′ extends vertically upward through a suitable bearing $k$ on the tongue

and supports at its top a pipe or standard L, herein shown secured to said shaft by an ordinary pipe-coupling *l*.

The wagon W, Fig. 3, in connection with which the header is used and into which the elevator E discharges the cut grain, is driven opposite the header in such position relatively thereto as to bring the wagon-box directly beneath the upper outer end of said elevator. For the purpose of maintaining the correct relative positions of the header and wagon I provide a rigid bar or reach M, adapted to be secured to the front end of the tongue $F^8$ and to the front of the wagon-body. As herein shown, said bar M is designed to be permanently connected with the wagon and detachably connected to the tongue of the header in such manner that when the wagon is filled the bar may be detached from the tongue by the driver of the wagon without necessitating his leaving his position. To this end I provide on the end of the tongue $F^8$ a loop N, Figs. 3 and $3^a$, formed by doubling a bar of iron and bolting its ends rigidly on each side of the tongue by means of suitable bolts *n*. The front end of such loop N is bent slightly toward the wagon side of the header and is adapted to be embraced between projecting hook-shaped irons M′, secured by bolts *m* to the top and bottom sides of the bar M. When so engaged with the loop N, the hooks M′ are normally prevented from slipping forwardly off the end of the loop by a latch N′, pivotally mounted between the sides of the loops upon a transverse bolt *n*′, and having its rear end extended backward to engage a catch $N^2$, pivoted to the side of the tongue on a bolt $n^2$. A cord $N^3$ is secured to the upper end of the catch $N^2$ and leads up to within convenient reach of the driver of the wagon, in a manner presently described, so that by pulling the said cord $N^3$ and releasing the catch $N^2$ the latch N′ will be left free to swing on its pivot *n*′ and permit the hooks M′ to slip forward off the loop N, thereby detaching the bar M from the tongue. A spring $n^3$, applied to the pivot $n^2$ of the catch $N^2$, serves to normally maintain the same in engagement with the latch N′, and the front upper end of the catch $N^2$ is beveled off, as shown, in order to engage said catch automatically when the rear end of the latter is thrown down against it. Rearward movement of the bar M relatively to the tongue $F^8$ is prevented by a stop-pawl $N^4$, pivoted on a transverse bolt $n^4$, extending between the sides of the loop N about midway of the length thereof. Said pawl is adapted to extend forward between the hooks M′ when the latter are embracing the loop N; and is provided with a notch $n^5$, adapted to normally engage the rear edge of the lower hook M′, and resist any tendency of the bar to move backward.

The connections between the bar M and the wagon-body are in this instance constructed as follows: $M^2$ designates a flat metallic strap bolted to the upper side of the bar M at the end thereof opposite to the hooks M′, and curved downwardly toward its outer end, where it terminates in an eye *m*′.

O designates a tubular bar bolted at its rear end to one of the beams *w* of the wagon-body by means of clips *o*, and curved downwardly and forwardly therefrom. The strap $M^2$ is adapted to hook over and rest upon the outer end of said tubular bar O, as shown in Fig. 8, and is retained loosely in place on said bar O by a looped rod *o*′ on the upper side thereof.

For the purpose of enabling the bar M to be shifted to a position directly in front of the wagon when it is detached from the header the loop *o*′ is made high enough to permit said bar to be slipped endwise through it when lifted high enough to clear the bar N, and a lever $N^3$ for this purpose is pivotally attached at its lower end to the eye *m*′ at the end of the strap $M^2$, and extends upwardly through a guide-loop *w*′ on the front of the wagon-box to within convenient reach of the driver. A rod $M^4$, pivoted to the bar M at the outer end thereof adjacent to the hooks M′, inclines upwardly toward the wagon and may be fastened to rest on the edge of the wagon-box by means of a cord $M^5$ or otherwise. When the cord $N^3$ is pulled to release the latch N′ from the hooked ends M′ of the bar M, the latter may be lifted and drawn bodily through the loop *o*′ by means of the lever $M^3$, and may thus be shifted into a position where it will extend transversely across the front of the wagon-body without projecting an inconvenient distance on either side of the same. Friction-rollers $w^2$ on the loop *w*′ provide for the easy movement of the lifting-rod $M^3$, and a similar friction-roller $O^2$, placed on the tubular bar O between the sides of the loop *o*′, permits the bar M to slide easily upon said bar.

Pivotally secured to the standard L, which is rigidly mounted on the top of shaft K′, is an upwardly-inclined lever P, Figs. 3, $3^a$, and 5, adapted to extend within easy reach of the driver of the wagon when said wagon is secured to the header by means of the bar M. A brace-rod P′, attached to the standard L at its upper end and secured to the lever P by a bolt *p*, maintains the lever in its inclined position. The principal function of the lever P is that of adjusting the height of the front edge of the grain-platform and cutting apparatus above the ground. To this end a rope $P^2$ is rigidly attached to the lever P at a point *p*′ near the lower end thereof, and at its other end is rigidly attached to the front platform A, said rope passing between its ends over a pulley $P^3$, suspended from the tongue $F^8$ at a point directly above the front edge of the platform A. The weight of the platform will obviously produce a strain on said rope $P^2$, tending to swing the lever P rearwardly about the standard L as a pivot, and to resist this strain and render the position of the lever adjustable I provide an angle-bar $P^4$, Figs. 2

and 5, which is secured to the tongue $F^8$ by the same bolt $f^9$ which secures the tubular brace $F^{10}$ thereto, and which extends at its front end through a clip $P^5$, provided on the lever P some distance above its lower end. The lower flange of the angle-bar $P^4$ is provided with notches $p^2$, which are normally engaged by a catch $P^6$, pivoted at $p^3$ to the clip $P^5$. A link $P^7$ is attached to the upper end of the catch $P^6$ and, passing through a guide-clip $P^8$ higher up on the lever P, is connected by rope or rod $P^9$ with a hand-latch $P^{10}$ at the upper end of the lever. A spring $p^4$ on the link $P^7$ between the catch $P^6$ and the clip $P^8$ serves to normally maintain said catch in engagement with the notches $p^2$ of the angle-bar $P^4$, and a lug $p^5$ on said catch $P^6$ is bent into U shape to embrace the upper edge of the clip $P^5$ and serves to prevent lateral displacement of said catch, the top of the clip $P^5$ being curved on a radius about the pivot $p^3$ to serve as a guide for the lug $p^5$. With this construction by pressing on the hand-latch $P^{10}$ the driver may release the catch $P^6$ from its engagement with the tooth-bar $P^4$, swing the lever P about the standard L as a pivot, and either raise or lower the front of the harvester-platform, as desired, it being obvious that if the lever P is swung to the rear the rope $P^2$ will slip through the pulley $P^3$ and lower said platform, while if the lever P is swung forwardly the rope $P^2$ will be drawn up through said pulley $P^3$ and the platform A will be raised.

On reference to Fig. 1 it is seen that by reason of the forward reach of pole $F^8$ the suspension-rope $P^2$ for the cutter-platform is sustained along the tongue $F^8$ by pulley $P^3$ or like expedient in position most effective for the application of the power in raising said platform about its rear pivots. When the lifting-rope $P^2$ is secured at the front edge of the platform, as shown by Fig. 1, the shift of the platform occurs with least expenditure of power and the strength of the operator is correspondingly saved. It will be further observed that if occasion requires the height of the main frame to be changed the construction of the parts is such as to permit the front end of the cutter-platform to be first set in new relation through the medium of its suspender $P^2$, according as the stand of grain may determine, after which the main frame can be shifted at the rear through its radius-arm $D' D^2$ and radius-link $c c'$ to properly level the whole cutter-platform in keeping with the height assigned to its front end at the outset. During the radial adjustment of the main frame the rear pivots for the cutter-platform necessarily participate in the movement, whereas at its front end the platform remains practically stationary, and is affected only so far as its suspender $P^2$ may be attached thereto farther and farther toward the rear and also in minor degree by the shift of tongue $F^8$, which raises or lowers as a part of the main frame, turning upon axle of leader-wheel K as a center. The tongue at point of suspension for the cutter-platform being comparatively remote from the arc of greatest movement imparts no material shift to the front of the platform. It appears, therefore, that the cutter-platform is independently pivoted both at front and rear of its transverse mid-length and that the platform can be raised or lowered and leveled by alternate adjustment of the front and rear sets of pivotal connections, one of which remains stationary during the change in height effected at the other.

For the purpose of enabling the driver to control the operation of the clutch-lever $C^3$ without leaving his station I have provided a rope $C^6$, attached to the outer end of the lever $C^3$, Figs. 2 and 4, and extending through a pulley $p^6$ at the bottom of the lever P, Fig. 3, up along the lever to a hand-latch $p^7$ at the upper end thereof, said rope being deflected near its rear end by a short rope $c^5$, fastened to the tongue $F^8$, Fig. 2. By pulling on the hand-latch $p^7$ the rope $C^6$ may be tightened to throw the clutch $C^2$ out of engagement with the hub of the pulley and stop the operation of the working parts of the header. In a similar manner the cord $N^3$, Figs. 3 and $3^a$, for releasing the latch N' is carried up through suitable guides and secured to a staple $p^8$ at the upper end of the lever P within convenient reach of the driver of the wagon.

For the purpose of partially counterbalancing the weight of the grain-platform and, to a great extent, the strain on the rope $P^2$ and the parts with which it is connected I provide devices as follows: Q designates a tubular bar, Figs. 1 and 2, bolted at its forward end upon tongue $F^8$, and also bolted to the top of the tubular cross-bar F, the greater length of the bar Q extending rearwardly from the said beam F. Q' designates a powerful coiled spring arranged along the top of the bar Q and adjustably secured at its rear to the rear end of said bar, the connection being in this instance formed by a screw-bolt $Q^2$, which passes through the upturned end $q$ of the bar and is provided with an adjusting-nut $q'$, to which the rear end coil of the spring Q' is fastened. The front end of the spring Q' is attached to a rope R, which extends over a pulley $q^2$, provided at the inner end of the bar Q, and thence downwardly to the rear of the platform A, to which it is rigidly secured, as at $R^{10}$, Fig. 4. The tension of the spring Q', exerted on the platform through the medium of the rope R, will obviously tend to lift the latter, and such tension may be adjusted at will by turning the bolt $Q^2$ at the rear end of the spring. The tension of the spring is not made sufficient to carry the entire weight of the platform, so that the height of the latter may be adjusted by means of the rope $P^2$, as hereinbefore explained, the spring yielding to permit the desired adjustment. In some cases it is necessary to drop the front edge of the grain-platform until almost in

contact with the ground, for which reason the forward ends of the supporting truss-beams $A^3$ and $A^4$ are flattened, as shown in Fig. 5ª, so as to extend as little as possible below the front edge of the platform, and the forward end of the bar $A^{16}$ is similarly flattened. For the same reason the front edge of the channel-bar $H^{10}$ at the inner end of the grain-platform, Fig. 1, is twisted at right angles at its forward end in order that the amount of its projection below the front edge of the platform A may be lessened at this point.

In the operation of the header it will be secured to the wagon by the bar M, as hereinbefore described, and will be drawn along in connection with said wagon until the box on the latter is completely filled with the cut grain. A single horse attached to the front end of the tongue by means of a singletree S will provide sufficient tractive force for drawing the header along and actuating its operating mechanism, the relative positions longitudinally of the header and wagon being maintained by properly controlling and guiding of such horse and of the horses attached to the wagon. Ordinarily every wagon which is to be used in connection with the header will be provided with its separate attaching-reach M, which, when the wagon is filled with grain, can be readily detached from the header without any stoppage of the wagon by drawing on the latch-cord $N^3$, and which, when so detached, may be readily moved endwise to lie across the front of the wagon-body by means of the lever $M^3$ in a manner hereinbefore described. Said reach may also be connected with the header without stopping the wagon by so guiding its outer end by means of the rod $M^4$ as to cause the hooks M′ to embrace the loop N at the rear thereof and then sliding said hooks forward on the loop until the upper hook strikes the latch N′, the stop-pawl $N^4$ lifting as the lower hook M′ passes beneath it and then dropping into place with its notch $n^5$ engaging said hook.

Obviously no special attendant for the header will be necessary, since the driver of a wagon without leaving his station in the fore part thereof may raise or lower the grain-platform of the header as desired or may at any instant throw the operative machinery of the header out of gear. In the improved construction shown, when the clutch $C^3$ is released the entire operative mechanism of the header simultaneously ceases its action, since the reel and elevator and cutting mechanism are all driven from the shaft C′, which will cease to rotate the instant the clutch $C^2$ is disengaged from the hub of the drive-wheel. The canvas of the belts being supported on rollers runs with but little friction and will be drawn more tightly as it is covered with grain by reason of the weight of the latter. The sickle being directly coupled to the pitman, a bearing is avoided at their point of connection, and by making the sickle of a flexible steel band its weight may be reduced to about one-fifth of the ordinary sickle. With the arrangement shown the pitman which drives the sickle is, moreover, of great length, so that its angular movement is small, and the friction on the sickle produced by reason of such angular movement is greatly reduced. Preferably, and as herein shown, the greater part of the framework of the header will be made of thin steel tubing, by means of which great strength is secured with exceedingly light weight. The machine, as shown, is furthermore braced and supported against strains in every direction and is little liable to get out of order or to require extensive repairs. Moreover, its construction is such that almost any of its parts may be repaired or replaced at the farm or local blacksmith-shop without requiring a visit to a regular machine-shop or the sending to the maker for duplicate parts.

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

1. In headers, the combination at the drive-wheel and with its power-shaft, of the radius-links centering loosely thereon, the counter-shaft pivotally carried at the free ends of said links parallel to and in gear with the power-shaft, the main frame and the cutter-platform pivoted loosely but separately upon the counter-shaft, suitable means to hold in unison said counter-shaft with the main frame and cutter-platform at various heights on adjustment of the radius-links around the power-shaft as a center, a driven shaft at the cutter-platform supported in mesh with the counter-shaft aforesaid and a suspender carried by the main frame to separately shift the cutter-platform, substantially as described.

2. In a header the combination with a main frame, comprising a transverse beam supported by the driving and grain wheels, and a forwardly-extending tongue resting upon such transverse beam at its rear end and supported at its forward end by a third wheel, of a grain platform and elevator the supporting-frame of which is pivotally hung below said transverse bar, a rope attached to the front of the platform and carried through a pulley on said tongue, an upwardly-inclined lever pivotally mounted at the front end of the tongue and to which the front end of said rope is attached, means for adjusting the position of said lever relative to the header-frame, and detachable connections adapted to secure the front end of the tongue to a wagon and hold the latter in correct position to receive the discharge from the elevator, the upper end of said lever being extended above the wagon whereby the height of the cutting apparatus above the ground may be regulated from the wagon by adjusting said lever, substantially as described.

3. In a header the combination with a framework comprising a transverse beam supported at opposite ends by the grain and driving wheels and a forwardly-extending tongue

attached at its rear to said transverse beam and mounted at its forward end upon a third wheel, of a grain platform and elevator the supporting-frame of which is pivotally attached at its rear end to said transverse bar, a rope attached to the front of the grain-platform and carried through a pulley on the tongue, an upwardly-inclined laterally-extended lever pivotally mounted at the front of the header-frame and to which the front end of said rope is secured, detachable connections adapted to secure the front end of the tongue to a wagon and hold the latter in correct position to receive the discharge of the elevator, a clutch mechanism between the driving-wheel and the operative mechanism of the header, a lever for releasing said clutch mechanism, and a rope secured to said lever and carried forward along the tongue and up the lever at the front thereof, the upper end of the lever being extended above the wagon whereby the height of the grain-platform and the operation of the operative parts of the header may be controlled from the wagon, substantially as described.

4. In a header the combination with a header-frame supported at its rear end upon driving and grain wheels and provided with a forwardly-extending tongue supported at its front end by a third wheel, a grain platform and elevator carried by the header-frame, and means for detachably connecting the front end of the tongue to a wagon to hold the latter in correct position to receive the discharge from the elevator, comprising a loop-shaped metallic strap secured at its ends to the opposite sides of the tongue, and a removable bar adapted to be connected with the wagon at its outer end and provided at its inner end with horizontally-projecting hooks adapted to embrace said loop between them, a pivoted stop-pawl within the loop adapted to engage the rear of the lower hook, a latch pivotally mounted within said loop and normally engaging the upper hook, a spring-catch at the rear of the loop normally holding said latch in operative position, and a cord attached to said latch and extending within reach of the driver of the wagon, substantially as described.

5. The combination with a header having a supporting-frame carried at its rear end by driving and grain wheels, and provided with a forwardly-extending tongue supported at its rear end by a third wheel, and a grain platform and elevator carried by said header-frame of a wagon into which the elevator is adapted to discharge the cut grain, of detachable connections between the wagon and the front end of the tongue comprising a bar adapted to detachably engage the tongue at its inner end, a forwardly-extending tubular bar on the front of the wagon, a metallic strap bolted to the end of the connecting-bar and adapted to hook over said tubular bar, an upwardly-projecting metallic loop between the sides of which said straps are placed and through which the connecting-bar is endwise movable, a lifting-lever pivotally attached to the end of the strap and by means of which the connecting-bar may be raised and moved endwise through said loop, a metallic loop on the front of the wagon through which said lever extends upwardly to within reach of the driver, and a rod pivotally attached to the inner end of the connecting-bar and extending outwardly upward to within reach of the driver, substantially as described.

6. A header the frame of which comprises a transverse beam supported at its outer end by a grain-wheel, a forwardly-extending tongue rigidly secured to said transverse beam and carried at its forward end upon a third wheel, and means for adjustably supporting the inner end of said transverse beam from the driving-wheel comprising parallel depending bars rigidly secured to said beam at their upper ends and provided at their lower ends with sleeves engaging a horizontal shaft, braces also secured to said sleeves and extending upward to the tongue of the header, radius-bars pivotally connecting said horizontal shaft with the shaft of the driving-wheel, a segment-bar bolted to one of said braces and to the adjacent depending bar, a lever sleeved on said horizontal shaft and adapted to adjustably engage said segment-bar, and an arm on said lever rigidly connected at its outer end with a part sleeved on the driving-shaft, whereby by adjusting said lever on said radius-bar the supporting-framework will be raised or lowered, substantially as described.

7. In a header, the combination with a framework comprising a transverse beam supported at opposite ends by the grain and driving wheels, and a forwardly-extending tongue attached at its rear end to said transverse beam and mounted at its forward end upon a third wheel, of a grain-platform the carrying-frame of which is pivotally supported at its rear from said transverse bar, adjustable connections between the front of the platform and the tongue for regulating the height of the platform above the ground, and means for counterbalancing the weight of the platform comprising a rearwardly-extending bar secured at its front end to the tongue and resting upon the transverse beam, and a tension-spring adjustably secured at its rear end to the rear end of said bar, a cord attached at its ends to the inner end of said spring and to the platform and a pulley at the inner end of the bar over which said cord is trained, substantially as described.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

HENRY C. BURMEISTER.

Witnesses:
HENRY W. CARTER,
JNO. W. ADAMS.